2005 Annual Report
St. Regis Paper Company and City Dump Pit Site
Cass Lake, Minnesota

March 2006

Prepared for:
US Environmental Protection Agency, Region 5

Prepared by:
International Paper Project Team:

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INTERNATIONAL PAPER

EPA Region 5 Records Ctr.
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Table of Contents

1.0 Introduction 1

2.0 Monitoring Activities 2
- 2.1 OU1 – Treating Facility Operable Unit 3
  - 2.1.1 Activities 3
  - 2.1.2 Water Levels 4
  - 2.1.3 Water Quality 4
- 2.2 OU2 – Containment Vault Operable Unit 4
  - 2.2.1 Activities 4
  - 2.2.2 Water Levels 4
  - 2.2.3 Water Quality 4
- 2.3 OU3 – City Dump Pit Operable Unit 5
  - 2.3.1 Activities 5
  - 2.3.2 Water Levels 5
  - 2.3.3 Water Quality 5
- 2.4 Extraction Wells 5
- 2.5 Groundwater Treatment System 6
  - 2.5.1 Activities 6
  - 2.5.2 Water Quality 6
- 2.6 Fish Hatchery Wells 7
- 2.7 Product Collection Activities 7

3.0 Monitoring Results 9
- 3.1 Groundwater Elevations 9
  - 3.1.1 OU1 – Treating Facility Operable Unit 9
  - 3.1.2 OU2 – Containment Vault Operable Unit 10
  - 3.1.3 OU3 – City Dump Pit Operable Unit 10
- 3.2 Water Quality 10
  - 3.2.1 OU1 – Treating Facility Operable Unit 11
  - 3.2.2 OU2 – Containment Vault Operable Unit 11
  - 3.2.3 OU3 – City Dump Pit Operable Unit 12
  - 3.2.4 Extraction Wells 12
  - 3.2.5 GAC Treatment System 12
  - 3.2.6 Fish Hatchery Well Monitoring 13
- 3.3 Vault Inspection 13
  - 3.3.1 Run-On and Runoff Control System 13
  - 3.3.2 Leachate Collection and Leak Detection System 13
  - 3.3.3 Benchmarks and Wells 14
  - 3.3.4 Security System 14
  - 3.3.5 Corrective Actions 14
- 3.4 Vault Dewatering Activities 14

4.0 Summary 16

5.0 Recommendations 17

6.0 Monitoring Plan for 2006 18

List of Tables

Table 1 2005 Monitoring Event Summary, St. Regis Paper Company and City Dump Pit Sites

Table 2 2005 NPDES and Performance Monitoring Event Summary, St. Regis Paper Company and City Dump Pit Sites

Table 3 Monthly Average Extraction Rate and Precipitation

Table 4 2005 Groundwater and Surface Water Elevations, St. Regis Paper Company Site

Table 5 Target Compound List and Target Quantitation Limits, St. Regis Paper Company Site

Table 6 Groundwater Quality Data, Shallow Surficial Aquifer, OU1 – Treating Facility Area, St. Regis Paper Company and City Dump Pit Sites

Table 7 Groundwater Quality Data, Base of Surficial Aquifer, OU1 – Treating Facility Area, St. Regis Paper Company and City Dump Pit Sites

Table 8 Groundwater Quality Data, Lower Aquifer, OU1 – Treating Facility Area, St. Regis Paper Company and City Dump Pit Sites

Table 9 Surface Water Quality Data, Cass Lake/Pike Bay Channel

Table 10 Groundwater Quality Data Over Time, OU1 – Treating Facility Area, St. Regis Paper Company and City Dump Pit Sites

Table 11 Groundwater Quality Data, Surficial Aquifer, OU2 – Containment Vault Area, St. Regis Paper Company and City Dump Pit Sites

Table 12 Groundwater Quality Data Over Time, OU2 – Containment Vault Area, St. Regis Paper Company and City Dump Pit Sites

Table 13 Groundwater Quality Data, Shallow Surficial Aquifer, OU3 – City Dump Pit Site

Table 14 Groundwater Quality Data, Base of Surficial Aquifer, OU3 – City Dump Operable Unit

Table 15 Groundwater Quality Data, Lower Aquifer, OU3 – City Dump Operable Unit

Table 16 Water Quality Data Over Time, OU3 – City Dump Pit Site

Table 17 Groundwater Quality Data, Surficial Aquifer, Extraction Wells, St. Regis Paper Company and City Dump Pit Sites

Table 18 Water Quality Data Over Time, Extraction Wells, St. Regis Paper Company and City Dump Pit Sites

Table 19 Water Quality Data, Pentachlorophenol, Groundwater Treatment System, St. Regis Paper Company and City Dump Pit Sites

Table 20 Water Quality Data, PAH Compounds, Groundwater Treatment System, St. Regis Paper Company and City Dump Pit Sites

Table 21 Water Quality Data, HxCDD, Groundwater Treatment System, St. Regis Paper Company and City Dump Pit Sites

Table 22 2005 Monthly Flow Rate, Groundwater Treatment System, St. Regis Paper Company and City Dump Pit Sites

Table 23 2005 Average Monthly pH Data, Groundwater Treatment System, St. Regis Paper Company and City Dump Pit Sites

Table 24 Groundwater Quality Data, Lower Aquifer, Fish Hatchery Wells

Table 25 Water Quality Data Over Time, Fish Hatchery Wells

Table 26 Leachate Elevations, OU2 – Containment Vault, St. Regis Paper Company and City Dump Pit Sites

Table 27 Benchmark Elevations, OU2 – Containment Vault, St. Regis Paper Company and City Dump Pit Sites

Table 28 Leachate Removal Summary, OU2 – Containment Vault, St. Regis Paper Company and City Dump Pit Sites

List of Figures

Figure 1 St. Regis Paper Company Site

Figure 2 Monitoring Well and Extraction Well Locations

Figure 3 Groundwater Elevations, Surficial Aquifer, May 2005

Figure 4 Groundwater Elevations, Lower Aquifer, May 2005

Figure 5 tPAH Distribution, Surficial Aquifer, May 2005

Figure 6 PCP Distribution, Surficial Aquifer, May 2005

Figure 7 Leachate Elevations, OU2 Containment Vault

List of Appendices

Appendix A Quality Control Review

Appendix B Laboratory Analytical Reports

Appendix C Containment Vault Inspection Forms

Appendix D Water Quality Trend Analysis

1.0 Introduction

This report has been prepared to fulfill the requirements of Section IX, Paragraphs 33, 34, and 35 of the January 24, 1995 Administrative Order (Order) issued by the U.S. Environmental Protection Agency pursuant to Section 106(a) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 as amended, (CERCLA) 42 U.S.C. § 9601 (a).

The January 24, 1995 Administrative Order designated the following operable units at the Site:

- OU1 (Treating Facility Operable Unit)
- OU2 (Containment Vault Operable Unit)
- OU3 (City Dump Pit Operable Unit)

These operable units are shown on Figure 1. Construction and implementation of the response actions at the Site began in 1985 and were completed in 1987. Operation and maintenance of the selected response actions are continuing.

This annual report summarizes the results of routine monitoring and maintenance activities at the St. Regis Paper Company site (Site) as described in the 2004 Annual Monitoring Report for the calendar year 2005.

2.0 Monitoring Activities

Monitoring at the Site was conducted in accordance with and as required by the following permits and plans:

- The January 24, 1995 Administrative Order (Order) issued by the U.S. Environmental Protection Agency pursuant to Section 106(a) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 as amended, (CERCLA) 42 U.S.C.§ 9601 (a).
- Recommendations of the 2004 Annual Monitoring Report.
- NPDES and State Disposal System Permit Program (April 1992).
- Draft Quality Assurance Project Plan, Revision 2, St. Regis Paper Company Sites, (March 1999).

Appendix A is a review of the monitoring data quality.

The geologic setting and hydrogeologic conditions at the Site are described in the following reports:

- Remedial Investigation/Alternatives Report (April 1985).
- Supplemental Remedial Investigation Report (July 1985).
- Groundwater Flow Model, Model Construction (May 1996).

Monitoring wells at the Site are identified according to the following numerical system, which depends on the screened interval of the well:

Screened Interval	Well Number		
	OU1	OU2	OU3
Monitoring Wells			
Surficial Aquifer – Top	1XX	124-130	21XX
Surficial Aquifer – Base	2XX	--	22XX
Lower Aqufier	3XX	--	23XX
Extraction Wells			
Surficial Aquifer	4XX	--	24XX
Observation/Scavenger Wells			
Surficial Aquifer	5XX	--	25XX

The monitoring wells at OU2 – Containment Vault (Wells 124 through 130) are screened throughout the saturated thickness of the surficial aquifer.

The following sections summarize the monitoring activities conducted in 2005 at each of the operable units. These monitoring activities consisted of measurement of groundwater elevations, collection of groundwater and surface water samples, and inspection and dewatering of the containment vault. Tables 1 and 2 summarize the sampling events conducted in 2005 and the locations monitored during each sampling event. The locations of the monitoring and extraction wells, and the fish hatchery wells at or associated with the Site are shown on Figure 2.

2.1 OU1 – Treating Facility Operable Unit

2.1.1 Activities

The operation of the treating facility operable unit extraction system remained essentially the same as preceding years. Approximate annual average pumping rates for each well were as follows:

Extraction Well	2003 Pumping Rate [gpm]	2004 Pumping Rate [gpm]	2005 Pumping Rate [gpm]
401	6	4.8	4.1
402	4	5.4	5.3
403	4	3.7	5.2
404	0	0	0
405	17	18.9	18.3
406	4	3.9	2.9
407	8	8.1	5.2
408	9	6.7	4.8
409	11	14.0	15.6
410	6	5.1	4.2
Total	69	70.6	~~65.7~~ 65.6

Summary and Table 3

The extraction system was maintained as described in the *Operation and Maintenance Plan, St. Regis Paper Company Site, Cass Lake, Minnesota*, dated March, 1995. Table 3 presents the average pumping rate by month for each of the remediation wells, along with the monthly precipitation.

2.1.2 Water Levels

Table 4 lists water levels measured at monitoring wells and staff gages in May at the treating facility operable unit as indicated in Table 1. The difference between the north and south staff gages was very high, and resurvey of the gages showed that the north gage had shifted. All monitoring stations are being resurveyed in early 2006.

2.1.3 Water Quality

Water samples were collected from monitoring wells, extraction wells and the channel connecting Pike Bay and Cass Lake during 2005. Groundwater samples were collected in May from wells screened in the surficial aquifer (top and bottom) and the lower aquifer. Samples were analyzed for pentachlorophenol (PCP) and the polyaromatic hydrocarbon (PAH) compounds listed in Table 5. The results are in Tables 6 through 8.

Surface water samples were collected in May at the north end (CL-N) and south end (CL-S) of the channel connecting Cass Lake and Pike Bay. The samples were analyzed for PCP (Table 9).

Table 10 presents historical water quality data for OU1.

2.2 OU2 – Containment Vault Operable Unit

2.2.1 Activities

The contaminated soil containment vault was inspected on May 11 and November 2, 2005. Results of the inspection are discussed in Section 3.3 of this report. Vault dewatering activities resumed as described in the September 17, 2001 Updated Leachate Disposal Plan. Approximately 10,700 gallons of water was removed from the vault between October 2 and November 5, 2005.

2.2.2 Water Levels

Water levels at the vault monitoring wells were measured in May as indicated in Table 1. Water elevations are provided in Table 4. All monitoring stations are being resurveyed in early 2006.

2.2.3 Water Quality

Vault monitoring wells were sampled in May and analyzed for PCP and the PAH compounds listed in Table 5. The results are in Tables 11 and 12.

2.3 OU3 – City Dump Pit Operable Unit

2.3.1 Activities

Calculated pumping rates for each well were as follows:

Extraction Well	2003 Pumping Rate [gpm]	2004 Pumping Rate [gpm]	2005 Pumping Rate [gpm]
2401	5	7.6	4.2
2402	15	14.6	16.1
2403	18	19.6	14.6
Total	38	41.9	34.9

The extraction system was maintained as described in the *Operation and Maintenance Plan, St. Regis Paper Company Site, Cass Lake, Minnesota*, dated March 1995. Table 3 presents the average pumping rate by month for each of the remediation wells, along with the monthly precipitation.

2.3.2 Water Levels

Water levels were measured in monitoring wells at the city dump pit operable unit in May as indicated in Table 1. Water elevations are provided in Table 4. All monitoring stations are being resurveyed in early 2006.

2.3.3 Water Quality

Groundwater samples were collected in May from wells screened in the surficial aquifer (top and bottom) and lower aquifer. The groundwater samples were analyzed for PCP and the PAH compounds listed in Table 5. The results are in Tables 13 through 16.

2.4 Extraction Wells

Groundwater samples were collected from the extraction wells at the treating facility operable unit in May. The samples were analyzed for PCP and the PAH compounds listed in Table 5. The results are in Tables 17 and 18.

2.5 Groundwater Treatment System

The extracted groundwater is treated prior to discharge to the Cass Lake/Pike Bay Channel to meet limits in accordance with NPDES and State Disposal System Permit No. MN0056537 and reporting agreement with EPA[1]. The groundwater treatment system utilizes granular activated carbon and consists of three 20,000 lbs carbon units operated in series. The carbon units are designated Adsorber "A", Adsorber "B", and Adsorber "C".

2.5.1 Activities

Carbon system was operated as indicated below:

Date	Primary	Secondary	Tertiary
Begin 2005	A	B	C
Change out A on 1/28/06	B	C	A
Change out B on 8/17/06	C	A	B
End 2005	C	A	B

During change-out, the spent carbon was removed from the primary adsorber and replaced with regenerated carbon. After change-out, the primary vessel is switched to the tertiary position, the tertiary vessel is switched to the secondary position, and the secondary vessel becomes the primary. The spent carbon was dewatered on-site and then loaded and transported to the Envirotrol facility located in Beaver Falls, Pennsylvania for regeneration. Regenerated carbon is returned and reused at the site as needed.

2.5.2 Water Quality

2.5.2.1 NPDES Required Monitoring

Influent and effluent samples were collected as required by the NPDES and State Disposal System Permit No. MN0056537. One sample of effluent was analyzed each month for PCP (Table 19). Effluent samples were collected in January, April, July, and October and analyzed for PAH

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[1] Agreement between Mr. John Colletti of U.S. EPA Region 5 and Tom Ross of International Paper, February 18, 2004.

compounds and quinoline (Table 20). Influent samples were collected in January, April, July, and October and analyzed for hexachlorodibenzo- p-dioxin (Table 21). Water flow rate and pH were measured continuously; these data are summarized in Tables 22 and 23 respectively.

Per agreement with EPA[2], no fish collection is required under this Permit due to the ongoing evaluation of fish tissue under Docket No. V-W-'04-C-796.

2.5.2.2 GAC Performance Monitoring

In addition to the NPDES monitoring, samples were collected from the influent and the effluent from each adsorber and analyzed for PCP monthly (Table 19). This information was used to evaluate PCP breakthrough and plan for GAC change-out.

2.6 Fish Hatchery Wells

A groundwater sample was collected from the Fish Hatchery's south production well (Fish 4) on May 9, 2005 (Table 24) and was analyzed for PCP and the PAH compounds listed in Table 3. Table 25 provides a comparison of the 2005 results with historical results from the fish hatchery wells.

2.7 Product Collection Activities

Product monitoring and collection activities are described in the Free Product Recovery/Reuse Plan, April 1993. These monitoring and collection activities were conducted on May 13, 2005. Product levels were measured with an interface probe and a disposable bailer was used to recover the product. The product collection activities are summarized in the following table:

Well ID	Product Level [feet TOR]		Groundwater Level [feet TOR]		Product Thickness [feet]		Recovered Product [Liters]
	Initial	Final	Initial	Final	Initial	Final	
OU3 – City Dump Pit Area							
W2105	19.43	19.54	23.48	19.54	4.05	~ 0	3.125
W2104	14.77	---	14.88	---	0.11	---	0
W2103	15.89	---	15.89	---	Film	---	0

[2] Letter from Jo Lynn Traub of U.S. EPA Region 5 to Tom Ross of International Paper, dated June 17, 2004

Well ID	Product Level [feet TOR]		Groundwater Level [feet TOR]		Product Thickness [feet]		Recovered Product [Liters]
	Initial	Final	Initial	Final	Initial	Final	
W2102	None	NA	NA	NA	NA	NA	NA
W2504	7.34	7.39	8.15	7.48	0.81	0.09	0.75
S2401	9.7	9.72	9.78	9.74	0.08	0.02	9
S2402	7.23	7.35	7.3	7.37	0.07	0.02	11
S2403	None	NA	NA	NA	NA	NA	NA
OU1 – Treating Facility Area							
SO401	None	NA	NA	NA	NA	NA	NA
SO402	None	NA	NA	NA	NA	NA	NA
SO403	None	NA	NA	NA	NA	NA	NA
SO405	None	NA	NA	NA	NA	NA	NA
W118	17.16	---	17.26	----	0.1	0.1	0
W506	None	NA	NA	NA	NA	NA	NA
W507	None	NA	NA	NA	NA	NA	NA
Total							**23.9**

TOR – top of riser --- No measurement

Recovered product was placed in the storage tank at the Water Treatment building located at OU1. A total of approximately 150 gallons have been collected over the 11-year period.

3.0 Monitoring Results

3.1 Groundwater Elevations

Groundwater flow patterns at the treating facility, containment vault, and city dump pit operable units are summarized in the following sections. Groundwater elevations measured at each operable unit are summarized in Table 4.

3.1.1 OU1 – Treating Facility Operable Unit

The water table contours shown for the surficial aquifer (Figure 3) and the potentiometric levels for the lower aquifer (Figure 4) indicate that the general flow pattern is consistent with those observed in the past. The groundwater elevations in wells east of the channel indicate that the groundwater is flowing in a south-westerly direction (i.e., toward the extraction wells and Pike Bay).

"easterly" means "from the east"

One of the recommendations coming out of the USEPA's Amendments to the O&M Plan for the site (August 15, 2005 letter to Tom Ross) is to construct water table maps using consistent methods. Various methods of presenting the water level data are being evaluated, and a method will be proposed in a later submittal. In addition, several significant modifications of the monitoring system are proposed for 2006, aimed at filling some data gaps and at replacing monitoring points that have apparently provided anomalous data in the past.

Groundwater elevation contours of the 2005 data were generated using tools contained in the 3D Analyst extension for ArcMap 9.0. There are several options for contouring data; a natural neighbor approach was selected because it provided the most physically reasonable results. The algorithm works by creating a set of Thiessen polygons that bound the data points. The user specifies a grid spacing to create an array of target points for which the elevation will be estimated. This grid of target points is added to the existing data set, which modifies the geometry of the existing Thiessen polygons. The area associated with the target's Thiessen polygon that was taken from an existing polygon is called the "borrowed area." To estimate the value of the target point, the algorithm uses a weighted average of the neighboring observations, where the weights are proportional to the "borrowed area." The natural neighbor method does not extrapolate contour lines beyond the outline of the outermost Thiessen polygons.

Groundwater flow lines were generated using the Groundwater tools package in Spatial Analyst for ArcMap 9.0. The user supplies data files containing the spatial distribution of groundwater

elevations, effective porosity, saturated thickness, and transmissivity. The Darcy Flow tool then calculates the magnitude and direction of the groundwater flow field at points along a user specified grid. The Particle Track tool was then used to generate flow lines based on the calculated flow field. The Particle Track tool allows the user to specify the starting point of a particle and the length of time to track that particle. For the flow lines generated for this report, the tracking time was set to infinity and the starting locations were selected to obtain a reasonably uniform distribution of flow lines across the site. The Darcy Flow tool was unable to generate a flow field for the northern part of the site between Cass Lake and Pike Bay, probably because there are very few data points in that area and the gradient is very flat. Flow lines were drawn by hand in this area. Plans for the site in 2006 include installation of a well (proposed well 222) to provide an additional data point.

3.1.2 OU2 – Containment Vault Operable Unit

The water table contours shown for the surficial aquifer (Figure 3) indicate that the groundwater flow direction in the surficial aquifer is toward the southeast, which is the natural groundwater flow direction. Previous groundwater elevation data indicate that the flow direction may switch between southeast and southwest dependant on the use of the Fish hatchery's production well system.

3.1.3 OU3 – City Dump Pit Operable Unit

The water table contours shown for the surficial aquifer (Figure 3) and potentiometric levels for the lower aquifer (Figure 4) indicate that the flow patterns are generally consistent with those observed in the past.

3.2 Water Quality

Samples from monitoring wells and surface water stations at the Site were collected and analyzed according to procedures specified in the Draft QAPP, Revision 2. A review of the quality control data is provided in Appendix A. Laboratory analytical reports for sampling performed in 2005 are contained in Appendix B. Analytical data tables are provided in the Tables section, which summarize the parameters and concentrations at each location. Parameters listed with a "<" symbol followed by a value were not detected in the sample at the method quantitation limit (i.e., value). The following sections summarize the analytical results of samples collected at the Site during the calendar year 2005.

3.2.1 OU1 – Treating Facility Operable Unit

The analytical results of samples collected from monitoring wells screened in the surficial aquifer at the treating facility operable unit are summarized in Table 6 (top of surficial aquifer). Parameter concentrations in the samples from Wells 105, 114 and 115 are below the Response Actions Limits (RAL) established in the Minnesota Enforcement Decision Document (MEDD).

The analytical results of samples collected from monitoring wells screened at the base of the surficial aquifer are summarized in Table 7. Parameter concentrations in samples from Wells 212, 213, 215, 219 and 220 exceed certain RALs established in the MEDD. The groundwater quality data continue to indicate a steady to decreasing trend over time at these locations.

Table 8 summarizes the analytical results of the samples collected from the lower aquifer monitoring wells at the treating facility operable unit. As is typical, PAH compounds and PCP were not detected in lower aquifer groundwater samples, with the exception of trace detection of a single compound (fluoranthene).

Water quality results and contours are plotted on Figures 5 and 6. The extents indicated by the 2005 data are comparable to historic results, and indicate the remediation systems performed adequately in 2005.

The analytical results for surface water samples collected from the north end and south end of the channel connecting Cass Lake and Pike Bay during the May 2005 sampling event are summarized in Table 9. PCP was not detected (<0.5 μg/l) in either surface water sample, which is typical.

Table 10 summarizes the analytical data for the cPAH, nPAH and PCP concentrations at each monitoring station over time. The 2005 data are consistent with historical trends, as shown on the plots of concentration over time in Appendix D.

3.2.2 OU2 – Containment Vault Operable Unit

The analytical results of samples collected from the containment vault monitoring wells are summarized in Table 11; all parameters were below detection limits in all samples. Table 12 summarizes the analytical data for the cPAH, nPAH and PCP concentrations in each well over time. Typical results are below detection or very near detection limits, so there is no indication of a trend of increasing concentrations in the data from any well.

3.2.3 OU3 – City Dump Pit Operable Unit

The analytical results of samples collected in 2005 from the monitoring wells screened in the surficial aquifer at the city dump pit operable unit are summarized in Table 13. Parameter concentrations in samples collected from groundwater monitoring wells screened in the surficial aquifer are below the Response Action Levels established in the MEDD except well 2128.

Results from the sample collected at the base of the surficial aquifer at the city dump operable unit (Well 2234) are summarized in Table 14. PAH compounds and PCP were not detected in this sample.

Table 15 summarizes the analytical results of the samples collected from wells screened in the lower aquifer at the city dump operable unit. Naphthalene was detected in the samples from wells 2301 and 2326 and a low concentration of acenaphthene was detected in the sample from 2326; all results were below the RALs. These wells are upgradient of the former city dump pit.

Water quality results and contours are plotted on Figures 5 and 6.

Table 16 summarizes the analytical data for the cPAH, nPAH and PCP concentrations in each well over time. The results from 2005 are consistent with historical results, as shown on the plots of concentration over time in Appendix D.

3.2.4 Extraction Wells

The analytical results of the sample collected from the extraction wells at OU1 are summarized in Table 17. Table 18 summarizes the analytical data for the PCP concentrations in each extraction well over time. The 2005 water quality data are consistent with historical results, as shown on the plots of concentration over time in Appendix D.

3.2.5 GAC Treatment System

The analytical results of samples collected from the influent and effluent of the carbon treatment system are summarized in Tables 19 through 23. Quarterly monitoring of the effluent indicates that PAH compounds are below the water quality standards for Class 2B State waters (Table 20). Analytical results of 2005 effluent samples show the PCP concentrations were below the permit limit of 8 μg/L for all effluent samples (Table 19).

Influent PCP concentration to the treatment plant ranged from 2,100 to 2,700 μg/L with an average concentration of approximately 2,400 μg/L. This is consistent with historic results.

Influent at the carbon treatment system was analyzed for hexachlorodibenzo-p-dioxin (HxCDD) in January, April, July, and October, and the data are summarized in Table 21. Hexachlorodibenzo-p-dioxin was not detected in any influent sample.

Flow rates and effluent pH were measured continuously at the carbon treatment system throughout the year. The monthly volume and effluent pH data are presented in Tables 22 and 23, respectively.

The flow rate and concentration data were used to estimate the mass of PCP and PAHs removed by the carbon treatment system. The annual mass recovered was relatively high for the first few years, dropped, and has remained fairly steady since about 1991. The estimated mass removed is shown below:

Water Volume		PCP		PAHs	
2005 [10^6 gallons]	Historical Total [10^6 gallons]	2005 [kg]	Historical Total [kg]	2005 [kg]	Historical Total [kg]
52.9	1,033	472	11,066	134	3,875

3.2.6 Fish Hatchery Well Monitoring

The analytical results of the sample collected from the Fish Hatchery's south production well are summarized in Table 24. All monitoring parameters (including PCP) were not detected in the groundwater sample. These analytical results are consistent with previous data (Table 25).

3.3 Vault Inspection

The vault was inspected on May 11 and November 2, 2005. A copy of the completed vault inspection forms are contained in Appendix C. The inspection did not identify any deficiencies.

3.3.1 Run-On and Runoff Control System

The run-on and runoff control systems were clear of debris. The systems contained adequate vegetation and no standing water or erosion was present. No deficiencies of the systems were noted.

3.3.2 Leachate Collection and Leak Detection System

Leachate is present in the leachate collection manhole (LCM) and leak detection manhole (LDM). The leachate elevations were recorded during the vault inspections and are summarized in Table 26.

The LCM and LDM are covered and no damage to either manhole was noted.

3.3.3 Benchmarks and Wells

The benchmarks and protective posts were not damaged and did not show signs of deterioration. Benchmarks were surveyed on May 6, 2005. The elevations are listed in Table 27 and are consistent with previous measurements. The wells and protective posts also were not damaged. The metal caps are in place and locked. No deficiencies were identified.

3.3.4 Security System

The chain link fence and vehicle gate were not damaged. The gate is locked when not attended. No deficiencies in the security system were identified.

3.3.5 Corrective Actions

No corrective actions were necessary in this time period.

3.4 Vault Dewatering Activities

Vault dewatering activities were conducted in October and November 2005. Approximately 10,700 gallons of water were removed from the vault in accordance with the approved leachate disposal plan. Flow meter readings and leachate elevations for this event are summarized in Table 28. The volume of leachate removed from the vault since the vault was closed in 1987 is:

Year	Volume [gallons]
1987 – 1988	1,216,000
1992	164,000
2001	129,500
2002	27,500
2003	17,100
2004	10,500
2005	10,700
Total	1,575,300

Leachate elevations recorded over time are plotted on Figure 7. Each dewatering event is marked by a rapid lowering of the water level in the leachate collection system. The water levels show a rapid recovery period followed by a slower but steady increase in the water levels. The rapid recovery is

attributed to water within the drainage layer flowing to the collection system sump. The slower but steady increase is attributed to continued drainage of pore water from the previously water-saturated soils. After vault closure in 1987, the initial water levels indicate that the lower 14 feet of soil contained in the vault was water-saturated. This soil will continue to release its excess pore water and this water continues to accumulate at a slow rate in the collection system. Therefore, leachate levels should continue to be monitored, and removed from the vault as practicable.

4.0 Summary

Monitoring at the Site in 2005 was completed in accordance with the requirements of the permits and monitoring plans listed in Section 2.0. A summary of the monitoring results are listed below:

- PAH compounds and PCP are the indicator chemicals from former operations at the Site.
- Decreasing concentration trends over time of PAH compounds and PCP continue to be observed at the Site.
- Reported concentrations of PAH compounds in samples collected from the lower aquifer at the Site are consistent with historical values. Reported concentrations are below the RALs specified in the MEDD.
- PCP was not detected in any vault monitoring well sample during 2005.
- The carbon treatment system effectively removed PCP and PAH compounds from the extracted groundwater at the Site. HxCDD was not detected in the influent samples collected from the water treatment system.
- The carbon treatment system has removed approximately 11,000 kg of PCP and 3,900 kg of PAH compounds from approximately 1.0 billion gallons of water over its operational lifetime.
- A total of approximately 150 gallons of liquid product have been recovered over an 11-year period, including 6.3 gallons in 2005.
- Approximately 10,700 gallons of water was removed from the vault in 2005, bringing the total volume removed to approximately 1,575,000 gallons.

5.0 Recommendations

1. Continue operation of the groundwater extraction and treatment systems in accordance with the Order, the MDNR water appropriation permit, the NPDES permit, and the recommended 2006 monitoring plan (Section 6).

2. Continue monitoring of water level elevations and water quality in accordance with the recommended 2006 monitoring plan (Section 6).

3. Maintain the extraction and groundwater treatment system components (i.e., pumps, valves, piping, flow meters) as necessary, according to the *Operation and Maintenance Plan, St. Regis Paper Company Site, Cass Lake, Minnesota*, dated March, 1995.

4. Continue monitoring and recovery of free product as described in the Free Product Recovery/Reuse Plan, April 1993.

5. Periodically pump water from the vault as it accumulates in the manholes. Water levels are recorded during each vault inspection.

6.0 Monitoring Plan for 2006

The USEPA completed a review of the historical project monitoring and performance, and made several recommendations and required changes to the monitoring system in the Amendments to the O&M Plan for the Site dated August 15, 2005. In response, a Hydraulic Capture Zone Monitoring Plan was submitted to USEPA on January 20, 2006 (e-mail from Tom Mattison of Barr Engineering Co.). This plan focuses on improving the site monitoring system. USEPA provided comments on the plan on February 16, 2006, and a revised Hydraulic Capture Zone Monitoring Plan was provided on March 15, 2006. The monitoring program will incorporate the modifications as they are completed at the site.

A draft of the Annual Monitoring Plan was submitted to the U.S. EPA on January 6, 2006. U.S. EPA provided comments on this draft plan in a March 7, 2006 email. The Annual Monitoring Plan is currently being revised and will be submitted as a separate document along with the revised Quality Assurance Project Plan and Field Sampling Plan.

Tables

Table 1
2005 Monitoring Event Summary
St. Regis Paper Company and City Dump Pit Sites
Cass Lake, Minnesota

Operable Unit	Screened Interval	Location	Category	Second Quarter					
				Water Elevation	PAHs		PCP		
				2nd Qtr. '05	Std	Low	Std	Low	8151
OU1-Treating Facility Area	Top of Surficial	MW104	P	X		X		X	
		MW105	P	X		X			X
		MW112	P	X		X			X
		MW113	Screen collapsed						
		MW114	I	X		X			X
		MW115	I	X		X			X
		MW118	O	X					
	Bottom of Surficial	MW205	P	X		X			X
		MW209	P	X		X			X
		MW212	I	X		X		X	
		MW213	I	X		X			X
		MW215	I	X		X		X	
		MW217	P	X		X			X
		MW218	P	X		X		X	
		MW219	P	X		X			X
		MW220	I	X		X			X
		MW221	P	X		X			X
	Lower Aquifer	MW3	P	X		X			X
		MW302	P	X		X			X
		MW306	I	X		X			X
	Pump-out Wells	W401	P		X		X		
		W402	P		X		X		
		W403	P		X		X		
		W404							
		W405	P		X		X		
		W406	P			X			X
		W407	P			X			X
		W408	I		X		X		
		W409	P		X		X		
		W410	P		X		X		
		MW411	P	X		X		X	
	Observation Wells	MW501		X					
		MW502		X					
		MW503		X					
		MW504		X					
		MW505		X					
		MW506		X					
		MW507		X					
		MW508		X					
	Special Observation Wells	SO401	O	X					
		SO402		X					
		SO403		X					
		SO405		X					
	Channel	CL-N	I						X
		CL-S	I						X
		Hwy 2 Staff		X					
		RR Staff		X					
		South Staff		X					

Table 1
2005 Monitoring Event Summary
St. Regis Paper Company and City Dump Pit Sites
Cass Lake, Minnesota

Operable Unit	Screened Interval	Location	Category	Second Quarter					
				Water Elevation	PAHs		PCP		
				2nd Qtr. '05	Std	Low	Std	Low	8151
OU2 - Containment Vault Area	Upper Aquifer	MW124	I	X		X			X
		MW125	I	X		X			X
		MW126	I	X		X			X
		MW127	P	X		X			X
		MW128	I	X		X			X
		MW129	I	X		X			X
		MW130	I	X		X			X
OU3 - City Dump Pit Area	Top of Surficial	MW2102	O	X					
		MW2103	O	X					
		MW2104	O	X					
		MW2105	O	X					
		MW2106	O	X					
		MW2127	I	X		X			X
		MW2128	P	X		X			X
		MW2129	I	X		X			X
		MW2134	P	X		X			X
		MW2135	I	X		X			X
	Bottom of Surficial	MW2234	I	X		X			X
	Lower Aquifer	MW2301	P	X		X			X
		MW2325	P	X		X			X
		MW2326	P	X		X			X
		MW2329	P	X		X			X
		MW2333	P	X		X			X
		MW2335	I	X		X			X
	Pump-out Wells	W2401	P		X		X		
		W2402	P		X		X		
		W2403	P		X		X		
	Scavenger Wells	S2401	O	X					
		S2402	O	X					
		S2403	P	X					
	Observation Wells	MW2501		X					
		MW2502		X					
		MW2503		X					
		MW2504		X					
Additional Wells	HatcheryWells	Fish 1							
		Fish 2							
		Fish 3							
		Fish 4	I			X			X

Category

I - Indicator Monitoring Program (Annual Sampling)

P - Performance Monitoring Program (Bi-annual Sampling)

O - Oil Monitoring and Recovery Program

Table 2

2005 NPDES and Performance Monitoring Event Summary
St. Regis Paper Company and City Dump Pit Sites
Cass Lake, Minnesota

Month	PCP				PAHs	Quinoline	HxCDD	HxCDD
	Influent	Primary	Secondary	Effluent	Effluent	Effluent	Influent	Fish
EPA Method	8151				8270-SIM	8270-SIM	8280	8290
01/03/2005	X	X	X	X	X	X	X	–
02/07/2005	X	X	X	X	–	–	–	–
03/07/2005	X	X	X	X	–	–	–	–
04/05/2005	X	X	X	X	X	X	X	–
05/03/2005	X	X	X	X	–	–	–	–
06/07/2005	X	X	X	X	–	–	–	–
07/05/2005	X	X	X	X	X	X	X	–
08/22/2005	X	X	X	X	–	–	–	–
09/13/2005	X	X	X	X	–	–	–	–
10/11/2005	X	X	X	X	X	X	X	–
11/29/2005	X	X	X	X	–	–	–	–
12/13/2005	X	X	X	X	–	–	–	–

Flow rate and pH are measured continuously.

Table 3

Monthly Average Extraction Rate and Precipitation
Extraction Wells
St. Regis Paper Company Site

Year: 2005

[in gallons per minute (gpm)]

	401	402	403	404	405	406	407	408	409	410	2401	2402	2403	Monthly Average	Monthly Precipitation [1] [inches]
Jan-05	2	6	3	--	16	4	9	4	12	5	3	15	16	94	1.76
Feb-05	6	6	4	--	20	3	10	5	17	7	3	17	21	120	0.45
Mar-05	7	6	4	--	20	2	8	5	17	6	3	17	18	114	0.69
Apr-05	6	5	4	--	20	5	5	5	17	6	3	16	20	112	1.17
May-05	5	6	4	--	20	4	4	5	16	5	8	15	18	110	3.66
Jun-05	5	6	3	--	19	3	4	5	12	2	9	15	16	99	4.47
Jul-05	4	5	4	--	18	2	5	4	15	5	6	15	14	97	1.18
Aug-05	4	5	6	--	17	1	5	4	15	6	4	17	12	95	2.64
Sep-05	3	5	7	--	18	3	4	5	17	4	3	18	12	101	1.87
Oct-05	3	5	7	--	18	4	3	5	17	3	3	17	11	95	3.19
Nov-05	3	5	7	--	17	3	3	5	17	2	3	17	10	90	4.32
Dec-05	2	5	7	--	17	1	3	4	17	1	3	16	9	85	1.15
Yearly Average	4.1	5.3	5.2	--	18.3	2.9	5.2	4.8	15.6	4.2	4.2	16.1	14.6	100.7	26.55

[1] Station: 211374 Cass Lake. http://climate.umn.edu/HIDradius/radius.asp

Table 4
2005 Groundwater and Surface Water Elevation
St. Regis Paper Company and City Dump Pit Sites
Cass Lake, Minnesota

Location	Water Elevation 5/04/05 (ft. MSL)	Location	Water Elevation 5/04/05 (ft. MSL)
OU1 - Treating facility Area		**OU2 - Contaminant Vault Area**	
W104	1302.47	W124	1304.52
W105	1301.80	W125	1304.69
W112	1301.14	W126	1304.15
W114	1301.16	W127	1304.21
W115	1300.64	W128	1304.29
W118	1302.81	W129	1304.51
W205	1301.38	W130	1304.08
W209	1301.88		
W212	1301.04	**OU3 - City Dump Pit Area**	
W213	1300.79	W2102	1302.63
W215	1300.98	W2103	1302.47
W217	1301.50	W2104	1302.37
W218	1302.93	W2105	1302.26
W219	1300.91	W2106	1302.06
W220	1300.68	W2127	1301.87
W221	1301.54	W2128	1301.65
W411	1301.39	W2129	1301.08
MW3	1305.39	W2134	1302.13
W302	1304.54	W2135	1302.03
W306	1301.44	W2234	1302.11
W501	1301.54	W2301	1302.92
W502	1301.51	W2325	1303.15
W504	1301.71	W2326	1302.94
W505	1301.25	W2329	1302.33
W506	1301.50	W2333	1302.73
W507	1301.15	W2335	1302.12
W508	1301.29	W2501	1302.51
S401	1302.91	W2502	1302.07
S402	1301.62	W2503	1302.87
S403	1302.43	W2504	1302.06
S405	1301.56	S2401	1302.51
South Staff	1300.3	S2402	1303.25
RR Staff	1300.7	S2403	1303.05
North Staff	1301.5	W2401	1280.84
		W2402	1296.85
		W2403	1283.13

Table 5
Target Compound List and Target Quantitation Limits
St. Regis Paper Company and City Dump Pit Sites
Cass Lake, Minnesota

Compound	CAS Number	Target Quantitation Limits Water Standard [µg/l]	Target Quantitation Limits Water Low-Range [µg/l]
Routine Monitoring			
EPA Method		**8270**	**8270-SIM**
cPAHs			
Benzo(a)anthracene	56553	10	0.02
Chrysene	210819	10	0.02
Benzo(b)fluoranthene	205992	10	0.02
Benzo(k)fluoranthene	207089	10	0.02
Benzo(a)pyrene	50328	10	0.02
Indeno(1,2,3-cd)pyrene	193395	10	0.02
Dibenzo(a,h)anthracene	53703	10	0.02
Quinoline	91225	10	0.02
nPAHs			
Naphthalene	91203	10	0.02
Acenaphthylene	208968	10	0.02
Acenaphthene	83329	10	0.02
Fluorene	86737	10	0.02
Phenanthrene	851018	10	0.02
Anthracene	120127	10	0.02
Fluoranthene	206440	10	0.02
Pyrene	129000	10	0.02
Benzo(g,h,i)perylene	191242	10	0.02
Pentachlorophenol	87865	50	3
EPA Method		**8151**	
Pentachlorophenol	87865	0.5	

Compound	CAS Number	Target Quantitation Limits Water [µg/l]
NPDES and GAC Performance Monitoring		
EPA Method		**8270-SIM**
cPAHs		
Benzo(a)anthracene	56553	0.02
Chrysene	210819	0.02
Benzo(b)fluoranthene	205992	0.02
Benzo(k)fluoranthene	207089	0.02
Benzo(a)pyrene	50328	0.02
Indeno(1,2,3-cd)pyrene	193395	0.02
Dibenzo(a,h)anthracene	53703	0.02
Quinoline	91225	0.02
nPAHs		
Naphthalene	91203	0.02
Acenaphthylene	208968	0.02
Acenaphthene	83329	0.02
Fluorene	86737	0.02
Phenanthrene	851018	0.02
Anthracene	120127	0.02
Fluoranthene	206440	0.02
Pyrene	129000	0.02
Benzo(g,h,i)perylene	191242	0.02
EPA Method		**8151**
Pentachlorophenol	87865	0.5
EPA Method		**8280**
HxCDD (Total)	19408743	1.7E-03
EPA Method		**8290**
HxCDD (Fish) [mg/kg]	19408743	2.6E-06

Table 6
Groundwater Quality Data
Shallow Surficial Aquifer
OU1 - Treating Facility Area
St. Regis Paper Company and City Dump Pit Sites
Cass Lake, Minnesota
(concentrations in ug/L)

	Response Action Levels	W104 GW0187 5/14/2005	W105 GW0150 5/7/2005	W112 GW0169 5/8/2005	W114 GW0172 5/7/2005	W115 GW0173 5/7/2005
Benzo(a)anthracene	–	<0.020	<0.021	<0.020	<0.021	<0.022
Chrysene	–	<0.020	<0.021	<0.020	<0.021	<0.022
Benzo(b)fluoranthene	–	<0.020	<0.021	<0.020	<0.021	<0.022
Benzo(k)fluoranthene	–	<0.020	<0.021	<0.020	<0.021	<0.022
Benzo(a)pyrene	–	<0.020	<0.021	<0.020	<0.021	<0.022
Indeno(1,2,3-cd)pyrene	–	<0.020	<0.021	<0.020	<0.021	<0.022
Dibenz(a,h)anthracene	–	<0.020	<0.021	<0.020	<0.021	<0.022
Quinoline	–	0.085	<0.021	<0.020	<0.021	<0.022
Σ(cPAH)	0.028	**0.085**	ND	ND	ND	ND
Naphthalene	–	1.7	<0.021	<0.020	<0.021	<0.022
Acenaphthylene	–	0.16	<0.021	<0.020	<0.021	<0.022
Acenaphthene	–	5.6	<0.021	<0.020	<0.021	<0.022
Fluorene	–	6.4	<0.021	<0.020	<0.021	<0.022
Phenanthrene	–	1.6	<0.021	<0.020	<0.021	<0.022
Anthracene	–	0.29	<0.021	<0.020	<0.021	<0.022
Fluoranthene	–	<0.020	0.044	0.10	<0.021	<0.022
Pyrene	–	<0.020	0.035	0.086	<0.021	<0.022
Benzo(g,h,i)perylene	–	<0.020	<0.021	<0.020	<0.021	<0.022
Σ(nPAH)	0.3	**16**	0.079	0.19	ND	ND
Pentachlorophenol	1010	310	<0.50	<0.50	<0.50	<0.50

– No RAL (response action level).
RAL exceedances are presented in bold.
ND Not detected.

Table 7
Groundwater Quality Data
Base of Surficial Aquifer
OU1 - Treating Facility Area
St. Regis Paper Company Site
Cass Lake, Minnesota
(concentrations in ug/L)

	Response Action Levels	W205 GW0151 5/7/2005	W209 GW0152 5/7/2005	W212 GW0184 5/15/2005	W213 GW0180 5/15/2005	W215 GW0183 5/15/2005	W217 GW0148 5/7/2005	W218 GW0182 5/14/2005	W219 GW0174 5/7/2005	W220 GW0181 5/15/2005	W221 GW0149 5/7/2005
Benzo(a)anthracene	--	<0.020	<0.022	<0.020	<0.020	<0.021	<0.020	<0.020	<0.020	<0.020	<0.020
Chrysene	--	<0.020	<0.022	<0.020	<0.020	<0.021	<0.020	<0.020	<0.020	<0.020	<0.020
Benzo(b)fluoranthene	--	<0.020	<0.022	<0.020	<0.020	<0.021	<0.020	<0.020	<0.020	<0.020	<0.020
Benzo(k)fluoranthene	--	<0.020	<0.022	<0.020	<0.020	<0.021	<0.020	<0.020	<0.020	<0.020	<0.020
Benzo(a)pyrene	--	<0.020	<0.022	<0.020	<0.020	<0.021	<0.020	<0.020	<0.020	<0.020	<0.020
Indeno(1,2,3-cd)pyrene	--	<0.020	<0.022	<0.020	<0.020	<0.021	<0.020	<0.020	<0.020	<0.020	<0.020
Dibenz(a,h)anthracene	--	<0.020	<0.022	<0.020	<0.020	<0.021	<0.020	<0.020	<0.020	<0.020	<0.020
Quinoline	--	<0.020	<0.022	<0.020	0.087	<0.021	<0.020	<0.020	<0.020	0.037	0.025
Σ(cPAH)	0.028	ND	ND	ND	**0.087**	ND	ND	ND	ND	**0.037**	0.025
Naphthalene	--	<0.020	<0.022	1.8	200	0.64	<0.020	<0.020	0.12 b	16	<0.020
Acenaphthylene	--	<0.020	<0.022	<0.020	0.095	<0.021	<0.020	<0.020	<0.020	<0.020	<0.020
Acenaphthene	--	<0.020	<0.022	0.032	6.3	0.072	<0.020	<0.020	0.34	0.038	<0.020
Fluorene	--	<0.020	<0.022	<0.020	1.2	<0.021	<0.020	<0.020	<0.020	0.38	<0.020
Phenanthrene	--	<0.020	<0.022	<0.020	0.022	<0.021	<0.020	<0.020	0.039	<0.020	<0.020
Anthracene	--	<0.020	<0.022	<0.020	0.29	<0.021	<0.020	<0.020	<0.020	0.056	<0.020
Fluoranthene	--	<0.020	<0.022	<0.020	0.022	<0.021	<0.020	<0.020	0.046	<0.020	<0.020
Pyrene	--	<0.020	<0.022	<0.020	<0.020	<0.021	<0.020	<0.020	0.027	<0.020	<0.020
Benzo(g,h,i)perylene	--	<0.020	<0.022	<0.020	<0.020	<0.021	<0.020	<0.020	<0.020	<0.020	<0.020
Σ(nPAH)	0.3	ND	ND	**1.8**	**210**	**0.71**	ND	ND	**0.57 a**	**16**	ND
Pentachlorophenol	1010	<0.50	<0.50	46	<0.50	21	<0.50	110	<0.50	9.6	<0.50

-- No RAL (response action level).

RAL exceedances are presented in bold.

ND Not detected.

b Potential false positive based on blank data validation procedure.

a Estimated value, calculated using some or all values that are estimates.

Table 8
Groundwater Quality Data
Lower Aquifer
OU1 - Treating Facility Area
St. Regis Paper Company Site
Cass Lake, Minnesota
(concentrations in ug/L)

	Response Action Levels	W302 GW0154 5/8/2005	W306 GW0155 5/14/2005	MW3 GW0153 5/8/2005
Benzo(a)anthracene	--	<0.020	<0.021	<0.021
Chrysene	--	<0.020	<0.021	<0.021
Benzo(b)fluoranthene	--	<0.020	<0.021	<0.021
Benzo(k)fluoranthene	--	<0.020	<0.021	<0.021
Benzo(a)pyrene	--	<0.020	<0.021	<0.021
Indeno(1,2,3-cd)pyrene	--	<0.020	<0.021	<0.021
Dibenz(a,h)anthracene	--	<0.020	<0.021	<0.021
Quinoline	--	<0.024	<0.021	<0.021
Σ(cPAH)	0.028	ND	ND	ND
Naphthalene	--	<0.020	<0.021	<0.021
Acenaphthylene	--	<0.020	<0.021	<0.021
Acenaphthene	--	<0.020	<0.021	<0.021
Fluorene	--	<0.020	<0.021	<0.021
Phenanthrene	--	<0.020	<0.021	<0.021
Anthracene	--	<0.020	<0.021	<0.021
Fluoranthene	--	0.022	<0.021	<0.021
Pyrene	--	<0.020	<0.021	<0.021
Benzo(g,h,i)perylene	--	<0.020	<0.021	<0.021
Σ(nPAH)	0.3	0.022	ND	ND
Pentachlorophenol	1010	<0.50	<0.50	<0.50

-- No RAL (response action level).
ND Not detected.

Table 9
Surface Water Quality
Cass Lake/Pike Bay Channel
Cass Lake, Minnesota
(concentrations in ug/L)

	Criterion Continuous Concentration [1]	CL-N SW0016 5/12/2005	CL-S SW0015 5/12/2005
Pentachlorophenol	5.7	<0.50	<0.50
Water pH = 7			

CLN - Sample collected at the north end of the channel.
CLS - Sample collected at the south end of the channel.

(1) 40 CFR § 131.36; Footnote f.

Water Qua ata Over Time
OU1 - Treating Facility Area
St. Regis Paper Company and City Dump Pit Sites
Cass Lake, Minnesota
(concentrations in ug/L)

Top of Surficial Aquifer

	MW104			MW105			MW112			MW113			MW114			MW115			MW118		
Year	Σ(cPAH)	Σ(nPAH)	PCP	Σ(cPAH)	Σ(nPAH)	PCP	Σ(cPAH)	Σ(nPAH)	PCP	Σ(cPAH)	Σ(nPAH)	PCP	Σ(cPAH)	Σ(nPAH)	PCP	Σ(cPAH)	Σ(nPAH)	PCP	Σ(cPAH)	Σ(nPAH)	PCP
RAL	0.028	0.3	1,010	0.028	0.3	1,010	0.028	0.3	1,010	0.028	0.3	1,010	0.028	0.3	1,010	0.028	0.3	1,010	0.028	0.3	1,010
1986	<0.6	24	670	<0.001	0.056	<5	0.010	0.60	<6	<0.0043	0.048	<5	<0.0043	0.068	<5	<0.0017	0.035	<6	—	—	—
1987	<6	14	1,000	—	—	—	0.012	0.29	<6	6.3	6.6	100	<0.0017	0.063	<6	0.0086	0.050	<6	<1,200	29,000	150,000
1988	<6	61	990	—	—	—	0.009	0.24	<6	0.012	0.058	<6	<0.0017	0.048	<6	0.0025	0.034	<6	<600	51,000	49,000
1989	<10	<10	330	—	—	—	0.030	0.36	<6	<0.0017	0.01	<6	<0.0017	0.031	<6	<0.0017	0.017	<6	360	5,900	46,000
1990	<10	53	820	—	—	—	0.013	0.24	<6	0.0022	0.017	<6	<0.0017	0.011	<6	<0.0017	0.003	<6	470	3,300	54,000
1991	<10	2.0	200	—	—	—	<0.12	0.25	<6	<0.096	1.9	<6	<0.003	0.031	<6	<0.003	0.003	<6	1,500	45,000	60,000
1992	<10	<10	84	—	—	—	<0.006	0.17	<6	0.066	0.8	<6	<0.012	<0.012	<6	<0.006	0.037	<6	—	—	—
1993	<10	16	250			<6	<0.006	0.11	<6	<0.012	0.10	<6	<0.006	0.013	<6	<0.006	0.021	<6	—	—	—
1994	<0.8	20	110	<0.003	0.025	<3	0.019	0.20	<3	<0.2	<0.35	<3	<0.02	0.036	<3	<0.02	0.009	<3	—	—	—
1995	<4	69	590	—	—	—	0.010	0.18	<3	—	—	—	<0.02	0.007	<3	<0.02	0.003	<3	—	—	—
1996	—	—	—	—	—	—	—	—	—	—	—	—	<10	<10	<50	<10	<10	<50	—	—	—
1997	<80	57a	740	—	—	—	<10	<10	<50	—	—	—	<10	<10	<50	<10	<10	<50	—	—	—
1998	—	—	—	—	—	—	—	—	—	—	—	—	<1.0	<1.0	<5j	<1.0	<0.1	<5j	—	—	—
1999	<0.02	18	1,000	<0.02	<0.02	<3	<0.02	0.13	<3	—	—	—	<0.02	<0.02	<3	<0.02	<0.02	<3	—	—	—
2000	—	—	—	—	—	—	—	—	—	—	—	—	<0.02	<0.02	<3	<0.02	<0.02	<3	—	—	—
2001	<0.019	23	2,400	<0.02	<0.02	<0.5	<0.019	0.12	<0.5	—	—	—	<0.02	<0.02	<0.5	<0.019	<0.019	<0.5	—	—	—
2002	—	—	—	—	—	—	—	—	—	—	—	—	<0.02	<0.02	<3	<0.021	<0.021	<3.1	—	—	—
2003	0.075	46	3,200	0.46	0.65	<0.50	<0.020	0.19	<0.50	—	—	—	<0.020	<0.020	<0.50	<0.020	<0.020	<0.50	—	—	—
2004	—	—	—	—	—	—	—	—	—	—	—	—	<0.020	<0.020	<0.96	<0.020	<0.020	<0.96	—	—	—
2005	0.085	16	310	<0.021	0.079	<0.50	<0.020	0.19	<0.50	—	—	—	<0.021	<0.021	<0.50	<0.022	<0.022	<0.50	—	—	—

a Estimated value, calculated using some or all values that are estimates.
Shaded cell indicates concentration above response action level (RAL).

Table 10
Water Quality Data Over Time
OU1 - Treating Facility Area
St. Regis Paper Company and City Dump Pit Sites
Cass Lake, Minnesota
(concentrations in ug/L)

Base of Surficial Aquifer

	MW205			MW209			MW212			MW213			MW215			MW217			MW218		
Year	Σ(cPAH)	Σ(nPAH)	PCP	Σ(cPAH)	Σ(nPAH)	PCP	Σ(cPAH)	Σ(nPAH)	PCP	Σ(cPAH)	Σ(nPAH)	PCP	Σ(cPAH)	Σ(nPAH)	PCP	Σ(cPAH)	Σ(nPAH)	PCP	Σ(cPAH)	Σ(nPAH)	PCP
RAL	0.028	0.3	1,010	0.028	0.3	1,010	0.028	0.3	1,010	0.028	0.3	1,010	0.028	0.3	1,010	0.028	0.3	1,010	0.028	0.3	1,010
1986	<0.003	0.060	<6	0.14	0.48	<6	47	1500	8900	1700	2600	20000	<0.0017	0.02	<6	<0.0043	0.13	<6	—	—	—
1987	—	—	—	—	—	—	<120	740	4000	1000	4600	12000	<6	59	27000	0.0018	0.052	<6	0.26	11	3000
1988	—	—	—	—	—	—	<6	920	3800	160	2100	4800	<6	63	4400	<0.0017	0.026	<6	<0.0017	8.3	860
1989	—	—	—	—	—	—	<20	380	3500	700	2000	13000	<10	20	2700	<0.0017	0.013	<6	<0.068	13	78
1990	—	—	—	—	—	—	<10	150	5100	19	1100	5800	<10	66	4200	<0.0017	0.005	<6	<0.24	17	570
1991	—	—	—	—	—	—	<100	28	2200	<40	1100	830	<100	22	2800	<0.003	0.004	<6	<0.006	3.4	170
1992	—	—	—	—	—	—	<150	<150	2200	<10	330	300	<75	16	1900	0.0038	0.042	<6	<0.048	0.39	14
1993		0.015	<6	—	—	—	<10	42	2900	<10	250	<10	<10	29a	2200	<0.006	0.003	<6	0.022	0.856	26
1994	<0.12	<0.12	<3	—	—	—	<10	46a	3900	<20	240a	<20	<10	46a	3400	<0.04	0.025	<3	<0.4	0.355	13
1995	—	—	—	—	—	—	<750	<750	2300	<10	150a	<10	<500	<500	1600	<0.02	<0.035	<3	<0.08	0.37	26
1996	—	—	—	—	—	—	<10	27	1300	<10	90	<50	<10	29	1100	—	—	—	—	—	—
1997	—	—	—	—	—	—	<70	13a	950	<10	72a	<50	<100	20a	1200	<10	<10	<50	<10	<10	17j
1998	—	—	—	—	—	—	<4.0	8.2	470	<1.0	44	3j	<7.0	19	700	—	—	—	—	—	—
1999	<0.02	<0.02	<3	<0.02	<0.02	<3	<0.02	2.47	430	<0.02	24.17	<3	<0.02	0.51	680	<0.02	<0.02	<3	<0.02	<0.02	45
2000	—	—	—	—	—	—	<0.02	2.9	60	0.15	494	1900	<0.02	0.59	68	—	—	—	—	—	—
2001	<0.019	<0.019	<0.5	<0.019	<0.019	<0.5	<0.019	3.1	110	0.044	68	<0.5	<0.019	0.58	360	<0.02	<0.02	<0.5	<0.019	<0.19	34
2002	—	—	—	—	—	—	<0.020	1.2	19	0.042	39	<3	0.036	0.59	160	—	—	—	—	—	—
2003	<0.020	<0.020	<0.50	<0.020	<0.020	<0.50	<0.020	1.4	45	<0.020	34	<0.50	<0.020	0.36	47	<0.020	<0.020	<0.50	<0.020	0.12	3.6
2004	—	—	—	—	—	—	<0.020	1.9	46	<0.020	24	<0.96	<0.020	0.48	78	—	—	—	—	—	—
2005	<0.020	<0.020	<0.50	<0.022	<0.022	<0.50	<0.020	1.8	46	0.087	210	<0.50	<0.021	0.71	21	<0.020	<0.020	<0.50	<0.020	<0.020	110

a Estimated value, calculated using some or all values that are estimates.
Shaded cell indicates concentration above response action level (RAL).

10

Water Quality Data Over Time
OU1 - Treating Facility Area
St. Regis Paper Company and City Dump Pit Sites
Cass Lake, Minnesota
(concentrations in ug/L)

Base of Surficial Aquifer										Lower Aquifer											
	MW219			MW220			MW221			MW302			MW306			MW3			MW411		
Year	Σ(cPAH)	Σ(nPAH)	PCP	Σ(cPAH)	Σ(nPAH)	PCP	Σ(cPAH)	Σ(nPAH)	PCP	Σ(cPAH)	Σ(nPAH)	PCP	Σ(cPAH)	Σ(nPAH)	PCP	Σ(cPAH)	Σ(nPAH)	PCP	Σ(cPAH)	Σ(nPAH)	PCP
RAL	0.028	0.3	1,010	0.028	0.3	1,010	0.028	0.3	1,010	0.028	0.3	1,010	0.028	0.3	1,010	0.028	0.3	1,010	0.028	0.3	1,010
1986	<0.034	1.2	<6	—	—	—	—	—	—	0.002	0.026	<6	<0.0017	0.004	<6	<0.0017	0.005	<5			—
1987	<6	8.6	<6	—	—	—	—	—	—	0.005	0.11	<6	0.0044	0.13	<6	0.0036	0.073	<6			690
1988	<6	9.7	<6	—	—	—	—	—	—	0.13	0.21	<6	0.01	0.05	<6	<0.0017	0.018	<6			—
1989	<0.068	18	16	—	—	—	—	—	—	0.002	0.091	<6	<0.0017	0.011	<6	<0.0017	0.017	<6			—
1990	<10	16	<10	—	—	—	—	—	—	0.013	0.070	<6	<0.0017	0.006	<6	0.0022	0.050	<6			—
1991	<10	8	<10	—	—	—	—	—	—	0.016	0.059	<6	<0.003	0.34	<6	<0.003	0.012	<6			—
1992	<10	8	<10	—	—	—	—	—	—	0.003	0.24	<6	<0.012	0.016	<6	<0.006	0.050	<6			—
1993	<0.192	6.21	<6	—	—	—	—	—	—	<0.006	0.017	<6	<0.006	<0.006	<6	<0.003	0.009	<6			—
1994	<2.4	8.27	<3	<20	527	1,000	<0.4	0.006	<3	<0.08	0.883	<3	0.023	0.022	<3	0.01	0.014	<3			—
1995	<3.0	7	<3	<200	250a	570	<0.02	<0.035	<3	<0.02	0.059	<3	<0.02	0.018	<3	<0.02	0.048	<3			—
1996	—	—	—	<10	120	180	—	—	—	—	—	—	<10	<10	<50	—	—	—			—
1997	<10	8a	<50	<40	81a	200	<10	<10	<50	<10	<10	<50	<10	<10	<50	<10	<10	<50			—
1998	—	—	—	<12	42	98	—	—	—	—	—	—	<1.0	<1.0	<5j	—	—	—			—
1999	<0.02	0.472	<3	<0.02	11.55	72	<0.02	<0.02	<3	<0.02	<0.02	<3	<0.02	0.08	<3	<0.02	<0.02	<3			350
2000	<0.02	0.68	<3	0.03	20	73	—	—	—	—	—	—	<0.02	<0.02	<3	—	—	—			—
2001	<0.02	0.58	<0.5	0.044	18	24	<0.02	<0.02	<0.5	<0.02	<0.02	<0.5	<0.02	<0.02	<0.5	<0.02	<0.02	<0.5			14
2002	<0.021	0.72	<3.1	0.037	16	4.5	—	—	—	—	—	—	<0.021	0.023	<0.5	—	—	—			—
2003	<0.020	0.49	<0.50	0.03	7.9	51	<0.020	<0.020	<0.50	<0.020	0.042	<0.50	<0.020	0.031	<0.50	<0.020	<0.020	<0.50	<0.020	<0.020	12
2004	0.045	0.821	<0.96	<0.020	15	8	—	—	—	—	—	—	<0.020	<0.020	<0.96	—	—	—	—	—	—
2005	<0.020	0.57a	<0.50	0.037	16	9.6	0.025	<0.020	<0.50	<0.024	0.022	<0.50	<0.021	<0.021	<0.50	<0.021	<0.021	<0.50	<0.023	<0.023	17

a Estimated value, calculated using some or all values that are estimates.
Shaded cell indicates concentration above response action level (RAL).

Table 10
Water Quality Data Over Time
OU1 - Treating Facility Area
St. Regis Paper Company and City Dump Pit Sites
Cass Lake, Minnesota
(concentrations in ug/L)

Surface Water						
	CL-N			CL-S		
Year	Σ(cPAH)	Σ(nPAH)	PCP	Σ(cPAH)	Σ(nPAH)	PCP
SWQ			5.5			5.5
1986	0.003	0.009	<5	<0.001	0.0015	<5
1987	—	—	<6	—	—	<6
1988	—	—	<10	—	—	<10
1989	—	—	<6	—	—	<6
1990	<0.003	0.006	<6	<0.001	0.004	<6
1991	—	—	<10	—	—	<10
1992	—	—	<10	—	—	<10
1993	—	—	<10	—	—	<10
1994	—	—	<3	—	—	<3
1995	—	—	<3	—	—	<3
1996	—	—	<50	—	—	<50
1997	—	—	<50	—	—	<50
1998	—	—	<5j	—	—	<5j
1999	—	—	<0.5	—	—	<0.5
2000	—	—	<0.5	—	—	2.2
2001	—	—	<0.5	—	—	<0.5
2002	—	—	<0.5	—	—	<0.5
2003	—	—	<0.5	—	—	<0.5
2004	—	—	<0.6	—	—	<0.6
2005	—	—	<0.50	—	—	<0.50

a Estimated value, calculated using some or all values that are estimates.
Shaded cell indicates concentration above response action level (RAL).

Table 11
Groundwater Quality Data
Surficial Aquifer
OU2 - Containment Vault Area
St. Regis Paper Company and City Dump Pit Sites
Cass Lake, Minnesota
(concentrations in ug/L)

	W124 GW0142 5/11/2005	W125 GW0141 5/11/2005	W126 GW0140 5/10/2005	W127 GW0144 5/10/2005	W128 GW0145 5/10/2005	W129 GW0146 5/11/2005	W130 GW0143 5/10/2005
Benzo(a)anthracene	<0.021	<0.021	<0.021	<0.022	<0.022	<0.021	<0.022
Chrysene	<0.021	<0.021	<0.021	<0.022	<0.022	<0.021	<0.022
Benzo(b)fluoranthene	<0.021	<0.021	<0.021	<0.022	<0.022	<0.021	<0.022
Benzo(k)fluoranthene	<0.021	<0.021	<0.021	<0.022	<0.022	<0.021	<0.022
Benzo(a)pyrene	<0.021	<0.021	<0.021	<0.022	<0.022	<0.021	<0.022
Indeno(1,2,3-cd)pyrene	<0.021	<0.021	<0.021	<0.022	<0.022	<0.021	<0.022
Dibenz(a,h)anthracene	<0.021	<0.021	<0.021	<0.022	<0.022	<0.021	<0.022
Quinoline	<0.021	<0.021	<0.021	<0.022	<0.022	<0.021	<0.022
Σ(cPAH)	ND	ND	ND	ND	ND	ND	ND
Naphthalene	<0.021	<0.021	<0.021	<0.022	<0.022	<0.021	<0.022
Acenaphthylene	<0.021	<0.021	<0.021	<0.022	<0.022	<0.021	<0.022
Acenaphthene	<0.021	<0.021	<0.021	<0.022	<0.022	<0.021	<0.022
Fluorene	<0.021	<0.021	<0.021	<0.022	<0.022	<0.021	<0.022
Phenanthrene	<0.021	<0.021	<0.021	<0.022	<0.022	<0.021	<0.022
Anthracene	<0.021	<0.021	<0.021	<0.022	<0.022	<0.021	<0.022
Fluoranthene	<0.021	<0.021	<0.021	<0.022	<0.022	<0.021	<0.022
Pyrene	<0.021	<0.021	<0.021	<0.022	<0.022	<0.021	<0.022
Benzo(g,h,i)perylene	<0.021	<0.021	<0.021	<0.022	<0.022	<0.021	<0.022
Σ(nPAH)	ND	ND	ND	ND	ND	ND	ND
Pentachlorophenol	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50

ND Not detected.

Table 12
Groundwater Quality Data Over Time
OU2 - Containment Vault Area
St. Regis Paper Company and City Dump Pit Sites
Cass Lake, Minnesota
(concentrations in ug/L)

Surficial Aquifer																					
	MW124			MW125			MW126			MW127			MW128			MW129			MW130		
Year	Σ(cPAH)	Σ(nPAH)	PCP	Σ(cPAH)	Σ(nPAH)	PCP	Σ(cPAH)	Σ(nPAH)	PCP	Σ(cPAH)	Σ(nPAH)	PCP	Σ(cPAH)	Σ(nPAH)	PCP	Σ(cPAH)	Σ(nPAH)	PCP	Σ(cPAH)	Σ(nPAH)	PCP
1987	0.004	0.026	<6	0.0031	0.024	<6	0.028	0.060	<6	0.005	0.034	<6	0.005	0.028	<6	--	--	--	--	--	--
1988	<0.001	0.054	<6	<0.001	0.013	<6	<0.001	0.012	<6	<0.001	0.017	<6	<0.001	0.014	<6	--	--	--	--	--	--
1989	<0.001	0.007	<6	<0.001	0.013	<6	<0.001	0.015	<6	<0.001	0.006	<6	<0.001	0.010	<6	--	--	--	--	--	--
1990	<0.001	0.015	<6	<0.002	<0.002	<6	<0.001	0.006	<6	<0.001	0.009	<6	<0.001	0.007	<6	--	--	--	--	--	--
1991	<0.003	<0.003	<6	<0.003	<0.003	<6	<0.003	<0.003	<6	<0.003	0.005	<6	<0.003	0.003	<6	--	--	--	--	--	--
1992	<0.003	<0.003	<6	<0.003	0.084	<6	<0.003	0.005	<6	<0.003	0.010	<6	<0.003	0.004	<6	<0.003	0.022	<6	<0.003	<0.003	<6
1993	<0.003	<0.003	<6	<0.003	<0.003	<6	<0.003	<0.003	<6	--	--	--	<0.003	<0.003	<6	<0.003	<0.003	<6	<0.006	<0.006	<6
1994	<0.003	0.004	<3	<0.003	0.005	<3	<0.003	0.009	<3	--	--	--	<0.003	0.033	<3	<0.003	0.003	<3	<0.003	0.004	<3
1995	<0.003	0.004	<3	<0.003	0.006	<3	<0.003	0.025	<3	--	--	--	<0.003	<0.003	<3	<0.003	0.007	<3	<0.003	<0.003	<3
1996	<10	<10	<50	<10	<10	<50	<10	<10	<50	--	--	--	<10	<10	<50	<10	<10	<50	<10	<10	<50
1997	<10	<10	<50	<10	<10	<50	<10	<10	<50	--	--	--	<10	<10	<50	<10	<10	<50	<10	<10	<50
1998	<0.10	<0.10	<0.50	<0.10	<0.10	<0.50	<0.10	<0.10	<5j	--	--	--	<0.10	<0.10	<0.50	<0.10	<0.10	<0.50	<0.10	<0.10	<5j
1999	<0.02	<0.02	<3	<0.02	<0.02	<3	<0.02	<0.02	<3	<0.02	0.02	<3	<0.02	<0.02	<3	<0.02	<0.02	<3	<0.02	<0.02	<3
2000	<0.02	<0.02	<3	<0.02	0.05	<3	<0.02	0.08	<3	<0.02	0.03	<3	<0.02	0.04	<3	<0.02	<0.02	<3	<0.02	<0.02	<3
2001	<0.019	<0.019	<0.5	<0.02	<0.02	<0.5	<0.02	<0.02	<0.5	<0.02	<0.02	<0.5	<0.02	<0.02	<0.5	<0.019	<0.019	<0.5	<0.02	<0.02	<0.5
2002	<0.021	<0.021	<3.1	<0.020	0.023	<3.0	<0.020	0.023	<2.9	<0.020	0.024	<2.9	<0.020	<0.020	<3.1	<0.021	<0.021	<3.1	<0.020	<0.02	<3.0
2003	<0.020	0.021	<0.50	<0.020	<0.020	<0.50	<0.020	<0.020	<0.50	<0.020	<0.020	<0.50	<0.020	<0.020	<0.50	<0.020	0.023	<0.50	<0.020	<0.020	<0.50
2004	<0.020	<0.020	<0.96	<0.020	0.079	<0.96	<0.020	0.13	<0.96	<0.020	0.082	<0.97	<0.020	0.082	<0.98	<0.020	0.14	<0.99	<0.020	<0.020	<0.98
2005	<0.021	<0.021	<0.50	<0.021	<0.021	<0.50	<0.021	<0.021	<0.50	<0.022	<0.022	<0.50	<0.022	<0.022	<0.50	<0.021	<0.021	<0.50	<0.022	<0.022	<0.50

-- No sample.

Table 13
Groundwater Quality Data
Shallow Surficial Aquifer
OU3 - City Dump Pit Site
Cass Lake, Minnesota
(concentrations in ug/L)

	Response Action Levels	W2127 GW0166 5/15/2005	W2128 GW0165 5/15/2005	W2129 GW0167 5/15/2005	W2134 GW0164 5/14/2005	W2135 GW0163 5/14/2005
Benzo(a)anthracene	--	<0.020	<0.020	<0.020	<0.021	<0.021
Chrysene	--	<0.020	<0.020	<0.020	<0.021	<0.021
Benzo(b)fluoranthene	--	<0.020	<0.020	<0.020	<0.021	<0.021
Benzo(k)fluoranthene	--	<0.020	<0.020	<0.020	<0.021	<0.021
Benzo(a)pyrene	--	<0.020	<0.020	<0.020	<0.021	<0.021
Indeno(1,2,3-cd)pyrene	--	<0.020	<0.020	<0.020	<0.021	<0.021
Dibenz(a,h)anthracene	--	<0.020	<0.020	<0.020	<0.021	<0.021
Quinoline	--	<0.020	<0.020	<0.020	<0.021	<0.021
Σ(cPAH)	0.28	ND	ND	ND	ND	ND
Naphthalene	--	<0.020	6.1	<0.020	<0.021	<0.021
Acenaphthylene	--	<0.020	<0.020	<0.020	<0.021	<0.021
Acenaphthene	--	<0.020	0.79	<0.020	<0.021	<0.021
Fluorene	--	<0.020	0.048	<0.020	<0.021	<0.021
Phenanthrene	--	<0.020	<0.020	<0.020	<0.021	<0.021
Anthracene	--	<0.020	<0.020	<0.020	<0.021	<0.021
Fluoranthene	--	<0.020	<0.020	<0.020	<0.021	<0.021
Pyrene	--	<0.020	<0.020	<0.020	<0.021	<0.021
Benzo(g,h,i)perylene	--	<0.020	<0.020	<0.020	<0.021	<0.021
Σ(nPAH)	0.3	ND	**6.9**	ND	ND	ND
Pentachlorophenol	220	<0.50	6.4	<0.50	<0.50	<0.50

-- No RAL (response action level).
RAL exceedances are presented in bold.
ND Not detected.

Table 14
Groundwater Quality Data
Base of Surficial Aquifer
OU3 - City Dump Operable Unit
Cass Lake, Minnesota
(concentrations in ug/L)

	Response Action Levels	W2234 GW0177 5/14/2005
Benzo(a)anthracene	--	<0.021
Chrysene	--	<0.021
Benzo(b)fluoranthene	--	<0.021
Benzo(k)fluoranthene	--	<0.021
Benzo(a)pyrene	--	<0.021
Indeno(1,2,3-cd)pyrene	--	<0.021
Dibenz(a,h)anthracene	--	<0.021
Quinoline	--	<0.021
Σ(cPAH)	0.28	ND
Naphthalene	--	<0.021
Acenaphthylene	--	<0.021
Acenaphthene	--	<0.021
Fluorene	--	<0.021
Phenanthrene	--	<0.021
Anthracene	--	<0.021
Fluoranthene	--	<0.021
Pyrene	--	<0.021
Benzo(g,h,i)perylene	--	<0.021
Σ(nPAH)	0.3	ND
Pentachlorophenol	220	<0.50

-- No RAL (response action level).
ND Not detected.

Table 15
Groundwater Quality Data
Lower Aquifer
OU3 - City Dump Operable Unit
Cass Lake, Minnesota
(concentrations in ug/L)

	Response Action Levels	W2301 GW0156 5/11/2005	W2325 GW0157 5/11/2005	W2326 GW0158 5/11/2005	W2329 GW0168 5/15/2005	W2333 GW0161 5/11/2005	W2335 GW0162 5/14/2005
Benzo(a)anthracene	--	<0.020	<0.021	<0.021	<0.021	<0.022	<0.022
Chrysene	--	<0.020	<0.021	<0.021	<0.021	<0.022	<0.022
Benzo(b)fluoranthene	--	<0.020	<0.021	<0.021	<0.021	<0.022	<0.022
Benzo(k)fluoranthene	--	<0.020	<0.021	<0.021	<0.021	<0.022	<0.022
Benzo(a)pyrene	--	<0.020	<0.021	<0.021	<0.021	<0.022	<0.022
Indeno(1,2,3-cd)pyrene	--	<0.020	<0.021	<0.021	<0.021	<0.022	<0.022
Dibenz(a,h)anthracene	--	<0.020	<0.021	<0.021	<0.021	<0.022	<0.022
Quinoline	--	<0.020	<0.021	<0.021	<0.021	<0.022	<0.022
Σ(cPAH)	0.28	ND	ND	ND	ND	ND	ND
Naphthalene	--	0.12	<0.021	0.25	<0.021	<0.022	<0.022
Acenaphthylene	--	<0.020	<0.021	<0.021	<0.021	<0.022	<0.022
Acenaphthene	--	<0.020	<0.021	0.028	<0.021	<0.022	<0.022
Fluorene	--	<0.020	<0.021	<0.021	<0.021	<0.022	<0.022
Phenanthrene	--	<0.020	<0.021	<0.021	<0.021	<0.022	<0.022
Anthracene	--	<0.020	<0.021	<0.021	<0.021	<0.022	<0.022
Fluoranthene	--	<0.020	<0.021	<0.021	<0.021	<0.022	<0.022
Pyrene	--	<0.020	<0.021	<0.021	<0.021	<0.022	<0.022
Benzo(g,h,i)perylene	--	<0.020	<0.021	<0.021	<0.021	<0.022	<0.022
Σ(nPAH)	0.3	0.12	ND	0.28	ND	ND	ND
Pentachlorophenol	220	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50

-- No RAL (response action level).
ND Not detected.

Table 16
Water Quality Data Over Time
OU3 - City Dump Pit Site
City Dump Pit Site
Cass Lake, Minnesota
(concentrations in ug/L)

Top of Surficial Aquifer																Base of Surficial Aquifer		
	MW2127			MW2128			MW2129			MW2134			MW2135			MW2234		
Year	Σ(cPAH)	Σ(nPAH)	PCP	Σ(cPAH)	Σ(nPAH)	PCP	Σ(cPAH)	Σ(nPAH)	PCP	Σ(cPAH)	Σ(nPAH)	PCP	Σ(cPAH)	Σ(nPAH)	PCP	Σ(cPAH)	Σ(nPAH)	PCP
RAL	0.28	0.3	220	0.28	0.3	220	0.28	0.3	220	0.28	0.3	220	0.28	0.3	220	0.28	0.3	220
1987	<0.0017	0.037	<6	<6	110	2600	<0.0043	0.088	9.1	<6	<6	11000	0.0026	0.047	<6	0.0039	0.05	<6
1988	0.0017	0.088	<6	<6	55	2100	<0.0017	0.021	<6	<6	<6	4600	<0.0034	0.035	<6	<0.0034	0.13	<6
1989	<0.0017	0.089	<6	<120	1500	760	<10	<10	<10	<0.0068	6.5	74	<0.0017	0.005	<6	0.0045	0.16	<6
1990	<0.0017	0.0034	<6	<10	5	190	<0.0017	0.0054	<6	<10	<10	<10	<0.0017	0.0038	<6	—	—	—
1991	<0.012	0.32	<6	<10	<10	99	0.004	0.0033	<6	<10	<10	<10	<0.006	0.01	<6	<0.003	<0.003	<6
1992	<0.006	0.0065	<6	<10	<10	<10	<0.006	<0.006	<6	<10	<10	<10	<0.006	0.0078	<6	<10	<10	<10
1993	<0.006	0.00903	<6	<0.336	7.47	130	<0.006	<0.006	<6	0.0167	0.428	<6	0.0163	0.161	<6	<0.1443	4.63	<6
1994	<0.2	<0.35	<3	<0.8	7.7	38	<0.02	<0.035	<3	<0.4	0.072	<3	<0.4	<0.7	<3	<0.4	<0.7	<3
1995	<0.02	0.003	<3	<4.0	40	120	<0.02	0.004	<3	<0.02	0.004	<3	<0.02	0.003	<3	<0.02	0.004	<3
1996	<10	<10	<50	—	—	—	<10	<10	<50	—	—	—	<10	<10	<50	<10	<10	<50
1997	<10	<10	<50	<10	160a	79	<10	<10	<50	<10	<10	<50	<10	<10	<50	<10	<10	<50
1998	<1.0	<1.0	<5j	—	—	—	<1.0	<1.0	<5j	—	—	—	<1.0	<1.0	<5j	<1.0	<1.0	<5j
1999	<0.02	<0.02	<3	<0.02	24	3.7	<0.02	<0.02	<3	<0.02	<0.02	<3	<0.02	<0.02	—	<0.02	<0.02	<3
2000	<0.02	<0.02	<3	<0.02	25	4	<0.02	<0.02	<3	—	—	—	<0.02	<0.02	<3	<0.02	<0.02	<3
2001	<0.02	<0.02	<0.5	<0.02	51	48	<0.02	<0.02	1.5	<0.019	<0.019	<0.5	<0.019	<0.019	<0.5	<0.019	<0.019	<0.5
2002	<0.02	<0.02	<2.9	<0.02	45	<2.9	<0.02	0.034	<0.5	—	—	—	<0.021	0.085	<3.2	<0.02	<0.02	<3
2003	<0.020	<0.020	<0.50	<0.020	27	25	<0.020	<0.020	<0.50	<0.020	<0.020	<0.50	<0.020	<0.020	<0.50	<0.020	<0.020	<0.50
2004	<0.020	<0.020	<0.96	<0.020	2.59	5.5	<0.020	0.0084a	<0.50	—	—	—	<0.020	<0.020	<0.96	<0.020	<0.020	<0.98
2005	<0.020	<0.020	<0.50	<0.020	6.9	6.4	<0.020	<0.020	<0.50	<0.021	<0.021	<0.50	<0.021	<0.021	<0.50	<0.021	<0.021	<0.50

Water Quality Data Over Time
OU3 - City Dump Pit Site
City Dump Pit Site
Cass Lake, Minnesota
(concentrations in ug/L)

Lower Aquifer

	MW2301			MW2325			MW2326			MW2329			MW2333			MW2335		
Year	Σ(cPAH)	Σ(nPAH)	PCP	Σ(cPAH)	Σ(nPAH)	PCP	Σ(cPAH)	Σ(nPAH)	PCP	Σ(cPAH)	Σ(nPAH)	PCP	Σ(cPAH)	Σ(nPAH)	PCP	Σ(cPAH)	Σ(nPAH)	PCP
RAL	0.28	0.3	220	0.28	0.3	220	0.28	0.3	220	0.28	0.3	220	0.28	0.3	220	0.28	0.3	220
1987	0.0066	0.028	<6	0.003	0.021	<6	0.0046	0.054	<6	—	—	—	<0.0017	0.027	<6	0.0021	0.034	<6
1988	<0.0034	0.046	<6	<0.0034	0.047	<6	<0.0034	0.032	<6	—	—	—	<0.0017	0.019	<6	<0.0034	0.054	<6
1989	<0.0017	0.094	<6	<0.0017	0.063	<6	<0.0017	0.047	<6	—	—	—	<1	0.018	<6	<0.0017	0.034	<6
1990	<0.0017	0.029	<6	<0.0017	0.035	<6	<10	<10	<10	—	—	—	<10	<10	<10	<0.0017	0.024	<6
1991	<0.003	<0.003	<6	<0.003	<0.003	<6	<10	<10	<10	—	—	—	<10	<10	<10	<0.003	0.011	<6
1992	<0.006	0.024	<6	<0.006	0.011	<6	<10	16	<10	—	—	—	<10	<10	<10	<0.006	0.024	<6
1993	<0.006	0.026	<6	0.0141	0.21	<6	<0.018	0.15	<6	—	—	—	<0.006	0.0265	<6	0.0031	0.18	<6
1994	<10	<10	<5	<10	<10	<5	<0.4	<0.7	<3	<0.04	<0.2	<3	<1	0.146a	<3	<0.2	<0.35	<3
1995	<0.02	0.022	<3	<0.02	0.004	<3	<0.02	0.035	<3	<0.02	0.004	<3	<0.02	0.004	<3	<0.02	0.003	<3
1996	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	<10	<10	<50
1997	<10	<10	<50	<10	<10	<50	<10	<10	<50	<10	<10	<50	<10	<10	<50	<10	<10	<50
1998	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	<1.0	<1.0	<5j
1999	<0.02	0.03	<3	<0.02	<0.02	<3	<0.02	0.10	<3	<0.02	<0.02	<3	<0.02	<0.02	<3	<0.02	0.07	<3
2000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	<0.02	<0.02	<3
2001	<0.023	0.16	<0.5	<0.019	<0.019	<0.5	<0.022	0.20	<0.5	<0.02	<0.02	<0.5	<0.019	<0.019	<0.5	<0.022	<0.022	<0.5
2002	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	<0.020	<0.020	<2.9
2003	<0.020	0.13	<0.50	<0.020	<0.020	<0.50	<0.020	0.067	<0.50	<0.020	<0.020	<0.50	<0.020	<0.020	<0.50	<0.020	0.083	<0.50
2004	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	<0.020	0.14	<0.96
2005	<0.020	0.12	<0.50	<0.021	<0.021	<0.50	<0.021	0.28	<0.50	<0.021	<0.021	<0.50	<0.022	<0.022	<0.50	<0.022	<0.022	<0.50

a Estimated value, calculated using some or all values that are estimates.
Shaded cell indicates concentration above response action level (RAL).

Table 17
Groundwater Quality Data
Surficial Aquifer
Extraction Wells
St. Regis Paper Company and City Dump Pit Sites
Cass Lake, Minnesota
(concentrations in ug/L)

	Response Action Levels	W401 GW0193 5/8/2005	W402 GW0192 5/8/2005	W403 GW0191 5/8/2005	W405 GW0194 5/8/2005	W406 GW0190 5/8/2005	W407 GW0189 5/8/2005	W408 GW0197 5/8/2005	W409 GW0200 5/8/2005	W410 GW0201 5/8/2005	W411 GW0188 5/14/2005	W2401 GW0203 5/9/2005	W2402 GW0202 5/9/2005	W2403 GW0204 5/9/2005
Benzo(a)anthracene	--	0.81	0.64	<0.40	<0.40	<0.020	<0.020	<0.40	<0.40	<0.40	<0.023	62	<0.40	<0.40
Chrysene	--	0.70	0.64	<0.40	<0.40	<0.020	<0.020	<0.40	<0.40	<0.40	<0.023	60	<0.40	<0.40
Benzo(b)fluoranthene	--	<0.40	<0.40	<0.40	<0.40	<0.020	<0.020	<0.40	<0.40	<0.40	<0.023	21	<0.40	<0.40
Benzo(k)fluoranthene	--	<0.40	<0.40	<0.40	<0.40	<0.020	<0.020	<0.40	<0.40	<0.40	<0.023	17	<0.40	<0.40
Benzo(a)pyrene	--	<0.40	<0.40	<0.40	<0.40	<0.020	<0.020	<0.40	<0.40	<0.40	<0.023	16	<0.40	<0.40
Indeno(1,2,3-cd)pyrene	--	<0.40	<0.40	<0.40	<0.40	<0.020	<0.020	<0.40	<0.40	<0.40	<0.023	5.4	<0.40	<0.40
Dibenz(a,h)anthracene	--	<0.40	<0.40	<0.40	<0.40	<0.020	<0.020	<0.40	<0.40	<0.40	<0.023	1.7	<0.40	<0.40
Quinoline	--	<0.40	<0.40	<0.40	170	<0.020	<0.020	<0.40	6.6	<0.40	<0.023	390	<0.40	30
Σ(cPAH)	0.28	**1.5**	**1.3**	ND	**170**	ND	ND	ND	**6.6**	ND	ND	**570**	ND	**30**
Naphthalene	--	<0.40	<2.3	0.93 b	1500	0.39 b	<0.020	76	130	0.87 b	<0.18	2800	<0.40	3.6
Acenaphthylene	--	0.55	0.49	<0.40	2.7	<0.020	<0.020	<0.40	<0.40	<0.40	<0.023	9.7	<0.40	1.6
Acenaphthene	--	16	2.0	<0.40	110	0.58	<0.020	7.6	9.8	<0.40	<0.023	790	<0.40	92
Fluorene	--	1.1	1.2	<0.40	46	0.50	<0.020	1.2	5.3	<0.40	<0.023	550	<0.40	45
Phenanthrene	--	<0.40	<0.40	<0.40	14	0.45	<0.020	<0.40	1.7	<0.40	<0.023	1100	<0.40	14
Anthracene	--	1.1	<0.40	<0.40	2.9	0.044	<0.020	<0.40	<0.40	<0.40	<0.023	130	<0.40	3.3
Fluoranthene	--	13	4.1	<0.40	<0.40	0.084	<0.020	<0.40	<0.40	<0.40	<0.023	440	<0.40	0.56
Pyrene	--	7.2	2.9	<0.40	<0.40	0.038	<0.020	<0.40	<0.40	<0.40	<0.023	270	<0.40	<0.40
Benzo(g,h,i)perylene	--	<0.40	<0.40	<0.40	<0.40	<0.020	<0.020	<0.40	<0.40	<0.40	<0.023	3.5	<0.40	<0.40
Σ(nPAH)	0.3	**39**	**11**	**0.93 a**	**170**	**2.1 a**	ND	**85**	**150**	**0.87 a**	ND	**6100**	ND	**160**
Pentachlorophenol	220	**2200**	**950**	**820**	**9900**	<0.50	<0.50	**820**	**1900**	<20	17	**2900**	**220**	**2100**

-- No RAL (response action level).

RAL exceedances are presented in bold.

ND Not detected.

b Potential false positive based on blank data validation procedure.

a Estimated value, calculated using some or all values that are estimates.

T 18

Water Qual. Data Over Time
Extraction Wells
St. Regis Paper Company and City Dump Pit Sites
Cass Lake, Minnesota
(concentrations in ug/L)

	OU1 - Extraction Wells										OU3 - Extraction Wells		
Year	W401 PCP	W402 PCP	W403 PCP	W404 PCP	W405 PCP	W406 PCP	W407 PCP	W408 PCP	W409 PCP	W410 PCP	W2401 PCP	W2402 PCP	W2403 PCP
1987	3,000	1,600	9,300	17,000	8,000	<6	<6	9,900	21,000	<6	—	—	—
1988	2,000	1,300	2,200	6,300	4,500	12	<5	5,000	18,000	280	16,000	17,000	6,900
1989	56	1,200	1,500	9,000	7,000	<5	—	5,600	8,900	130	—	2,500	4,500
1990	1,500	700	790	—	5,500	—	—	4,800	5,800	39	—	700	2,600
1991	3,900	1,600	1,200	—	1,500	<10	—	9,100	11,000	<10	—	820	3,800
1992	1,500	1,100	560	—	840	—	—	3,800	5,400	<5	—	580	3,400
1993	970	810	300	—	6,400	—	—	4,400	4,800	<5	3,100	450	2,800
1994	2,000	2,200	320	—	6,500	<5	<5	3,100	3,700	8	3,800	280	1,900
1995	890	1,200	190	—	5,300	<5	<5	1,300	2,100	14	1,800	220	1,600
1996	—	—	—	—	—	—	—	2,000	—	—	—	—	—
1997	1,000	950	560	—	5,300	58	<50	2,000	5,000	—	5,700	1,000	2,200
1998	—	—	—	—	—	—	—	1,200	—	—	—	—	—
1999	1,500	1,300	640	—	7,000	<50	<50	1,800	2,900	<50	4,400	1,400	3,500
2000	—	—	—	—	—	—	—	—	—	—	—	—	—
2001	1,700	1,900	530	—	7,400	<24	<24	1,200	3,100	50	3,200	340	3,000
2002	—	—	—	—	—	—	—	430	—	—	—	—	—
2003	1,700	290	400	—	7,500	<0.50	<0.50	700	1,700	3.1	3,100	<0.50	1,800
2004	—	—	—	—	—	—	—	450	—	—	—	—	—
2005	2,200	950	820	—	9,900	<0.50	<0.50	820	1,900	<20	2900	220	2,100

- No sample.

Table 19
Water Quality Data
Pentachlorophenol
Groundwater Treatment System
St. Regis Paper Company and City Dump Pit Sites
Cass Lake, Minnesota
(concentrations in ug/L)

	Influent	Primary	Secondary	Effluent	NPDES Effluent Limit
01/03/2005	2400	1800 (AdsA)	36 (AdsB)	<0.50 (AdsC)	8
02/07/2005	2500	550 (AdsB)	<0.50 (AdsC)	<0.50 (AdsA)	8
03/07/2005	2500	1300 (AdsB)	0.98 (AdsC)	<0.50 (AdsA)	8
04/05/2005	2400	1200 (AdsB)	13 (AdsC)	<0.50 (AdsA)	8
05/03/2005	2200	1500 (AdsB)	56 (AdsC)	<0.50 (AdsA)	8
06/07/2005	2700	1800 (AdsB)	120 (AdsC)	<0.50 (AdsA)	8
07/05/2005	2100	1500 (AdsB)	300 (AdsC)	<0.50 (AdsA)	8
08/22/2005	2700	520 (AdsC)	<0.50 (AdsA)	<0.50 (AdsB)	8
09/13/2005	2000	900 (AdsC)	<0.50 (AdsA)	<0.50 (AdsB)	8
10/11/2005	2300	1400 (AdsC)	<0.50 (AdsA)	<0.50 (AdsB)	8
11/29/2005	2100	1500 (AdsC)	<0.50 (AdsA)	<0.50 (AdsB)	8
12/13/2005	2400	1800 (AdsC)	<0.50 (AdsA)	<0.50 (AdsB)	8

NPDES Effluent Limit exceedances are presented in bold.

Table 20
Water Quality Data
PAH Compounds
Groundwater Treatment System
St. Regis Paper Company and City Dump Pit Sites
Cass Lake, Minnesota
(concentrations in ug/L)

	Minnesota Class 2B Chronic	Effluent ADSA 4/5/2005	Effluent ADSA 7/5/2005	Effluent ADSB 10/11/2005	Effluent ADSC 1/3/2005
Benzo(a)anthracene	--	<0.020	<0.020	<0.020	<0.020
Chrysene	--	<0.020	<0.020	<0.020	<0.020
Benzo(b)fluoranthene	--	<0.020	<0.020	<0.020	<0.020
Benzo(k)fluoranthene	--	<0.020	<0.020	<0.020	<0.020
Benzo(a)pyrene	--	<0.020	<0.020	<0.020	<0.020
Indeno(1,2,3-cd)pyrene	--	<0.020	<0.020	<0.020	<0.020
Dibenz(a,h)anthracene	--	<0.020	<0.020	<0.020	<0.020
Quinoline	--	<0.020	<0.020	<0.020	<0.020
Σ(cPAH)	--	ND	ND	ND	ND
Naphthalene	81	<0.020	<0.020	<0.020	<0.020
Acenaphthylene	--	<0.020	<0.020	<0.020	<0.020
Acenaphthene	20	<0.020	<0.020	<0.020	<0.020
Fluorene	--	<0.020	<0.020	<0.020	<0.020
Phenanthrene	3.6	<0.020	<0.020	<0.020	<0.020
Anthracene	0.035	<0.020	<0.020	<0.020	<0.020
Fluoranthene	1.9	<0.020	<0.020	<0.020	<0.020
Pyrene	--	<0.020	<0.020	<0.020	<0.020
Benzo(g,h,i)perylene	--	<0.020	<0.020	<0.020	<0.020
Σ(nPAH)	--	ND	ND	ND	ND

-- No criteria.
ND Not detected.

Table 21
Water Quality Data
HxCDD
Groundwater Treatment System
St. Regis Paper Company and City Dump Pit Sites
Cass Lake, Minnesota
(concentrations in ug/L)

	Influent
01/03/2005	<0.0017
04/05/2005	<0.00074
07/05/2005	<0.00048
10/11/2005	<0.00074

Table 22
2005 Monthly Flow Rate Data
Groundwater Treatment System
St. Regis Paper Company and City Dump Site
Cass Lake, Minnesota

Month	Flow (10^6 gallons)
Jan-05	4.1
Feb-05	4.8
Mar-05	5.1
Apr-05	4.9
May-05	4.8
Jun-05	4.2
Jul-05	4.3
Aug-05	4.2
Sep-05	4.4
Oct-05	4.2
Nov-05	3.9
Dec-05	3.8
Total	52.9

Table 23
2005 Average Monthly pH Data
Groundwater Treatment System
St. Regis Paper Company and City Dump Sites
Cass Lake, Minnesota

Month	pH
Jan-05	6.9
Feb-05	7.0
Mar-05	7.0
Apr-05	6.9
May-05	6.8
Jun-05	6.8
Jul-05	6.7
Aug-05	6.8
Sep-05	6.6
Oct-05	6.4
Nov-05	6.9
Dec-05	6.8
Average	6.8

Table 24
Groundwater Quality Data
Lower Aquifer
Fish Hatchery Wells
Cass Lake, Minnesota
(concentrations in ug/L)

	FISH4 GW0147 5/9/2005
Benzo(a)anthracene	<0.020
Chrysene	<0.020
Benzo(b)fluoranthene	<0.020
Benzo(k)fluoranthene	<0.020
Benzo(a)pyrene	<0.020
Indeno(1,2,3-cd)pyrene	<0.020
Dibenz(a,h)anthracene	<0.020
Quinoline	<0.020
Σ(cPAH)	ND
Naphthalene	<0.020
Acenaphthylene	<0.020
Acenaphthene	<0.020
Fluorene	<0.020
Phenanthrene	<0.020
Anthracene	<0.020
Fluoranthene	<0.020
Pyrene	<0.020
Benzo(g,h,i)perylene	<0.020
Σ(nPAH)	ND
Pentachlorophenol	<0.50

ND Not detected.

Table 25
Water Quality Data Over Time
Fish Hatchery Wells
Cass Lake, Minnesota
(concentrations in ug/L)

Year	Fish 1			Fish 2			Fish 3			Fish 4		
	Σ(cPAH)	Σ(nPAH)	PCP	Σ(cPAH)	Σ(nPAH)	PCP	Σ(cPAH)	Σ(nPAH)	PCP	Σ(cPAH)	Σ(nPAH)	PCP
May-92	<0.003	0.004	<6	<0.003	0.005	<6	<0.003	0.004	<6	<0.045	1.4	<6
Dec-92	—	—	—	—	—	—	—	—	—	<0.003	0.19	—
Jun-93	—	—	—	—	—	—	—	—	—	—	—	<6
Jul-93	—	—	—	—	—	—	—	—	—	<0.003	0.010	—
Feb-94	—	—	—	—	—	—	—	—	—	<0.090	1.3	<6
Jun-94	—	—	—	—	—	—	—	—	—	<0.090	3.2	<3
Dec-94	—	—	—	—	—	—	—	—	—	<0.003	0.030	<3
Jun-95	<0.003	<0.003	<3	<0.003	<0.003	<3	<0.003	0.003	<3	<0.30	5.2	<3
Nov-95	—	—	—	—	—	—	—	—	—	<0.006	<0.006	<3
Jun-97	—	—	—	—	—	—	—	—	—	<10	6a	<50
May-98	—	—	—	—	—	—	—	—	—	<0.10	0.37	<0.50
May-99	—	—	—	—	—	—	—	—	—	<0.02	0.35	<3
Apr-00	—	—	—	—	—	—	—	—	—	<0.02	0.03	<0.50
Apr-01	—	—	—	—	—	—	—	—	—	<0.019	<0.019	<0.50
May-02	—	—	—	—	—	—	—	—	—	<0.020	<0.020	<3
May-02	—	—	—	—	—	—	—	—	—	<0.020	<0.020	<0.50 h
May-03	—	—	—	—	—	—	—	—	—	<0.020	<0.020	<0.50
Apr-04	—	—	—	—	—	—	—	—	—	<0.019	<0.019	<0.50
May-05	—	—	—	—	—	—	—	—	—	<0.020	<0.020	<0.50

— Not analyzed.

a Estimated value, calculated using some or all values that are estimates.

h EPA sample extraction or analysis holding time was exceeded.

Table 26
Leachate Elevations
OU2- Containment Vault
St. Regis Paper Company and City Dump Pit Sites
Cass Lake, Minnesota
[Elevations in ft. MSL]

Date	Leachate Collection Manhole	Leak Detection Manhole
12/04/92	1312.40	1312.39
05/17/93	1313.32	1313.14
08/02/93	1313.63	1313.32
10/07/93	1313.65	1313.47
04/15/94	1313.82	1313.80
09/13/94	1313.82	1313.80
04/27/95	1314.15	1314.22
07/18/95	1314.15	1314.22
06/13/96	1314.59	1314.66
09/22/97	1314.90	1314.91
05/05/98	1314.82	1314.72
08/31/98	1314.86	1314.80
05/06/99	1315.03	1314.72
09/22/99	1315.15	1315.14
04/27/00	1315.36	1315.39
09/27/00	1315.19	1315.22
05/31/01	1315.73	1315.80
10/03/01	1315.78	1315.85
10/05/01	1315.78	1315.85
10/22/01	1314.19	1313.39
10/29/01	1312.36	1312.20
11/13/01	1312.36	1311.22
05/03/02	1313.78	1313.72
10/02/02	1313.94	1313.91
10/21/02	1313.94	1313.91
12/11/02	1313.86	1312.64
05/23/03	1313.53	1313.60
11/06/03	1313.23	1313.01
05/17/04	1313.32	1313.28
11/05/04	1313.34	1312.89
05/11/05	1313.36	1313.26
10/03/05	1313.53	1313.35
11/02/05	1313.28	1312.60

Notes:
LCM - Bottom elevation - 1312.19 ft MSL
LDM - Bottom elevation - 1311.20 ft MSL

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Table 27
Benchmark Elevations
OU2 - Containment Vault Operable Unit
St. Regis Paper Company Site

[Elevations in Ft. MSL]

Date	BM-1	BM-2	BM-3	BM-4	BM-5
12/21/88	1341.41	1338.42	1338.89	1341.18	1338.83
04/08/91	1341.44	1338.46	1338.93	1341.21	1338.82
08/09/92	1341.43	1338.44	1338.93	1341.20	1338.83
10/07/93	1341.49	1338.56	1339.05	1341.17	1338.85
06/16/94	1341.69	1338.69	1339.17	1341.46	1338.98
06/09/95	1341.70	1338.74	1339.19	1341.47	1339.09
06/04/96	1341.69	1338.70	1339.18	1341.47	1339.08
06/04/97	1341.69	1338.72	1339.20	1342.48[1]	1339.09
05/01/98	1341.68	1338.67	1339.18	1341.46	1339.07
05/14/99	1341.68	1338.69	1339.17	1341.46	1339.06
04/06/00	1341.68	1338.68	1339.14	1341.46	1339.08
04/27/01	1341.67	1338.70	1339.17	1341.45	1339.06
05/06/02	1341.70	1338.70	1339.16	1341.45	1339.06
05/12/03	1341.68	1338.70	1339.18	1341.46	1339.07
04/28/04	1341.68	1338.72	1339.19	1341.46	1339.08
05/06/05	1341.69	1338.71	1339.18	1341.47	1339.07

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Table 28

Leachate Removal Summary
OU2 - Containment Vault
St. Regis Paper Company Site
Cass Lake, Minnesota

Date	Flowmeter (cf)	Volume Removed (gallons)	LCM Depth	LCM Elevation	LDM Depth	LDM Elevation
10/03/05	5		31.63	1313.53	31.88	1313.35
10/03/05	271	1,990				
10/12/05	1,034	5,707				
10/20/05	1,188	1,152				
10/26/05	1,433	1,832	Meter Quit - Timed (130 minutes @ 14 gpm)			
11/02/05	--	--	31.88	1313.28	32.63	1312.60

LCM	LDM
1345.15	1345.22

Leachate Removal Summary

2005	**10,700**	**gallons**
Prior Years	**1,564,600**	**gallons**
Total	**1,575,300**	**gallons**

Annual Totals

2001	**129,535**	**gallons**
2002	**27,470**	**gallons**
2003	**17,092**	**gallons**
2004	**10,487**	**gallons**
2005	**10,681**	**gallons**

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Figures

Appendices

Appendix A

Quality Control Review

Appendix A

Quality Control Review
2005 Annual Monitoring Report
St. Regis Paper Company Site

Table of Contents

Introduction 1
Data Validation 1
Field Quality Control 2
Laboratory Quality Control 2
Conclusions 4

List of Tables

Table A-1 Field Blank Samples, PAH Compounds and Pentachlorophenol

Table A-2 Laboratory Blank Samples, EPA Method 8270, PAH Compounds

Table A-3 Blind Duplicate Samples, PAH Compounds and Pentachlorophenol

Table A-4 Laboratory Blank Samples, EPA Method 8280, HxCDD

Table A-5 Laboratory Blank Samples, EPA Method 8151, Pentachlorophenol

Introduction

A review of the quality assurance/quality control data was conducted to assess the integrity of the sampling procedures and the validity of the analytical results for monitoring of the Cass Lake Sites in 2005. The quality control practices and procedures, both field and laboratory, followed during the sampling, and analysis of samples are detailed in the Draft Quality Assurance Project Plan (QAPP), Cass Lake Sites (2000), prepared by Barr Engineering Company.

Samples collected at the site were analyzed by Columbia Analytical Services Inc. in Kelso Washington, for polynuclear aromatic hydrocarbons (PAHs) and pentachlorophenol (PCP) using modified EPA Method SW846 8270/SIM and 8151M, respectively. Severn Trent Services in West Sacramento, California, analyzed samples for hexachlorodibenzo-p-dioxin (HxCDD) using EPA Method SW846 8280A.

Data Validation

The analytical data from the monitoring program was reviewed in general conformance with the validation procedures detailed in the Draft Quality Assurance Project Plan (QAPP), Cass Lake Sites (2000), prepared by Barr Engineering Company. In general, the areas covered by the validation process are:

- EPA Recommended Holding Times
- Blank Analyses
- Spike and Duplicate Analyses
- Surrogate Recoveries
- Overall Assessment

These areas were evaluated with the criteria in the EPA data validation or specific method guidelines. Any data qualifiers are Barr defined qualifiers, not EPA defined qualifiers.

Field Quality Control

A review of the analytical results for the field blanks and field duplicates was conducted to assess the integrity of the sampling procedures and the analytical results for samples collected during the monitoring period.

Field blanks, laboratory blanks and trip blanks were collected and analyzed to monitor contamination from any improper equipment decontamination; sample collection, transport, storage or laboratory procedures.

Field and laboratory blank data is provided in Tables A-1 and A-2, respectively. With the exception of the sample from May 8, 2005, no detectable concentrations of PAHs compounds or pentachlorophenol were found in any of the field blanks collected during the monitoring period of 2004. In the May 8 field blank, a naphthalene concentration of 0.61 was detected (MRL for naphthalene is 0.40). Sample data within five times the naphthalene value detected in this field blank for this event has been qualified as potentially being a false positive (***b***). No detectable concentrations of target compounds were reported in the 2005 laboratory blank data.

Field duplicate samples were collected and analyzed to determine the precision of the analytical data. The precision was determined by calculating the relative percent difference (RPD) for the data pairs. The RPD formula is as follows:

$$RPD = \frac{(D1 - D2)}{(D1 + D2)/2} \times 100\%$$

Where: D1 = concentration of the native sample
D2 = concentration of the duplicate sample

The field duplicate samples were collected from wells W105 and W2234. RPD results display acceptable levels of reproducibility.

Laboratory Quality Control

Laboratory based QC procedures were used to determine and monitor the validity of the analytical data generated from the analytical systems used for sample analysis. Established acceptance criteria were used to measure the degree of precision and accuracy obtained from the analytical process.

All samples met established EPA recommended holding time requirements for extraction and analysis.

Both field and laboratory duplicate samples were analyzed to determine the data precision as measured by the reproducibility of the field sampling, laboratory analysis, and the degree of sample homogeneity.

The data accuracy was monitored by evaluating the surrogate spike recoveries, sample matrix spike recoveries, and laboratory control sample recoveries whenever the QC data were available. The acceptance criteria used for the accuracy were taken from the EPA data validation guidelines or from the laboratory-based QC limits associated with the specific SW846 methodology as stated in the laboratory SOPs.

All surrogate standard recoveries were reviewed for the organic analyses. Most of the trace PAH and PCP analyses surrogate recoveries met established acceptance criteria. EPA guidance states that one surrogate recovery can fall outside acceptance criteria if greater than 10%, therefore, no data were qualified based on this variability. Any PCP surrogate recoveries falling outside acceptance criteria were due to necessary dilutions of the samples. No further action was needed.

Matrix spike (MS) and matrix spike duplicate (MSD) (when available) and laboratory control sample (LCS) and laboratory control sample duplicate sample (LCSD) were reviewed to ensure the accuracy and precision of the analytical systems. The majority of the MS and MSD samples met laboratory established acceptance criteria, however, some variability was present due to the matrices of the samples. Because all the LCS and LCSD samples met acceptance criteria, indicating an in-control analytical system, no qualifiers have been applied because of the variation in MS/MSD percent recoveries.

The quality control aspects of the dioxin analysis were all met. The internal standard (or labeled compound) percent recovery for HxCDD met the laboratory established criteria. All ion abundance and signal to noise ratios met acceptance criteria. No qualifiers were necessary.

A comparison of the current sample data with historical data is completed to note any deviations in the data. The data for 2005 corresponded well with historical results.

Conclusions

The quality control aspects of the monitoring program overall at the Cass Lake site demonstrate compliance to the data quality objectives as measured by the quality control samples. All analytical data were validated and determined useable with the qualifiers applied in the summary tables.

Table A-1
Field Blank Samples
PAH Compounds and Pentachlorophenol
St. Regis Paper Company
Cass Lake, Minnesota
(concentrations in ug/L)

Location Date Lab	Field Blank 5/7/2005 CAS	Field Blank 5/8/2005 CAS	Field Blank 5/8/2005 CAS	Field Blank 5/11/2005 CAS	Field Blank 5/14/2005 CAS	Field Blank 5/15/2005 CAS
Acenaphthene	<0.022	<0.40	<0.021	<0.021	<0.021	<0.022
Acenaphthylene	<0.022	<0.40	<0.021	<0.021	<0.021	<0.022
Anthracene	<0.022	<0.40	<0.021	<0.021	<0.021	<0.022
Benzo(a)anthracene	<0.022	<0.40	<0.021	<0.021	<0.021	<0.022
Benzo(a)pyrene	<0.022	<0.40	<0.021	<0.021	<0.021	<0.022
Benzo(b)fluoranthene	<0.022	<0.40	<0.021	<0.021	<0.021	<0.022
Benzo(g,h,i)perylene	<0.022	<0.40	<0.021	<0.021	<0.021	<0.022
Benzo(k)fluoranthene	<0.022	<0.40	<0.021	<0.021	<0.021	<0.022
Chrysene	<0.022	<0.40	<0.021	<0.021	<0.021	<0.022
Dibenz(a,h)anthracene	<0.022	<0.40	<0.021	<0.021	<0.021	<0.022
Fluoranthene	<0.022	<0.40	<0.021	<0.021	<0.021	<0.022
Fluorene	<0.022	<0.40	<0.021	<0.021	<0.021	<0.022
Indeno(1,2,3-cd)pyrene	<0.022	<0.40	<0.021	<0.021	<0.021	<0.022
Naphthalene	<0.022	0.61	<0.021	<0.021	<0.021	<0.022
Phenanthrene	<0.022	<0.40	<0.021	<0.021	<0.021	<0.022
Pyrene	<0.022	<0.40	<0.021	<0.021	<0.021	<0.022
Quinoline	<0.022	<0.40	<0.021	<0.021	<0.021	<0.022
Pentachlorophenol	<0.50	<20	<0.50	<0.50	<0.50	<0.50

Table A-2
Laboratory Blank Samples
EPA Method 8270, PAH Compounds
St. Regis Paper Company
Cass Lake, Minnesota
(concentrations in ug/L)

Location Date Lab	Lab Blank 1/3/2005 CAS	Lab Blank 4/5/2005 CAS	Lab Blank 5/9/2005 CAS	Lab Blank 5/9/2005 CAS	Lab Blank 5/12/2005 CAS	Lab Blank 5/15/2005 CAS	Lab Blank 7/5/2005 CAS	Lab Blank 10/13/2005 CAS
Acenaphthene	<0.020	<0.020	<0.40	<0.020	<0.020	<0.020	<0.020	<0.020
Acenaphthylene	<0.020	<0.020	<0.40	<0.020	<0.020	<0.020	<0.020	<0.020
Anthracene	<0.020	<0.020	<0.40	<0.020	<0.020	<0.020	<0.020	<0.020
Benzo(a)anthracene	<0.020	<0.020	<0.40	<0.020	<0.020	<0.020	<0.020	<0.020
Benzo(a)pyrene	<0.020	<0.020	<0.40	<0.020	<0.020	<0.020	<0.020	<0.020
Benzo(b)fluoranthene	<0.020	<0.020	<0.40	<0.020	<0.020	<0.020	<0.020	<0.020
Benzo(g,h,i)perylene	<0.020	<0.020	<0.40	<0.020	<0.020	<0.020	<0.020	<0.020
Benzo(k)fluoranthene	<0.020	<0.020	<0.40	<0.020	<0.020	<0.020	<0.020	<0.020
Chrysene	<0.020	<0.020	<0.40	<0.020	<0.020	<0.020	<0.020	<0.020
Dibenz(a,h)anthracene	<0.020	<0.020	<0.40	<0.020	<0.020	<0.020	<0.020	<0.020
Fluoranthene	<0.020	<0.020	<0.40	<0.020	<0.020	<0.020	<0.020	<0.020
Fluorene	<0.020	<0.020	<0.40	<0.020	<0.020	<0.020	<0.020	<0.020
Indeno(1,2,3-cd)pyrene	<0.020	<0.020	<0.40	<0.020	<0.020	<0.020	<0.020	<0.020
Naphthalene	<0.020	<0.020	<0.40	<0.020	<0.020	<0.020	<0.020	<0.020
Phenanthrene	<0.020	<0.020	<0.40	<0.020	<0.020	<0.020	<0.020	<0.020
Pyrene	<0.020	<0.020	<0.40	<0.020	<0.020	<0.020	<0.020	<0.020
Quinoline	<0.020	<0.020	<0.40	<0.020	<0.020	<0.020	<0.020	<0.020

Table A-3
Blind Duplicate Sample Results
PAH Compounds and Pentachlorophenol
St. Regis Paper Company Site
Cass Lake, Minnesota
(concentrations in ug/L)

Location	W112		RPD	W212		RPD	W219		RPD	W2234		RPD	W2326		RPD	W408		RPD
Date	5/8/2005 Sample	5/8/2005 Duplicate		5/15/2005 Sample	5/15/2005 Duplicate		5/7/2005 Sample	5/7/2005 Duplicate		5/14/2005 Sample	5/14/2005 Duplicate		5/11/2005 Sample	5/11/2005 Duplicate		5/8/2005 Sample	5/8/2005 Duplicate	
Benzo(a)anthracene	<0.020	<0.020		<0.020	<0.020		<0.020	<0.020		<0.021	<0.021		<0.021	<0.020		<0.40	<0.40	
Chrysene	<0.020	<0.020		<0.020	<0.020		<0.020	<0.020		<0.021	<0.021		<0.021	<0.020		<0.40	<0.40	
Benzo(b)fluoranthene	<0.020	<0.020		<0.020	<0.020		<0.020	<0.020		<0.021	<0.021		<0.021	<0.020		<0.40	<0.40	
Benzo(k)fluoranthene	<0.020	<0.020		<0.020	<0.020		<0.020	<0.020		<0.021	<0.021		<0.021	<0.020		<0.40	<0.40	
Benzo(a)pyrene	<0.020	<0.020		<0.020	<0.020		<0.020	<0.020		<0.021	<0.021		<0.021	<0.020		<0.40	<0.40	
Indeno(1,2,3-cd)pyrene	<0.020	<0.020		<0.020	<0.020		<0.020	<0.020		<0.021	<0.021		<0.021	<0.020		<0.40	<0.40	
Dibenz(a,h)anthracene	<0.020	<0.020		<0.020	<0.020		<0.020	<0.020		<0.021	<0.021		<0.021	<0.020		<0.40	<0.40	
Quinoline	<0.020	<0.020		<0.020	<0.020		<0.020	<0.020		<0.021	<0.021		<0.021	<0.020		<0.40	<0.40	
Naphthalene	<0.020	<0.020		1.8	1.7	5.7	0.12 b	0.11 b		<0.021	<0.021		0.25	0.23	8.3	76	78	2.6
Acenaphthylene	<0.020	<0.020		<0.020	<0.020		<0.020	<0.020		<0.021	<0.021		<0.021	<0.020		<0.40	<0.40	
Acenaphthene	<0.020	<0.020		0.032	0.030	6.5	0.34	0.33	3	<0.021	<0.021		0.028	<0.020		7.6	7.8	2.6
Fluorene	<0.020	<0.020		<0.020	<0.020		<0.020	<0.020		<0.021	<0.021		<0.021	<0.020		1.2	1.2	0
Phenanthrene	<0.020	<0.020		<0.020	<0.020		0.039	0.040	2.5	<0.021	<0.021		<0.021	0.022		<0.40	<0.40	
Anthracene	<0.020	<0.020		<0.020	<0.020		<0.020	0.022		<0.021	<0.021		<0.021	<0.020		<0.40	<0.40	
Fluoranthene	0.10	0.093	7.3	<0.020	<0.020		0.046	0.045	2.2	<0.021	<0.021		<0.021	<0.020		<0.40	<0.40	
Pyrene	0.086	0.081	6	<0.020	<0.020		0.027	0.025	7.7	<0.021	<0.021		<0.021	<0.020		<0.40	<0.40	
Benzo(g,h,i)perylene	<0.020	<0.020		<0.020	<0.020		<0.020	<0.020		<0.021	<0.021		<0.021	<0.020		<0.40	<0.40	
Pentachlorophenol	<0.50	<0.50		46	46	0	<0.50	<0.50		<0.50	<0.50		<0.50	<0.50		820	870	5.9

RPD Relative Percent Difference.

b Potential false positive based on blank data validation procedure.

Table A-4
Laboratory Blank Samples
EPA Method 8280, HxCDD
St. Regis Paper Company Site
Cass Lake, Minnesota
(concentrations in ug/L)

Location Date	Lab Blank 1/3/2005	Lab Blank 4/5/2005	Lab Blank 7/5/2005	Lab Blank 10/11/2005
Dioxin, hexa, Total	<0.00039	<0.00027	<0.00016	<0.00040

Table A-5
Laboratory Blank Samples
EPA Method 8151, Pentachlorophenol
St. Regis Paper Company Site
Cass Lake, Minnesota
(concentrations in ug/L)

Location	Date	Pentachlorophenol
Lab Blank	01/03/2005	<0.50
Lab Blank	02/07/2005	<0.50
Lab Blank	03/07/2005	<0.50
Lab Blank	04/05/2005	<0.50
Lab Blank	05/03/2005	<0.50
Lab Blank	05/09/2005	<0.50
Lab Blank	05/09/2005	<20
Lab Blank	05/12/2005	<0.50
Lab Blank	05/15/2005	<0.50
Lab Blank	06/07/2005	<0.50
Lab Blank	07/05/2005	<0.50
Lab Blank	08/22/2005	<0.50
Lab Blank	09/13/2005	<0.50
Lab Blank	10/18/2005	<0.50
Lab Blank	12/06/2005	<0.50
Lab Blank	12/16/2005	<0.50

Appendix B

Laboratory Analytical Reports

1317 South 13th Avenue P.O. Box 479 Kelso, Washington 98626 (360) 577-7222 ph (360) 636-1068 fax

Columbia Analytical Services INC.
An Employee - Owned Company

January 11, 2005

Service Request No: K2500057

Marta Nelson
Barr Engineering
4700 West 77th Street
Minneapolis, MN 55435-4803

RECEIVED
FEB 07 2005
BARR ENGINEERING CO.

RE: 23/11-005Y02 110

Dear Marta:

Enclosed are the results of the rush sample(s) submitted to our laboratory on January 4, 2005. For your reference, these analyses have been assigned our service request number K2500057.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAC standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3358.

Respectfully submitted,

Columbia Analytical Services, Inc.

Lynda Huckestein
Client Services Manager

LH/jeb

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
	The analyte was found in the associated method blank at a level that is significant relative to the sample result.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a matrix interference.
X	See case narrative.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
B	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL has been elevated due to a matrix interference.
X	See case narrative.
*	The duplicate analysis not within control limits. See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results (25% for CLP Pesticides).
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a chromatographic interference.
X	See case narrative.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

Case Narrative

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	Barr Engineering Company	**Service Request No.:**	K2500057
Project:	23/11-005Y02 110	**Date Received:**	1/4/05
Sample Matrix:	Water		

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Matrix/Duplicate Matrix Spike (MS/DMS), and Laboratory Control Sample (LCS).

Sample Receipt

Four water samples were received for analysis at Columbia Analytical Services on 1/4/05. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Pentachlorophenol by EPA Method 8151M

Continuing Calibration Verification Exceptions:
The primary evaluation criterion was exceeded for the following analyte in Continuing Calibration Verifications (CCV) 0108F066 and 0110F016: 4-Bromo-2,6-dichlorophenol. In accordance with CAS standard operating procedures, the alternative evaluation specified in the EPA method was performed using the average percent recovery of all analytes in the verification standard. The standard meets the alternative evaluation criteria.

Elevated Method Reporting Limits:
Samples Ads A and Influent required dilution due to the presence of elevated levels of target analyte. The reporting limits are adjusted to reflect the dilution.

Surrogate Exceptions:
The control criteria for the following surrogate in samples Ads A and Influent are not applicable: 4-Bromo-2,6-dichlorophenol. The analysis of the sample required a dilution, which resulted in a surrogate concentration below the Method Reporting Limit (MRL). No further corrective action was appropriate.

Polynuclear Aromatic Hydrocarbons by EPA Method 8270C

Initial Calibration Exceptions:
The primary evaluation criterion was exceeded for the following analytes in Initial Calibration (ICAL) ID CAL4064: 2,6-Dimethylnaphthalene, Fluorene-d10, 2,4,6-Tribromophenol, Fluoranthene-d10, Dibenz(a,h)anthracene. In accordance with CAS standard operating procedures, the alternative evaluation specified in the EPA method was performed using the mean Relative Standard Deviation (RSD) of all analytes in the calibration. The result of the mean RSD calculation was 10.7%. The calibration meets the alternative evaluation criteria. Note that CAS/Kelso policy does not allow the use of averaging if any analyte in the ICAL exceeds 30% RSD.

Approved by _____ Date 2/4/05

Chain of Custody Documentation

K7500 57

Chain of Custody

BARR

4700 West 77th Street
Minneapolis, MN 55435-4803
(952) 832-2600

Project Number: 23/11-005Y02 110

№ 16390

Project Manager: Tom Mattison

Project Contact: Erik Gohl

Laboratory: Columbia Analytical Services

00007

Number of Containers/Preservative

Sample Identification	Collection Date	Collection Time	Matrix: Water	Matrix: Soil	Matrix: Other	Type: Grab	Type: Comp.	Type: QC	Volatile Organic (Unpres.)	Volatile Organic (Pres.)	Semivolatile Organic	Total Metals (HNO_3)	Dissolved Metals (HNO_3)	General (Unpreserved)	Cyanide (NaOH,Asc. Acid)	Nutrients (H_2SO_4)	Oil and Grease (H_2SO_4)	TOC (H_2SO_4)	Sulfide (Zn Acetate)	Dioxin	Whirlpak	Total Phenol (H_2SO_4)	Methane	(HCL)/DRO, 1L Glass	Lugols, Glass, Amber	Formalin, Glass					Total No. Of Containers	Remarks/ Analysis Required:
1. Ads A	1/3/05	9:30	X			X					X																				1	PCP
2. Ads B	1/3/05	9:30	X			X					X																				1	PCP
3. Ads C	1-3-05	9:30	X			X					X																				1	PCP
4. Influent	1-3-05	9:30	X			X					X																				1	PCP
5. Ads C	1-3-05	9:30	X			X					X																				2	P.A.H. See attached list
6.																																
7.																																
8.																																
9.																																
10.																																
11.																																
12.																																
13.																																
14.																																
15.																																
16.																																

Sampled By:	Relinquished By:	Date	Time	Received by:	Date	Time
Jamie Eedsmoe	Jamie Eedsmoe	1-3-05	9:30 AM	CAS	1/4/05	~~1500~~
Remarks:	Relinquished By:	Date	Time	Received by:	Date	Time 1500
	Samples Shipped VIA ☐ Air Freight ☐ Fed. Exp. ☐ Sampler ☐ Other			Air Bill Number: 822775788468		

H:RLGISTDFORMS\CHAINCST.CDR

Distribution: White-Original Accompanies Shipment to Lab; Yellow - Field Copy; Pink - Lab Coordinator

Rev. 08/01/01

Columbia Analytical Services Inc.
Cooler Receipt and Preservation Form

PC Lynda

Project/Client BARR Work Order K250 00057

Cooler received on 1/4/05 and opened on 1/4/05 by [illegible]

1. Were custody seals on outside of coolers? FX Y N
   If yes, how many and where? —
2. Were custody seals intact? Y N
3. Were signature and date present on the custody seals? Y N
4. Is the shipper's airbill available and filed? If no, record airbill number: Y N
5. COC#
   Temperature of cooler(s) upon receipt: (°C) 1.2
   Temperature Blank: (°C) N/P
   Were samples hand delivered on the same day as collection? Y N
6. Were custody papers properly filled out (ink, signed, etc.)? Y N
7. Type of packing material present STYRO, BUBBLE
8. **Did all bottles arrive in good condition (unbroken)?** Y N
9. Were all bottle labels complete (i.e analysis, preservation, etc.)? Y N
10. Did all bottle labels and tags agree with custody papers? Y N
11. **Were the correct types of bottles used for the tests indicated?** Y N
12. Were all of the preserved bottles received at the lab with the appropriate pH? Y N
13. Were VOA vials checked for absence of air bubbles, and if present, noted below? Y
14. Did the bottles originate from CAS/K or a branch laboratory? Y
15. **Are CWA Microbiology samples received with >1/2 the 24hr. hold time remaining from collection?** Y N
16. Was C12/Res negative? Y N

Explain any discrepancies:

RESOLUTION:

Samples that required preservation or received out of temperature:

Sample ID	Reagent	Volume	Lot Number	Bottle Type	Rec'd out of Temperature	Initials

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Barr Engineering Co.	**Service Request:**	K2500057
Project:	23/11-005Y02 110	**Date Collected:**	01/03/2005
Sample Matrix:	Water	**Date Received:**	01/04/2005

Pentachlorophenol

Sample Name:	Ads A	**Units:**	ug/L
Lab Code:	K2500057-001	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	**1800**	D	50	100	01/07/05	01/10/05	KWG0500422	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	88	32-124	01/10/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Barr Engineering Co.	**Service Request:**	K2500057
Project:	23/11-005Y02 110	**Date Collected:**	01/03/2005
Sample Matrix:	Water	**Date Received:**	01/04/2005

Pentachlorophenol

Sample Name:	Ads B	**Units:**	ug/L
Lab Code:	K2500057-002	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	**36**		0.50	1	01/07/05	01/10/05	KWG0500422	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	79	32-124	01/10/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Barr Engineering Co.	**Service Request:**	K2500057
Project:	23/11-005Y02 110	**Date Collected:**	01/03/2005
Sample Matrix:	Water	**Date Received:**	01/04/2005

Pentachlorophenol

Sample Name:	Ads C	**Units:**	ug/L
Lab Code:	K2500057-003	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	01/07/05	01/10/05	KWG0500422	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	82	32-124	01/10/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Barr Engineering Co.
Project: 23/11-005Y02 110
Sample Matrix: Water

Service Request: K2500057
Date Collected: 01/03/2005
Date Received: 01/04/2005

Pentachlorophenol

Sample Name: Influent
Lab Code: K2500057-004

Units: ug/L
Basis: NA

Extraction Method: METHOD
Analysis Method: 8151M

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	**2400**	D	50	100	01/07/05	01/10/05	KWG0500422	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	76	32-124	01/10/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Barr Engineering Co.	**Service Request:**	K2500057
Project:	23/11-005Y02 110	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Pentachlorophenol

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG0500422-4	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	01/07/05	01/10/05	KWG0500422	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	78	32-124	01/10/05	Acceptable

Comments:

00013

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Barr Engineering Co.
Project: 23/11-005Y02 110
Sample Matrix: Water

Service Request: K2500057

Surrogate Recovery Summary
Pentachlorophenol

Extraction Method: METHOD
Analysis Method: 8151M

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1
Ads A	K2500057-001	88 D #
Ads B	K2500057-002	79
Ads C	K2500057-003	82
Influent	K2500057-004	76 D #
Method Blank	KWG0500422-4	78
Batch QC	K2500058-001	77
Batch QCMS	KWG0500422-1	69
Batch QCDMS	KWG0500422-2	74
Lab Control Sample	KWG0500422-3	78

Surrogate Recovery Control Limits (%)

Sur1 = 4-Bromo-2,6-dichlorophenol 32-124

Results flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Barr Engineering Co.	**Service Request:**	K2500057
Project:	23/11-005Y02 110	**Date Extracted:**	01/07/2005
ple Matrix:	Water	**Date Analyzed:**	01/10/2005

Matrix Spike/Duplicate Matrix Spike Summary
Pentachlorophenol

Sample Name:	Batch QC	**Units:**	ug/L
Lab Code:	K2500058-001	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M	**Extraction Lot:**	KWG0500422

Analyte Name	Sample Result	Batch QCMS KWG0500422-1 Matrix Spike			Batch QCDMS KWG0500422-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Pentachlorophenol	ND	9.03	10.0	90	9.91	10.0	99	36-110	9	30

lts flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00015

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Barr Engineering Co.
Project: 23/11-005Y02 110
Sample Matrix: Water

Service Request: K2500057
Date Extracted: 01/07/2005
Date Analyzed: 01/10/2005

Lab Control Spike Summary
Pentachlorophenol

Extraction Method: METHOD
Analysis Method: 8151M

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG0500422

	Lab Control Sample KWG0500422-3 Lab Control Spike			
Analyte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
Pentachlorophenol	10.1	10.0	101	43-107

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00016

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Barr Engineering Co.	**Service Request:**	K2500057
Project:	23/11-005Y02 110	**Date Collected:**	01/03/2005
Sample Matrix:	Water	**Date Received:**	01/04/2005

Polynuclear Aromatic Hydrocarbons

Sample Name:	Ads C	**Units:**	ug/L
Lab Code:	K2500057-003	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.020	1	01/06/05	01/20/05	KWG0500369	
Acenaphthylene	ND	U	0.020	1	01/06/05	01/20/05	KWG0500369	
Acenaphthene	ND	U	0.020	1	01/06/05	01/20/05	KWG0500369	
Fluorene	ND	U	0.020	1	01/06/05	01/20/05	KWG0500369	
Phenanthrene	ND	U	0.020	1	01/06/05	01/20/05	KWG0500369	
Anthracene	ND	U	0.020	1	01/06/05	01/20/05	KWG0500369	
Fluoranthene	ND	U	0.020	1	01/06/05	01/20/05	KWG0500369	
Pyrene	ND	U	0.020	1	01/06/05	01/20/05	KWG0500369	
Benz(a)anthracene	ND	U	0.020	1	01/06/05	01/20/05	KWG0500369	
Chrysene	ND	U	0.020	1	01/06/05	01/20/05	KWG0500369	
Benzo(b)fluoranthene	ND	U	0.020	1	01/06/05	01/20/05	KWG0500369	
Benzo(k)fluoranthene	ND	U	0.020	1	01/06/05	01/20/05	KWG0500369	
Benzo(a)pyrene	ND	U	0.020	1	01/06/05	01/20/05	KWG0500369	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	1	01/06/05	01/20/05	KWG0500369	
Dibenz(a,h)anthracene	ND	U	0.020	1	01/06/05	01/20/05	KWG0500369	
Benzo(g,h,i)perylene	ND	U	0.020	1	01/06/05	01/20/05	KWG0500369	
Quinoline	ND	U	0.020	1	01/06/05	02/01/05	KWG0500369	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	84	37-107	01/20/05	Acceptable
Fluoranthene-d10	101	18-137	01/20/05	Acceptable
Terphenyl-d14	124	18-153	01/20/05	Acceptable

Comments:

00017

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Barr Engineering Co.
Project: 23/11-005Y02 110
Sample Matrix: Water

Service Request: K2500057
Date Collected: NA
Date Received: NA

Polynuclear Aromatic Hydrocarbons

Sample Name: Method Blank
Lab Code: KWG0500369-3

Units: ug/L
Basis: NA

Extraction Method: EPA 3520C
Analysis Method: 8270C SIM

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.020	1	01/06/05	01/20/05	KWG0500369	
Acenaphthylene	ND	U	0.020	1	01/06/05	01/20/05	KWG0500369	
Acenaphthene	ND	U	0.020	1	01/06/05	01/20/05	KWG0500369	
Fluorene	ND	U	0.020	1	01/06/05	01/20/05	KWG0500369	
Phenanthrene	ND	U	0.020	1	01/06/05	01/20/05	KWG0500369	
Anthracene	ND	U	0.020	1	01/06/05	01/20/05	KWG0500369	
Fluoranthene	ND	U	0.020	1	01/06/05	01/20/05	KWG0500369	
Pyrene	ND	U	0.020	1	01/06/05	01/20/05	KWG0500369	
Benz(a)anthracene	ND	U	0.020	1	01/06/05	01/20/05	KWG0500369	
Chrysene	ND	U	0.020	1	01/06/05	01/20/05	KWG0500369	
Benzo(b)fluoranthene	ND	U	0.020	1	01/06/05	01/20/05	KWG0500369	
Benzo(k)fluoranthene	ND	U	0.020	1	01/06/05	01/20/05	KWG0500369	
Benzo(a)pyrene	ND	U	0.020	1	01/06/05	01/20/05	KWG0500369	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	1	01/06/05	01/20/05	KWG0500369	
Dibenz(a,h)anthracene	ND	U	0.020	1	01/06/05	01/20/05	KWG0500369	
Benzo(g,h,i)perylene	ND	U	0.020	1	01/06/05	01/20/05	KWG0500369	
Quinoline	ND	U	0.020	1	01/06/05	02/01/05	KWG0500369	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	81	37-107	01/20/05	Acceptable
Fluoranthene-d10	96	18-137	01/20/05	Acceptable
Terphenyl-d14	121	18-153	01/20/05	Acceptable

Comments:

00018

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Barr Engineering Co.
Project: 23/11-005Y02 110
Sample Matrix: Water

Service Request: K2500057

Surrogate Recovery Summary
Polynuclear Aromatic Hydrocarbons

Extraction Method: EPA 3520C
Analysis Method: 8270C SIM

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1	Sur2	Sur3
Ads C	K2500057-003	84	101	124
Method Blank	KWG0500369-3	81	96	121
Lab Control Sample	KWG0500369-1	87	96	110
Duplicate Lab Control Sample	KWG0500369-2	85	97	109

Surrogate Recovery Control Limits (%)

Sur1 =	Fluorene-d10	37-107
Sur2 =	Fluoranthene-d10	18-137
Sur3 =	Terphenyl-d14	18-153

Results flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.

00019

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Barr Engineering Co.
Project: 23/11-005Y02 110
Sample Matrix: Water

Service Request: K2500057
Date Extracted: 01/06/2005
Date Analyzed: 01/20/2005
02/01/20

Lab Control Spike/Duplicate Lab Control Spike Summary
Polynuclear Aromatic Hydrocarbons

Extraction Method: EPA 3520C
Analysis Method: 8270C SIM

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG0500369

	Lab Control Sample KWG0500369-1 Lab Control Spike			Duplicate Lab Control Sample KWG0500369-2 Duplicate Lab Control Spike					
Analyte Name	**Result**	**Expected**	**%Rec**	**Result**	**Expected**	**%Rec**	**%Rec Limits**	**RPD**	**RPD Limit**
Naphthalene	1.68	2.38	71	1.90	2.38	80	41-115	12	30
Acenaphthylene	1.77	2.38	74	1.97	2.38	83	44-122	11	30
Acenaphthene	1.73	2.38	73	1.90	2.38	80	41-123	9	30
Fluorene	1.68	2.38	70	1.85	2.38	78	44-128	10	30
Phenanthrene	1.80	2.38	76	1.99	2.38	83	45-127	10	30
Anthracene	1.64	2.38	69	1.89	2.38	80	40-126	14	30
Fluoranthene	1.77	2.38	74	2.02	2.38	85	41-141	13	30
Pyrene	1.76	2.38	74	2.00	2.38	84	34-152	12	30
Benz(a)anthracene	1.71	2.38	72	1.87	2.38	78	46-132	9	30
Chrysene	1.80	2.38	76	1.96	2.38	82	46-136	9	30
Benzo(b)fluoranthene	1.85	2.38	78	2.07	2.38	87	54-137	12	30
Benzo(k)fluoranthene	1.73	2.38	73	1.92	2.38	81	54-141	10	30
Benzo(a)pyrene	1.72	2.38	72	1.90	2.38	80	49-133	10	30
Indeno(1,2,3-cd)pyrene	1.49	2.38	63	1.66	2.38	70	41-141	10	30
Dibenz(a,h)anthracene	1.41	2.38	59	1.52	2.38	64	39-143	7	30
Benzo(g,h,i)perylene	1.58	2.38	67	1.76	2.38	74	46-133	11	30
Quinoline	2.22	2.38	93	2.13	2.38	90	70-130	4	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00020

SEVERN TRENT STL

STL Sacramento
880 Riverside Parkway
West Sacramento, CA 95605

Tel: 916 373 5600 Fax: 916 372 1059
www.stl-inc.com

January 21, 2005

STL SACRAMENTO PROJECT NUMBER: G5A040195
PO/CONTRACT:

Ms. Marta Nelson
Barr Engineering Co.
4700 West 77th Street
Minneapolis, MN 55435-4803

RECEIVED
JAN 25 2005
BARR
ENGINEERING CO.

Dear Ms Nelson,

This report contains the analytical results for the sample received under chain of custody by STL Sacramento on January 4, 2005. This sample is associated with your 23/11-005AMG110 project.

The test results in this report meet all NELAC requirements for parameters that accreditation is required or available. Any exceptions to NELAC requirements are noted in the case narrative. The case narrative is an integral part of this report.

If you have any questions, please feel free to call me at (916) 374-4362.

Sincerely,

Diana Brooks
Project Manager

TABLE OF CONTENTS

STL SACRAMENTO PROJECT NUMBER G5A040195

Case Narrative

STL Sacramento Quality Assurance Program

Sample Description Information

Chain of Custody Documentation

WATER, 8280A, HxCDD Only
Sample: 1
- Sample Data Sheet
- Method Blank Report
- Laboratory QC Reports

CASE NARRATIVE

STL SACRAMENTO PROJECT NUMBER G5A040195

There were no anomalies associated with this project.

SEVERN TRENT STL

ACCREDITED IN ACCORDANCE WITH nelac

STL Sacramento Certifications/Accreditations

Certifying State	Certificate #	Certifying State	Certificate #
Alaska	UST-055	Oregon	CA 200005
Arizona	AZ0616	Pennsylvania	68-1272
Arkansas	NA	South Carolina	87014001
California*	01119CA	Utah*	QUAN1
Connecticut	PH-0691	Virginia	00178
Florida*	E87570	Washington	C087
Georgia	960	West Virginia	9930C, 334
Hawaii	NA	Wisconsin	998204680
Louisiana*	01944	NFESC	NA
Michigan	9947	USACE	NA
Nevada	CA 044	USACE	NA
New Jersey*	CA005	USDA Foreign Plant	37-82605
New York*	11666	USDA Foreign Soil	S-46613

*NELAP accredited. A more detailed parameter list is available upon request.

QC Parameter Definitions

QC Batch: The QC batch consists of a set of up to 20 field samples that behave similarly (i.e., same matrix) and are processed using the same procedures, reagents, and standards at the same time.

Method Blank: An analytical control consisting of all reagents, which may include internal standards and surrogates, and is carried through the entire analytical procedure. The method blank is used to define the level of laboratory background contamination.

Laboratory Control Sample and Laboratory Control Sample Duplicate (LCS/LCSD): An aliquot of blank matrix spiked with known amounts of representative target analytes. The LCS (and LCSD as required) is carried through the entire analytical process and is used to monitor the accuracy of the analytical process independent of potential matrix effects. If an LCSD is performed, it may also used to evaluate the precision of the process.

Duplicate Sample (DU): Different aliquots of the same sample are analyzed to evaluate the precision of an analysis.

Surrogates: Organic compounds not expected to be detected in field samples, which behave similarly to target analytes. These are added to every sample within a batch at a known concentration to determine the efficiency of the sample preparation and analytical process.

Matrix Spike and Matrix Spike Duplicate (MS/MSD): An MS is an aliquot of a matrix fortified with known quantities of specific compounds and subjected to an entire analytical procedure in order to indicate the appropriateness of the method for a particular matrix. The percent recovery for the respective compound(s) is then calculated. The MSD is a second aliquot of the same matrix as the matrix spike, also spiked, in order to determine the precision of the method.

Isotope Dilution: For isotope dilution methods, isotopically labeled analogs (internal standards) of the native target analytes are spiked into the sample at time of extraction. These internal standards are used for quantitation, and monitor and correct for matrix effects. Since matrix effects on method performance can be judged by the recovery of these analogs, there is little added benefit of performing MS/MSD for these methods. MS/MSD are only performed for client or QAPP requirements.

Control Limits: The reported control limits are either based on laboratory historical data, method requirements, or project data quality objectives. The control limits represent the estimated uncertainty of the test results.

Sample Summary
G5A040195

WO#	Sample #	Client Sample ID	Sampling Date	Received Date
G14ND	1	INFLUENT	1/3/05 09:30 AM	1/4/05 09:00 AM

Notes(s):

- The analytical results of the samples listed above are presented on the following pages.
- *All calculations are performed before rounding to avoid round-off errors in calculated results.*
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity, pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight

G5A040195

Chain of Custody

BARR

4700 West 77th Street
Minneapolis, MN 55435-4803
(952) 832-2600

Project Number: 23 / 11 - 005 Y02 110

№ 16367

Project Manager: Tom Mattison

Project Contact: Erik Gohl

Laboratory: Severn Trent

Remarks/ Analysis Required:

Sample Identification	Collection Date	Collection Time	Matrix: Water	Matrix: Soil	Matrix: Other	Type: Grab	Type: Comp.	Type: QC	Volatile Organic (Unpres.)	Volatile Organic (Pres.)	Semivolatile Organic	Total Metals (HNO_3)	Dissolved Metals (HNO_3)	General (Unpreserved)	Cyanide (NaOH, Asc. Acid)	Nutrients (H_2SO_4)	Oil and Grease (H_2SO_4)	TOC (H_2SO_4)	Sulfide (Zn Acetate)	Dioxin	Whirlpak	Total Phenol (H_2SO_4)	Methane	(HCL)/DRO, 1L Glass	Lugols, Glass, Amber	Formalin, Glass					Total No. Of Containers	Remarks/ Analysis Required
1. In Alvest	1/3/05	9:30	X			X					X																				2	Dioxin
2.																																
3.																																
4.																																
5.																																
6.																																
7.																																
8.																																
9.																																
10.																																
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13.																																
14.																																
15.																																
16.																																

RECEIVED IN GOOD CONDITION UNDER COC
JAN 4 2005
Ge

Sampled By: Jamie Edsmoe

Remarks:

Relinquished By:	Date	Time	Received by:	Date	Time
Jamie Edsmoe	1-3-05	9:30 am	[signature]	1-4-05	1055
Relinquished By:	Date	Time	Received by:	Date	Time
Samples Shipped VIA ☐ Air Freight ☐ Fed. Exp. ☐ Sampler ☐ Other			Air Bill Number: 811310490740		

Distribution: White-Original Accompanies Shipment to Lab; Yellow - Field Copy; Pink - Lab Coordinator

Rev. 08/01/01

WATER, 8280A, HxCDD Only

Barr Engineering Company

Client Sample ID: INFLUENT

Trace Level Organic Compounds

Lot-Sample #...: G5A040195-001 Work Order #...: G14ND1AA Matrix.....: WATER
Date Sampled...: 01/03/05 Date Received..: 01/04/05
Prep Date.....: 01/14/05 Analysis Date..: 01/15/05
Prep Batch #...: 5014337
Dilution Factor: 1

PARAMETER	RESULT	DETECTION LIMIT	UNITS	METHOD
Total HxCDD	ND	1.7	ng/L	SW846 8280A

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-1,2,3,6,7,8-HxCDD	90	(25 - 150)

QC DATA ASSOCIATION SUMMARY

G5A040195

Sample Preparation and Analysis Control Numbers

SAMPLE#	MATRIX	ANALYTICAL METHOD	LEACH BATCH #	PREP BATCH #	MS RUN#
001	WATER	SW846 8280A		5014337	

METHOD BLANK REPORT

Trace Level Organic Compounds

Client Lot #...: G5A040195 **Work Order #...:** G2LWP1AA **Matrix.....:** WATER
MB Lot-Sample #: G5A140000-337

Prep Date.....: 01/14/05
Analysis Date..: 01/15/05 **Prep Batch #...:** 5014337
Dilution Factor: 1

PARAMETER	RESULT	DETECTION LIMIT	UNITS	METHOD
Total HxCDD	ND	0.39	ng/L	SW846 8280A

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-1,2,3,6,7,8-HxCDD	91	(25 - 150)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

Trace Level Organic Compounds

Client Lot #...: G5A040195 **Work Order #...:** G2LWP1AC **Matrix.....:** WATER
LCS Lot-Sample#: G5A140000-337
Prep Date.....: 01/14/05 **Analysis Date..:** 01/15/05
Prep Batch #...: 5014337
Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	METHOD
2,3,7,8-TCDD	**107**	**(74 - 129)**	**SW846 8280A**
1,2,3,7,8-PeCDD	**107**	**(70 - 132)**	**SW846 8280A**
1,2,3,6,7,8-HxCDD	**108**	**(63 - 131)**	**SW846 8280A**
1,2,3,4,6,7,8-HpCDD	**105**	**(66 - 137)**	**SW846 8280A**
OCDD	**111**	**(69 - 135)**	**SW846 8280A**
2,3,7,8-TCDF	**99**	**(71 - 131)**	**SW846 8280A**
1,2,3,7,8-PeCDF	**109**	**(62 - 147)**	**SW846 8280A**
1,2,3,6,7,8-HxCDF	**105**	**(67 - 136)**	**SW846 8280A**
1,2,3,4,6,7,8-HpCDF	**103**	**(72 - 137)**	**SW846 8280A**
OCDF	**107**	**(66 - 138)**	**SW846 8280A**

INTERNAL STANDARD	PERCENT RECOVERY	RECOVERY LIMITS
13C-1,2,3,6,7,8-HxCDD	88	(25 - 150)
13C-2,3,7,8-TCDD	92	(25 - 150)
13C-2,3,7,8-TCDF	90	(25 - 150)
13C-1,2,3,4,6,7,8-HpCDF	90	(25 - 150)
13C-OCDD	83	(25 - 150)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE DATA REPORT

Trace Level Organic Compounds

Client Lot #...: G5A040195 Work Order #...: G2LWP1AC Matrix.....: WATER
LCS Lot-Sample#: G5A140000-337
Prep Date.....: 01/14/05 Analysis Date..: 01/15/05
Prep Batch #...: 5014337
Dilution Factor: 1

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	METHOD
2,3,7,8-TCDD	25.0	26.7	ng/L	107	SW846 8280A
1,2,3,7,8-PeCDD	62.5	66.9	ng/L	107	SW846 8280A
1,2,3,6,7,8-HxCDD	62.5	67.3	ng/L	108	SW846 8280A
1,2,3,4,6,7,8-HpCDD	62.5	65.9	ng/L	105	SW846 8280A
OCDD	125	138	ng/L	111	SW846 8280A
2,3,7,8-TCDF	25.0	24.8	ng/L	99	SW846 8280A
1,2,3,7,8-PeCDF	62.5	68.2	ng/L	109	SW846 8280A
1,2,3,6,7,8-HxCDF	62.5	65.5	ng/L	105	SW846 8280A
1,2,3,4,6,7,8-HpCDF	62.5	64.4	ng/L	103	SW846 8280A
OCDF	125	134	ng/L	107	SW846 8280A

INTERNAL STANDARD	PERCENT RECOVERY	RECOVERY LIMITS
13C-1,2,3,6,7,8-HxCDD	88	(25 - 150)
13C-2,3,7,8-TCDD	92	(25 - 150)
13C-2,3,7,8-TCDF	90	(25 - 150)
13C-1,2,3,4,6,7,8-HpCDF	90	(25 - 150)
13C-OCDD	83	(25 - 150)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

17 South 13th Avenue P.O. Box 479 Kelso, Washington 98626 (360) 577-7222 ph (360) 636-1068 fax

Columbia Analytical Services INC.
An Employee - Owned Company

February 24, 2005 Service Request No: K2500968

Marta Nelson
Barr Engineering
4700 West 77th Street
Minneapolis, MN 55435-4803

RE: IP/C. LAKE/23-11-005Y02 110

Dear Marta:

Enclosed are the results of the sample(s) submitted to our laboratory on February 8, 2005. For your reference, these analyses have been assigned our service request number K2500968.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAC standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3358.

Respectfully submitted,

Columbia Analytical Services, Inc.

Lynda Huckestein
Client Services Manager

LH/dj

NELAP Accredited ACIL Seal of Excellence Award

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a matrix interference.
X	See case narrative.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
B	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL has been elevated due to a matrix interference.
X	See case narrative.
*	The duplicate analysis not within control limits. See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results (25% for CLP Pesticides).
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a chromatographic interference.
X	See case narrative.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Case Narrative

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	Barr Engineering Company	**Service Request No.:**	K2500968
Project:	IP/Cass Lake	**Date Received:**	2/8/2005
Sample Matrix:	Water		

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Matrix/Duplicate Matrix Spike (MS/DMS), and Laboratory Control Sample (LCS).

Sample Receipt

Four water samples were received for analysis at Columbia Analytical Services on 2/8/2005. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Pentachlorophenol by EPA Method 8151M

Continuing Calibration Verification Exceptions:
The primary evaluation criterion was exceeded for several analytes in Continuing Calibration Verification (CCV) 0218F018 and 0218F032. In accordance with CAS standard operating procedures, the alternative evaluation specified in the EPA method was performed using the average percent recovery of all analytes in the verification standard. The standard meets the alternative evaluation criteria.

Results for Pentachlorophenol in sample Influent have been reported from a column using average percent recovery of all analytes in the verification standard.

Elevated Method Reporting Limits:
Samples Abs B and Influent required dilution due to the presence of elevated levels of target analyte. The reporting limits are adjusted to reflect the dilution.

Surrogate Exceptions:
The control criteria for the following surrogate in sample Influent are not applicable: 4-Bromo-2,6-dichlorophenol. The analysis of the sample required a dilution, which resulted in a surrogate concentration below the Method Reporting Limit (MRL). No further corrective action was appropriate.

Matrix Spike Recovery Exceptions:
The control criteria for matrix spike recovery of Pentachlorophenol for sample Abs B is not applicable. The analyte concentration in the sample was significantly higher than the added spike concentration, preventing accurate evaluation of the spike recovery.

Approved by _____ **Date** 2/24/05

Chain of Custody Documentation

K2-0968

BARR

Chain of Custody

4700 West 77th Street
Minneapolis, MN 55435-4803
(952) 832-2600

Project Number: 23 / 11 - 005 Y02 110

№ 16391

Project Manager: **Tom Mattison**

Project Contact: **Erik Gohl**

Laboratory: **Columbia Analytical Services**

00007

Number of Containers/Preservative

Sample Identification	Collection Date	Collection Time	Matrix: Water	Matrix: Soil	Matrix: Other	Type: Grab	Type: Comp.	Type: QC	Volatile Organic (Unpres.)	Volatile Organic (Pres.)	Semivolatile Organic	Total Metals (HNO_3)	Dissolved Metals (HNO_3)	General (Unpreserved)	Cyanide (NaOH, Asc. Acid)	Nutrients (H_2SO_4)	Oil and Grease (H_2SO_4)	TOC (H_2SO_4)	Sulfide (Zn Acetate)	Dioxin	Whirlpak	Total Phenol (H_2SO_4)	Methane	(HCL)/DRO, 1L Glass	Lugols, Glass, Amber	Formalin, Glass					Total No. Of Containers	Remarks/ Analysis Required:
1. Ads A	2/7/05	9:00	X			X					X																				1	PCP
2. Ads B	2/7/05	9:00	X			X					X																				1	PCP
3. Ads C	2/7/05	9:00	X			X					X																				1	PCP
4. Influent	2/7/05	9:00	X			X					X																				1	PCP
5.																																
6.																																
7.																																
8.																																
9.																																
10.																																
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13.																																
14.																																
15.																																
16.																																

Sampled By: Jamie Edsmoe

Remarks:

Relinquished By:	Date	Time	Received by:	Date	Time
Jamie Edsmoe	2-7-05	9:00	[signature] CAS	2/8/05	1015
Relinquished By:	Date	Time	Received by:	Date	Time
Samples Shipped VIA ☐ Air Freight ☐ Fed. Exp. ☐ Sampler ☐ Other			Air Bill Number: 822775788479		

Distribution: White-Original Accompanies Shipment to Lab; Yellow - Field Copy; Pink - Lab Coordinator

Rev. 08/01/01

H:RLG\STDFORMS\CHAINCST.CDR

Columbia Analytical Services Inc.
Cooler Receipt and Preservation Form

PC LH

Project/Client Barr Work Order K250 0968

Cooler received on 2/8/15 and opened on 2/8/15 by TBlack

1.	Were custody seals on outside of coolers?	Y	N
	If yes, how many and where?		
2.	Were custody seals intact?	Y	N
3.	Were signature and date present on the custody seals?	Y	N
4.	Is the shipper's airbill available and filed? If no, record airbill number:	Y	N
5.	COC#		
	Temperature of cooler(s) upon receipt: (°C) 2.1		
	Temperature Blank: (°C) Na		
	Were samples hand delivered on the same day as collection?	Y	N
6.	Were custody papers properly filled out (ink, signed, etc.)?	Y	N
7.	Type of packing material present: ice in bags - bmap - insert		
8.	**Did all bottles arrive in good condition (unbroken)?**	Y	N
9.	Were all bottle labels complete (i.e analysis, preservation, etc.)?	Y	N
10.	Did all bottle labels and tags agree with custody papers?	Y	N
11.	**Were the correct types of bottles used for the tests indicated?**	Y	N
12.	Were all of the preserved bottles received at the lab with the appropriate pH?	Y	N
13.	Were VOA vials checked for absence of air bubbles, and if present, noted below?	Y	
14.	Did the bottles originate from CAS/K or a branch laboratory?	Y	N
15.	**Are CWA Microbiology samples received with >1/2 the 24hr. hold time remaining from collection?**	~~Y~~	~~N~~
16.	Was C12/Res negative?	Y	N

Explain any discrepancies:

RESOLUTION:

Samples that required preservation or received out of temperature:

Sample ID	Reagent	Volume	Lot Number	Bottle Type	Rec'd out of Temperature	Initials

00008

Pentachlorophenol
EPA Method 8151 Modified

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Barr Engineering Co.	**Service Request:**	K2500968
Project:	IP/C. LAKE/23/11-005Y02110	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Pentachlorophenol

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG0502101-4	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	02/09/05	02/18/05	KWG0502101	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	87	35-133	02/18/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Barr Engineering Co.
Project: IP/C. LAKE/23/11-005Y02110
Sample Matrix: Water

Service Request: K2500968

Surrogate Recovery Summary
Pentachlorophenol

Extraction Method: METHOD
Analysis Method: 8151M

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1
Ads A	K2500968-001	97
Ads B	K2500968-002	70 D
Ads C	K2500968-003	91
Influent	K2500968-004	0 D #
Method Blank	KWG0502101-4	87
Ads BMS	KWG0502101-1	77 D
Ads BDMS	KWG0502101-2	98 D
Lab Control Sample	KWG0502101-3	89

Surrogate Recovery Control Limits (%)

Sur1 = 4-Bromo-2,6-dichlorophenol 35-133

Results flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.

00015

1317 South 13th Avenue P.O. Box 479 Kelso, Washington 98626 (360) 577-7222 ph (360) 636-1068 fax

Columbia Analytical Services INC.
An Employee - Owned Company

RECEIVED
MAR 25 2005
BARR ENGINEERING CO.

March 21, 2005 Service Request No: K2501752

Marta Nelson
Barr Engineering
4700 West 77th Street
Minneapolis, MN 55435-4803

RE: 23/11-005~~Y02~~ Y05 110

Dear Marta:

Enclosed are the results of the sample(s) submitted to our laboratory on March 10, 2005. For your reference, these analyses have been assigned our service request number K2501752.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAC standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3358.

Respectfully submitted,

Columbia Analytical Services, Inc.

Lynda Huckestein
Client Services Manager

LH/jeb

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
,	The analyte was found in the associated method blank at a level that is significant relative to the sample result.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a matrix interference.
X	See case narrative.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
B	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL has been elevated due to a matrix interference.
X	See case narrative.
*	The duplicate analysis not within control limits. See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results (25% for CLP Pesticides).
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a chromatographic interference.
X	See case narrative.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
J	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

Case Narrative

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	Barr Engineering Company	**Service Request No.:**	K2501752
Project:	23/11-005Y02 110	**Date Received:**	3/10/05
Sample Matrix:	Water		

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Matrix/Duplicate Matrix Spike (MS/DMS), and Laboratory Control Sample (LCS).

Sample Receipt

Four water samples were received for analysis at Columbia Analytical Services on 3/10/05. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Pentachlorophenol by EPA Method 8151M

Matrix Spike Recovery Exceptions:
The matrix spike recovery of Pentachlorophenol for the Batch QC sample was outside control criteria. Recovery in the Laboratory Control Sample (LCS) was acceptable, which indicates the analytical batch was in control. The matrix spike outlier suggests a potential high bias in this matrix. No further corrective action was appropriate.

Elevated Method Reporting Limits:
Samples Ads B and Influent required dilution due to the presence of elevated levels of target analyte. The reporting limits are adjusted to reflect the dilution

Approved by LAL **Date** 3/27/05

Chain of Custody Documentation

K2L 1752

BARR

Chain of Custody

4700 West 77th Street
Minneapolis, MN 55435-4803
(952) 832-2600

Project Number: 23 / 11 - 005 Y02 110

№ 16392

Project Manager: **Tom Mattison**

Project Contact: **Erik Gohl**

Laboratory: **Columbia Analytical Services**

Number of Containers/Preservative

Sample Identification	Collection Date	Collection Time	Matrix: Water	Matrix: Soil	Matrix: Other	Type: Grab	Type: Comp.	Type: QC	Volatile Organic (Unpres.)	Volatile Organic (Pres.)	Semivolatile Organic	Total Metals (HNO_3)	Dissolved Metals (HNO_3)	General (Unpreserved)	Cyanide (NaOH, Asc. Acid)	Nutrients (H_2SO_4)	Oil and Grease (H_2SO_4)	TOC (H_2SO_4)	Sulfide (Zn Acetate)	Dioxin	Whirlpak	Total Phenol (H_2SO_4)	Methane	(HCL)/DRO, 1L Glass	Lugols, Glass, Amber	Formalin, Glass					Total No. Of Containers	Remarks/ Analysis Required:
1. Ads A	3/7/05	Am 9:00	X			X					X																				1	PCP
2. Ads B	3/7/05	9:00	X			X					X																				1	PCP
3. Ads C	3/7/05	9:00	X			X					X																				1	PCP
4. Influent	3/7/05	9:00	X			X					X																				1	PCP
5.																																
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16.																																

Sampled By: JAMIE ELDSMOE

Remarks:

Relinquished By:	Date	Time	Received by:	Date	Time
Jamie Eldsmoe	3-7-05	9:00 AM	[signature]	3/10/05	1000
Relinquished By:	Date	Time	Received by:	Date	Time
Samples Shipped VIA ☐ Air Freight ☐ Fed. Exp. ☐ Sampler ☐ Other			Air Bill Number: 822775788619		

Distribution: White-Original Accompanies Shipment to Lab; Yellow - Field Copy; Pink - Lab Coordinator

Rev. 08/01/01

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Columbia Analytical Services Inc.
Cooler Receipt and Preservation Form

PC Lynda

Project/Client Bace Work Order K250 1752

Cooler received on 3/10/05 and opened on 3/10/05 by [illegible]

1. Were custody seals on outside of coolers? Y N
   If yes, how many and where? —
2. Were custody seals intact? Y N
3. Were signature and date present on the custody seals? Y N
4. Is the shipper's airbill available and filed? If no, record airbill number: 822775788619 Y N
5. COC#
   Temperature of cooler(s) upon receipt: (°C) 4.7
   Temperature Blank: (°C) N/P
   Were samples hand delivered on the same day as collection? Y N
6. Were custody papers properly filled out (ink, signed, etc.)? Y N
7. Type of packing material present Styrofoam
8. **Did all bottles arrive in good condition (unbroken)?** Y N
9. Were all bottle labels complete (i.e analysis, preservation, etc.)? Y N
10. Did all bottle labels and tags agree with custody papers? Y N
11. **Were the correct types of bottles used for the tests indicated?** Y N
12. Were all of the preserved bottles received at the lab with the appropriate pH? Y N
13. Were VOA vials checked for absence of air bubbles, and if present, noted below? Y
14. Did the bottles originate from CAS/K or a branch laboratory? Y N
15. **Are CWA Microbiology samples received with >1/2 the 24hr. hold time remaining from collection?** Y N
16. Was C12/Res negative? Y N

Explain any discrepancies:

RESOLUTION:

Samples that required preservation or received out of temperature:

Sample ID	Reagent	Volume	Lot Number	Bottle Type	Rec'd out of Temperature	Initials

Pentachlorophenol

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Barr Engineering Co.
Project: 23/11-005Y02 110
Sample Matrix: Water

Service Request: K2501752
Date Collected: 03/07/2005
Date Received: 03/10/2005

Pentachlorophenol

Sample Name: Ads A
Lab Code: K2501752-001

Units: ug/L
Basis: NA

Extraction Method: METHOD
Analysis Method: 8151M

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	03/11/05	03/15/05	KWG0503939	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	75	35-133	03/15/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Barr Engineering Co.	**Service Request:**	K2501752
Project:	23/11-005Y02 110	**Date Collected:**	03/07/2005
Sample Matrix:	Water	**Date Received:**	03/10/2005

Pentachlorophenol

Sample Name:	Ads B	**Units:**	ug/L
Lab Code:	K2501752-002	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	**1300**	D	50	100	03/11/05	03/15/05	KWG0503939	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	106	35-133	03/15/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Barr Engineering Co.	**Service Request:**	K2501752
Project:	23/11-005Y02 110	**Date Collected:**	03/07/2005
Sample Matrix:	Water	**Date Received:**	03/10/2005

Pentachlorophenol

Sample Name:	Ads C	**Units:**	ug/L
Lab Code:	K2501752-003	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	**0.98**		0.50	1	03/11/05	03/15/05	KWG0503939	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	82	35-133	03/15/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Barr Engineering Co.	**Service Request:**	K2501752
Project:	23/11-005Y02 110	**Date Collected:**	03/07/2005
Sample Matrix:	Water	**Date Received:**	03/10/2005

Pentachlorophenol

Sample Name:	Influent	**Units:**	ug/L
Lab Code:	K2501752-004	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	**2500**	D	50	100	03/11/05	03/15/05	KWG0503939	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	83	35-133	03/15/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Barr Engineering Co.	**Service Request:**	K2501752
Project:	23/11-005Y02 110	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Pentachlorophenol

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG0503939-4	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	03/11/05	03/15/05	KWG0503939	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	70	35-133	03/15/05	Acceptable

Comments:

00014

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Barr Engineering Co.
Project: 23/11-005Y02 110
Sample Matrix: Water

Service Request: K2501752

Surrogate Recovery Summary
Pentachlorophenol

Extraction Method: METHOD
Analysis Method: 8151M

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1
Ads A	K2501752-001	75
Ads B	K2501752-002	106 D #
Ads C	K2501752-003	82
Influent	K2501752-004	83 D #
Method Blank	KWG0503939-4	70
Batch QC	K2501745-001	81
Batch QCMS	KWG0503939-1	79
Batch QCDMS	KWG0503939-2	78
Lab Control Sample	KWG0503939-3	76

Surrogate Recovery Control Limits (%)

Sur1 = 4-Bromo-2,6-dichlorophenol 35-133

Results flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Barr Engineering Co.	**Service Request:**	K2501752
Project:	23/11-005Y02 110	**Date Extracted:**	03/11/2005
Sample Matrix:	Water	**Date Analyzed:**	03/15/2005

Matrix Spike/Duplicate Matrix Spike Summary
Pentachlorophenol

Sample Name:	Batch QC	**Units:**	ug/L
Lab Code:	K2501745-001	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M	**Extraction Lot:**	KWG0503939

		Batch QCMS KWG0503939-1 Matrix Spike			Batch QCDMS KWG0503939-2 Duplicate Matrix Spike					
Analyte Name	**Sample Result**	**Result**	**Expected**	**%Rec**	**Result**	**Expected**	**%Rec**	**%Rec Limits**	**RPD**	**RPD Limit**
Pentachlorophenol	11	22.7	10.0	122	24.4	10.0	139 *	34-124	7	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00016

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Barr Engineering Co.	**Service Request:**	K2501752
Project:	23/11-005Y02 110	**Date Extracted:**	03/11/2005
Sample Matrix:	Water	**Date Analyzed:**	03/15/2005

Lab Control Spike Summary
Pentachlorophenol

Extraction Method:	METHOD	**Units:**	ug/L
Analysis Method:	8151M	**Basis:**	NA
		Level:	Low
		Extraction Lot:	KWG0503939

	Lab Control Sample KWG0503939-3 Lab Control Spike			
Analyte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
Pentachlorophenol	8.63	10.0	86	44-116

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00017

SEVERN TRENT STL

STL Sacramento
880 Riverside Parkway
West Sacramento, CA 95605

Tel: 916 373 5600 Fax: 916 372 1059
www.stl-inc.com

April 28, 2005

STL SACRAMENTO PROJECT NUMBER: G5D070147

Marti Nelson
Barr Engineering Co.
4700 West 77th Street
Minneapolis, MN 55435-4803

RECEIVED
MAY 0 2 2005
BARR
ENGINEERING CO.

Dear Ms. Nelson,

This report contains the analytical results for the sample received under chain of custody by STL Sacramento on April 6, 2005. This sample is associated with your 23/11-005Y02110 project.

The test results in this report meet all NELAC requirements for parameters that accreditation is required or available. Any exceptions to NELAC requirements are noted in the case narrative. The case narrative is an integral part of this report.

If you have any questions, please feel free to call me at (916) 374-4433.

Sincerely,

Robert Hrabak
Project Manager

CASE NARRATIVE

STL SACRAMENTO PROJECT NUMBER G5D070147

There were no anomalies associated with this project.

SEVERN TRENT STL

ACCREDITED IN ACCORDANCE WITH nelac

STL Sacramento Certifications/Accreditations

Certifying State	Certificate #	Certifying State	Certificate #
Alaska	UST-055	Oregon*	CA 200005
Arizona	AZ0616	Pennsylvania	68-1272
Arkansas	04-067-0	South Carolina	87014002
California*	01119CA	Texas	TX 270-2004A
Colorado	NA	Utah*	QUAN1
Connecticut	PH-0691	Virginia	00178
Florida*	E87570	Washington	C087
Georgia	960	West Virginia	9930C, 334
Hawaii	NA	Wisconsin	998204680
Louisiana*	01944	NFESC	NA
Michigan	9947	USACE	NA
Nevada	CA44	USDA Foreign Plant	37-82605
New Jersey*	CA005	USDA Foreign Soil	S-46613
New York*	11666		

*NELAP accredited. A more detailed parameter list is available upon request. Updated 1/27/05

QC Parameter Definitions

QC Batch: The QC batch consists of a set of up to 20 field samples that behave similarly (i.e., same matrix) and are processed using the same procedures, reagents, and standards at the same time.

Method Blank: An analytical control consisting of all reagents, which may include internal standards and surrogates, and is carried through the entire analytical procedure. The method blank is used to define the level of laboratory background contamination.

Laboratory Control Sample and Laboratory Control Sample Duplicate (LCS/LCSD): An aliquot of blank matrix spiked with known amounts of representative target analytes. The LCS (and LCSD as required) is carried through the entire analytical process and is used to monitor the accuracy of the analytical process independent of potential matrix effects. If an LCSD is performed, it may also used to evaluate the precision of the process.

Duplicate Sample (DU): Different aliquots of the same sample are analyzed to evaluate the precision of an analysis.

Surrogates: Organic compounds not expected to be detected in field samples, which behave similarly to target analytes. These are added to every sample within a batch at a known concentration to determine the efficiency of the sample preparation and analytical process.

Matrix Spike and Matrix Spike Duplicate (MS/MSD): An MS is an aliquot of a matrix fortified with known quantities of specific compounds and subjected to an entire analytical procedure in order to indicate the appropriateness of the method for a particular matrix. The percent recovery for the respective compound(s) is then calculated. The MSD is a second aliquot of the same matrix as the matrix spike, also spiked, in order to determine the precision of the method.

Isotope Dilution: For isotope dilution methods, isotopically labeled analogs (internal standards) of the native target analytes are spiked into the sample at time of extraction. These internal standards are used for quantitation, and monitor and correct for matrix effects. Since matrix effects on method performance can be judged by the recovery of these analogs, there is little added benefit of performing MS/MSD for these methods. MS/MSD are only performed for client or QAPP requirements.

Control Limits: The reported control limits are either based on laboratory historical data, method requirements, or project data quality objectives. The control limits represent the estimated uncertainty of the test results.

SAMPLE SUMMARY

G5D070147

WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
G7VNQ	001	Influent	04/05/05	09:00

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

Chain of Custody

BARR

4700 West 77th Street
Minneapolis, MN 55435-4803
(952) 832-2600

Project Number: 23/11+005Y02 110

№ 16377

Project Manager: Tom Mattison

Project Contact: Erik Gohl

Laboratory: Severn Trent

Sample Identification	Collection Date	Collection Time	Matrix: Water	Matrix: Soil	Matrix: Other	Type: Grab	Type: Comp.	Type: QC	Volatile Organic (Unpres.)	Volatile Organic (Pres.)	Semivolatile Organic	Total Metals (HNO_3)	Dissolved Metals (HNO_3)	General (Unpreserved)	Cyanide (NaOH,Asc. Acid)	Nutrients (H_2SO_4)	Oil and Grease (H_2SO_4)	TOC (H_2SO_4)	Sulfide (Zn Acetate)	Dioxin	Whirlpak	Total Phenol (H_2SO_4)	Methane	(HCL)/DRO, 1L Glass	Lugols, Glass, Amber	Formalin, Glass					Total No. Of Containers	Remarks/ Analysis Required:
1. Influent	4/5/05	9:00 AM	X			X					X																				2	Dioxin
2.																																
3.																																
4.																																
5.																																
6.																																
7.																																
8.																																
9.																																
10.																																
11.																																
12.																																
13.																																
14.																																
15.																																
16.																																

Number of Containers/Preservative

Sampled By: Jamie Eidsmoe

Remarks:

Relinquished By	Date	Time	Received by	Date	Time
Jamie Eidsmoe	4/5/05	9:00 AM	[illegible]	4-6-05	[illegible]
Relinquished By:	Date	Time	Received by:	Date	Time

Samples Shipped VIA: ☐ Air Freight ☐ Fed. Exp. ☐ Sampler ☐ Other

Air Bill Number: 822775788663

Distribution: White-Original Accompanies Shipment to Lab; Yellow - Field Copy; Pink - Lab Coordinator

Rev. 08/01/01

G5D/01H
SFL-SDS/MIN/ (310) 370-3000
H:RLGISTDFORMSICHAINCST.CDR

SEVERN TRENT STL

LOT RECEIPT CHECKLIST
STL Sacramento

CLIENT Barr PM DB LOG # 31897

LOT# (QUANTIMS ID) G5D070147 QUOTE# 27945 LOCATION W20C

	Initials	Date
DATE RECEIVED 4-6-05 TIME RECEIVED 920	DG	4-6-05

DELIVERED BY ☑ FEDEX ☐ CA OVERNIGHT ☐ CLIENT ☐ AIRBORNE ☐ GOLDENSTATE ☐ DHL ☐ UPS ☐ BAX GLOBAL ☐ GO-GETTERS ☐ STL COURIER ☐ COURIERS ON DEMAND ☐ OTHER

CUSTODY SEAL STATUS ☐ INTACT ☐ BROKEN ☑ N/A

CUSTODY SEAL #(S)

SHIPPPING CONTAINER(S) ☐ STL ☑ CLIENT ☐ N/A

TEMPERTURE RECORD (IN °C) IR 1☐ 3☑ ☐ OTHER

COC #(S)

TEMPERATURE BLANK N/A

SAMPLE TEMPERATURE 3°

COLLECTOR'S NAME: ☐ Verified from COC ☑ Not on COC

pH MEASURED ☐ YES ☐ ANOMALY ☑ N/A

LABELED BY.....

LABELS CHECKED BY.....

PEER REVIEW ☑ NA

SHORT HOLD TEST NOTIFICATION

SAMPLE RECEIVING

WETCHEM ☑ N/A

VOA-ENCORES ☑ N/A

☐ METALS NOTIFIED OF FILTER/PRESERVE VIA VERBAL & EMAIL ☑ N/A

☑ COMPLETE SHIPMENT RECEIVED IN GOOD CONDITION WITH APPROPRIATE TEMPERATURES, CONTAINERS, PRESERVATIVES ☐ N/A

☐ Clouseau ☐ TEMPERATURE EXCEEDED (2 °C – 6 °C)*1 ☑ N/A

☐ WET ICE ☐ BLUE ICE ☐ GEL PACK ☐ NO COOLING AGENTS USED ☐ PM NOTIFIED

Notes:

*1 Acceptable temperature range for State of Wisconsin samples is ≤ 4°C.

Barr Engineering Company

Client Sample ID: Influent

Trace Level Organic Compounds

Lot-Sample #...: G5D070147-001 **Work Order #...:** G7VNQ1AA **Matrix.....:** WATER
Date Sampled...: 04/05/05 **Date Received..:** 04/06/05
Prep Date.....: 04/13/05 **Analysis Date..:** 04/25/05
Prep Batch #...: 5103506
Dilution Factor: 1

PARAMETER	RESULT	DETECTION LIMIT	UNITS	METHOD
Total HxCDD	ND	0.74	ng/L	SW846 8280A

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-1,2,3,6,7,8-HxCDD	81	(25 - 150)

QC DATA ASSOCIATION SUMMARY

G5D070147

Sample Preparation and Analysis Control Numbers

SAMPLE#	MATRIX	ANALYTICAL METHOD	LEACH BATCH #	PREP BATCH #	MS RUN#
001	WATER	SW846 8280A		5103506	

METHOD BLANK REPORT

Trace Level Organic Compounds

Client Lot #...: G5D070147 **Work Order #...:** G8AHL1AA **Matrix.....:** WATER
MB Lot-Sample #: G5D130000-506

Prep Date.....: 04/13/05
Analysis Date..: 04/25/05 **Prep Batch #...:** 5103506
Dilution Factor: 1

PARAMETER	RESULT	DETECTION LIMIT	UNITS	METHOD
Total HxCDD	ND	0.27	ng/L	SW846 8280A

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-1,2,3,6,7,8-HxCDD	80	(25 - 150)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

Trace Level Organic Compounds

Client Lot #...: G5D070147 **Work Order #...:** G8AHL1AC **Matrix.....:** WATER
LCS Lot-Sample#: G5D130000-506
Prep Date.....: 04/13/05 **Analysis Date..:** 04/25/05
Prep Batch #...: 5103506
Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	METHOD
2,3,7,8-TCDD	**119**	**(74 - 129)**	**SW846 8280A**
1,2,3,6,7,8-HxCDD	**106**	**(63 - 131)**	**SW846 8280A**

INTERNAL STANDARD	PERCENT RECOVERY	RECOVERY LIMITS
13C-1,2,3,6,7,8-HxCDD	75	(25 - 150)
13C-2,3,7,8-TCDD	83	(25 - 150)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE DATA REPORT

Trace Level Organic Compounds

Client Lot #...: G5D070147 **Work Order #...:** G8AHL1AC **Matrix.....:** WATER
LCS Lot-Sample#: G5D130000-506
Prep Date.....: 04/13/05 **Analysis Date..:** 04/25/05
Prep Batch #...: 5103506
Dilution Factor: 1

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	METHOD
2,3,7,8-TCDD	**25.0**	**29.8**	**ng/L**	**119**	**SW846 8280A**
1,2,3,6,7,8-HxCDD	**62.5**	**66.1**	**ng/L**	**106**	**SW846 8280A**

INTERNAL STANDARD	PERCENT RECOVERY	RECOVERY LIMITS
13C-1,2,3,6,7,8-HxCDD	75	(25 - 150)
13C-2,3,7,8-TCDD	83	(25 - 150)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

1317 South 13th Avenue P.O. Box 479 Kelso, Washington 98626 (360) 577-7222 ph (360) 636-1068 fax

Columbia Analytical Services INC.
An Employee - Owned Company

May 3, 2005

Service Request No: K2502454

RECEIVED
MAY 09 2005
BARR ENGINEERING CO.

Marta Nelson
Barr Engineering
4700 West 77th Street
Minneapolis, MN 55435-4803

RE: 23/11-005Y02 110

Dear Marta:

Enclosed are the results of the sample(s) submitted to our laboratory on April 6, 2005. For your reference, these analyses have been assigned our service request number K2502454.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAC standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3358.

Respectfully submitted,

Columbia Analytical Services, Inc.

Lynda Huckestein
Client Services Manager

LH/jeb

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
"	The control limit criteria is not applicable. See case narrative.
	The analyte was found in the associated method blank at a level that is significant relative to the sample result.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a matrix interference.
X	See case narrative.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
B	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL has been elevated due to a matrix interference.
X	See case narrative.
*	The duplicate analysis not within control limits. See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results (25% for CLP Pesticides).
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a chromatographic interference.
X	See case narrative.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

Case Narrative

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	Barr Engineering Company	**Service Request No.:**	K2502454
Project:	23/11-005Y02 110	**Date Received:**	4/6/2005
Sample Matrix:	Water		

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Laboratory Control Sample (LCS).

Sample Receipt

Four water samples were received for analysis at Columbia Analytical Services on 4/6/2005. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Pentachlorophenol by EPA Method 8151M

Elevated Method Reporting Limits:
Samples Ads B and Influent required a dilution due to the presence of elevated levels of target analyte. The reporting limits are adjusted to reflect the dilution.

Surrogate Exceptions:
The control criteria for the following surrogate in sample Ads B and Influent are not applicable: 4-Bromo-2,6-dichlorophenol. The analysis of the sample required a dilution, which resulted in a surrogate concentration below the Method Reporting Limit (MRL). No further corrective action was appropriate.

Polynuclear Aromatic Hydrocarbons by EPA Method 8270C

Initial Calibration Exceptions:
The primary evaluation criterion was exceeded for the following analytes in Initial Calibration (ICAL) ID CAL4424: Quinoline, Indeno(1,2,3-cd)pyrene, Dibenz(a,h)anthracene. In accordance with CAS standard operating procedures, the alternative evaluation specified in the EPA method was performed using the mean Relative Standard Deviation (RSD) of all analytes in the calibration. The result of the mean RSD calculation was 11.3%. The calibration meets the alternative evaluation criteria. Note that CAS/Kelso policy does not allow the use of averaging if any analyte in the ICAL exceeds 30% RSD.

Approved by_____ Date 5/3/05

Chain of Custody Documentation

K250%, 154

Chain of Custody

BARR

4700 West 77th Street
Minneapolis, MN 55435-4803
(952) 832-2600

Project Number: 23 11 005 Y02 110

№ 16393

Project Manager: Tom Mattison

Project Contact: Erik Gohl

Laboratory: Columbia Analytical Services

00007

Sample Identification	Collection Date	Collection Time	Matrix: Water	Matrix: Soil	Matrix: Other	Type: Grab	Type: Comp.	Type: QC	Volatile Organic (Unpres.)	Volatile Organic (Pres.)	Semivolatile Organic	Total Metals (HNO_3)	Dissolved Metals (HNO_3)	General (Unpreserved)	Cyanide (NaOH,Asc. Acid)	Nutrients (H_2SO_4)	Oil and Grease (H_2SO_4)	TOC (H_2SO_4)	Sulfide (Zn Acetate)	Dioxin	Whirlpak	Total Phenol (H_2SO_4)	Methane	(HCL)/DRO, 1L Glass	Lugols, Glass, Amber	Formalin, Glass	Total No. Of Containers	Remarks/ Analysis Required:
1. Ads A	4/5/05	AM 9:00	X			X					X																1	PCP
2. Ads B	4/5/05	9:00	X			X					X																1	PCP
3. Ads C	4/5/05	9:00	X			X					X																1	PCP
4. Influent	4/5/05	9:00	X			X					X																1	PCP
5. Ads A	4/5/05	9:00	X			X					X																2	P.A.H see attached list
6.																												
7.																												
8.																												
9.																												
10.																												
11.																												
12.																												
13.																												
14.																												
15.																												
16.																												

Number of Containers/Preservative

Sampled By: Jamie Eidsmoe

Remarks:

Relinquished By: Jamie Eidsmoe — Date: 4/5/05 — Time: 9:00 AM

Relinquished By: — Date: — Time:

Received by: C. Nicell CAS — Date: 4-6-05 — Time: 1100

Received by: — Date: — Time:

Samples Shipped VIA: ☐ Air Freight ☐ Fed. Exp. ☐ Sampler ☐ Other

Air Bill Number: 822775788608

H:RLG\STDFORMS\CHAINCST.CDR

Distribution: White-Original Accompanies Shipment to Lab; Yellow - Field Copy; Pink - Lab Coordinator

Rev. 08/01/01

PAH - Target Parameter List
Water Treatment System
St. Regis Paper Company Site
Cass Lake, Minnesota

Method 8270-SIM	**MRL**
Benzo(a)anthracene	0.020 µg/L
Chrysene	0.020 µg/L
Benzo(b)fluoranthene	0.020 µg/L
Benzo(k)fluoranthene	0.020 µg/L
Benzo(a)pyrene	0.020 µg/L
Indeno(1,2,3-cd)pyrene	0.020 µg/L
Dibenzo(a,h)anthracene	0.020 µg/L
Quinoline	0.020 µg/L
Naphthalene	0.020 µg/L
Acenaphthylene	0.020 µg/L
Acenaphthene	0.020 µg/L
Fluorene	0.020 µg/L
Phenanthrene	0.020 µg/L
Anthracene	0.020 µg/L
Fluoranthene	0.020 µg/L
Pyrene	0.020 µg/L
Benzo(g,h,i)perylene	0.020 µg/L

Columbia Analytical Services Inc.
Cooler Receipt and Preservation Form

PC Lynda

Project/Client BARR Work Order K250 2454

Cooler received on 4/6/05 and opened on 4/6/05 by [illegible]

1. Were custody seals on outside of coolers? FK Y (N)
   If yes, how many and where? —
2. Were custody seals intact? ~~Y~~ N
3. Were signature and date present on the custody seals? ~~Y~~ N
4. Is the shipper's airbill available and filed? If no, record airbill number: (Y) N
5. COC#
   Temperature of cooler(s) upon receipt: (°C) 1.1
   Temperature Blank: (°C) N/A
   Were samples hand delivered on the same day as collection? ~~Y~~ N
6. Were custody papers properly filled out (ink, signed, etc.)? (Y) N
7. Type of packing material present STYRO, MESH
8. **Did all bottles arrive in good condition (unbroken)?** (Y) N
9. Were all bottle labels complete (i.e analysis, preservation, etc.)? (Y) N
10. Did all bottle labels and tags agree with custody papers? (Y) N
11. **Were the correct types of bottles used for the tests indicated?** (Y) N
12. Were all of the preserved bottles received at the lab with the appropriate pH? ~~Y~~ N
    Were VOA vials checked for absence of air bubbles, and if present, noted below? ~~Y~~ ~~N~~
14. Did the bottles originate from CAS/K or a branch laboratory? (Y) N
15. **Are CWA Microbiology samples received with >1/2 the 24hr. hold time remaining from collection?** ~~Y~~ N
16. Was C12/Res negative? (Y) N

Explain any discrepancies:

RESOLUTION:

Samples that required preservation or received out of temperature:

Sample ID	Reagent	Volume	Lot Number	Bottle Type	Rec'd out of Temperature	Initials

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Barr Engineering Co.	**Service Request:**	K2502454
Project:	23/11-005Y02 110	**Date Collected:**	04/05/2005
Sample Matrix:	Water	**Date Received:**	04/06/2005

Pentachlorophenol

Sample Name:	Ads A	**Units:**	ug/L
Lab Code:	K2502454-001	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	04/12/05	04/14/05	KWG0505824	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	85	35-133	04/14/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Barr Engineering Co.	**Service Request:**	K2502454
Project:	23/11-005Y02 110	**Date Collected:**	04/05/2005
Sample Matrix:	Water	**Date Received:**	04/06/2005

Pentachlorophenol

Sample Name:	Ads B	**Units:**	ug/L
Lab Code:	K2502454-002	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	**1200**	D	50	100	04/12/05	04/14/05	KWG0505824	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	91	35-133	04/14/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Barr Engineering Co.	**Service Request:**	K2502454
Project:	23/11-005Y02 110	**Date Collected:**	04/05/2005
Sample Matrix:	Water	**Date Received:**	04/06/2005

Pentachlorophenol

Sample Name:	Ads C	**Units:**	ug/L
Lab Code:	K2502454-003	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	**13**		0.50	1	04/12/05	04/14/05	KWG0505824	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	97	35-133	04/14/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Barr Engineering Co.	**Service Request:**	K2502454
Project:	23/11-005Y02 110	**Date Collected:**	04/05/2005
Sample Matrix:	Water	**Date Received:**	04/06/2005

Pentachlorophenol

Sample Name:	Influent	**Units:**	ug/L
Lab Code:	K2502454-004	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	**2400**	D	50	100	04/12/05	04/14/05	KWG0505824	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	130	35-133	04/14/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Barr Engineering Co.
Project: 23/11-005Y02 110
Sample Matrix: Water

Service Request: K2502454
Date Collected: NA
Date Received: NA

Pentachlorophenol

Sample Name: Method Blank
Lab Code: KWG0505824-4

Units: ug/L
Basis: NA

Extraction Method: METHOD
Analysis Method: 8151M

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	04/12/05	04/14/05	KWG0505824	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	101	35-133	04/14/05	Acceptable

Comments:

00014

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Barr Engineering Co.
Project: 23/11-005Y02 110
Sample Matrix: Water

Service Request: K2502454

Surrogate Recovery Summary
Pentachlorophenol

Extraction Method: METHOD
Analysis Method: 8151M

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1
Ads A	K2502454-001	85
Ads B	K2502454-002	91 D #
Ads C	K2502454-003	97
Influent	K2502454-004	130 D #
Method Blank	KWG0505824-4	101
Batch QC	K2502515-012	86
Batch QCMS	KWG0505824-1	108
Batch QCDMS	KWG0505824-2	98
Lab Control Sample	KWG0505824-3	111

Surrogate Recovery Control Limits (%)

Sur1 = 4-Bromo-2,6-dichlorophenol 35-133

Results flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.

00015

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Barr Engineering Co.	**Service Request:**	K2502454
Project:	23/11-005Y02 110	**Date Extracted:**	04/12/2005
Sample Matrix:	Water	**Date Analyzed:**	04/14/2005

Matrix Spike/Duplicate Matrix Spike Summary
Pentachlorophenol

Sample Name:	Batch QC	**Units:**	ug/L
Lab Code:	K2502515-012	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M	**Extraction Lot:**	KWG0505824

		Batch QCMS KWG0505824-1 Matrix Spike			Batch QCDMS KWG0505824-2 Duplicate Matrix Spike					
Analyte Name	**Sample Result**	**Result**	**Expected**	**%Rec**	**Result**	**Expected**	**%Rec**	**%Rec Limits**	**RPD**	**RPD Limit**
Pentachlorophenol	ND	10.8	10.0	108	9.98	10.0	100	34-124	8	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00016

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Barr Engineering Co.	**Service Request:**	K2502454
Project:	23/11-005Y02 110	**Date Extracted:**	04/12/2005
Sample Matrix:	Water	**Date Analyzed:**	04/14/2005

Lab Control Spike Summary
Pentachlorophenol

Extraction Method:	METHOD	**Units:**	ug/L
Analysis Method:	8151M	**Basis:**	NA
		Level:	Low
		Extraction Lot:	KWG0505824

	Lab Control Sample KWG0505824-3 Lab Control Spike			
Analyte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
Pentachlorophenol	10.6	10.0	106	44-116

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00017

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Barr Engineering Co.
Project: 23/11-005Y02 110
Sample Matrix: Water

Service Request: K2502454
Date Collected: 04/05/2005
Date Received: 04/06/2005

Polynuclear Aromatic Hydrocarbons

Sample Name: Ads A
Lab Code: K2502454-001

Units: ug/L
Basis: NA

Extraction Method: EPA 3520C
Analysis Method: 8270C SIM

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.020	1	04/12/05	04/29/05	KWG0505865	
Acenaphthylene	ND	U	0.020	1	04/12/05	04/29/05	KWG0505865	
Acenaphthene	ND	U	0.020	1	04/12/05	04/29/05	KWG0505865	
Fluorene	ND	U	0.020	1	04/12/05	04/29/05	KWG0505865	
Phenanthrene	ND	U	0.020	1	04/12/05	04/29/05	KWG0505865	
Anthracene	ND	U	0.020	1	04/12/05	04/29/05	KWG0505865	
Fluoranthene	ND	U	0.020	1	04/12/05	04/29/05	KWG0505865	
Pyrene	ND	U	0.020	1	04/12/05	04/29/05	KWG0505865	
Benz(a)anthracene	ND	U	0.020	1	04/12/05	04/29/05	KWG0505865	
Chrysene	ND	U	0.020	1	04/12/05	04/29/05	KWG0505865	
Benzo(b)fluoranthene	ND	U	0.020	1	04/12/05	04/29/05	KWG0505865	
Benzo(k)fluoranthene	ND	U	0.020	1	04/12/05	04/29/05	KWG0505865	
Benzo(a)pyrene	ND	U	0.020	1	04/12/05	04/29/05	KWG0505865	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	1	04/12/05	04/29/05	KWG0505865	
Dibenz(a,h)anthracene	ND	U	0.020	1	04/12/05	04/29/05	KWG0505865	
Benzo(g,h,i)perylene	ND	U	0.020	1	04/12/05	04/29/05	KWG0505865	
Quinoline	ND	U	0.020	1	04/12/05	04/29/05	KWG0505865	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	91	37-107	04/29/05	Acceptable
Fluoranthene-d10	110	18-137	04/29/05	Acceptable
Terphenyl-d14	121	18-153	04/29/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Barr Engineering Co.	**Service Request:**	K2502454
Project:	23/11-005Y02 110	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Polynuclear Aromatic Hydrocarbons

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG0505865-3	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.020	1	04/12/05	04/29/05	KWG0505865	
Acenaphthylene	ND	U	0.020	1	04/12/05	04/29/05	KWG0505865	
Acenaphthene	ND	U	0.020	1	04/12/05	04/29/05	KWG0505865	
Fluorene	ND	U	0.020	1	04/12/05	04/29/05	KWG0505865	
Phenanthrene	ND	U	0.020	1	04/12/05	04/29/05	KWG0505865	
Anthracene	ND	U	0.020	1	04/12/05	04/29/05	KWG0505865	
Fluoranthene	ND	U	0.020	1	04/12/05	04/29/05	KWG0505865	
Pyrene	ND	U	0.020	1	04/12/05	04/29/05	KWG0505865	
Benz(a)anthracene	ND	U	0.020	1	04/12/05	04/29/05	KWG0505865	
Chrysene	ND	U	0.020	1	04/12/05	04/29/05	KWG0505865	
Benzo(b)fluoranthene	ND	U	0.020	1	04/12/05	04/29/05	KWG0505865	
Benzo(k)fluoranthene	ND	U	0.020	1	04/12/05	04/29/05	KWG0505865	
Benzo(a)pyrene	ND	U	0.020	1	04/12/05	04/29/05	KWG0505865	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	1	04/12/05	04/29/05	KWG0505865	
Dibenz(a,h)anthracene	ND	U	0.020	1	04/12/05	04/29/05	KWG0505865	
Benzo(g,h,i)perylene	ND	U	0.020	1	04/12/05	04/29/05	KWG0505865	
Quinoline	ND	U	0.020	1	04/12/05	04/29/05	KWG0505865	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	89	37-107	04/29/05	Acceptable
Fluoranthene-d10	105	18-137	04/29/05	Acceptable
Terphenyl-d14	118	18-153	04/29/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Barr Engineering Co.
Project: 23/11-005Y02 110
Sample Matrix: Water

Service Request: K2502454

Surrogate Recovery Summary
Polynuclear Aromatic Hydrocarbons

Extraction Method: EPA 3520C
Analysis Method: 8270C SIM

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1	Sur2	Sur3
Ads A	K2502454-001	91	110	121
Method Blank	KWG0505865-3	89	105	118
Lab Control Sample	KWG0505865-1	91	108	106
Duplicate Lab Control Sample	KWG0505865-2	97	112	111

Surrogate Recovery Control Limits (%)

Sur1 =	Fluorene-d10	37-107
Sur2 =	Fluoranthene-d10	18-137
Sur3 =	Terphenyl-d14	18-153

Results flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.

00020

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Barr Engineering Co.
Project: 23/11-005Y02 110
Sample Matrix: Water

Service Request: K2502454
Date Extracted: 04/12/2005
Date Analyzed: 04/29/2005

Lab Control Spike/Duplicate Lab Control Spike Summary
Polynuclear Aromatic Hydrocarbons

Extraction Method: EPA 3520C
Analysis Method: 8270C SIM

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG0505865

	Lab Control Sample KWG0505865-1 Lab Control Spike			Duplicate Lab Control Sample KWG0505865-2 Duplicate Lab Control Spike					
Analyte Name	**Result**	**Expected**	**%Rec**	**Result**	**Expected**	**%Rec**	**%Rec Limits**	**RPD**	**RPD Limit**
Naphthalene	2.15	2.38	90	2.16	2.38	91	41-115	1	30
Acenaphthylene	2.25	2.38	94	2.30	2.38	97	44-122	2	30
Acenaphthene	2.17	2.38	91	2.21	2.38	93	41-123	2	30
Fluorene	2.24	2.38	94	2.29	2.38	96	44-128	2	30
Phenanthrene	2.25	2.38	94	2.18	2.38	92	45-127	3	30
Anthracene	2.00	2.38	84	2.02	2.38	85	40-126	1	30
Fluoranthene	2.42	2.38	102	2.43	2.38	102	41-141	0	30
Pyrene	2.24	2.38	94	2.28	2.38	96	34-152	2	30
Benz(a)anthracene	2.15	2.38	90	2.22	2.38	93	46-132	3	30
Chrysene	2.23	2.38	94	2.28	2.38	96	46-136	2	30
[illegible]o(b)fluoranthene	2.33	2.38	98	2.39	2.38	101	54-137	3	30
[illegible](k)fluoranthene	2.32	2.38	98	2.33	2.38	98	54-141	0	30
Benzo(a)pyrene	2.33	2.38	98	2.37	2.38	99	49-133	1	30
Indeno(1,2,3-cd)pyrene	2.37	2.38	100	2.46	2.38	103	41-141	4	30
Dibenz(a,h)anthracene	2.53	2.38	106	2.61	2.38	110	39-143	3	30
Benzo(g,h,i)perylene	2.41	2.38	101	2.46	2.38	103	46-133	2	30
Quinoline	1.88	2.38	79	2.32	2.38	98	70-130	21	30

Re[illegible]s flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00021

1317 South 13th Avenue P.O. Box 479 Kelso, Washington 98626 (360) 577-7222 ph (360) 636-1068 fax

Columbia Analytical Services INC.
An Employee - Owned Company

May 24, 2005 Service Request No: K2503221

Tom Mattison
Barr Engineering
4700 West 77th Street
Minneapolis, MN 55435-4803

RECEIVED
MAY 27 2005
BARR ENGINEERING CO.

RE: IP/C. LAKE / 23/11/-005YO2 110

Dear Tom:

Enclosed are the results of the sample(s) submitted to our laboratory on May 4, 2005. For your reference, these analyses have been assigned our service request number K2503221.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAC standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3358.

Respectfully submitted,

Columbia Analytical Services, Inc.

Lynda Huckestein
Client Services Manager

LH/jeb

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
	The analyte was found in the associated method blank at a level that is significant relative to the sample result.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a matrix interference.
X	See case narrative.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
B	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL has been elevated due to a matrix interference.
X	See case narrative.
*	The duplicate analysis not within control limits. See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results (25% for CLP Pesticides).
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a chromatographic interference.
X	See case narrative.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

Case Narrative

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	Barr Engineering Company	**Service Request No.:**	K2503221
Project:	23/11-005Y02 110	**Date Received:**	5/4/2005
Sample Matrix:	Water		

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Matrix/Duplicate Matrix Spike (MS/DMS), and Laboratory Control Sample (LCS).

Sample Receipt

Four water samples were received for analysis at Columbia Analytical Services on 5/4/2005. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Pentachlorophenol by EPA Method 8151M

Elevated Method Reporting Limits:
Samples Ads B and Influent required dilution due to the presence of elevated levels of target analyte. The reporting limits are adjusted to reflect the dilution.

Continuing Calibration Verification Exceptions:
The primary evaluation criterion was exceeded for the following analytes in Continuing Calibration Verification (CCV) 0521F043: Pentachlorophenol. In accordance with CAS standard operating procedures, the alternative evaluation specified in the EPA method was performed using the average percent recovery of all analytes in the verification standard. The standard meets the alternative evaluation criteria.

Approved by_____ Date 5/24/05

Chain of Custody Documentation

K25 3221

Chain of Custody

BARR

4700 West 77th Street
Minneapolis, MN 55435-4803
(952) 832-2600

Project Number: 23/11-005Y02 110

№ 16394

Project Manager: Tom Mattison

Project Contact: Erik Gohl

Laboratory: Columbia Analytical Services

Sample Identification	Collection Date	Collection Time	Matrix: Water	Matrix: Soil	Matrix: Other	Type: Grab	Type: Comp.	Type: QC	Volatile Organic (Unpres.)	Volatile Organic (Pres.)	Semivolatile Organic	Total Metals (HNO_3)	Dissolved Metals (HNO_3)	General (Unpreserved)	Cyanide (NaOH,Asc. Acid)	Nutrients (H_2SO_4)	Oil and Grease (H_2SO_4)	TOC (H_2SO_4)	Sulfide (Zn Acetate)	Dioxin	Whirlpak	Total Phenol (H_2SO_4)	Methane	(HCL)/DRO, 1L Glass	Lugols, Glass, Amber	Formalin, Glass					Total No. Of Containers	Remarks/ Analysis Required:
1. Ads A	5/3/05	AM 9:00	X			X					X																				1	PCP
2. Ads B	5/3/05	9:00	X			X					X																				1	PCP
3. Ads C	5/3/05	9:00	X			X					X																				1	PCP
4. Influent	5/3/05	9:00	X			X					X																				1	PCP
5.																																
6.																																
7.																																
8.																																
9.																																
10.																																
11.																																
12.																																
13.																																
14.																																
15.																																
16.																																

Number of Containers/Preservative

Sampled By:	Relinquished By:	Date	Time	Received by:	Date	Time
Jamie Edemon	Jamie Edemon	5-3-05	900AM	CAS	5/4/05	1:00
Remarks:	Relinquished By:	Date	Time	Received by:	Date	Time
	Samples Shipped VIA ☐ Air Freight ☐ Fed. Exp. ☐ Sampler ☐ Other			Air Bill Number: 822775788538		

Distribution: White-Original Accompanies Shipment to Lab; Yellow - Field Copy; Pink - Lab Coordinator

Rev. 08/01/01

H:RLGISTDFORMS\CHAINCST.CDR

Columbia Analytical Services Inc.
Cooler Receipt and Preservation Form

PC Lynda

Project/Client Basil Work Order K250 3221

Cooler received on 5-4-05 and opened on 5-4-05 by A. Jewell

1. Were custody seals on outside of coolers? Y (N)
   If yes, how many and where?
2. Were custody seals intact? ~~Y N~~
3. Were signature and date present on the custody seals? ~~Y N~~
4. Is the shipper's airbill available and filed? If no, record airbill number: 8227 7578 8638 Y (N)
5. COC#
   Temperature of cooler(s) upon receipt: (°C) 4.9
   Temperature Blank: (°C) NA
   Were samples hand delivered on the same day as collection? ~~Y N~~
6. Were custody papers properly filled out (ink, signed, etc.)? (Y) N
7. Type of packing material present insert
8. **Did all bottles arrive in good condition (unbroken)?** (Y) N
9. Were all bottle labels complete (i.e analysis, preservation, etc.)? (Y) N
10. Did all bottle labels and tags agree with custody papers? (Y) N
11. **Were the correct types of bottles used for the tests indicated?** (Y) N
12. Were all of the preserved bottles received at the lab with the appropriate pH? ~~Y N~~
13. Were VOA vials checked for absence of air bubbles, and if present, noted below? ~~Y~~
14. Did the bottles originate from CAS/K or a branch laboratory? (Y) N
15. **Are CWA Microbiology samples received with >1/2 the 24hr. hold time remaining from collection?** ~~Y N~~
16. Was C12/Res negative? ~~Y N~~

Explain any discrepancies:

RESOLUTION:

Samples that required preservation or received out of temperature:

Sample ID	Reagent	Volume	Lot Number	Bottle Type	Rec'd out of Temperature	Initials

00008

Pentachlorophenol
EPA Method 8151 Modified

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Barr Engineering Co.
Project: 23/11-005YO2 110
Sample Matrix: Water

Service Request: K2503221
Date Collected: 05/03/2005
Date Received: 05/04/200

Pentachlorophenol

Sample Name: Ads A
Lab Code: K2503221-001

Units: ug/L
Basis: NA

Extraction Method: METHOD
Analysis Method: 8151M

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	05/09/05	05/22/05	KWG0507284	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	105	35-133	05/22/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Barr Engineering Co.	**Service Request:**	K2503221
Project:	23/11-005YO2 110	**Date Collected:**	05/03/2005
Sample Matrix:	Water	**Date Received:**	05/04/2005

Pentachlorophenol

Sample Name:	Ads B	**Units:**	ug/L
Lab Code:	K2503221-002	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	**1500**	D	25	50	05/09/05	05/22/05	KWG0507284	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	106	35-133	05/22/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Barr Engineering Co.	**Service Request:**	K2503221
Project:	23/11-005YO2 110	**Date Collected:**	05/03/2005
Sample Matrix:	Water	**Date Received:**	05/04/2005

Pentachlorophenol

Sample Name:	Ads C	**Units:**	ug/L
Lab Code:	K2503221-003	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	**56**		0.50	1	05/09/05	05/23/05	KWG0507284	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	110	35-133	05/23/05	Acceptable

Comments:

00012

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Barr Engineering Co.	**Service Request:**	K2503221
Project:	23/11-005YO2 110	**Date Collected:**	05/03/2005
ıple Matrix:	Water	**Date Received:**	05/04/2005

Pentachlorophenol

Sample Name:	Influent	**Units:**	ug/L
Lab Code:	K2503221-004	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	**2200**	D	25	50	05/09/05	05/23/05	KWG0507284	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	100	35-133	05/23/05	Acceptable

ıments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Barr Engineering Co.
Project: 23/11-005YO2 110
Sample Matrix: Water

Service Request: K2503221
Date Collected: NA
Date Received: NA

Pentachlorophenol

Sample Name: Method Blank
Lab Code: KWG0507284-4

Units: ug/L
Basis: NA

Extraction Method: METHOD
Analysis Method: 8151M

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	05/09/05	05/22/05	KWG0507284	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	120	35-133	05/22/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Barr Engineering Co.
Project: 23/11-005YO2 110
Sample Matrix: Water

Service Request: K2503221

Surrogate Recovery Summary
Pentachlorophenol

Extraction Method: METHOD
Analysis Method: 8151M

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1
Ads A	K2503221-001	105
Ads B	K2503221-002	106 D
Ads C	K2503221-003	110
Influent	K2503221-004	100 D
Method Blank	KWG0507284-4	120
Ads AMS	KWG0507284-1	112
Ads ADMS	KWG0507284-2	103
Lab Control Sample	KWG0507284-3	108

Surrogate Recovery Control Limits (%)

Sur1 = 4-Bromo-2,6-dichlorophenol 35-133

ults flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.

00015

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Barr Engineering Co.	**Service Request:**	K2503221
Project:	23/11-005YO2 110	**Date Extracted:**	05/09/2005
Sample Matrix:	Water	**Date Analyzed:**	05/22/200

Matrix Spike/Duplicate Matrix Spike Summary
Pentachlorophenol

Sample Name:	Ads A	**Units:**	ug/L
Lab Code:	K2503221-001	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M	**Extraction Lot:**	KWG0507284

		Ads AMS KWG0507284-1 Matrix Spike			Ads ADMS KWG0507284-2 Duplicate Matrix Spike					
Analyte Name	**Sample Result**	**Result**	**Expected**	**%Rec**	**Result**	**Expected**	**%Rec**	**%Rec Limits**	**RPD**	**RPD Limit**
Pentachlorophenol	ND	10.2	10.0	102	11.1	10.0	111	34-124	8	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00016

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Barr Engineering Co.
Project: 23/11-005YO2 110
Sample Matrix: Water

Service Request: K2503221
Date Extracted: 05/09/2005
Date Analyzed: 05/22/2005

Lab Control Spike Summary
Pentachlorophenol

Extraction Method: METHOD
Analysis Method: 8151M

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG0507284

	Lab Control Sample KWG0507284-3 Lab Control Spike			
Analyte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
Pentachlorophenol	9.32	10.0	93	44-116

ts flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00017

1317 South 13th Avenue P.O. Box 479 Kelso, Washington 98626 (360) 577-7222 ph (360) 636-1068 fax

Columbia Analytical Services INC.
An Employee - Owned Company

23/11-005Y05

June 7, 2005 Service Request No: K0500232

David Cosgriff
Arrowhead Engineering
P. O. Box 843
Libby, MT 59923

RECEIVED
JUN 20 2005
BARR ENGINEERING CO.

RE: St.Regis Paper Co.-2005 Annual GW Sampling/226-00-297

Dear David:

Enclosed are the results of the sample(s) submitted to our laboratory on May 13, 2005. For your reference, these analyses have been assigned our service request number K0500232.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAC standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3358.

Respectfully submitted,

Columbia Analytical Services, Inc.

Lynda Huckestein
Client Services Manager

LH/jeb

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
	The analyte was found in the associated method blank at a level that is significant relative to the sample result.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a matrix interference.
X	See case narrative.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
B	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL has been elevated due to a matrix interference.
X	See case narrative.
*	The duplicate analysis not within control limits. See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results (25% for CLP Pesticides).
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a chromatographic interference.
X	See case narrative.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

Case Narrative

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	Arrowhead Engineering Company	**Service Request No.:**	K0500232
Project:	St. Regis Paper Co.	**Date Received:**	5/13/2005
Sample Matrix:	Water		

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Matrix/Duplicate Matrix Spike (MS/DMS), and Laboratory Control Sample (LCS).

Sample Receipt

Fifteen water samples were received for analysis at Columbia Analytical Services on 5/13/2005. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Pentachlorophenol by EPA Method 8151M

Continuing Calibration Verification Exceptions:
The primary evaluation criterion was exceeded for the following analytes in Continuing Calibration Verification (CCV) 0602F018: Pentachlorophenol. In accordance with CAS standard operating procedures, the alternative evaluation specified in the EPA method was performed using the average percent recovery of all analytes in the verification standard. The standard meets the alternative evaluation criteria.

Polynuclear Aromatic Hydrocarbons by EPA Method 8270C

Initial Calibration Exceptions:
The primary evaluation criterion was exceeded for the following analytes in Initial Calibration (ICAL) ID CAL4424: Quinoline, Indeno(1,2,3-cd)pyrene, Dibenz(a,h)anthracene. In accordance with CAS standard operating procedures, the alternative evaluation specified in the EPA method was performed using the mean Relative Standard Deviation (RSD) of all analytes in the calibration. The result of the mean RSD calculation was 11.3%. The calibration meets the alternative evaluation criteria. Note that CAS/Kelso policy does not allow the use of averaging if any analyte in the ICAL exceeds 30% RSD.

Approved by LAt Date 6/7/05

Chain of Custody Documentation

CHAIN OF CUSTODY RECORD/SAMPLE ANALYSIS REQUEST FORM

Facility Number/Project Name: 226-00-297 St. Regis Paper Co Site – 2005 Annual GW Sampling

Lab Contact: Lynda Hackstein Office:

Ship to: Columbia Analytical Services
1317 South 13th Ave
Kelso WA 98626

Lab Contact Phone: 360-577-7222

Samplers: D. Cogger, R. Cummings

Company Name: Arrowhead Engineering, Inc.

INTERNATIONAL PAPER

Sample No.	Date	Time	Matrix	PCP-8151	PAH-8270 SIM					Extra Container	Archive	Remarks
GW-0158	5-11-05	P.M.	GW	X	X					✓		
GW-0158 MS	"	"	"	X	X					✓		Invoice & Rpt to:
GW-0158 MSD	"	"	"	X	X					✓		Arrowhead Eng. Inc.
2 GW-0157	"	"	"	X	X					✓		PO Box 843
												Libby, MT 59923
												ph. 406.293.7387

K0500232
Arrowhead Engineering
Cass Lake

Matrix Code: GW - Groundwater SL - Soil SD - Sediment SW - Surface water
OTHER - Please identify codes

Priority: ☒ Normal ☐ Rush Rush time period

Shipped via: ☒ FedEx/UPS ☐ Courier Airbill

Condition of Samples Upon Receipt:

Custody Seal Intact: ☐ Yes ☐ No ☐ None

Relinquished by: (Signature) Date/Time: 5-12-05 1700 hrs Received by: Amanda Hull CAS (Signature) Date/Time: 5/13/05 1020

Company: AEI Company:

Relinquished by: (Signature) Date/Time: Received by: (Signature) Date/Time:

Company: Company:

Distribution: White and Yellow Copies - Accompany Shipment; Pink Copy - Project File

CHAIN OF CUSTODY RECORD/SAMPLE ANALYSIS REQUEST FORM

Facility Number/Project Name: 226-00-277 St. Regis Paper Co Site - 2005 Annual GW Sampling

Lab Contact: Lynda Huckestein Office:

Ship to: Columbia Analytical Services
1317 South 13th Ave
Kelso, WA 98626

Lab Contact Phone: 360-577-7222

Samplers: D. Cosgriff R. Cummings

Company Name: Arrowhead Eng. Inc.

INTERNATIONAL PAPER

	Sample No.	Date	Time	Matrix	Pap 8151	PAH 8270 SIM					Extra Container	Archive	Remarks
3	GW-0156	5-11-05	P.M.	GW	X	X					✓		
4	GW-0157	"	"	"	X	X					✓		Invoice & Rpt to:
5	GW-0161	"	"	"	X	X					✓		
6	SW-0017	5-12-05	A.M.	SW	X						✓		Arrowhead Engineering Inc
7	SW-0018	"	"	"	X						✓		P.O. Box 843
													Libby, MT 59923
													ph. 406.293.9387

Matrix Code: GW - Groundwater SL - Soil SD - Sediment SW - Surface water
OTHER - Please identify codes

Priority: ☑ Normal ☐ Rush Rush time period

Shipped via: ☒ FedEx/UPS ☐ Courier ☐ Airbill

Condition of Samples Upon Receipt:

Custody Seal Intact: ☐ Yes ☐ No ☐ None

Relinquished by: (Signature) Date/Time: 5-12-05 1700 hrs Received by: Amanda Huell CAS (Signature) Date/Time: 5/13/05 1020

Company: AEI Company:

Relinquished by: (Signature) Date/Time: Received by: (Signature) Date/Time:

Company: Company:

Distribution: White and Yellow Copies - A[illegible]any Shipment; Pink Copy - Project File

CHAIN OF CUSTODY RECORD/SAMPLE ANALYSIS REQUEST FORM

Facility Number/Project Name: 226-00-297 St. Regis Paper Co Site - 2005 Annual GW Sampling

Lab Contact: Lynda Huckestein Office:

Ship to: Columbia Analytical Services
1317 South 13th Ave
Kelso, WA 98626

Lab Contact Phone: 360-577-7222

Samplers: D. Cosgriff, R. Cummings

Company Name: Arrowhead Eng., Inc.

INTERNATIONAL PAPER

	Sample No.	Date	Time	Matrix	PCP-8151	PAH 8270 SIM					Extra Container	Archive	Remarks
8	GW-0206	5-11-05	A.M.	GW	X	X					✓		
9	GW-0210	"	"	"	X	X					✓		Invoice & Rpt to:
10	GW-0160	"	P.M.	"	X	X					✓		
11	GW-0205	"	A.M.	"	X	X					✓		Arrowhead Eng, Inc.
													P.O. Box 843
													Libby, MT 59923
													p. 406.293.9387

Matrix Code: GW - Groundwater SL - Soil SD - Sediment SW - Surface water
OTHER - Please identify codes

Priority: ☒ Normal ☐ Rush Rush time period

Shipped via: ☒ FedEx/UPS ☐ Courier / Airbill

Condition of Samples Upon Receipt:

Custody Seal Intact: ☐ Yes ☐ No ☐ None

Relinquished by: [signature] (Signature) Date/Time: 5-12-2005 1700 hrs Received by: Amanda Jewell CAS (Signature) Date/Time: 05/13/05 1020

Company: AEI Company:

Relinquished by: (Signature) Date/Time: Received by: (Signature) Date/Time:

Company: Company:

Distribution: White and Yellow Copies - Accompany Shipment; Pink Copy - Project File

CHAIN OF CUSTODY RECORD/SAMPLE ANALYSIS REQUEST FORM

00010

Facility Number/Project Name: 226-00-297 St. Regis Paper Co. - 2005 Annual GW Sampling

Lab Contact: Lynda Huckestein Office:

Ship to: Columbia Analytical Services
1317 South 13th Ave
Kelso, WA 98626

Lab Contact Phone: 360-577-7222

Samplers: D. Cosgriff, R. Cummings

Company Name: Arrowhead Engineering, Inc.

INTERNATIONAL PAPER

	Sample No.	Date	Time	Matrix	PCP - 8151m	PAH 8270 SIM					Extra Container	Archive	Remarks
12	GW-0209	5-10-05	P.M.	GW	X	X					✓		
13	GW-0208	"	"	"	X	X					✓		Invoice & Rpt to:
14	GW-0211	"	"	"	X	X					✓		Arrowhead Eng. Inc
15	GW-0207	"	"	"	X	X					✓		P.O. Box 843
													Libby, MT 59923
													p. 406.293.9387

Matrix Code: GW - Groundwater SL - Soil SD - Sediment SW - Surface water
OTHER - Please identify codes

Priority: ☒ Normal ☐ Rush Rush time period

Shipped via: ☒ FedEx/UPS ☐ Courier Airbill

Condition of Samples Upon Receipt:

Custody Seal Intact: ☒ Yes ☐ No ☐ None

Relinquished by: [signature] (Signature) Date/Time: 5-12-2005 1700 hrs Received by: Amanda Juell CAS (Signature) Date/Time: 5/13/05 1050

Company: AEI Company:

Relinquished by: (Signature) Date/Time: Received by: (Signature) Date/Time:

Company: Company:

Distribution: White and Yellow Copies - Acc[illegible]any Shipment; Pink Copy - Project File

Columbia Analytical Services Inc.
Cooler Receipt and Preservation Form

PC Lynda

Project/Client Arrowhead Work Order K250 K0500232

Cooler received on 5-13-05 and opened on 5-13-05 by A. Juell

1.	Were custody seals on outside of coolers? If yes, how many and where? 17	Y	N
2.	Were custody seals intact?	Y	N
3.	Were signature and date present on the custody seals?	Y	N
4.	Is the shipper's airbill available and filed? If no, record airbill number: enclosed	Y	N
5.	COC#		

Temperature of cooler(s) upon receipt: (°C)	5.7	2.3	1.3	2.0
Temperature Blank: (°C)	3.3	1.7	3.2	3.4

	Were samples hand delivered on the same day as collection?	~~Y~~	~~N~~
6.	Were custody papers properly filled out (ink, signed, etc.)?	Y	N
7.	Type of packing material present inserts		
8.	**Did all bottles arrive in good condition (unbroken)?**	Y	N
9.	Were all bottle labels complete (i.e analysis, preservation, etc.)?	Y	N
10.	Did all bottle labels and tags agree with custody papers?	Y	N
11.	**Were the correct types of bottles used for the tests indicated?**	Y	N
12.	Were all of the preserved bottles received at the lab with the appropriate pH?	~~Y~~	~~N~~
	Were VOA vials checked for absence of air bubbles, and if present, noted below?	~~Y~~	~~N~~
14.	Did the bottles originate from CAS/K or a branch laboratory?	Y	N
15.	**Are CWA Microbiology samples received with >1/2 the 24hr. hold time remaining from collection?**	~~Y~~	~~N~~
16.	Was C12/Res negative?	Y	N

Explain any discrepancies:

RESOLUTION:

Samples that required preservation or received out of temperature:

Sample ID	Reagent	Volume	Lot Number	Bottle Type	Rec'd out of Temperature	Initials

Pentachlorophenol
EPA Method 8151 Modified

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500232
Project:	St.Regis Paper Co.-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/11/2005
Sample Matrix:	Water	**Date Received:**	05/13/2005

Pentachlorophenol

Sample Name:	GW-0158	**Units:**	ug/L
Lab Code:	K0500232-001	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	05/17/05	06/02/05	KWG0507894	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	79	35-133	06/02/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500232
Project:	St.Regis Paper Co.-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/11/2005
Sample Matrix:	Water	**Date Received:**	05/13/20

Pentachlorophenol

Sample Name:	GW-0159	**Units:**	ug/L
Lab Code:	K0500232-002	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	05/17/05	06/02/05	KWG0507894	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	83	35-133	06/02/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500232
Project:	St.Regis Paper Co.-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/11/2005
Sample Matrix:	Water	**Date Received:**	05/13/2005

Pentachlorophenol

Sample Name:	GW-0156	**Units:**	ug/L
Lab Code:	K0500232-003	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	05/17/05	06/02/05	KWG0507894	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	79	35-133	06/02/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Arrowhead Engineering
Project: St.Regis Paper Co.-2005 Annual GW Sampling/226-00-297
Sample Matrix: Water

Service Request: K0500232
Date Collected: 05/11/2005
Date Received: 05/13/2005

Pentachlorophenol

Sample Name: GW-0157
Lab Code: K0500232-004

Units: ug/L
Basis: NA

Extraction Method: METHOD
Analysis Method: 8151M

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	05/17/05	06/02/05	KWG0507894	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	77	35-133	06/02/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500232
Project:	St.Regis Paper Co.-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/11/2005
Sample Matrix:	Water	**Date Received:**	05/13/2005

Pentachlorophenol

Sample Name:	GW-0161	**Units:**	ug/L
Lab Code:	K0500232-005	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	05/17/05	06/02/05	KWG0507894	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	73	35-133	06/02/05	Acceptable

Comments:

00017

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500232
Project:	St.Regis Paper Co.-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/12/2005
Sample Matrix:	Water	**Date Received:**	05/13/200[illegible]

Pentachlorophenol

Sample Name:	SW-0017	**Units:**	ug/L
Lab Code:	K0500232-006	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	05/17/05	06/02/05	KWG0507894	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	73	35-133	06/02/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500232
Project:	St.Regis Paper Co.-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/12/2005
Sample Matrix:	Water	**Date Received:**	05/13/2005

Pentachlorophenol

Sample Name:	SW-0018	**Units:**	ug/L
Lab Code:	K0500232-007	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	05/17/05	06/02/05	KWG0507894	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	75	35-133	06/02/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500232
Project:	St.Regis Paper Co.-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/11/2005
Sample Matrix:	Water	**Date Received:**	05/13/20

Pentachlorophenol

Sample Name:	GW-0206	**Units:**	ug/L
Lab Code:	K0500232-008	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	05/17/05	06/02/05	KWG0507894	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	77	35-133	06/02/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500232
Project:	St.Regis Paper Co.-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/11/2005
Sample Matrix:	Water	**Date Received:**	05/13/2005

Pentachlorophenol

Sample Name:	GW-0210	**Units:**	ug/L
Lab Code:	K0500232-009	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	05/17/05	06/02/05	KWG0507894	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	73	35-133	06/02/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500232
Project:	St.Regis Paper Co.-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/11/2005
Sample Matrix:	Water	**Date Received:**	05/13/2005

Pentachlorophenol

Sample Name:	GW-0160	**Units:**	ug/L
Lab Code:	K0500232-010	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	05/17/05	06/02/05	KWG0507894	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	80	35-133	06/02/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500232
Project:	St.Regis Paper Co.-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/11/2005
Sample Matrix:	Water	**Date Received:**	05/13/2005

Pentachlorophenol

Sample Name:	GW-0205	**Units:**	ug/L
Lab Code:	K0500232-011	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	05/17/05	06/02/05	KWG0507894	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	80	35-133	06/02/05	Acceptable

Comments:

00023

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Arrowhead Engineering
Project: St.Regis Paper Co.-2005 Annual GW Sampling/226-00-297
Sample Matrix: Water

Service Request: K0500232
Date Collected: 05/10/2005
Date Received: 05/13/200

Pentachlorophenol

Sample Name: GW-0209
Lab Code: K0500232-012

Units: ug/L
Basis: NA

Extraction Method: METHOD
Analysis Method: 8151M

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	05/17/05	06/02/05	KWG0507894	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	75	35-133	06/02/05	Acceptable

Comments:

00024

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500232
Project:	St.Regis Paper Co.-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/10/2005
Sample Matrix:	Water	**Date Received:**	05/13/2005

Pentachlorophenol

Sample Name:	GW-0208	**Units:**	ug/L
Lab Code:	K0500232-013	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	05/17/05	06/02/05	KWG0507894	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	72	35-133	06/02/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500232
Project:	St.Regis Paper Co.-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/10/2005
Sample Matrix:	Water	**Date Received:**	05/13/200

Pentachlorophenol

Sample Name:	GW-0211	**Units:**	ug/L
Lab Code:	K0500232-014	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	05/17/05	06/02/05	KWG0507894	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	70	35-133	06/02/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500232
Project:	St.Regis Paper Co.-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/10/2005
Sample Matrix:	Water	**Date Received:**	05/13/2005

Pentachlorophenol

Sample Name:	GW-0207	**Units:**	ug/L
Lab Code:	K0500232-015	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	05/17/05	06/02/05	KWG0507894	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	76	35-133	06/02/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500232
Project:	St.Regis Paper Co.-2005 Annual GW Sampling/226-00-297	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Pentachlorophenol

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG0507894-4	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	05/17/05	06/02/05	KWG0507894	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	84	35-133	06/02/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Arrowhead Engineering
Project: St.Regis Paper Co.-2005 Annual GW Sampling/226-00-297
Sample Matrix: Water

Service Request: K0500232

Surrogate Recovery Summary
Pentachlorophenol

Extraction Method: METHOD
Analysis Method: 8151M

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1
GW-0158	K0500232-001	79
GW-0159	K0500232-002	83
GW-0156	K0500232-003	79
GW-0157	K0500232-004	77
GW-0161	K0500232-005	73
SW-0017	K0500232-006	73
SW-0018	K0500232-007	75
GW-0206	K0500232-008	77
GW-0210	K0500232-009	73
GW-0160	K0500232-010	80
GW-0205	K0500232-011	80
GW-0209	K0500232-012	75
GW-0208	K0500232-013	72
GW-0211	K0500232-014	70
[illegible]0207	K0500232-015	76
[illegible]od Blank	KWG0507894-4	84
GW-0158MS	KWG0507894-1	70
GW-0158DMS	KWG0507894-2	74
Lab Control Sample	KWG0507894-3	83

Surrogate Recovery Control Limits (%)

Sur1 = 4-Bromo-2,6-dichlorophenol 35-133

Results flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Arrowhead Engineering	**Service Request:**	K0500232
Project:	St.Regis Paper Co.-2005 Annual GW Sampling/226-00-297	**Date Extracted:**	05/17/2005
Sample Matrix:	Water	**Date Analyzed:**	06/02/20

Matrix Spike/Duplicate Matrix Spike Summary
Pentachlorophenol

Sample Name:	GW-0158	**Units:**	ug/L
Lab Code:	K0500232-001	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M	**Extraction Lot:**	KWG0507894

		GW-0158MS KWG0507894-1 Matrix Spike			GW-0158DMS KWG0507894-2 Duplicate Matrix Spike					
Analyte Name	**Sample Result**	**Result**	**Expected**	**%Rec**	**Result**	**Expected**	**%Rec**	**%Rec Limits**	**RPD**	**RPD Limit**
Pentachlorophenol	ND	9.25	10.0	92	9.52	10.0	95	34-124	3	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00030

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Arrowhead Engineering	**Service Request:**	K0500232
Project:	St.Regis Paper Co.-2005 Annual GW Sampling/226-00-297	**Date Extracted:**	05/17/2005
Sample Matrix:	Water	**Date Analyzed:**	06/02/2005

Lab Control Spike Summary
Pentachlorophenol

Extraction Method:	METHOD	**Units:**	ug/L
Analysis Method:	8151M	**Basis:**	NA
		Level:	Low
		Extraction Lot:	KWG0507894

	Lab Control Sample KWG0507894-3 Lab Control Spike			
Analyte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
Pentachlorophenol	9.23	10.0	92	44-116

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00031

Polynuclear Aromatic Hydrocarbons
EPA Method 8270C

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500232
Project:	St.Regis Paper Co.-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/11/2005
Sample Matrix:	Water	**Date Received:**	05/13/2005

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0158	**Units:**	ug/L
Lab Code:	K0500232-001	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**0.25**		0.021	1	05/16/05	05/23/05	KWG0507762	
Acenaphthylene	ND	U	0.021	1	05/16/05	05/23/05	KWG0507762	
Acenaphthene	**0.028**		0.021	1	05/16/05	05/23/05	KWG0507762	
Fluorene	ND	U	0.021	1	05/16/05	05/23/05	KWG0507762	
Phenanthrene	ND	U	0.021	1	05/16/05	05/23/05	KWG0507762	
Anthracene	ND	U	0.021	1	05/16/05	05/23/05	KWG0507762	
Fluoranthene	ND	U	0.021	1	05/16/05	05/23/05	KWG0507762	
Pyrene	ND	U	0.021	1	05/16/05	05/23/05	KWG0507762	
Benz(a)anthracene	ND	U	0.021	1	05/16/05	05/23/05	KWG0507762	
Chrysene	ND	U	0.021	1	05/16/05	05/23/05	KWG0507762	
Benzo(b)fluoranthene	ND	U	0.021	1	05/16/05	05/23/05	KWG0507762	
Benzo(k)fluoranthene	ND	U	0.021	1	05/16/05	05/23/05	KWG0507762	
zo(a)pyrene	ND	U	0.021	1	05/16/05	05/23/05	KWG0507762	
eno(1,2,3-cd)pyrene	ND	U	0.021	1	05/16/05	05/23/05	KWG0507762	
Dibenz(a,h)anthracene	ND	U	0.021	1	05/16/05	05/23/05	KWG0507762	
Benzo(g,h,i)perylene	ND	U	0.021	1	05/16/05	05/23/05	KWG0507762	
Quinoline	ND	U	0.021	1	05/16/05	05/23/05	KWG0507762	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	95	37-107	05/23/05	Acceptable
Fluoranthene-d10	115	18-137	05/23/05	Acceptable
Terphenyl-d14	102	18-153	05/23/05	Acceptable

ments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500232
Project:	St.Regis Paper Co.-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/11/2005
Sample Matrix:	Water	**Date Received:**	05/13/2005

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0159	**Units:**	ug/L
Lab Code:	K0500232-002	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**0.23**		0.020	1	05/16/05	05/23/05	KWG0507762	
Acenaphthylene	ND	U	0.020	1	05/16/05	05/23/05	KWG0507762	
Acenaphthene	ND	U	0.020	1	05/16/05	05/23/05	KWG0507762	
Fluorene	ND	U	0.020	1	05/16/05	05/23/05	KWG0507762	
Phenanthrene	**0.022**		0.020	1	05/16/05	05/23/05	KWG0507762	
Anthracene	ND	U	0.020	1	05/16/05	05/23/05	KWG0507762	
Fluoranthene	ND	U	0.020	1	05/16/05	05/23/05	KWG0507762	
Pyrene	ND	U	0.020	1	05/16/05	05/23/05	KWG0507762	
Benz(a)anthracene	ND	U	0.020	1	05/16/05	05/23/05	KWG0507762	
Chrysene	ND	U	0.020	1	05/16/05	05/23/05	KWG0507762	
Benzo(b)fluoranthene	ND	U	0.020	1	05/16/05	05/23/05	KWG0507762	
Benzo(k)fluoranthene	ND	U	0.020	1	05/16/05	05/23/05	KWG0507762	
Benzo(a)pyrene	ND	U	0.020	1	05/16/05	05/23/05	KWG0507762	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	1	05/16/05	05/23/05	KWG0507762	
Dibenz(a,h)anthracene	ND	U	0.020	1	05/16/05	05/23/05	KWG0507762	
Benzo(g,h,i)perylene	ND	U	0.020	1	05/16/05	05/23/05	KWG0507762	
Quinoline	ND	U	0.020	1	05/16/05	05/23/05	KWG0507762	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	93	37-107	05/23/05	Acceptable
Fluoranthene-d10	111	18-137	05/23/05	Acceptable
Terphenyl-d14	92	18-153	05/23/05	Acceptable

Comments:

00034

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500232
Project:	St.Regis Paper Co.-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/11/2005
Sample Matrix:	Water	**Date Received:**	05/13/2005

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0156	**Units:**	ug/L
Lab Code:	K0500232-003	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**0.12**		0.020	1	05/16/05	05/23/05	KWG0507762	
Acenaphthylene	ND	U	0.020	1	05/16/05	05/23/05	KWG0507762	
Acenaphthene	ND	U	0.020	1	05/16/05	05/23/05	KWG0507762	
Fluorene	ND	U	0.020	1	05/16/05	05/23/05	KWG0507762	
Phenanthrene	ND	U	0.020	1	05/16/05	05/23/05	KWG0507762	
Anthracene	ND	U	0.020	1	05/16/05	05/23/05	KWG0507762	
Fluoranthene	ND	U	0.020	1	05/16/05	05/23/05	KWG0507762	
Pyrene	ND	U	0.020	1	05/16/05	05/23/05	KWG0507762	
Benz(a)anthracene	ND	U	0.020	1	05/16/05	05/23/05	KWG0507762	
Chrysene	ND	U	0.020	1	05/16/05	05/23/05	KWG0507762	
Benzo(b)fluoranthene	ND	U	0.020	1	05/16/05	05/23/05	KWG0507762	
Benzo(k)fluoranthene	ND	U	0.020	1	05/16/05	05/23/05	KWG0507762	
[illegible]o(a)pyrene	ND	U	0.020	1	05/16/05	05/23/05	KWG0507762	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	1	05/16/05	05/23/05	KWG0507762	
Dibenz(a,h)anthracene	ND	U	0.020	1	05/16/05	05/23/05	KWG0507762	
Benzo(g,h,i)perylene	ND	U	0.020	1	05/16/05	05/23/05	KWG0507762	
Quinoline	ND	U	0.020	1	05/16/05	05/23/05	KWG0507762	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	88	37-107	05/23/05	Acceptable
Fluoranthene-d10	108	18-137	05/23/05	Acceptable
Terphenyl-d14	102	18-153	05/23/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500232
Project:	St.Regis Paper Co.-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/11/2005
Sample Matrix:	Water	**Date Received:**	05/13/20

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0157	**Units:**	ug/L
Lab Code:	K0500232-004	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Acenaphthylene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Acenaphthene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Fluorene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Phenanthrene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Anthracene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Fluoranthene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Pyrene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Benz(a)anthracene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Chrysene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Benzo(b)fluoranthene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Benzo(k)fluoranthene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Benzo(a)pyrene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Indeno(1,2,3-cd)pyrene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Dibenz(a,h)anthracene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Benzo(g,h,i)perylene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Quinoline	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	94	37-107	05/24/05	Acceptable
Fluoranthene-d10	108	18-137	05/24/05	Acceptable
Terphenyl-d14	114	18-153	05/24/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500232
Project:	St.Regis Paper Co.-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/11/2005
Sample Matrix:	Water	**Date Received:**	05/13/2005

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0161	**Units:**	ug/L
Lab Code:	K0500232-005	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Acenaphthylene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Acenaphthene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Fluorene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Phenanthrene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Anthracene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Fluoranthene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Pyrene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Benz(a)anthracene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Chrysene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Benzo(b)fluoranthene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Benzo(k)fluoranthene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Benzo(a)pyrene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Indeno(1,2,3-cd)pyrene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Dibenz(a,h)anthracene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Benzo(g,h,i)perylene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Quinoline	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	98	37-107	05/24/05	Acceptable
Fluoranthene-d10	118	18-137	05/24/05	Acceptable
Terphenyl-d14	118	18-153	05/24/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500232
Project:	St.Regis Paper Co.-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/11/2005
Sample Matrix:	Water	**Date Received:**	05/13/2005

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0206	**Units:**	ug/L
Lab Code:	K0500232-008	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Acenaphthylene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Acenaphthene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Fluorene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Phenanthrene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Anthracene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Fluoranthene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Pyrene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Benz(a)anthracene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Chrysene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Benzo(b)fluoranthene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Benzo(k)fluoranthene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Benzo(a)pyrene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Indeno(1,2,3-cd)pyrene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Dibenz(a,h)anthracene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Benzo(g,h,i)perylene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Quinoline	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	92	37-107	05/24/05	Acceptable
Fluoranthene-d10	111	18-137	05/24/05	Acceptable
Terphenyl-d14	112	18-153	05/24/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500232
Project:	St.Regis Paper Co.-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/11/2005
Sample Matrix:	Water	**Date Received:**	05/13/2005

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0210	**Units:**	ug/L
Lab Code:	K0500232-009	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Acenaphthylene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Acenaphthene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Fluorene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Phenanthrene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Anthracene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Fluoranthene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Pyrene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Benz(a)anthracene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Chrysene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Benzo(b)fluoranthene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Benzo(k)fluoranthene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Benzo(a)pyrene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Indeno(1,2,3-cd)pyrene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Dibenz(a,h)anthracene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Benzo(g,h,i)perylene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Quinoline	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	94	37-107	05/24/05	Acceptable
Fluoranthene-d10	110	18-137	05/24/05	Acceptable
Terphenyl-d14	110	18-153	05/24/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500232
Project:	St.Regis Paper Co.-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/11/2005
Sample Matrix:	Water	**Date Received:**	05/13/200

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0160	**Units:**	ug/L
Lab Code:	K0500232-010	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Acenaphthylene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Acenaphthene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Fluorene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Phenanthrene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Anthracene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Fluoranthene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Pyrene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Benz(a)anthracene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Chrysene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Benzo(b)fluoranthene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Benzo(k)fluoranthene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Benzo(a)pyrene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Indeno(1,2,3-cd)pyrene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Dibenz(a,h)anthracene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Benzo(g,h,i)perylene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Quinoline	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	96	37-107	05/24/05	Acceptable
Fluoranthene-d10	110	18-137	05/24/05	Acceptable
Terphenyl-d14	111	18-153	05/24/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500232
Project:	St.Regis Paper Co.-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/10/2005
Sample Matrix:	Water	**Date Received:**	05/13/200

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0209	**Units:**	ug/L
Lab Code:	K0500232-012	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Acenaphthylene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Acenaphthene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Fluorene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Phenanthrene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Anthracene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Fluoranthene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Pyrene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Benz(a)anthracene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Chrysene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Benzo(b)fluoranthene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Benzo(k)fluoranthene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Benzo(a)pyrene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Indeno(1,2,3-cd)pyrene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Dibenz(a,h)anthracene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Benzo(g,h,i)perylene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Quinoline	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	91	37-107	05/24/05	Acceptable
Fluoranthene-d10	118	18-137	05/24/05	Acceptable
Terphenyl-d14	114	18-153	05/24/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500232
Project:	St.Regis Paper Co.-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/11/2005
Sample Matrix:	Water	**Date Received:**	05/13/2005

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0205	**Units:**	ug/L
Lab Code:	K0500232-011	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Acenaphthylene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Acenaphthene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Fluorene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Phenanthrene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Anthracene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Fluoranthene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Pyrene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Benz(a)anthracene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Chrysene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Benzo(b)fluoranthene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Benzo(k)fluoranthene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Benzo(a)pyrene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Indeno(1,2,3-cd)pyrene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Dibenz(a,h)anthracene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Benzo(g,h,i)perylene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Quinoline	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	92	37-107	05/24/05	Acceptable
Fluoranthene-d10	111	18-137	05/24/05	Acceptable
Terphenyl-d14	111	18-153	05/24/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500232
Project:	St.Regis Paper Co.-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/10/2005
Sample Matrix:	Water	**Date Received:**	05/13/2005

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0208	**Units:**	ug/L
Lab Code:	K0500232-013	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Acenaphthylene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Acenaphthene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Fluorene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Phenanthrene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Anthracene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Fluoranthene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Pyrene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Benz(a)anthracene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Chrysene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Benzo(b)fluoranthene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Benzo(k)fluoranthene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Benzo(a)pyrene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Indeno(1,2,3-cd)pyrene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Dibenz(a,h)anthracene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Benzo(g,h,i)perylene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Quinoline	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	87	37-107	05/24/05	Acceptable
Fluoranthene-d10	114	18-137	05/24/05	Acceptable
Terphenyl-d14	115	18-153	05/24/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500232
Project:	St.Regis Paper Co.-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/10/2005
Sample Matrix:	Water	**Date Received:**	05/13/200[illegible]

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0211	**Units:**	ug/L
Lab Code:	K0500232-014	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Acenaphthylene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Acenaphthene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Fluorene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Phenanthrene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Anthracene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Fluoranthene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Pyrene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Benz(a)anthracene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Chrysene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Benzo(b)fluoranthene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Benzo(k)fluoranthene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Benzo(a)pyrene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Indeno(1,2,3-cd)pyrene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Dibenz(a,h)anthracene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Benzo(g,h,i)perylene	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	
Quinoline	ND	U	0.022	1	05/16/05	05/24/05	KWG0507762	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	95	37-107	05/24/05	Acceptable
Fluoranthene-d10	110	18-137	05/24/05	Acceptable
Terphenyl-d14	113	18-153	05/24/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500232
Project:	St.Regis Paper Co.-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/10/2005
Sample Matrix:	Water	**Date Received:**	05/13/2005

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0207	**Units:**	ug/L
Lab Code:	K0500232-015	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Acenaphthylene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Acenaphthene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Fluorene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Phenanthrene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Anthracene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Fluoranthene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Pyrene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Benz(a)anthracene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Chrysene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Benzo(b)fluoranthene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Benzo(k)fluoranthene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
zo(a)pyrene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
ıdeno(1,2,3-cd)pyrene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Dibenz(a,h)anthracene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Benzo(g,h,i)perylene	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	
Quinoline	ND	U	0.021	1	05/16/05	05/24/05	KWG0507762	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	96	37-107	05/24/05	Acceptable
Fluoranthene-d10	110	18-137	05/24/05	Acceptable
Terphenyl-d14	98	18-153	05/24/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Arrowhead Engineering
Project: St.Regis Paper Co.-2005 Annual GW Sampling/226-00-297
Sample Matrix: Water

Service Request: K0500232
Date Collected: NA
Date Received: NA

Polynuclear Aromatic Hydrocarbons

Sample Name: Method Blank
Lab Code: KWG0507762-4

Units: ug/L
Basis: NA

Extraction Method: EPA 3520C
Analysis Method: 8270C SIM

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.020	1	05/16/05	05/23/05	KWG0507762	
Acenaphthylene	ND	U	0.020	1	05/16/05	05/23/05	KWG0507762	
Acenaphthene	ND	U	0.020	1	05/16/05	05/23/05	KWG0507762	
Fluorene	ND	U	0.020	1	05/16/05	05/23/05	KWG0507762	
Phenanthrene	ND	U	0.020	1	05/16/05	05/23/05	KWG0507762	
Anthracene	ND	U	0.020	1	05/16/05	05/23/05	KWG0507762	
Fluoranthene	ND	U	0.020	1	05/16/05	05/23/05	KWG0507762	
Pyrene	ND	U	0.020	1	05/16/05	05/23/05	KWG0507762	
Benz(a)anthracene	ND	U	0.020	1	05/16/05	05/23/05	KWG0507762	
Chrysene	ND	U	0.020	1	05/16/05	05/23/05	KWG0507762	
Benzo(b)fluoranthene	ND	U	0.020	1	05/16/05	05/23/05	KWG0507762	
Benzo(k)fluoranthene	ND	U	0.020	1	05/16/05	05/23/05	KWG0507762	
Benzo(a)pyrene	ND	U	0.020	1	05/16/05	05/23/05	KWG0507762	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	1	05/16/05	05/23/05	KWG0507762	
Dibenz(a,h)anthracene	ND	U	0.020	1	05/16/05	05/23/05	KWG0507762	
Benzo(g,h,i)perylene	ND	U	0.020	1	05/16/05	05/23/05	KWG0507762	
Quinoline	ND	U	0.020	1	05/16/05	05/23/05	KWG0507762	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	96	37-107	05/23/05	Acceptable
Fluoranthene-d10	119	18-137	05/23/05	Acceptable
Terphenyl-d14	121	18-153	05/23/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Arrowhead Engineering
Project: St.Regis Paper Co.-2005 Annual GW Sampling/226-00-297
Sample Matrix: Water

Service Request: K0500232

Surrogate Recovery Summary
Polynuclear Aromatic Hydrocarbons

Extraction Method: EPA 3520C
Analysis Method: 8270C SIM

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1	Sur2	Sur3
GW-0158	K0500232-001	95	115	102
GW-0159	K0500232-002	93	111	92
GW-0156	K0500232-003	88	108	102
GW-0157	K0500232-004	94	108	114
GW-0161	K0500232-005	98	118	118
GW-0206	K0500232-008	92	111	112
GW-0210	K0500232-009	94	110	110
GW-0160	K0500232-010	96	110	111
GW-0205	K0500232-011	92	111	111
GW-0209	K0500232-012	91	118	114
GW-0208	K0500232-013	87	114	115
GW-0211	K0500232-014	95	110	113
GW-0207	K0500232-015	96	110	98
Method Blank	KWG0507762-4	96	119	121
GW-0158MS	KWG0507762-1	94	107	88
GW-0158DMS	KWG0507762-2	94	106	81
Lab Control Sample	KWG0507762-3	93	107	98

Surrogate Recovery Control Limits (%)

Sur1 =	Fluorene-d10	37-107
Sur2 =	Fluoranthene-d10	18-137
Sur3 =	Terphenyl-d14	18-153

Results flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Arrowhead Engineering	**Service Request:**	K0500232
Project:	St.Regis Paper Co.-2005 Annual GW Sampling/226-00-297	**Date Extracted:**	05/16/2005
Sample Matrix:	Water	**Date Analyzed:**	05/23/20[illegible]

Matrix Spike/Duplicate Matrix Spike Summary
Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0158	**Units:**	ug/L
Lab Code:	K0500232-001	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM	**Extraction Lot:**	KWG0507762

		GW-0158MS KWG0507762-1 Matrix Spike			GW-0158DMS KWG0507762-2 Duplicate Matrix Spike					
Analyte Name	**Sample Result**	**Result**	**Expected**	**%Rec**	**Result**	**Expected**	**%Rec**	**%Rec Limits**	**RPD**	**RPD Limit**
Naphthalene	0.25	2.25	2.43	82	2.27	2.55	79	27-109	1	30
Acenaphthylene	ND	2.07	2.43	85	2.23	2.55	87	30-118	7	30
Acenaphthene	0.028	2.04	2.43	83	2.16	2.55	83	28-115	5	30
Fluorene	ND	2.24	2.43	92	2.39	2.55	94	28-122	6	30
Phenanthrene	ND	2.21	2.43	91	2.46	2.55	97	24-129	11	30
Anthracene	ND	1.91	2.43	78	2.12	2.55	83	26-118	11	30
Fluoranthene	ND	2.37	2.43	98	2.63	2.55	103	18-133	10	30
Pyrene	ND	2.20	2.43	91	2.37	2.55	93	19-133	7	30
Benz(a)anthracene	ND	1.85	2.43	76	2.15	2.55	84	19-136	15	[illegible]
Chrysene	ND	1.96	2.43	81	2.25	2.55	88	22-129	14	
Benzo(b)fluoranthene	ND	1.93	2.43	79	2.25	2.55	88	19-141	15	30
Benzo(k)fluoranthene	ND	1.84	2.43	76	2.14	2.55	84	19-138	15	30
Benzo(a)pyrene	ND	1.80	2.43	74	2.13	2.55	84	10-142	17	30
Indeno(1,2,3-cd)pyrene	ND	1.75	2.43	72	2.11	2.55	83	19-151	19	30
Dibenz(a,h)anthracene	ND	1.76	2.43	73	2.12	2.55	83	16-146	19	30
Benzo(g,h,i)perylene	ND	1.77	2.43	73	2.11	2.55	83	22-134	18	30
Quinoline	ND	2.62	2.43	108	2.63	2.55	103	70-130	1	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00046

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Arrowhead Engineering	**Service Request:**	K0500232
Project:	St.Regis Paper Co.-2005 Annual GW Sampling/226-00-297	**Date Extracted:**	05/16/2005
Sample Matrix:	Water	**Date Analyzed:**	05/23/2005

Lab Control Spike Summary
Polynuclear Aromatic Hydrocarbons

Extraction Method:	EPA 3520C	**Units:**	ug/L
Analysis Method:	8270C SIM	**Basis:**	NA
		Level:	Low
		Extraction Lot:	KWG0507762

	Lab Control Sample KWG0507762-3 Lab Control Spike			
Analyte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
Naphthalene	2.10	2.50	84	41-115
Acenaphthylene	2.21	2.50	88	44-122
Acenaphthene	2.12	2.50	85	41-123
Fluorene	2.33	2.50	93	44-128
Phenanthrene	2.24	2.50	90	45-127
Anthracene	1.92	2.50	77	40-126
Fluoranthene	2.50	2.50	100	41-141
Pyrene	2.38	2.50	95	34-152
Benz(a)anthracene	2.20	2.50	88	46-132
Chrysene	2.28	2.50	91	46-136
nzo(b)fluoranthene	2.41	2.50	97	54-137
ızo(k)fluoranthene	2.45	2.50	98	54-141
Benzo(a)pyrene	2.36	2.50	95	49-133
Indeno(1,2,3-cd)pyrene	2.19	2.50	88	41-141
Dibenz(a,h)anthracene	2.17	2.50	87	39-143
Benzo(g,h,i)perylene	2.22	2.50	89	46-133
Quinoline	2.79	2.50	112	70-130

its flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00049

17 South 13th Avenue P.O. Box 479 Kelso, Washington 98626 (360) 577-7222 ph (360) 636-1068 fax

Columbia Analytical Services INC.
An Employee - Owned Company

June 7, 2005 Service Request No: K0500276

RECEIVED
JUN 20 2005
BARR ENGINEERING CO.

David Cosgriff
Arrowhead Engineering
P.O. Box 843
Libby, MT 59923

RE: St. Regis Paper Co Site-2005 Annual GW Sampling / 226-00-297

Dear David:

Enclosed are the results of the sample(s) submitted to our laboratory on February 24, 2005. For your reference, these analyses have been assigned our service request number K0500276.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAC standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3358.

Respectfully submitted,

Columbia Analytical Services, Inc.

Lynda Huckestein
Client Services Manager

LH/jeb

NELAP Accredited ACIL Seal of Excellence Award

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a matrix interference.
X	See case narrative.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
B	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL has been elevated due to a matrix interference.
X	See case narrative.
*	The duplicate analysis not within control limits. See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results (25% for CLP Pesticides).
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a chromatographic interference.
X	See case narrative.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

Chain of Custody Documentation

Cooler #0

CHAIN OF CUSTODY RECORD/SAMPLE ANALYSIS REQUEST FORM

Facility Number/Project Name: 226-00-297 St. Regis Paper Co Site - 2005 Annual GW Sampling

Lab Contact: Lynda Huckestein Office:

Ship to: Columbia Analytical Services
1317 South 13th Ave
Kelso, WA 98626

Lab Contact Phone: 360-577-7222

Samplers: D. Cogger, R. Cummings

Company Name: Arrowhead Eng. Inc

INTERNATIONAL PAPER

	Sample No.	Date	Time	Matrix	PAH/PCP 8270 SIM						Extra Container	Archive	Remarks
1	GW-0184	5-15-05	A.m.	GW	X						✓		
1	GW-0184 MS	"	"	"	X						✓		Invoice & Rpt to:
1	GW-0184 MSD	"	"	"	X						✓		Arrowhead Eng. Inc
2	GW-0185	"	"	"	X						✓		P.O. Box 843
3	GW-0186	"	"	"	X						✓		Libby, MT 59923
													ph. 406. 293. 9387

K0500276
Arrowhead Engineering

Matrix Code: GW - Groundwater SL - Soil SD - Sediment SW - Surface water
OTHER - Please identify codes

Priority: ☑ Normal ☐ Rush Rush time period

Shipped via: ☒ FedEx/UPS ☐ Courier Airbill

Condition of Samples Upon Receipt:

Custody Seal Intact: ☐ Yes ☐ No ☐ None

Relinquished by: (Signature) Date/Time: 5-16-05 1200 hrs.
Company: AEI

Received by: Amanda Jewell (Signature) Date/Time: 5/17/05 1000
Company:

Relinquished by: (Signature) Date/Time:
Company:

Received by: (Signature) Date/Time:
Company:

Distribution: White and Yellow Copies - Accompany Shipment; Pink Copy - Project File

CHAIN OF CUSTODY RECORD/SAMPLE ANALYSIS REQUEST FORM

Facility Number/Project Name: 226-00-297 St. Regis Paper Co. site - 2005 Annual GW Sampling

Lab Contact: Lynda Huckestein Office:

Ship to: Columbia Analytical Services
1317 South 13th Ave
Kelso, WA 98626

Lab Contact Phone: 360-577-7222

Samplers: D. Cosgriff, R. Cummings

Company Name: Arrowhead Engineering, Inc

INTERNATIONAL PAPER

	Sample No.	Date	Time	Matrix	PAH 8270 SIM	PAH/PCP 8270 SIM	8151m PCP				Extra Container	Archive	Remarks
4	GW-0187	5-14-05	P.m.	X		X					✓		
5	GW-0182	"	"	X		X					✓		Invoice & Rpt to
6	GW-0188	"	"	X		X					✓		Arrowhead Eng, Inc
7	GW-0179	"	A.m.	X	X		X				✓		PO Box 847
													Libby, MT 59923
													ph. 406.292-9387

Analyses Requested

Matrix Code: GW - Groundwater SL - Soil SD - Sediment SW - Surface water
OTHER - Please identify codes

Priority: ☒ Normal ☐ Rush Rush time period

Shipped via: ☒ FedEx/UPS ☐ Courier Airbill

Condition of Samples Upon Receipt:

Custody Seal Intact: ☐ Yes ☐ No ☐ None

Relinquished by: (Signature) Date/Time: 5-16-05 1200 hrs Received by: Amanda Jewell (Signature) Date/Time: 5/17/05 1000

Company: Arrowhead Engineering, Inc Company:

Relinquished by: (Signature) Date/Time: Received by: (Signature) Date/Time:

Company: Company:

Distribution: White and Yellow Copies - [illegible]pany Shipment; Pink Copy - Project File

CHAIN OF CUSTODY RECORD/SAMPLE ANALYSIS REQUEST FORM

Facility Number/Project Name: 226-00-297 St. Regis Paper Co Site - 2005 Annual GW Sampling

Lab Contact: Lynda Huckestein Office:

Ship to: Columbia Analytical Services
1317 South 13th Ave.
Kelso, WA 98626

Lab Contact Phone: 360-577-7222

Samplers: D. Cosgriff, R. Cummings

Company Name: Arrowhead Engineering, Inc

INTERNATIONAL PAPER

	Sample No.	Date	Time	Matrix	PAH 8270 SIM	PCP 8151m					Extra Container	Archive	Remarks
8	GW-0177	5-14-05	A.m.	GW	X	X					✓		
8	GW-0177 MS	"	"	"	X	X					✓		Invoice & Rpt to
8	GW-0177 MSD	"	"	"	X	X					✓		Arrowhead Eng, Inc
9	GW-0178	"	"	"	X	X					✓		P.O. Box 843
													Libby, MT 59923
													ph 406. 293.9387

Matrix Code: GW - Groundwater SL - Soil SD - Sediment SW - Surface water
OTHER - Please identify codes

Priority: ☒ Normal ☐ Rush Rush time period

Shipped via: ☒ FedEx/UPS ☐ Courier Airbill

Condition of Samples Upon Receipt:

Custody Seal Intact: ☐ Yes ☐ No ☐ None

Relinquished by: [signature] (Signature) Date/Time: 5-16-05 1200 hrs Received by: Amanda Juell (Signature) Date/Time: 5/17/05 1000

Company: AEI Company:

Relinquished by: (Signature) Date/Time: Received by: (Signature) Date/Time:

Company: Company:

Distribution: White and Yellow Copies - Accompany Shipment; Pink Copy - Project File

CHAIN OF CUSTODY RECORD/SAMPLE ANALYSIS REQUEST FORM

Facility Number/Project Name: 226-00-297 St. Regis Paper Co Site - 2005 Annual GW Sampling

Lab Contact: Lynda Huckestein Office:

Ship to: Columbia Analytical Service
1317 South 13th Ave
Kelso, WA 98626

Lab Contact Phone: 360-577-7222

Samplers: D. Cosgriff R. Cummings

Company Name: Arrowhead Engineering, Inc

INTERNATIONAL PAPER

	Sample No.	Date	Time	Matrix	PAH 8270 SIM	Acp 8151 m					Extra Container	Archive	Remarks
10	GW-0155	5-14-05	A.M.	GW	X	X					✓		
11	GW-0162	"	P.M.	"	X	X					✓		Invoice & Rpt to:
12	GW-0163	"	"	"	X	X					✓		Arrowhead Eng., Inc.
13	GW-0164	"	"	"	X	X					✓		P.O. Box 843
													Libby, MT 59923
													p. 406. 293.9387

Matrix Code: GW - Groundwater SL - Soil SD - Sediment SW - Surface water
OTHER - Please identify codes

Priority: ☒ Normal ☐ Rush Rush time period

Shipped via: ☒ FedEx/UPS ☐ Courier Airbill

Condition of Samples Upon Receipt:

Custody Seal Intact: ☐ Yes ☐ No ☐ None

Relinquished by: (Signature) Date/Time: 5-16-05 1200 hrs Received by: Amanda Jewell (Signature) Date/Time: 5/17/05 1000

Company: AEI Company:

Relinquished by: (Signature) Date/Time: Received by: (Signature) Date/Time:

Company: Company:

Distribution: White and Yellow Copies - Company Shipment; Pink Copy - Project File

00010

CHAIN OF CUSTODY RECORD/SAMPLE ANALYSIS REQUEST FORM

Facility Number/Project Name: 226-00-297 St. Regis Paper Co. Site - 2005 Annual GW Sampling

Lab Contact: Lynda Huckestein Office:

Ship to: Columbia Analytical Services
1317 South 13th Ave
Kelso, WA 98626

Lab Contact Phone: 360-577-7222

Samplers: D. Cosgriff, Randy Cummings

Company Name: Arrowhead Engineering, Inc

INTERNATIONAL PAPER

	Sample No.	Date	Time	Matrix	PAH 8270 SIM	PCP 8151m					Extra Container	Archive	Remarks
14	GW-0180	5-15-05	P.M.	GW	X	X					✓		
15	GW-0183	"	A.M.	"	X	X					✓		Invoice & Rpt to:
16	GW-0181	"	P.M.	"	X	X					✓		Arrowhead Eng, Inc
													P.O. Box 843
													Libby, MT 59923
													ph. 406-293-9387

Matrix Code: GW - Groundwater SL - Soil SD - Sediment SW - Surface water
OTHER - Please identify codes

Priority: ☒ Normal ☐ Rush Rush time period

Shipped via: ☒ FedEx/UPS ☐ Courier Airbill

Condition of Samples Upon Receipt:

Custody Seal Intact: ☐ Yes ☐ No ☐ None

Relinquished by: (Signature) Date/Time: 5-16-05 1200 hrs Received by: Amanda Jewell (Signature) Date/Time: 5/17/05 1000

Company: AEI Company:

Relinquished by: (Signature) Date/Time: Received by: (Signature) Date/Time:

Company: Company:

Distribution: White and Yellow Copies - Accompany Shipment; Pink Copy - Project File

CHAIN OF CUSTODY RECORD/SAMPLE ANALYSIS REQUEST FORM

00012

Facility Number/Project Name: 226-00-297 St. Regis Paper Co Site - 2005 Annual GW Sampling

Lab Contact: Lynda Huckestein Office:

Ship to: Columbia Analytical Services
1317 South 13th Ave
Kelso, WA 98626

Lab Contact Phone: 360-577-7222

Samplers: David Cosgriff, Randy Cummings

Company Name: Arrowhead Engineering, Inc.

INTERNATIONAL PAPER

	Sample No.	Date	Time	Matrix	PAH 8270 SIM	PCP 8151M					Extra Container	Archive	Remarks
17	GW-0165	5-14-05	P.M.	GW	X	X					✓		
18	GW-0166	"	"	"	X	X					✓		Invoice & Rpt to:
19	GW-0167	"	"	"	X	X					✓		Arrowhead Eng. Inc.
20	GW-0168	"	"	"	X	X					✓		P.O Box 843
													Libby, MT 59923
													ph. 406.293.9387

Matrix Code: GW - Groundwater SL - Soil SD - Sediment SW - Surface water
OTHER - Please identify codes

Priority: ☒ Normal ☐ Rush Rush time period

Shipped via: ☒ FedEx/UPS ☐ Courier Airbill

Condition of Samples Upon Receipt:

Custody Seal Intact: ☐ Yes ☐ No ☐ None

Relinquished by: (Signature) Date/Time: 5-16-05 1200 hrs Received by: Amanda Juell (Signature) Date/Time: 5/17/05

Company:

Relinquished by: (Signature) Date/Time: Received by: (Signature) Date/Time:

Company: Company:

Distribution: White and Yellow Copies - Ar[illegible]any Shipment; Pink Copy - Project File

Columbia Analytical Services Inc.
Cooler Receipt and Preservation Form

PC LH

Project/Client Arrowhead Work Order K250 -K0800276

Cooler received on 5/17/05 and opened on 5/17/05 by A. Juell

1. Were custody seals on outside of coolers? Y N
   If yes, how many and where? 1f
2. Were custody seals intact? Y N
3. Were signature and date present on the custody seals? Y N
4. Is the shipper's airbill available and filed? If no, record airbill number:_____ Y N
5. COC#

Temperature of cooler(s) upon receipt: (°C)	3.2	2.3	5.7	4.9	6.0	5.2
Temperature Blank: (°C)	2.8	1.7	2.8	1.3	5.8	2.9

Were samples hand delivered on the same day as collection? ~~Y N~~

6. Were custody papers properly filled out (ink, signed, etc.)? Y N
7. Type of packing material present inserts, Burrap
8. **Did all bottles arrive in good condition (unbroken)?** Y N
9. Were all bottle labels complete (i.e analysis, preservation, etc.)? Y N
10. Did all bottle labels and tags agree with custody papers? Y N
11. **Were the correct types of bottles used for the tests indicated?** Y N
12. Were all of the preserved bottles received at the lab with the appropriate pH? ~~Y~~ N
13. Were VOA vials checked for absence of air bubbles, and if present, noted below? ~~Y N~~
14. Did the bottles originate from CAS/K or a branch laboratory? Y N
15. **Are CWA Microbiology samples received with >1/2 the 24hr. hold time remaining from collection?** ~~Y N~~
16. Was C12/Res negative? Y N

Explain any discrepancies:_____

RESOLUTION:_____

Samples that required preservation or received out of temperature:

Sample ID	Reagent	Volume	Lot Number	Bottle Type	Rec'd out of Temperature	Initials

Pentachlorophenol
EPA Method 8151 Modified

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500276
Project:	St. Regis Paper Co Site-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/15/2005
Sample Matrix:	Water	**Date Received:**	05/17/2005

Pentachlorophenol

Sample Name:	GW-0184	**Units:**	ug/L
Lab Code:	K0500276-001	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	**46**		0.50	1	05/21/05	06/02/05	KWG0508009	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	83	35-133	06/02/05	Acceptable

Comments:

00015

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500276
Project:	St. Regis Paper Co Site-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/15/2005
Sample Matrix:	Water	**Date Received:**	05/17/200

Pentachlorophenol

Sample Name:	GW-0185	**Units:**	ug/L
Lab Code:	K0500276-002	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	**46**		0.50	1	05/21/05	06/02/05	KWG0508009	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	88	35-133	06/02/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500276
Project:	St. Regis Paper Co Site-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/15/2005
ple Matrix:	Water	**Date Received:**	05/17/2005

Pentachlorophenol

Sample Name:	GW-0186	**Units:**	ug/L
Lab Code:	K0500276-003	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	05/21/05	06/02/05	KWG0508009	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	78	35-133	06/02/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Arrowhead Engineering
Project: St. Regis Paper Co Site-2005 Annual GW Sampling/226-00-297
Sample Matrix: Water

Service Request: K0500276
Date Collected: 05/14/2005
Date Received: 05/17/20

Pentachlorophenol

Sample Name: GW-0187
Lab Code: K0500276-004

Units: ug/L
Basis: NA

Extraction Method: METHOD
Analysis Method: 8151M

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	**310**	D	10	20	05/21/05	06/02/05	KWG0508009	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	52	35-133	06/02/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500276
Project:	St. Regis Paper Co Site-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/14/2005
Sample Matrix:	Water	**Date Received:**	05/17/2005

Pentachlorophenol

Sample Name:	GW-0182	**Units:**	ug/L
Lab Code:	K0500276-005	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	**110**	D	5.0	10	05/21/05	06/02/05	KWG0508009	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	104	35-133	06/02/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500276
Project:	St. Regis Paper Co Site-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/14/2005
Sample Matrix:	Water	**Date Received:**	05/17/200

Pentachlorophenol

Sample Name:	GW-0188	**Units:**	ug/L
Lab Code:	K0500276-006	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	**17**		0.50	1	05/21/05	06/02/05	KWG0508009	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	84	35-133	06/02/05	Acceptable

Comments:

00020

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500276
Project:	St. Regis Paper Co Site-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/14/2005
Sample Matrix:	Water	**Date Received:**	05/17/2005

Pentachlorophenol

Sample Name:	GW-0179	**Units:**	ug/L
Lab Code:	K0500276-007	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	05/21/05	06/03/05	KWG0508009	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	86	35-133	06/03/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500276
Project:	St. Regis Paper Co Site-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/14/2005
Sample Matrix:	Water	**Date Received:**	05/17/200

Pentachlorophenol

Sample Name:	GW-0177	**Units:**	ug/L
Lab Code:	K0500276-008	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	05/21/05	06/03/05	KWG0508009	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	88	35-133	06/03/05	Acceptable

Comments:

00022

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500276
Project:	St. Regis Paper Co Site-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/14/2005
ple Matrix:	Water	**Date Received:**	05/17/2005

Pentachlorophenol

Sample Name:	GW-0178	**Units:**	ug/L
Lab Code:	K0500276-009	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	05/21/05	06/03/05	KWG0508009	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	88	35-133	06/03/05	Acceptable

Comments:

00023

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500276
Project:	St. Regis Paper Co Site-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/14/2005
Sample Matrix:	Water	**Date Received:**	05/17/200

Pentachlorophenol

Sample Name:	GW-0155	**Units:**	ug/L
Lab Code:	K0500276-010	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	05/21/05	06/03/05	KWG0508009	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	94	35-133	06/03/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500276
Project:	St. Regis Paper Co Site-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/14/2005
le Matrix:	Water	**Date Received:**	05/17/2005

Pentachlorophenol

Sample Name:	GW-0162	**Units:**	ug/L
Lab Code:	K0500276-011	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	05/21/05	06/03/05	KWG0508009	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	89	35-133	06/03/05	Acceptable

Comments:

00025

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500276
Project:	St. Regis Paper Co Site-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/14/2005
Sample Matrix:	Water	**Date Received:**	05/17/200

Pentachlorophenol

Sample Name:	GW-0163	**Units:**	ug/L
Lab Code:	K0500276-012	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	05/21/05	06/03/05	KWG0508009	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	80	35-133	06/03/05	Acceptable

Comments:

00026

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500276
Project:	St. Regis Paper Co Site-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/14/2005
ple Matrix:	Water	**Date Received:**	05/17/2005

Pentachlorophenol

Sample Name:	GW-0164	**Units:**	ug/L
Lab Code:	K0500276-013	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	05/21/05	06/03/05	KWG0508009	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	77	35-133	06/03/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500276
Project:	St. Regis Paper Co Site-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/15/2005
Sample Matrix:	Water	**Date Received:**	05/17/200

Pentachlorophenol

Sample Name:	GW-0180	**Units:**	ug/L
Lab Code:	K0500276-014	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	05/21/05	06/03/05	KWG0508009	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	72	35-133	06/03/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500276
Project:	St. Regis Paper Co Site-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/15/2005
ple Matrix:	Water	**Date Received:**	05/17/2005

Pentachlorophenol

Sample Name:	GW-0183	**Units:**	ug/L
Lab Code:	K0500276-015	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	**21**	D	2.5	5	05/21/05	06/03/05	KWG0508009	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	82	35-133	06/03/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500276
Project:	St. Regis Paper Co Site-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/15/2005
Sample Matrix:	Water	**Date Received:**	05/17/200

Pentachlorophenol

Sample Name:	GW-0181	**Units:**	ug/L
Lab Code:	K0500276-016	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	**9.6**		0.50	1	05/21/05	06/03/05	KWG0508009	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	81	35-133	06/03/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500276
Project:	St. Regis Paper Co Site-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/15/2005
Sample Matrix:	Water	**Date Received:**	05/17/2005

Pentachlorophenol

Sample Name:	GW-0165	**Units:**	ug/L
Lab Code:	K0500276-017	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	**6.4**		0.50	1	05/21/05	06/03/05	KWG0508009	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	76	35-133	06/03/05	Acceptable

Comments:

00031

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500276
Project:	St. Regis Paper Co Site-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/15/2005
Sample Matrix:	Water	**Date Received:**	05/17/200

Pentachlorophenol

Sample Name:	GW-0166	**Units:**	ug/L
Lab Code:	K0500276-018	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	05/21/05	06/03/05	KWG0508009	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	76	35-133	06/03/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500276
Project:	St. Regis Paper Co Site-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/15/2005
Sample Matrix:	Water	**Date Received:**	05/17/2005

Pentachlorophenol

Sample Name:	GW-0167	**Units:**	ug/L
Lab Code:	K0500276-019	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	05/21/05	06/03/05	KWG0508009	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	86	35-133	06/03/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500276
Project:	St. Regis Paper Co Site-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/15/2005
Sample Matrix:	Water	**Date Received:**	05/17/20

Pentachlorophenol

Sample Name:	GW-0168	**Units:**	ug/L
Lab Code:	K0500276-020	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	05/21/05	06/03/05	KWG0508009	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	83	35-133	06/03/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500276
Project:	St. Regis Paper Co Site-2005 Annual GW Sampling/226-00-297	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Pentachlorophenol

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG0508009-4	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	05/21/05	06/02/05	KWG0508009	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	77	35-133	06/02/05	Acceptable

Comments:

00035

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Arrowhead Engineering
Project: St. Regis Paper Co Site-2005 Annual GW Sampling/226-00-297
Sample Matrix: Water

Service Request: K0500276

Surrogate Recovery Summary
Pentachlorophenol

Extraction Method: METHOD
Analysis Method: 8151M

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1
GW-0184	K0500276-001	83
GW-0185	K0500276-002	88
GW-0186	K0500276-003	78
GW-0187	K0500276-004	52 D
GW-0182	K0500276-005	104 D
GW-0188	K0500276-006	84
GW-0179	K0500276-007	86
GW-0177	K0500276-008	88
GW-0178	K0500276-009	88
GW-0155	K0500276-010	94
GW-0162	K0500276-011	89
GW-0163	K0500276-012	80
GW-0164	K0500276-013	77
GW-0180	K0500276-014	72
GW-0183	K0500276-015	82 D
GW-0181	K0500276-016	81
GW-0165	K0500276-017	76
GW-0166	K0500276-018	76
GW-0167	K0500276-019	86
GW-0168	K0500276-020	83
Method Blank	KWG0508009-4	77
GW-0184MS	KWG0508009-1	82
GW-0184DMS	KWG0508009-2	86
Lab Control Sample	KWG0508009-3	78

Surrogate Recovery Control Limits (%)

Sur1 = 4-Bromo-2,6-dichlorophenol 35-133

Results flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.

00036

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Arrowhead Engineering	**Service Request:**	K0500276
Project:	St. Regis Paper Co Site-2005 Annual GW Sampling/226-00-297	**Date Extracted:**	05/21/2005
ple Matrix:	Water	**Date Analyzed:**	06/02/2005

Matrix Spike/Duplicate Matrix Spike Summary
Pentachlorophenol

Sample Name:	GW-0184	**Units:**	ug/L
Lab Code:	K0500276-001	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M	**Extraction Lot:**	KWG0508009

Analyte Name	Sample Result	GW-0184MS KWG0508009-1 Matrix Spike			GW-0184DMS KWG0508009-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Pentachlorophenol	46	52.6	10.0	69 #	55.1	10.0	94 #	34-124	5	30

ts flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00037

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Arrowhead Engineering	**Service Request:**	K0500276
Project:	St. Regis Paper Co Site-2005 Annual GW Sampling/226-00-297	**Date Extracted:**	05/21/2005
Sample Matrix:	Water	**Date Analyzed:**	06/02/200

Lab Control Spike Summary
Pentachlorophenol

Extraction Method:	METHOD	**Units:**	ug/L
Analysis Method:	8151M	**Basis:**	NA
		Level:	Low
		Extraction Lot:	KWG0508009

	Lab Control Sample KWG0508009-3 Lab Control Spike			
Analyte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
Pentachlorophenol	8.73	10.0	87	44-116

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00038

Polynuclear Aromatic Hydrocarbons
EPA Method 8270C

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500276
Project:	St. Regis Paper Co Site-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/15/2005
Sample Matrix:	Water	**Date Received:**	05/17/20C

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0184	**Units:**	ug/L
Lab Code:	K0500276-001	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**1.8**		0.020	1	05/19/05	05/25/05	KWG0508045	
Acenaphthylene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Acenaphthene	**0.032**		0.020	1	05/19/05	05/25/05	KWG0508045	
Fluorene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Phenanthrene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Anthracene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Fluoranthene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Pyrene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Benz(a)anthracene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Chrysene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Benzo(b)fluoranthene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Benzo(k)fluoranthene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Benzo(a)pyrene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Dibenz(a,h)anthracene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Benzo(g,h,i)perylene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Quinoline	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	83	37-107	05/25/05	Acceptable
Fluoranthene-d10	114	18-137	05/25/05	Acceptable
Terphenyl-d14	118	18-153	05/25/05	Acceptable

Comments:

00040

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500276
Project:	St. Regis Paper Co Site-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/15/2005
Sample Matrix:	Water	**Date Received:**	05/17/2005

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0185	**Units:**	ug/L
Lab Code:	K0500276-002	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**1.7**		0.020	1	05/19/05	05/25/05	KWG0508045	
Acenaphthylene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Acenaphthene	**0.030**		0.020	1	05/19/05	05/25/05	KWG0508045	
Fluorene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Phenanthrene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Anthracene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Fluoranthene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Pyrene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Benz(a)anthracene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Chrysene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Benzo(b)fluoranthene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Benzo(k)fluoranthene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Benzo(a)pyrene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Dibenz(a,h)anthracene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Benzo(g,h,i)perylene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Quinoline	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	77	37-107	05/25/05	Acceptable
Fluoranthene-d10	109	18-137	05/25/05	Acceptable
Terphenyl-d14	111	18-153	05/25/05	Acceptable

Comments:

00041

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500276
Project:	St. Regis Paper Co Site-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/15/2005
Sample Matrix:	Water	**Date Received:**	05/17/200

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0186	**Units:**	ug/L
Lab Code:	K0500276-003	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.022	1	05/19/05	05/25/05	KWG0508045	
Acenaphthylene	ND	U	0.022	1	05/19/05	05/25/05	KWG0508045	
Acenaphthene	ND	U	0.022	1	05/19/05	05/25/05	KWG0508045	
Fluorene	ND	U	0.022	1	05/19/05	05/25/05	KWG0508045	
Phenanthrene	ND	U	0.022	1	05/19/05	05/25/05	KWG0508045	
Anthracene	ND	U	0.022	1	05/19/05	05/25/05	KWG0508045	
Fluoranthene	ND	U	0.022	1	05/19/05	05/25/05	KWG0508045	
Pyrene	ND	U	0.022	1	05/19/05	05/25/05	KWG0508045	
Benz(a)anthracene	ND	U	0.022	1	05/19/05	05/25/05	KWG0508045	
Chrysene	ND	U	0.022	1	05/19/05	05/25/05	KWG0508045	
Benzo(b)fluoranthene	ND	U	0.022	1	05/19/05	05/25/05	KWG0508045	
Benzo(k)fluoranthene	ND	U	0.022	1	05/19/05	05/25/05	KWG0508045	
Benzo(a)pyrene	ND	U	0.022	1	05/19/05	05/25/05	KWG0508045	
Indeno(1,2,3-cd)pyrene	ND	U	0.022	1	05/19/05	05/25/05	KWG0508045	
Dibenz(a,h)anthracene	ND	U	0.022	1	05/19/05	05/25/05	KWG0508045	
Benzo(g,h,i)perylene	ND	U	0.022	1	05/19/05	05/25/05	KWG0508045	
Quinoline	ND	U	0.022	1	05/19/05	05/25/05	KWG0508045	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	102	37-107	05/25/05	Acceptable
Fluoranthene-d10	115	18-137	05/25/05	Acceptable
Terphenyl-d14	113	18-153	05/25/05	Acceptable

Comments:

00042

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500276
Project:	St. Regis Paper Co Site-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/14/2005
ple Matrix:	Water	**Date Received:**	05/17/2005

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0187	**Units:**	ug/L
Lab Code:	K0500276-004	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**1.7**		0.020	1	05/19/05	05/25/05	KWG0508045	
Acenaphthylene	**0.16**		0.020	1	05/19/05	05/25/05	KWG0508045	
Acenaphthene	**5.6**		0.020	1	05/19/05	05/25/05	KWG0508045	
Fluorene	**6.4**		0.020	1	05/19/05	05/25/05	KWG0508045	
Phenanthrene	**1.6**		0.020	1	05/19/05	05/25/05	KWG0508045	
Anthracene	**0.29**		0.020	1	05/19/05	05/25/05	KWG0508045	
Fluoranthene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Pyrene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Benz(a)anthracene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Chrysene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Benzo(b)fluoranthene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Benzo(k)fluoranthene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
zo(a)pyrene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Dibenz(a,h)anthracene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Benzo(g,h,i)perylene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Quinoline	**0.085**		0.020	1	05/19/05	05/25/05	KWG0508045	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	104	37-107	05/25/05	Acceptable
Fluoranthene-d10	107	18-137	05/25/05	Acceptable
Terphenyl-d14	109	18-153	05/25/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500276
Project:	St. Regis Paper Co Site-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/14/2005
Sample Matrix:	Water	**Date Received:**	05/17/200

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0182	**Units:**	ug/L
Lab Code:	K0500276-005	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Acenaphthylene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Acenaphthene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Fluorene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Phenanthrene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Anthracene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Fluoranthene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Pyrene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Benz(a)anthracene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Chrysene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Benzo(b)fluoranthene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Benzo(k)fluoranthene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Benzo(a)pyrene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Dibenz(a,h)anthracene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Benzo(g,h,i)perylene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Quinoline	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	104	37-107	05/25/05	Acceptable
Fluoranthene-d10	113	18-137	05/25/05	Acceptable
Terphenyl-d14	114	18-153	05/25/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500276
Project:	St. Regis Paper Co Site-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/14/2005
Matrix:	Water	**Date Received:**	05/17/2005

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0188	**Units:**	ug/L
Lab Code:	K0500276-006	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	Ui	0.18	1	05/19/05	05/25/05	KWG0508045	
Acenaphthylene	ND	U	0.023	1	05/19/05	05/25/05	KWG0508045	
Acenaphthene	ND	U	0.023	1	05/19/05	05/25/05	KWG0508045	
Fluorene	ND	U	0.023	1	05/19/05	05/25/05	KWG0508045	
Phenanthrene	ND	U	0.023	1	05/19/05	05/25/05	KWG0508045	
Anthracene	ND	U	0.023	1	05/19/05	05/25/05	KWG0508045	
Fluoranthene	ND	U	0.023	1	05/19/05	05/25/05	KWG0508045	
Pyrene	ND	U	0.023	1	05/19/05	05/25/05	KWG0508045	
Benz(a)anthracene	ND	U	0.023	1	05/19/05	05/25/05	KWG0508045	
Chrysene	ND	U	0.023	1	05/19/05	05/25/05	KWG0508045	
Benzo(b)fluoranthene	ND	U	0.023	1	05/19/05	05/25/05	KWG0508045	
Benzo(k)fluoranthene	ND	U	0.023	1	05/19/05	05/25/05	KWG0508045	
Benzo(a)pyrene	ND	U	0.023	1	05/19/05	05/25/05	KWG0508045	
Indeno(1,2,3-cd)pyrene	ND	U	0.023	1	05/19/05	05/25/05	KWG0508045	
Dibenz(a,h)anthracene	ND	U	0.023	1	05/19/05	05/25/05	KWG0508045	
Benzo(g,h,i)perylene	ND	U	0.023	1	05/19/05	05/25/05	KWG0508045	
Quinoline	ND	U	0.023	1	05/19/05	05/25/05	KWG0508045	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	107	37-107	05/25/05	Acceptable
Fluoranthene-d10	114	18-137	05/25/05	Acceptable
Terphenyl-d14	108	18-153	05/25/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500276
Project:	St. Regis Paper Co Site-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/14/2005
Sample Matrix:	Water	**Date Received:**	05/17/200

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0179	**Units:**	ug/L
Lab Code:	K0500276-007	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.021	1	05/19/05	05/25/05	KWG0508045	
Acenaphthylene	ND	U	0.021	1	05/19/05	05/25/05	KWG0508045	
Acenaphthene	ND	U	0.021	1	05/19/05	05/25/05	KWG0508045	
Fluorene	ND	U	0.021	1	05/19/05	05/25/05	KWG0508045	
Phenanthrene	ND	U	0.021	1	05/19/05	05/25/05	KWG0508045	
Anthracene	ND	U	0.021	1	05/19/05	05/25/05	KWG0508045	
Fluoranthene	ND	U	0.021	1	05/19/05	05/25/05	KWG0508045	
Pyrene	ND	U	0.021	1	05/19/05	05/25/05	KWG0508045	
Benz(a)anthracene	ND	U	0.021	1	05/19/05	05/25/05	KWG0508045	
Chrysene	ND	U	0.021	1	05/19/05	05/25/05	KWG0508045	
Benzo(b)fluoranthene	ND	U	0.021	1	05/19/05	05/25/05	KWG0508045	
Benzo(k)fluoranthene	ND	U	0.021	1	05/19/05	05/25/05	KWG0508045	
Benzo(a)pyrene	ND	U	0.021	1	05/19/05	05/25/05	KWG0508045	
Indeno(1,2,3-cd)pyrene	ND	U	0.021	1	05/19/05	05/25/05	KWG0508045	
Dibenz(a,h)anthracene	ND	U	0.021	1	05/19/05	05/25/05	KWG0508045	
Benzo(g,h,i)perylene	ND	U	0.021	1	05/19/05	05/25/05	KWG0508045	
Quinoline	ND	U	0.021	1	05/19/05	05/25/05	KWG0508045	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	102	37-107	05/25/05	Acceptable
Fluoranthene-d10	113	18-137	05/25/05	Acceptable
Terphenyl-d14	114	18-153	05/25/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500276
Project:	St. Regis Paper Co Site-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/14/2005
Sample Matrix:	Water	**Date Received:**	05/17/2005

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0177	**Units:**	ug/L
Lab Code:	K0500276-008	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.021	1	05/19/05	05/25/05	KWG0508045	
Acenaphthylene	ND	U	0.021	1	05/19/05	05/25/05	KWG0508045	
Acenaphthene	ND	U	0.021	1	05/19/05	05/25/05	KWG0508045	
Fluorene	ND	U	0.021	1	05/19/05	05/25/05	KWG0508045	
Phenanthrene	ND	U	0.021	1	05/19/05	05/25/05	KWG0508045	
Anthracene	ND	U	0.021	1	05/19/05	05/25/05	KWG0508045	
Fluoranthene	ND	U	0.021	1	05/19/05	05/25/05	KWG0508045	
Pyrene	ND	U	0.021	1	05/19/05	05/25/05	KWG0508045	
Benz(a)anthracene	ND	U	0.021	1	05/19/05	05/25/05	KWG0508045	
Chrysene	ND	U	0.021	1	05/19/05	05/25/05	KWG0508045	
Benzo(b)fluoranthene	ND	U	0.021	1	05/19/05	05/25/05	KWG0508045	
Benzo(k)fluoranthene	ND	U	0.021	1	05/19/05	05/25/05	KWG0508045	
Benzo(a)pyrene	ND	U	0.021	1	05/19/05	05/25/05	KWG0508045	
Indeno(1,2,3-cd)pyrene	ND	U	0.021	1	05/19/05	05/25/05	KWG0508045	
Dibenz(a,h)anthracene	ND	U	0.021	1	05/19/05	05/25/05	KWG0508045	
Benzo(g,h,i)perylene	ND	U	0.021	1	05/19/05	05/25/05	KWG0508045	
Quinoline	ND	U	0.021	1	05/19/05	05/25/05	KWG0508045	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	101	37-107	05/25/05	Acceptable
Fluoranthene-d10	113	18-137	05/25/05	Acceptable
Terphenyl-d14	113	18-153	05/25/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500276
Project:	St. Regis Paper Co Site-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/14/2005
Sample Matrix:	Water	**Date Received:**	05/17/20

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0178	**Units:**	ug/L
Lab Code:	K0500276-009	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.021	1	05/19/05	05/25/05	KWG0508045	
Acenaphthylene	ND	U	0.021	1	05/19/05	05/25/05	KWG0508045	
Acenaphthene	ND	U	0.021	1	05/19/05	05/25/05	KWG0508045	
Fluorene	ND	U	0.021	1	05/19/05	05/25/05	KWG0508045	
Phenanthrene	ND	U	0.021	1	05/19/05	05/25/05	KWG0508045	
Anthracene	ND	U	0.021	1	05/19/05	05/25/05	KWG0508045	
Fluoranthene	ND	U	0.021	1	05/19/05	05/25/05	KWG0508045	
Pyrene	ND	U	0.021	1	05/19/05	05/25/05	KWG0508045	
Benz(a)anthracene	ND	U	0.021	1	05/19/05	05/25/05	KWG0508045	
Chrysene	ND	U	0.021	1	05/19/05	05/25/05	KWG0508045	
Benzo(b)fluoranthene	ND	U	0.021	1	05/19/05	05/25/05	KWG0508045	
Benzo(k)fluoranthene	ND	U	0.021	1	05/19/05	05/25/05	KWG0508045	
Benzo(a)pyrene	ND	U	0.021	1	05/19/05	05/25/05	KWG0508045	
Indeno(1,2,3-cd)pyrene	ND	U	0.021	1	05/19/05	05/25/05	KWG0508045	
Dibenz(a,h)anthracene	ND	U	0.021	1	05/19/05	05/25/05	KWG0508045	
Benzo(g,h,i)perylene	ND	U	0.021	1	05/19/05	05/25/05	KWG0508045	
Quinoline	ND	U	0.021	1	05/19/05	05/25/05	KWG0508045	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	102	37-107	05/25/05	Acceptable
Fluoranthene-d10	113	18-137	05/25/05	Acceptable
Terphenyl-d14	114	18-153	05/25/05	Acceptable

Comments:

00048

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500276
Project:	St. Regis Paper Co Site-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/14/2005
Sample Matrix:	Water	**Date Received:**	05/17/2005

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0155	**Units:**	ug/L
Lab Code:	K0500276-010	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Acenaphthylene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Acenaphthene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Fluorene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Phenanthrene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Anthracene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Fluoranthene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Pyrene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Benz(a)anthracene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Chrysene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Benzo(b)fluoranthene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Benzo(k)fluoranthene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Benzo(a)pyrene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Indeno(1,2,3-cd)pyrene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Dibenz(a,h)anthracene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Benzo(g,h,i)perylene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Quinoline	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	99	37-107	05/26/05	Acceptable
Fluoranthene-d10	111	18-137	05/26/05	Acceptable
Terphenyl-d14	112	18-153	05/26/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500276
Project:	St. Regis Paper Co Site-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/14/2005
Sample Matrix:	Water	**Date Received:**	05/17/200

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0162	**Units:**	ug/L
Lab Code:	K0500276-011	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.022	1	05/19/05	05/26/05	KWG0508045	
Acenaphthylene	ND	U	0.022	1	05/19/05	05/26/05	KWG0508045	
Acenaphthene	ND	U	0.022	1	05/19/05	05/26/05	KWG0508045	
Fluorene	ND	U	0.022	1	05/19/05	05/26/05	KWG0508045	
Phenanthrene	ND	U	0.022	1	05/19/05	05/26/05	KWG0508045	
Anthracene	ND	U	0.022	1	05/19/05	05/26/05	KWG0508045	
Fluoranthene	ND	U	0.022	1	05/19/05	05/26/05	KWG0508045	
Pyrene	ND	U	0.022	1	05/19/05	05/26/05	KWG0508045	
Benz(a)anthracene	ND	U	0.022	1	05/19/05	05/26/05	KWG0508045	
Chrysene	ND	U	0.022	1	05/19/05	05/26/05	KWG0508045	
Benzo(b)fluoranthene	ND	U	0.022	1	05/19/05	05/26/05	KWG0508045	
Benzo(k)fluoranthene	ND	U	0.022	1	05/19/05	05/26/05	KWG0508045	
Benzo(a)pyrene	ND	U	0.022	1	05/19/05	05/26/05	KWG0508045	
Indeno(1,2,3-cd)pyrene	ND	U	0.022	1	05/19/05	05/26/05	KWG0508045	
Dibenz(a,h)anthracene	ND	U	0.022	1	05/19/05	05/26/05	KWG0508045	
Benzo(g,h,i)perylene	ND	U	0.022	1	05/19/05	05/26/05	KWG0508045	
Quinoline	ND	U	0.022	1	05/19/05	05/26/05	KWG0508045	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	104	37-107	05/26/05	Acceptable
Fluoranthene-d10	114	18-137	05/26/05	Acceptable
Terphenyl-d14	108	18-153	05/26/05	Acceptable

Comments:

00050

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500276
Project:	St. Regis Paper Co Site-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/14/2005
Sample Matrix:	Water	**Date Received:**	05/17/2005

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0163	**Units:**	ug/L
Lab Code:	K0500276-012	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Acenaphthylene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Acenaphthene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Fluorene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Phenanthrene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Anthracene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Fluoranthene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Pyrene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Benz(a)anthracene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Chrysene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Benzo(b)fluoranthene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Benzo(k)fluoranthene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Benzo(a)pyrene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Indeno(1,2,3-cd)pyrene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Dibenz(a,h)anthracene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Benzo(g,h,i)perylene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Quinoline	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	98	37-107	05/26/05	Acceptable
Fluoranthene-d10	107	18-137	05/26/05	Acceptable
Terphenyl-d14	111	18-153	05/26/05	Acceptable

Comments:

00051

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500276
Project:	St. Regis Paper Co Site-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/14/2005
Sample Matrix:	Water	**Date Received:**	05/17/20

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0164	**Units:**	ug/L
Lab Code:	K0500276-013	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Acenaphthylene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Acenaphthene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Fluorene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Phenanthrene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Anthracene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Fluoranthene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Pyrene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Benz(a)anthracene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Chrysene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Benzo(b)fluoranthene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Benzo(k)fluoranthene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Benzo(a)pyrene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Indeno(1,2,3-cd)pyrene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Dibenz(a,h)anthracene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Benzo(g,h,i)perylene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Quinoline	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	97	37-107	05/26/05	Acceptable
Fluoranthene-d10	110	18-137	05/26/05	Acceptable
Terphenyl-d14	109	18-153	05/26/05	Acceptable

Comments:

00052

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500276
Project:	St. Regis Paper Co Site-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/15/2005
ple Matrix:	Water	**Date Received:**	05/17/2005

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0180	**Units:**	ug/L
Lab Code:	K0500276-014	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**200**	D	2.0	100	05/19/05	05/27/05	KWG0508045	
Acenaphthylene	**0.095**		0.020	1	05/19/05	05/26/05	KWG0508045	
Acenaphthene	**6.3**		0.020	1	05/19/05	05/26/05	KWG0508045	
Fluorene	**1.2**		0.020	1	05/19/05	05/26/05	KWG0508045	
Phenanthrene	**0.022**		0.020	1	05/19/05	05/26/05	KWG0508045	
Anthracene	**0.29**		0.020	1	05/19/05	05/26/05	KWG0508045	
Fluoranthene	**0.022**		0.020	1	05/19/05	05/26/05	KWG0508045	
Pyrene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Benz(a)anthracene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Chrysene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Benzo(b)fluoranthene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
zo(k)fluoranthene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
zo(a)pyrene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Dibenz(a,h)anthracene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Benzo(g,h,i)perylene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Quinoline	**0.087**		0.020	1	05/19/05	05/26/05	KWG0508045	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	56	37-107	05/26/05	Acceptable
Fluoranthene-d10	94	18-137	05/26/05	Acceptable
Terphenyl-d14	101	18-153	05/26/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500276
Project:	St. Regis Paper Co Site-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/15/2005
Sample Matrix:	Water	**Date Received:**	05/17/200

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0183	**Units:**	ug/L
Lab Code:	K0500276-015	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**0.64**		0.021	1	05/19/05	05/26/05	KWG0508045	
Acenaphthylene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Acenaphthene	**0.072**		0.021	1	05/19/05	05/26/05	KWG0508045	
Fluorene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Phenanthrene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Anthracene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Fluoranthene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Pyrene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Benz(a)anthracene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Chrysene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Benzo(b)fluoranthene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Benzo(k)fluoranthene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Benzo(a)pyrene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Indeno(1,2,3-cd)pyrene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Dibenz(a,h)anthracene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Benzo(g,h,i)perylene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Quinoline	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	62	37-107	05/26/05	Acceptable
Fluoranthene-d10	102	18-137	05/26/05	Acceptable
Terphenyl-d14	109	18-153	05/26/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500276
Project:	St. Regis Paper Co Site-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/15/2005
Sample Matrix:	Water	**Date Received:**	05/17/2005

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0181	**Units:**	ug/L
Lab Code:	K0500276-016	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**16**	D	0.10	5	05/19/05	05/27/05	KWG0508045	
Acenaphthylene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Acenaphthene	**0.038**		0.020	1	05/19/05	05/26/05	KWG0508045	
Fluorene	**0.38**		0.020	1	05/19/05	05/26/05	KWG0508045	
Phenanthrene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Anthracene	**0.056**		0.020	1	05/19/05	05/26/05	KWG0508045	
Fluoranthene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Pyrene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Benz(a)anthracene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Chrysene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Benzo(b)fluoranthene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Benzo(k)fluoranthene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Benzo(a)pyrene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Dibenz(a,h)anthracene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Benzo(g,h,i)perylene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Quinoline	**0.037**		0.020	1	05/19/05	05/26/05	KWG0508045	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	75	37-107	05/26/05	Acceptable
Fluoranthene-d10	107	18-137	05/26/05	Acceptable
Terphenyl-d14	113	18-153	05/26/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500276
Project:	St. Regis Paper Co Site-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/15/2005
Sample Matrix:	Water	**Date Received:**	05/17/2005

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0166	**Units:**	ug/L
Lab Code:	K0500276-018	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Acenaphthylene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Acenaphthene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Fluorene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Phenanthrene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Anthracene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Fluoranthene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Pyrene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Benz(a)anthracene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Chrysene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Benzo(b)fluoranthene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Benzo(k)fluoranthene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Benzo(a)pyrene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Dibenz(a,h)anthracene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Benzo(g,h,i)perylene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Quinoline	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	104	37-107	05/26/05	Acceptable
Fluoranthene-d10	113	18-137	05/26/05	Acceptable
Terphenyl-d14	121	18-153	05/26/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500276
Project:	St. Regis Paper Co Site-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/15/2005
Sample Matrix:	Water	**Date Received:**	05/17/20(

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0165	**Units:**	ug/L
Lab Code:	K0500276-017	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**6.1**		0.020	1	05/19/05	05/26/05	KWG0508045	
Acenaphthylene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Acenaphthene	**0.79**		0.020	1	05/19/05	05/26/05	KWG0508045	
Fluorene	**0.048**		0.020	1	05/19/05	05/26/05	KWG0508045	
Phenanthrene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Anthracene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Fluoranthene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Pyrene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Benz(a)anthracene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Chrysene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Benzo(b)fluoranthene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Benzo(k)fluoranthene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Benzo(a)pyrene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Dibenz(a,h)anthracene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Benzo(g,h,i)perylene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Quinoline	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	85	37-107	05/26/05	Acceptable
Fluoranthene-d10	109	18-137	05/26/05	Acceptable
Terphenyl-d14	116	18-153	05/26/05	Acceptable

Comments:

00056

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500276
Project:	St. Regis Paper Co Site-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/15/2005
Sample Matrix:	Water	**Date Received:**	05/17/200

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0167	**Units:**	ug/L
Lab Code:	K0500276-019	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Acenaphthylene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Acenaphthene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Fluorene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Phenanthrene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Anthracene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Fluoranthene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Pyrene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Benz(a)anthracene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Chrysene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Benzo(b)fluoranthene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Benzo(k)fluoranthene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Benzo(a)pyrene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Dibenz(a,h)anthracene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Benzo(g,h,i)perylene	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	
Quinoline	ND	U	0.020	1	05/19/05	05/26/05	KWG0508045	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	92	37-107	05/26/05	Acceptable
Fluoranthene-d10	104	18-137	05/26/05	Acceptable
Terphenyl-d14	111	18-153	05/26/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500276
Project:	St. Regis Paper Co Site-2005 Annual GW Sampling/226-00-297	**Date Collected:**	05/15/2005
ple Matrix:	Water	**Date Received:**	05/17/2005

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0168	**Units:**	ug/L
Lab Code:	K0500276-020	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Acenaphthylene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Acenaphthene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Fluorene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Phenanthrene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Anthracene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Fluoranthene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Pyrene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Benz(a)anthracene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Chrysene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Benzo(b)fluoranthene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
zo(k)fluoranthene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
zo(a)pyrene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Indeno(1,2,3-cd)pyrene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Dibenz(a,h)anthracene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Benzo(g,h,i)perylene	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	
Quinoline	ND	U	0.021	1	05/19/05	05/26/05	KWG0508045	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	96	37-107	05/26/05	Acceptable
Fluoranthene-d10	107	18-137	05/26/05	Acceptable
Terphenyl-d14	115	18-153	05/26/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500276
Project:	St. Regis Paper Co Site-2005 Annual GW Sampling/226-00-297	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Polynuclear Aromatic Hydrocarbons

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG0508045-6	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Acenaphthylene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Acenaphthene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Fluorene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Phenanthrene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Anthracene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Fluoranthene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Pyrene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Benz(a)anthracene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Chrysene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Benzo(b)fluoranthene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Benzo(k)fluoranthene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Benzo(a)pyrene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Dibenz(a,h)anthracene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Benzo(g,h,i)perylene	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	
Quinoline	ND	U	0.020	1	05/19/05	05/25/05	KWG0508045	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	104	37-107	05/25/05	Acceptable
Fluoranthene-d10	123	18-137	05/25/05	Acceptable
Terphenyl-d14	123	18-153	05/25/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Arrowhead Engineering
Project: St. Regis Paper Co Site-2005 Annual GW Sampling/226-00-297
Sample Matrix: Water

Service Request: K0500276

Surrogate Recovery Summary
Polynuclear Aromatic Hydrocarbons

Extraction Method: EPA 3520C
Analysis Method: 8270C SIM

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1	Sur2	Sur3
GW-0184	K0500276-001	83	114	118
GW-0185	K0500276-002	77	109	111
GW-0186	K0500276-003	102	115	113
GW-0187	K0500276-004	104	107	109
GW-0182	K0500276-005	104	113	114
GW-0188	K0500276-006	107	114	108
GW-0179	K0500276-007	102	113	114
GW-0177	K0500276-008	101	113	113
GW-0178	K0500276-009	102	113	114
GW-0155	K0500276-010	99	111	112
GW-0162	K0500276-011	104	114	108
GW-0163	K0500276-012	98	107	111
GW-0164	K0500276-013	97	110	109
GW-0180	K0500276-014	56	94	101
[illegible]-0183	K0500276-015	62	102	109
[illegible]0181	K0500276-016	75	107	113
GW-0165	K0500276-017	85	109	116
GW-0166	K0500276-018	104	113	121
GW-0167	K0500276-019	92	104	111
GW-0168	K0500276-020	96	107	115
Method Blank	KWG0508045-6	104	123	123
GW-0184MS	KWG0508045-1	77	112	106
GW-0184DMS	KWG0508045-2	73	101	98
GW-0177MS	KWG0508045-3	102	112	104
GW-0177DMS	KWG0508045-4	101	111	103
Lab Control Sample	KWG0508045-5	98	113	102

Surrogate Recovery Control Limits (%)

Sur1 =	Fluorene-d10	37-107
Sur2 =	Fluoranthene-d10	18-137
Sur3 =	Terphenyl-d14	18-153

Results flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.

00061

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Arrowhead Engineering	**Service Request:**	K0500276
Project:	St. Regis Paper Co Site-2005 Annual GW Sampling/226-00-297	**Date Extracted:**	05/19/2005
Sample Matrix:	Water	**Date Analyzed:**	05/25/20

Matrix Spike/Duplicate Matrix Spike Summary
Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0184	**Units:**	ug/L
Lab Code:	K0500276-001	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM	**Extraction Lot:**	KWG0508045

Analyte Name	Sample Result	GW-0184MS KWG0508045-1 Matrix Spike			GW-0184DMS KWG0508045-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Naphthalene	1.8	3.84	2.45	85	3.76	2.58	77	27-109	2	30
Acenaphthylene	ND	1.73	2.45	71	1.73	2.58	67	30-118	0	30
Acenaphthene	0.032	1.69	2.45	68	1.67	2.58	64	28-115	1	30
Fluorene	ND	1.77	2.45	72	1.79	2.58	70	28-122	1	30
Phenanthrene	ND	2.25	2.45	92	2.16	2.58	84	24-129	4	30
Anthracene	ND	2.25	2.45	92	2.13	2.58	83	26-118	5	30
Fluoranthene	ND	2.39	2.45	97	2.30	2.58	89	18-133	4	30
Pyrene	ND	2.38	2.45	97	2.30	2.58	89	19-133	3	30
Benz(a)anthracene	ND	2.26	2.45	92	2.19	2.58	85	19-136	3	
Chrysene	ND	2.27	2.45	93	2.21	2.58	86	22-129	2	
Benzo(b)fluoranthene	ND	2.43	2.45	99	2.27	2.58	88	19-141	7	30
Benzo(k)fluoranthene	ND	2.26	2.45	92	2.28	2.58	88	19-138	1	30
Benzo(a)pyrene	ND	2.32	2.45	95	2.22	2.58	86	10-142	4	30
Indeno(1,2,3-cd)pyrene	ND	2.36	2.45	96	2.29	2.58	89	19-151	3	30
Dibenz(a,h)anthracene	ND	2.33	2.45	95	2.26	2.58	88	16-146	3	30
Benzo(g,h,i)perylene	ND	2.36	2.45	96	2.30	2.58	89	22-134	2	30
Quinoline	ND	2.87	2.45	117	2.97	2.58	115	70-130	4	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00062

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Arrowhead Engineering	**Service Request:**	K0500276
Project:	St. Regis Paper Co Site-2005 Annual GW Sampling/226-00-297	**Date Extracted:**	05/19/2005
Matrix:	Water	**Date Analyzed:**	05/25/2005

Matrix Spike/Duplicate Matrix Spike Summary
Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0177	**Units:**	ug/L
Lab Code:	K0500276-008	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM	**Extraction Lot:**	KWG0508045

Analyte Name	Sample Result	GW-0177MS KWG0508045-3 Matrix Spike			GW-0177DMS KWG0508045-4 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Naphthalene	ND	2.07	2.55	81	2.03	2.50	81	27-109	2	30
Acenaphthylene	ND	2.34	2.55	92	2.27	2.50	91	30-118	3	30
Acenaphthene	ND	2.22	2.55	87	2.16	2.50	87	28-115	2	30
Fluorene	ND	2.43	2.55	95	2.32	2.50	93	28-122	5	30
Phenanthrene	ND	2.27	2.55	89	2.17	2.50	87	24-129	5	30
Anthracene	ND	2.06	2.55	81	2.01	2.50	80	26-118	3	30
Fluoranthene	ND	2.50	2.55	98	2.35	2.50	94	18-133	6	30
Pyrene	ND	2.40	2.55	94	2.28	2.50	91	19-133	5	30
[illegible](a)anthracene	ND	2.25	2.55	88	2.11	2.50	84	19-136	6	30
[illegible]sene	ND	2.30	2.55	90	2.15	2.50	86	22-129	7	30
Benzo(b)fluoranthene	ND	2.45	2.55	96	2.24	2.50	89	19-141	9	30
Benzo(k)fluoranthene	ND	2.27	2.55	89	2.15	2.50	86	19-138	6	30
Benzo(a)pyrene	ND	2.05	2.55	80	1.93	2.50	77	10-142	6	30
Indeno(1,2,3-cd)pyrene	ND	2.40	2.55	94	2.18	2.50	87	19-151	10	30
Dibenz(a,h)anthracene	ND	2.33	2.55	91	2.15	2.50	86	16-146	8	30
Benzo(g,h,i)perylene	ND	2.40	2.55	94	2.22	2.50	89	22-134	8	30
Quinoline	ND	2.78	2.55	109	2.70	2.50	108	70-130	3	30

[illegible] flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00063

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Arrowhead Engineering	**Service Request:**	K0500276
Project:	St. Regis Paper Co Site-2005 Annual GW Sampling/226-00-297	**Date Extracted:**	05/19/2005
Sample Matrix:	Water	**Date Analyzed:**	05/25/200

Lab Control Spike Summary
Polynuclear Aromatic Hydrocarbons

Extraction Method:	EPA 3520C	**Units:**	ug/L
Analysis Method:	8270C SIM	**Basis:**	NA
		Level:	Low
		Extraction Lot:	KWG0508045

	Lab Control Sample KWG0508045-5 Lab Control Spike			
Analyte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
Naphthalene	2.13	2.50	85	41-115
Acenaphthylene	2.36	2.50	94	44-122
Acenaphthene	2.25	2.50	90	41-123
Fluorene	2.43	2.50	97	44-128
Phenanthrene	2.29	2.50	92	45-127
Anthracene	2.28	2.50	91	40-126
Fluoranthene	2.54	2.50	102	41-141
Pyrene	2.48	2.50	99	34-152
Benz(a)anthracene	2.36	2.50	94	46-132
Chrysene	2.37	2.50	95	46-136
Benzo(b)fluoranthene	2.45	2.50	98	54-137
Benzo(k)fluoranthene	2.42	2.50	97	54-141
Benzo(a)pyrene	2.36	2.50	94	49-133
Indeno(1,2,3-cd)pyrene	2.48	2.50	99	41-141
Dibenz(a,h)anthracene	2.43	2.50	97	39-143
Benzo(g,h,i)perylene	2.46	2.50	99	46-133
Quinoline	2.75	2.50	110	70-130

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

317 South 13th Avenue P.O. Box 479 Kelso, Washington 98626 (360) 577-7222 ph (360) 636-1068 fax

Columbia Analytical Services INC.
An Employee - Owned Company

RECEIVED
JUN 20 2005
ARROWHEAD ENGINEERING CO.

June 8, 2005 Service Request No: K0500180

David Cosgriff
Arrowhead Engineering
P.O. Box 843
Libby, MT 59923

RE: St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297

Dear David:

Enclosed are the results of the sample(s) submitted to our laboratory on May 11, 2005. For your reference, these analyses have been assigned our service request number K0500180.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAC standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3358.

Respectfully submitted,

Columbia Analytical Services, Inc.

Lynda Huckestein
Client Services Manager

LH/jeb

NELAP Accredited ACIL Seal of Excellence Award

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
	The control limit criteria is not applicable. See case narrative.
	The analyte was found in the associated method blank at a level that is significant relative to the sample result.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a matrix interference.
X	See case narrative.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
B	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL has been elevated due to a matrix interference.
X	See case narrative.
*	The duplicate analysis not within control limits. See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results (25% for CLP Pesticides).
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a chromatographic interference.
X	See case narrative.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

Case Narrative

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	Arrowhead Engineering	**Service Request No.:**	K0500180
Project:	St. Regis Paper Company	**Date Received:**	5/11/2005
Sample Matrix:	Water		

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Matrix/Duplicate Matrix Spike (MS/DMS), and Laboratory Control Sample (LCS).

Sample Receipt

Thirty water samples were received for analysis at Columbia Analytical Services on 5/11/2005. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Pentachlorophenol by EPA Method 8151M

No anomalies associated with the analysis of these samples were observed.

Polynuclear Aromatic Hydrocarbons by EPA Method 8270C

Surrogate Exceptions:
The upper control criterion was exceeded for the following surrogate in samples GW-0193: Fluorene-d10. Several target analytes were detected in the sample. The error associated with an elevated recovery equates to a slightly high bias. The quality of the sample data is not significantly affected. No further corrective action was taken.

Elevated Method Reporting Limits:
The reporting limit is elevated for Naphthalene in GW-0192 because of matrix interferences. The chromatogram indicated the presence of non-target background components. The matrix interference prevented adequate resolution of the target compound at the reporting limit. The result is flagged to indicate the matrix interference.

Initial Calibration Exceptions:
The primary evaluation criterion was exceeded for the following analytes in Initial Calibration (ICAL) ID 4489: Quinoline, 2,4,6-Tribromophenol, Pentachlorophenol, Dibenz(a,h)anthracene. In accordance with CAS standard operating procedures, the alternative evaluation specified in the EPA method was performed using the mean Relative Standard Deviation (RSD) of all analytes in the calibration. The result of the mean RSD calculation was 9.7%. The calibration meets the alternative evaluation criteria. Note that CAS/Kelso policy does not allow the use of averaging if any analyte in the ICAL exceeds 30% RSD.
The primary evaluation criterion was exceeded for the following analytes in Initial Calibration (ICAL) ID CAL4424: Quinoline, Indeno(1,2,3-cd)pyrene, Dibenz(a,h)anthracene. In accordance with CAS standard operating procedures, the alternative evaluation specified in the EPA method was performed using the mean Relative Standard Deviation (RSD) of all analytes in the calibration. The result of the mean RSD calculation was 11.3%. The calibration meets the alternative evaluation criteria. Note that CAS/Kelso policy does not allow the use of averaging if any analyte in the ICAL exceeds 30% RSD.

Approved by LAT Date 6/9/05

Chain of Custody Documentation

K0500180

K0500172

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CHAIN OF CUSTODY RECORD/SAMPLE ANALYSIS REQUEST FORM

Facility Number/Project Name: 226-00-297 St. Regis Paper Co site - 2005 Annual GW Sampling

Lab Contact: Lynda Huckestein Office:

Ship to: Columbia Analytical Services
1317 South 13th Ave
Kelso, WA 98626

Lab Contact Phone: 360-577-7222

Samplers: D. Cosgriff, R. Cummings

Company Name: Arrowhead Engineering, Inc.

INTERNATIONAL PAPER

	Sample No.	Date	Time	Matrix	8270 SIM (PAH)	8270 PAH/PCP	8151 PCP				Extra Container	Archive	Remarks
6	GW-0147	5-9-05	A.M	GW	X						✓		
7	GW-0203	"	"	"		X					✓		Invoice & Rpt to:
8	GW-0174	5-7-05	A.m.	"			X				✓		Arrowhead Engineering Inc
8 9	GW-0174 MS	"	"	"			X				✓		D. Cosgriff
8 10	GW-0174 MSD	"	"	"			X				✓		P.O. Box 843
9 11	GW-0175	"	"	"			X				✓		Libby, MT 59923
10 12	GW-0176	"	"	"			X				✓		
11 13	GW-0169	5-8-05	"	"			X				✓		p. 406, 293-9387
11 14	GW-0169 MS	"	"	"			X				✓		
11 15	GW-0169 MSD	"	"	"			X				✓		
12 16	GW-0170	"	"	"			X				✓		
13 17	GW-0171	"	"	"			X				✓		
6 14	GW-0147	5-9-05	"	"			X				✓		
14 19	GW-0153	5-8-05	P.m.	"			X				✓		
15 6 20	GW-0148	5-7-05	A.m.	"			X				✓		
16 7 21	GW-0149	"	"	"			X				✓		
17 8 22	GW-0150	"	P.m.	"			X				✓		
18 9 23	GW-0151	"	"	"			X				✓		

Matrix Code: GW - Groundwater SL - Soil SD - Sediment SW - Surface water
OTHER - Please identify codes

Priority: ☒ Normal ☐ Rush Rush time period

Shipped via: ☒ FedEx/UPS ☐ Courier Airbill

Condition of Samples Upon Receipt:

Custody Seal Intact: ☐ Yes ☐ No ☐ None

Relinquished by: (Signature) Date/Time: 5-9-05 1700 hrs Received by: (Signature) Date/Time: 5/10/05 1000

Company: AEI Company:

Relinquished by: (Signature) Date/Time: Received by: (Signature) Date/Time:

Company: Company:

Distribution: White and Yellow Copies - Accompany Shipment; Pink Copy - Project File

K0500180
~~K0500172~~

E

CHAIN OF CUSTODY RECORD/SAMPLE ANALYSIS REQUEST FORM

00008

Facility Number/Project Name: 226-00-297 St. Regis Paper Co Site - 2005 Annual GW- Sampling

Lab Contact: Lynda Huckestein Office:

Ship to: Columbia Analytical Services
1317 South 13th Ave
Kelso, WA 98626

Lab Contact Phone: 360-577-7222

Samplers: D. Cosgriff, R. Cummings

Company Name: Arrowhead Eng., Inc

INTERNATIONAL PAPER

Sample No.	Date	Time	Matrix	8270 SIM	8151-Acf					Extra Container	Archive	Remarks
	5-7-05	A.M.	GW.									
GW-0174 8	"	"		X						✓		Invoice & Rpt to:
GW-0174 MS 8	"	"		X						✓		Arrowhead Eng. Inc
GW-0174 MSD 8	"	"		X						✓		David Cosgriff
GW-0175 9	"	"		X						✓		P.O. Box 843
GW-0176 10	"	"		X						✓		Libby, MT 59923
												ph. 406.293.9387

Matrix Code: GW - Groundwater SL - Soil SD - Sediment SW - Surface water
OTHER - Please identify codes

Priority: ☒ Normal ☐ Rush Rush time period

Shipped via: ☒ FedEx/UPS ☐ Courier / Airbill

Condition of Samples Upon Receipt:

Custody Seal Intact: ☐ Yes ☐ No ☐ None

Relinquished by: (Signature) Date/Time: 5-9-05 1700 hrs Received by: (Signature) CAS Date/Time: 5/10/05 1000
Company: AEI Company:

Relinquished by: (Signature) Date/Time: Received by: (Signature) Date/Time:
Company: Company:

Distribution: White and Yellow Copies - [illegible]pany Shipment; Pink Copy - Project File

K0500180

~~K0500172~~

CHAIN OF CUSTODY RECORD/SAMPLE ANALYSIS REQUEST FORM

C

00009

Facility Number/Project Name: 226-00-297 St. Regis Paper Co - 2005 Annual GW Sampling

Lab Contact: Lynda Huckestein Office:

Ship to: Columbia Analytical Services
1317 South 13th Ave
Kelso, WA 98626

Lab Contact Phone: 360-577-7222

Samplers: D. Cosgriff, R. Cummings

Company Name: Arrowhead Eng., Inc.

INTERNATIONAL PAPER

Sample No.		Date	Time	Matrix	Analyses Requested: 8270 SIM						Extra Container	Archive	Remarks
GW-0148	15	5-7-05	A.M.	GW	X						✓		
GW-0149	16	"	"	"	X						✓		
GW-0150	17	"	P.M.	"	X						✓		
GW-0151	18	"	"	"	X						✓		
GW-0153	14	5-8-05	P.M	GW	X						✓		

20 21 21 25 22 26 23 27 24 28 5/11/05

Matrix Code: GW - Groundwater SL - Soil SD - Sediment SW - Surface water
OTHER - Please identify codes

Priority: ☒ Normal ☐ Rush Rush time period

Shipped via: ☒ FedEx/UPS ☐ Courier Airbill

Condition of Samples Upon Receipt:

Custody Seal Intact: ☐ Yes ☐ No ☐ None

Relinquished by: [signature] (Signature) Date/Time: 5-9-05 1700 hrs Received by: [signature] CAS (Signature) Date/Time: 5/10/05 1600

Company: AEI Company:

Relinquished by: (Signature) Date/Time: Received by: (Signature) Date/Time:

Company: Company:

Distribution: White and Yellow Copies - Accompany Shipment; Pink Copy - Project File

K0500180
~~K0500172~~

CHAIN OF CUSTODY RECORD/SAMPLE ANALYSIS REQUEST FORM

Facility Number/Project Name: 226-00-297 St. Regis Paper Co. Site - 2005 Annual GW Sampling

Lab Contact: Lynda Huckestein Office:

Ship to: Columbia Analytical Services
1317 South 13th Ave
Kelso WA 98626

Lab Contact Phone: 360-577-7222

Samplers: D. Cosgroff, Randy Cummings

Company Name: Arrowhead Engineering, Inc.

INTERNATIONAL PAPER

Sample No.	Date	Time	Matrix	8270-SIm	8151 PCP					Extra Container	Archive	Remarks
GW-0154 19	5-8-05	P.M	GW	X	X					✓		
GW-0173 20	5-7-05	P.M.	GW	X	X					✓		Invoice & Rpt to:
GW-0152 21	"	"	"	X	X					✓		
GW-0172 22	"	"	"	X	X					✓		Arrowhead Eng. Inc
												David Cosgroff
												P.O. Box 843
												Libby, MT 59923
												ph. 406.293.9387

Matrix Code: GW - Groundwater SL - Soil SD - Sediment SW - Surface water
OTHER - Please identify codes

Priority: ☒ Normal ☐ Rush Rush time period

Shipped via: ☒ FedEx/UPS ☐ Courier Airbill

Condition of Samples Upon Receipt:

Custody Seal Intact: ☐ Yes ☐ No ☐ None

Relinquished by: (Signature) Date/Time: 5-9-2005 1700 hrs
Company: AEI

Received by: (Signature) CAS Date/Time: 5/10/05 1000
Company:

Relinquished by: (Signature) Date/Time:
Company:

Received by: (Signature) Date/Time:
Company:

Distribution: White and Yellow Copies - A[illegible]pany Shipment; Pink Copy - Project File

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K05 1180

CHAIN OF CUSTODY RECORD/SAMPLE ANALYSIS REQUEST FORM

00011

Facility Number/Project Name: 226-00-297 St. Regis Paper Co. Site - 2005 Annual GW Sampling

Lab Contact: Lynda Huckestein Office:

Ship to: Columbia Analytical Services
1317 South 13th Ave
Kelso, WA 98626

Lab Contact Phone: 360-577-7222

Samplers: D. Coggoff, R. Cummings

Company Name: Arrowhead Engineering, Inc

INTERNATIONAL PAPER

	Sample No.	Date	Time	Matrix	Analyses Requested: 8270 SIM						Extra Container	Archive	Remarks
11	GW-0169	5-8-05	A.M.	GW	X						✓		
11	GW-0169 MS	"	"	"	X						✓		Invoice & Rpt to:
11	GW-0169 MSD	"	"	"	X						✓		
12	GW-0170	"	"	"	X						✓		Arrowhead Eng, Inc
13	GW-0171	"	"	"	X						✓		David Coggoff
													P.O. Box 843
													Libby, MT 59923
													ph. 406.293.9387

Matrix Code: GW - Groundwater SL - Soil SD - Sediment SW - Surface water
OTHER - Please identify codes

Priority: ☒ Normal ☐ Rush Rush time period

Shipped via: ☒ FedEx/UPS ☐ Courier Airbill

Condition of Samples Upon Receipt:

Custody Seal Intact: ☐ Yes ☐ No ☐ None

Relinquished by: [signature] (Signature) Date/Time: 5-9-05 1700 hrs
Company:

Received by: [signature] CAS (Signature) Date/Time: 5/11/05 1000
Company:

Relinquished by: (Signature) Date/Time:
Company:

Received by: (Signature) Date/Time:
Company:

Distribution: White and Yellow Copies - Accompany Shipment; Pink Copy - Project File

K0500180

CHAIN OF CUSTODY RECORD/SAMPLE ANALYSIS REQUEST FORM

.00012

Facility Number/Project Name: 226-00-297 St Regis Paper Co. Site 2005 Annual GW Sampling

Lab Contact: Linda Hydrstrin Office:

Ship to: Columbia Analytical Serv.
1317 S. 13th Ave.
Kelso, Wa. 98626

Lab Contact Phone: 360-577-7222

Samplers: D. Cosgriff, R. Cummings

Company Name: Arrowhead Eng. Inc.

INTERNATIONAL PAPER

	Sample No.	Date	Time	Matrix	PAH 8270	PCP 8270	PAH 8270 SIM	PCP 8151			Extra Container	Archive	Remarks
23	GW-0193	5-8	PM	GW	X	X					1		
24	GW-0191	5-8	PM	GW	X	X					1		
25	GW-0192	5-8	PM	GW	X	X					1		Inv & Report To
26	GW-0190	5-8	PM	GW			X				1		David Cosgriff
27	GW-0190	5-8	PM	GW				X			1		Arrowhead Eng Inc.
28	GW-0189	5-8	PM	GW			X				1		P.O. Bx. 843
29	GW-0189	5-8	PM	GW				X			1		Libby, Mt 59923
													406-293-9387

Matrix Code: (GW) Groundwater SL - Soil SD - Sediment SW - Surface water
OTHER - Please identify codes

Priority: ☑ Normal ☐ Rush Rush time period

Shipped via: ☑ FedEx/UPS ☐ Courier Airbill

Condition of Samples Upon Receipt:

Custody Seal Intact: ☐ Yes ☐ No ☐ None

Relinquished by: (Signature) Date/Time: 1700 5-9-05 Received by: (Signature) Date/Time: 5/11/05 1000
Company: GEI Company:

Relinquished by: (Signature) Date/Time: Received by: (Signature) Date/Time:
Company: Company:

Distribution: White and Yellow Copies - [illegible]pany Shipment; Pink Copy - Project File

K0500 D

CHAIN OF CUSTODY RECORD/SAMPLE ANALYSIS REQUEST FORM

.00013

Facility Number/Project Name: 226-00-297 St. Regis Paper Co Site - 2005 Annual GW Sampling

Lab Contact: Lynda Huckestein Office:

Ship to: Columbia Analytical Services
1317 South 13th Ave
Kelso, WA 98626

Lab Contact Phone: 360-577-7222

Samplers: D. Cooper, R. Cummings

Company Name: Arrowhead Engineering, Inc

INTERNATIONAL PAPER

	Sample No.	Date	Time	Matrix	Analyses Requested: 8270 PAH/PCP						Extra Container	Archive	Remarks
28	GW-0197	5-8-05	p.m.	GW	X						✓		
28	GW-0197 MS	"	"	"	X						✓		Invoice & Rpt to:
28	GW-0197 MSD	"	"	"	X						✓		Arrowhead Eng. Inc
29	GW-0198	"	"	"	X						✓		P.O. Box 843
30	GW-0199	"	"	"	X						✓		Libby, MT 59923
													ph. 406.293.9357

Matrix Code: GW - Groundwater SL - Soil SD - Sediment SW - Surface water
OTHER - Please identify codes

Priority: ☒ Normal ☐ Rush Rush time period

Shipped via: ☒ FedEx/UPS ☐ Courier Airbill

Condition of Samples Upon Receipt:

Custody Seal Intact: ☐ Yes ☐ No ☐ None

Relinquished by: [signature] (Signature) Date/Time: 5-9-05 1700 hrs
Company: AEI

Received by: [signature] CMS (Signature) Date/Time: 5/11/05 1000
Company:

Relinquished by: (Signature) Date/Time:
Company:

Received by: (Signature) Date/Time:
Company:

Distribution: White and Yellow Copies - Accompany Shipment; Pink Copy - Project File

K0500180
Arrowhead Engineering

CHAIN OF CUSTODY RECORD/SAMPLE ANALYSIS REQUEST FORM

00014

Facility Number/Project Name: 226-00297 St. Regis Paper Co Site - 2005 Annual GW Sampling

Lab Contact: Lynda Huckestein Office:
Ship to: Columbia Analytical Services
1317 South 13th Ave
Kelso, WA 98626
Lab Contact Phone: 360. 577-7222

Samplers: D. Cosgriff, R. Cummings
Company Name: Arrowhead Engineering, Inc.

INTERNATIONAL PAPER

	Sample No.	Date	Time	Matrix	Analyses Requested: 8270 PAH/PCP						Extra Container	Archive	Remarks
1	GW-0194	5-8-05	P.M	GW	X						✓		
2	GW-0200	"	"	"	X						✓		Invoice & Rpt to:
3	GW-0202	5-9-05	A.M.	"	X						✓		Arrowhead Eng. Inc
4	GW-0204	"	"	"	X						✓		P.O. Box 843
5	GW-0201	5-8-05	P.M.	"	X						✓		Libby, MT 59923
													ph. 406. 293 9367

Matrix Code: GW - Groundwater SL - Soil SD - Sediment SW - Surface water
OTHER - Please identify codes

Priority: [X] Normal [ ] Rush Rush time period

Shipped via: [X] FedEx/UPS [ ] Courier Airbill

Condition of Samples Upon Receipt:

Custody Seal Intact: [ ] Yes [ ] No [ ] None

Relinquished by: (Signature) Date/Time: 5-9-05 1700 hrs Received by: (Signature) Date/Time: 5/10/05 1000
Company: AEI Company:
Relinquished by: (Signature) Date/Time: Received by: (Signature) Date/Time:
Company: Company:

Distribution: White and Yellow Copies ... mpany Shipment: Pink Copy - Project File

Columbia Analytical Services Inc.
Cooler Receipt and Preservation Form

PC Cynder

Project/Client ARROWHEAD Work Order K250 K0500180

Cooler received on 5/11/05 and opened on 5/11/05 by AP

1. Were custody seals on outside of coolers? FK Y N
   If yes, how many and where? 2F
2. Were custody seals intact? Y N
3. Were signature and date present on the custody seals? 6121330200625 Y N
4. Is the shipper's airbill available and filed? If no, record airbill number: 6121330200614 Y N
5. COC#

Temperature of cooler(s) upon receipt: (°C)	4.1	2.0	5.8	3.2
Temperature Blank: (°C)	2.3	1.8	N/P	4.2

Were samples hand delivered on the same day as collection? Y N

6. Were custody papers properly filled out (ink, signed, etc.)? Y N
7. Type of packing material present INSERT, ICE
8. **Did all bottles arrive in good condition (unbroken)?** Y N
9. Were all bottle labels complete (i.e analysis, preservation, etc.)? Y N
10. Did all bottle labels and tags agree with custody papers? Y N
11. **Were the correct types of bottles used for the tests indicated?** Y N
12. Were all of the preserved bottles received at the lab with the appropriate pH? Y N
    Were VOA vials checked for absence of air bubbles, and if present, noted below? Y N
14. Did the bottles originate from CAS/K or a branch laboratory? Y N
15. **Are CWA Microbiology samples received with >1/2 the 24hr. hold time remaining from collection?** Y N
16. Was C12/Res negative? Y N

Explain any discrepancies:

RESOLUTION:

Samples that required preservation or received out of temperature:

Sample ID	Reagent	Volume	Lot Number	Bottle Type	Rec'd out of Temperature	Initials

Columbia Analytical Services Inc.
Cooler Receipt and Preservation Form

PC LYNDA

Project/Client Arrowhead Work Order K250 K0500180

Cooler received on 5/10/05 and opened on 5/10/05 by FA/BW

1. Were custody seals on outside of coolers? (Y) N
   If yes, how many and where? 1 front
2. Were custody seals intact? (Y) N
3. Were signature and date present on the custody seals? (Y) N
4. Is the shipper's airbill available and filed? If no, record airbill number: See xtra sheet Y N
5. COC#

	A	B	C	D	E
Temperature of cooler(s) upon receipt: (°C)	-0.8	1.0	0.5	0.5	1.3
Temperature Blank: (°C)	1.2	0.8	1.0	3.2	1.2

Were samples hand delivered on the same day as collection? ~~Y~~ ~~N~~

6. Were custody papers properly filled out (ink, signed, etc.)? (Y) N
7. Type of packing material present foam inserts, ICE, baggies
8. **Did all bottles arrive in good condition (unbroken)?** (Y) N
9. Were all bottle labels complete (i.e analysis, preservation, etc.)? (Y) N
10. Did all bottle labels and tags agree with custody papers? (Y) N
11. **Were the correct types of bottles used for the tests indicated?** (Y) N
12. Were all of the preserved bottles received at the lab with the appropriate pH? (Y) N
13. Were VOA vials checked for absence of air bubbles, and if present, noted below? ~~Y~~
14. Did the bottles originate from CAS/K or a branch laboratory? (Y) N
15. **Are CWA Microbiology samples received with >1/2 the 24hr. hold time remaining from collection?** ~~Y~~ ~~N~~
16. Was C12/Res negative? Y N

Explain any discrepancies:

RESOLUTION:

Samples that required preservation or received out of temperature:

Sample ID	Reagent	Volume	Lot Number	Bottle Type	Rec'd out of Temperature	Initials

Pentachlorophenol
EPA Method 8151 Modified

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500180
Project:	St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297	**Date Collected:**	05/09/2005
Sample Matrix:	Water	**Date Received:**	05/11/2005

Pentachlorophenol

Sample Name:	GW-0147	**Units:**	ug/L
Lab Code:	K0500180-006	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	05/12/05	06/01/05	KWG0507580	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	106	35-133	06/01/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500180
Project:	St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297	**Date Collected:**	05/07/2005
Sample Matrix:	Water	**Date Received:**	05/11/2005

Pentachlorophenol

Sample Name:	GW-0174	**Units:**	ug/L
Lab Code:	K0500180-008	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	05/12/05	06/01/05	KWG0507580	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	114	35-133	06/01/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500180
Project:	St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297	**Date Collected:**	05/07/2005
Sample Matrix:	Water	**Date Received:**	05/11/2005

Pentachlorophenol

Sample Name:	GW-0175	**Units:**	ug/L
Lab Code:	K0500180-009	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	05/12/05	06/01/05	KWG0507580	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	106	35-133	06/01/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500180
Project:	St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297	**Date Collected:**	05/07/2005
Sample Matrix:	Water	**Date Received:**	05/11/2005

Pentachlorophenol

Sample Name:	GW-0176	**Units:**	ug/L
Lab Code:	K0500180-010	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	05/12/05	06/01/05	KWG0507580	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	105	35-133	06/01/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500180
Project:	St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297	**Date Collected:**	05/08/2005
Sample Matrix:	Water	**Date Received:**	05/11/2005

Pentachlorophenol

Sample Name:	GW-0169	**Units:**	ug/L
Lab Code:	K0500180-011	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	05/12/05	06/01/05	KWG0507580	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	112	35-133	06/01/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500180
Project:	St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297	**Date Collected:**	05/08/2005
Sample Matrix:	Water	**Date Received:**	05/11/2005

Pentachlorophenol

Sample Name:	GW-0170	**Units:**	ug/L
Lab Code:	K0500180-012	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	05/12/05	06/01/05	KWG0507580	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	123	35-133	06/01/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500180
Project:	St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297	**Date Collected:**	05/08/2005
Sample Matrix:	Water	**Date Received:**	05/11/2005

Pentachlorophenol

Sample Name:	GW-0171	**Units:**	ug/L
Lab Code:	K0500180-013	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	05/12/05	06/01/05	KWG0507580	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	100	35-133	06/01/05	Acceptable

Comments:

00024

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500180
Project:	St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297	**Date Collected:**	05/08/2005
ple Matrix:	Water	**Date Received:**	05/11/2005

Pentachlorophenol

Sample Name:	GW-0153	**Units:**	ug/L
Lab Code:	K0500180-014	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	05/12/05	06/01/05	KWG0507580	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	112	35-133	06/01/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500180
Project:	St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297	**Date Collected:**	05/07/2005
Sample Matrix:	Water	**Date Received:**	05/11/2005

Pentachlorophenol

Sample Name:	GW-0148	**Units:**	ug/L
Lab Code:	K0500180-015	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	05/12/05	06/01/05	KWG0507580	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	119	35-133	06/01/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500180
Project:	St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297	**Date Collected:**	05/07/2005
Sample Matrix:	Water	**Date Received:**	05/11/2005

Pentachlorophenol

Sample Name:	GW-0149	**Units:**	ug/L
Lab Code:	K0500180-016	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	05/12/05	06/01/05	KWG0507580	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	103	35-133	06/01/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500180
Project:	St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297	**Date Collected:**	05/07/2005
Sample Matrix:	Water	**Date Received:**	05/11/2005

Pentachlorophenol

Sample Name:	GW-0150	**Units:**	ug/L
Lab Code:	K0500180-017	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	05/12/05	06/01/05	KWG0507580	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	123	35-133	06/01/05	Acceptable

Comments:

00028

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500180
Project:	St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297	**Date Collected:**	05/07/2005
Sample Matrix:	Water	**Date Received:**	05/11/2005

Pentachlorophenol

Sample Name:	GW-0151	**Units:**	ug/L
Lab Code:	K0500180-018	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	05/12/05	06/01/05	KWG0507580	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	123	35-133	06/01/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500180
Project:	St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297	**Date Collected:**	05/08/2005
Sample Matrix:	Water	**Date Received:**	05/11/2005

Pentachlorophenol

Sample Name:	GW-0154	**Units:**	ug/L
Lab Code:	K0500180-019	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	05/12/05	06/01/05	KWG0507580	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	120	35-133	06/01/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500180
Project:	St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297	**Date Collected:**	05/07/2005
Sample Matrix:	Water	**Date Received:**	05/11/2005

Pentachlorophenol

Sample Name:	GW-0173	**Units:**	ug/L
Lab Code:	K0500180-020	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	05/12/05	06/01/05	KWG0507580	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	123	35-133	06/01/05	Acceptable

Comments:

00031

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500180
Project:	St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297	**Date Collected:**	05/07/2005
Sample Matrix:	Water	**Date Received:**	05/11/2005

Pentachlorophenol

Sample Name:	GW-0152	**Units:**	ug/L
Lab Code:	K0500180-021	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	05/12/05	06/01/05	KWG0507580	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	108	35-133	06/01/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500180
Project:	St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297	**Date Collected:**	05/07/2005
Sample Matrix:	Water	**Date Received:**	05/11/2005

Pentachlorophenol

Sample Name:	GW-0172	**Units:**	ug/L
Lab Code:	K0500180-022	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	05/12/05	06/01/05	KWG0507580	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	127	35-133	06/01/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500180
Project:	St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297	**Date Collected:**	05/08/2005
Sample Matrix:	Water	**Date Received:**	05/11/2005

Pentachlorophenol

Sample Name:	GW-0190	**Units:**	ug/L
Lab Code:	K0500180-026	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	05/12/05	06/01/05	KWG0507580	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	125	35-133	06/01/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500180
Project:	St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297	**Date Collected:**	05/08/2005
le Matrix:	Water	**Date Received:**	05/11/2005

Pentachlorophenol

Sample Name:	GW-0189	**Units:**	ug/L
Lab Code:	K0500180-027	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	05/12/05	06/01/05	KWG0507580	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	126	35-133	06/01/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500180
Project:	St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Pentachlorophenol

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG0507580-6	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	05/12/05	06/01/05	KWG0507580	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	97	35-133	06/01/05	Acceptable

Comments:

00036

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Arrowhead Engineering
Project: St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297
Sample Matrix: Water

Service Request: K0500180

Surrogate Recovery Summary
Pentachlorophenol

Extraction Method: METHOD
Analysis Method: 8151M

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1
GW-0147	K0500180-006	106
GW-0174	K0500180-008	114
GW-0175	K0500180-009	106
GW-0176	K0500180-010	105
GW-0169	K0500180-011	112
GW-0170	K0500180-012	123
GW-0171	K0500180-013	100
GW-0153	K0500180-014	112
GW-0148	K0500180-015	119
GW-0149	K0500180-016	103
GW-0150	K0500180-017	123
GW-0151	K0500180-018	123
GW-0154	K0500180-019	120
GW-0173	K0500180-020	123
-0152	K0500180-021	108
-0172	K0500180-022	127
GW-0190	K0500180-026	125
GW-0189	K0500180-027	126
Method Blank	KWG0507580-6	97
GW-0174MS	KWG0507580-1	106
GW-0174DMS	KWG0507580-2	108
GW-0169MS	KWG0507580-3	116
GW-0169DMS	KWG0507580-4	114
Lab Control Sample	KWG0507580-5	98

Surrogate Recovery Control Limits (%)

Sur1 = 4-Bromo-2,6-dichlorophenol 35-133

Results flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.

00037

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Arrowhead Engineering	**Service Request:**	K0500180
Project:	St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297	**Date Extracted:**	05/12/2005
Sample Matrix:	Water	**Date Analyzed:**	06/01/2005

Matrix Spike/Duplicate Matrix Spike Summary
Pentachlorophenol

Sample Name:	GW-0174	**Units:**	ug/L
Lab Code:	K0500180-008	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M	**Extraction Lot:**	KWG0507580

		GW-0174MS KWG0507580-1 Matrix Spike			GW-0174DMS KWG0507580-2 Duplicate Matrix Spike					
Analyte Name	**Sample Result**	**Result**	**Expected**	**%Rec**	**Result**	**Expected**	**%Rec**	**%Rec Limits**	**RPD**	**RPD Limit**
Pentachlorophenol	ND	9.96	10.0	100	9.54	10.0	95	34-124	4	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00038

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Arrowhead Engineering	**Service Request:**	K0500180
Project:	St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297	**Date Extracted:**	05/12/2005
Sample Matrix:	Water	**Date Analyzed:**	06/01/2005

Matrix Spike/Duplicate Matrix Spike Summary
Pentachlorophenol

Sample Name:	GW-0169	**Units:**	ug/L
Lab Code:	K0500180-011	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M	**Extraction Lot:**	KWG0507580

		GW-0169MS KWG0507580-3 Matrix Spike			GW-0169DMS KWG0507580-4 Duplicate Matrix Spike					
Analyte Name	**Sample Result**	**Result**	**Expected**	**%Rec**	**Result**	**Expected**	**%Rec**	**%Rec Limits**	**RPD**	**RPD Limit**
Pentachlorophenol	ND	9.60	10.0	96	9.69	10.0	97	34-124	1	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00039

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Arrowhead Engineering	**Service Request:**	K0500180
Project:	St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297	**Date Extracted:**	05/12/2005
Sample Matrix:	Water	**Date Analyzed:**	06/01/2005

Lab Control Spike Summary
Pentachlorophenol

Extraction Method:	METHOD	**Units:**	ug/L
Analysis Method:	8151M	**Basis:**	NA
		Level:	Low
		Extraction Lot:	KWG0507580

	Lab Control Sample KWG0507580-5 Lab Control Spike			
Analyte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
Pentachlorophenol	8.25	10.0	83	44-116

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00040

Polynuclear Aromatic Hydrocarbons
EPA Method 8270C

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Arrowhead Engineering
Project: St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297
Sample Matrix: Water

Service Request: K0500180
Date Collected: 05/08/2005
Date Received: 05/11/200

Polynuclear Aromatic Hydrocarbons

Sample Name: GW-0194
Lab Code: K0500180-001

Units: ug/L
Basis: NA

Extraction Method: EPA 3520C
Analysis Method: 8270C SIM

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**1500**	D	4.0	10	05/13/05	05/24/05	KWG0507645	
Acenaphthylene	**2.7**		0.40	1	05/13/05	05/23/05	KWG0507645	
Acenaphthene	**110**		0.40	1	05/13/05	05/23/05	KWG0507645	
Fluorene	**46**		0.40	1	05/13/05	05/23/05	KWG0507645	
Pentachlorophenol	**9900**	D	4000	100	05/13/05	05/25/05	KWG0507645	
Phenanthrene	**14**		0.40	1	05/13/05	05/23/05	KWG0507645	
Anthracene	**2.9**		0.40	1	05/13/05	05/23/05	KWG0507645	
Fluoranthene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Pyrene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Benz(a)anthracene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Chrysene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Benzo(b)fluoranthene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Benzo(k)fluoranthene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Benzo(a)pyrene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Indeno(1,2,3-cd)pyrene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Dibenz(a,h)anthracene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Benzo(g,h,i)perylene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Quinoline	**170**	D	4.0	10	05/13/05	05/24/05	KWG0507645	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	97	37-107	05/23/05	Acceptable
Fluoranthene-d10	121	18-137	05/23/05	Acceptable
Terphenyl-d14	105	18-153	05/23/05	Acceptable
2,4,6-Tribromophenol	121	10-145	05/23/05	Acceptable

Comments:

00042

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500180
Project:	St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297	**Date Collected:**	05/08/2005
Sample Matrix:	Water	**Date Received:**	05/11/2005

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0200	**Units:**	ug/L
Lab Code:	K0500180-002	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**130**		0.40	1	05/13/05	05/23/05	KWG0507645	
Acenaphthylene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Acenaphthene	**9.8**		0.40	1	05/13/05	05/23/05	KWG0507645	
Fluorene	**5.3**		0.40	1	05/13/05	05/23/05	KWG0507645	
Pentachlorophenol	**1900**	D	400	10	05/13/05	05/24/05	KWG0507645	
Phenanthrene	**1.7**		0.40	1	05/13/05	05/23/05	KWG0507645	
Anthracene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Fluoranthene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Pyrene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Benz(a)anthracene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Chrysene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Benzo(b)fluoranthene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Benzo(k)fluoranthene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Benzo(a)pyrene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Indeno(1,2,3-cd)pyrene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Dibenz(a,h)anthracene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Benzo(g,h,i)perylene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Quinoline	**6.6**	D	4.0	10	05/13/05	05/24/05	KWG0507645	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	95	37-107	05/23/05	Acceptable
Fluoranthene-d10	110	18-137	05/23/05	Acceptable
Terphenyl-d14	102	18-153	05/23/05	Acceptable
2,4,6-Tribromophenol	104	10-145	05/23/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500180
Project:	St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297	**Date Collected:**	05/09/200
Sample Matrix:	Water	**Date Received:**	05/11/200

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0202	**Units:**	ug/L
Lab Code:	K0500180-003	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Acenaphthylene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Acenaphthene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Fluorene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Pentachlorophenol	**220**		40	1	05/13/05	05/23/05	KWG0507645	
Phenanthrene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Anthracene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Fluoranthene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Pyrene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Benz(a)anthracene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Chrysene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Benzo(b)fluoranthene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Benzo(k)fluoranthene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Benzo(a)pyrene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Indeno(1,2,3-cd)pyrene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Dibenz(a,h)anthracene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Benzo(g,h,i)perylene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Quinoline	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	106	37-107	05/23/05	Acceptable
Fluoranthene-d10	116	18-137	05/23/05	Acceptable
Terphenyl-d14	109	18-153	05/23/05	Acceptable
2,4,6-Tribromophenol	91	10-145	05/23/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500180
Project:	St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297	**Date Collected:**	05/09/2005
Sample Matrix:	Water	**Date Received:**	05/11/2005

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0204	**Units:**	ug/L
Lab Code:	K0500180-004	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**3.6**		0.40	1	05/13/05	05/23/05	KWG0507645	
Acenaphthylene	**1.6**		0.40	1	05/13/05	05/23/05	KWG0507645	
Acenaphthene	**92**		0.40	1	05/13/05	05/23/05	KWG0507645	
Fluorene	**45**		0.40	1	05/13/05	05/23/05	KWG0507645	
Pentachlorophenol	**2100**	D	800	20	05/13/05	05/24/05	KWG0507645	
Phenanthrene	**14**		0.40	1	05/13/05	05/23/05	KWG0507645	
Anthracene	**3.3**		0.40	1	05/13/05	05/23/05	KWG0507645	
Fluoranthene	**0.56**		0.40	1	05/13/05	05/23/05	KWG0507645	
Pyrene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Benz(a)anthracene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Chrysene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Benzo(b)fluoranthene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Benzo(k)fluoranthene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Benzo(a)pyrene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Indeno(1,2,3-cd)pyrene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Dibenz(a,h)anthracene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Benzo(g,h,i)perylene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Quinoline	**30**	D	8.0	20	05/13/05	05/24/05	KWG0507645	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	102	37-107	05/23/05	Acceptable
Fluoranthene-d10	108	18-137	05/23/05	Acceptable
Terphenyl-d14	103	18-153	05/23/05	Acceptable
2,4,6-Tribromophenol	121	10-145	05/23/05	Acceptable

Comments:

00045

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500180
Project:	St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297	**Date Collected:**	05/08/2005
Sample Matrix:	Water	**Date Received:**	05/11/20(

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0201	**Units:**	ug/L
Lab Code:	K0500180-005	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**0.87**		0.40	1	05/13/05	05/31/05	KWG0507645	
Acenaphthylene	ND	U	0.40	1	05/13/05	05/31/05	KWG0507645	
Acenaphthene	ND	U	0.40	1	05/13/05	05/31/05	KWG0507645	
Fluorene	ND	U	0.40	1	05/13/05	05/31/05	KWG0507645	
Pentachlorophenol	ND	U	20	1	05/13/05	05/31/05	KWG0507645	
Phenanthrene	ND	U	0.40	1	05/13/05	05/31/05	KWG0507645	
Anthracene	ND	U	0.40	1	05/13/05	05/31/05	KWG0507645	
Fluoranthene	ND	U	0.40	1	05/13/05	05/31/05	KWG0507645	
Pyrene	ND	U	0.40	1	05/13/05	05/31/05	KWG0507645	
Benz(a)anthracene	ND	U	0.40	1	05/13/05	05/31/05	KWG0507645	
Chrysene	ND	U	0.40	1	05/13/05	05/31/05	KWG0507645	
Benzo(b)fluoranthene	ND	U	0.40	1	05/13/05	05/31/05	KWG0507645	
Benzo(k)fluoranthene	ND	U	0.40	1	05/13/05	05/31/05	KWG0507645	
Benzo(a)pyrene	ND	U	0.40	1	05/13/05	05/31/05	KWG0507645	
Indeno(1,2,3-cd)pyrene	ND	U	0.40	1	05/13/05	05/31/05	KWG0507645	
Dibenz(a,h)anthracene	ND	U	0.40	1	05/13/05	05/31/05	KWG0507645	
Benzo(g,h,i)perylene	ND	U	0.40	1	05/13/05	05/31/05	KWG0507645	
Quinoline	ND	U	0.40	1	05/13/05	05/31/05	KWG0507645	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	97	37-107	05/31/05	Acceptable
Fluoranthene-d10	103	18-137	05/31/05	Acceptable
Terphenyl-d14	101	18-153	05/31/05	Acceptable
2,4,6-Tribromophenol	37	10-145	05/31/05	Acceptable

Comments:

00046

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500180
Project:	St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297	**Date Collected:**	05/09/2005
Sample Matrix:	Water	**Date Received:**	05/11/2005

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0203	**Units:**	ug/L
Lab Code:	K0500180-007	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**2800**	D	8.0	20	05/13/05	05/25/05	KWG0507645	
Acenaphthylene	**9.7**		0.40	1	05/13/05	05/23/05	KWG0507645	
Acenaphthene	**790**	D	4.0	10	05/13/05	05/24/05	KWG0507645	
Fluorene	**550**	D	4.0	10	05/13/05	05/24/05	KWG0507645	
Pentachlorophenol	**2900**	D	800	20	05/13/05	05/25/05	KWG0507645	
Phenanthrene	**1100**	D	4.0	10	05/13/05	05/24/05	KWG0507645	
Anthracene	**130**		0.40	1	05/13/05	05/23/05	KWG0507645	
Fluoranthene	**440**	D	4.0	10	05/13/05	05/24/05	KWG0507645	
Pyrene	**270**	D	4.0	10	05/13/05	05/24/05	KWG0507645	
Benz(a)anthracene	**62**		0.40	1	05/13/05	05/23/05	KWG0507645	
Chrysene	**60**		0.40	1	05/13/05	05/23/05	KWG0507645	
zo(b)fluoranthene	**21**		0.40	1	05/13/05	05/23/05	KWG0507645	
zo(k)fluoranthene	**17**		0.40	1	05/13/05	05/23/05	KWG0507645	
Benzo(a)pyrene	**16**		0.40	1	05/13/05	05/23/05	KWG0507645	
Indeno(1,2,3-cd)pyrene	**5.4**		0.40	1	05/13/05	05/23/05	KWG0507645	
Dibenz(a,h)anthracene	**1.7**		0.40	1	05/13/05	05/23/05	KWG0507645	
Benzo(g,h,i)perylene	**3.5**		0.40	1	05/13/05	05/23/05	KWG0507645	
Quinoline	**390**	D	4.0	10	05/13/05	05/24/05	KWG0507645	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	94	37-107	05/23/05	Acceptable
Fluoranthene-d10	105	18-137	05/23/05	Acceptable
Terphenyl-d14	99	18-153	05/23/05	Acceptable
2,4,6-Tribromophenol	110	10-145	05/23/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500180
Project:	St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297	**Date Collected:**	05/08/2005
Sample Matrix:	Water	**Date Received:**	05/11/200

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0193	**Units:**	ug/L
Lab Code:	K0500180-023	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Acenaphthylene	**0.55**		0.40	1	05/13/05	05/23/05	KWG0507645	
Acenaphthene	**16**		0.40	1	05/13/05	05/23/05	KWG0507645	
Fluorene	**1.1**		0.40	1	05/13/05	05/23/05	KWG0507645	
Pentachlorophenol	**2200**	D	800	20	05/13/05	05/25/05	KWG0507645	
Phenanthrene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Anthracene	**1.1**		0.40	1	05/13/05	05/23/05	KWG0507645	
Fluoranthene	**13**		0.40	1	05/13/05	05/23/05	KWG0507645	
Pyrene	**7.2**		0.40	1	05/13/05	05/23/05	KWG0507645	
Benz(a)anthracene	**0.81**		0.40	1	05/13/05	05/23/05	KWG0507645	
Chrysene	**0.70**		0.40	1	05/13/05	05/23/05	KWG0507645	
Benzo(b)fluoranthene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Benzo(k)fluoranthene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Benzo(a)pyrene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Indeno(1,2,3-cd)pyrene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Dibenz(a,h)anthracene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Benzo(g,h,i)perylene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Quinoline	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	109	37-107	05/23/05	Outside Control Limits
Fluoranthene-d10	115	18-137	05/23/05	Acceptable
Terphenyl-d14	109	18-153	05/23/05	Acceptable
2,4,6-Tribromophenol	124	10-145	05/23/05	Acceptable

Comments:

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500180
Project:	St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297	**Date Collected:**	05/08/2005
Sample Matrix:	Water	**Date Received:**	05/11/2005

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0191	**Units:**	ug/L
Lab Code:	K0500180-024	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**0.93**		0.40	1	05/13/05	05/23/05	KWG0507645	
Acenaphthylene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Acenaphthene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Fluorene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Pentachlorophenol	**820**	D	400	10	05/13/05	05/25/05	KWG0507645	
Phenanthrene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Anthracene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Fluoranthene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Pyrene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Benz(a)anthracene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Chrysene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Benzo(b)fluoranthene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Benzo(k)fluoranthene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Benzo(a)pyrene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Indeno(1,2,3-cd)pyrene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Dibenz(a,h)anthracene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Benzo(g,h,i)perylene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Quinoline	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	102	37-107	05/23/05	Acceptable
Fluoranthene-d10	112	18-137	05/23/05	Acceptable
Terphenyl-d14	103	18-153	05/23/05	Acceptable
2,4,6-Tribromophenol	77	10-145	05/23/05	Acceptable

Comments:

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500180
Project:	St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297	**Date Collected:**	05/08/200
Sample Matrix:	Water	**Date Received:**	05/11/20

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0192	**Units:**	ug/L
Lab Code:	K0500180-025	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	Ui	2.3	1	05/13/05	05/23/05	KWG0507645	
Acenaphthylene	**0.49**		0.40	1	05/13/05	05/23/05	KWG0507645	
Acenaphthene	**2.0**		0.40	1	05/13/05	05/23/05	KWG0507645	
Fluorene	**1.2**		0.40	1	05/13/05	05/23/05	KWG0507645	
Pentachlorophenol	**950**	D	400	10	05/13/05	05/25/05	KWG0507645	
Phenanthrene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Anthracene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Fluoranthene	**4.1**		0.40	1	05/13/05	05/23/05	KWG0507645	
Pyrene	**2.9**		0.40	1	05/13/05	05/23/05	KWG0507645	
Benz(a)anthracene	**0.64**		0.40	1	05/13/05	05/23/05	KWG0507645	
Chrysene	**0.64**		0.40	1	05/13/05	05/23/05	KWG0507645	
Benzo(b)fluoranthene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Benzo(k)fluoranthene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Benzo(a)pyrene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Indeno(1,2,3-cd)pyrene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Dibenz(a,h)anthracene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Benzo(g,h,i)perylene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Quinoline	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	97	37-107	05/23/05	Acceptable
Fluoranthene-d10	107	18-137	05/23/05	Acceptable
Terphenyl-d14	101	18-153	05/23/05	Acceptable
2,4,6-Tribromophenol	76	10-145	05/23/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500180
Project:	St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297	**Date Collected:**	05/08/2005
Sample Matrix:	Water	**Date Received:**	05/11/2005

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0197	**Units:**	ug/L
Lab Code:	K0500180-028	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**76**		0.40	1	05/13/05	05/23/05	KWG0507645	
Acenaphthylene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Acenaphthene	**7.6**		0.40	1	05/13/05	05/23/05	KWG0507645	
Fluorene	**1.2**		0.40	1	05/13/05	05/23/05	KWG0507645	
Pentachlorophenol	**820**	D	200	5	05/13/05	05/25/05	KWG0507645	
Phenanthrene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Anthracene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Fluoranthene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Pyrene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Benz(a)anthracene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Chrysene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Benzo(b)fluoranthene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Benzo(k)fluoranthene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Benzo(a)pyrene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Indeno(1,2,3-cd)pyrene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Dibenz(a,h)anthracene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Benzo(g,h,i)perylene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Quinoline	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	99	37-107	05/23/05	Acceptable
Fluoranthene-d10	114	18-137	05/23/05	Acceptable
Terphenyl-d14	105	18-153	05/23/05	Acceptable
2,4,6-Tribromophenol	111	10-145	05/23/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500180
Project:	St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297	**Date Collected:**	05/08/2005
Sample Matrix:	Water	**Date Received:**	05/11/20(

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0198	**Units:**	ug/L
Lab Code:	K0500180-029	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**78**		0.40	1	05/13/05	05/23/05	KWG0507645	
Acenaphthylene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Acenaphthene	**7.8**		0.40	1	05/13/05	05/23/05	KWG0507645	
Fluorene	**1.2**		0.40	1	05/13/05	05/23/05	KWG0507645	
Pentachlorophenol	**870**	D	400	10	05/13/05	05/25/05	KWG0507645	
Phenanthrene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Anthracene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Fluoranthene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Pyrene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Benz(a)anthracene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Chrysene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Benzo(b)fluoranthene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Benzo(k)fluoranthene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Benzo(a)pyrene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Indeno(1,2,3-cd)pyrene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Dibenz(a,h)anthracene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Benzo(g,h,i)perylene	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	
Quinoline	ND	U	0.40	1	05/13/05	05/23/05	KWG0507645	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	100	37-107	05/23/05	Acceptable
Fluoranthene-d10	113	18-137	05/23/05	Acceptable
Terphenyl-d14	109	18-153	05/23/05	Acceptable
2,4,6-Tribromophenol	115	10-145	05/23/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500180
Project:	St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297	**Date Collected:**	05/08/2005
Sample Matrix:	Water	**Date Received:**	05/11/2005

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0199	**Units:**	ug/L
Lab Code:	K0500180-030	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**0.61**		0.40	1	05/13/05	05/26/05	KWG0507645	
Acenaphthylene	ND	U	0.40	1	05/13/05	05/26/05	KWG0507645	
Acenaphthene	ND	U	0.40	1	05/13/05	05/26/05	KWG0507645	
Fluorene	ND	U	0.40	1	05/13/05	05/26/05	KWG0507645	
Pentachlorophenol	ND	U	20	1	05/13/05	05/26/05	KWG0507645	
Phenanthrene	ND	U	0.40	1	05/13/05	05/26/05	KWG0507645	
Anthracene	ND	U	0.40	1	05/13/05	05/26/05	KWG0507645	
Fluoranthene	ND	U	0.40	1	05/13/05	05/26/05	KWG0507645	
Pyrene	ND	U	0.40	1	05/13/05	05/26/05	KWG0507645	
Benz(a)anthracene	ND	U	0.40	1	05/13/05	05/26/05	KWG0507645	
Chrysene	ND	U	0.40	1	05/13/05	05/26/05	KWG0507645	
[illegible]zo(b)fluoranthene	ND	U	0.40	1	05/13/05	05/26/05	KWG0507645	
[illegible]o(k)fluoranthene	ND	U	0.40	1	05/13/05	05/26/05	KWG0507645	
Benzo(a)pyrene	ND	U	0.40	1	05/13/05	05/26/05	KWG0507645	
Indeno(1,2,3-cd)pyrene	ND	U	0.40	1	05/13/05	05/26/05	KWG0507645	
Dibenz(a,h)anthracene	ND	U	0.40	1	05/13/05	05/26/05	KWG0507645	
Benzo(g,h,i)perylene	ND	U	0.40	1	05/13/05	05/26/05	KWG0507645	
Quinoline	ND	U	0.40	1	05/13/05	05/26/05	KWG0507645	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	104	37-107	05/26/05	Acceptable
Fluoranthene-d10	110	18-137	05/26/05	Acceptable
Terphenyl-d14	106	18-153	05/26/05	Acceptable
2,4,6-Tribromophenol	46	10-145	05/26/05	Acceptable

Comments:

00053

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Arrowhead Engineering
Project: St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297
Sample Matrix: Water

Service Request: K0500180
Date Collected: NA
Date Received: NA

Polynuclear Aromatic Hydrocarbons

Sample Name: Method Blank
Lab Code: KWG0507645-4

Units: ug/L
Basis: NA

Extraction Method: EPA 3520C
Analysis Method: 8270C SIM

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.40	1	05/13/05	05/26/05	KWG0507645	
Acenaphthylene	ND	U	0.40	1	05/13/05	05/26/05	KWG0507645	
Acenaphthene	ND	U	0.40	1	05/13/05	05/26/05	KWG0507645	
Fluorene	ND	U	0.40	1	05/13/05	05/26/05	KWG0507645	
Pentachlorophenol	ND	U	20	1	05/13/05	05/26/05	KWG0507645	
Phenanthrene	ND	U	0.40	1	05/13/05	05/26/05	KWG0507645	
Anthracene	ND	U	0.40	1	05/13/05	05/26/05	KWG0507645	
Fluoranthene	ND	U	0.40	1	05/13/05	05/26/05	KWG0507645	
Pyrene	ND	U	0.40	1	05/13/05	05/26/05	KWG0507645	
Benz(a)anthracene	ND	U	0.40	1	05/13/05	05/26/05	KWG0507645	
Chrysene	ND	U	0.40	1	05/13/05	05/26/05	KWG0507645	
Benzo(b)fluoranthene	ND	U	0.40	1	05/13/05	05/26/05	KWG0507645	
Benzo(k)fluoranthene	ND	U	0.40	1	05/13/05	05/26/05	KWG0507645	
Benzo(a)pyrene	ND	U	0.40	1	05/13/05	05/26/05	KWG0507645	
Indeno(1,2,3-cd)pyrene	ND	U	0.40	1	05/13/05	05/26/05	KWG0507645	
Dibenz(a,h)anthracene	ND	U	0.40	1	05/13/05	05/26/05	KWG0507645	
Benzo(g,h,i)perylene	ND	U	0.40	1	05/13/05	05/26/05	KWG0507645	
Quinoline	ND	U	0.40	1	05/13/05	05/26/05	KWG0507645	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	102	37-107	05/26/05	Acceptable
Fluoranthene-d10	106	18-137	05/26/05	Acceptable
Terphenyl-d14	110	18-153	05/26/05	Acceptable
2,4,6-Tribromophenol	66	10-145	05/26/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Arrowhead Engineering
Project: St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297
Sample Matrix: Water

Service Request: K0500180

Surrogate Recovery Summary
Polynuclear Aromatic Hydrocarbons

Extraction Method: EPA 3520C
Analysis Method: 8270C SIM

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1	Sur2	Sur3	Sur4
GW-0194	K0500180-001	97	121	105	121
GW-0200	K0500180-002	95	110	102	104
GW-0202	K0500180-003	106	116	109	91
GW-0204	K0500180-004	102	108	103	121
GW-0201	K0500180-005	97	103	101	37
GW-0203	K0500180-007	94	105	99	110
GW-0193	K0500180-023	109	* 115	109	124
GW-0191	K0500180-024	102	112	103	77
GW-0192	K0500180-025	97	107	101	76
GW-0197	K0500180-028	99	114	105	111
GW-0198	K0500180-029	100	113	109	115
GW-0199	K0500180-030	104	110	106	46
Method Blank	KWG0507645-4	102	106	110	66
GW-0197MS	KWG0507645-1	93	106	97	92
0197DMS	KWG0507645-2	94	106	98	84
Control Sample	KWG0507645-3	96	105	95	112

Surrogate Recovery Control Limits (%)

Sur1 =	Fluorene-d10	37-107
Sur2 =	Fluoranthene-d10	18-137
Sur3 =	Terphenyl-d14	18-153
=	2,4,6-Tribromophenol	10-145

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

00055

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Arrowhead Engineering
Project: St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297
Sample Matrix: Water

Service Request: K0500180
Date Extracted: 05/13/2005
Date Analyzed: 05/24/200
05/25/2005

Matrix Spike/Duplicate Matrix Spike Summary
Polynuclear Aromatic Hydrocarbons

Sample Name: GW-0197
Lab Code: K0500180-028

Units: ug/L
Basis: NA

Extraction Method: EPA 3520C
Analysis Method: 8270C SIM

Level: Low
Extraction Lot: KWG0507645

Analyte Name	Sample Result	GW-0197MS KWG0507645-1 Matrix Spike			GW-0197DMS KWG0507645-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Naphthalene	76	117	50.0	82	114	50.0	76	27-109	3	30
Acenaphthylene	ND	42.9	50.0	86	41.3	50.0	83	30-118	4	30
Acenaphthene	7.6	48.9	50.0	83	47.2	50.0	79	28-115	3	30
Fluorene	1.2	45.7	50.0	89	44.7	50.0	87	28-122	2	30
Pentachlorophenol	820	1000	250	71	1030	250	81	20-167	2	30
Phenanthrene	ND	44.4	50.0	89	43.6	50.0	87	24-129	2	30
Anthracene	ND	39.4	50.0	79	39.5	50.0	79	26-118	0	30
Fluoranthene	ND	49.3	50.0	99	48.5	50.0	97	18-133	2	30
Pyrene	ND	47.7	50.0	95	47.5	50.0	95	19-133	0	[illegible]
Benz(a)anthracene	ND	45.8	50.0	92	45.3	50.0	91	19-136	1	[illegible]
Chrysene	ND	45.9	50.0	92	45.0	50.0	90	22-129	2	30
Benzo(b)fluoranthene	ND	46.0	50.0	92	44.6	50.0	89	19-141	3	30
Benzo(k)fluoranthene	ND	45.0	50.0	90	42.6	50.0	85	19-138	6	30
Benzo(a)pyrene	ND	45.7	50.0	91	44.4	50.0	89	10-142	3	30
Indeno(1,2,3-cd)pyrene	ND	46.8	50.0	94	46.7	50.0	93	19-151	0	30
Dibenz(a,h)anthracene	ND	46.5	50.0	93	46.6	50.0	93	16-146	0	30
Benzo(g,h,i)perylene	ND	47.0	50.0	94	45.1	50.0	90	22-134	4	30
Quinoline	ND	56.8	50.0	114	52.2	50.0	104	70-130	8	30

Results flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.
Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00056

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Arrowhead Engineering	**Service Request:**	K0500180
Project:	St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297	**Date Extracted:**	05/13/2005
Sample Matrix:	Water	**Date Analyzed:**	05/24/2005

Lab Control Spike Summary
Polynuclear Aromatic Hydrocarbons

Extraction Method:	EPA 3520C	**Units:**	ug/L
Analysis Method:	8270C SIM	**Basis:**	NA
		Level:	Low
		Extraction Lot:	KWG0507645

	Lab Control Sample KWG0507645-3 Lab Control Spike			
Analyte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
Naphthalene	43.5	50.0	87	41-115
Acenaphthylene	43.5	50.0	87	44-122
Acenaphthene	43.2	50.0	86	41-123
Fluorene	46.4	50.0	93	44-128
Pentachlorophenol	200	250	80	10-117
Phenanthrene	44.7	50.0	89	45-127
Anthracene	36.9	50.0	74	40-126
Fluoranthene	48.5	50.0	97	41-141
Pyrene	46.0	50.0	92	34-152
[illegible](a)anthracene	44.2	50.0	88	46-132
[illegible]ysene	44.8	50.0	90	46-136
Benzo(b)fluoranthene	46.0	50.0	92	54-137
Benzo(k)fluoranthene	43.9	50.0	88	54-141
Benzo(a)pyrene	42.8	50.0	86	49-133
Indeno(1,2,3-cd)pyrene	46.8	50.0	94	41-141
Dibenz(a,h)anthracene	46.7	50.0	93	39-143
Benzo(g,h,i)perylene	46.0	50.0	92	46-133
Quinoline	39.6	50.0	79	70-130

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00057

Polynuclear Aromatic Hydrocarbons
EPA Method 8270C

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500180
Project:	St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297	**Date Collected:**	05/09/2005
Sample Matrix:	Water	**Date Received:**	05/11/2005

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0147	**Units:**	ug/L
Lab Code:	K0500180-006	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Acenaphthylene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Acenaphthene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Fluorene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Phenanthrene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Anthracene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Fluoranthene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Pyrene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Benz(a)anthracene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Chrysene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Benzo(b)fluoranthene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Benzo(k)fluoranthene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Benzo(a)pyrene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Dibenz(a,h)anthracene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Benzo(g,h,i)perylene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Quinoline	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	94	37-107	05/20/05	Acceptable
Fluoranthene-d10	114	18-137	05/20/05	Acceptable
Terphenyl-d14	106	18-153	05/20/05	Acceptable

Comments:

00059

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500180
Project:	St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297	**Date Collected:**	05/07/2005
Sample Matrix:	Water	**Date Received:**	05/11/2005

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0174	**Units:**	ug/L
Lab Code:	K0500180-008	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**0.12**		0.020	1	05/13/05	05/20/05	KWG0507646	
Acenaphthylene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Acenaphthene	**0.34**		0.020	1	05/13/05	05/20/05	KWG0507646	
Fluorene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Phenanthrene	**0.039**		0.020	1	05/13/05	05/20/05	KWG0507646	
Anthracene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Fluoranthene	**0.046**		0.020	1	05/13/05	05/20/05	KWG0507646	
Pyrene	**0.027**		0.020	1	05/13/05	05/20/05	KWG0507646	
Benz(a)anthracene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Chrysene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Benzo(b)fluoranthene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Benzo(k)fluoranthene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Benzo(a)pyrene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Dibenz(a,h)anthracene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Benzo(g,h,i)perylene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Quinoline	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	89	37-107	05/20/05	Acceptable
Fluoranthene-d10	100	18-137	05/20/05	Acceptable
Terphenyl-d14	103	18-153	05/20/05	Acceptable

Comments:

00060

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500180
Project:	St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297	**Date Collected:**	05/07/2005
Sample Matrix:	Water	**Date Received:**	05/11/2005

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0175	**Units:**	ug/L
Lab Code:	K0500180-009	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**0.11**		0.020	1	05/13/05	05/20/05	KWG0507646	
Acenaphthylene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Acenaphthene	**0.33**		0.020	1	05/13/05	05/20/05	KWG0507646	
Fluorene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Phenanthrene	**0.040**		0.020	1	05/13/05	05/20/05	KWG0507646	
Anthracene	**0.022**		0.020	1	05/13/05	05/20/05	KWG0507646	
Fluoranthene	**0.045**		0.020	1	05/13/05	05/20/05	KWG0507646	
Pyrene	**0.025**		0.020	1	05/13/05	05/20/05	KWG0507646	
Benz(a)anthracene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Chrysene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Benzo(b)fluoranthene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Benzo(k)fluoranthene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Benzo(a)pyrene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Dibenz(a,h)anthracene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Benzo(g,h,i)perylene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Quinoline	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	84	37-107	05/20/05	Acceptable
Fluoranthene-d10	101	18-137	05/20/05	Acceptable
Terphenyl-d14	101	18-153	05/20/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500180
Project:	St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297	**Date Collected:**	05/08/2005
Sample Matrix:	Water	**Date Received:**	05/11/2005

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0171	**Units:**	ug/L
Lab Code:	K0500180-013	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Acenaphthylene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Acenaphthene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Fluorene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Phenanthrene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Anthracene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Fluoranthene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Pyrene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Benz(a)anthracene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Chrysene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Benzo(b)fluoranthene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Benzo(k)fluoranthene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Benzo(a)pyrene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Indeno(1,2,3-cd)pyrene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Dibenz(a,h)anthracene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Benzo(g,h,i)perylene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Quinoline	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	91	37-107	05/20/05	Acceptable
Fluoranthene-d10	105	18-137	05/20/05	Acceptable
Terphenyl-d14	99	18-153	05/20/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500180
Project:	St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297	**Date Collected:**	05/08/2005
Sample Matrix:	Water	**Date Received:**	05/11/2005

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0170	**Units:**	ug/L
Lab Code:	K0500180-012	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Acenaphthylene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Acenaphthene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Fluorene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Phenanthrene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Anthracene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Fluoranthene	**0.093**		0.020	1	05/13/05	05/20/05	KWG0507646	
Pyrene	**0.081**		0.020	1	05/13/05	05/20/05	KWG0507646	
Benz(a)anthracene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Chrysene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Benzo(b)fluoranthene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Benzo(k)fluoranthene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Benzo(a)pyrene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Dibenz(a,h)anthracene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Benzo(g,h,i)perylene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Quinoline	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	102	37-107	05/20/05	Acceptable
Fluoranthene-d10	121	18-137	05/20/05	Acceptable
Terphenyl-d14	113	18-153	05/20/05	Acceptable

Comments:

00064

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500180
Project:	St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297	**Date Collected:**	05/08/2005
Sample Matrix:	Water	**Date Received:**	05/11/2005

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0169	**Units:**	ug/L
Lab Code:	K0500180-011	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Acenaphthylene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Acenaphthene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Fluorene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Phenanthrene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Anthracene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Fluoranthene	**0.10**		0.020	1	05/13/05	05/20/05	KWG0507646	
Pyrene	**0.086**		0.020	1	05/13/05	05/20/05	KWG0507646	
Benz(a)anthracene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Chrysene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Benzo(b)fluoranthene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Benzo(k)fluoranthene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
[illegible]o(a)pyrene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Dibenz(a,h)anthracene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Benzo(g,h,i)perylene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Quinoline	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	90	37-107	05/20/05	Acceptable
Fluoranthene-d10	113	18-137	05/20/05	Acceptable
Terphenyl-d14	102	18-153	05/20/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500180
Project:	St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297	**Date Collected:**	05/07/2005
Sample Matrix:	Water	**Date Received:**	05/11/2005

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0176	**Units:**	ug/L
Lab Code:	K0500180-010	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.022	1	05/13/05	05/20/05	KWG0507646	
Acenaphthylene	ND	U	0.022	1	05/13/05	05/20/05	KWG0507646	
Acenaphthene	ND	U	0.022	1	05/13/05	05/20/05	KWG0507646	
Fluorene	ND	U	0.022	1	05/13/05	05/20/05	KWG0507646	
Phenanthrene	ND	U	0.022	1	05/13/05	05/20/05	KWG0507646	
Anthracene	ND	U	0.022	1	05/13/05	05/20/05	KWG0507646	
Fluoranthene	ND	U	0.022	1	05/13/05	05/20/05	KWG0507646	
Pyrene	ND	U	0.022	1	05/13/05	05/20/05	KWG0507646	
Benz(a)anthracene	ND	U	0.022	1	05/13/05	05/20/05	KWG0507646	
Chrysene	ND	U	0.022	1	05/13/05	05/20/05	KWG0507646	
Benzo(b)fluoranthene	ND	U	0.022	1	05/13/05	05/20/05	KWG0507646	
Benzo(k)fluoranthene	ND	U	0.022	1	05/13/05	05/20/05	KWG0507646	
Benzo(a)pyrene	ND	U	0.022	1	05/13/05	05/20/05	KWG0507646	
Indeno(1,2,3-cd)pyrene	ND	U	0.022	1	05/13/05	05/20/05	KWG0507646	
Dibenz(a,h)anthracene	ND	U	0.022	1	05/13/05	05/20/05	KWG0507646	
Benzo(g,h,i)perylene	ND	U	0.022	1	05/13/05	05/20/05	KWG0507646	
Quinoline	ND	U	0.022	1	05/13/05	05/20/05	KWG0507646	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	98	37-107	05/20/05	Acceptable
Fluoranthene-d10	123	18-137	05/20/05	Acceptable
Terphenyl-d14	113	18-153	05/20/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Arrowhead Engineering	**Service Request:**	K0500180
Project:	St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297	**Date Extracted:**	05/13/2005
Sample Matrix:	Water	**Date Analyzed:**	05/24/2005

Matrix Spike/Duplicate Matrix Spike Summary
Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0169	**Units:**	ug/L
Lab Code:	K0500180-011	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM	**Extraction Lot:**	KWG0507646

		GW-0169MS KWG0507646-3 Matrix Spike			GW-0169DMS KWG0507646-4 Duplicate Matrix Spike					
Analyte Name	**Sample Result**	**Result**	**Expected**	**%Rec**	**Result**	**Expected**	**%Rec**	**%Rec Limits**	**RPD**	**RPD Limit**
Naphthalene	ND	1.73	2.48	70	1.73	2.45	71	27-109	0	30
Acenaphthylene	ND	1.88	2.48	76	1.94	2.45	79	30-118	3	30
Acenaphthene	ND	1.82	2.48	74	1.87	2.45	76	28-115	3	30
Fluorene	ND	2.00	2.48	81	2.08	2.45	85	28-122	4	30
Phenanthrene	ND	1.87	2.48	75	1.95	2.45	80	24-129	4	30
Anthracene	ND	1.64	2.48	66	1.70	2.45	69	26-118	3	30
Fluoranthene	0.10	2.20	2.48	85	2.25	2.45	88	18-133	3	30
Pyrene	0.086	2.16	2.48	84	2.20	2.45	86	19-133	2	30
Benz(a)anthracene	ND	1.92	2.48	78	1.99	2.45	81	19-136	4	
Chrysene	ND	1.94	2.48	78	2.01	2.45	82	22-129	4	
Benzo(b)fluoranthene	ND	1.94	2.48	79	1.97	2.45	80	19-141	1	30
Benzo(k)fluoranthene	ND	1.74	2.48	70	1.92	2.45	78	19-138	10	30
Benzo(a)pyrene	ND	1.77	2.48	71	1.82	2.45	74	10-142	3	30
Indeno(1,2,3-cd)pyrene	ND	1.92	2.48	78	2.03	2.45	83	19-151	6	30
Dibenz(a,h)anthracene	ND	1.90	2.48	77	2.03	2.45	83	16-146	7	30
Benzo(g,h,i)perylene	ND	1.85	2.48	75	1.97	2.45	80	22-134	6	30
Quinoline	ND	2.39	2.48	97	2.50	2.45	102	70-130	4	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00080

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Arrowhead Engineering	**Service Request:**	K0500180
Project:	St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297	**Date Extracted:**	05/13/2005
Sample Matrix:	Water	**Date Analyzed:**	05/24/2005

Matrix Spike/Duplicate Matrix Spike Summary
Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0174	**Units:**	ug/L
Lab Code:	K0500180-008	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM	**Extraction Lot:**	KWG0507646

		GW-0174MS KWG0507646-1 Matrix Spike			GW-0174DMS KWG0507646-2 Duplicate Matrix Spike					
Analyte Name	**Sample Result**	**Result**	**Expected**	**%Rec**	**Result**	**Expected**	**%Rec**	**%Rec Limits**	**RPD**	**RPD Limit**
Naphthalene	0.12	1.85	2.48	70	1.80	2.48	68	27-109	3	30
Acenaphthylene	ND	1.90	2.48	77	1.77	2.48	72	30-118	7	30
Acenaphthene	0.34	2.13	2.48	72	2.03	2.48	68	28-115	5	30
Fluorene	ND	2.03	2.48	82	1.92	2.48	78	28-122	5	30
Phenanthrene	0.039	1.89	2.48	75	1.71	2.48	67	24-129	10	30
Anthracene	ND	1.63	2.48	66	1.58	2.48	64	26-118	3	30
Fluoranthene	0.046	2.01	2.48	79	1.93	2.48	76	18-133	4	30
Pyrene	0.027	2.06	2.48	82	1.98	2.48	79	19-133	4	30
[illegible](a)anthracene	ND	1.91	2.48	77	1.73	2.48	70	19-136	10	30
[illegible]ysene	ND	1.93	2.48	78	1.78	2.48	72	22-129	8	30
Benzo(b)fluoranthene	ND	1.82	2.48	73	1.60	2.48	65	19-141	13	30
Benzo(k)fluoranthene	ND	1.67	2.48	68	1.54	2.48	62	19-138	8	30
Benzo(a)pyrene	ND	1.77	2.48	71	1.60	2.48	65	10-142	10	30
Indeno(1,2,3-cd)pyrene	ND	1.86	2.48	75	1.73	2.48	70	19-151	8	30
Dibenz(a,h)anthracene	ND	1.87	2.48	76	1.73	2.48	70	16-146	8	30
Benzo(g,h,i)perylene	ND	1.80	2.48	73	1.66	2.48	67	22-134	8	30
Quinoline	ND	2.34	2.48	95	2.25	2.48	91	70-130	4	30

[illegible]s flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00079

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Arrowhead Engineering
Project: St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297
Sample Matrix: Water

Service Request: K0500180

Surrogate Recovery Summary
Polynuclear Aromatic Hydrocarbons

Extraction Method: EPA 3520C
Analysis Method: 8270C SIM

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1	Sur2	Sur3
GW-0147	K0500180-006	94	114	106
GW-0174	K0500180-008	89	100	103
GW-0175	K0500180-009	84	101	101
GW-0176	K0500180-010	98	123	113
GW-0169	K0500180-011	90	113	102
GW-0170	K0500180-012	102	121	113
GW-0171	K0500180-013	91	105	99
GW-0153	K0500180-014	77	98	90
GW-0148	K0500180-015	88	108	100
GW-0149	K0500180-016	85	113	104
GW-0150	K0500180-017	87	118	106
GW-0151	K0500180-018	91	113	106
GW-0154	K0500180-019	83	100	87
GW-0173	K0500180-020	85	104	96
GW-0152	K0500180-021	101	120	110
GW-0172	K0500180-022	91	107	99
GW-0190	K0500180-026	82	106	99
GW-0189	K0500180-027	84	105	98
Method Blank	KWG0507646-6	103	117	115
GW-0174MS	KWG0507646-1	82	93	92
GW-0174DMS	KWG0507646-2	90	95	93
GW-0169MS	KWG0507646-3	92	106	98
GW-0169DMS	KWG0507646-4	92	106	96
Lab Control Sample	KWG0507646-5	93	106	95

Surrogate Recovery Control Limits (%)

Sur1 =	Fluorene-d10	37-107
Sur2 =	Fluoranthene-d10	18-137
Sur3 =	Terphenyl-d14	18-153

Results flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.

00078

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500180
Project:	St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Polynuclear Aromatic Hydrocarbons

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG0507646-6	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Acenaphthylene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Acenaphthene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Fluorene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Phenanthrene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Anthracene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Fluoranthene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Pyrene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Benz(a)anthracene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Chrysene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Benzo(b)fluoranthene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Benzo(k)fluoranthene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Benzo(a)pyrene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Dibenz(a,h)anthracene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Benzo(g,h,i)perylene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Quinoline	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	103	37-107	05/20/05	Acceptable
Fluoranthene-d10	117	18-137	05/20/05	Acceptable
Terphenyl-d14	115	18-153	05/20/05	Acceptable

Comments:

00077

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Arrowhead Engineering
Project: St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297
Sample Matrix: Water

Service Request: K0500180
Date Collected: 05/08/2005
Date Received: 05/11/200

Polynuclear Aromatic Hydrocarbons

Sample Name: GW-0189
Lab Code: K0500180-027

Units: ug/L
Basis: NA

Extraction Method: EPA 3520C
Analysis Method: 8270C SIM

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.020	1	05/13/05	05/23/05	KWG0507646	
Acenaphthylene	ND	U	0.020	1	05/13/05	05/23/05	KWG0507646	
Acenaphthene	ND	U	0.020	1	05/13/05	05/23/05	KWG0507646	
Fluorene	ND	U	0.020	1	05/13/05	05/23/05	KWG0507646	
Phenanthrene	ND	U	0.020	1	05/13/05	05/23/05	KWG0507646	
Anthracene	ND	U	0.020	1	05/13/05	05/23/05	KWG0507646	
Fluoranthene	ND	U	0.020	1	05/13/05	05/23/05	KWG0507646	
Pyrene	ND	U	0.020	1	05/13/05	05/23/05	KWG0507646	
Benz(a)anthracene	ND	U	0.020	1	05/13/05	05/23/05	KWG0507646	
Chrysene	ND	U	0.020	1	05/13/05	05/23/05	KWG0507646	
Benzo(b)fluoranthene	ND	U	0.020	1	05/13/05	05/23/05	KWG0507646	
Benzo(k)fluoranthene	ND	U	0.020	1	05/13/05	05/23/05	KWG0507646	
Benzo(a)pyrene	ND	U	0.020	1	05/13/05	05/23/05	KWG0507646	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	1	05/13/05	05/23/05	KWG0507646	
Dibenz(a,h)anthracene	ND	U	0.020	1	05/13/05	05/23/05	KWG0507646	
Benzo(g,h,i)perylene	ND	U	0.020	1	05/13/05	05/23/05	KWG0507646	
Quinoline	ND	U	0.020	1	05/13/05	05/23/05	KWG0507646	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	84	37-107	05/23/05	Acceptable
Fluoranthene-d10	105	18-137	05/23/05	Acceptable
Terphenyl-d14	98	18-153	05/23/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500180
Project:	St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297	**Date Collected:**	05/08/2005
Sample Matrix:	Water	**Date Received:**	05/11/2005

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0190	**Units:**	ug/L
Lab Code:	K0500180-026	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**0.39**		0.020	1	05/13/05	05/23/05	KWG0507646	
Acenaphthylene	ND	U	0.020	1	05/13/05	05/23/05	KWG0507646	
Acenaphthene	**0.58**		0.020	1	05/13/05	05/23/05	KWG0507646	
Fluorene	**0.50**		0.020	1	05/13/05	05/23/05	KWG0507646	
Phenanthrene	**0.45**		0.020	1	05/13/05	05/23/05	KWG0507646	
Anthracene	**0.044**		0.020	1	05/13/05	05/23/05	KWG0507646	
Fluoranthene	**0.084**		0.020	1	05/13/05	05/23/05	KWG0507646	
Pyrene	**0.038**		0.020	1	05/13/05	05/23/05	KWG0507646	
Benz(a)anthracene	ND	U	0.020	1	05/13/05	05/23/05	KWG0507646	
Chrysene	ND	U	0.020	1	05/13/05	05/23/05	KWG0507646	
Benzo(b)fluoranthene	ND	U	0.020	1	05/13/05	05/23/05	KWG0507646	
Benzo(k)fluoranthene	ND	U	0.020	1	05/13/05	05/23/05	KWG0507646	
Benzo(a)pyrene	ND	U	0.020	1	05/13/05	05/23/05	KWG0507646	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	1	05/13/05	05/23/05	KWG0507646	
Dibenz(a,h)anthracene	ND	U	0.020	1	05/13/05	05/23/05	KWG0507646	
Benzo(g,h,i)perylene	ND	U	0.020	1	05/13/05	05/23/05	KWG0507646	
Quinoline	ND	U	0.020	1	05/13/05	05/23/05	KWG0507646	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	82	37-107	05/23/05	Acceptable
Fluoranthene-d10	106	18-137	05/23/05	Acceptable
Terphenyl-d14	99	18-153	05/23/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Arrowhead Engineering
Project: St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297
Sample Matrix: Water

Service Request: K0500180
Date Collected: 05/07/2005
Date Received: 05/11/2005

Polynuclear Aromatic Hydrocarbons

Sample Name: GW-0172
Lab Code: K0500180-022

Units: ug/L
Basis: NA

Extraction Method: EPA 3520C
Analysis Method: 8270C SIM

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Acenaphthylene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Acenaphthene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Fluorene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Phenanthrene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Anthracene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Fluoranthene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Pyrene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Benz(a)anthracene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Chrysene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Benzo(b)fluoranthene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Benzo(k)fluoranthene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Benzo(a)pyrene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Indeno(1,2,3-cd)pyrene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Dibenz(a,h)anthracene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Benzo(g,h,i)perylene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Quinoline	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	91	37-107	05/20/05	Acceptable
Fluoranthene-d10	107	18-137	05/20/05	Acceptable
Terphenyl-d14	99	18-153	05/20/05	Acceptable

Comments:

00074

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500180
Project:	St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297	**Date Collected:**	05/07/2005
le Matrix:	Water	**Date Received:**	05/11/2005

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0152	**Units:**	ug/L
Lab Code:	K0500180-021	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.022	1	05/13/05	05/20/05	KWG0507646	
Acenaphthylene	ND	U	0.022	1	05/13/05	05/20/05	KWG0507646	
Acenaphthene	ND	U	0.022	1	05/13/05	05/20/05	KWG0507646	
Fluorene	ND	U	0.022	1	05/13/05	05/20/05	KWG0507646	
Phenanthrene	ND	U	0.022	1	05/13/05	05/20/05	KWG0507646	
Anthracene	ND	U	0.022	1	05/13/05	05/20/05	KWG0507646	
Fluoranthene	ND	U	0.022	1	05/13/05	05/20/05	KWG0507646	
Pyrene	ND	U	0.022	1	05/13/05	05/20/05	KWG0507646	
Benz(a)anthracene	ND	U	0.022	1	05/13/05	05/20/05	KWG0507646	
Chrysene	ND	U	0.022	1	05/13/05	05/20/05	KWG0507646	
Benzo(b)fluoranthene	ND	U	0.022	1	05/13/05	05/20/05	KWG0507646	
[illegible]zo(k)fluoranthene	ND	U	0.022	1	05/13/05	05/20/05	KWG0507646	
[illegible](a)pyrene	ND	U	0.022	1	05/13/05	05/20/05	KWG0507646	
Indeno(1,2,3-cd)pyrene	ND	U	0.022	1	05/13/05	05/20/05	KWG0507646	
Dibenz(a,h)anthracene	ND	U	0.022	1	05/13/05	05/20/05	KWG0507646	
Benzo(g,h,i)perylene	ND	U	0.022	1	05/13/05	05/20/05	KWG0507646	
Quinoline	ND	U	0.022	1	05/13/05	05/20/05	KWG0507646	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	101	37-107	05/20/05	Acceptable
Fluoranthene-d10	120	18-137	05/20/05	Acceptable
Terphenyl-d14	110	18-153	05/20/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Arrowhead Engineering
Project: St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297
Sample Matrix: Water

Service Request: K0500180
Date Collected: 05/07/2005
Date Received: 05/11/2005

Polynuclear Aromatic Hydrocarbons

Sample Name: GW-0173
Lab Code: K0500180-020

Units: ug/L
Basis: NA

Extraction Method: EPA 3520C
Analysis Method: 8270C SIM

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.022	1	05/13/05	05/20/05	KWG0507646	
Acenaphthylene	ND	U	0.022	1	05/13/05	05/20/05	KWG0507646	
Acenaphthene	ND	U	0.022	1	05/13/05	05/20/05	KWG0507646	
Fluorene	ND	U	0.022	1	05/13/05	05/20/05	KWG0507646	
Phenanthrene	ND	U	0.022	1	05/13/05	05/20/05	KWG0507646	
Anthracene	ND	U	0.022	1	05/13/05	05/20/05	KWG0507646	
Fluoranthene	ND	U	0.022	1	05/13/05	05/20/05	KWG0507646	
Pyrene	ND	U	0.022	1	05/13/05	05/20/05	KWG0507646	
Benz(a)anthracene	ND	U	0.022	1	05/13/05	05/20/05	KWG0507646	
Chrysene	ND	U	0.022	1	05/13/05	05/20/05	KWG0507646	
Benzo(b)fluoranthene	ND	U	0.022	1	05/13/05	05/20/05	KWG0507646	
Benzo(k)fluoranthene	ND	U	0.022	1	05/13/05	05/20/05	KWG0507646	
Benzo(a)pyrene	ND	U	0.022	1	05/13/05	05/20/05	KWG0507646	
Indeno(1,2,3-cd)pyrene	ND	U	0.022	1	05/13/05	05/20/05	KWG0507646	
Dibenz(a,h)anthracene	ND	U	0.022	1	05/13/05	05/20/05	KWG0507646	
Benzo(g,h,i)perylene	ND	U	0.022	1	05/13/05	05/20/05	KWG0507646	
Quinoline	ND	U	0.022	1	05/13/05	05/20/05	KWG0507646	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	85	37-107	05/20/05	Acceptable
Fluoranthene-d10	104	18-137	05/20/05	Acceptable
Terphenyl-d14	96	18-153	05/20/05	Acceptable

Comments:

00072

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500180
Project:	St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297	**Date Collected:**	05/08/2005
Sample Matrix:	Water	**Date Received:**	05/11/2005

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0154	**Units:**	ug/L
Lab Code:	K0500180-019	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Acenaphthylene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Acenaphthene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Fluorene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Phenanthrene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Anthracene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Fluoranthene	**0.022**		0.020	1	05/13/05	05/20/05	KWG0507646	
Pyrene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Benz(a)anthracene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Chrysene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Benzo(b)fluoranthene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Benzo(k)fluoranthene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Benzo(a)pyrene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Dibenz(a,h)anthracene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Benzo(g,h,i)perylene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Quinoline	ND	Ui	0.024	1	05/13/05	05/20/05	KWG0507646	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	83	37-107	05/20/05	Acceptable
Fluoranthene-d10	100	18-137	05/20/05	Acceptable
Terphenyl-d14	87	18-153	05/20/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Arrowhead Engineering
Project: St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297
Sample Matrix: Water

Service Request: K0500180
Date Collected: 05/07/2005
Date Received: 05/11/2005

Polynuclear Aromatic Hydrocarbons

Sample Name: GW-0151
Lab Code: K0500180-018

Units: ug/L
Basis: NA

Extraction Method: EPA 3520C
Analysis Method: 8270C SIM

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Acenaphthylene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Acenaphthene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Fluorene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Phenanthrene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Anthracene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Fluoranthene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Pyrene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Benz(a)anthracene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Chrysene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Benzo(b)fluoranthene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Benzo(k)fluoranthene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Benzo(a)pyrene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Dibenz(a,h)anthracene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Benzo(g,h,i)perylene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Quinoline	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	91	37-107	05/20/05	Acceptable
Fluoranthene-d10	113	18-137	05/20/05	Acceptable
Terphenyl-d14	106	18-153	05/20/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500180
Project:	St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297	**Date Collected:**	05/07/2005
Sample Matrix:	Water	**Date Received:**	05/11/2005

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0150	**Units:**	ug/L
Lab Code:	K0500180-017	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Acenaphthylene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Acenaphthene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Fluorene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Phenanthrene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Anthracene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Fluoranthene	**0.044**		0.021	1	05/13/05	05/20/05	KWG0507646	
Pyrene	**0.035**		0.021	1	05/13/05	05/20/05	KWG0507646	
Benz(a)anthracene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Chrysene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Benzo(b)fluoranthene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Benzo(k)fluoranthene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Benzo(a)pyrene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Indeno(1,2,3-cd)pyrene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Dibenz(a,h)anthracene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Benzo(g,h,i)perylene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Quinoline	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	87	37-107	05/20/05	Acceptable
Fluoranthene-d10	118	18-137	05/20/05	Acceptable
Terphenyl-d14	106	18-153	05/20/05	Acceptable

Comments:

00069

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Arrowhead Engineering
Project: St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297
Sample Matrix: Water

Service Request: K0500180
Date Collected: 05/07/2005
Date Received: 05/11/2005

Polynuclear Aromatic Hydrocarbons

Sample Name: GW-0149
Lab Code: K0500180-016

Units: ug/L
Basis: NA

Extraction Method: EPA 3520C
Analysis Method: 8270C SIM

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.020	1	05/13/05	05/24/05	KWG0507646	
Acenaphthylene	ND	U	0.020	1	05/13/05	05/24/05	KWG0507646	
Acenaphthene	ND	U	0.020	1	05/13/05	05/24/05	KWG0507646	
Fluorene	ND	U	0.020	1	05/13/05	05/24/05	KWG0507646	
Phenanthrene	ND	U	0.020	1	05/13/05	05/24/05	KWG0507646	
Anthracene	ND	U	0.020	1	05/13/05	05/24/05	KWG0507646	
Fluoranthene	ND	U	0.020	1	05/13/05	05/24/05	KWG0507646	
Pyrene	ND	U	0.020	1	05/13/05	05/24/05	KWG0507646	
Benz(a)anthracene	ND	U	0.020	1	05/13/05	05/24/05	KWG0507646	
Chrysene	ND	U	0.020	1	05/13/05	05/24/05	KWG0507646	
Benzo(b)fluoranthene	ND	U	0.020	1	05/13/05	05/24/05	KWG0507646	
Benzo(k)fluoranthene	ND	U	0.020	1	05/13/05	05/24/05	KWG0507646	
Benzo(a)pyrene	ND	U	0.020	1	05/13/05	05/24/05	KWG0507646	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	1	05/13/05	05/24/05	KWG0507646	
Dibenz(a,h)anthracene	ND	U	0.020	1	05/13/05	05/24/05	KWG0507646	
Benzo(g,h,i)perylene	ND	U	0.020	1	05/13/05	05/24/05	KWG0507646	
Quinoline	**0.025**		0.020	1	05/13/05	05/24/05	KWG0507646	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	85	37-107	05/24/05	Acceptable
Fluoranthene-d10	113	18-137	05/24/05	Acceptable
Terphenyl-d14	104	18-153	05/24/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500180
Project:	St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297	**Date Collected:**	05/07/2005
le Matrix:	Water	**Date Received:**	05/11/2005

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0148	**Units:**	ug/L
Lab Code:	K0500180-015	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Acenaphthylene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Acenaphthene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Fluorene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Phenanthrene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Anthracene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Fluoranthene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Pyrene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Benz(a)anthracene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Chrysene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Benzo(b)fluoranthene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Benzo(k)fluoranthene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
o(a)pyrene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Dibenz(a,h)anthracene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Benzo(g,h,i)perylene	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	
Quinoline	ND	U	0.020	1	05/13/05	05/20/05	KWG0507646	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	88	37-107	05/20/05	Acceptable
Fluoranthene-d10	108	18-137	05/20/05	Acceptable
Terphenyl-d14	100	18-153	05/20/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Arrowhead Engineering	**Service Request:**	K0500180
Project:	St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297	**Date Collected:**	05/08/2005
Sample Matrix:	Water	**Date Received:**	05/11/2005

Polynuclear Aromatic Hydrocarbons

Sample Name:	GW-0153	**Units:**	ug/L
Lab Code:	K0500180-014	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Acenaphthylene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Acenaphthene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Fluorene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Phenanthrene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Anthracene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Fluoranthene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Pyrene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Benz(a)anthracene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Chrysene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Benzo(b)fluoranthene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Benzo(k)fluoranthene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Benzo(a)pyrene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Indeno(1,2,3-cd)pyrene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Dibenz(a,h)anthracene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Benzo(g,h,i)perylene	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	
Quinoline	ND	U	0.021	1	05/13/05	05/20/05	KWG0507646	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	77	37-107	05/20/05	Acceptable
Fluoranthene-d10	98	18-137	05/20/05	Acceptable
Terphenyl-d14	90	18-153	05/20/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Arrowhead Engineering	**Service Request:**	K0500180
Project:	St. Regis Paper Co Site - 2005 Annual GW Sampling/226-00297	**Date Extracted:**	05/13/2005
Sample Matrix:	Water	**Date Analyzed:**	05/24/2005

Lab Control Spike Summary
Polynuclear Aromatic Hydrocarbons

Extraction Method:	EPA 3520C	**Units:**	ug/L
Analysis Method:	8270C SIM	**Basis:**	NA
		Level:	Low
		Extraction Lot:	KWG0507646

	Lab Control Sample KWG0507646-5 Lab Control Spike			
Analyte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
Naphthalene	2.01	2.50	81	41-115
Acenaphthylene	2.03	2.50	81	44-122
Acenaphthene	2.01	2.50	80	41-123
Fluorene	2.20	2.50	88	44-128
Phenanthrene	2.12	2.50	85	45-127
Anthracene	1.41	2.50	57	40-126
Fluoranthene	2.38	2.50	95	41-141
Pyrene	2.24	2.50	89	34-152
Benz(a)anthracene	2.01	2.50	80	46-132
Chrysene	2.18	2.50	87	46-136
Benzo(b)fluoranthene	2.23	2.50	89	54-137
Benzo(k)fluoranthene	2.12	2.50	85	54-141
Benzo(a)pyrene	1.37	2.50	55	49-133
Indeno(1,2,3-cd)pyrene	2.32	2.50	93	41-141
Dibenz(a,h)anthracene	2.23	2.50	89	39-143
Benzo(g,h,i)perylene	2.18	2.50	87	46-133
Quinoline	2.16	2.50	86	70-130

Values flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00081

17 South 13th Avenue P.O. Box 479 Kelso, Washington 98626 (360) 577-7222 ph (360) 636-1068 fax

Columbia Analytical Services INC.
An Employee - Owned Company

June 23, 2005

Service Request No: K0500914

RECEIVED
JUN 27 2005
Barr Engineering Co.

Marta Nelson
Barr Engineering
4700 West 77th Street
Minneapolis, MN 55435

RE: 23/11-005Y02 110

Dear Marta:

Enclosed are the results of the sample(s) submitted to our laboratory on June 8, 2005. For your reference, these analyses have been assigned our service request number K0500914.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAC standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3358.

Respectfully submitted,

Columbia Analytical Services, Inc.

Lynda Huckestein
Client Services Manager

LH/jeb

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
,	The analyte was found in the associated method blank at a level that is significant relative to the sample result.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a matrix interference.
X	See case narrative.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
B	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL has been elevated due to a matrix interference.
X	See case narrative.
*	The duplicate analysis not within control limits. See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results (25% for CLP Pesticides).
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a chromatographic interference.
X	See case narrative.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
)	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

Case Narrative

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	Barr Engineering Company	**Service Request No.:**	K0500914
Project:	23/11-005Y02 110	**Date Received:**	6/8/2005
Sample Matrix:	Water		

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Matrix/Duplicate Matrix Spike (MS/DMS), and Laboratory Control Sample (LCS).

Sample Receipt

Four water samples were received for analysis at Columbia Analytical Services on 6/8/2005. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Pentachlorophenol by EPA Method 8151M

Elevated Method Reporting Limits:
Sample Ads B, Ads C, and Influent required dilution due to the presence of elevated levels of target analyte. The reporting limits are adjusted to reflect the dilution.

Surrogate Exceptions:
The control criteria for the following surrogate in sample Ads B and Influent are not applicable: 4-Bromo-2,6-dichlorophenol. The analysis of the sample required a dilution, which resulted in a surrogate concentration below the Method Reporting Limit (MRL). No further corrective action was appropriate.

Approved by _____ Date 6/23/05

Chain of Custody Documentation

BARR

Chain of Custody

4700 West 77th Street
Minneapolis, MN 55435-4803
(952) 832-2600

Project Number: 23 / 11 - 005 Y02 110

№ 16395

Project Manager: **Tom Mattison**

Project Contact: **Erik Gohl**

Laboratory: **Columbia Analytical Services**

00007

Sample Identification	Collection Date	Collection Time	Matrix: Water	Matrix: Soil	Matrix: Other	Type: Grab	Type: Comp.	Type: QC	Volatile Organic (Unpres.)	Volatile Organic (Pres.)	Semivolatile Organic	Total Metals (HNO_3)	Dissolved Metals (HNO_3)	General (Unpreserved)	Cyanide (NaOH,Asc. Acid)	Nutrients (H_2SO_4)	Oil and Grease (H_2SO_4)	TOC (H_2SO_4)	Sulfide (Zn Acetate)	Dioxin	Whirlpak	Total Phenol (H_2SO_4)	Methane	(HCL)/DRO, 1L Glass	Lugols, Glass, Amber	Formalin, Glass					Total No. Of Containers	Remarks/ Analysis Required:
1. Ads A	6/7/05	Am-9:00	X			X					X																				1	PCP
2. Ads B	6/7/05	9:00	X			X					X																				1	PCP
3. Ads C	6/7/05	9:00	X			X					X																				1	PCP
4. Influent	6/7/05	9:00	X			X					X																				1	PCP
5.																																
6.																																
7.																																
8.																																
9.																																
10.																																
11.																																
12.																																
13.																																
14.																																
15.																																
16.																																

K0500914
Barr Engineering

Sampled By:	Relinquished By:	Date	Time	Received by:	Date	Time
Jamie Eidsmoe	Jamie Eidsmoe	6-7-05	900 AM	[signature] Apparatus CAS	6/8/05	1000
Remarks:	Relinquished By:	Date	Time	Received by:	Date	Time
	Samples Shipped VIA ☐ Air Freight ☐ Fed. Exp. ☐ Sampler ☐ Other			Air Bill Number: 822775788527		

H:RLG\STDFORMS\CHAINCST.CDR

Distribution: White-Original Accompanies Shipment to Lab; Yellow - Field Copy; Pink - Lab Coordinator

Rev. 08/01/01

Columbia Analytical Services Inc.
Cooler Receipt and Preservation Form

PC hh

Project/Client Barr Engineering Work Order K05 00914

Cooler received on 6/8/05 and opened on 6/8/05 by _____

1. Were custody seals on outside of coolers? Y N
   If yes, how many and where? 1 front
2. Were custody seals intact? Y N
3. Were signature and date present on the custody seals? Y N
4. Is the shipper's airbill available and filed? If no, record airbill number: _____ Y N
5. COC#

Temperature of cooler(s) upon receipt: (°C)	2.8			
Temperature Blank: (°C)	—			

Were samples hand delivered on the same day as collection? Y N

6. Were custody papers properly filled out (ink, signed, etc.)? Y N
7. Type of packing material present VOA carrier
8. **Did all bottles arrive in good condition (unbroken)?** Y N
9. Were all bottle labels complete (i.e analysis, preservation, etc.)? Y N
10. Did all bottle labels and tags agree with custody papers? Y N
11. **Were the correct types of bottles used for the tests indicated?** Y N
12. Were all of the preserved bottles received at the lab with the appropriate pH? ~~Y N~~
13. Were VOA vials checked for absence of air bubbles, and if present, noted below? Y
14. Did the bottles originate from CAS/K or a branch laboratory? Y N
15. **Are CWA Microbiology samples received with >1/2 the 24hr. hold time remaining from collection?** ~~Y N~~
16. Was C12/Res negative? ~~Y N~~

Explain any discrepancies: All samples have bubbles - not applicable

RESOLUTION: _____

Samples that required preservation or received out of temperature:

Sample ID	Reagent	Volume	Lot Number	Bottle Type	Rec'd out of Temperature	Initials

Pentachlorophenol
EPA Method 8151 Modified

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Barr Engineering	**Service Request:**	K0500914
Project:	23/11-005Y02 110	**Date Collected:**	06/07/2005
Sample Matrix:	Water	**Date Received:**	06/08/2005

Pentachlorophenol

Sample Name:	Ads A	**Units:**	ug/L
Lab Code:	K0500914-001	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	06/13/05	06/20/05	KWG0509565	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	79	35-133	06/20/05	Acceptable

Comments:

00010

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Barr Engineering	**Service Request:**	K0500914
Project:	23/11-005Y02 110	**Date Collected:**	06/07/2005
Sample Matrix:	Water	**Date Received:**	06/08/2005

Pentachlorophenol

Sample Name:	Ads B	**Units:**	ug/L
Lab Code:	K0500914-002	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	**1800**	D	50	100	06/13/05	06/20/05	KWG0509565	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	105	35-133	06/20/05	Acceptable

Comments:

00011

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Barr Engineering	**Service Request:**	K0500914
Project:	23/11-005Y02 110	**Date Collected:**	06/07/2005
Sample Matrix:	Water	**Date Received:**	06/08/200

Pentachlorophenol

Sample Name:	Ads C	**Units:**	ug/L
Lab Code:	K0500914-003	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	**120**	D	5.0	10	06/13/05	06/20/05	KWG0509565	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	61	35-133	06/20/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Barr Engineering	**Service Request:**	K0500914
Project:	23/11-005Y02 110	**Date Collected:**	06/07/2005
Sample Matrix:	Water	**Date Received:**	06/08/2005

Pentachlorophenol

Sample Name:	Influent	**Units:**	ug/L
Lab Code:	K0500914-004	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	**2700**	D	50	100	06/13/05	06/20/05	KWG0509565	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	60	35-133	06/20/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Barr Engineering	**Service Request:**	K0500914
Project:	23/11-005Y02 110	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Pentachlorophenol

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG0509565-4	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	06/13/05	06/20/05	KWG0509565	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	78	35-133	06/20/05	Acceptable

Comments:

00014

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Barr Engineering
Project: 23/11-005Y02 110
Sample Matrix: Water

Service Request: K0500914

Surrogate Recovery Summary
Pentachlorophenol

Extraction Method: METHOD
Analysis Method: 8151M

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1
Ads A	K0500914-001	79
Ads B	K0500914-002	105 D #
Ads C	K0500914-003	61 D
Influent	K0500914-004	60 D #
Method Blank	KWG0509565-4	78
Ads AMS	KWG0509565-1	70
Ads ADMS	KWG0509565-2	72
Lab Control Sample	KWG0509565-3	82

Surrogate Recovery Control Limits (%)

Sur1 = 4-Bromo-2,6-dichlorophenol 35-133

Results flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.

00015

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Barr Engineering	**Service Request:**	K0500914
Project:	23/11-005Y02 110	**Date Extracted:**	06/13/2005
Sample Matrix:	Water	**Date Analyzed:**	06/20/2005

Matrix Spike/Duplicate Matrix Spike Summary
Pentachlorophenol

Sample Name:	Ads A	**Units:**	ug/L
Lab Code:	K0500914-001	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M	**Extraction Lot:**	KWG0509565

		Ads AMS KWG0509565-1 Matrix Spike			Ads ADMS KWG0509565-2 Duplicate Matrix Spike					
Analyte Name	**Sample Result**	**Result**	**Expected**	**%Rec**	**Result**	**Expected**	**%Rec**	**%Rec Limits**	**RPD**	**RPD Limit**
Pentachlorophenol	ND	6.94	10.0	69	9.28	10.0	93	34-124	29	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00016

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Barr Engineering
Project: 23/11-005Y02 110
Sample Matrix: Water

Service Request: K0500914
Date Extracted: 06/13/2005
Date Analyzed: 06/20/2005

Lab Control Spike Summary
Pentachlorophenol

Extraction Method: METHOD
Analysis Method: 8151M

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG0509565

	Lab Control Sample KWG0509565-3 Lab Control Spike			
Analyte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
Pentachlorophenol	8.01	10.0	80	44-116

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00017

SEVERN TRENT STL

STL Sacramento
880 Riverside Parkway
West Sacramento, CA 95605

Tel: 916 373 5600 Fax: 916 372 1059
www.stl-inc.com

July 25, 2005

STL SACRAMENTO PROJECT NUMBER: G5G060272
PO/CONTRACT:

Erik Gohl
Barr Engineering Co.
4700 West 77th Street
Minneapolis, MN 55435-4803

RECEIVED
AUG 01 2005
BARR
ENGINEERING CO.

Dear Mr. Gohl,

This report contains the analytical results for the sample received under chain of custody by STL Sacramento on July 6, 2005. This sample is associated with your 23/11-005Y02110 project.

The test results in this report meet all NELAC requirements for parameters that accreditation is required or available. Any exceptions to NELAC requirements are noted in the case narrative. The case narrative is an integral part of this report.

If you have any questions, please feel free to call me at (916) 374-4433.

Sincerely,

Robert Hrabak
Project Manager

CASE NARRATIVE

STL SACRAMENTO PROJECT NUMBER G5G060272

There were no anomalies associated with this project.

SEVERN TRENT STL

ACCREDITED IN ACCORDANCE WITH nelac

STL Sacramento Certifications/Accreditations

Certifying State	Certificate #	Certifying State	Certificate #
Alaska	UST-055	Oregon*	CA 200005
Arizona	AZ0616	Pennsylvania	68-1272
Arkansas	04-067-0	South Carolina	87014002
California*	01119CA	Texas	TX 270-2004A
Colorado	NA	Utah*	QUAN1
Connecticut	PH-0691	Virginia	00178
Florida*	E87570	Washington	C087
Georgia	960	West Virginia	9930C, 334
Hawaii	NA	Wisconsin	998204680
Louisiana*	01944	NFESC	NA
Michigan	9947	USACE	NA
Nevada	CA44	USDA Foreign Plant	37-82605
New Jersey*	CA005	USDA Foreign Soil	S-46613
New York*	11666		

*NELAP accredited. A more detailed parameter list is available upon request. Updated 1/27/05

QC Parameter Definitions

QC Batch: The QC batch consists of a set of up to 20 field samples that behave similarly (i.e., same matrix) and are processed using the same procedures, reagents, and standards at the same time.

Method Blank: An analytical control consisting of all reagents, which may include internal standards and surrogates, and is carried through the entire analytical procedure. The method blank is used to define the level of laboratory background contamination.

Laboratory Control Sample and Laboratory Control Sample Duplicate (LCS/LCSD): An aliquot of blank matrix spiked with known amounts of representative target analytes. The LCS (and LCSD as required) is carried through the entire analytical process and is used to monitor the accuracy of the analytical process independent of potential matrix effects. If an LCSD is performed, it may also used to evaluate the precision of the process.

Duplicate Sample (DU): Different aliquots of the same sample are analyzed to evaluate the precision of an analysis.

Surrogates: Organic compounds not expected to be detected in field samples, which behave similarly to target analytes. These are added to every sample within a batch at a known concentration to determine the efficiency of the sample preparation and analytical process.

Matrix Spike and Matrix Spike Duplicate (MS/MSD): An MS is an aliquot of a matrix fortified with known quantities of specific compounds and subjected to an entire analytical procedure in order to indicate the appropriateness of the method for a particular matrix. The percent recovery for the respective compound(s) is then calculated. The MSD is a second aliquot of the same matrix as the matrix spike, also spiked, in order to determine the precision of the method.

Isotope Dilution: For isotope dilution methods, isotopically labeled analogs (internal standards) of the native target analytes are spiked into the sample at time of extraction. These internal standards are used for quantitation, and monitor and correct for matrix effects. Since matrix effects on method performance can be judged by the recovery of these analogs, there is little added benefit of performing MS/MSD for these methods. MS/MSD are only performed for client or QAPP requirements.

Control Limits: The reported control limits are either based on laboratory historical data, method requirements, or project data quality objectives. The control limits represent the estimated uncertainty of the test results.

SAMPLE SUMMARY

G5G060272

WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
HE0C3	001	INLFUENT	07/05/05	09:00

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

G5C000272

Chain of Custody

BARR

4700 West 77th Street
Minneapolis, MN 55435-4803
(952) 832-2600

Project Number: 23 / 11 - 005 Y02 110

№ 16368

Project Manager: Tom Mattison

Project Contact: Erik Gohl

Laboratory: Severn Trent

Number of Containers/Preservative

Sample Identification	Collection Date	Collection Time	Matrix: Water	Matrix: Soil	Matrix: Other	Type: Grab	Type: Comp.	Type: QC	Volatile Organic (Unpres.)	Volatile Organic (Pres.)	Semivolatile Organic	Total Metals (HNO_3)	Dissolved Metals (HNO_3)	General (Unpreserved)	Cyanide (NaOH, Asc. Acid)	Nutrients (H_2SO_4)	Oil and Grease (H_2SO_4)	TOC (H_2SO_4)	Sulfide (Zn Acetate)	Dioxin	Whirlpak	Total Phenol (H_2SO_4)	Methane	(HCL)/DRO, 1L Glass	Lugols, Glass, Amber	Formalin, Glass					Total No. Of Containers	Remarks/ Analysis Required:
1. InFluent	7/5/05	Am 900	X			X					X																				2	Dioxin
2.																																
3.																																
4.																																
5.																																
6.																																
7.																																
8.																																
9.																																
10.																																
11.																																
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13.																																
14.																																
15.																																
16.																																

Sampled By: J. Eidsmoe

Remarks:

Relinquished By:	Date	Time	Received by:	Date	Time
[signature]	7-5-05	900 am	[signature]	[illegible]	[illegible]
Relinquished By:	Date	Time	Received by:	Date	Time
Samples Shipped VIA ☐ Air Freight ☐ Fed. Exp. ☐ Sampler ☐ Other			Air Bill Number: 822775788674		

Distribution: White-Original Accompanies Shipment to Lab; Yellow - Field Copy; Pink - Lab Coordinator

Rev. 08/01/01

H:RLG\STDFORMS\CHAINCST.CDR

STL Sacramento (916) 670-5600

4 of 10

SEVERN TRENT STL

LOT RECEIPT CHECKLIST
STL Sacramento

CLIENT Barr Engineering PM BK LOG # _____

LOT# (QUANTIMS ID) G5G060272 QUOTE# 27945 LOCATION WI/A

		Initials	Date
DATE RECEIVED 7/6/05 TIME RECEIVED 8:15		AN	7/6/05
DELIVERED BY	☑ FEDEX ☐ CA OVERNIGHT ☐ CLIENT ☐ AIRBORNE ☐ GOLDENSTATE ☐ DHL ☐ UPS ☐ BAX GLOBAL ☐ GO-GETTERS ☐ STL COURIER ☐ COURIERS ON DEMAND ☐ OTHER		
CUSTODY SEAL STATUS	☐ INTACT ☐ BROKEN ☑ N/A		
CUSTODY SEAL #(S)	N/A		
SHIPPPING CONTAINER(S)	☐ STL ☑ CLIENT ☐ N/A		
TEMPERTURE RECORD (IN °C)	IR 1☐ 3☑ ☐ OTHER _____		
COC #(S)	N/A		
TEMPERATURE BLANK	Observed: N/A Corrected: N/A		
SAMPLE TEMPERATURE	Observed: 2 3 ____ Average: 2.5 Corrected Average: N/A		
COLLECTOR'S NAME:	☐ Verified from COC ☑ Not on COC		
pH MEASURED	☐ YES ☐ ANOMALY ☑ N/A		
LABELED BY			
LABELS CHECKED BY			
PEER REVIEW	☑ NA		
SHORT HOLD TEST NOTIFICATION	SAMPLE RECEIVING		
	WETCHEM ☑ N/A		
	VOA-ENCORES ☑ N/A		
☐ METALS NOTIFIED OF FILTER/PRESERVE VIA VERBAL & EMAIL	☑ N/A		
☑ COMPLETE SHIPMENT RECEIVED IN GOOD CONDITION WITH APPROPRIATE TEMPERATURES, CONTAINERS, PRESERVATIVES	☐ N/A		
☐ Clouseau	☐ TEMPERATURE EXCEEDED (2 °C – 6 °C)*1 ☑ N/A		
☐ WET ICE	☐ BLUE ICE ☐ GEL PACK ☐ NO COOLING AGENTS USED ☐ PM NOTIFIED		

Notes: _____

*1 Acceptable temperature range for State of Wisconsin samples is < 4°C

Barr Engineering Company

Client Sample ID: INLFUENT

Trace Level Organic Compounds

Lot-Sample #...: G5G060272-001 Work Order #...: HE0C31AA Matrix.....: WATER
Date Sampled...: 07/05/05 Date Received..: 07/06/05
Prep Date.....: 07/12/05 Analysis Date..: 07/14/05
Prep Batch #...: 5193163
Dilution Factor: 1

PARAMETER	RESULT	DETECTION LIMIT	UNITS	METHOD
Total HxCDD	ND	0.48	ng/L	SW846 8280A

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-1,2,3,6,7,8-HxCDD	93	(25 - 150)

QC DATA ASSOCIATION SUMMARY

G5G060272

Sample Preparation and Analysis Control Numbers

SAMPLE#	MATRIX	ANALYTICAL METHOD	LEACH BATCH #	PREP BATCH #	MS RUN#
001	WATER	SW846 8280A		5193163	

METHOD BLANK REPORT

Trace Level Organic Compounds

Client Lot #...: G5G060272 Work Order #...: HE9H91AA Matrix.....: WATER
MB Lot-Sample #: G5G120000-163

Prep Date.....: 07/12/05
Analysis Date..: 07/14/05 Prep Batch #...: 5193163
Dilution Factor: 1

PARAMETER	RESULT	DETECTION LIMIT	UNITS	METHOD
Total HxCDD	ND	0.16	ng/L	SW846 8280A

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-1,2,3,6,7,8-HxCDD	85	(25 - 150)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

Trace Level Organic Compounds

Client Lot #...: G5G060272 **Work Order #...:** HE9H91AC **Matrix.....:** WATER
LCS Lot-Sample#: G5G120000-163
Prep Date.....: 07/12/05 **Analysis Date..:** 07/14/05
Prep Batch #...: 5193163
Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	METHOD
1,2,3,6,7,8-HxCDD	**103**	**(63 - 131)**	**SW846 8280A**

INTERNAL STANDARD	PERCENT RECOVERY	RECOVERY LIMITS
13C-1,2,3,6,7,8-HxCDD	95	(25 - 150)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE DATA REPORT

Trace Level Organic Compounds

Client Lot #...: G5G060272 **Work Order #...:** HE9H91AC **Matrix.....:** WATER
LCS Lot-Sample#: G5G120000-163
Prep Date.....: 07/12/05 **Analysis Date..:** 07/14/05
Prep Batch #...: 5193163
Dilution Factor: 1

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	METHOD
1,2,3,6,7,8-HxCDD	**62.5**	**64.4**	**ng/L**	**103**	**SW846 8280A**

INTERNAL STANDARD	PERCENT RECOVERY	RECOVERY LIMITS
13C-1,2,3,6,7,8-HxCDD	95	(25 - 150)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

1317 South 13th Avenue P.O. Box 479 Kelso, Washington 98626 (360) 577-7222 ph (360) 636-1068 fax

Columbia Analytical Services INC.
An Employee - Owned Company

RECEIVED
JUL 29 2005
Barr Engineering Co.

July 25, 2005

Service Request No: K0501686

Marta Nelson
Barr Engineering
4700 West 77th Street
Minneapolis, MN 55435

RE: 23/11-005Y02 110

Dear Marta:

Enclosed are the results of the sample(s) submitted to our laboratory on July 6, 2005. For your reference, these analyses have been assigned our service request number K0501686.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAC standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3358.

Respectfully submitted,

Columbia Analytical Services, Inc.

Lynda Huckestein
Client Services Manager

LH/jeb

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	*Practical Quantitation Limit*
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a matrix interference.
X	See case narrative.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
B	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL has been elevated due to a matrix interference.
X	See case narrative.
*	The duplicate analysis not within control limits. See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results (25% for CLP Pesticides).
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a chromatographic interference.
X	See case narrative.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

Case Narrative

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	Barr Engineering Company	**Service Request No.:**	K0501686
Project:	23/11-005Y02 110	**Date Received:**	7/6/2005
Sample Matrix:	Water		

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Matrix/Duplicate Matrix Spike (MS/DMS), and Laboratory Control Sample (LCS).

Sample Receipt

Four water samples were received for analysis at Columbia Analytical Services on 7/6/2005. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Pentachlorophenol by EPA Method 8151M

Elevated Method Reporting Limits:
Samples Abs B, Abs C, and Influent required dilution due to the presence of elevated levels of target analyte. The reporting limits are adjusted to reflect the dilution.

Surrogate Exceptions:
The control criteria for the following surrogate in sample Abs B and Influent are not applicable: 4-Bromo-2,6-dichlorophenol. The analysis of the sample required a dilution, which resulted in a surrogate concentration below the Method Reporting Limit (MRL). No further corrective action was appropriate.

Polynuclear Aromatic Hydrocarbons by EPA Method 8270C

Lab Control Sample Exceptions:
The control criterion was exceeded for the following analyte in the replicate Laboratory Control Sample (LCS) analyses (KWG0511183-1 and KWG0511183-2): Benzo(a)pyrene. Since the problem may indicate a potential bias in the analytical batch, all associated field samples were re-extracted 3 days past the recommended hold time and reanalyzed. The LCS met control criteria for the reanalysis. Note the results for the field samples were comparable for both determinations, which indicates the problem with the initial analysis was restricted to the LCS. Therefore, the results from the original analysis are reported. The data is flagged to indicate the problem.

Relative Percent Difference Exceptions:
The Relative Percent Difference (RPD) for the following analyte in the replicate Laboratory Control Sample (LCS) analyses (KWG0511183-1 and KWG0511183-2) was outside control criteria: Benzo(a)pyrene. The analyte in question was not detected in the associated field sample for either the original or re-extracted analyses. The data quality is not significantly affected. No further corrective action was taken.

Approved by _____ Date 7/25/05

Chain of Custody Documentation

K0501606

BARR

Chain of Custody

4700 West 77th Street
Minneapolis, MN 55435-4803
(952) 832-2600

Project Number: 23/11-005Y02 110

№ 16396

Project Manager: **Tom Mattison**

Project Contact: **Erik Gohl**

Laboratory: **Columbia Analytical Services**

00007

Sample Identification	Collection Date	Collection Time	Matrix: Water	Matrix: Soil	Matrix: Other	Type: Grab	Type: Comp.	Type: QC	Volatile Organic (Unpres.)	Volatile Organic (Pres.)	Semivolatile Organic	Total Metals (HNO_3)	Dissolved Metals (HNO_3)	General (Unpreserved)	Cyanide (NaOH, Asc. Acid)	Nutrients (H_2SO_4)	Oil and Grease (H_2SO_4)	TOC (H_2SO_4)	Sulfide (Zn Acetate)	Dioxin	Whirlpak	Total Phenol (H_2SO_4)	Methane	(HCL)/DRO, 1L Glass	Lugols, Glass, Amber	Formalin, Glass					Total No. Of Containers	Remarks/ Analysis Required:
1. Ads A	7/5/05	Am 9.00	X			X					X																				1	PCP
2. Ads B	7/5/05	9.00	X			X					X																				1	PCP
3. Ads C	7/5/05	9.00	X			X					X																				1	PCP
4. Influent	7/5/05	9.00	X			X					X																				1	PCP
5. Ads A	7/5/05	9.00	X			X					X																				4	P.A.H see attached list
6.																																
7.																																
8.																																
9.																																
10.																																
11.																																
12.																																
13.																																
14.																																
15.																																
16.																																

Sampled By: JAMIE Eidsmoo

Remarks:

Relinquished By:	Date	Time	Received by:	Date	Time
Jamie Eidsmoo	7-5-05	9.00	Amanda Juell - CAS	7/6/05	1100
Relinquished By:	Date	Time	Received by:	Date	Time
Samples Shipped VIA ☐ Air Freight ☐ Fed. Exp. ☐ Sampler ☐ Other			Air Bill Number: 822775788549		

Distribution: White-Original Accompanies Shipment to Lab; Yellow - Field Copy; Pink - Lab Coordinator

Rev. 08/01/01

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Columbia Analytical Services Inc.
Cooler Receipt and Preservation Form

PC Lynda

Project/Client Burr Eng. Work Order K05 011686

Cooler received on 7/6/05 and opened on 7/6/05 by TBlanc

1. Were custody seals on outside of coolers? Y N
   If yes, how many and where? 1 front
2. Were custody seals intact? Y N
3. Were signature and date present on the custody seals? Y N
4. Is the shipper's airbill available and filed? If no, record airbill number: 8227757885-49 Y N
5. COC#

Temperature of cooler(s) upon receipt: (°C)	2.7			
Temperature Blank: (°C)	n/a			

Were samples hand delivered on the same day as collection? Y N

6. Were custody papers properly filled out (ink, signed, etc.)? Y N
7. Type of packing material present bmap - loose ice
8. **Did all bottles arrive in good condition (unbroken)?** Y N
9. Were all bottle labels complete (i.e analysis, preservation, etc.)? Y N
10. Did all bottle labels and tags agree with custody papers? Y N
11. **Were the correct types of bottles used for the tests indicated?** Y N
12. Were all of the preserved bottles received at the lab with the appropriate pH? ~~Y~~ N
13. Were VOA vials checked for absence of air bubbles, and if present, noted below? ~~Y~~ N
14. Did the bottles originate from CAS/K or a branch laboratory? Y N
15. **Are CWA Microbiology samples received with >1/2 the 24hr. hold time remaining from collection?** ~~Y~~ N
16. Was C12/Res negative? Y N

Explain any discrepancies:

RESOLUTION:

Samples that required preservation or received out of temperature:

Sample ID	Reagent	Volume	Lot Number	Bottle Type	Rec'd out of Temperature	Initials

Pentachlorophenol
EPA Method 8151 Modified

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Barr Engineering	**Service Request:**	K0501686
Project:	23/11-005Y02 110	**Date Collected:**	07/05/2005
Sample Matrix:	Water	**Date Received:**	07/06/2005

Pentachlorophenol

Sample Name:	Ads A	**Units:**	ug/L
Lab Code:	K0501686-001	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	07/08/05	07/12/05	KWG0511202	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	77	35-133	07/12/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Barr Engineering	**Service Request:**	K0501686
Project:	23/11-005Y02 110	**Date Collected:**	07/05/2005
Sample Matrix:	Water	**Date Received:**	07/06/2005

Pentachlorophenol

Sample Name:	Ads B	**Units:**	ug/L
Lab Code:	K0501686-002	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	**1500**	D	100	200	07/08/05	07/12/05	KWG0511202	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	0	35-133	07/12/05	Outside Control Limits

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Barr Engineering	**Service Request:**	K0501686
Project:	23/11-005Y02 110	**Date Collected:**	07/05/2005
Sample Matrix:	Water	**Date Received:**	07/06/2005

Pentachlorophenol

Sample Name:	Ads C	**Units:**	ug/L
Lab Code:	K0501686-003	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	**300**	D	25	50	07/08/05	07/12/05	KWG0511202	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	84	35-133	07/12/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Barr Engineering	**Service Request:**	K0501686
Project:	23/11-005Y02 110	**Date Collected:**	07/05/2005
Sample Matrix:	Water	**Date Received:**	07/06/2005

Pentachlorophenol

Sample Name:	Influent	**Units:**	ug/L
Lab Code:	K0501686-004	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	**2100**	D	100	200	07/08/05	07/12/05	KWG0511202	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	0	35-133	07/12/05	Outside Control Limits

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Barr Engineering	**Service Request:**	K0501686
Project:	23/11-005Y02 110	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Pentachlorophenol

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG0511202-4	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	07/08/05	07/12/05	KWG0511202	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	88	35-133	07/12/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Barr Engineering
Project: 23/11-005Y02 110
Sample Matrix: Water

Service Request: K0501686

Surrogate Recovery Summary
Pentachlorophenol

Extraction Method: METHOD
Analysis Method: 8151M

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1
Ads A	K0501686-001	77
Ads B	K0501686-002	0 D #
Ads C	K0501686-003	84 D
Influent	K0501686-004	0 D #
Method Blank	KWG0511202-4	88
Ads AMS	KWG0511202-1	83
Ads ADMS	KWG0511202-2	82
Lab Control Sample	KWG0511202-3	84

Surrogate Recovery Control Limits (%)

Sur1 = 4-Bromo-2,6-dichlorophenol 35-133

Results flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.

00015

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Barr Engineering	**Service Request:**	K0501686
Project:	23/11-005Y02 110	**Date Extracted:**	07/08/2005
Sample Matrix:	Water	**Date Analyzed:**	07/12/2005

Matrix Spike/Duplicate Matrix Spike Summary
Pentachlorophenol

Sample Name:	Ads A	**Units:**	ug/L
Lab Code:	K0501686-001	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M	**Extraction Lot:**	KWG0511202

		Ads AMS KWG0511202-1 Matrix Spike			Ads ADMS KWG0511202-2 Duplicate Matrix Spike					
Analyte Name	**Sample Result**	**Result**	**Expected**	**%Rec**	**Result**	**Expected**	**%Rec**	**%Rec Limits**	**RPD**	**RPD Limit**
Pentachlorophenol	ND	8.06	10.0	81	8.03	10.0	80	34-124	0	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00016

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Barr Engineering	**Service Request:**	K0501686
Project:	23/11-005Y02 110	**Date Extracted:**	07/08/2005
ple Matrix:	Water	**Date Analyzed:**	07/12/2005

Lab Control Spike Summary
Pentachlorophenol

Extraction Method:	METHOD	**Units:**	ug/L
Analysis Method:	8151M	**Basis:**	NA
		Level:	Low
		Extraction Lot:	KWG0511202

	Lab Control Sample KWG0511202-3 Lab Control Spike			
Analyte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
Pentachlorophenol	8.38	10.0	84	44-116

lts flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00017

Semi-Volatile Organic Compounds
EPA Method 8270C

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Barr Engineering	**Service Request:**	K0501686
Project:	23/11-005Y02 110	**Date Collected:**	07/05/2005
Sample Matrix:	Water	**Date Received:**	07/06/2005

Polynuclear Aromatic Hydrocarbons

Sample Name:	Ads A	**Units:**	ug/L
Lab Code:	K0501686-001	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.020	1	07/07/05	07/13/05	KWG0511183	
Acenaphthylene	ND	U	0.020	1	07/07/05	07/13/05	KWG0511183	
Acenaphthene	ND	U	0.020	1	07/07/05	07/13/05	KWG0511183	
Fluorene	ND	U	0.020	1	07/07/05	07/13/05	KWG0511183	
Phenanthrene	ND	U	0.020	1	07/07/05	07/13/05	KWG0511183	
Anthracene	ND	U	0.020	1	07/07/05	07/13/05	KWG0511183	
Fluoranthene	ND	U	0.020	1	07/07/05	07/13/05	KWG0511183	
Pyrene	ND	U	0.020	1	07/07/05	07/13/05	KWG0511183	
Benz(a)anthracene	ND	U	0.020	1	07/07/05	07/13/05	KWG0511183	
Chrysene	ND	U	0.020	1	07/07/05	07/13/05	KWG0511183	
Benzo(b)fluoranthene	ND	U	0.020	1	07/07/05	07/13/05	KWG0511183	
Benzo(k)fluoranthene	ND	U	0.020	1	07/07/05	07/13/05	KWG0511183	
Benzo(a)pyrene	ND	U	0.020	1	07/07/05	07/13/05	KWG0511183	*
Indeno(1,2,3-cd)pyrene	ND	U	0.020	1	07/07/05	07/13/05	KWG0511183	
Dibenz(a,h)anthracene	ND	U	0.020	1	07/07/05	07/13/05	KWG0511183	
Benzo(g,h,i)perylene	ND	U	0.020	1	07/07/05	07/13/05	KWG0511183	
Quinoline	ND	U	0.020	1	07/07/05	07/13/05	KWG0511183	

* See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	100	24-111	07/13/05	Acceptable
Fluoranthene-d10	105	26-123	07/13/05	Acceptable
Terphenyl-d14	109	25-146	07/13/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Barr Engineering	**Service Request:**	K0501686
Project:	23/11-005Y02 110	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Polynuclear Aromatic Hydrocarbons

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG0511183-3	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.020	1	07/07/05	07/13/05	KWG0511183	
Acenaphthylene	ND	U	0.020	1	07/07/05	07/13/05	KWG0511183	
Acenaphthene	ND	U	0.020	1	07/07/05	07/13/05	KWG0511183	
Fluorene	ND	U	0.020	1	07/07/05	07/13/05	KWG0511183	
Phenanthrene	ND	U	0.020	1	07/07/05	07/13/05	KWG0511183	
Anthracene	ND	U	0.020	1	07/07/05	07/13/05	KWG0511183	
Fluoranthene	ND	U	0.020	1	07/07/05	07/13/05	KWG0511183	
Pyrene	ND	U	0.020	1	07/07/05	07/13/05	KWG0511183	
Benz(a)anthracene	ND	U	0.020	1	07/07/05	07/13/05	KWG0511183	
Chrysene	ND	U	0.020	1	07/07/05	07/13/05	KWG0511183	
Benzo(b)fluoranthene	ND	U	0.020	1	07/07/05	07/13/05	KWG0511183	
Benzo(k)fluoranthene	ND	U	0.020	1	07/07/05	07/13/05	KWG0511183	
Benzo(a)pyrene	ND	U	0.020	1	07/07/05	07/13/05	KWG0511183	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	1	07/07/05	07/13/05	KWG0511183	
Dibenz(a,h)anthracene	ND	U	0.020	1	07/07/05	07/13/05	KWG0511183	
Benzo(g,h,i)perylene	ND	U	0.020	1	07/07/05	07/13/05	KWG0511183	
Quinoline	ND	U	0.020	1	07/07/05	07/13/05	KWG0511183	

* See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	107	24-111	07/13/05	Acceptable
Fluoranthene-d10	115	26-123	07/13/05	Acceptable
Terphenyl-d14	121	25-146	07/13/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Barr Engineering
Project: 23/11-005Y02 110
Sample Matrix: Water

Service Request: K0501686

Surrogate Recovery Summary
Polynuclear Aromatic Hydrocarbons

Extraction Method: EPA 3520C
Analysis Method: 8270C SIM

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1	Sur2	Sur3
Ads A	K0501686-001	100	105	109
Method Blank	KWG0511183-3	107	115	121
Lab Control Sample	KWG0511183-1	94	100	95
Duplicate Lab Control Sample	KWG0511183-2	101	111	105

Surrogate Recovery Control Limits (%)

Sur1 =	Fluorene-d10	24-111
Sur2 =	Fluoranthene-d10	26-123
Sur3 =	Terphenyl-d14	25-146

s flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Barr Engineering
Project: 23/11-005Y02 110
Sample Matrix: Water

Service Request: K0501686
Date Extracted: 07/07/2005
Date Analyzed: 07/13/2005

Lab Control Spike/Duplicate Lab Control Spike Summary
Polynuclear Aromatic Hydrocarbons

Extraction Method: EPA 3520C
Analysis Method: 8270C SIM

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG0511183

	Lab Control Sample KWG0511183-1 Lab Control Spike			Duplicate Lab Control Sample KWG0511183-2 Duplicate Lab Control Spike					
Analyte Name	**Result**	**Expected**	**%Rec**	**Result**	**Expected**	**%Rec**	**%Rec Limits**	**RPD**	**RPD Limit**
Naphthalene	1.95	2.50	78	1.87	2.50	75	32-124	4	30
Acenaphthylene	1.95	2.50	78	1.83	2.50	73	36-128	6	30
Acenaphthene	1.99	2.50	80	1.92	2.50	77	36-126	3	30
Fluorene	1.98	2.50	79	1.96	2.50	78	41-130	1	30
Phenanthrene	2.04	2.50	82	1.96	2.50	78	43-129	4	30
Anthracene	1.59	2.50	63	1.21	2.50	48	36-131	27	30
Fluoranthene	1.99	2.50	80	1.99	2.50	80	45-139	0	30
Pyrene	2.04	2.50	82	2.01	2.50	80	38-143	1	30
Benz(a)anthracene	1.85	2.50	74	1.72	2.50	69	45-131	7	30
Chrysene	2.04	2.50	81	2.01	2.50	80	47-132	1	30
Benzo(b)fluoranthene	2.10	2.50	84	2.14	2.50	86	51-135	2	30
Benzo(k)fluoranthene	2.05	2.50	82	2.08	2.50	83	46-139	2	30
Benzo(a)pyrene	0.892	2.50	36 *	0.535	2.50	21 *	40-138	50 *	30
Indeno(1,2,3-cd)pyrene	1.85	2.50	74	1.83	2.50	73	35-148	1	30
Dibenz(a,h)anthracene	1.94	2.50	78	1.90	2.50	76	42-143	2	30
Benzo(g,h,i)perylene	1.99	2.50	80	1.98	2.50	79	42-139	0	30
Quinoline	1.48	2.50	59	1.53	2.50	61	46-125	3	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00022

1317 South 13th Avenue P.O. Box 479 Kelso, Washington 98626 (360) 577-7222 ph (360) 636-1068 fax

Columbia Analytical Services INC.
An Employee - Owned Company

September 15, 2005

Service Request No: K0503284

Marta Nelson
Barr Engineering
4700 West 77th Street
Minneapolis, MN 55435

RECEIVED
SEP 16 2005
BARR ENGINEERING CO.

RE: 23/11-005Y02 110

Dear Marta:

Enclosed are the results of the sample(s) submitted to our laboratory on August 23, 2005. For your reference, these analyses have been assigned our service request number K0503284.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAC standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3358.

Respectfully submitted,

Columbia Analytical Services, Inc.

Lynda Huckestein
Client Services Manager

LH/jeb

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a matrix interference.
X	See case narrative.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
B	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL has been elevated due to a matrix interference.
X	See case narrative.
*	The duplicate analysis not within control limits. See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results (25% for CLP Pesticides).
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a chromatographic interference.
X	See case narrative.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

Case Narrative

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	Barr Engineering Company	**Service Request No.:**	K0503284
Project:	23/11-005Y02 110	**Date Received:**	8/23/2005
Sample Matrix:	Water		

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Matrix/Duplicate Matrix Spike (MS/DMS), and Laboratory Control Sample (LCS).

Sample Receipt

Four water samples were received for analysis at Columbia Analytical Services on 8/23/2005. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Pentachlorophenol by EPA Method 8151M

Continuing Calibration Verification Exceptions:
The primary evaluation criterion was exceeded for the following analytes in Continuing Calibration Verification (CCV) 0831F018 and 0831F028: 4-Bromo-2,6-dichlorophenol. In accordance with CAS standard operating procedures, the alternative evaluation specified in the EPA method was performed using the average percent recovery of all analytes in the verification standard. The standard meets the alternative evaluation criteria.

Surrogate Exceptions:
The control criteria for the following surrogate in sample Influent are not applicable: 4-Bromo-2,6-dichlorophenol. The analysis of the sample required a dilution, which resulted in a surrogate concentration below the Method Reporting Limit (MRL). No further corrective action was appropriate.

Elevated Method Reporting Limits:
Samples Ads C and Influent required dilution due to the presence of elevated levels of target analyte. The reporting limits are adjusted to reflect the dilution.

Approved by LAI Date 9/15/05

Chain of Custody Documentation

KOS 3284

BARR

Chain of Custody

4700 West 77th Street
Minneapolis, MN 55435-4803
(952) 832-2600

Project Number: 23 / 11 - 005 Y02 110

№ 16398

Project Manager: Tom Mattison

Project Contact: Erik Gohl

Laboratory: Columbia Analytical Services

00007

Sample Identification	Collection Date	Collection Time	Matrix: Water	Matrix: Soil	Matrix: Other	Type: Grab	Type: Comp.	Type: QC	Volatile Organic (Unpres.)	Volatile Organic (Pres.)	Semivolatile Organic	Total Metals (HNO_3)	Dissolved Metals (HNO_3)	General (Unpreserved)	Cyanide (NaOH, Asc. Acid)	Nutrients (H_2SO_4)	Oil and Grease (H_2SO_4)	TOC (H_2SO_4)	Sulfide (Zn Acetate)	Dioxin	Whirlpak	Total Phenol (H_2SO_4)	Methane	(HCL)/DRO, 1L Glass	Lugols, Glass, Amber	Formalin, Glass					Total No. Of Containers	Remarks/ Analysis Required:
1. Ads A	8/22/05	Am 10.00	X			X					X																				1	PCP
2. Ads B	8/22/05	10.00	X			X					X																				1	PCP
3. Ads C	8/22/05	10.00	X			X					X																				1	PCP
4. Influent	8/22/05	10.00	X			X					X																				1	PCP
5.																																
6.																																
7.																																
8.																																
9.																																
10.																																
11.																																
12.																																
13.																																
14.																																
15.																																
16.																																

Sampled By: JAMIE Eidsmoe

Remarks:

Relinquished By:	Date	Time	Received by:	Date	Time
Jamie Eidsmoe	8-22-05	10.00 Am			
Relinquished By:	Date	Time	Received by: [signature] CAS	Date 8/23/05	Time 1000
Samples Shipped VIA ☐ Air Freight ☐ Fed. Exp. ☐ Sampler ☐ Other			Air Bill Number: 822775788593		

Distribution: White-Original Accompanies Shipment to Lab; Yellow - Field Copy; Pink - Lab Coordinator

Rev. 08/01/01

H:RLG\STDFORMS\CHAINCST.CDR

Columbia Analytical Services Inc.
Cooler Receipt and Preservation Form

PC Lynda

Project/Client Barr Eng. Work Order K05 3284

Cooler received on 8/23/05 and opened on 8/23/05 by A. Jurell

1. Were custody seals on outside of coolers? Y N
   If yes, how many and where? 1
2. Were custody seals intact? Y N
3. Were signature and date present on the custody seals? Y N
4. Is the shipper's airbill available and filed? If no, record airbill number: 822775788593 Y N
5. COC#

Temperature of cooler(s) upon receipt: (°C)	-0.4			
Temperature Blank: (°C)	NA			

Were samples hand delivered on the same day as collection? ~~Y~~ ~~N~~

6. Were custody papers properly filled out (ink, signed, etc.)? Y N
7. Type of packing material present Bubble, ice
8. **Did all bottles arrive in good condition (unbroken)?** Y N
9. Were all bottle labels complete (i.e analysis, preservation, etc.)? Y N
10. Did all bottle labels and tags agree with custody papers? Y N
11. **Were the correct types of bottles used for the tests indicated?** Y N
12. Were all of the preserved bottles received at the lab with the appropriate pH? ~~Y~~ ~~N~~
13. Were VOA vials checked for absence of air bubbles, and if present, noted below? ~~Y~~
14. Did the bottles originate from CAS/K or a branch laboratory? Y N
15. **Are CWA Microbiology samples received with >1/2 the 24hr. hold time remaining from collection?** ~~Y~~ ~~N~~
16. Was C12/Res negative? ~~Y~~ ~~N~~

Explain any discrepancies:

RESOLUTION:

Samples that required preservation or received out of temperature:

Sample ID	Reagent	Volume	Lot Number	Bottle Type	Rec'd out of Temperature	Initials

Pentachlorophenol
EPA Method 8151 Modified

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Barr Engineering	**Service Request:**	K0503284
Project:	23/11-005Y02 110	**Date Collected:**	08/22/2005
Sample Matrix:	Water	**Date Received:**	08/23/2005

Pentachlorophenol

Sample Name:	Ads A	**Units:**	ug/L
Lab Code:	K0503284-001	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	08/23/05	08/31/05	KWG0514427	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	116	35-133	08/31/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Barr Engineering	**Service Request:**	K0503284
Project:	23/11-005Y02 110	**Date Collected:**	08/22/2005
Sample Matrix:	Water	**Date Received:**	08/23/2005

Pentachlorophenol

Sample Name:	Ads B	**Units:**	ug/L
Lab Code:	K0503284-002	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	08/23/05	08/31/05	KWG0514427	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	117	35-133	08/31/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Barr Engineering	**Service Request:**	K0503284
Project:	23/11-005Y02 110	**Date Collected:**	08/22/2005
Sample Matrix:	Water	**Date Received:**	08/23/2005

Pentachlorophenol

Sample Name:	Ads C	**Units:**	ug/L
Lab Code:	K0503284-003	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	**520**	D	5.0	10	08/23/05	09/13/05	KWG0514427	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	77	35-133	09/13/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Barr Engineering	**Service Request:**	K0503284
Project:	23/11-005Y02 110	**Date Extracted:**	08/23/2005
Sample Matrix:	Water	**Date Analyzed:**	08/31/2005

Lab Control Spike Summary
Pentachlorophenol

Extraction Method:	METHOD	**Units:**	ug/L
Analysis Method:	8151M	**Basis:**	NA
		Level:	Low
		Extraction Lot:	KWG0514427

	Lab Control Sample KWG0514427-3 Lab Control Spike			
Analyte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
Pentachlorophenol	9.08	10.0	91	44-116

ılts flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00017

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Barr Engineering	**Service Request:**	K0503284
Project:	23/11-005Y02 110	**Date Extracted:**	08/23/2005
Sample Matrix:	Water	**Date Analyzed:**	08/31/2005

Matrix Spike/Duplicate Matrix Spike Summary
Pentachlorophenol

Sample Name:	Batch QC	**Units:**	ug/L
Lab Code:	K0503209-014	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M	**Extraction Lot:**	KWG0514427

		Batch QCMS KWG0514427-1 Matrix Spike			Batch QCDMS KWG0514427-2 Duplicate Matrix Spike					
Analyte Name	**Sample Result**	**Result**	**Expected**	**%Rec**	**Result**	**Expected**	**%Rec**	**%Rec Limits**	**RPD**	**RPD Limit**
Pentachlorophenol	ND	9.29	10.0	93	9.76	10.0	98	34-124	5	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00016

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Barr Engineering
Project: 23/11-005Y02 110
Sample Matrix: Water

Service Request: K0503284

Surrogate Recovery Summary
Pentachlorophenol

Extraction Method: METHOD
Analysis Method: 8151M

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1
Ads A	K0503284-001	116
Ads B	K0503284-002	117
Ads C	K0503284-003	77 D
Influent	K0503284-004	100 D #
Method Blank	KWG0514427-4	96
Batch QC	K0503209-014	97
Batch QCMS	KWG0514427-1	106
Batch QCDMS	KWG0514427-2	105
Lab Control Sample	KWG0514427-3	96

Surrogate Recovery Control Limits (%)

Sur1 = 4-Bromo-2,6-dichlorophenol 35-133

Results flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.

00015

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Barr Engineering	**Service Request:**	K0503284
Project:	23/11-005Y02 110	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Pentachlorophenol

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG0514427-4	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	08/23/05	08/31/05	KWG0514427	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	96	35-133	08/31/05	Acceptable

Comments:

00014

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

1317 South 13th Avenue P.O. Box 479 Kelso, Washington 98626 (360) 577-7222 (360) 636-1068 fax

Columbia Analytical Services INC.
An Employee - Owned Company

September 30, 2005 Service Request No: K0503919

Marta Nelson
Barr Engineering
4700 West 77th Street
Minneapolis, MN 55435

RE: 23/11-005Y02 110

Dear Marta:

Enclosed are the results of the sample(s) submitted to our laboratory on September 14, 2005. For your reference, these analyses have been assigned our service request number K0503919.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAC standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3358.

RECEIVED
OCT 06 2005
Barr Engineering Co.

Respectfully submitted,

Columbia Analytical Services, Inc.

Lynda Huckestein

Lynda Huckestein
Client Services Manager

LH/jeb

NELAP Accredited ACIL Seal of Excellence Award 100% Recycled

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a matrix interference.
X	See case narrative.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
B	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL has been elevated due to a matrix interference.
X	See case narrative.
*	The duplicate analysis not within control limits. See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results (25% for CLP Pesticides).
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a chromatographic interference.
X	See case narrative.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	Barr Engineering Company	**Service Request No.:**	K0503919
Project:	23/11-005Y02 110	**Date Received:**	9/14/2005
Sample Matrix:	Water		

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Matrix/Duplicate Matrix Spike (MS/DMS), and Laboratory Control Sample (LCS).

Sample Receipt

Four water samples were received for analysis at Columbia Analytical Services on 9/14/2005. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Pentachlorophenol by EPA Method 8151M

Surrogate Exceptions:
The control criteria for the following surrogate in samples Ads C and Influent are not applicable: 4-Bromo-2,6-dichlorophenol. The analysis of the sample required a dilution, which resulted in a surrogate concentration below the Method Reporting Limit (MRL). No further corrective action was appropriate.

Elevated Method Reporting Limits:
Samples Ads C and Influent required dilution due to the presence of elevated levels of target analyte. The reporting limits are adjusted to reflect the dilution.

Approved by LAH Date 10/3/05

Case Narrative

Chain of Custody Documentation

K. 03919

BARR

Chain of Custody

4700 West 77th Street
Minneapolis, MN 55435-4803
(952) 832-2600

Project Number: 23 / 11 – 005 Y02 110

№ 16399

Project Manager: Tom Mattison

Project Contact: Erik Gohl

Laboratory: Columbia Analytical Services

00007

Number of Containers/Preservative

Sample Identification	Collection Date	Collection Time	Matrix: Water	Matrix: Soil	Matrix: Other	Type: Grab	Type: Comp.	Type: QC	Volatile Organic (Unpres.)	Volatile Organic (Pres.)	Semivolatile Organic	Total Metals (HNO_3)	Dissolved Metals (HNO_3)	General (Unpreserved)	Cyanide (NaOH, Asc. Acid)	Nutrients (H_2SO_4)	Oil and Grease (H_2SO_4)	TOC (H_2SO_4)	Sulfide (Zn Acetate)	Dioxin	Whirlpak	Total Phenol (H_2SO_4)	Methane	(HCL)/DRO, 1L Glass	Lugols, Glass, Amber	Formalin, Glass					Total No. Of Containers	Remarks/ Analysis Required:
1. Ads A	9/13/05	AM 9:00	X			X					X																				1	PCP
2. Ads B	9/13/05	9:00	X			X					X																				1	PCP
3. Ads C	9/13/05	9:00	X			X					X																				1	PCP
4. Influent	9/13/05	9:00	X			X					X																				1	PCP
5.																																
6.																																
7.																																
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14.																																
15.																																
16.																																

Sampled By: Jamie Eidsmoe

Remarks:

Relinquished By:	Date	Time	Received by:	Date	Time
Jamie Eidsmoe	9-13-05	9:00 AM	Tracy Black CAS	9/14/05	1140
Relinquished By:	Date	Time	Received by:	Date	Time
Samples Shipped VIA ☐ Air Freight ☐ Fed. Exp. ☐ Sampler ☐ Other			Air Bill Number: 822775788550		

H:RLG\STDFORMS\CHAINCST.CDR

Distribution: White-Original Accompanies Shipment to Lab; Yellow - Field Copy; Pink - Lab Coordinator

Rev. 08/01/01

Columbia Analytical Services Inc.
Cooler Receipt and Preservation Form

PC CYNDA

Project/Client Bayer Work Order K05 3919

Cooler received on 9/14/05 and opened on 9/14 by Sp

1. Were custody seals on outside of coolers? Y N
   If yes, how many and where? 1F
2. Were custody seals intact? Y N
3. Were signature and date present on the custody seals? Y N
4. Is the shipper's airbill available and filed? If no, record airbill number: Y N
5. COC#
   Temperature of cooler(s) upon receipt: (°C) 4.3
   Temperature Blank: (°C) N/P
   Were samples hand delivered on the same day as collection? ~~Y N~~
6. Were custody papers properly filled out (ink, signed, etc.)? Y N
7. Type of packing material present ICE, Bubble
8. **Did all bottles arrive in good condition (unbroken)?** Y N
9. Were all bottle labels complete (i.e analysis, preservation, etc.)? Y N
10. Did all bottle labels and tags agree with custody papers? Y N
11. **Were the correct types of bottles used for the tests indicated?** Y N
12. Were all of the preserved bottles received at the lab with the appropriate pH? ~~Y N~~
13. Were VOA vials checked for absence of air bubbles, and if present, noted below? Y
14. Did the bottles originate from CAS/K or a branch laboratory? Y N
15. **Are CWA Microbiology samples received with >1/2 the 24hr. hold time remaining from collection?** ~~Y N~~
16. Was C12/Res negative? ~~Y N~~

Explain any discrepancies:

RESOLUTION:

Samples that required preservation or received out of temperature:

Sample ID	Reagent	Volume	Lot Number	Bottle Type	Rec'd out of Temperature	Initials

00008

Pentachlorophenol
EPA Method 8151 Modified

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Barr Engineering	**Service Request:**	K0503919
Project:	23/11-005Y02 110	**Date Collected:**	09/13/2005
Sample Matrix:	Water	**Date Received:**	09/14/2005

Pentachlorophenol

Sample Name:	Ads A	**Units:**	ug/L
Lab Code:	K0503919-001	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	09/15/05	09/23/05	KWG0516028	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	95	35-133	09/23/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Barr Engineering	**Service Request:**	K0503919
Project:	23/11-005Y02 110	**Date Collected:**	09/13/2005
Sample Matrix:	Water	**Date Received:**	09/14/2005

Pentachlorophenol

Sample Name:	Ads B	**Units:**	ug/L
Lab Code:	K0503919-002	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	09/15/05	09/23/05	KWG0516028	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	93	35-133	09/23/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Barr Engineering	**Service Request:**	K0503284
Project:	*23/11-005Y02 110*	**Date Collected:**	08/22/2005
Sample Matrix:	Water	**Date Received:**	08/23/2005

Pentachlorophenol

Sample Name:	Influent	**Units:**	ug/L
Lab Code:	K0503284-004	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	**2700**	D	50	100	08/23/05	09/13/05	KWG0514427	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	100	35-133	09/13/05	Acceptable

Comments:

00013

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Barr Engineering	**Service Request:**	K0503919
Project:	23/11-005Y02 110	**Date Collected:**	09/13/2005
Sample Matrix:	Water	**Date Received:**	09/14/2005

Pentachlorophenol

Sample Name:	Ads C	**Units:**	ug/L
Lab Code:	K0503919-003	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	**900**	D	50	100	09/15/05	09/23/05	KWG0516028	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	85	35-133	09/23/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Barr Engineering	**Service Request:**	K0503919
Project:	23/11-005Y02 110	**Date Collected:**	09/13/2005
Sample Matrix:	Water	**Date Received:**	09/14/2005

Pentachlorophenol

Sample Name:	Influent	**Units:**	ug/L
Lab Code:	K0503919-004	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	**2000**	D	50	100	09/15/05	09/23/05	KWG0516028	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	75	35-133	09/23/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Barr Engineering	**Service Request:**	K0503919
Project:	23/11-005Y02 110	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Pentachlorophenol

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG0516028-4	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	09/15/05	09/23/05	KWG0516028	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	98	35-133	09/23/05	Acceptable

Comments:

0001

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Barr Engineering
Project: 23/11-005Y02 110
Sample Matrix: Water

Service Request: K0503919

Surrogate Recovery Summary
Pentachlorophenol

Extraction Method: METHOD
Analysis Method: 8151M

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1
Ads A	K0503919-001	95
Ads B	K0503919-002	93
Ads C	K0503919-003	85 D #
Influent	K0503919-004	75 D #
Method Blank	KWG0516028-4	98
Lab Control Sample	KWG0516028-3	116

Surrogate Recovery Control Limits (%)

Sur1 = 4-Bromo-2,6-dichlorophenol 35-133

Results flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Barr Engineering
Project: 23/11-005Y02 110
Sample Matrix: Water

Service Request: K0503919
Date Extracted: 09/15/2005
Date Analyzed: 09/23/2005

Lab Control Spike Summary
Pentachlorophenol

Extraction Method: METHOD
Analysis Method: 8151M

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG0516028

	Lab Control Sample KWG0516028-3 Lab Control Spike			
Analyte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
Pentachlorophenol	9.88	10.0	99	44-116

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00016

SEVERN TRENT STL

STL Sacramento
880 Riverside Parkway
West Sacramento, CA 95605

Tel: 916 373 5600 Fax: 916 372 1059
www.stl-inc.com

October 26, 2005

STL SACRAMENTO PROJECT NUMBER: G5J120310
PO/CONTRACT:

Erik Gohl
Barr Engineering Co.
4700 West 77th Street
Minneapolis, MN 55435-4803

RECEIVED
NOV - 1 2005
BARR
ENGINEERING CO.

Dear Mr. Gohl,

This report contains the analytical results for the sample received under chain of custody by STL Sacramento on October 12, 2005. This sample is associated with your 23/11-005Y02110 project.

The test results in this report meet all NELAC requirements for parameters that accreditation is required or available. Any exceptions to NELAC requirements are noted in the case narrative. The case narrative is an integral part of this report.

Sincerely,

Jeremy Sadler
Project Manager

Robert Hrabak
Senior Project Manager

CASE NARRATIVE

STL SACRAMENTO PROJECT NUMBER G5J120310

There were no anomalies associated with this project.

SEVERN TRENT STL

ACCREDITED IN ACCORDANCE WITH nelac

STL Sacramento Certifications/Accreditations

Certifying State	Certificate #	Certifying State	Certificate #
Alaska	UST-055	Oregon*	CA 200005
Arizona	AZ0616	Pennsylvania	68-1272
Arkansas	04-067-0	South Carolina	87014002
California*	01119CA	Texas	TX 270-2004A
Colorado	NA	Utah*	QUAN1
Connecticut	PH-0691	Virginia	00178
Florida*	E87570	Washington	C087
Georgia	960	West Virginia	9930C, 334
Hawaii	NA	Wisconsin	998204680
Louisiana	01944	NFESC	NA
Michigan	9947	USACE	NA
Nevada	CA44	USDA Foreign Plant	37-82605
New Jersey*	CA005	USDA Foreign Soil	S-46613
New York*	11666		

*NELAP accredited. A more detailed parameter list is available upon request. Updated 1/27/05

QC Parameter Definitions

QC Batch: The QC batch consists of a set of up to 20 field samples that behave similarly (i.e., same matrix) and are processed using the same procedures, reagents, and standards at the same time.

Method Blank: An analytical control consisting of all reagents, which may include internal standards and surrogates, and is carried through the entire analytical procedure. The method blank is used to define the level of laboratory background contamination.

Laboratory Control Sample and Laboratory Control Sample Duplicate (LCS/LCSD): An aliquot of blank matrix spiked with known amounts of representative target analytes. The LCS (and LCSD as required) is carried through the entire analytical process and is used to monitor the accuracy of the analytical process independent of potential matrix effects. If an LCSD is performed, it may also used to evaluate the precision of the process.

Duplicate Sample (DU): Different aliquots of the same sample are analyzed to evaluate the precision of an analysis.

Surrogates: Organic compounds not expected to be detected in field samples, which behave similarly to target analytes. These are added to every sample within a batch at a known concentration to determine the efficiency of the sample preparation and analytical process.

Matrix Spike and Matrix Spike Duplicate (MS/MSD): An MS is an aliquot of a matrix fortified with known quantities of specific compounds and subjected to an entire analytical procedure in order to indicate the appropriateness of the method for a particular matrix. The percent recovery for the respective compound(s) is then calculated. The MSD is a second aliquot of the same matrix as the matrix spike, also spiked, in order to determine the precision of the method.

Isotope Dilution: For isotope dilution methods, isotopically labeled analogs (internal standards) of the native target analytes are spiked into the sample at time of extraction. These internal standards are used for quantitation, and monitor and correct for matrix effects. Since matrix effects on method performance can be judged by the recovery of these analogs, there is little added benefit of performing MS/MSD for these methods. MS/MSD are only performed for client or QAPP requirements.

Control Limits: The reported control limits are either based on laboratory historical data, method requirements, or project data quality objectives. The control limits represent the estimated uncertainty of the test results.

SAMPLE SUMMARY

G5J120310

WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
HMKEQ	001	INFLUENT	10/11/05	08:00

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

G5J120310

Chain of Custody

BARR

4700 West 77th Street
Minneapolis, MN 55435-4803
(952) 832-2600

Project Number: 23 / 11 - 005 Y02 110

№ 16370

Project Manager: Tom Mattison

Project Contact: Erik Gohl

Laboratory: Severn Trent

Sample Identification	Collection Date	Collection Time	Matrix: Water	Matrix: Soil	Matrix: Other	Type: Grab	Type: Comp.	Type: QC	Volatile Organic (Unpres.)	Volatile Organic (Pres.)	Semivolatile Organic	Total Metals (HNO_3)	Dissolved Metals (HNO_3)	General (Unpreserved)	Cyanide (NaOH,Asc. Acid)	Nutrients (H_2SO_4)	Oil and Grease (H_2SO_4)	TOC (H_2SO_4)	Sulfide (Zn Acetate)	Dioxin	Whirlpak	Total Phenol (H_2SO_4)	Methane	(HCL)/DRO, 1L Glass	Lugols, Glass, Amber	Formalin, Glass					Total No. Of Containers	Remarks/ Analysis Required:
1. TWFluent	10/11/05	Am 8:00	X			X					X																				2	Dioxin
2.																																
3.																																
4.																																
5.																																
6.																																
7.																																
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16.																																

RECEIVED IN GOOD CONDITION UNDER COC
OCT 12 2005
INI

RECEIVED IN GOOD CONDITION UNDER COC
OCT 12 2005
INI

Sampled By: Jamie Eckman

Remarks:

Relinquished By: Jamie Eckman — Date: 10/11/05 — Time: 8:00 am

Relinquished By: — Date: — Time:

Received by: — Date: 10/12/05 — Time: 1335

Received by: — Date: — Time:

Samples Shipped VIA: ☐ Air Freight ☐ Fed. Exp. ☐ Sampler ☐ Other

Air Bill Number: 822275788803

Distribution: White-Original Accompanies Shipment to Lab; Yellow - Field Copy; Pink - Lab Coordinator

Rev. 08/01/01

Barr Engineering Company

Client Sample ID: INFLUENT

Trace Level Organic Compounds

Lot-Sample #...: G5J120310-001 Work Order #...: HMKEQ1AA Matrix.....: WATER
Date Sampled...: 10/11/05 Date Received..: 10/12/05
Prep Date.....: 10/18/05 Analysis Date..: 10/20/05
Prep Batch #...: 5291203
Dilution Factor: 1

PARAMETER	RESULT	DETECTION LIMIT	UNITS	METHOD
Total HxCDD	ND	0.74	ng/L	SW846 8280A

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-1,2,3,6,7,8-HxCDD	95	(25 - 150)

QC DATA ASSOCIATION SUMMARY

G5J120310

Sample Preparation and Analysis Control Numbers

SAMPLE#	MATRIX	ANALYTICAL METHOD	LEACH BATCH #	PREP BATCH #	MS RUN#
001	WATER	SW846 8280A		5291203	

METHOD BLANK REPORT

Trace Level Organic Compounds

Client Lot #...: G5J120310 Work Order #...: HM0EE1AA Matrix.....: WATER
MB Lot-Sample #: G5J180000-203

Prep Date.....: 10/18/05
Analysis Date..: 10/20/05 Prep Batch #...: 5291203
Dilution Factor: 1

PARAMETER	RESULT	DETECTION LIMIT	UNITS	METHOD
Total HxCDD	ND	0.40	ng/L	SW846 8280A

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-1,2,3,6,7,8-HxCDD	100	(25 - 150)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

Trace Level Organic Compounds

Client Lot #...: G5J120310 Work Order #...: HM0EE1AC Matrix.....: WATER
LCS Lot-Sample#: G5J180000-203
Prep Date.....: 10/18/05 Analysis Date..: 10/20/05
Prep Batch #...: 5291203
Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	METHOD
2,3,7,8-TCDD	**109**	**(74 - 129)**	**SW846 8280A**
1,2,3,7,8-PeCDD	**106**	**(70 - 132)**	**SW846 8280A**
1,2,3,6,7,8-HxCDD	**105**	**(63 - 131)**	**SW846 8280A**
1,2,3,4,6,7,8-HpCDD	**104**	**(66 - 137)**	**SW846 8280A**
OCDD	**102**	**(69 - 135)**	**SW846 8280A**
2,3,7,8-TCDF	**106**	**(71 - 131)**	**SW846 8280A**
1,2,3,7,8-PeCDF	**111**	**(62 - 147)**	**SW846 8280A**
1,2,3,6,7,8-HxCDF	**102**	**(67 - 136)**	**SW846 8280A**
1,2,3,4,6,7,8-HpCDF	**105**	**(72 - 137)**	**SW846 8280A**
OCDF	**103**	**(66 - 138)**	**SW846 8280A**

INTERNAL STANDARD	PERCENT RECOVERY	RECOVERY LIMITS
13C-1,2,3,6,7,8-HxCDD	90	(25 - 150)
13C-2,3,7,8-TCDD	94	(25 - 150)
13C-2,3,7,8-TCDF	90	(25 - 150)
13C-1,2,3,4,6,7,8-HpCDF	90	(25 - 150)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE DATA REPORT

Trace Level Organic Compounds

Client Lot #...: G5J120310 Work Order #...: HM0EE1AC Matrix.....: WATER
LCS Lot-Sample#: G5J180000-203
Prep Date.....: 10/18/05 Analysis Date..: 10/20/05
Prep Batch #...: 5291203
Dilution Factor: 1

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	METHOD
2,3,7,8-TCDD	25.0	27.2	ng/L	109	SW846 8280A
1,2,3,7,8-PeCDD	62.5	66.5	ng/L	106	SW846 8280A
1,2,3,6,7,8-HxCDD	62.5	65.8	ng/L	105	SW846 8280A
1,2,3,4,6,7,8-HpCDD	62.5	64.8	ng/L	104	SW846 8280A
OCDD	125	128	ng/L	102	SW846 8280A
2,3,7,8-TCDF	25.0	26.6	ng/L	106	SW846 8280A
1,2,3,7,8-PeCDF	62.5	69.7	ng/L	111	SW846 8280A
1,2,3,6,7,8-HxCDF	62.5	64.0	ng/L	102	SW846 8280A
1,2,3,4,6,7,8-HpCDF	62.5	65.6	ng/L	105	SW846 8280A
OCDF	125	128	ng/L	103	SW846 8280A

INTERNAL STANDARD	PERCENT RECOVERY	RECOVERY LIMITS
13C-1,2,3,6,7,8-HxCDD	90	(25 - 150)
13C-2,3,7,8-TCDD	94	(25 - 150)
13C-2,3,7,8-TCDF	90	(25 - 150)
13C-1,2,3,4,6,7,8-HpCDF	90	(25 - 150)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

17 South 13th Avenue P.O. Box 479 Kelso, Washington 98626 (360) 577-7222 ph (360) 636-1068 fax

Columbia Analytical Services INC.
An Employee - Owned Company

November 2, 2005

Service Request No: K0504761

Marta Nelson
Barr Engineering
4700 West 77th Street
Minneapolis, MN 55435

NOV 07 2005

RE: 23/11-005Y02 110

Dear Marta:

Enclosed are the results of the sample(s) submitted to our laboratory on October 12, 2005. For your reference, these analyses have been assigned our service request number K0504761.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAC standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3358.

Respectfully submitted,

Columbia Analytical Services, Inc.

Lynda Huckestein
Client Services Manager

LH/jeb

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
[illegible]	The control limit criteria is not applicable. See case narrative.
[illegible]	The analyte was found in the associated method blank at a level that is significant relative to the sample result.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a matrix interference.
X	See case narrative.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
B	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL has been elevated due to a matrix interference.
X	See case narrative.
*	The duplicate analysis not within control limits. See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results (25% for CLP Pesticides).
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a chromatographic interference.
X	See case narrative.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
)	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	Barr Engineering Company	**Service Request No.:**	K0504761
Project:	23/11-005Y02 110	**Date Received:**	10/12/2005
Sample Matrix:	Water		

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Matrix/Duplicate Matrix Spike (MS/DMS), and Laboratory Control Sample (LCS).

Sample Receipt

Four water samples were received for analysis at Columbia Analytical Services on 10/12/2005. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Pentachlorophenol by EPA Method 8151M

Continuing Calibration Verification Exceptions:
The primary evaluation criterion was exceeded for the following analytes in Continuing Calibration Verification (CCV) 1101F003, 1101F020: 4-Bromo-2,6-dichlorophenol. In accordance with CAS standard operating procedures, the alternative evaluation specified in the EPA method was performed using the average percent recovery of all analytes in the verification standard. The standard meets the alternative evaluation criteria.

Results for the following analytes: 4-Bromo-2,6-dichlorophenol in all samples and QC samples have been reported from a column using average percent recovery of all analytes in the verification standard.

Surrogate Exceptions:
The upper control criterion was exceeded for the following surrogate in samples Ads A and Ads B and all QC samples: 4-Bromo-2,6-dichlorophenol. No target analytes were detected in the samples Ads A and Ads B. The error associated with an elevated recovery equates to a high bias. The quality of the sample data is not significantly affected. The high surrogate recovery is expected to be due to a high bias in the surrogate solution used and thus isolated to the surrogate recoveries. No further corrective action was appropriate.

The control criteria for the following surrogate in samples Ads C and Influent are not applicable: 4-Bromo-2,6-dichlorophenol. The analysis of the sample required a dilution, which resulted in a surrogate concentration below the Method Reporting Limit (MRL). No further corrective action was appropriate.

Semivolatile Organic Compounds by EPA Method 8270C

Initial Calibration Exceptions:
The primary evaluation criterion was exceeded for the following analytes in Initial Calibration (ICAL) ID CAL4880: Quinoline, 2-Methylnaphthalene, Biphenyl, 2,6-Dimethylnaphthalene, Pentachlorophenol, Dibenz(a,h)anthracene. In accordance with CAS standard operating procedures, the alternative evaluation specified in the EPA method was performed using the mean Relative Standard Deviation (RSD) of all analytes in the calibration. The result of the mean RSD calculation was 12.3%. The calibration meets the alternative evaluation criteria. Note that CAS/Kelso policy does not allow the use of averaging if any analyte in the ICAL exceeds 30% RSD.

Approved by CAH **Date** 11/3/05

Sample Notes and Discussion

Insufficient sample volume was received to perform a Matrix Spike/Matrix Spike Duplicate (MS/MSD). A Laboratory Control Sample/Duplicate Laboratory Control Sample (LCS/DLCS) was analyzed and reported in lieu of the MS/MSD for these samples.

Approved by _____ **Date** 11/3/05

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Barr Engineering	**Service Request:**	K0504761
Project:	23/11-005Y02 110	**Date Collected:**	10/11/2005
Sample Matrix:	Water	**Date Received:**	10/12/2005

Pentachlorophenol

Sample Name:	Ads A	**Units:**	ug/L
Lab Code:	K0504761-001	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	10/18/05	11/01/05	KWG0517946	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	149	35-133	11/01/05	Outside Control Limits

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Barr Engineering	**Service Request:**	K0504761
Project:	23/11-005Y02 110	**Date Collected:**	10/11/2005
Sample Matrix:	Water	**Date Received:**	10/12/2005

Pentachlorophenol

Sample Name:	Ads B	**Units:**	ug/L
Lab Code:	K0504761-002	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	10/18/05	11/01/05	KWG0517946	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	150	35-133	11/01/05	Outside Control Limits

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Barr Engineering	**Service Request:**	K0504761
Project:	23/11-005Y02 110	**Date Collected:**	10/11/2005
Sample Matrix:	Water	**Date Received:**	10/12/2005

Pentachlorophenol

Sample Name:	Ads C	**Units:**	ug/L
Lab Code:	K0504761-003	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	**1400**	D	50	100	10/18/05	11/01/05	KWG0517946	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	140	35-133	11/01/05	Outside Control Limits

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Barr Engineering	**Service Request:**	K0504761
Project:	23/11-005Y02 110	**Date Collected:**	10/11/2005
ple Matrix:	Water	**Date Received:**	10/12/2005

Pentachlorophenol

Sample Name:	Influent	**Units:**	ug/L
Lab Code:	K0504761-004	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	**2300**	D	50	100	10/18/05	11/01/05	KWG0517946	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	135	35-133	11/01/05	Outside Control Limits

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Barr Engineering	**Service Request:**	K0504761
Project:	23/11-005Y02 110	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Pentachlorophenol

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG0517946-4	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	10/18/05	11/01/05	KWG0517946	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	137	35-133	11/01/05	Outside Control Limits

Comments:

00010

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Barr Engineering
Project: 23/11-005Y02 110
le Matrix: Water

Service Request: K0504761

Surrogate Recovery Summary
Pentachlorophenol

Extraction Method: METHOD
Analysis Method: 8151M

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1	
Ads A	K0504761-001	149	*
Ads B	K0504761-002	150	*
Ads C	K0504761-003	140 D	#
Influent	K0504761-004	135 D	#
Method Blank	KWG0517946-4	137	*
Batch QC	K0504815-001	151	*
Batch QCMS	KWG0517946-1	154	*
Batch QCDMS	KWG0517946-2	141	*
Lab Control Sample	KWG0517946-3	142	*

Surrogate Recovery Control Limits (%)

Sur1 = 4-Bromo-2,6-dichlorophenol 35-133

Results flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.

00011

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Barr Engineering	**Service Request:**	K0504761
Project:	23/11-005Y02 110	**Date Extracted:**	10/18/2005
Sample Matrix:	Water	**Date Analyzed:**	11/01/2005

Matrix Spike/Duplicate Matrix Spike Summary
Pentachlorophenol

Sample Name:	Batch QC	**Units:**	ug/L
Lab Code:	K0504815-001	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M	**Extraction Lot:**	KWG0517946

		Batch QCMS KWG0517946-1 Matrix Spike			Batch QCDMS KWG0517946-2 Duplicate Matrix Spike					
Analyte Name	**Sample Result**	**Result**	**Expected**	**%Rec**	**Result**	**Expected**	**%Rec**	**%Rec Limits**	**RPD**	**RPD Limit**
Pentachlorophenol	ND	10.2	10.0	102	8.95	10.0	90	34-124	13	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00012

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Barr Engineering
Project: 23/11-005Y02 110
Sample Matrix: Water

Service Request: K0504761
Date Extracted: 10/18/2005
Date Analyzed: 11/01/2005

Lab Control Spike Summary
Pentachlorophenol

Extraction Method: METHOD
Analysis Method: 8151M

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG0517946

	Lab Control Sample KWG0517946-3 Lab Control Spike			
Analyte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
Pentachlorophenol	9.49	10.0	95	44-116

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Barr Engineering
Project: 23/11-005Y02 110
Sample Matrix: Water

Service Request: K0504761
Date Collected: 10/11/2005
Date Received: 10/12/2005

Polynuclear Aromatic Hydrocarbons

Sample Name: Ads B
Lab Code: K0504761-002

Units: ug/L
Basis: NA

Extraction Method: EPA 3520C
Analysis Method: 8270C SIM

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.020	1	10/13/05	10/26/05	KWG0517685	
Acenaphthylene	ND	U	0.020	1	10/13/05	10/26/05	KWG0517685	
Acenaphthene	ND	U	0.020	1	10/13/05	10/26/05	KWG0517685	
Fluorene	ND	U	0.020	1	10/13/05	10/26/05	KWG0517685	
Phenanthrene	ND	U	0.020	1	10/13/05	10/26/05	KWG0517685	
Anthracene	ND	U	0.020	1	10/13/05	10/26/05	KWG0517685	
Fluoranthene	ND	U	0.020	1	10/13/05	10/26/05	KWG0517685	
Pyrene	ND	U	0.020	1	10/13/05	10/26/05	KWG0517685	
Benz(a)anthracene	ND	U	0.020	1	10/13/05	10/26/05	KWG0517685	
Chrysene	ND	U	0.020	1	10/13/05	10/26/05	KWG0517685	
Benzo(b)fluoranthene	ND	U	0.020	1	10/13/05	10/26/05	KWG0517685	
Benzo(k)fluoranthene	ND	U	0.020	1	10/13/05	10/26/05	KWG0517685	
Benzo(a)pyrene	ND	U	0.020	1	10/13/05	10/26/05	KWG0517685	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	1	10/13/05	10/26/05	KWG0517685	
Dibenz(a,h)anthracene	ND	U	0.020	1	10/13/05	10/26/05	KWG0517685	
Benzo(g,h,i)perylene	ND	U	0.020	1	10/13/05	10/26/05	KWG0517685	
Quinoline	ND	U	0.020	1	10/13/05	10/26/05	KWG0517685	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	80	24-111	10/26/05	Acceptable
Fluoranthene-d10	98	26-123	10/26/05	Acceptable
Terphenyl-d14	123	25-146	10/26/05	Acceptable

Comments:

00014

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Barr Engineering	**Service Request:**	K0504761
Project:	23/11-005Y02 110	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Polynuclear Aromatic Hydrocarbons

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG0517685-3	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.020	1	10/13/05	10/26/05	KWG0517685	
Acenaphthylene	ND	U	0.020	1	10/13/05	10/26/05	KWG0517685	
Acenaphthene	ND	U	0.020	1	10/13/05	10/26/05	KWG0517685	
Fluorene	ND	U	0.020	1	10/13/05	10/26/05	KWG0517685	
Phenanthrene	ND	U	0.020	1	10/13/05	10/26/05	KWG0517685	
Anthracene	ND	U	0.020	1	10/13/05	10/26/05	KWG0517685	
Fluoranthene	ND	U	0.020	1	10/13/05	10/26/05	KWG0517685	
Pyrene	ND	U	0.020	1	10/13/05	10/26/05	KWG0517685	
Benz(a)anthracene	ND	U	0.020	1	10/13/05	10/26/05	KWG0517685	
Chrysene	ND	U	0.020	1	10/13/05	10/26/05	KWG0517685	
Benzo(b)fluoranthene	ND	U	0.020	1	10/13/05	10/26/05	KWG0517685	
Benzo(k)fluoranthene	ND	U	0.020	1	10/13/05	10/26/05	KWG0517685	
Benzo(a)pyrene	ND	U	0.020	1	10/13/05	10/26/05	KWG0517685	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	1	10/13/05	10/26/05	KWG0517685	
Dibenz(a,h)anthracene	ND	U	0.020	1	10/13/05	10/26/05	KWG0517685	
Benzo(g,h,i)perylene	ND	U	0.020	1	10/13/05	10/26/05	KWG0517685	
Quinoline	ND	U	0.020	1	10/13/05	10/26/05	KWG0517685	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	76	24-111	10/26/05	Acceptable
Fluoranthene-d10	92	26-123	10/26/05	Acceptable
Terphenyl-d14	112	25-146	10/26/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Barr Engineering
Project: 23/11-005Y02 110
Sample Matrix: Water

Service Request: K0504761

Surrogate Recovery Summary
Polynuclear Aromatic Hydrocarbons

Extraction Method: EPA 3520C
Analysis Method: 8270C SIM

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1	Sur2	Sur3
Ads B	K0504761-002	80	98	123
Method Blank	KWG0517685-3	76	92	112
Lab Control Sample	KWG0517685-1	90	101	112
Duplicate Lab Control Sample	KWG0517685-2	85	98	106

Surrogate Recovery Control Limits (%)

Sur1 =	Fluorene-d10	24-111
Sur2 =	Fluoranthene-d10	26-123
Sur3 =	Terphenyl-d14	25-146

Results flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.

00016

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Barr Engineering	**Service Request:**	K0504761
Project:	23/11-005Y02 110	**Date Extracted:**	10/13/2005
Sample Matrix:	Water	**Date Analyzed:**	10/26/2005

Lab Control Spike/Duplicate Lab Control Spike Summary
Polynuclear Aromatic Hydrocarbons

Extraction Method:	EPA 3520C	**Units:**	ug/L
Analysis Method:	8270C SIM	**Basis:**	NA
		Level:	Low
		Extraction Lot:	KWG0517685

	Lab Control Sample KWG0517685-1 Lab Control Spike			Duplicate Lab Control Sample KWG0517685-2 Duplicate Lab Control Spike					
Analyte Name	**Result**	**Expected**	**%Rec**	**Result**	**Expected**	**%Rec**	**%Rec Limits**	**RPD**	**RPD Limit**
Naphthalene	2.37	2.38	100	2.17	2.38	91	32-124	9	30
Acenaphthylene	2.39	2.38	101	2.25	2.38	94	36-128	6	30
Acenaphthene	2.38	2.38	100	2.17	2.38	91	36-126	9	30
Fluorene	2.48	2.38	104	2.24	2.38	94	41-130	10	30
Phenanthrene	2.44	2.38	103	2.19	2.38	92	43-129	11	30
Anthracene	1.72	2.38	72	2.04	2.38	86	36-131	17	30
Fluoranthene	2.50	2.38	105	2.30	2.38	97	45-139	8	30
Pyrene	2.54	2.38	107	2.29	2.38	96	38-143	10	30
Benz(a)anthracene	2.11	2.38	88	1.98	2.38	83	45-131	6	30
Chrysene	2.45	2.38	103	2.20	2.38	92	47-132	10	30
Benzo(b)fluoranthene	2.44	2.38	103	2.23	2.38	94	51-135	9	30
Benzo(k)fluoranthene	2.50	2.38	105	2.19	2.38	92	46-139	13	30
Benzo(a)pyrene	1.49	2.38	62	2.01	2.38	84	40-138	30	30
Indeno(1,2,3-cd)pyrene	2.27	2.38	95	1.97	2.38	83	35-148	14	30
Dibenz(a,h)anthracene	2.27	2.38	95	2.04	2.38	86	42-143	11	30
Benzo(g,h,i)perylene	2.57	2.38	108	2.36	2.38	99	42-139	9	30
Quinoline	2.50	2.38	105	1.98	2.38	83	46-125	23	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00017

K0504761

Chain of Custody

BARR

4700 West 77th Street
Minneapolis, MN 55435-4803
(952) 832-2600

Project Number: 23/11-005Y02 110

№ 16401

Project Manager: Tom Mattison

Project Contact: Erik Gohl

Laboratory: Columbia Analytical Services

Sample Identification	Collection Date	Collection Time	Matrix: Water	Matrix: Soil	Matrix: Other	Type: Grab	Type: Comp.	Type: QC	Volatile Organic (Unpres.)	Volatile Organic (Pres.)	Semivolatile Organic	Total Metals (HNO_3)	Dissolved Metals (HNO_3)	General (Unpreserved)	Cyanide ($NaOH$, Asc. Acid)	Nutrients (H_2SO_4)	Oil and Grease (H_2SO_4)	TOC (H_2SO_4)	Sulfide (Zn Acetate)	Dioxin	Whirlpak	Total Phenol (H_2SO_4)	Methane	(HCL)/DRO, 1L Glass	Lugols, Glass, Amber	Formalin, Glass	Total No. Of Containers	Remarks/ Analysis Required:
1. Ads A	10/11/05	AM 8:00	X			X					X																1	PCP
2. Ads B	10/11/05	8:00	X			X					X																1	PCP
3. Ads C	10/11/05	8:00	X			X					X																1	PCP
4. Influent	10/11/05	8:00	X			X					X																1	PCP
5. Ads B	10/11/05	8:00	X			X					X																2	P.A.H See attached List
6.																												
7.																												
8.																												
9.																												
10.																												
11.																												
12.																												
13.																												
14.																												
15.																												
16.																												

Sampled By: Jamie Eckenroe

Remarks:

Relinquished By: Jamie Eckenroe — Date: 10/11/05 — Time: 8:00 AM

Relinquished By: — Date: — Time:

Samples Shipped VIA: ☐ Air Freight ☐ Fed. Exp. ☐ Sampler ☐ Other

Received by: — Date: — Time:

Received by: Amanda Juell-CAS — Date: 10/12/05 — Time: 1100

Air Bill Number: 822775788560

Distribution: White-Original Accompanies Shipment to Lab; Yellow - Field Copy; Lab Coordinator

Rev. 08/01/01

H:\RLG\STDFORMS\CHAINCST.CDR

00018

Columbia Analytical Services Inc.
Cooler Receipt and Preservation Form

PC Lynda

Project/Client Barr Service Request K05 4761

Cooler received on 10/12/05 and opened on 10/12/05 by TSlack

1.	Were custody seals on outside of coolers?	Y	N
	If yes, how many and where? 1 front		
2.	Were custody seals intact?	Y	N
3.	Were signature and date present on the custody seals?	Y	N
4.	Is the shipper's airbill available and filed? If no, record airbill number: 822775788560	Y	N
5.	COC#		
	Temperature of cooler(s) upon receipt: (°C) -0.3		
	Temperature Blank: (°C) Na		
	Were samples hand delivered on the same day as collection?	Y	N
6.	Were custody papers properly filled out (ink, signed, etc.)?	Y	N
7.	Type of packing material present gel pouches bubble wrap		
8.	**Did all bottles arrive in good condition (unbroken)?**	Y	N
9.	Were all bottle labels complete (i.e analysis, preservation, etc.)?	Y	N
10.	Did all bottle labels and tags agree with custody papers?	Y	N
11.	**Were the correct types of bottles used for the tests indicated?**	Y	N
12.	Were all of the preserved bottles received at the lab with the appropriate pH?	~~Y~~	~~N~~
13.	Were VOA vials checked for absence of air bubbles, and if present, noted below?	Y	N
14.	Were the 1631 Mercury bottles checked for absence of air bubbles, and if present, noted below?	~~Y~~	~~N~~
15.	Did the bottles originate from CAS/K or a branch laboratory?	Y	N
16.	**Are CWA Microbiology samples received with >1/2 the 24hr. hold time remaining from collection?**	~~Y~~	~~N~~
17.	Was C12/Res negative?	Y	N

Explain any discrepancies:

RESOLUTION:

Samples that required preservation or received out of temperature:

Sample ID	Reagent	Volume	Lot Number	Bottle Type	Rec'd out of Temperature	Initials

7 South 13th Avenue P.O. Box 479 Kelso, Washington 98626 (360) 577-7222 ph (360) 636-1068 fax

Columbia Analytical Services INC.
An Employee - Owned Company

December 22, 2005

Service Request No: K0506190

Marta Nelson
Barr Engineering
4700 West 77th Street
Minneapolis, MN 55435

RECEIVED
DEC 27 2005
ENGINEERING CO

RE: 23/11-005Y02 110

Dear Marta:

Enclosed are the results of the sample(s) submitted to our laboratory on November 30, 2005. For your reference, these analyses have been assigned our service request number K0506190.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAC standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3358.

Respectfully submitted,

Columbia Analytical Services, Inc.

Lynda Huckestein
Client Services Manager

LH/jeb

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
≠	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a matrix interference.
X	See case narrative.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
B	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL has been elevated due to a matrix interference.
X	See case narrative.
*	The duplicate analysis not within control limits. See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results (25% for CLP Pesticides).
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a chromatographic interference.
X	See case narrative.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

Case Narrative

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	Barr Engineering Company	**Service Request No.:**	K0506190
Project:	23/11-005Y02 110	**Date Received:**	11/30/2005
Sample Matrix:	Water		

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Matrix/Duplicate Matrix Spike (MS/DMS), and Laboratory Control Sample (LCS).

Sample Receipt

Four water samples were received for analysis at Columbia Analytical Services on 11/30/2005. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Pentachlorophenol by EPA Method 8151M

Continuing Calibration Verification Exceptions:
The primary evaluation criterion was exceeded for the following analytes in Continuing Calibration Verification (CCV) 1219F042, 1219F057: 4-Bromo-2,6-dichlorophenol. In accordance with CAS standard operating procedures, the alternative evaluation specified in the EPA method was performed using the average percent recovery of all analytes in the verification standard. The standard meets the alternative evaluation criteria.

Approved by LAH Date 12/22/05

Chain of Custody Documentation

Chain of Custody

BARR

4700 West 77th Street
Minneapolis, MN 55435-4803
(952) 832-2600

Project Number: 23/11-005Y02 110

№ 16403

Project Manager: Tom Mattison

Project Contact: Erik Gohl

Laboratory: Columbia Analytical Services

Sample Identification	Collection Date	Collection Time	Matrix: Water	Matrix: Soil	Matrix: Other	Type: Grab	Type: Comp.	Type: QC	Volatile Organic (Unpres.)	Volatile Organic (Pres.)	Semivolatile Organic	Total Metals (HNO_3)	Dissolved Metals (HNO_3)	General (Unpreserved)	Cyanide (NaOH,Asc. Acid)	Nutrients (H_2SO_4)	Oil and Grease (H_2SO_4)	TOC (H_2SO_4)	Sulfide (Zn Acetate)	Dioxin	Whirlpak	Total Phenol (H_2SO_4)	Methane	(HCL)/DRO, 1L Glass	Lugols, Glass, Amber	Formalin, Glass	Total No. Of Containers	Remarks/ Analysis Required:
1. Acls A	11/29/05	AM 9:00	X			X					X																1	PCP
2. Acls B	11/29/05	9:00	X			X					X																1	PCP
3. Acls C	11/29/05	9:00	X			X					X																1	PCP
4. Influent	11/29/05	9:00	X			X					X																1	PCP
5.																												
6.																												
7.																												
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9.																												
10.																												
11.																												
12.																												
13.																												
14.																												
15.																												
16.																												

Sampled By: JAMIE Eedsmoe

Remarks:

Relinquished By: Jamie Eedsmoe — Date: 11-29-05 — Time: 9:00 AM

Relinquished By: — Date: — Time:

Received by: Tracy Black CAS — Date: 11/30/05 — Time: 1300

Received by: — Date: — Time:

Samples Shipped VIA: ☐ Air Freight ☐ Fed. Exp. ☐ Sampler ☐ Other

Air Bill Number: 822775788490

H:RLGISTDFORMS\CHAINCST.CDR

Distribution: White-Original Accompanies Shipment to Lab; Yellow - Field Copy; Pink - Lab Coordinator

Rev. 08/01/01

Columbia Analytical Services Inc.
Cooler Receipt and Preservation Form

PC Lynda

Project/Client Baker Service Request K05 6190

Cooler received on 11/30/05 and opened on 11/30/05 by AP

1. Were custody seals on outside of coolers? FR Y N
   If yes, how many and where? 1F
2. Were custody seals intact? Y N
3. Were signature and date present on the custody seals? Y N
4. Is the shipper's airbill available and filed? If no, record airbill number: Y N
5. COC#
   Temperature of cooler(s) upon receipt: (°C) 4.0
   Temperature Blank: (°C) N/P
   Were samples hand delivered on the same day as collection? ~~Y N~~
6. Were custody papers properly filled out (ink, signed, etc.)? Y N
7. Type of packing material present Bubble, ICE
8. **Did all bottles arrive in good condition (unbroken)?** Y N
9. Were all bottle labels complete (i.e analysis, preservation, etc.)? Y N
10. Did all bottle labels and tags agree with custody papers? Y N
11. **Were the correct types of bottles used for the tests indicated?** Y N
12. Were all of the preserved bottles received at the lab with the appropriate pH? ~~Y N~~
13. Were VOA vials checked for absence of air bubbles, and if present, noted below? Y
14. Were the 1631 Mercury bottles checked for absence of air bubbles, and if present, noted below? ~~Y N~~
15. Did the bottles originate from CAS/K or a branch laboratory? Y N
16. **Are CWA Microbiology samples received with >1/2 the 24hr. hold time remaining from collection?** ~~Y N~~
17. Was C12/Res negative? ~~Y N~~

Explain any discrepancies:

RESOLUTION:

Samples that required preservation or received out of temperature:

Sample ID	Reagent	Volume	Lot Number	Bottle Type	Rec'd out of Temperature	Initials

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Barr Engineering	**Service Request:**	K0506190
Project:	23/11-005Y02 110	**Date Collected:**	11/29/2005
Sample Matrix:	Water	**Date Received:**	11/30/2005

Pentachlorophenol

Sample Name:	Ads A	**Units:**	ug/L
Lab Code:	K0506190-001	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	12/06/05	12/20/05	KWG0520844	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	118	35-133	12/20/05	Acceptable

ments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Barr Engineering
Project: 23/11-005Y02 110
Sample Matrix: Water

Service Request: K0506190
Date Collected: 11/29/2005
Date Received: 11/30/2005

Pentachlorophenol

Sample Name: Ads B
Lab Code: K0506190-002

Units: ug/L
Basis: NA

Extraction Method: METHOD
Analysis Method: 8151M

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	12/06/05	12/20/05	KWG0520844	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	128	35-133	12/20/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Barr Engineering	**Service Request:**	K0506190
Project:	23/11-005Y02 110	**Date Collected:**	11/29/2005
Sample Matrix:	Water	**Date Received:**	11/30/2005

Pentachlorophenol

Sample Name:	Ads C	**Units:**	ug/L
Lab Code:	K0506190-003	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	**1500**	D	25	50	12/06/05	12/20/05	KWG0520844	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	107	35-133	12/20/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Barr Engineering
Project: 23/11-005Y02 110
Sample Matrix: Water

Service Request: K0506190
Date Collected: 11/29/200
Date Received: 11/30/20

Pentachlorophenol

Sample Name: Influent
Lab Code: K0506190-004

Units: ug/L
Basis: NA

Extraction Method: METHOD
Analysis Method: 8151M

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	**2100**	D	25	50	12/06/05	12/20/05	KWG0520844	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	102	35-133	12/20/05	Acceptable

mments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Barr Engineering	**Service Request:**	K0506190
Project:	23/11-005Y02 110	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Pentachlorophenol

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG0520844-4	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	12/06/05	12/20/05	KWG0520844	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	121	35-133	12/20/05	Acceptable

ents:

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Barr Engineering
Project: 23/11-005Y02 110
Sample Matrix: Water

Service Request: K0506190

Surrogate Recovery Summary
Pentachlorophenol

Extraction Method: METHOD
Analysis Method: 8151M

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1
Ads A	K0506190-001	118
Ads B	K0506190-002	128
Ads C	K0506190-003	107 D
Influent	K0506190-004	102 D
Method Blank	KWG0520844-4	121
Batch QC	K0506326-003	121
Batch QCMS	KWG0520844-1	123
Batch QCDMS	KWG0520844-2	127
Lab Control Sample	KWG0520844-3	110

rogate Recovery Control Limits (%)

1 = 4-Bromo-2,6-dichlorophenol 35-133

s flagged with an asterisk (*) indicate values outside control criteria.
s flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Barr Engineering	**Service Request:**	K0506190
Project:	23/11-005Y02 110	**Date Extracted:**	12/06/2005
Sample Matrix:	Surface water	**Date Analyzed:**	12/20/2005

Matrix Spike/Duplicate Matrix Spike Summary
Pentachlorophenol

Sample Name:	Batch QC	**Units:**	ug/L
Lab Code:	K0506326-003	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M	**Extraction Lot:**	KWG0520844

		Batch QCMS KWG0520844-1 Matrix Spike			Batch QCDMS KWG0520844-2 Duplicate Matrix Spike					
Analyte Name	**Sample Result**	**Result**	**Expected**	**%Rec**	**Result**	**Expected**	**%Rec**	**%Rec Limits**	**RPD**	**RPD Limit**
Pentachlorophenol	ND	9.40	10.0	94	10.2	10.0	102	34-124	8	30

sult ed with an asterisk (*) indicate values outside control criteria.

suh ed with a pound (#) indicate the control criteria is not applicable.

cent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Barr Engineering	**Service Request:**	K0506190
Project:	23/11-005Y02 110	**Date Extracted:**	12/06/2005
Sample Matrix:	Water	**Date Analyzed:**	12/20/2005

Lab Control Spike Summary
Pentachlorophenol

Extraction Method:	METHOD	**Units:**	ug/L
Analysis Method:	8151M	**Basis:**	NA
		Level:	Low
		Extraction Lot:	KWG0520844

	Lab Control Sample KWG0520844-3 Lab Control Spike			
Analyte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
Pentachlorophenol	10.5	10.0	105	44-116

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

1317 South 13th Avenue P.O. Box 479 Kelso, Washington 98626 (360) 577-7222 (360) 636-1068 fax

Columbia Analytical Services INC.
An Employee - Owned Company

December 30, 2005 Service Request No: K0506629

Marta Nelson
Barr Engineering
4700 West 77th Street
Minneapolis, MN 55435

RE: 23/11-005Y02 110

Dear Marta:

Enclosed are the results of the sample(s) submitted to our laboratory on December 14, 2005. For your reference, these analyses have been assigned our service request number K0506629.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAC standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3358.

Respectfully submitted,

Columbia Analytical Services, Inc.

Lynda Huckestein
Client Services Manager

LH/jeb

RECEIVED
JAN 06 2006
BARR ENGINEERING CO.

NELAP Accredited ACIL Seal of Excellence Award 100% Recycled

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a matrix interference.
X	See case narrative.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
B	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL has been elevated due to a matrix interference.
X	See case narrative.
*	The duplicate analysis not within control limits. See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results (25% for CLP Pesticides).
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a chromatographic interference.
X	See case narrative.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

Case Narrative

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	Marta Nelson	**Service Request No.:**	K0506629
Project:	23/11-005Y02 110	**Date Received:**	12/14/05
Sample Matrix:	Water		

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Matrix/Duplicate Matrix Spike (MS/DMS), and Laboratory Control Sample (LCS).

Sample Receipt

Four water samples were received for analysis at Columbia Analytical Services on 12/14/05 in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Chlorophenols by EPA Method 8151M

Elevated Method Reporting Limits:
Samples Ads C and Influent required dilution due to the presence of elevated levels of target analyte. The reporting limits are adjusted to reflect the dilution.

Surrogate Exceptions:
The control criteria for surrogate 4-Bromo-2,6-dichlorophenol in sample Ads C, and Influent are not applicable. The analysis of the sample required a dilution, which resulted in a surrogate concentration below the Method Reporting Limit (MRL). No further corrective action was appropriate.

Continuing Calibration Verification (CCV) Exceptions:
The primary evaluation criterion was exceeded for 4-Bromo-2,6-dichlorophenol in CCV 1228F032 and 1228F050. In accordance with CAS standard operating procedures, the alternative evaluation specified in the EPA method was performed using the average percent recovery of all analytes in the verification standard. The standard meets the alternative evaluation criteria.

Approved by JM Date 1/3/06

Chain of Custody Documentation

BARR

Chain of Custody

4700 West 77th Street
Minneapolis, MN 55435-4803
(952) 832-2600

Project Number: 23/11-005Y02 110

№ 16404

Project Manager: Tom Mattison

Project Contact: Erik Gohl

Laboratory: Columbia Analytical Services

Number of Containers/Preservative

Sample Identification	Collection Date	Collection Time	Matrix: Water	Matrix: Soil	Matrix: Other	Type: Grab	Type: Comp.	Type: QC	Volatile Organic (Unpres.)	Volatile Organic (Pres.)	Semivolatile Organic	Total Metals (HNO_3)	Dissolved Metals (HNO_3)	General (Unpreserved)	Cyanide (NaOH, Asc. Acid)	Nutrients (H_2SO_4)	Oil and Grease (H_2SO_4)	TOC (H_2SO_4)	Sulfide (Zn Acetate)	Dioxin	Whirlpak	Total Phenol (H_2SO_4)	Methane	(HCL)/DRO, 1L Glass	Lugols, Glass, Amber	Formalin, Glass					Total No. Of Containers	Remarks/ Analysis Required:
1. Ads A	12/13/05	AM 9:30	X			X					X																				1	PCP
2. Ads B	12/13/05	9:30	X			X					X																				1	PCP
3. Ads C	12/13/05	9:30	X			X					X																				1	PCP
4. Influent	12/13/05	9:30	X			X					X																				1	PCP
5.																																
6.																																
7.																																
8.																																
9.																																
10.																																
11.																																
12.																																
13.																																
14.																																
15.																																
16.																																

Sampled By: Jamie Eidsmoe

Remarks:

Relinquished By:	Date	Time	Received by:	Date	Time
Jamie Eidsmoe	12-13-05	9:30 Am	Tracy Black CAS	12/14/05	1100
Relinquished By:	Date	Time	Received by:	Date	Time
Samples Shipped VIA ☐ Air Freight ☐ Fed. Exp. ☐ Sampler ☐ Other			Air Bill Number: 822775788516		

Distribution: White-Original Accompanies Shipment to Lab; Yellow - Field Copy; Pink - Lab Coordinator

Rev. 08/01/01

H:RLG\STDFORMS\CHAINCST.CDR

00007

Columbia Analytical Services Inc.
Cooler Receipt and Preservation Form

PC MP 12/15 ~~EE~~ LYNDA

Project/Client Burr Service Request K05 ~~0635~~ 6629

Cooler received on 12/14/07 and opened on 12/14/07 by [illegible]

1. Were custody seals on outside of coolers? Y N
   If yes, how many and where? front
2. Were custody seals intact? Y N
3. Were signature and date present on the custody seals? Y N
4. Is the shipper's airbill available and filed? If no, record airbill number: 8227757885 74 Y N
5. COC#
   Temperature of cooler(s) upon receipt: (°C) 4.0
   Temperature Blank: (°C) 2.9
   Were samples hand delivered on the same day as collection? Y N
6. Were custody papers properly filled out (ink, signed, etc.)? Y N
7. Type of packing material present bmap - loose ice -
8. **Did all bottles arrive in good condition (unbroken)?** Y N
9. Were all bottle labels complete (i.e analysis, preservation, etc.)? Y N
10. Did all bottle labels and tags agree with custody papers? Y N
11. **Were the correct types of bottles used for the tests indicated?** Y N
12. Were all of the preserved bottles received at the lab with the appropriate pH? ~~Y~~ N
13. Were VOA vials checked for absence of air bubbles, and if present, noted below? Y
14. Were the 1631 Mercury bottles checked for absence of air bubbles, and if present, noted below? ~~Y~~
15. Did the bottles originate from CAS/K or a branch laboratory? Y N
16. **Are CWA Microbiology samples received with >1/2 the 24hr. hold time remaining from collection?** ~~Y N~~
17. Was C12/Res negative? ~~Y~~ N

Explain any discrepancies:

RESOLUTION:

Samples that required preservation or received out of temperature:

Sample ID	Reagent	Volume	Lot Number	Bottle Type	Rec'd out of Temperature	Initials

Pentachlorophenol
EPA Method 8151 Modified

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Barr Engineering	**Service Request:**	K0506629
Project:	23/11-005Y02 110	**Date Collected:**	12/13/200:
Sample Matrix:	Water	**Date Received:**	12/14/2005

Pentachlorophenol

Sample Name:	Ads A	**Units:**	ug/L
Lab Code:	K0506629-001	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	12/16/05	12/28/05	KWG0521508	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
-Bromo-2,6-dichlorophenol	114	35-133	12/28/05	Acceptable

nents:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Barr Engineering	**Service Request:**	K0506629
Project:	23/11-005Y02 110	**Date Collected:**	12/13/2005
Sample Matrix:	Water	**Date Received:**	12/14/2005

Pentachlorophenol

Sample Name:	Ads B	**Units:**	ug/L
Lab Code:	K0506629-002	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	12/16/05	12/28/05	KWG0521508	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	107	35-133	12/28/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Barr Engineering	**Service Request:**	K0506629
Project:	23/11-005Y02 110	**Date Collected:**	12/13/2005
Sample Matrix:	Water	**Date Received:**	12/14/200

Pentachlorophenol

Sample Name:	Ads C	**Units:**	ug/L
Lab Code:	K0506629-003	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	**1800**	D	50	100	12/16/05	12/28/05	KWG0521508	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	95	35-133	12/28/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Barr Engineering	**Service Request:**	K0506629
Project:	23/11-005Y02 110	**Date Collected:**	12/13/2005
Sample Matrix:	Water	**Date Received:**	12/14/2005

Pentachlorophenol

Sample Name:	Influent	**Units:**	ug/L
Lab Code:	K0506629-004	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	**2400**	D	50	100	12/16/05	12/28/05	KWG0521508	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	97	35-133	12/28/05	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Barr Engineering	**Service Request:**	K0506629
Project:	23/11-005Y02 110	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Pentachlorophenol

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG0521508-4	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Pentachlorophenol	ND	U	0.50	1	12/16/05	12/28/05	KWG0521508	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	85	35-133	12/28/05	Acceptable

nents:

00014

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Barr Engineering
Project: 23/11-005Y02 110
Sample Matrix: Water

Service Request: K0506629

Surrogate Recovery Summary
Pentachlorophenol

Extraction Method: METHOD
Analysis Method: 8151M

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1
Ads A	K0506629-001	114
Ads B	K0506629-002	107
Ads C	K0506629-003	95 D #
Influent	K0506629-004	97 D #
Method Blank	KWG0521508-4	85
Ads AMS	KWG0521508-1	94
Ads ADMS	KWG0521508-2	106
Lab Control Sample	KWG0521508-3	101

Surrogate Recovery Control Limits (%)

Sur1 = 4-Bromo-2,6-dichlorophenol 35-133

flagged with an asterisk (*) indicate values outside control criteria.
lts flagged with a pound (#) indicate the control criteria is not applicable.

00015

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Barr Engineering
Project: 23/11-005Y02 110
Sample Matrix: Water

Service Request: K0506629
Date Extracted: 12/16/200
Date Analyzed: 12/28/200

Matrix Spike/Duplicate Matrix Spike Summary
Pentachlorophenol

Sample Name: Ads A
Lab Code: K0506629-001

Units: ug/L
Basis: NA

Extraction Method: METHOD
Analysis Method: 8151M

Level: Low
Extraction Lot: KWG0521508

Analyte Name	Sample Result	Ads AMS KWG0521508-1 Matrix Spike			Ads ADMS KWG0521508-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Pentachlorophenol	ND	10.4	10.0	104	10.4	10.0	104	34-124	0	30

s flagged with an asterisk (*) indicate values outside control criteria.
s flagged with a pound (#) indicate the control criteria is not applicable.
: recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00016

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Barr Engineering	**Service Request:**	K0506629
Project:	23/11-005Y02 110	**Date Extracted:**	12/16/2005
Sample Matrix:	Water	**Date Analyzed:**	12/28/2005

Lab Control Spike Summary
Pentachlorophenol

Extraction Method:	METHOD	**Units:**	ug/L
Analysis Method:	8151M	**Basis:**	NA
		Level:	Low
		Extraction Lot:	KWG0521508

	Lab Control Sample KWG0521508-3 Lab Control Spike			
Analyte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
Pentachlorophenol	11.2	10.0	112	44-116

est ged with an asterisk (*) indicate values outside control criteria.

rce. coveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00017

Appendix C

Containment Vault Inspection Forms

CASS LAKE CONTAINMENT VAULT

INSPECTION FORM

Instructions: Mark the correct response with an "X" after inspecting each component of the vault. Any corrective action required by this inspection will be implemented as stated in the Revised Post-Closure Submittal, April 1992. This inspection form was developed to meet the requirements of MN Rules 7045.0452, Subp. 5, Item B.

		Yes	No
I.	**Run-on Control System**		
1.	Is there debris in the run-on control system?	☐	☒
2.	Is there debris blocking the culvert?	☐	☒
3.	Is there a significant amount of standing water in the run-on control system?	☐	☒
4.	Are there any signs of erosion to the run-on control system? (depressions, gullies, change in contour)	☐	☒
5.	Are there any areas that lack adequate vegetation?	☐	☒
6.	Is there any other deficiency of the run-on control system? (Describe in Section VI)	☐	☒
II.	**Run-off Control System**		
1.	Is there debris on the side slopes?	☐	☒
2.	Are there any signs of erosion of the side slopes? (Depressions, gullies, change in contour)	☐	☒
3.	Are there any areas that lack adequate vegetation on the side slopes?	☐	☒
4.	Is there debris on top of the vault?	☐	☒
5.	Are there any signs of erosion to the top of the vault? (Depressions, gullies, change in contour)	☐	☒
6.	Are there any areas that lack adequate vegetation on top of the vault?	☐	☒
7.	Is there any evidence of uneven settling of the cap? (Depressions, standing water)	☐	☒
8.	Is there debris in the storm sewer system?	☐	☒
9.	Is there any other deficiency of the run-off control system? (Describe in Section VI)	☐	☒
III.	**Leachate Collection Manhole (LCM) and Leak Detection Manhole (LDM)**		
1.	Is there leachate in the LCM?	☒	☐
	Depth to leachate: 31' 9½"		
2.	Is there leachate in the LDM?	☒	☐
	Depth to leachate: 31' 11½"		

23\11\005\INSPFRM.WP\DSD

		Yes	No
3.	Is the leachate evaporation system not functional? NA	☐	☐
4.	Is the LCM or LDM not covered?	☐	☒
5.	Is there any damage to the LCM or LDM?) (Describe in Section VI)	☐	☒

IV. Benchmarks and Wells

1.	Has any benchmark or protective post been damaged?	☐	☒
2.	Has any well or protective post been damaged?	☐	☒
3.	Is any well not locked?	☐	☒
4.	Is there any other deficiency noted? (Describe in Section VI)	☐	☒

V. Security System

1.	Is there any damage to the chain link fence?	☐	☒
2.	Is the gate unlocked when it is not attended?	☐	☒
3.	Are there any other deficiencies noted? (Describe in Section VI)	☐	☒

VI. Describe any other deficiencies or damage to any component of the vault. (Add additional pages, if necessary)

VII. Describe any corrective action required as the result of this inspection. Corrective action is required for each "Yes" response, except Section III, questions 1 & 2. (Add additional pages, if necessary)

Inspected by: Jamie Eckstrom **Inspection Date:** 5-11-05
(Please Print)

Signature: Jamie Eckstrom **Date:** 5-11-05

23\11\005\INSPFRM.WP\DSD

CASS LAKE CONTAINMENT VAULT

INSPECTION FORM

Instructions: Mark the correct response with an "X" after inspecting each component of the vault. Any corrective action required by this inspection will be implemented as stated in the Revised Post-Closure Submittal, April 1992. This inspection form was developed to meet the requirements of MN Rules 7045.0452, Subp. 5, Item B.

		Yes	No
I. Run-on Control System			
1.	Is there debris in the run-on control system?	☐	☒
2.	Is there debris blocking the culvert?	☐	☒
3.	Is there a significant amount of standing water in the run-on control system?	☐	☒
4.	Are there any signs of erosion to the run-on control system? (depressions, gullies, change in contour)	☐	☒
5.	Are there any areas that lack adequate vegetation?	☐	☒
6.	Is there any other deficiency of the run-on control system? (Describe in Section VI)	☐	☒
II. Run-off Control System			
1.	Is there debris on the side slopes?	☐	☒
2.	Are there any signs of erosion of the side slopes? (Depressions, gullies, change in contour)	☐	☒
3.	Are there any areas that lack adequate vegetation on the side slopes?	☐	☒
4.	Is there debris on top of the vault?	☐	☒
5.	Are there any signs of erosion to the top of the vault? (Depressions, gullies, change in contour)	☐	☒
6.	Are there any areas that lack adequate vegetation on top of the vault?	☐	☒
7.	Is there any evidence of uneven settling of the cap? (Depressions, standing water)	☐	☒
8.	Is there debris in the storm sewer system?	☐	☒
9.	Is there any other deficiency of the run-off control system? (Describe in Section VI)	☐	☒
III. Leachate Collection Manhole (LCM) and Leak Detection Manhole (LDM)			
1.	Is there leachate in the LCM?	☒	☐
	Depth to leachate: 31' 10½"		
2.	Is there leachate in the LDM?	☒	☐
	Depth to leachate: 32' 7½"		

		Yes	No
3.	Is the leachate evaporation system not functional? NA	☐	☐
4.	Is the LCM or LDM not covered?	☐	☒
5.	Is there any damage to the LCM or LDM?) (Describe in Section VI)	☐	☒

IV. Benchmarks and Wells

1.	Has any benchmark or protective post been damaged?	☐	☒
2.	Has any well or protective post been damaged?	☐	☒
3.	Is any well not locked?	☐	☒
4.	Is there any other deficiency noted? (Describe in Section VI)	☐	☒

V. Security System

1.	Is there any damage to the chain link fence?	☐	☒
2.	Is the gate unlocked when it is not attended?	☐	☒
3.	Are there any other deficiencies noted? (Describe in Section VI)	☐	☒

VI. Describe any other deficiencies or damage to any component of the vault. (Add additional pages, if necessary)

VII. Describe any corrective action required as the result of this inspection. Corrective action is required for each "Yes" response, except Section III, questions 1 & 2. (Add additional pages, if necessary)

Inspected by: Jamie Eidsmoe **Inspection Date:** 11-2-05
(Please Print)

Signature: Jamie Eidsmoe **Date:** 11-2-05

23\11\005\INSPFRM.WP\DSD

Appendix D

Water Quality Trend Analysis

Figure 1

LOCATION MAP

St. Regis Paper Company Site and
City Dump Pit Site
Cass Lake, Minnesota

LEGEND

St. Regis Paper Company Site

Cass Lake City Dump Site

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Figure 2

MONITORING STATION LOCATIONS

St. Regis Paper Company Site
and City Dump Site
Cass Lake, Minnesota

LEGEND

- St. Regis Paper Company Site
- Cass Lake City Dump Site
- Fish Wells
- Monitoring Locations

N W E S

0 150 300 600 900 1,200 1,500

Feet

Barr Footer: Date: 3/16/2... 09:22 PM File: I:\Projects\23\11\005\gis\Maps\Annual Report Feb 2006\Fig02_Monitoring_Locations.mxd

Legend

- ⊕ Monitoring well
- Groundwater elevation contour (Contour interval = 0.5 ft)
- Groundwater flow path

N

Feet
750 0 750 1,500

Meters
250 0 250 500

Figure 3

GROUNDWATER ELEVATIONS, SURFICIAL AQUIFER
MAY 2005
St. Regis Paper Company Site
Cass Lake, Minnesota

Barr Footer: Date 3/29/2006 4:02:00 PM File I:\projects\23\11\005\gis\Maps\GW_Contour\May05_Upper_GWContour.mxd User: jam2

Barr Footer: Date 3/17/2006 12:06:09 PM File: I:\projects\23\11005\gis\Maps\GW_Contour\May05_Lower_GWContour.mxd User: JAM2

Legend

- ⊕ Monitoring well
- Groundwater elevation contour (Contour interval = 0.5 ft)
- Groundwater flow path

N

Feet
500 0 500 1,000

Meters
200 0 200 400

Figure 4

GROUNDWATER ELEVATIONS, LOWER AQUIFER
MAY 2005
St. Regis Paper Company Site
Cass Lake, Minnesota

Monitoring Well
St. Regis Paper Company Site
Cass Lake City Dump Site
Vault Fence
PCP Contour

N

Feet
300 0 300 600 900 1,200 1,500

Meters
100 0 100 200 300

Figure 5

tPAH DISTRIBUTION - MAY 2005
St. Regis Company Site
Cass Lake, Minnesota

Barr Footer: Date: 3/22/2006 4:31:59 PM File: I:\Projects\23\11\005\gis\Maps\Annual Report Feb 2006\Fig05_tPAH_Report_05.mxd User: lkp

Monitoring Well

Surface Water Sample Location

St. Regis Paper Company Site

Cass Lake City Dump Site

Vault Fence

PCP Contour

N

Feet

300 0 300 600 900 1,200

Meters

100 0 100 200 300

Figure 6

PCP DISTRIBUTION - MAY 2005
St. Regis Company Site
Cass Lake, Minnesota

3arr Footer: Date: 3/22/2006 4:42:14 PM File: I:\Projects\23\11\005\gis\Maps\Annual Report Feb 2006\Fig06_PCP_Report_05.mxd User: lkp

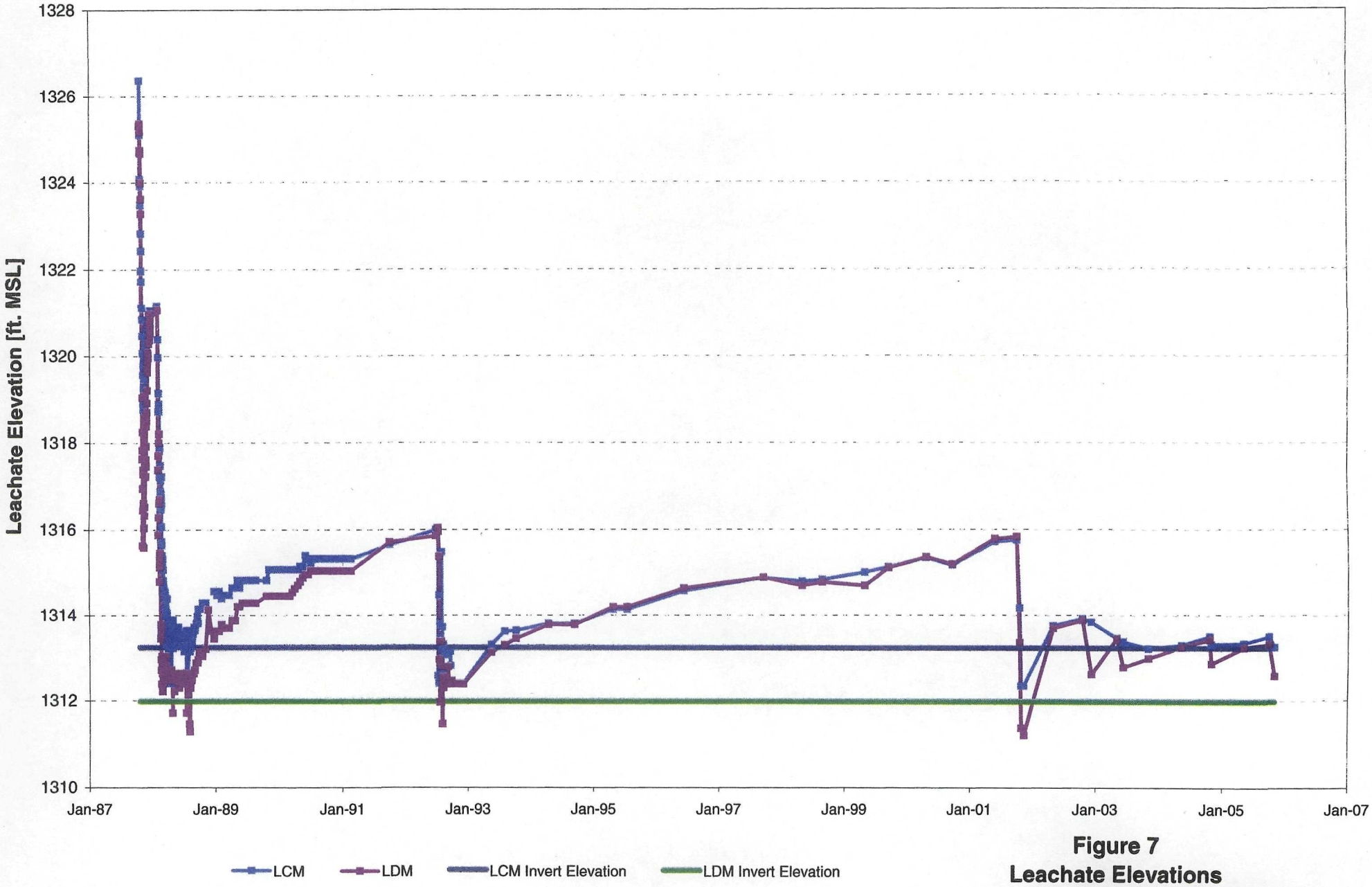
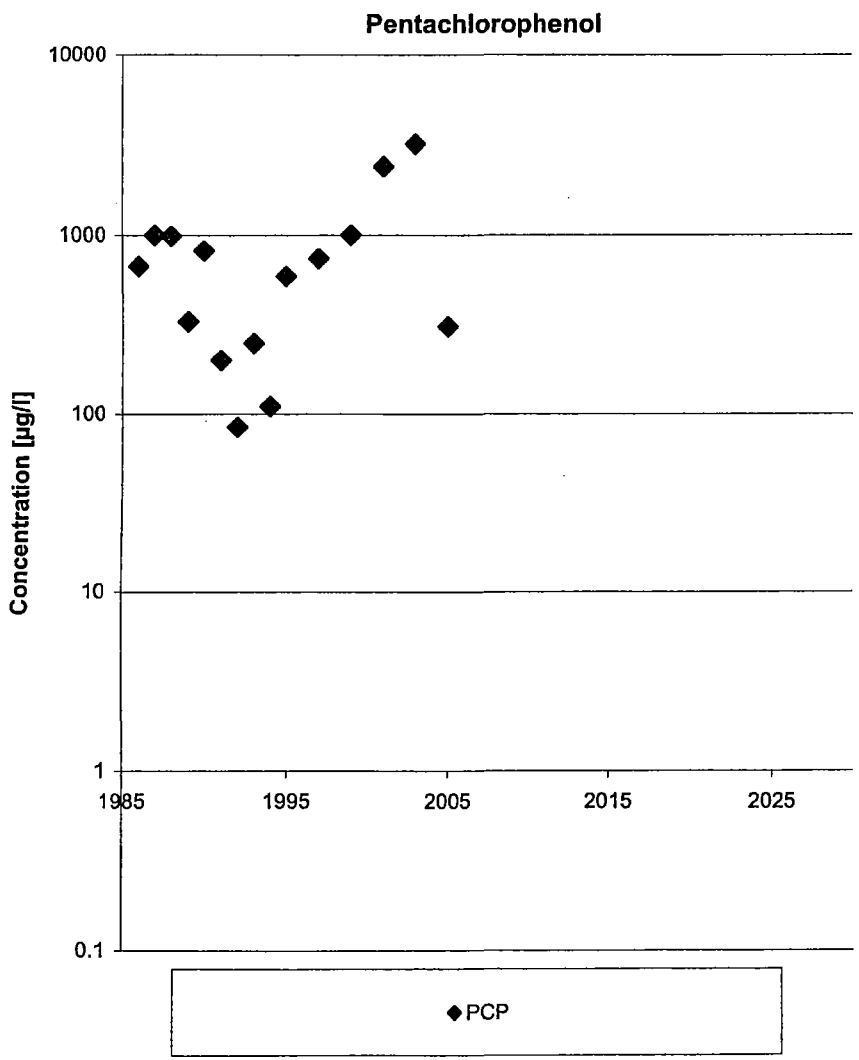
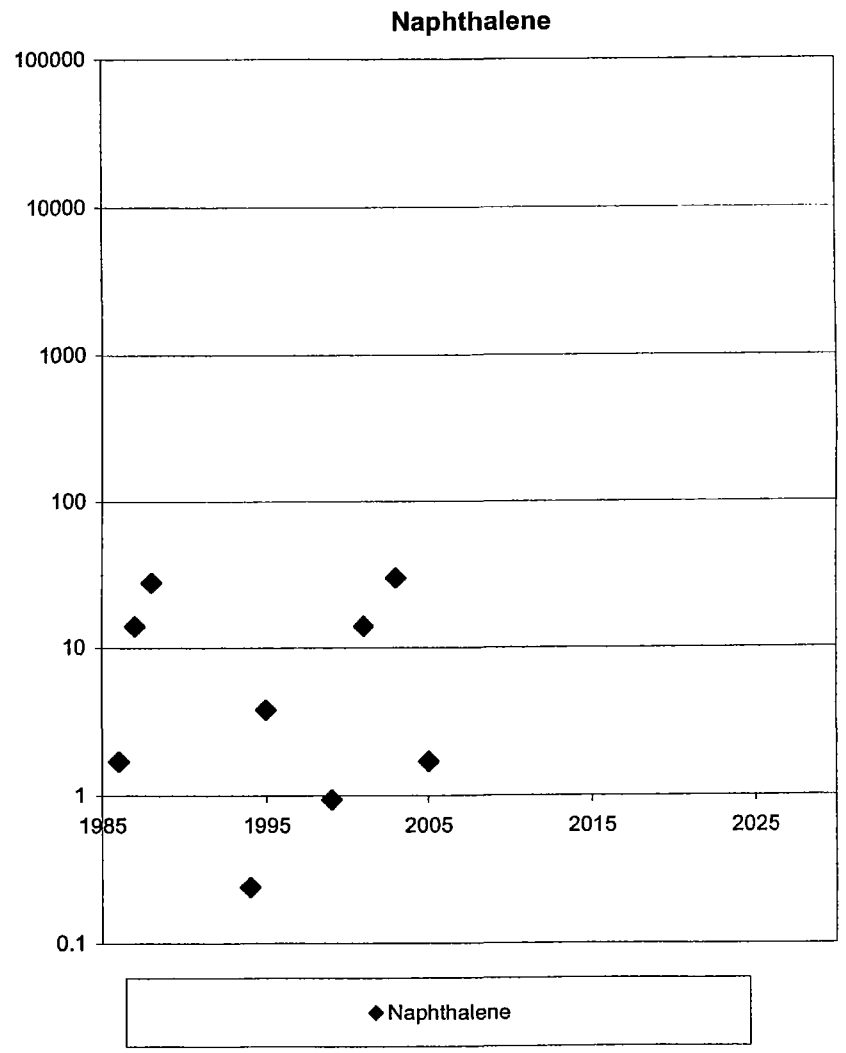


Figure 7
Leachate Elevations
OU2 - Containment Vault
St. Regis Paper Company Site

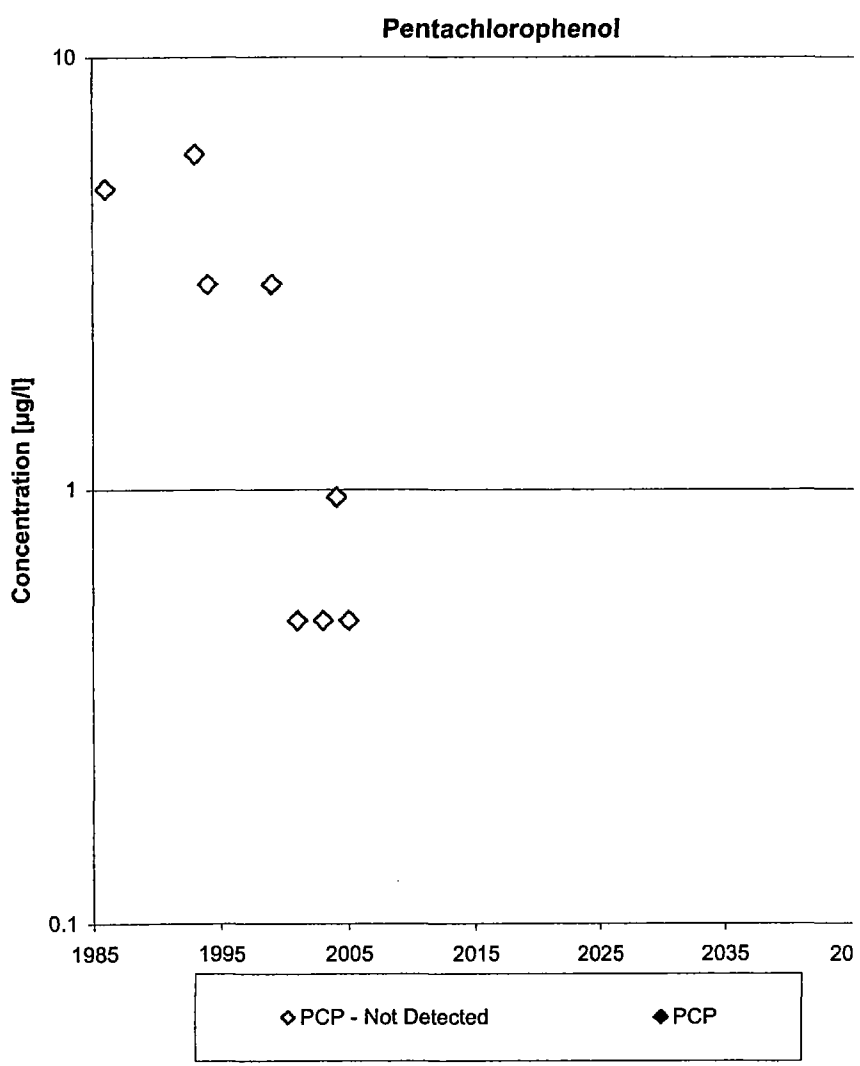
P:\23\[illegible]05\Vault Dewatering\Leachate Elevations

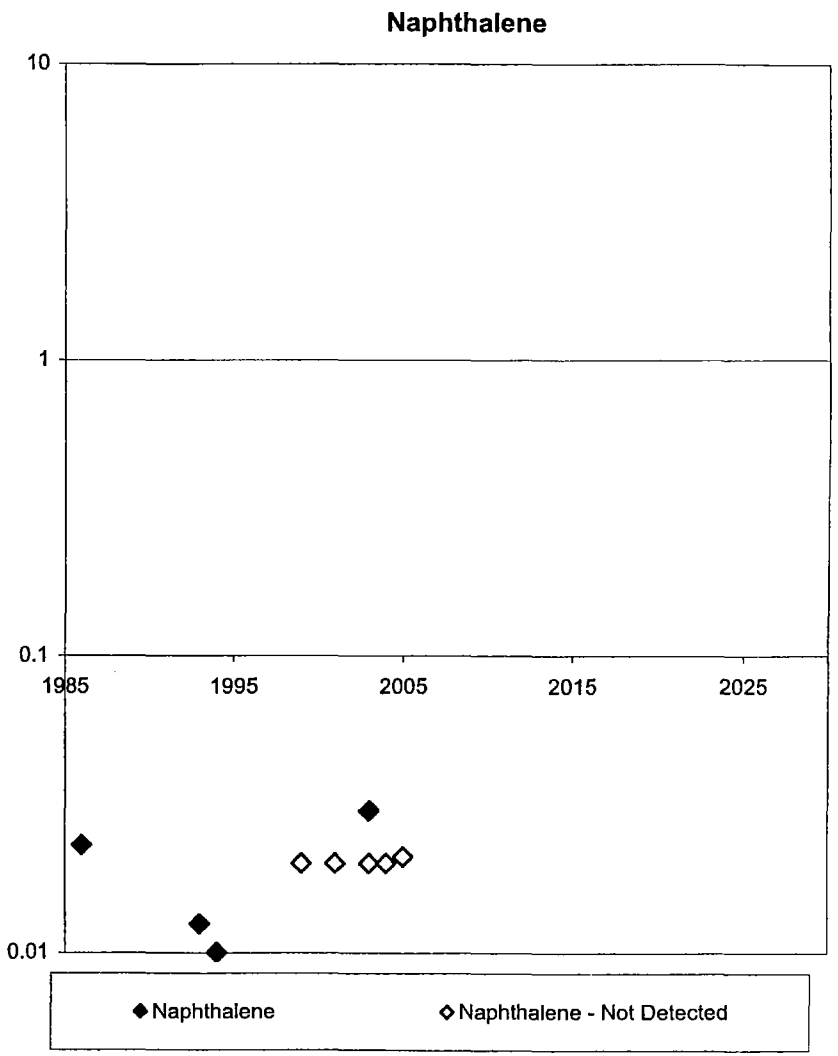
Well 104
St. Regis Paper Company Site



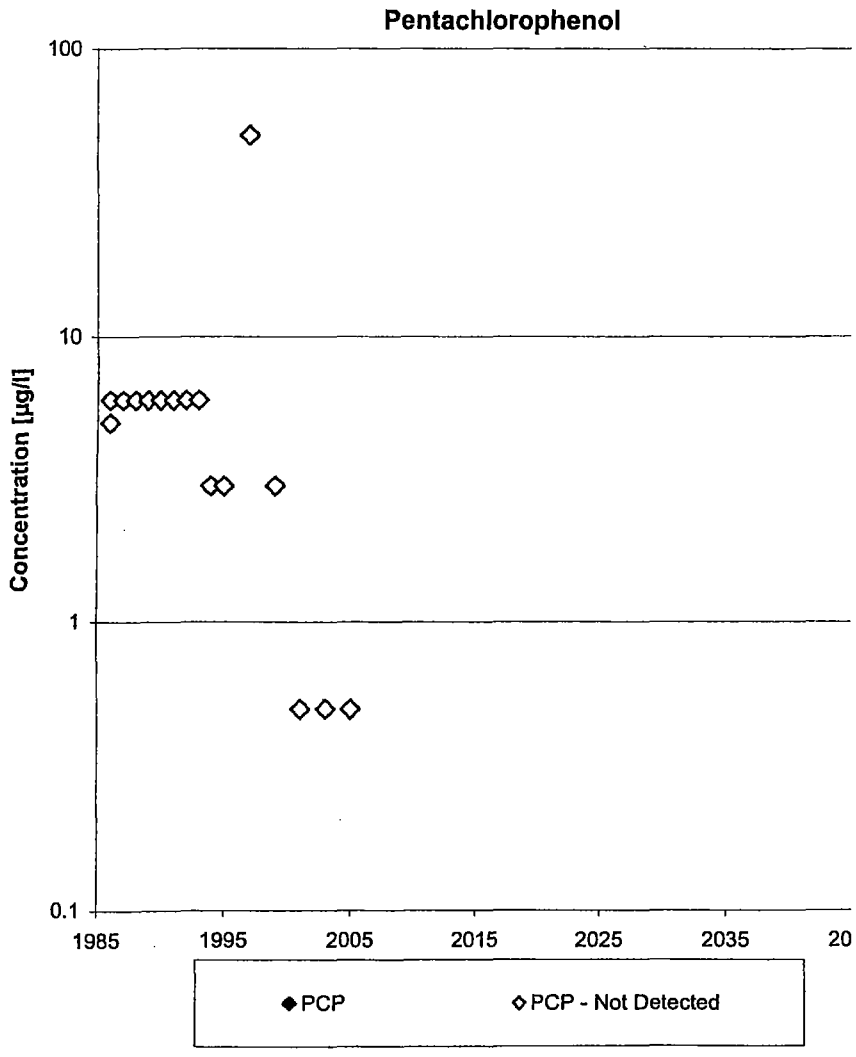


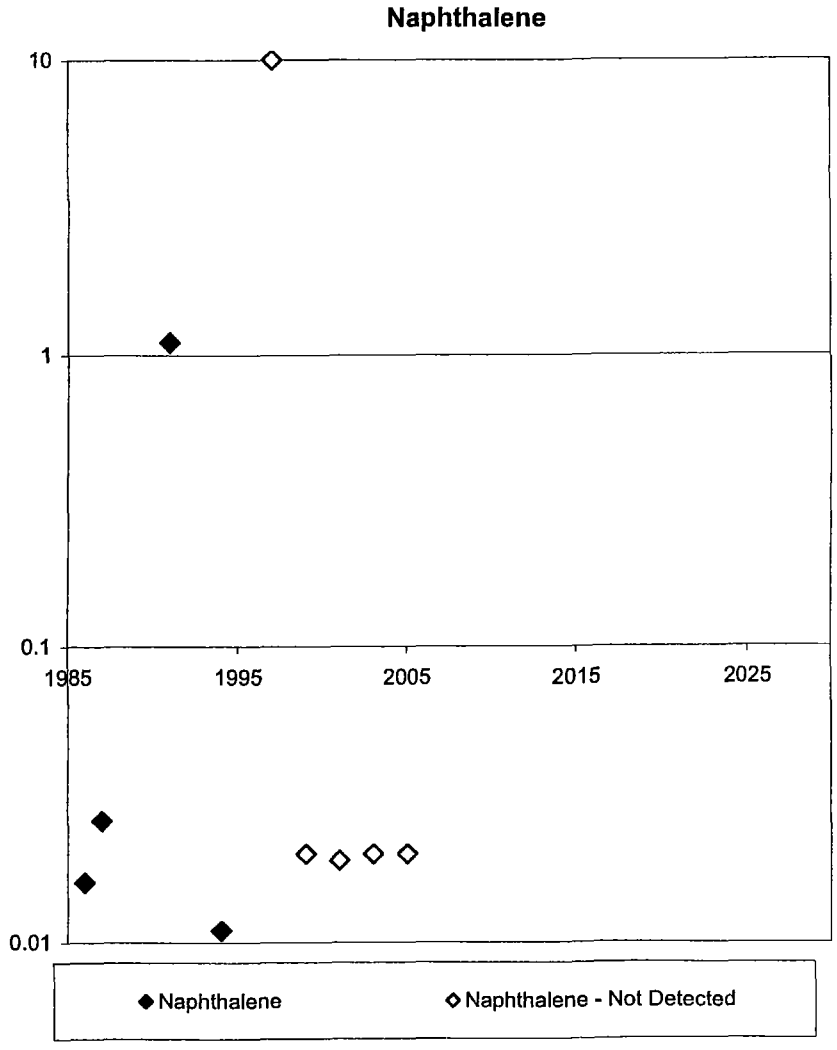
Well 105
St. Regis Paper Company Site





Well 112
St. Regis Paper Company Site





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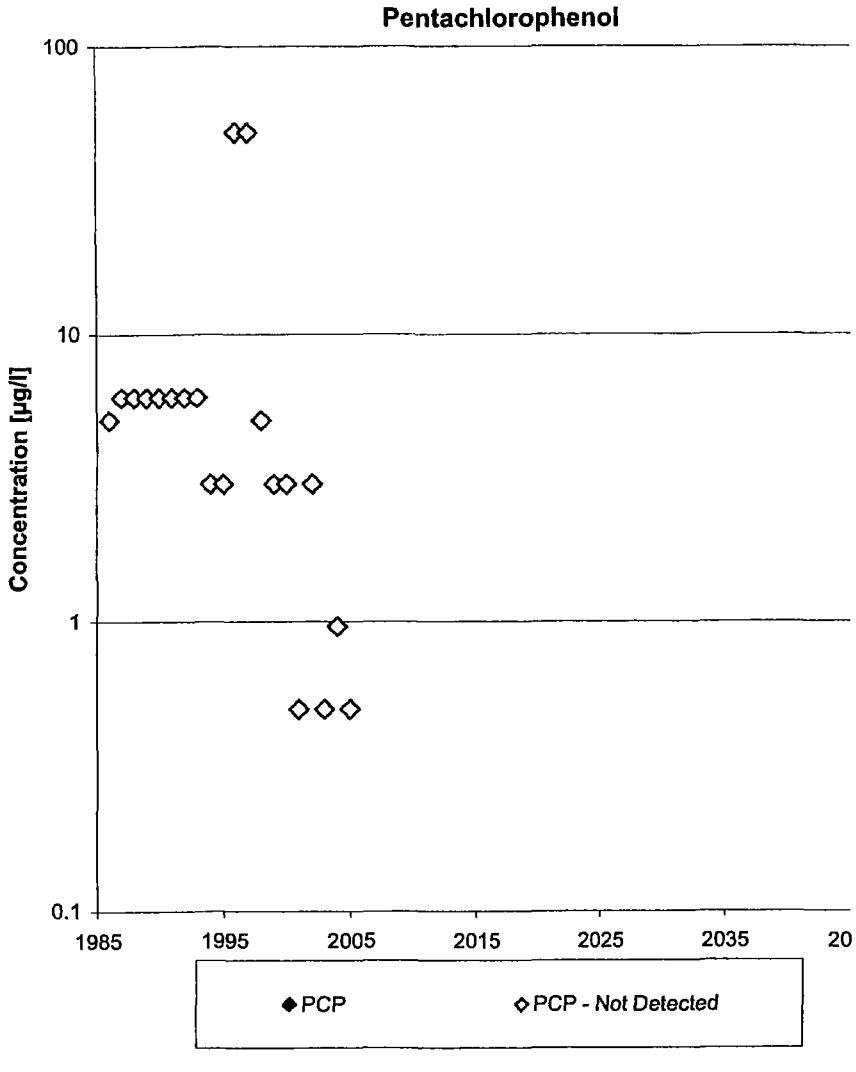

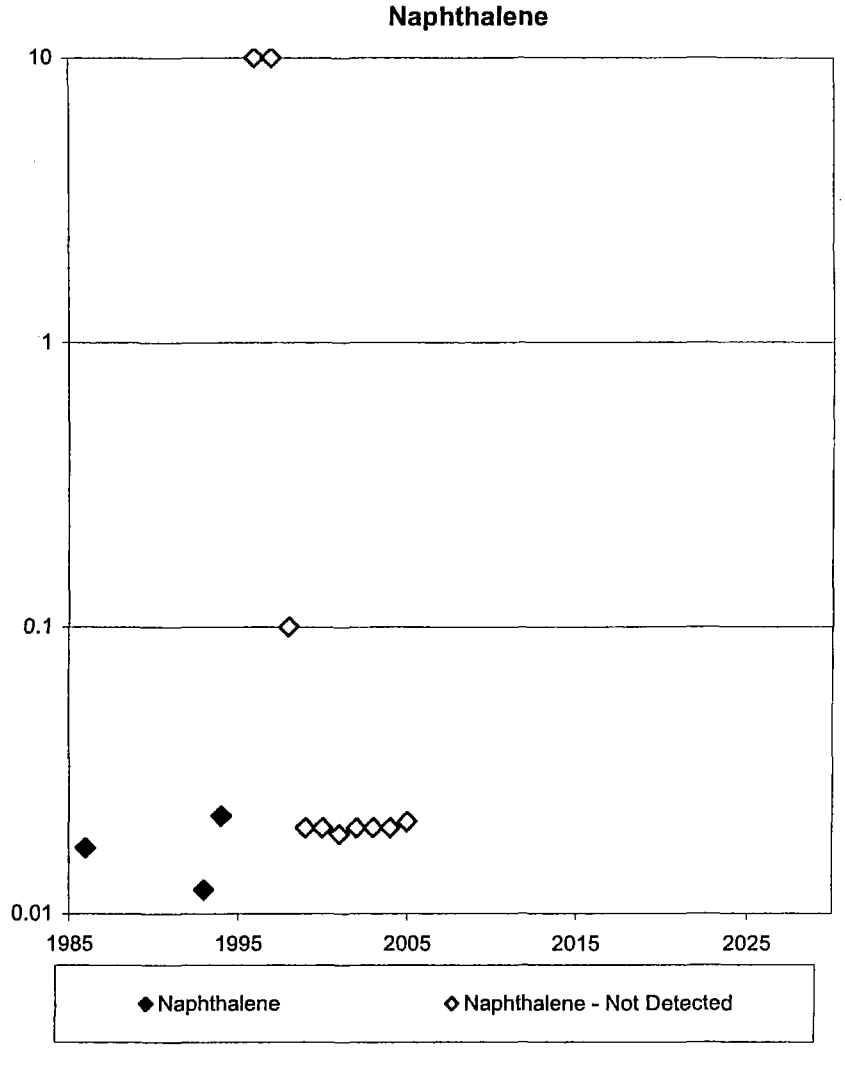

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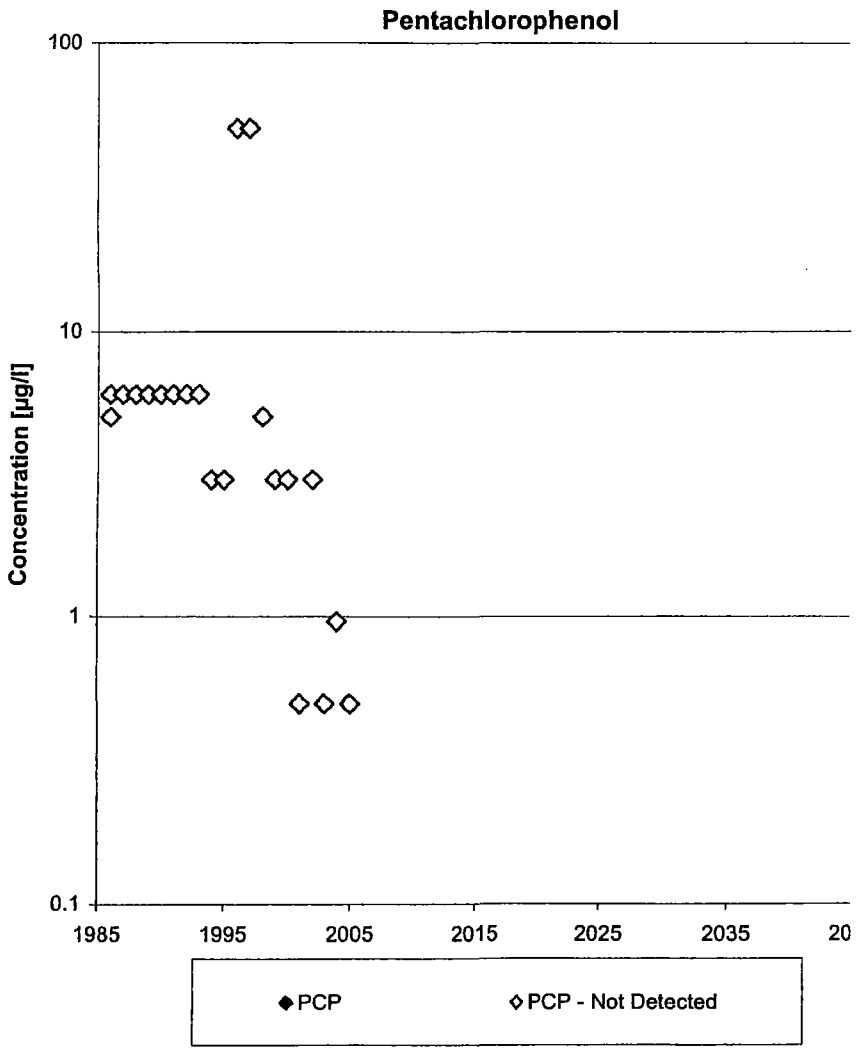

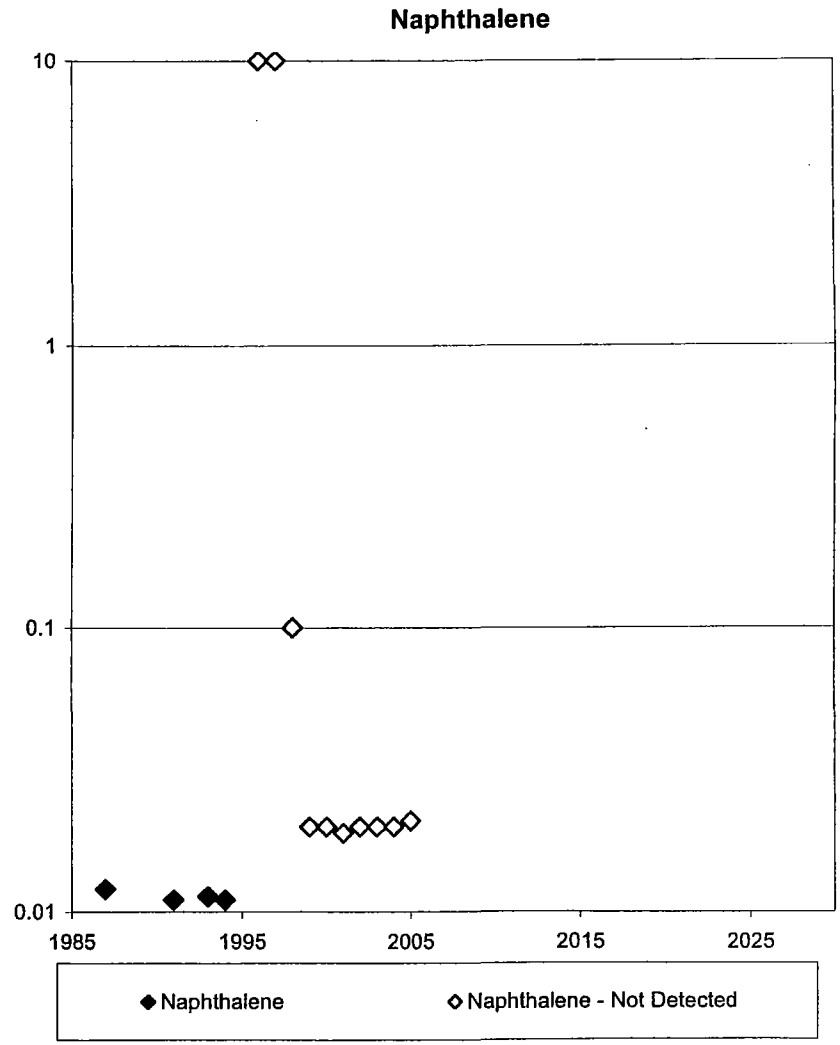

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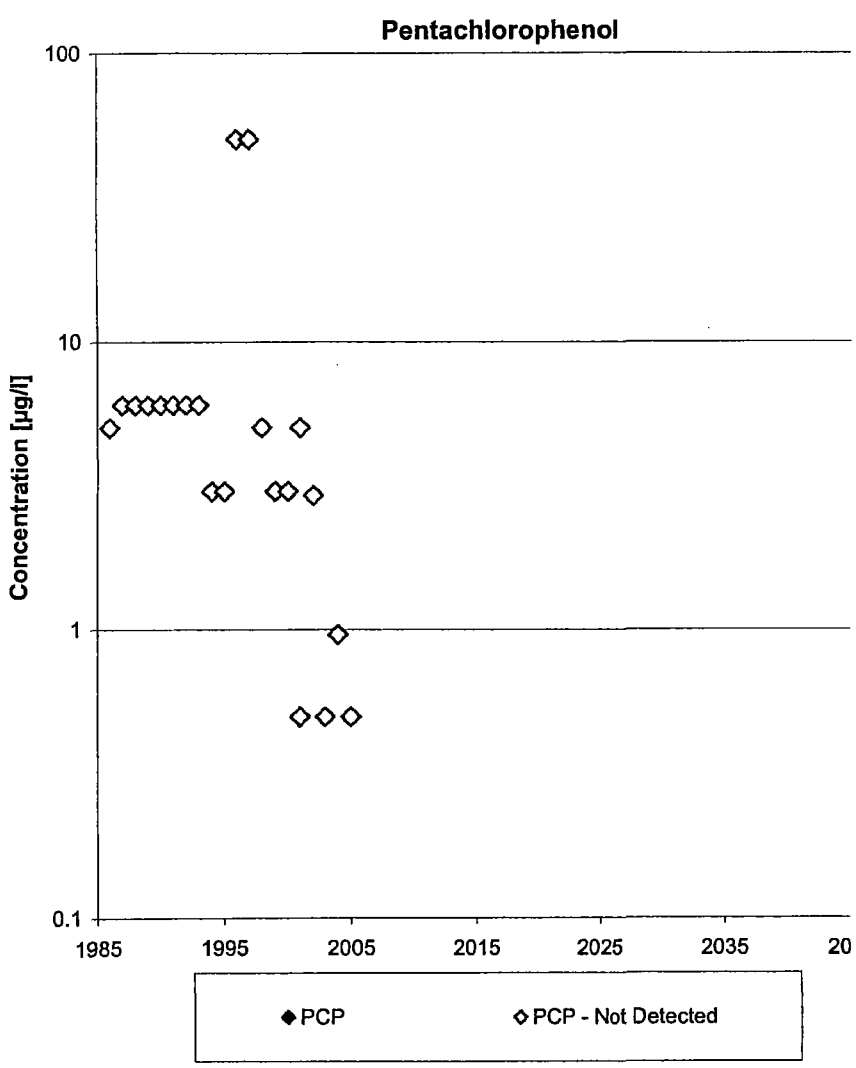

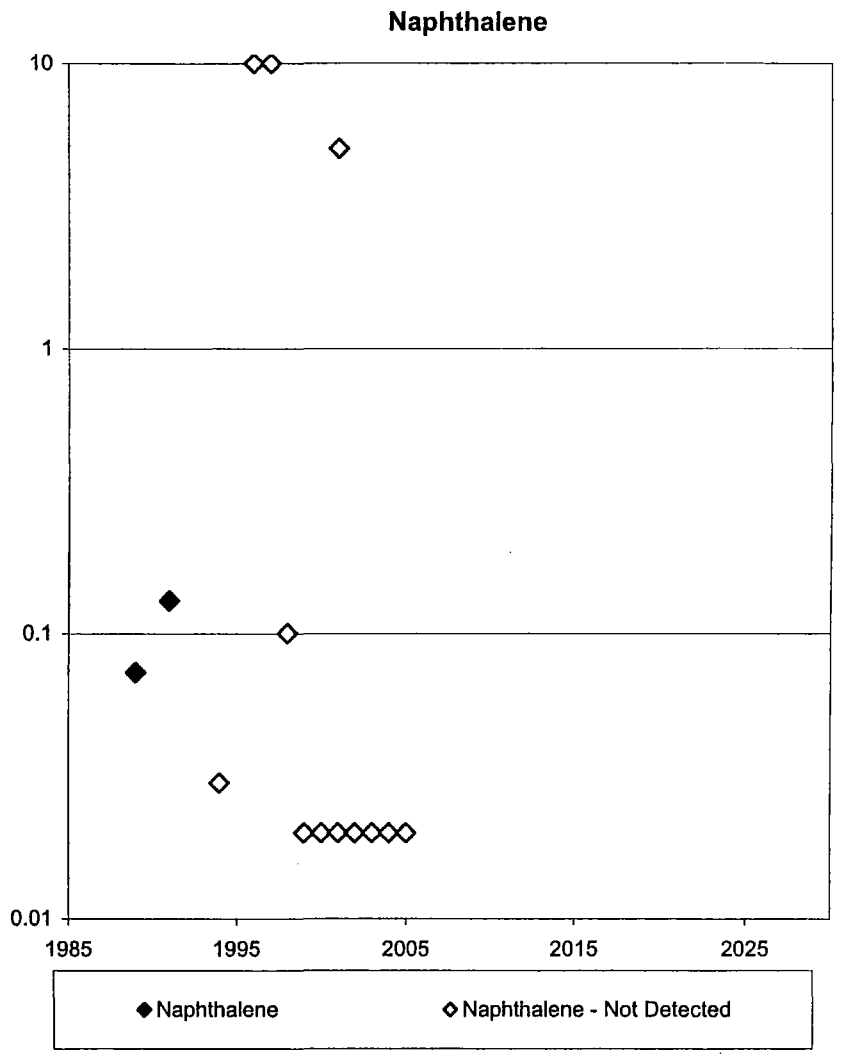

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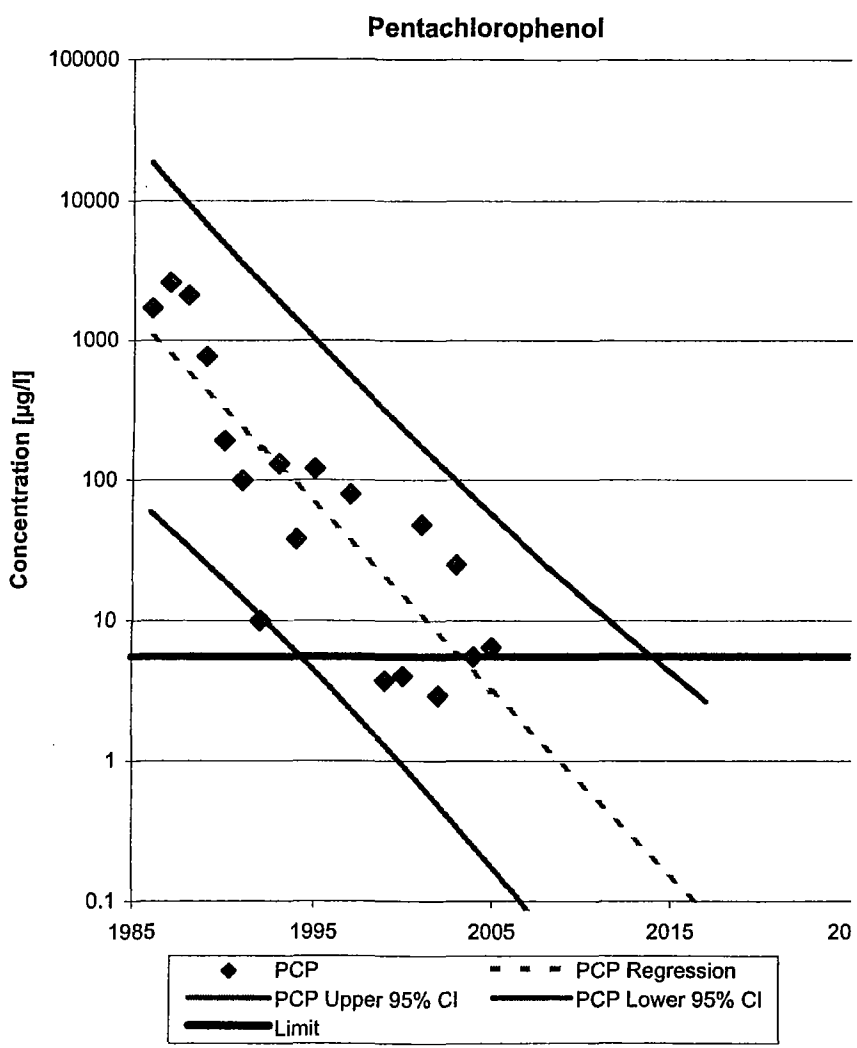

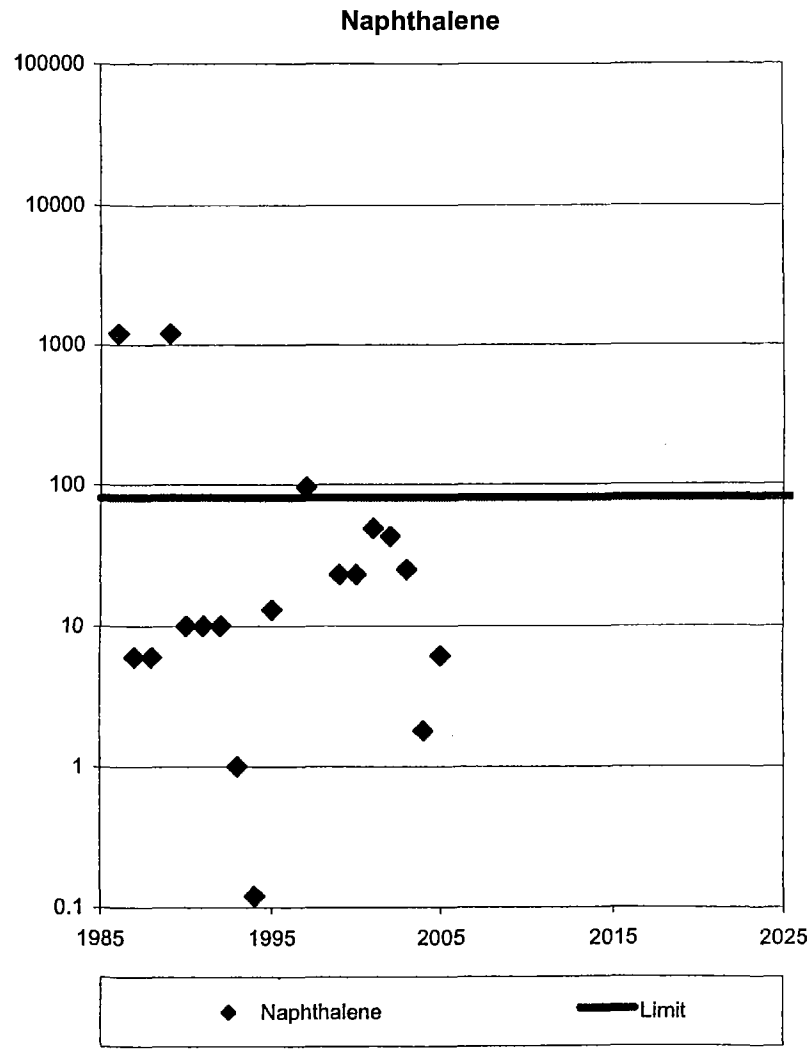

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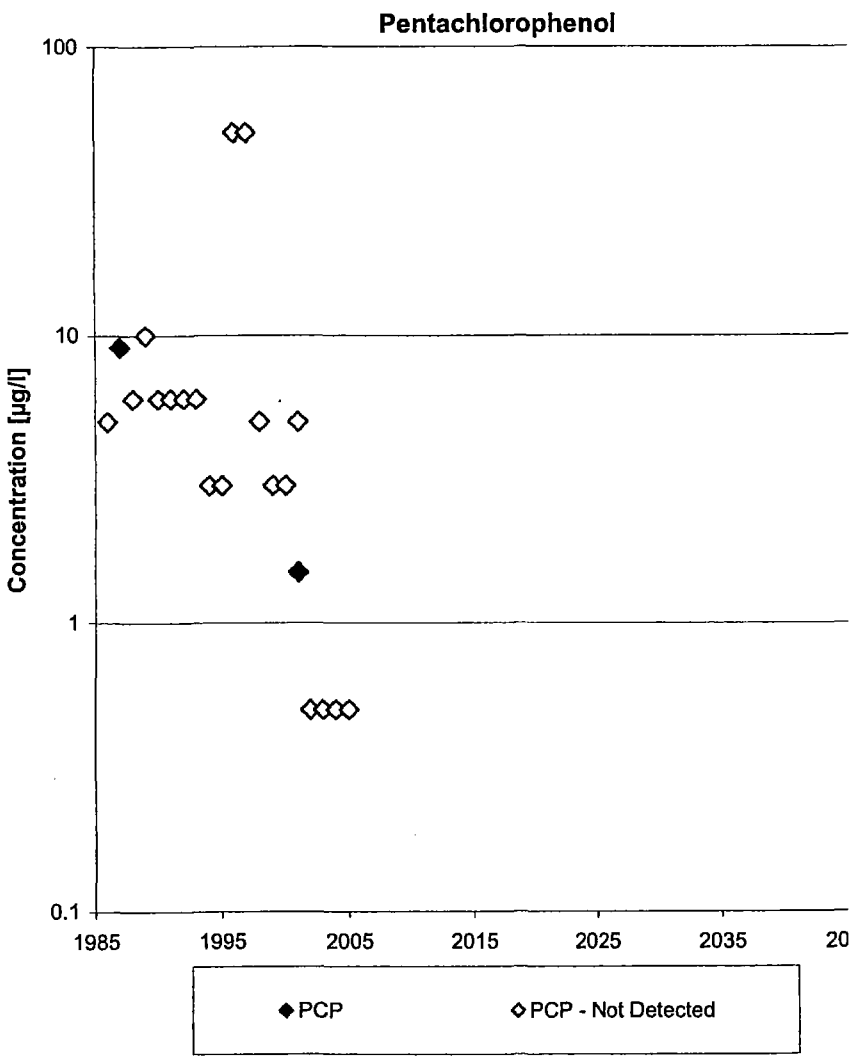

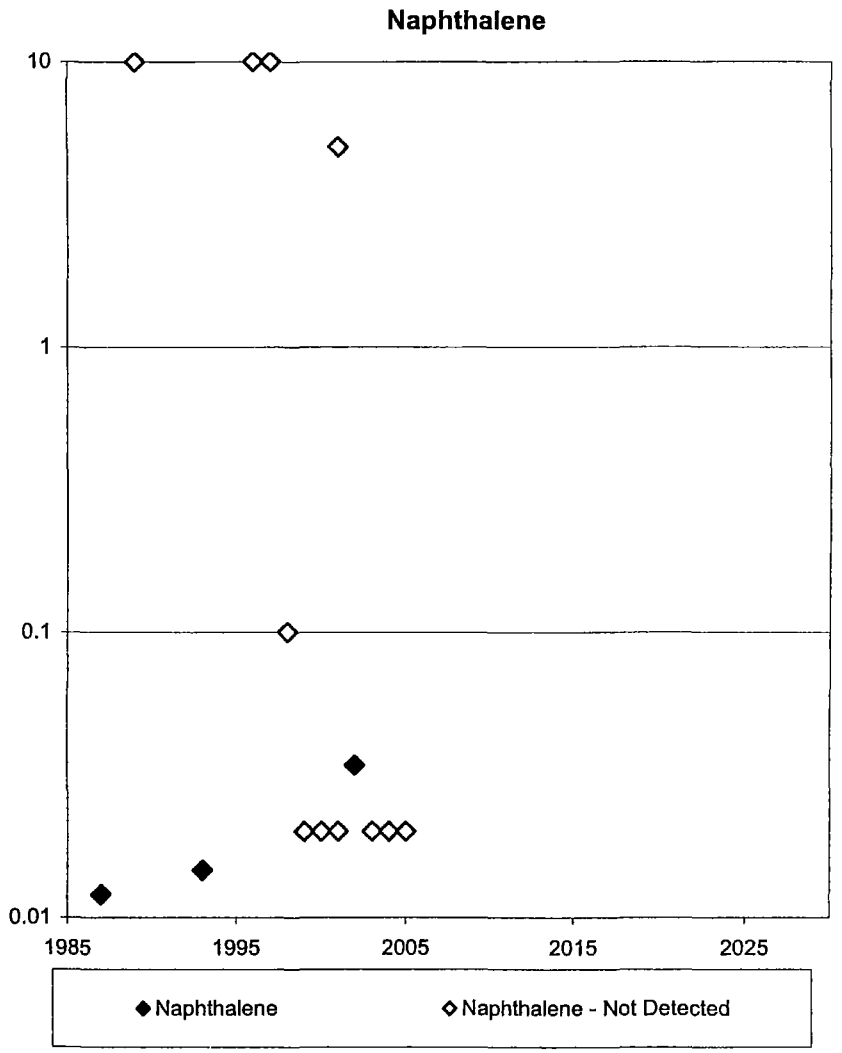

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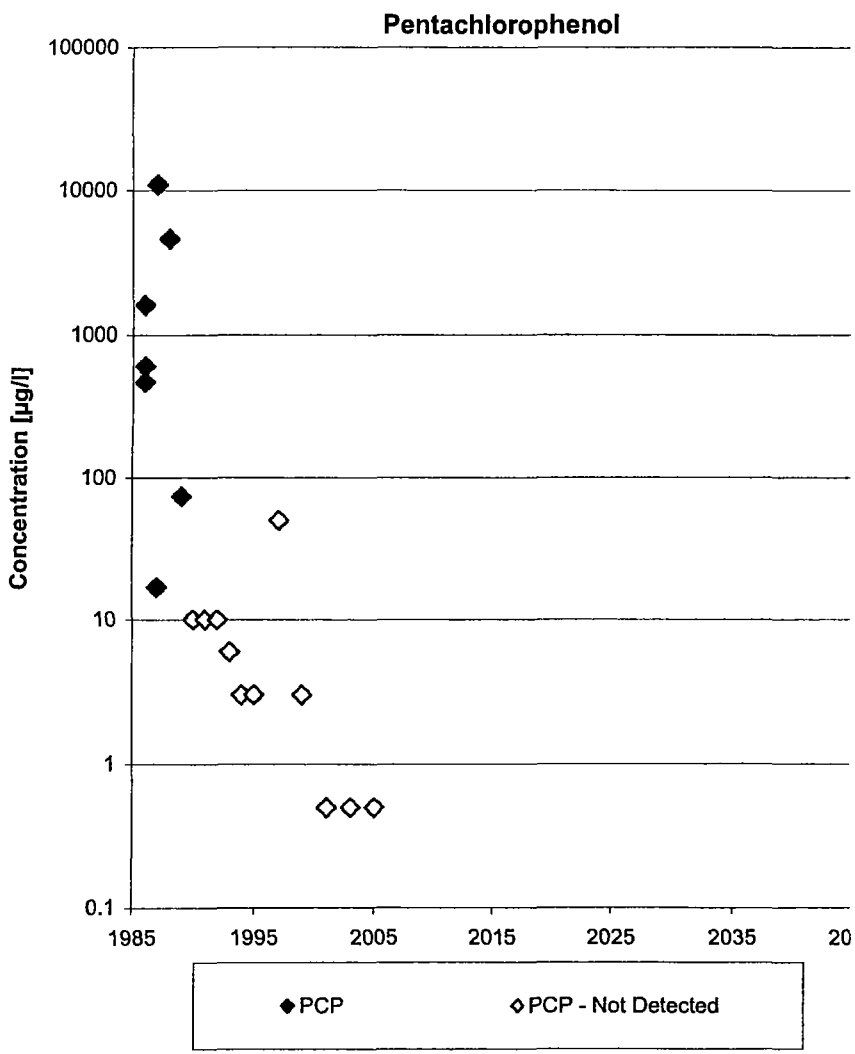

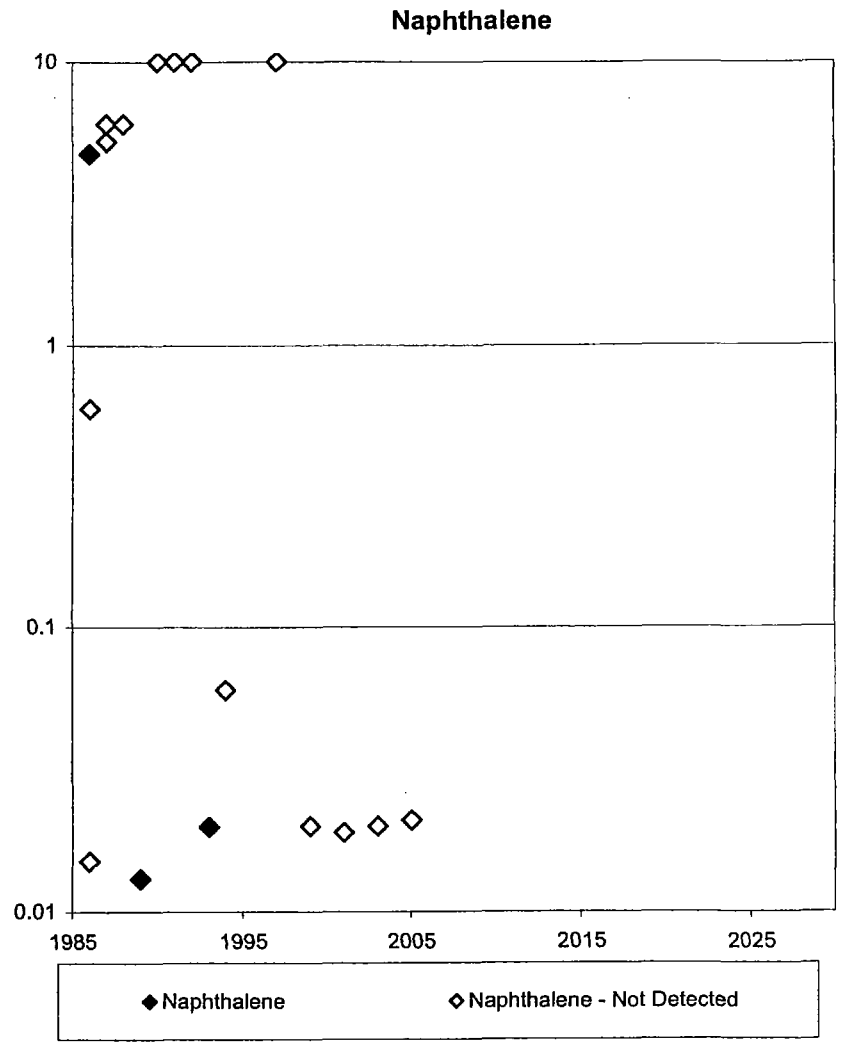

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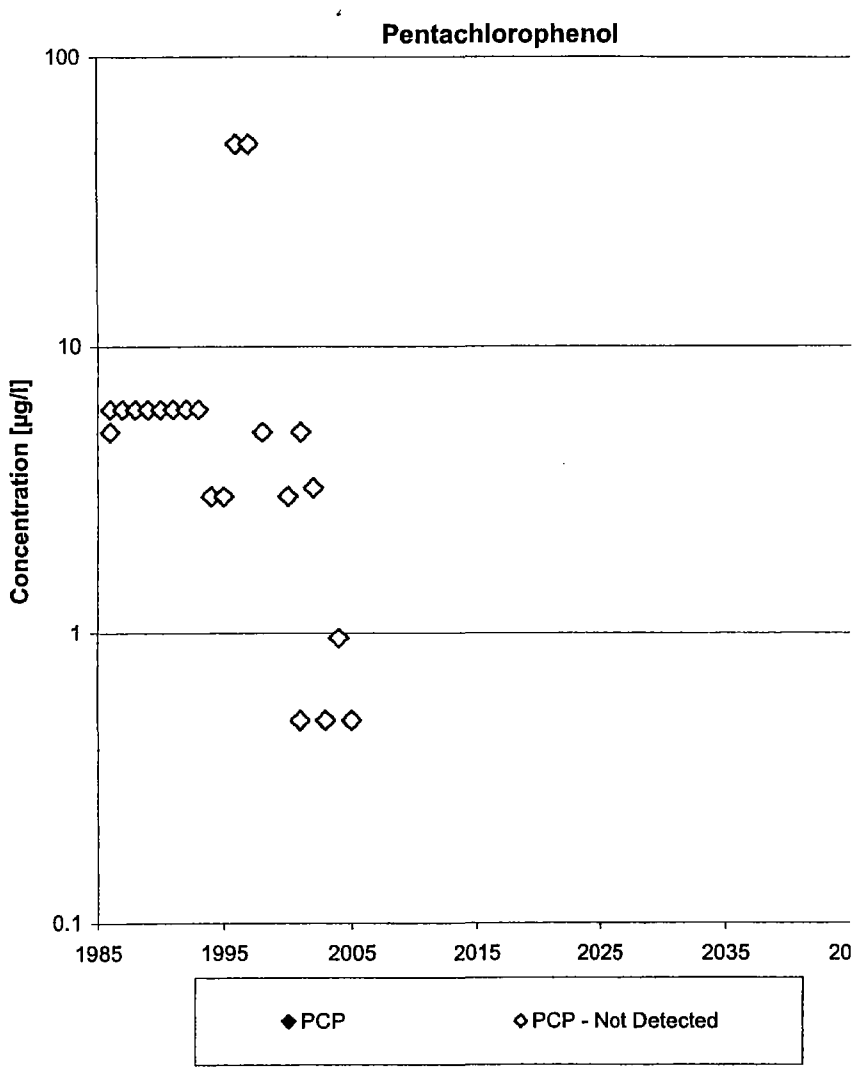

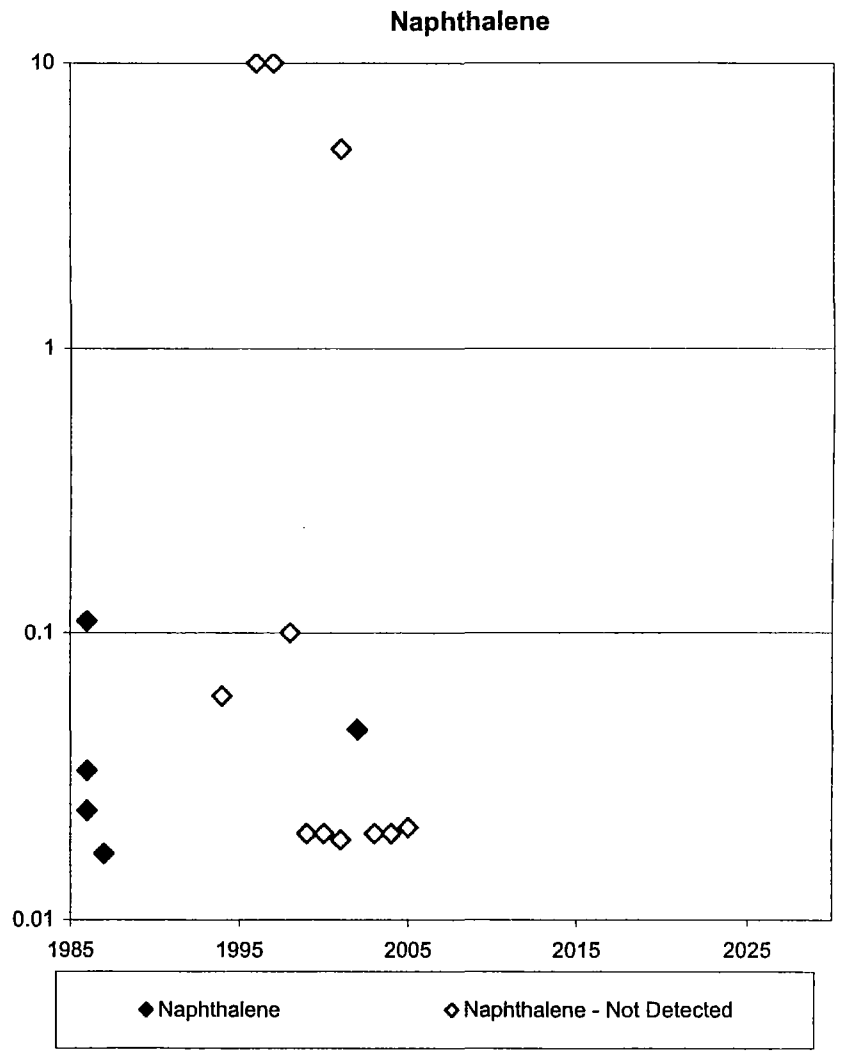

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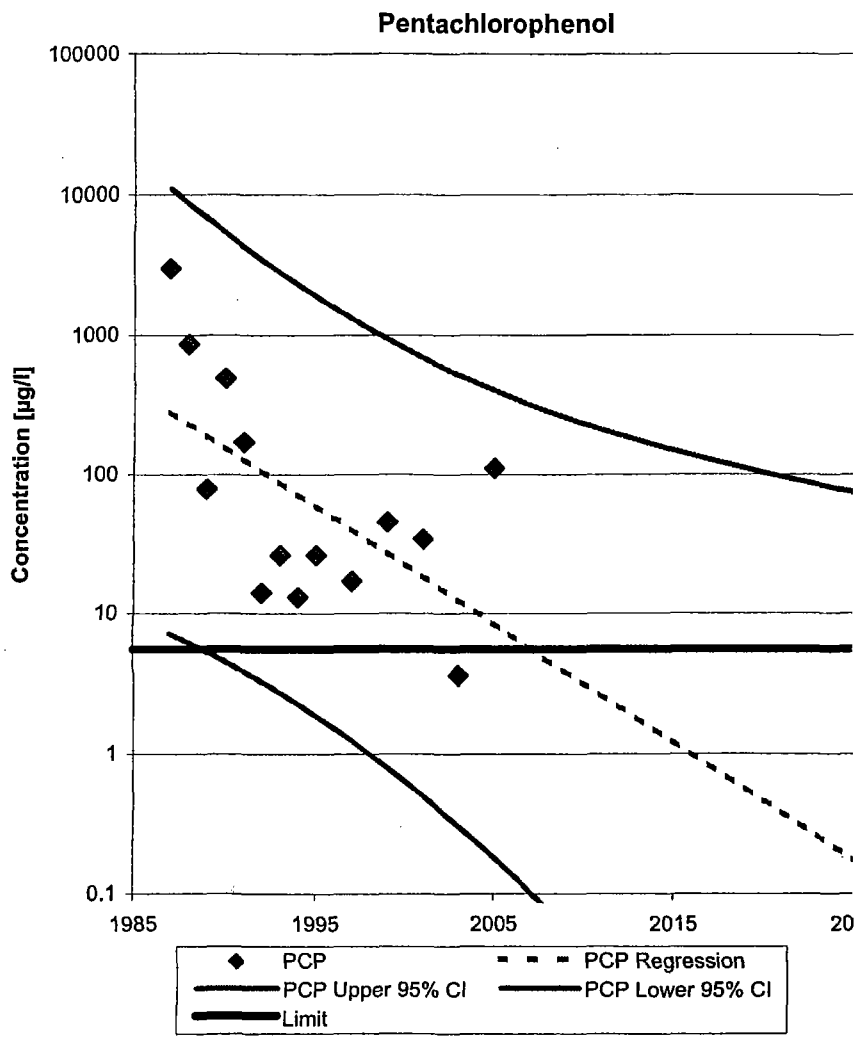

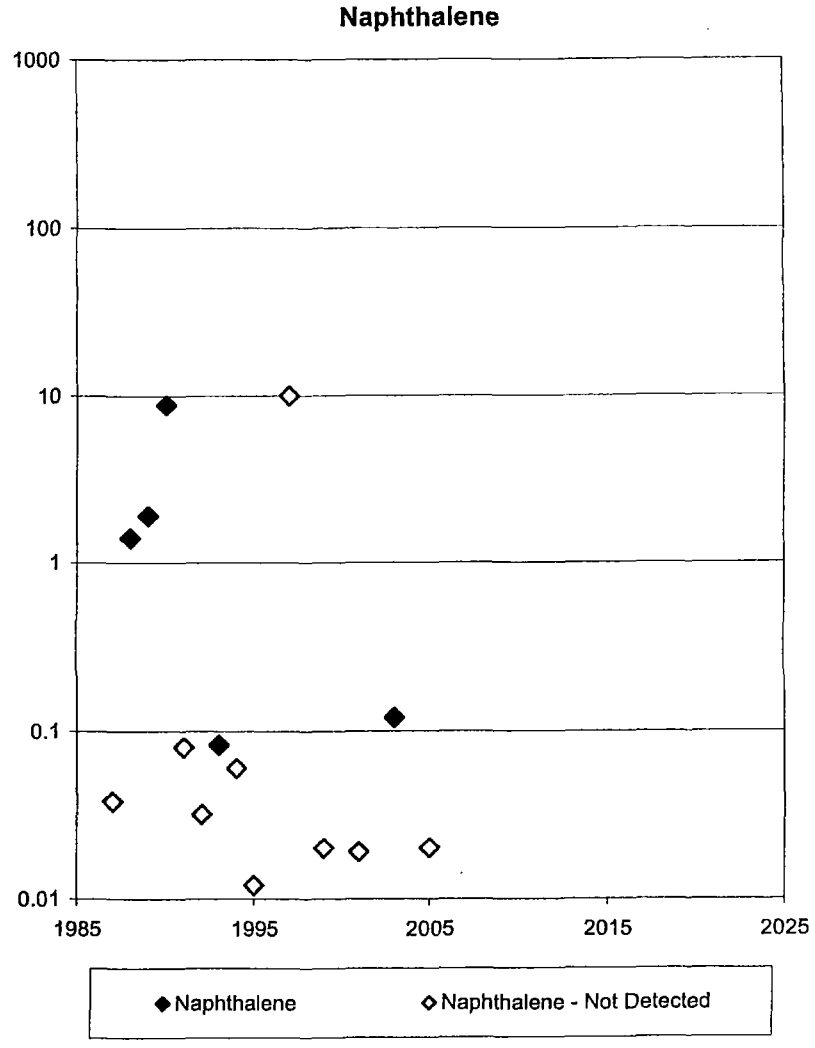

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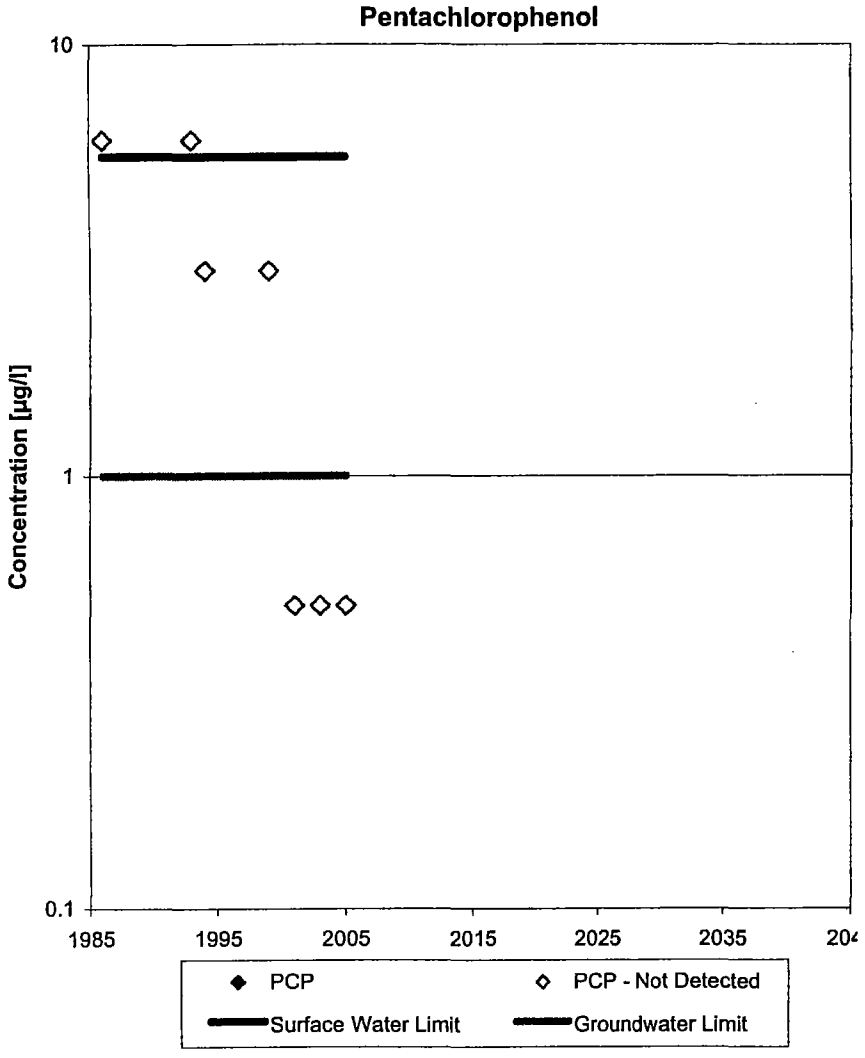

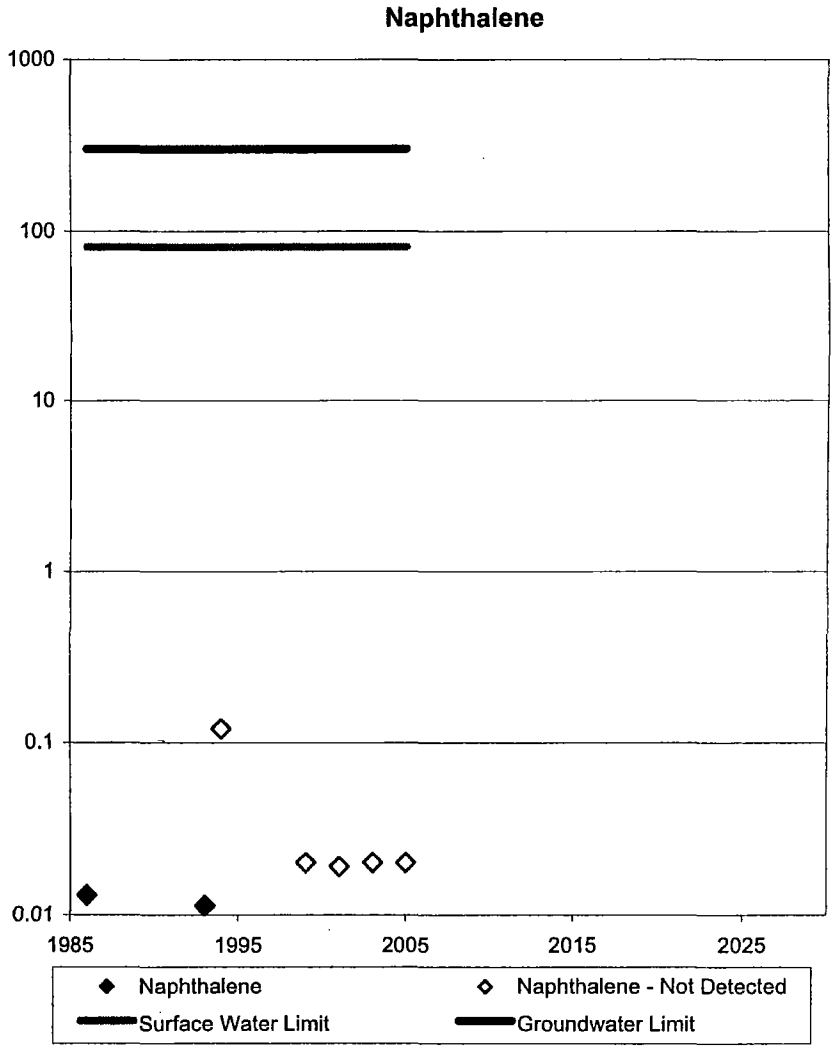

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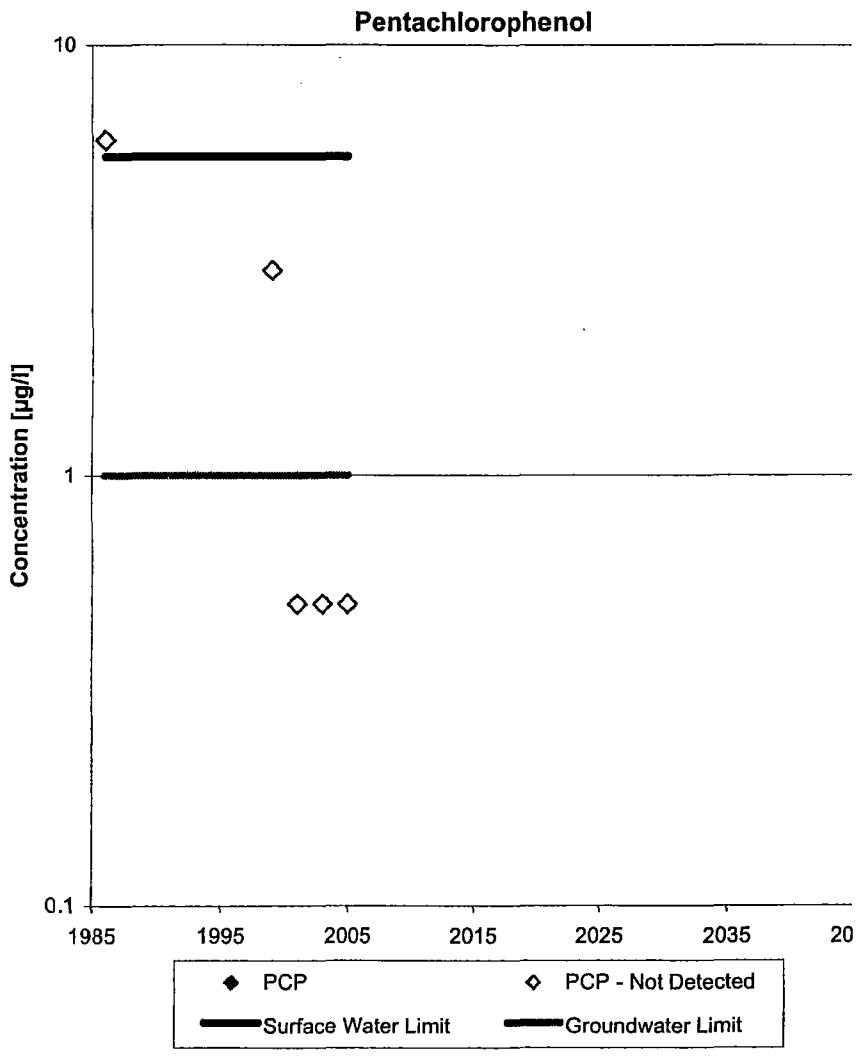

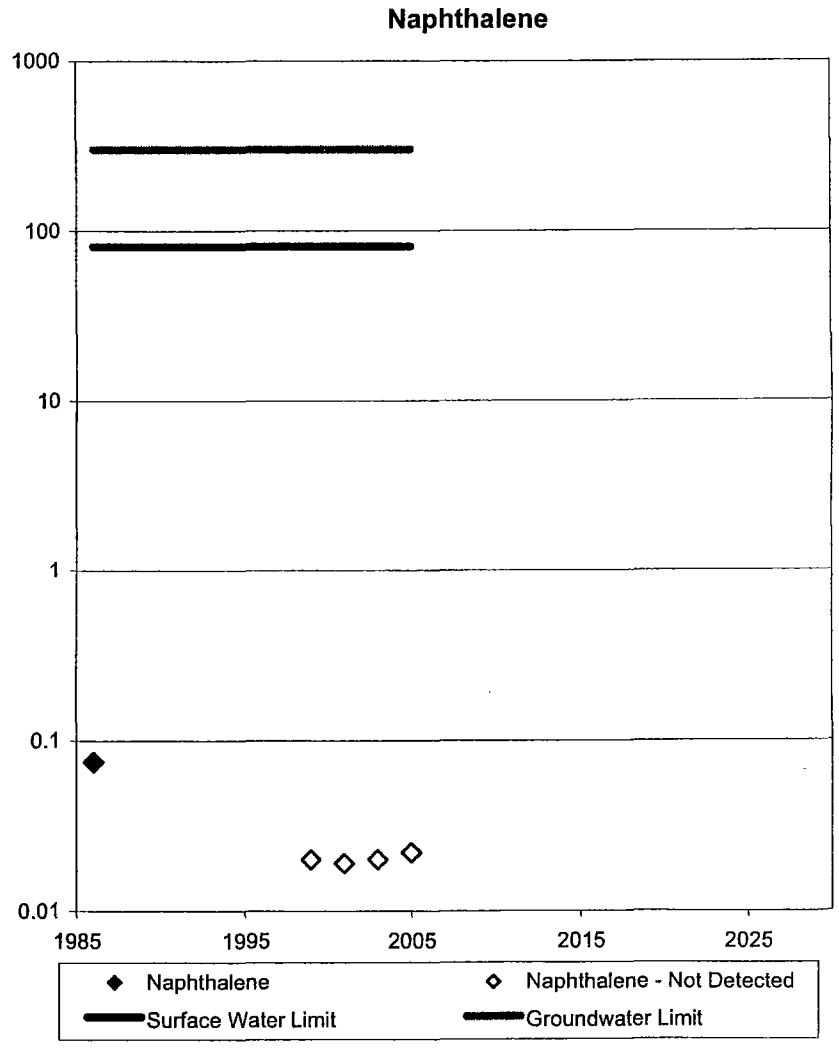

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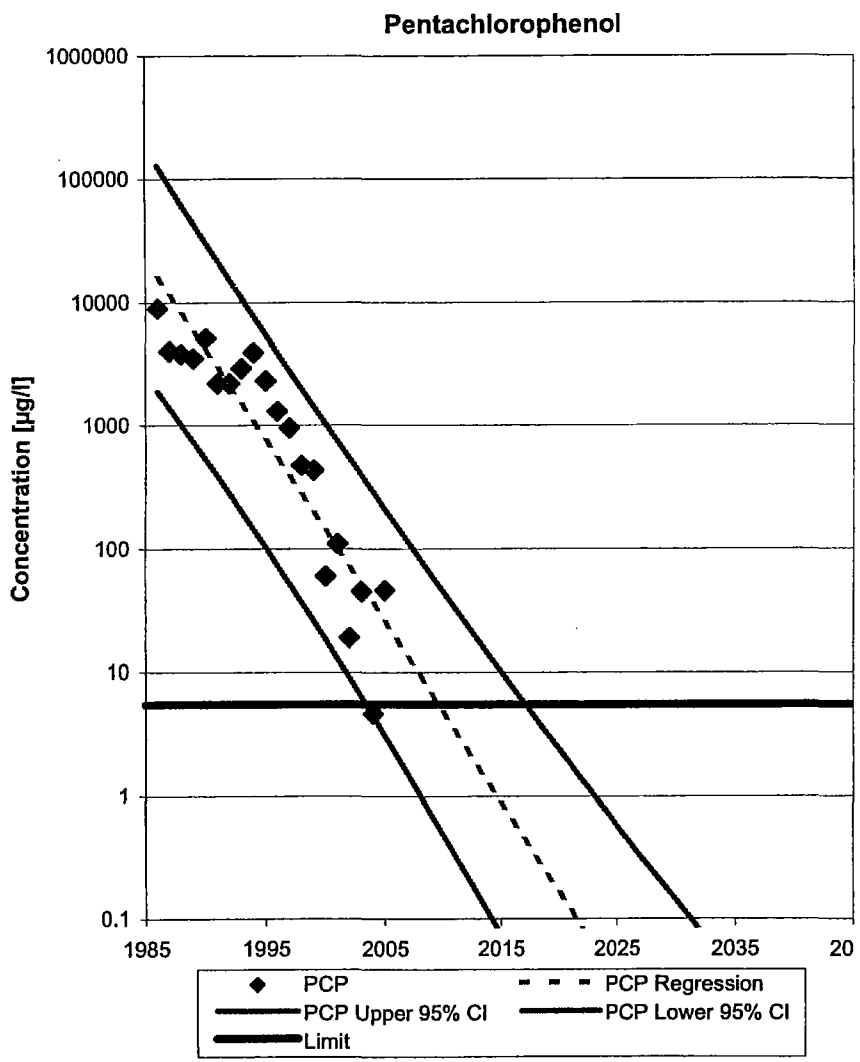

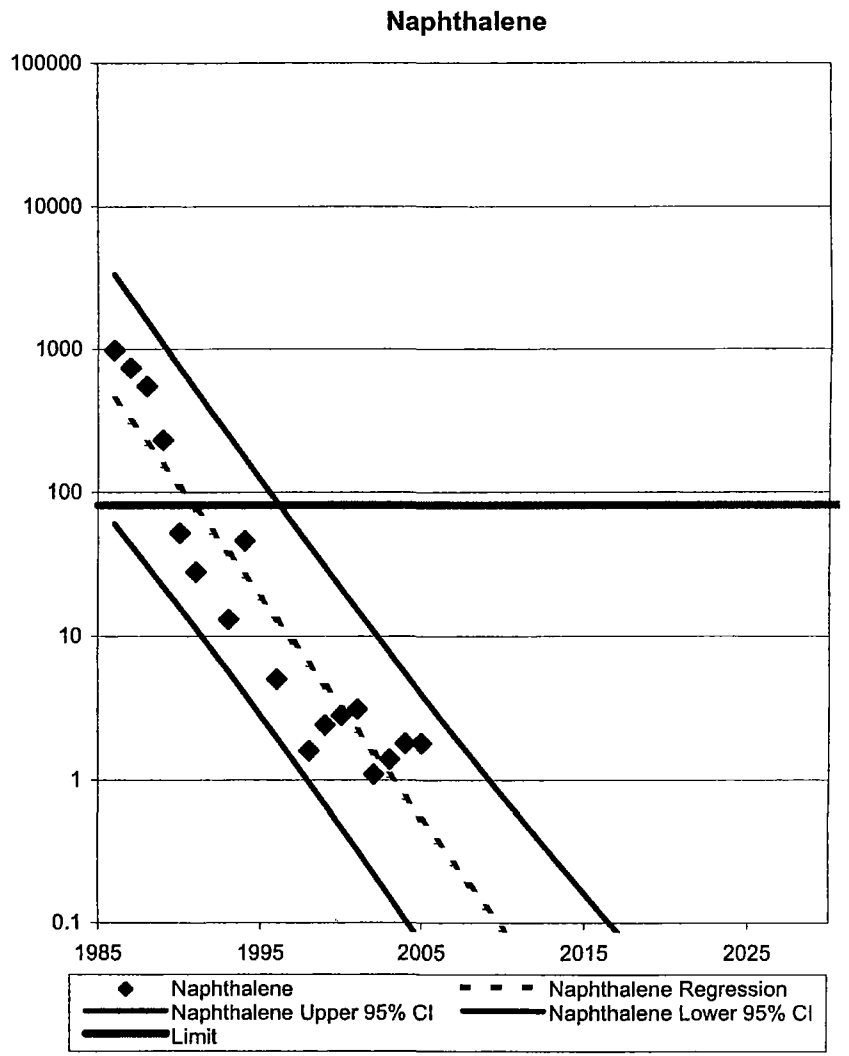

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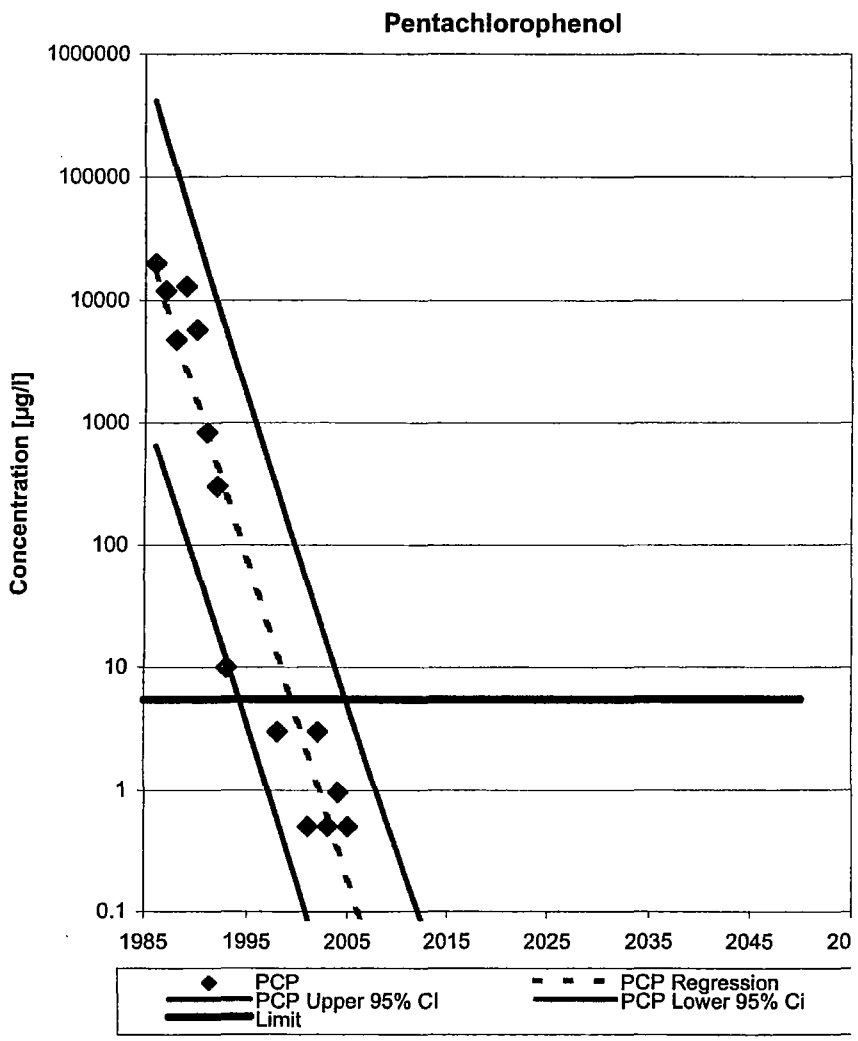

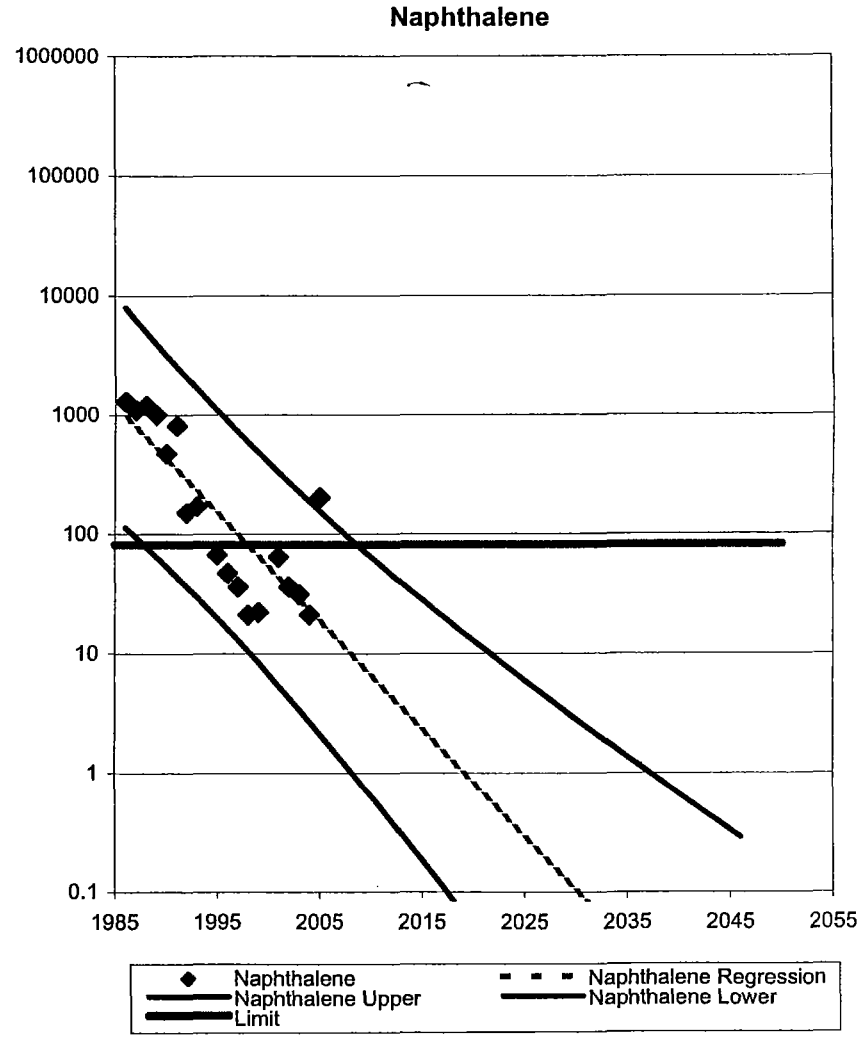

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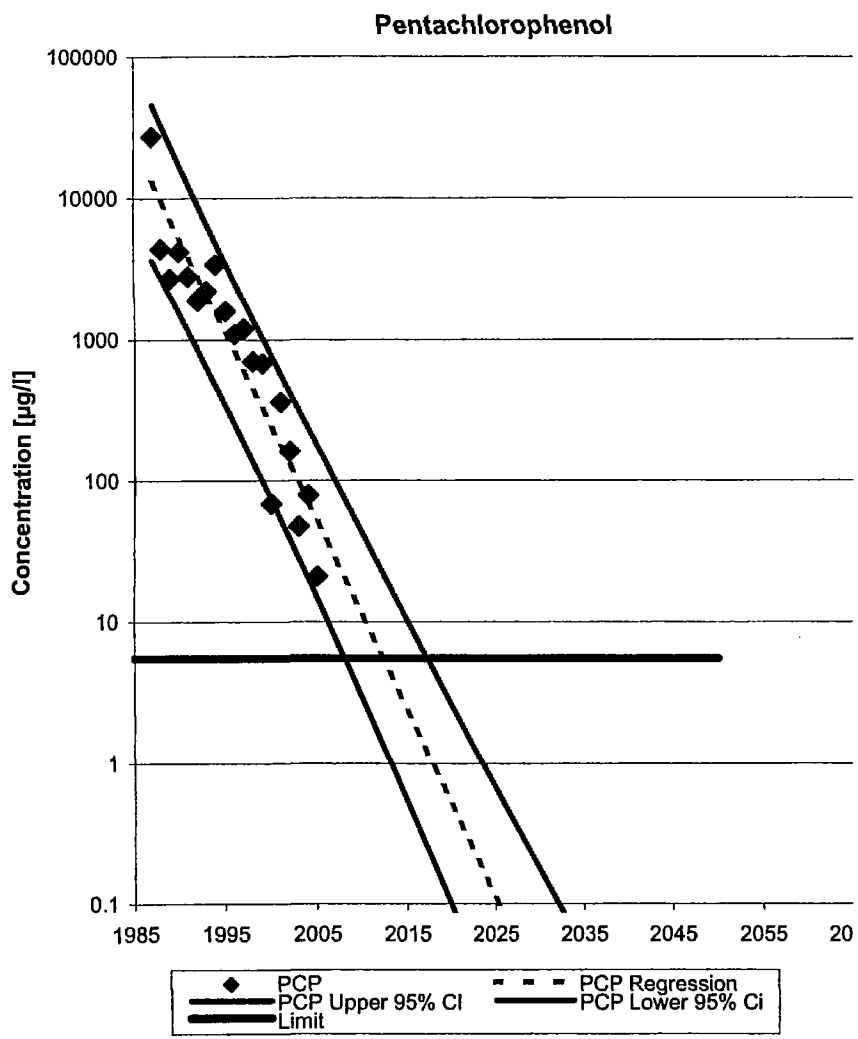

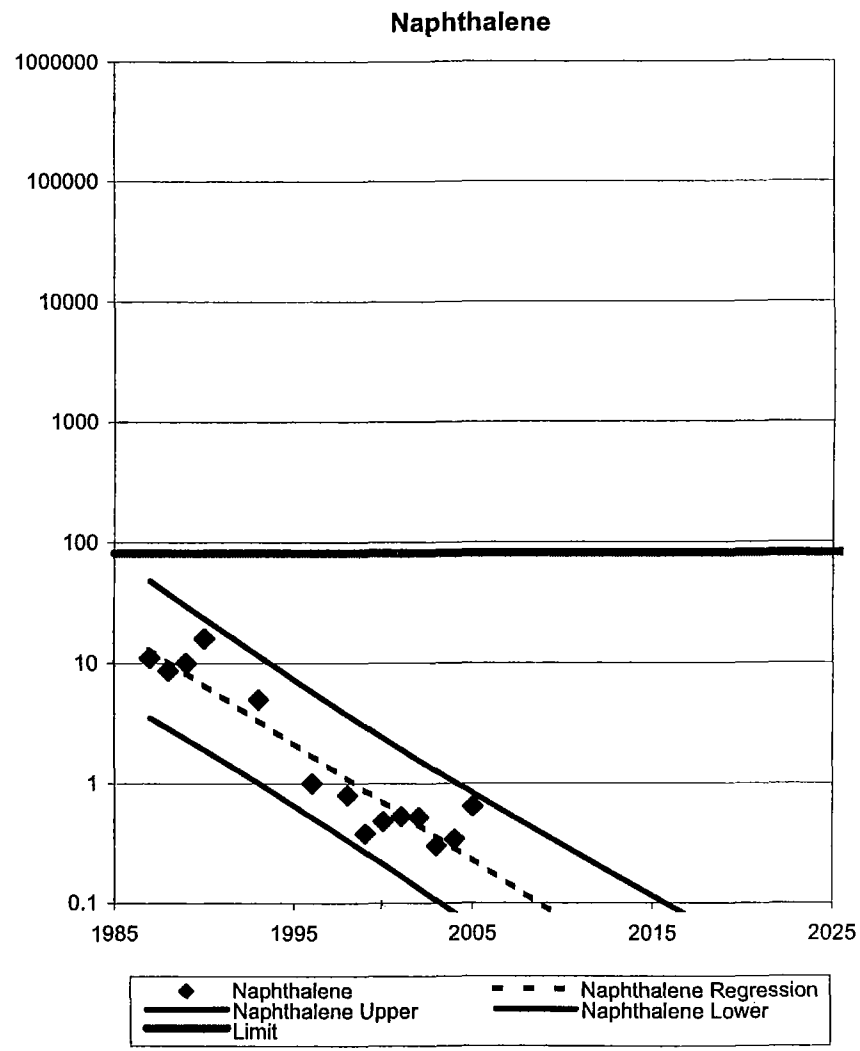

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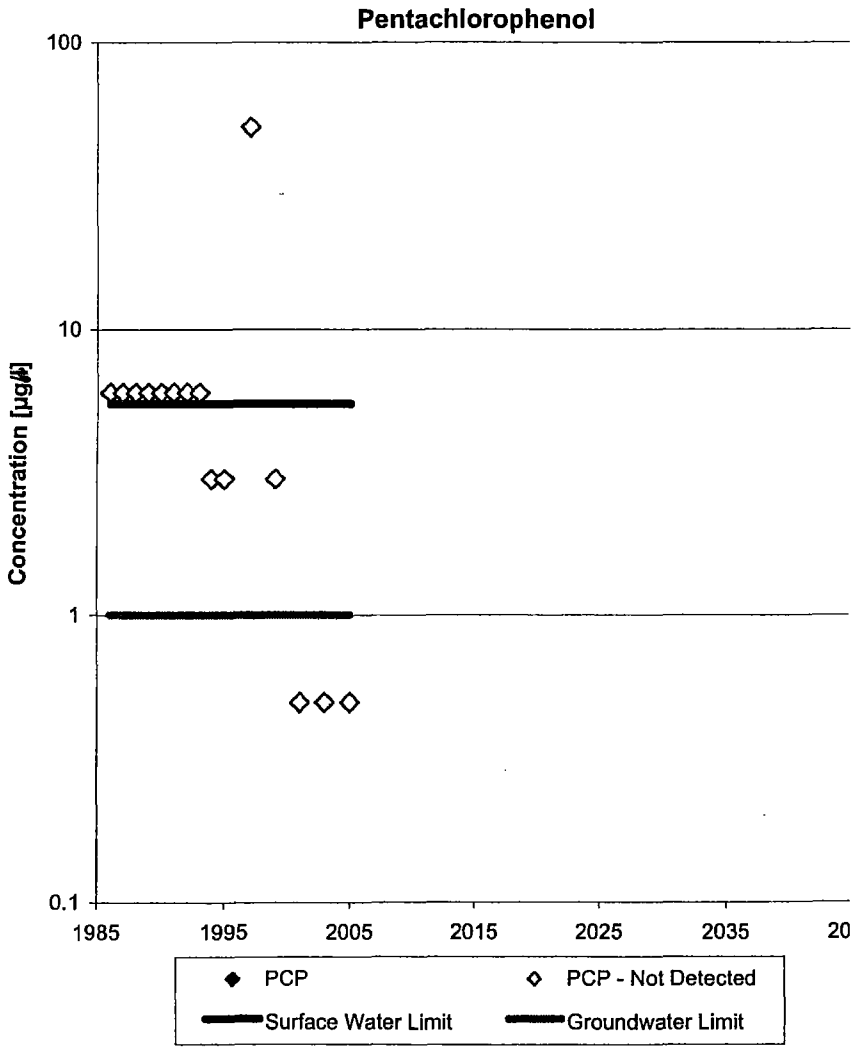

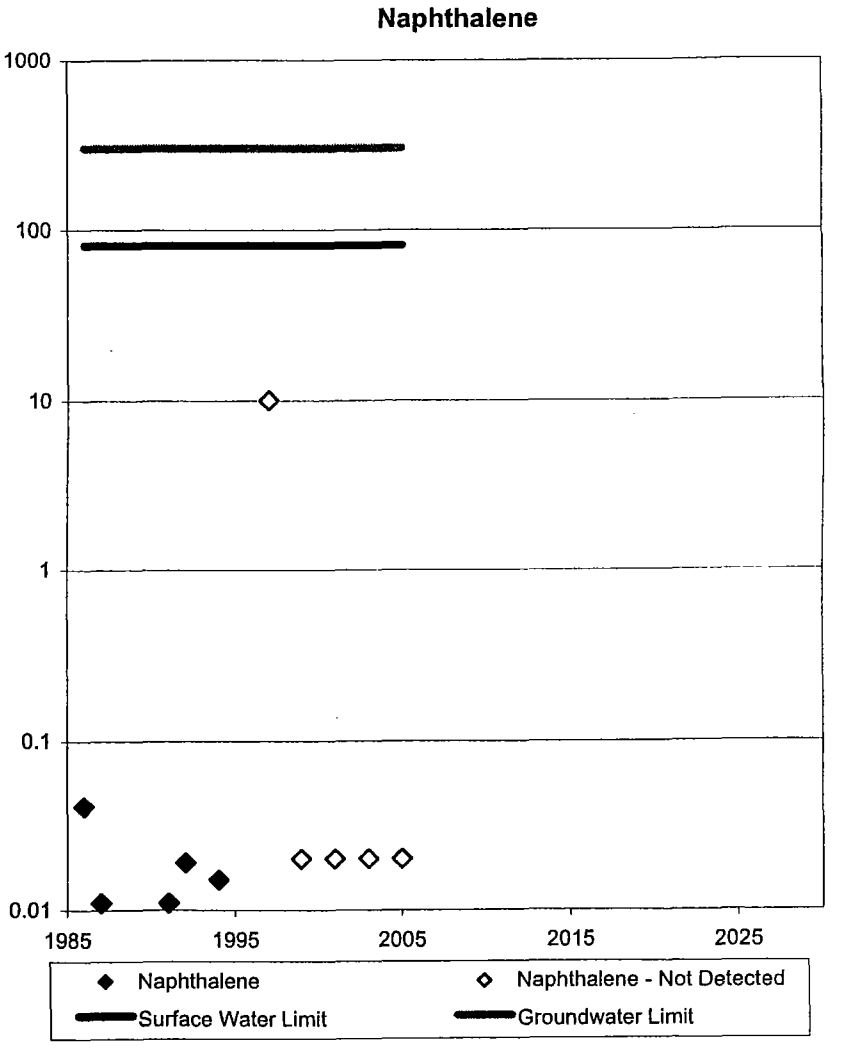

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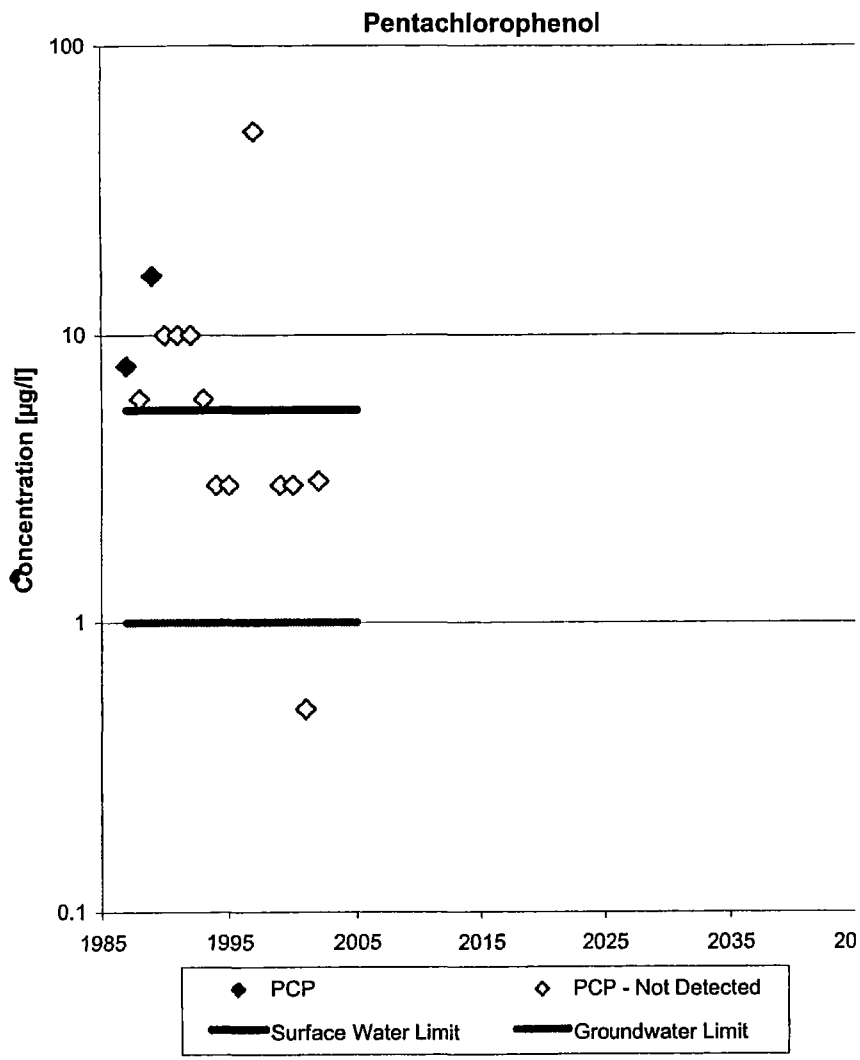

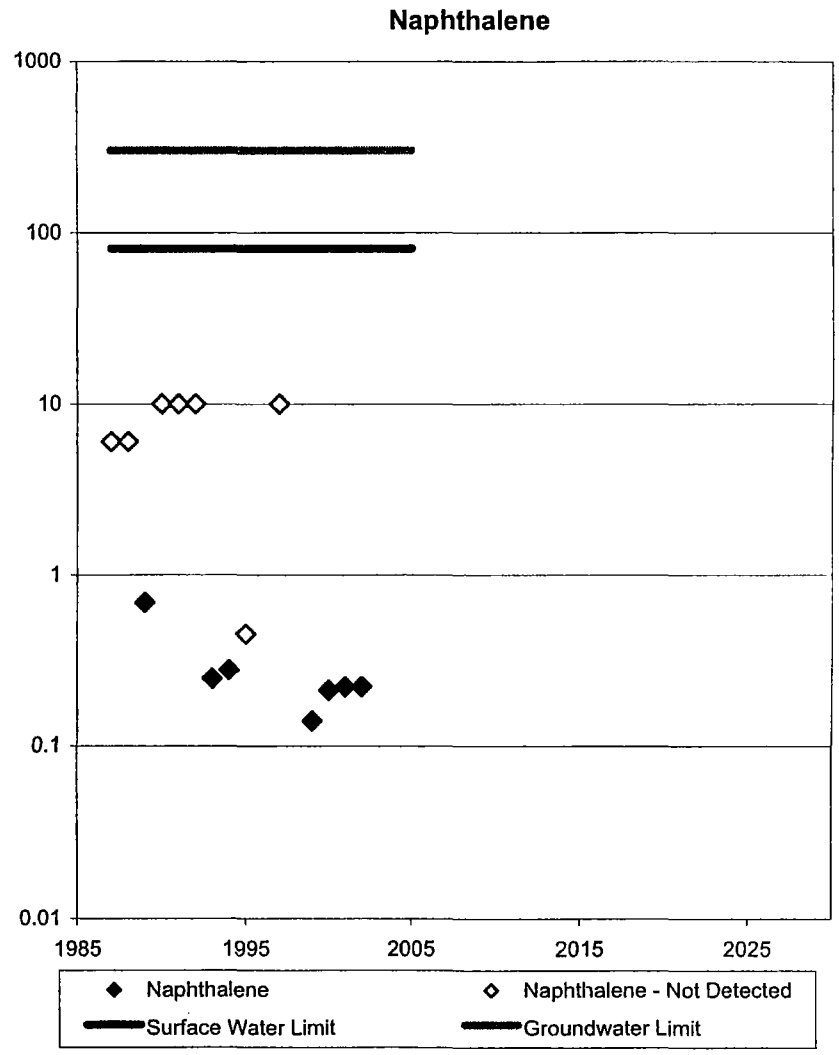

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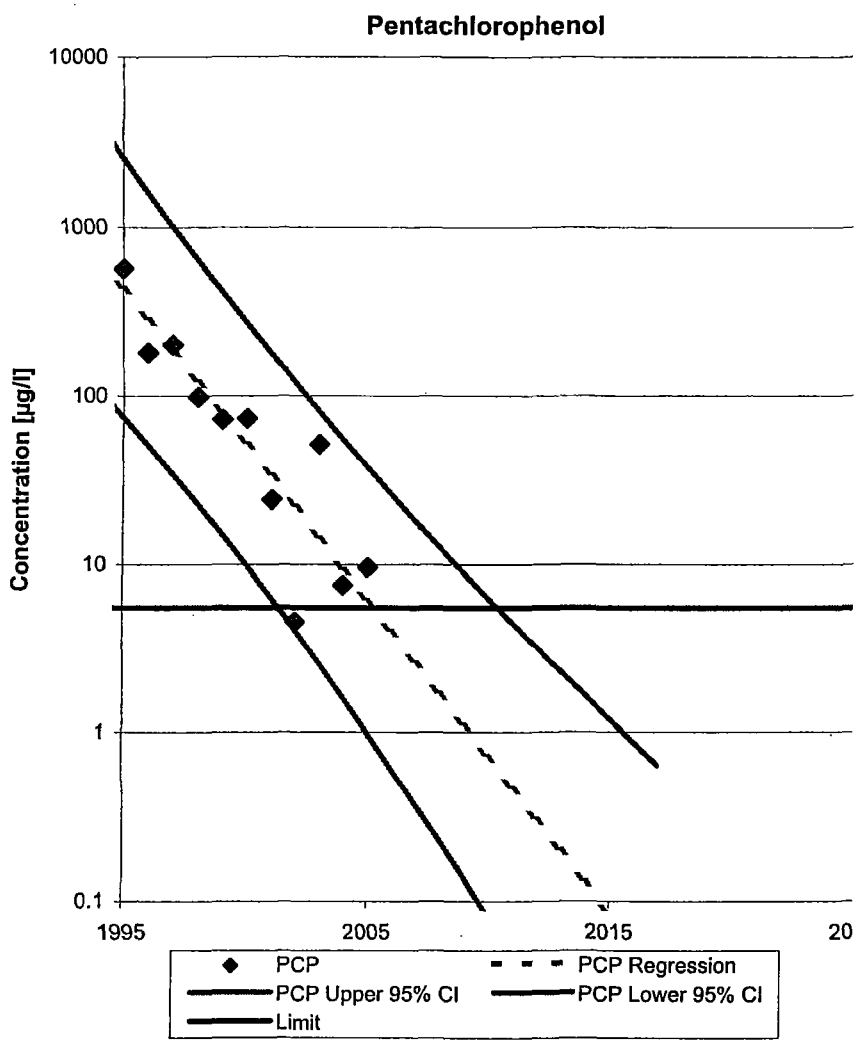

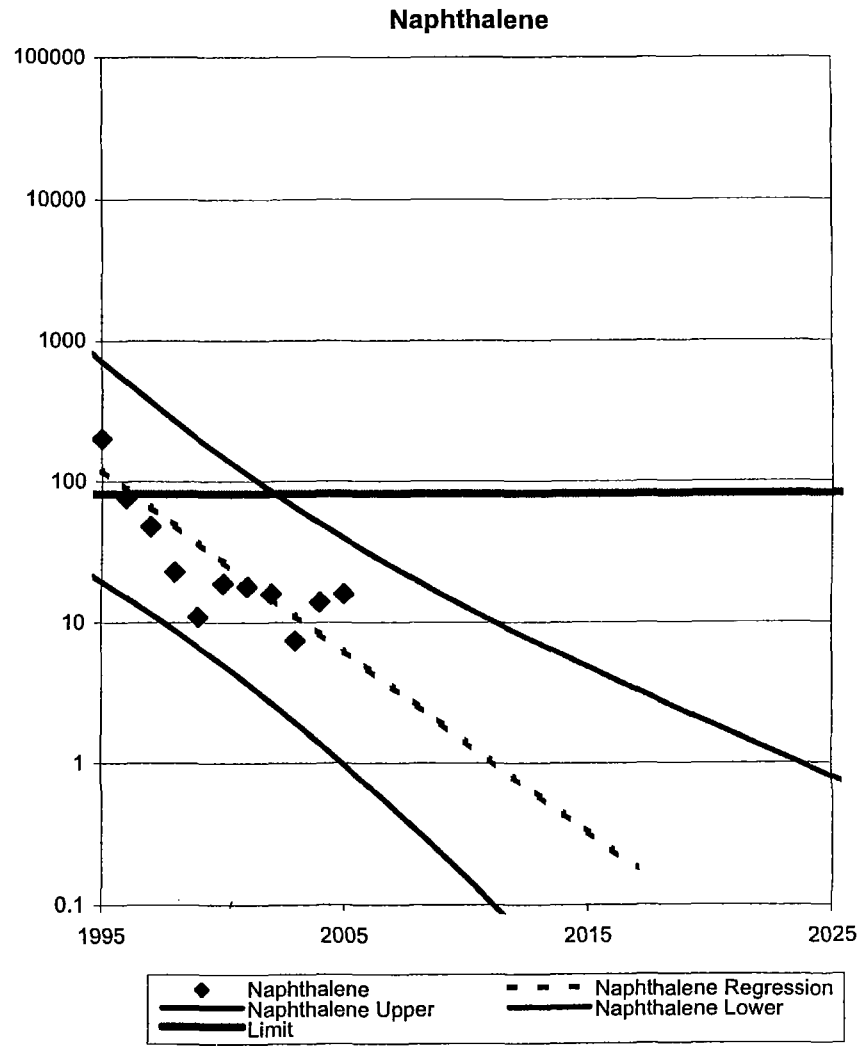

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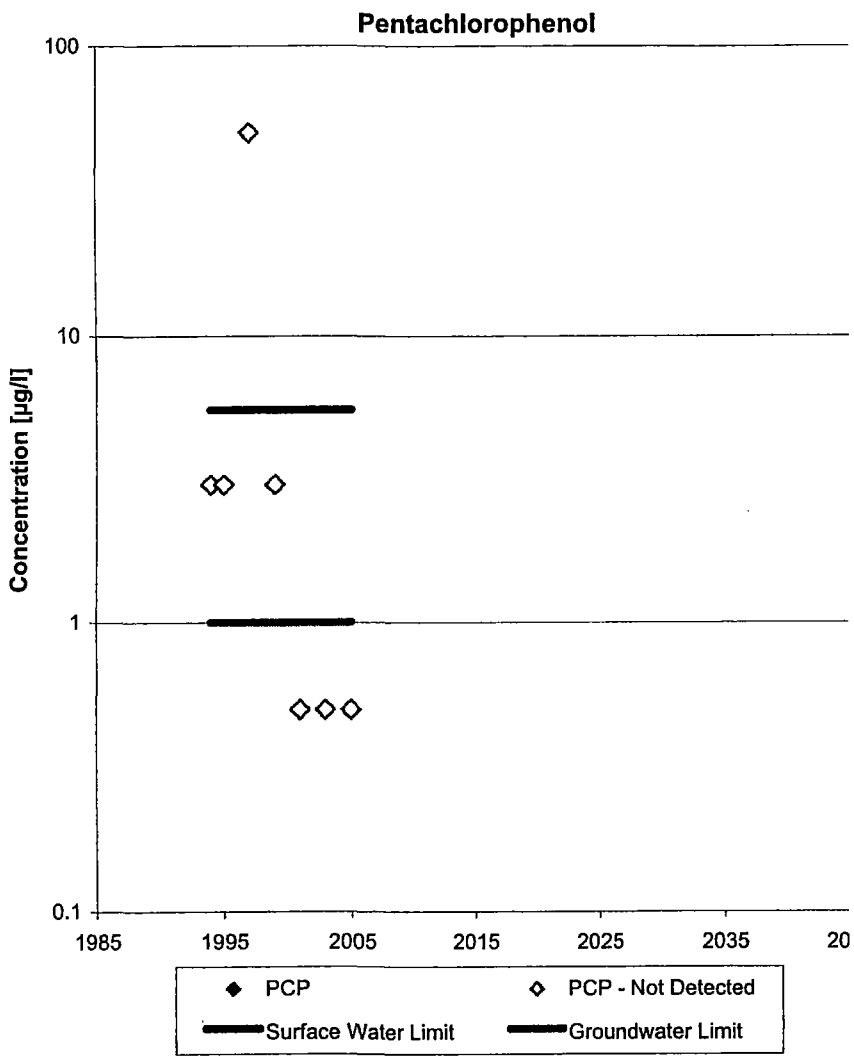

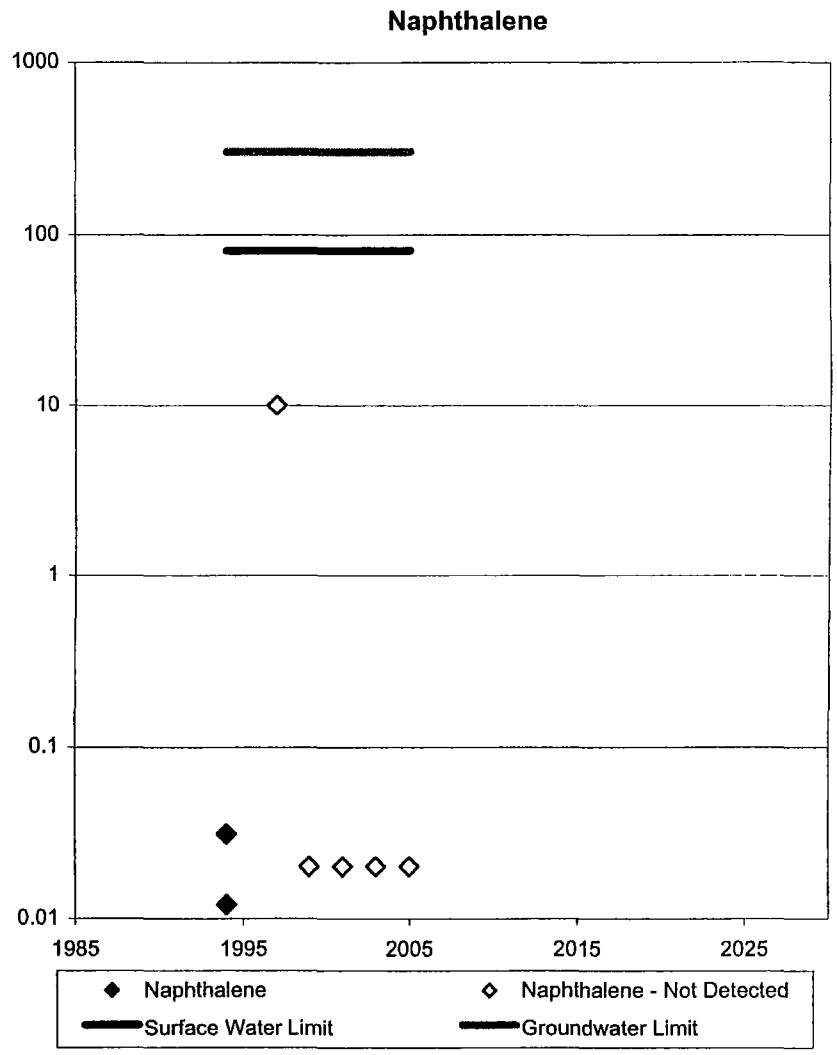

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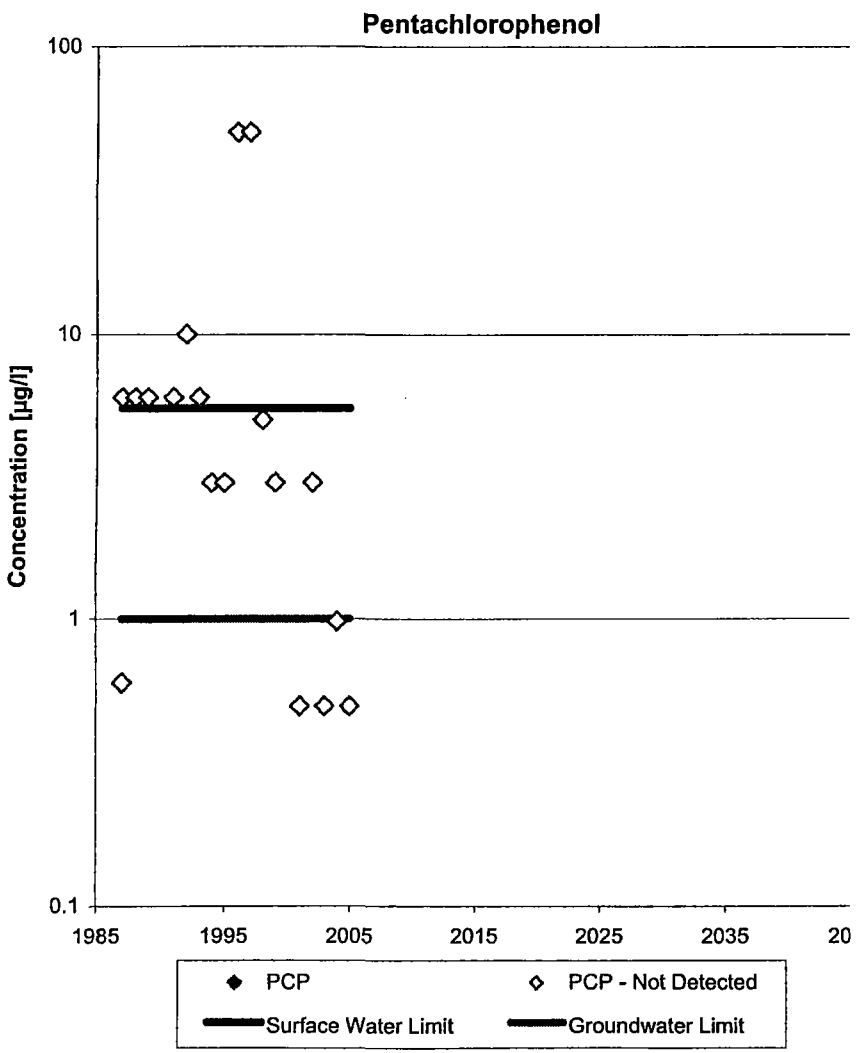

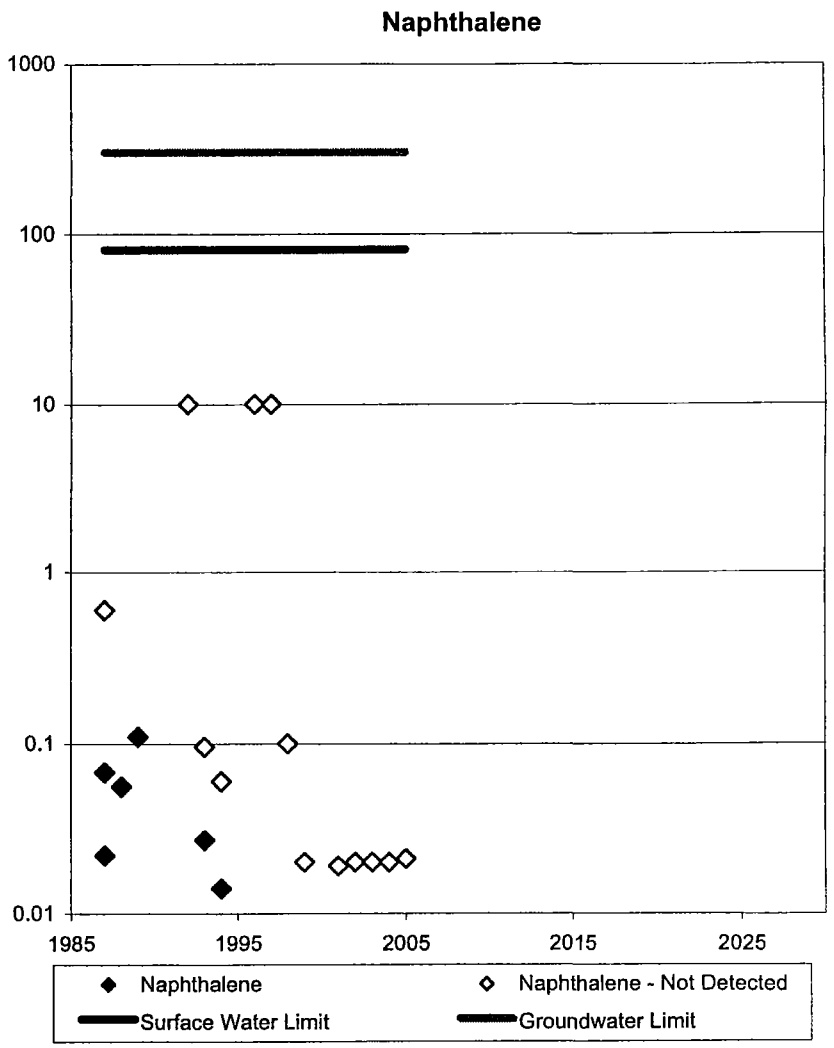

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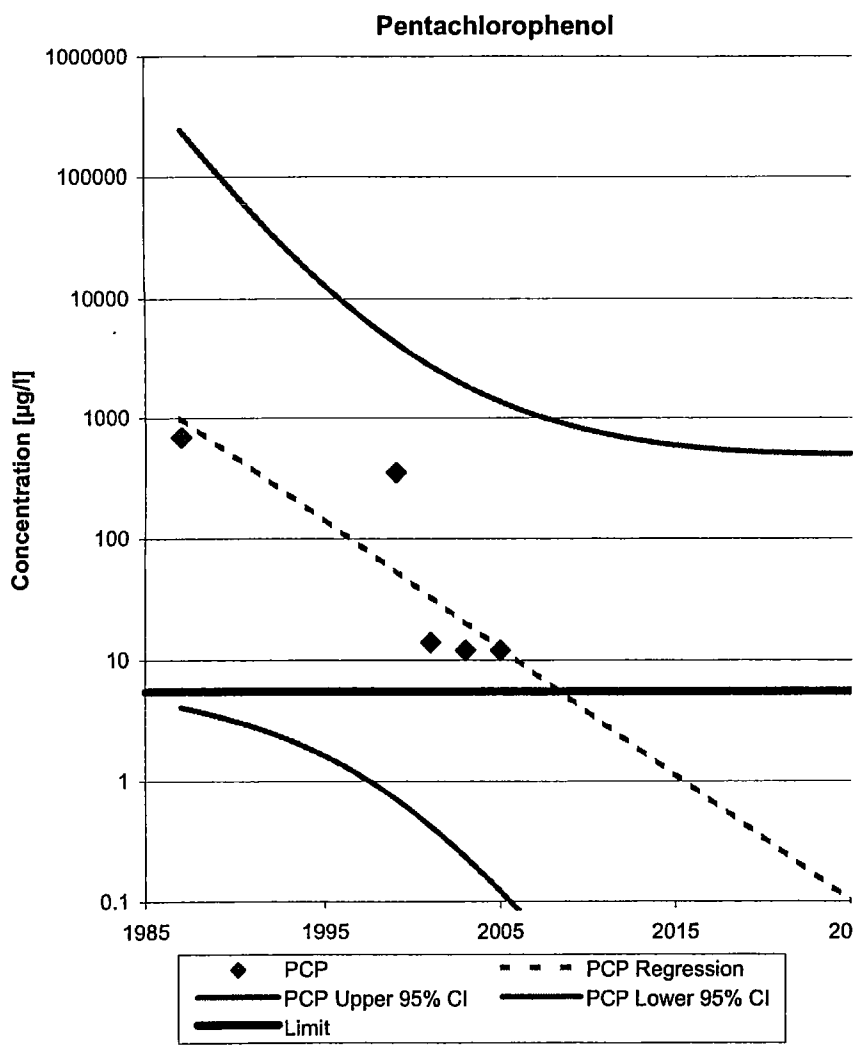

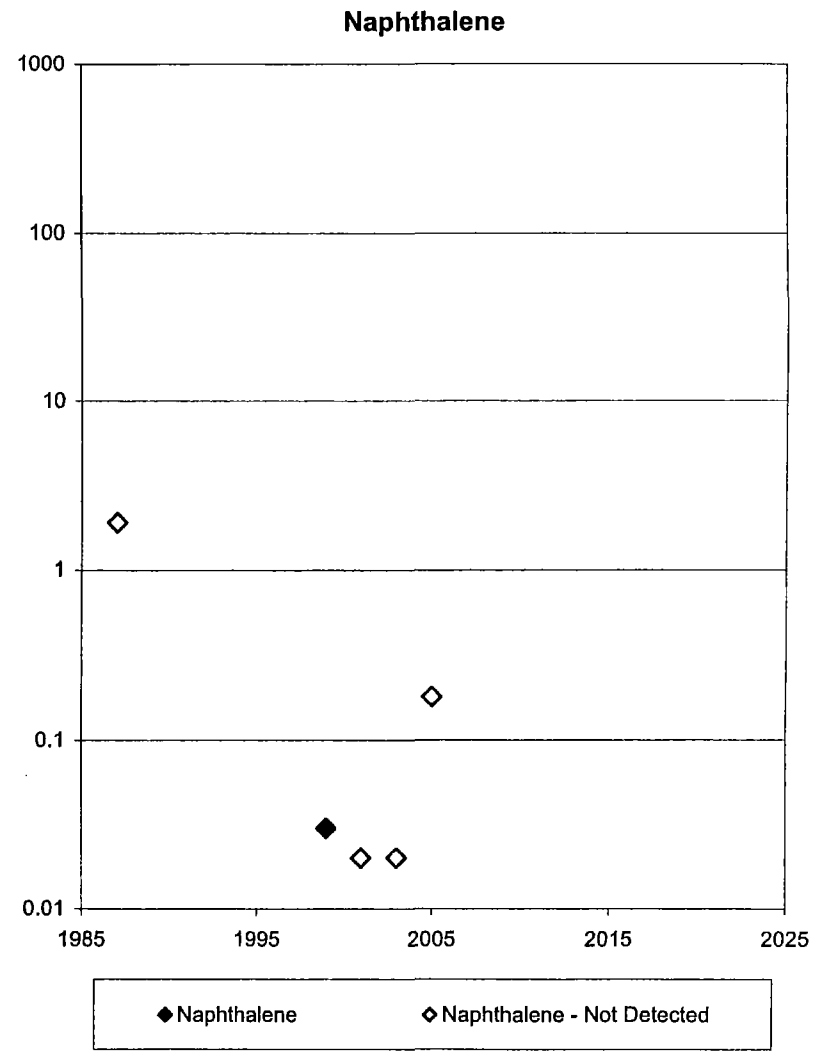

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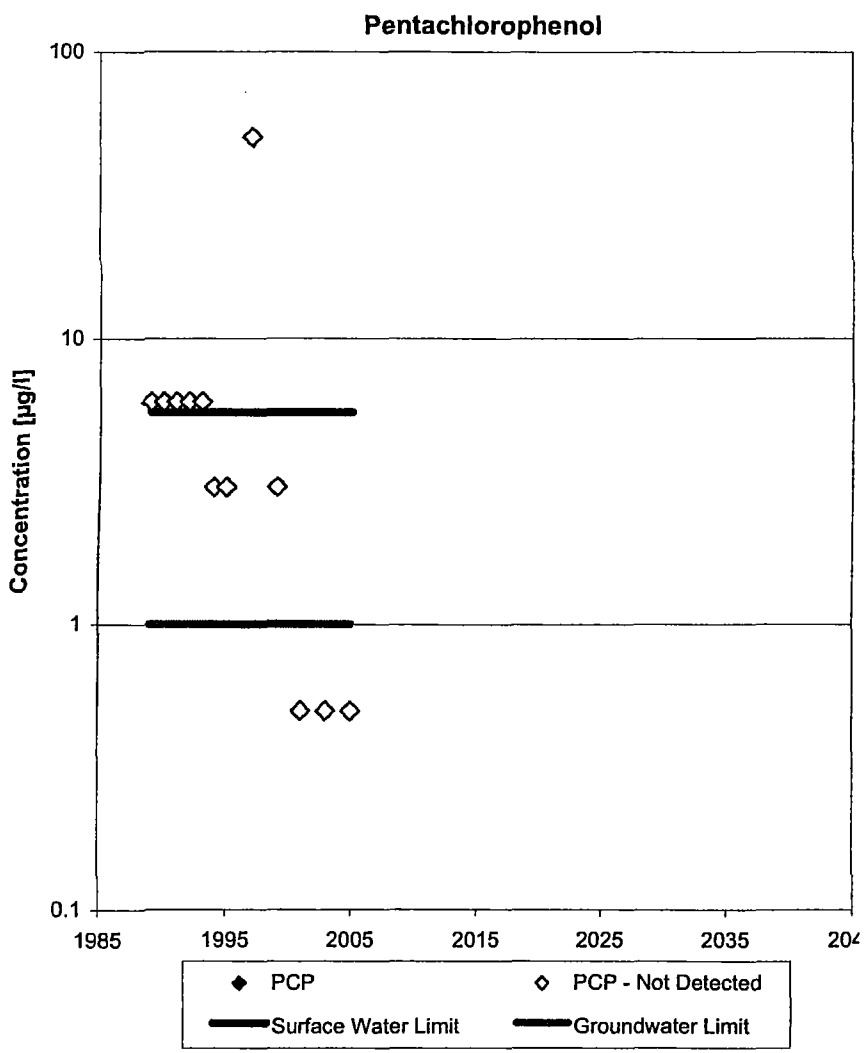

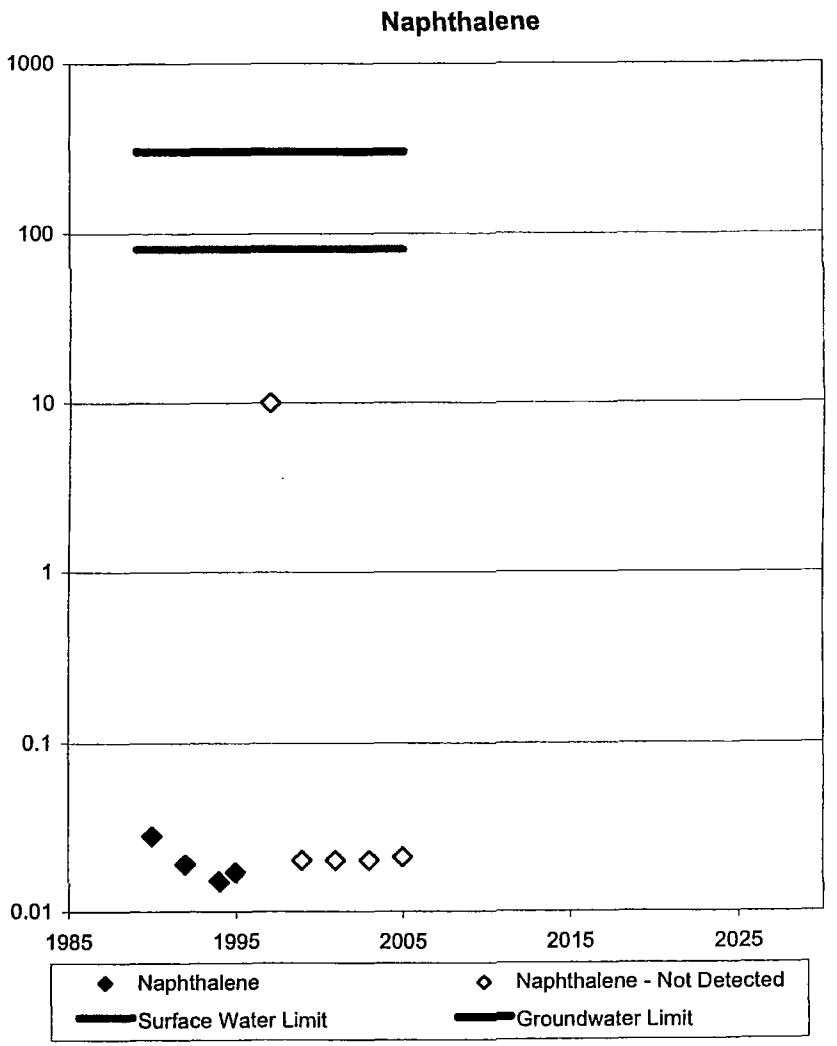

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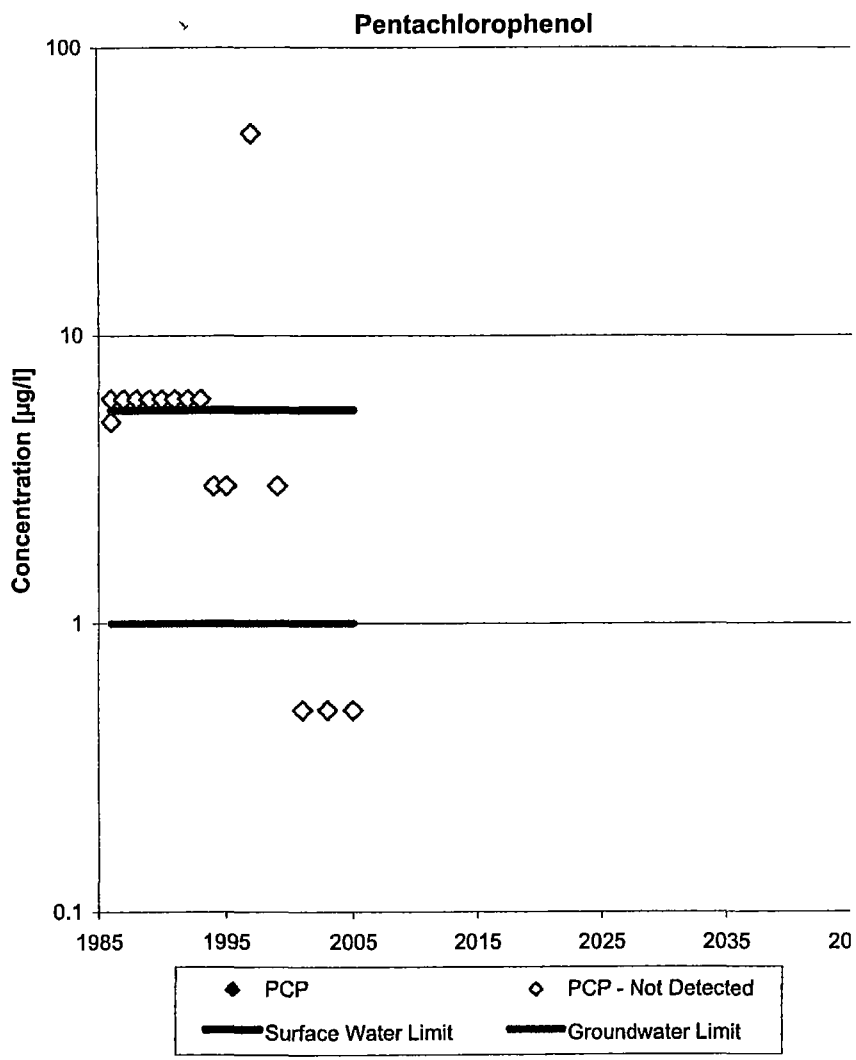

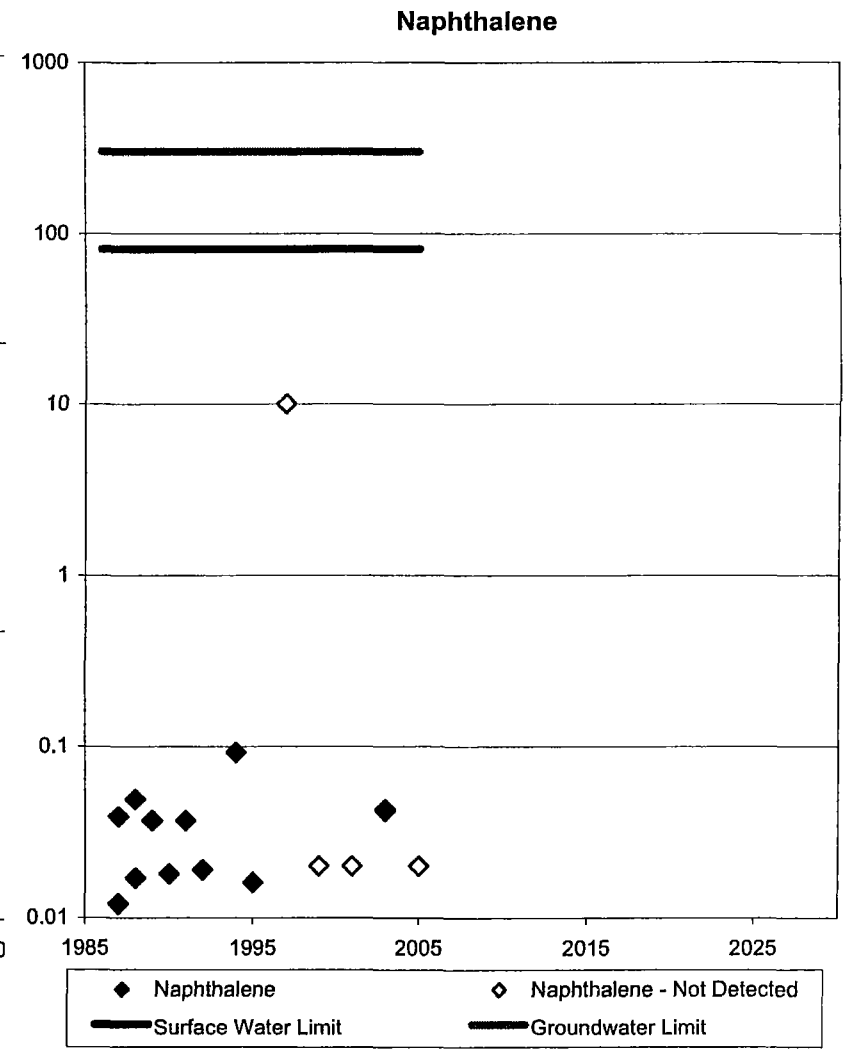

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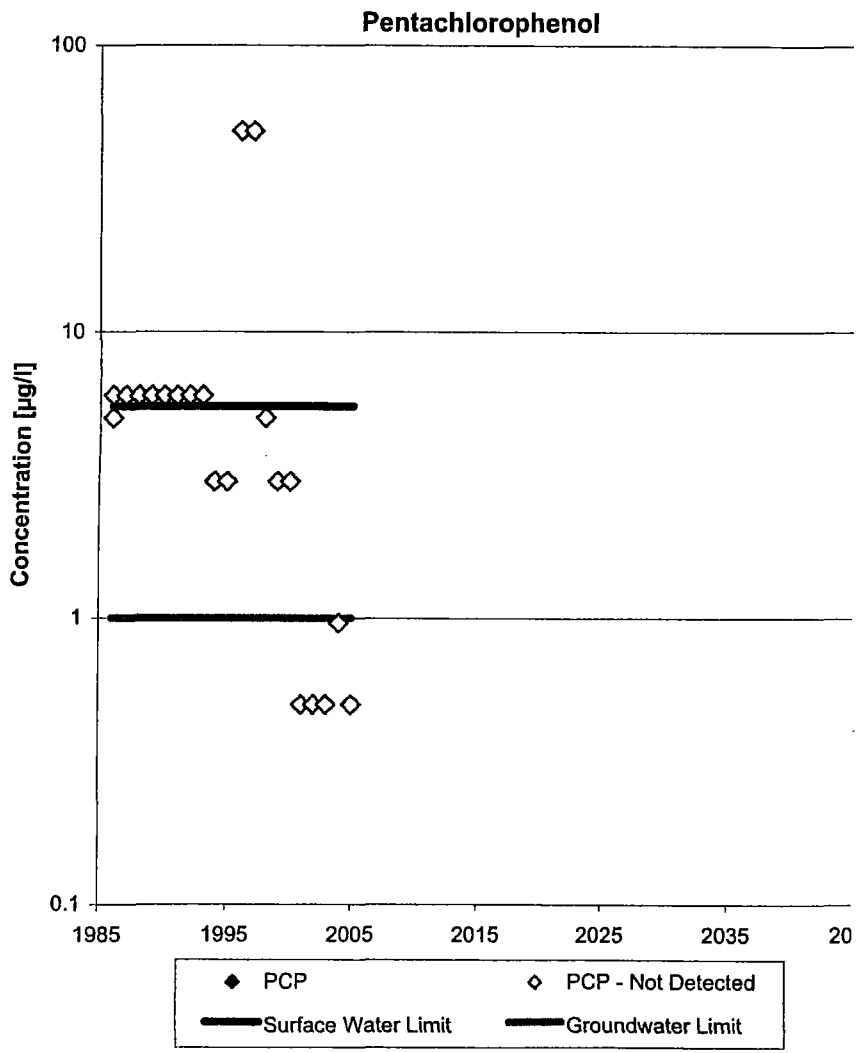

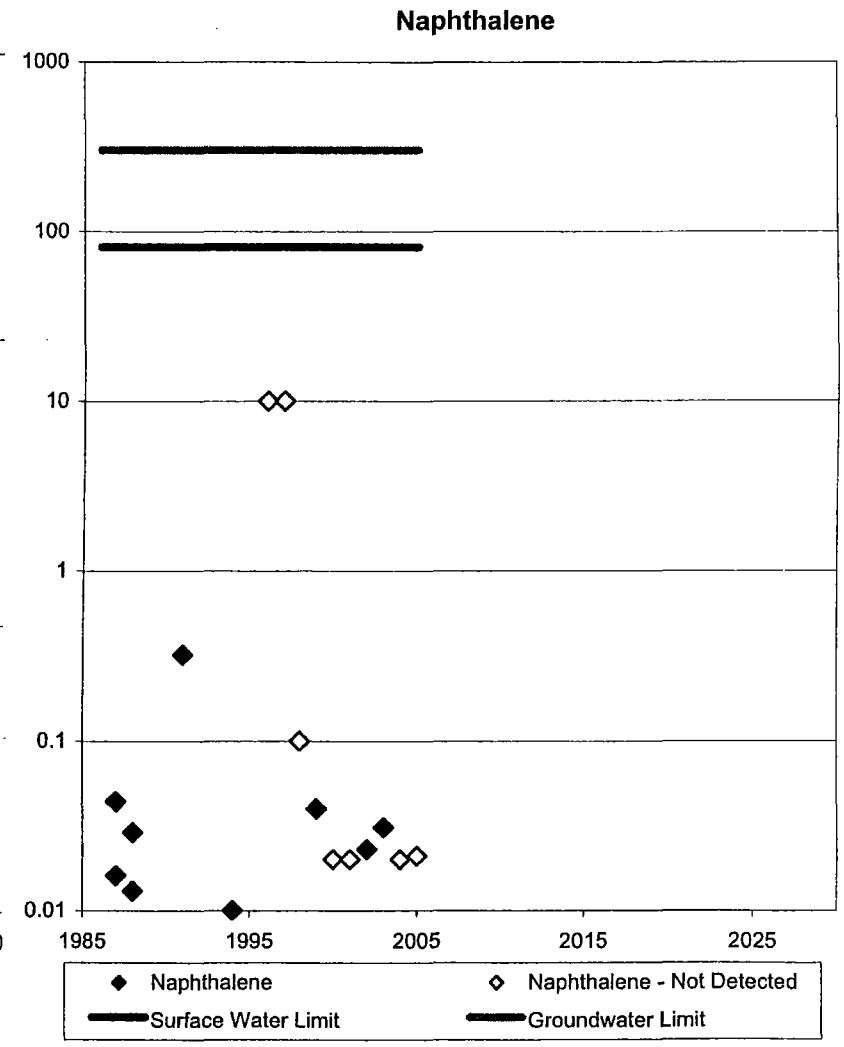

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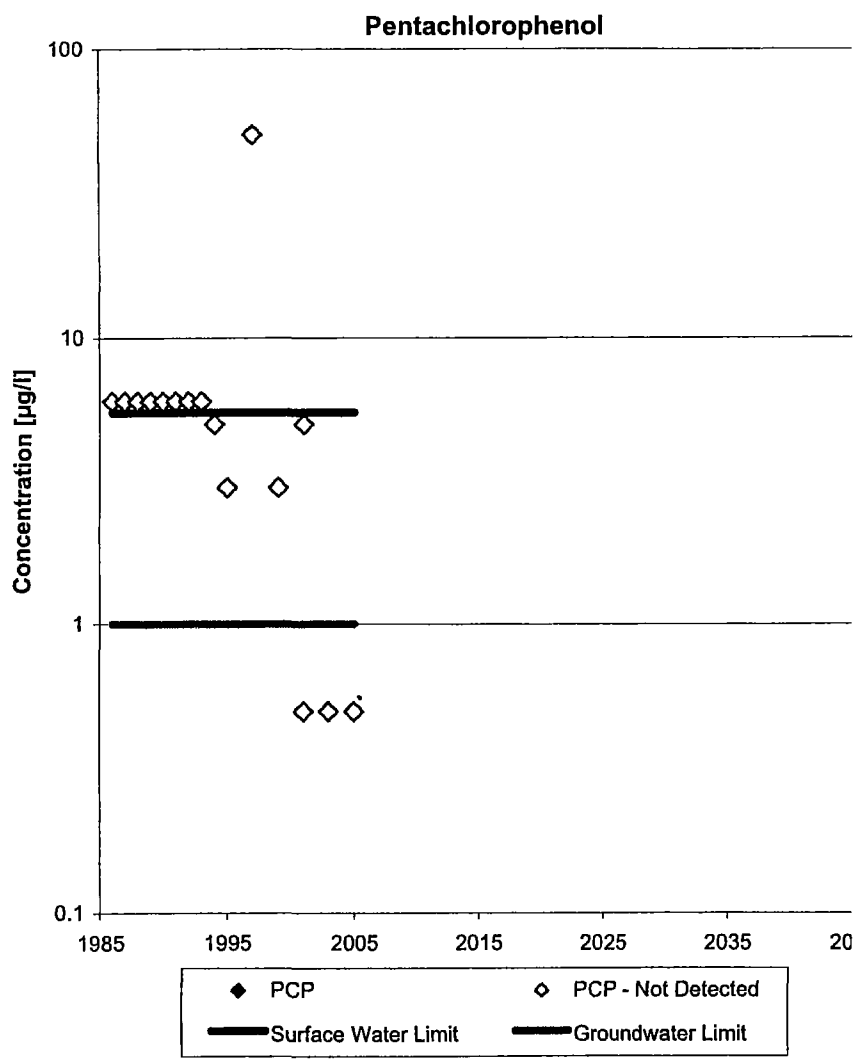

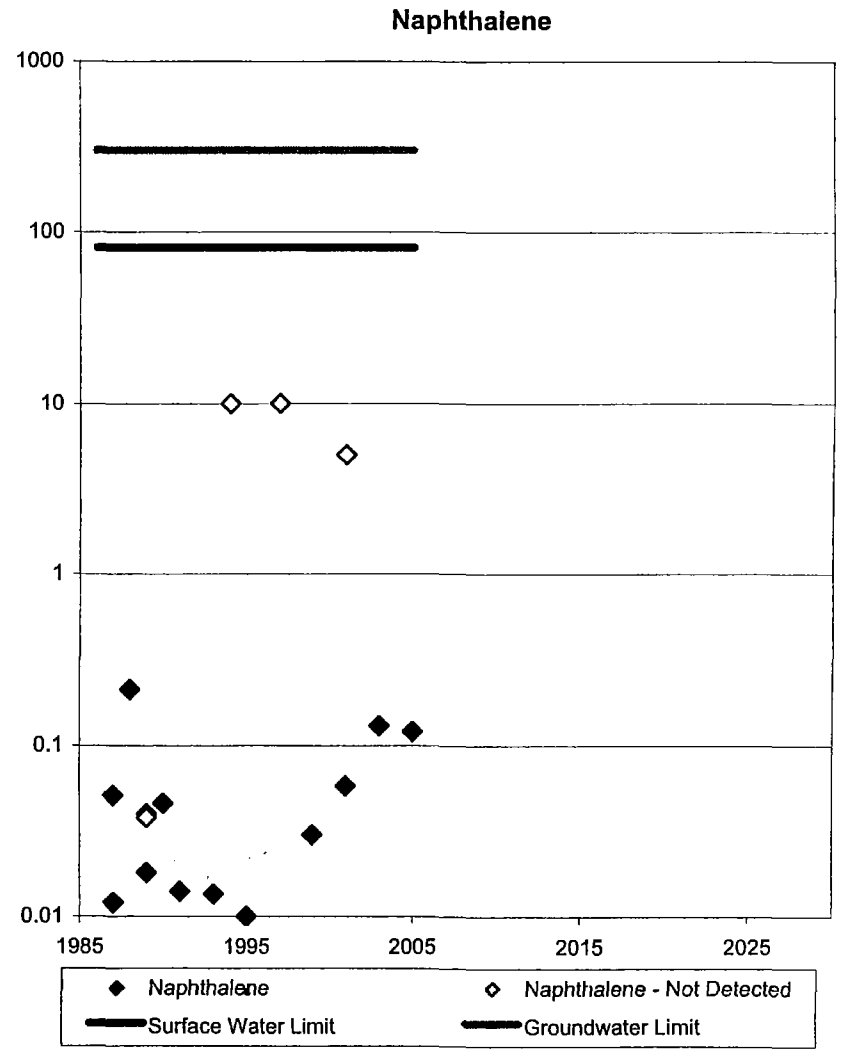

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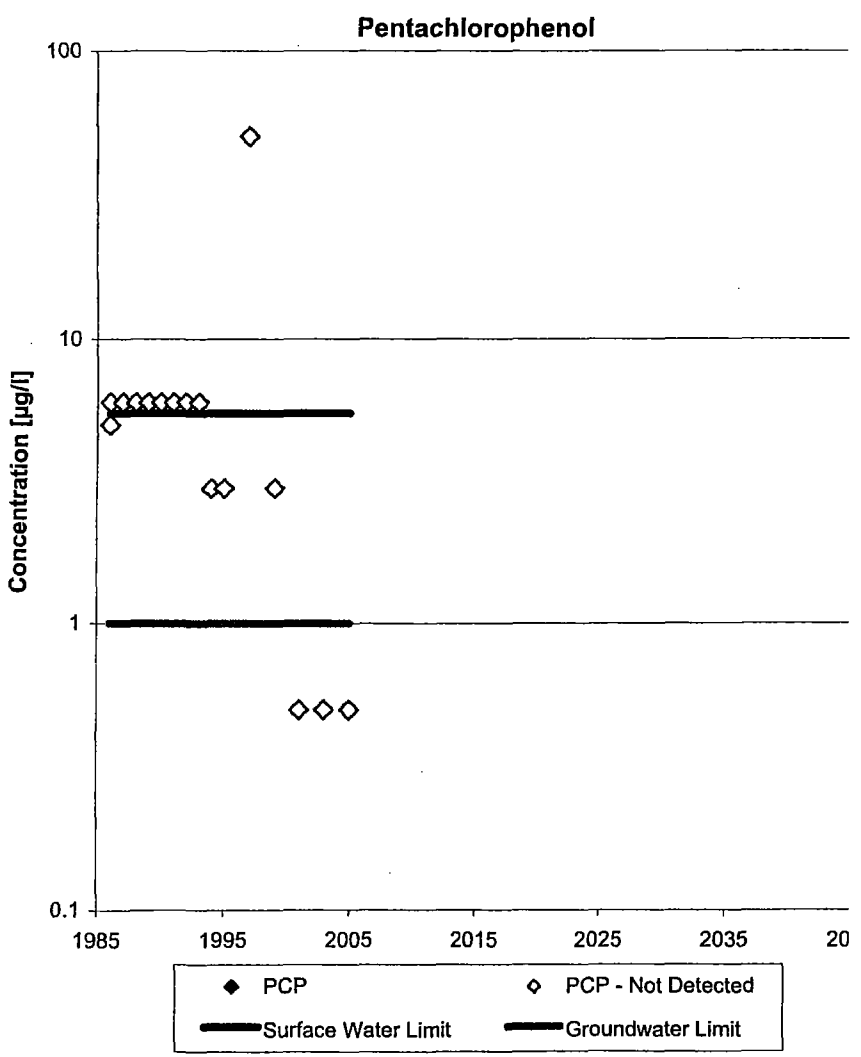

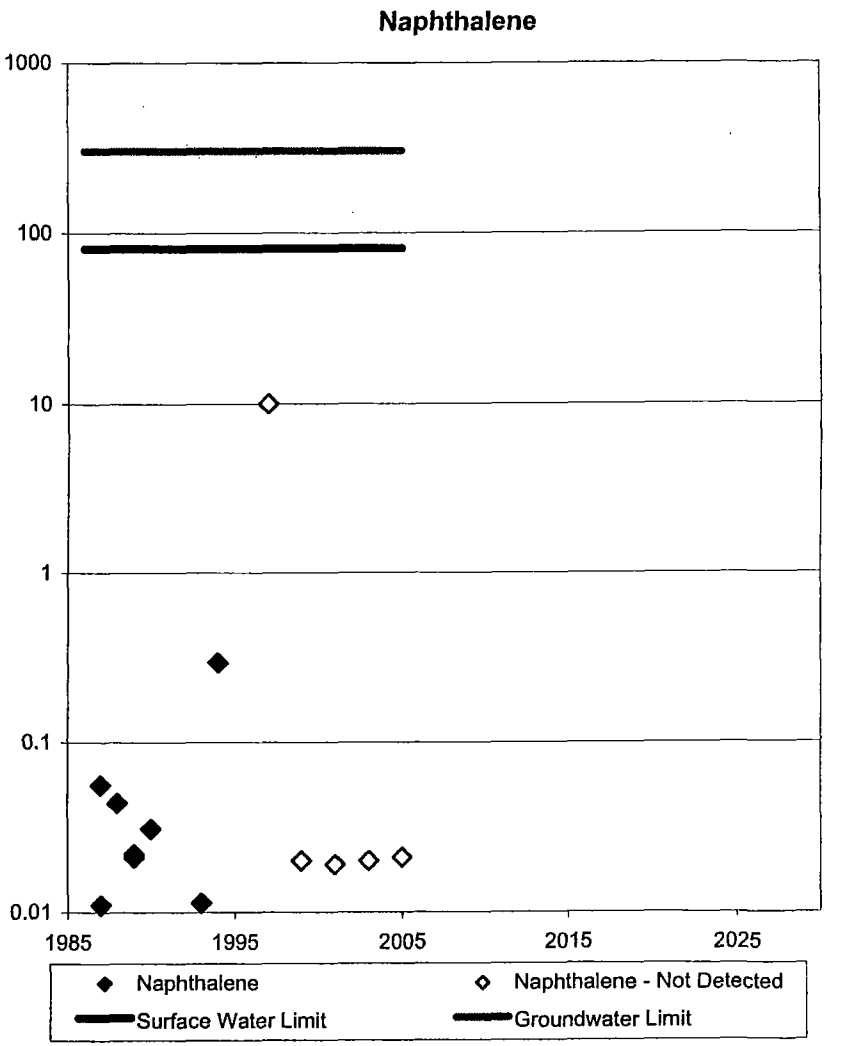

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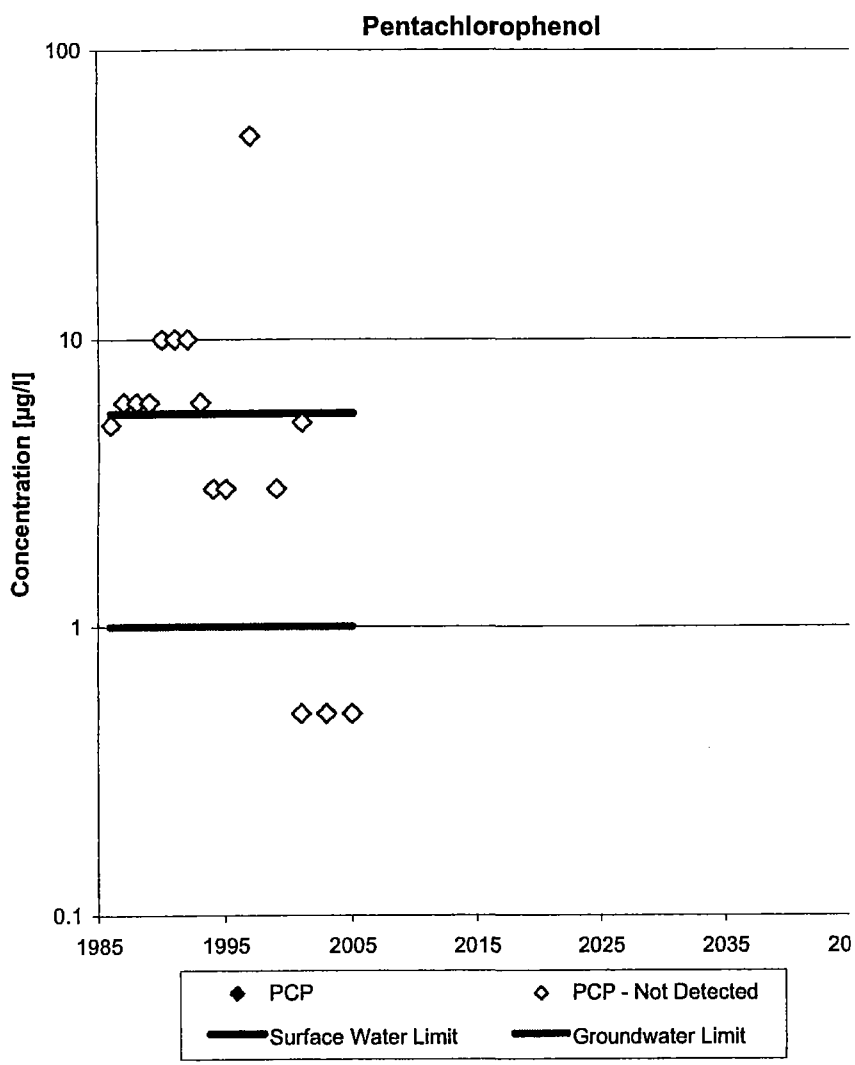

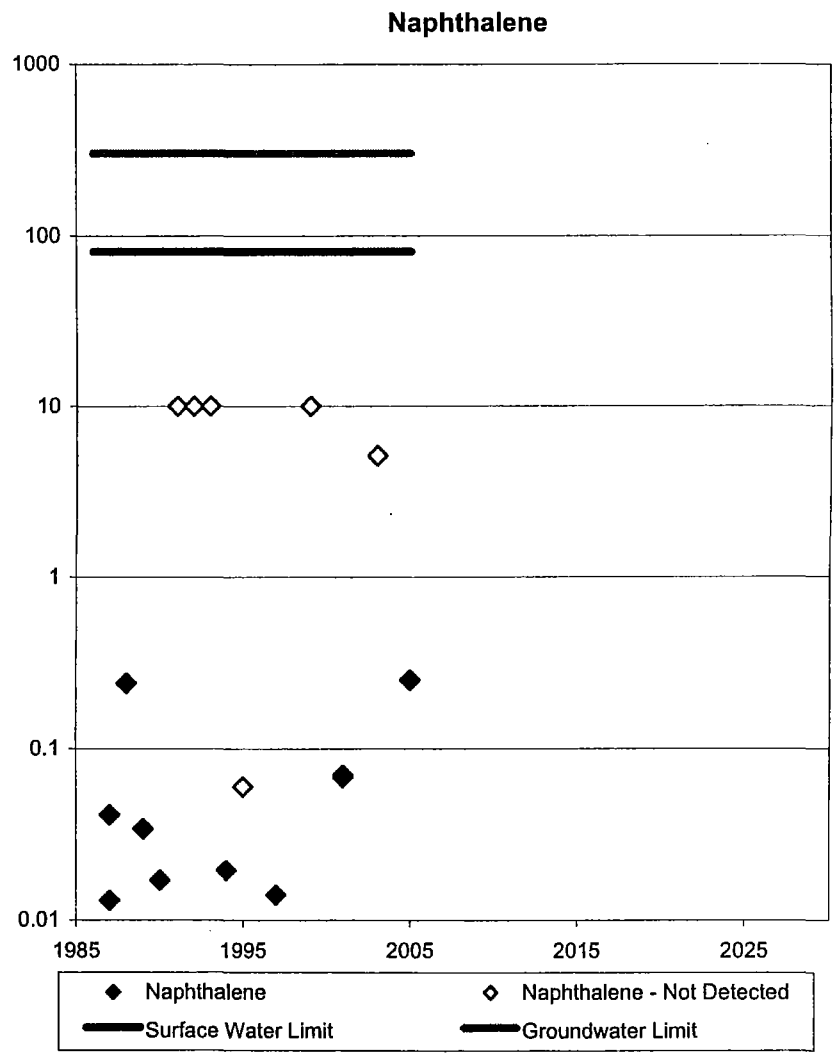

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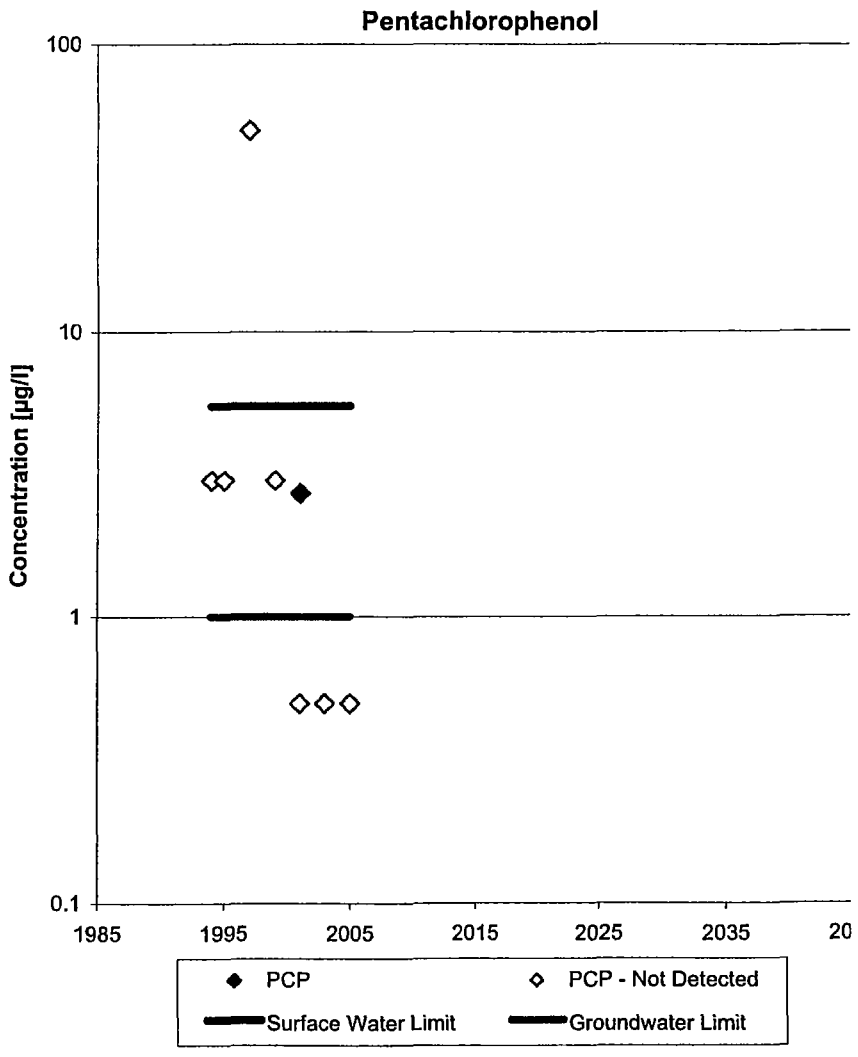

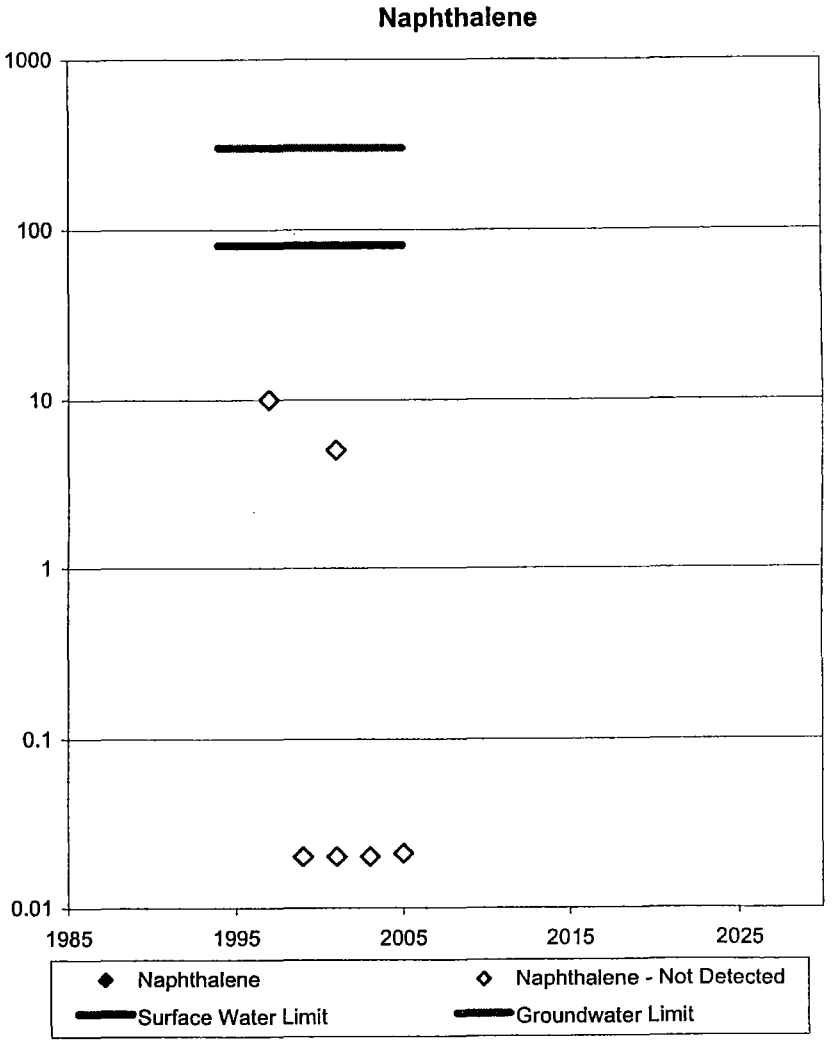

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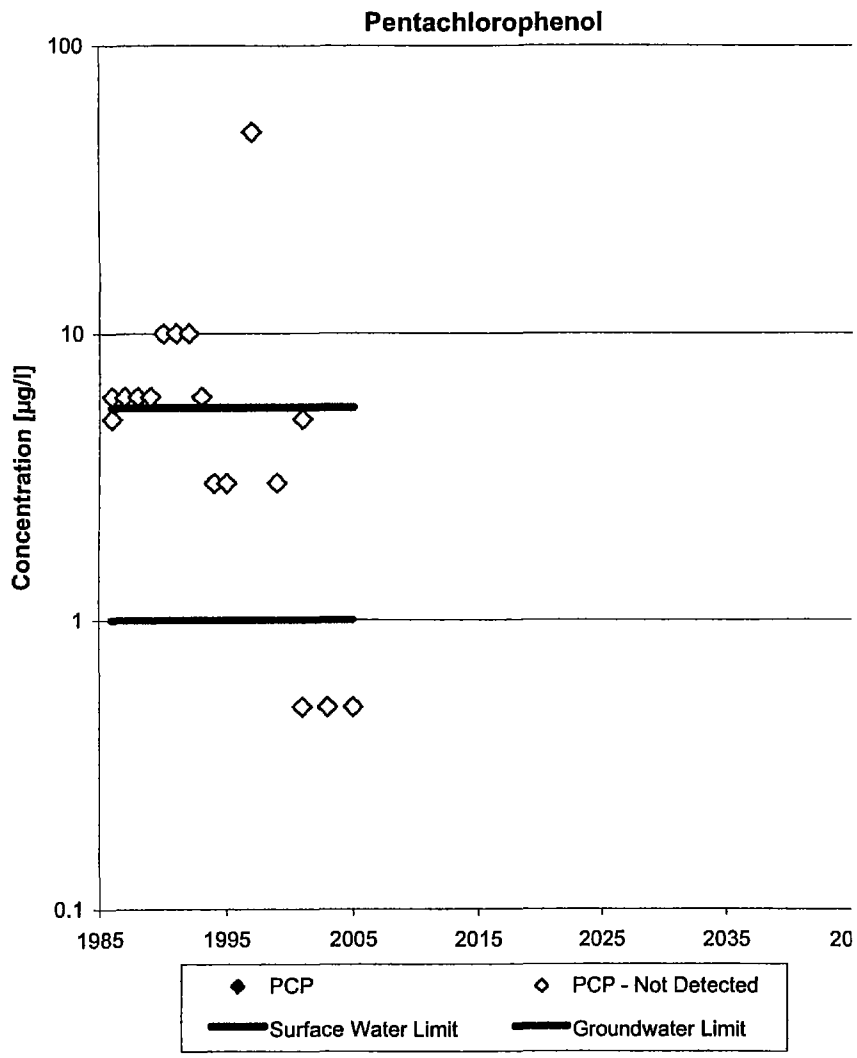

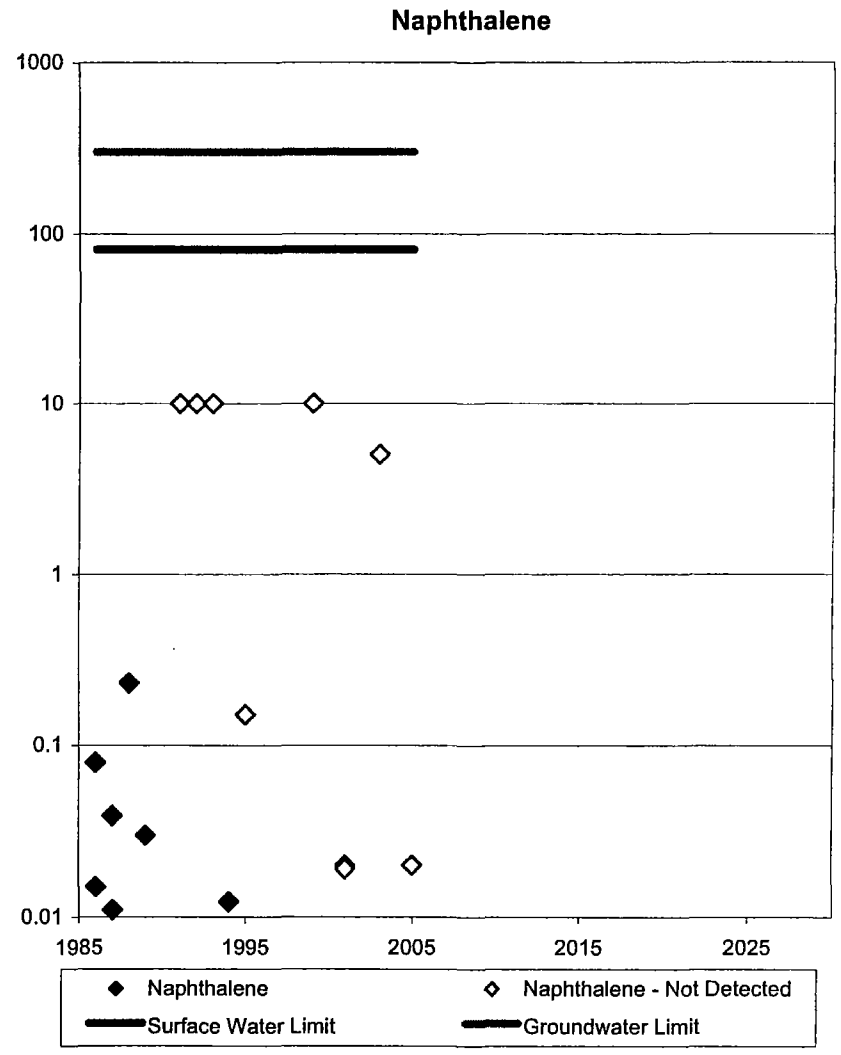

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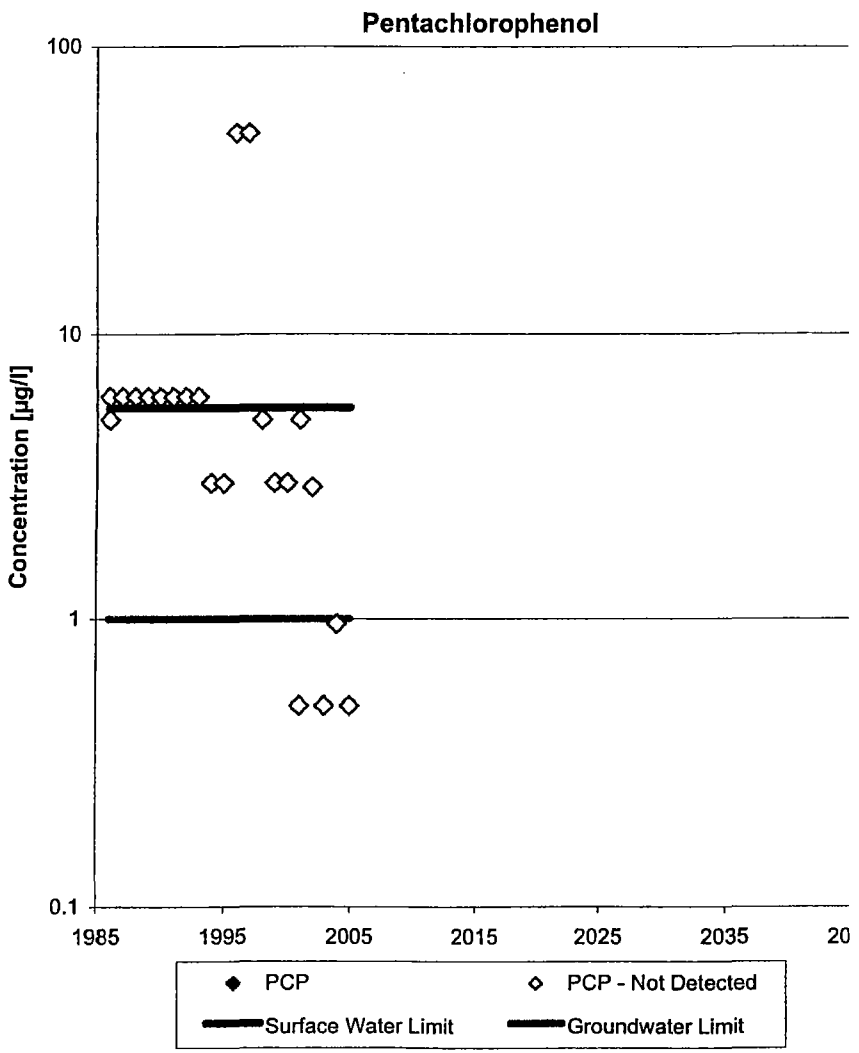

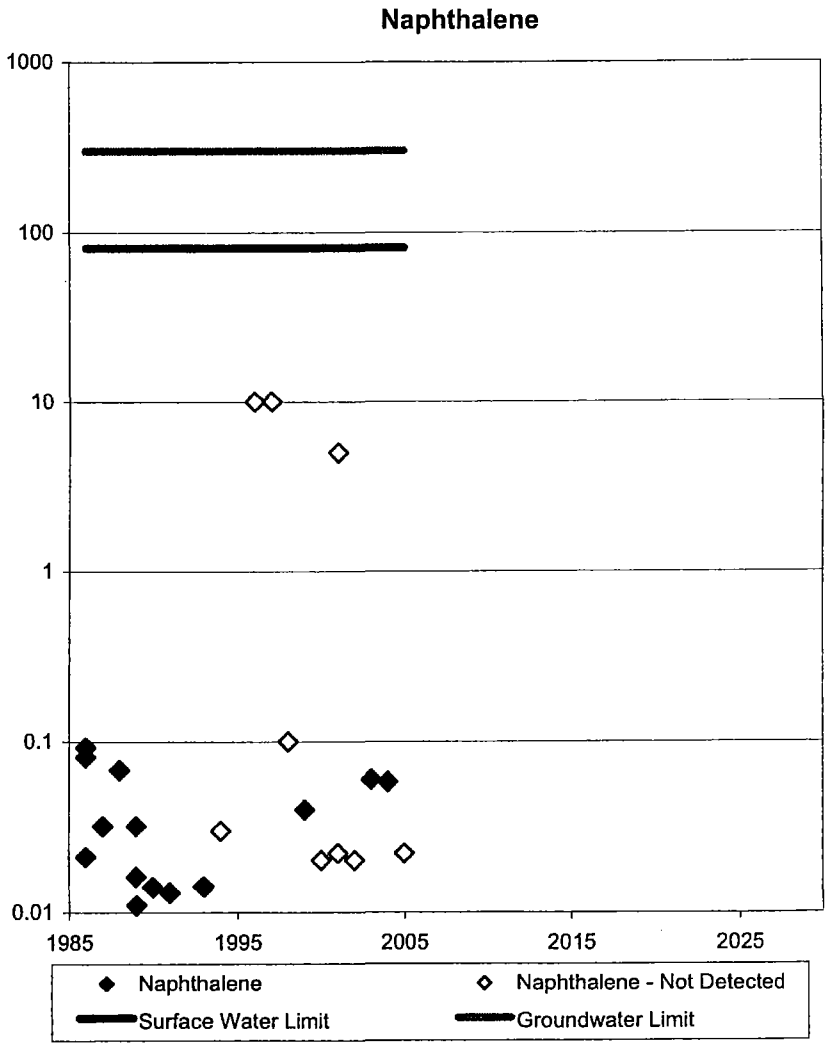

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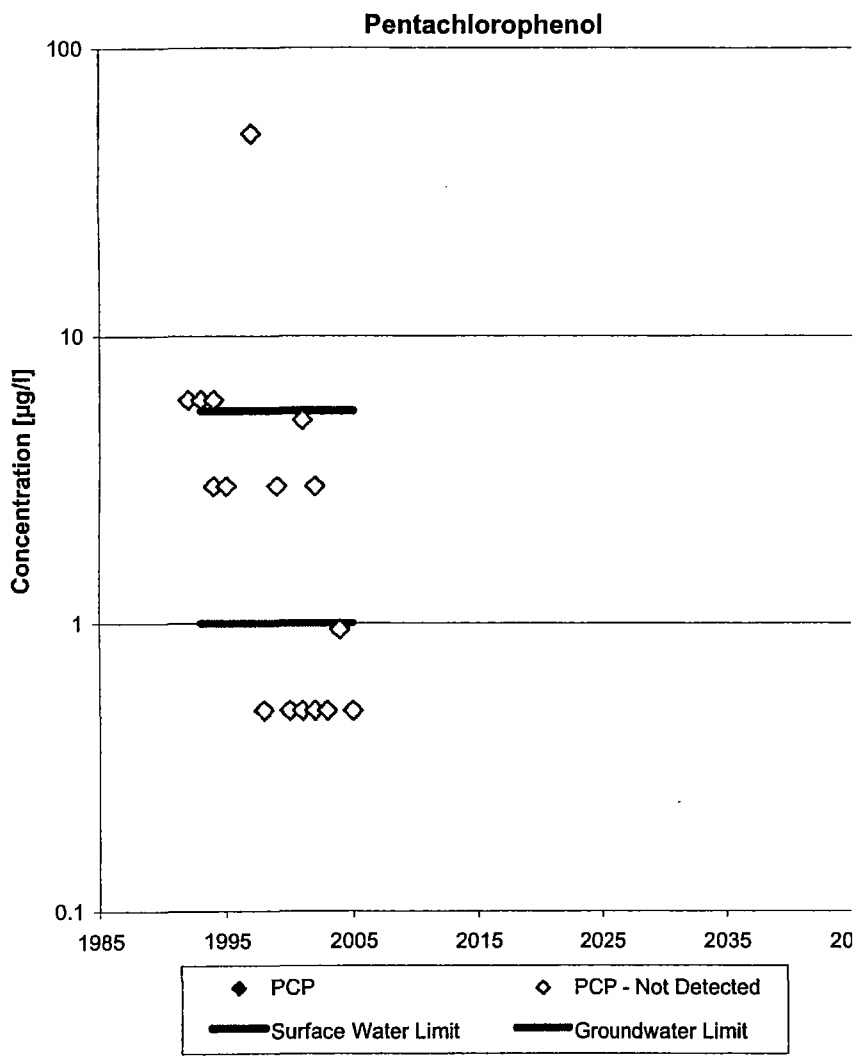

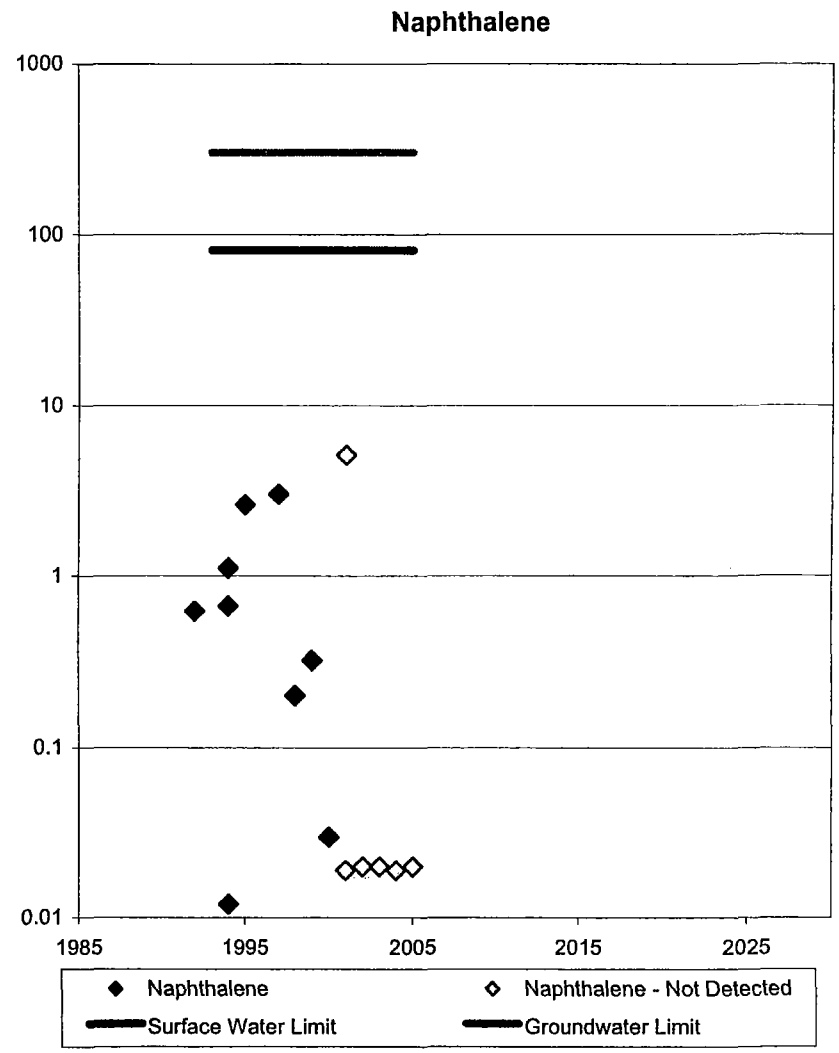

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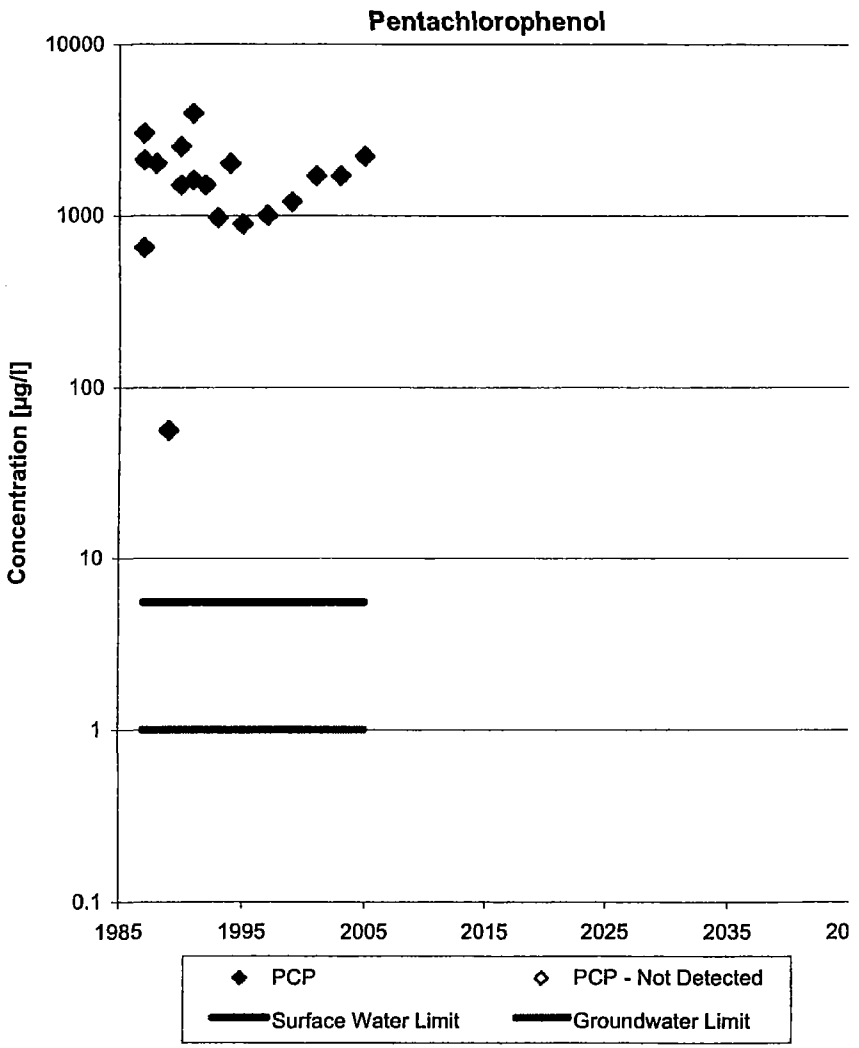

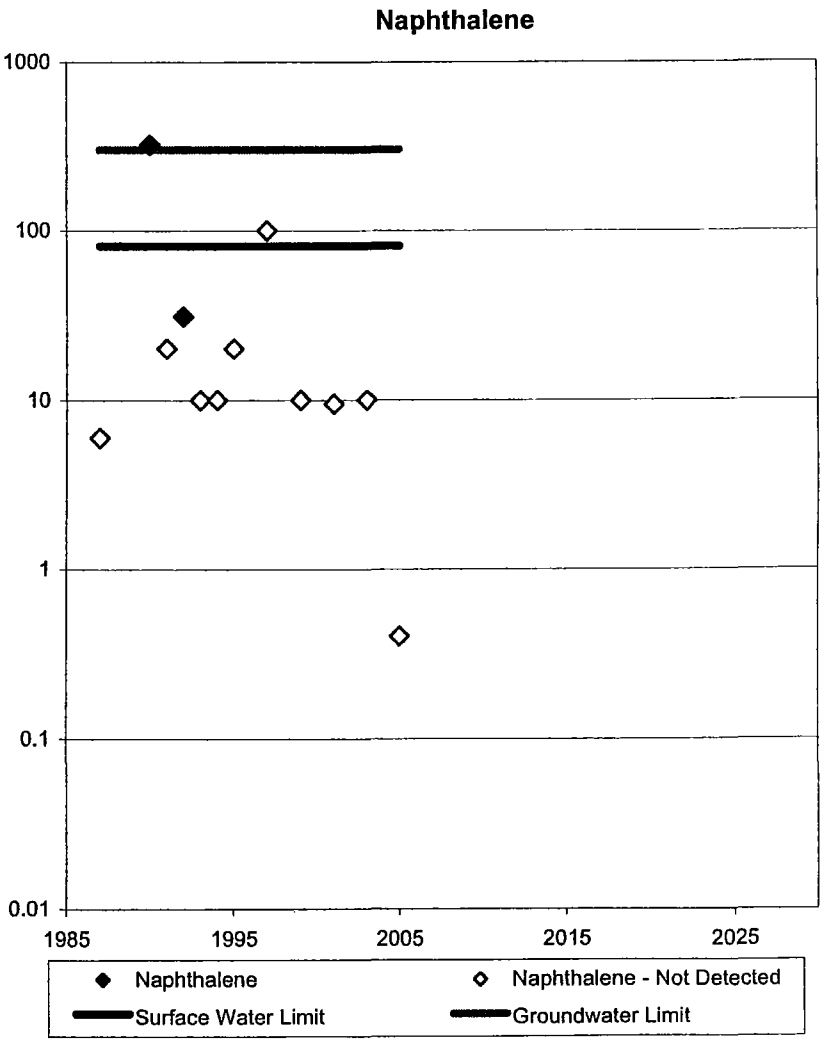

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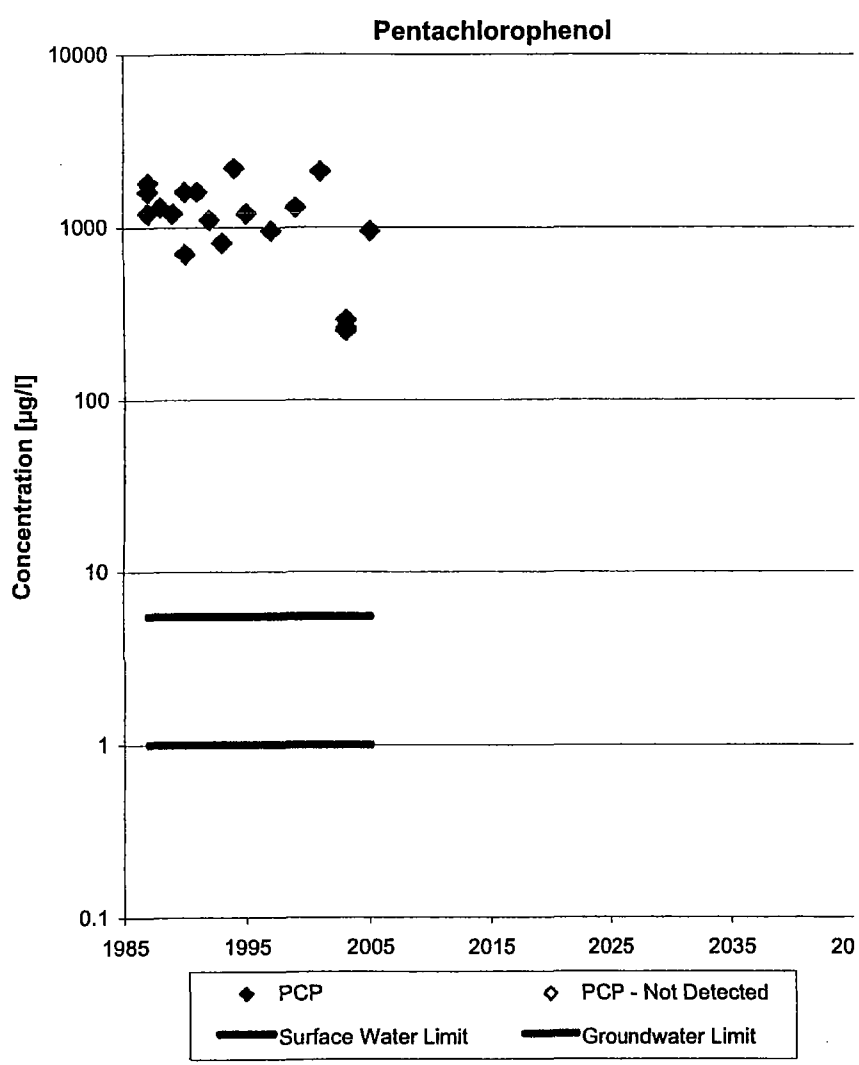

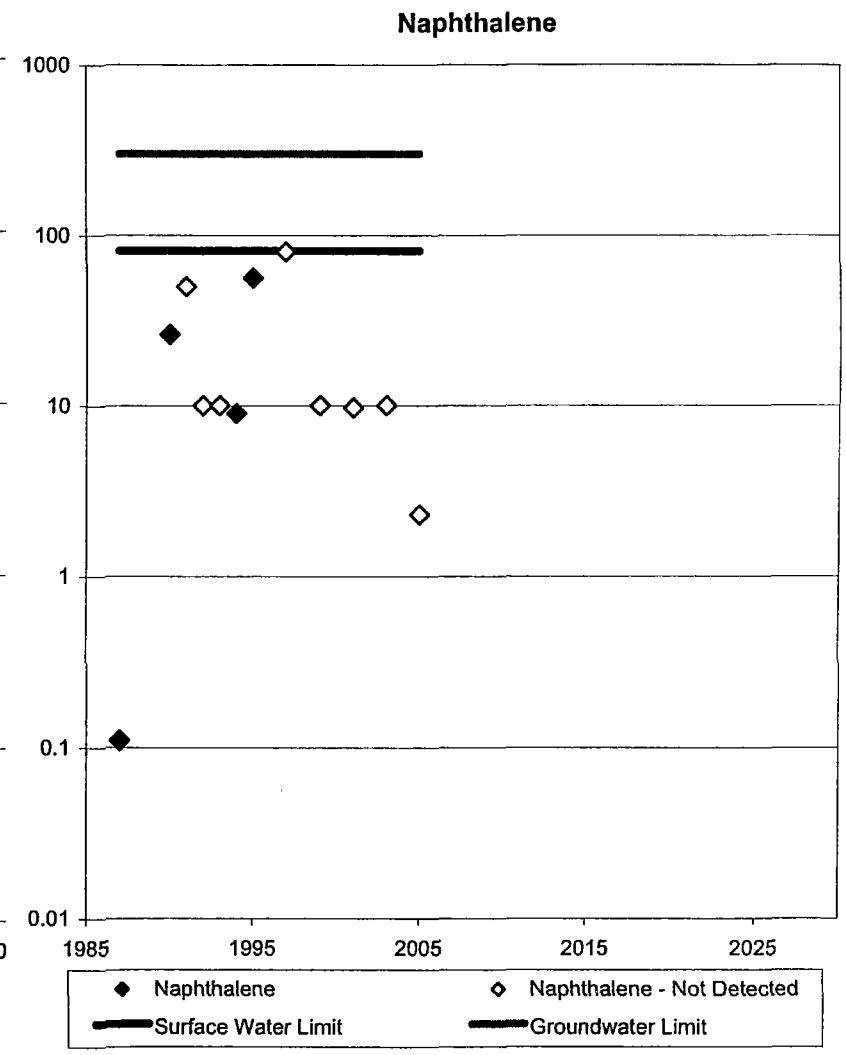

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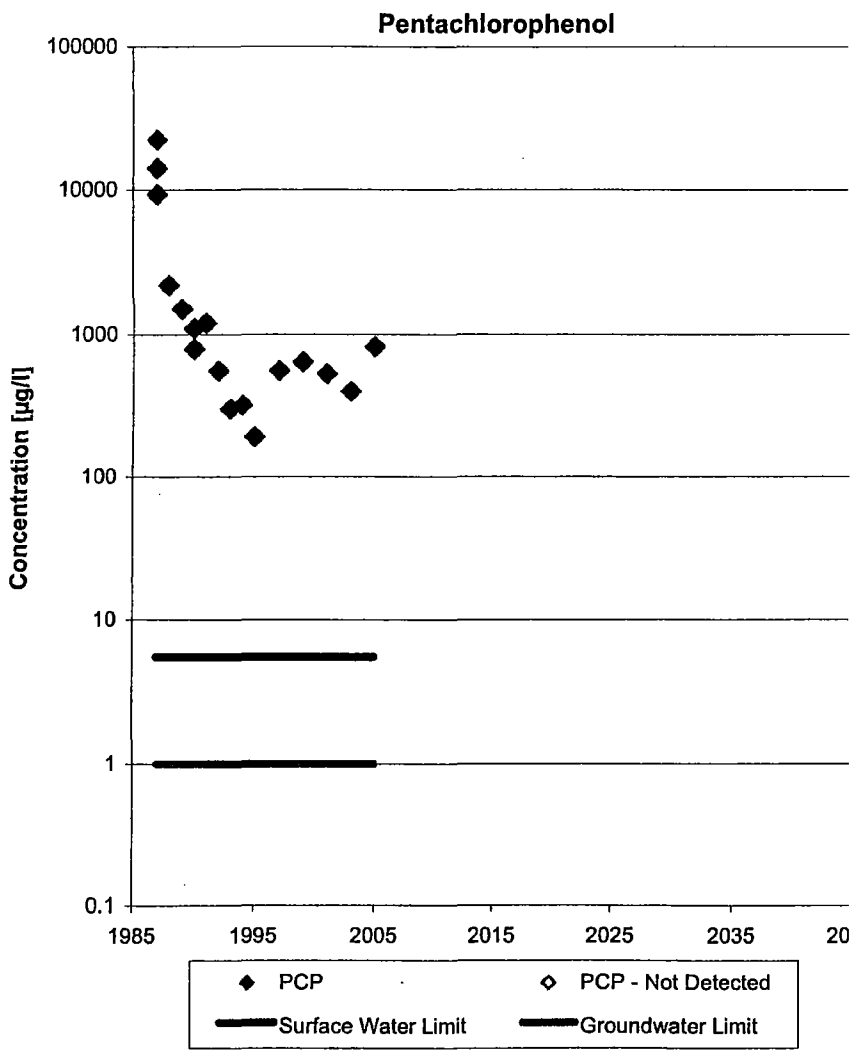

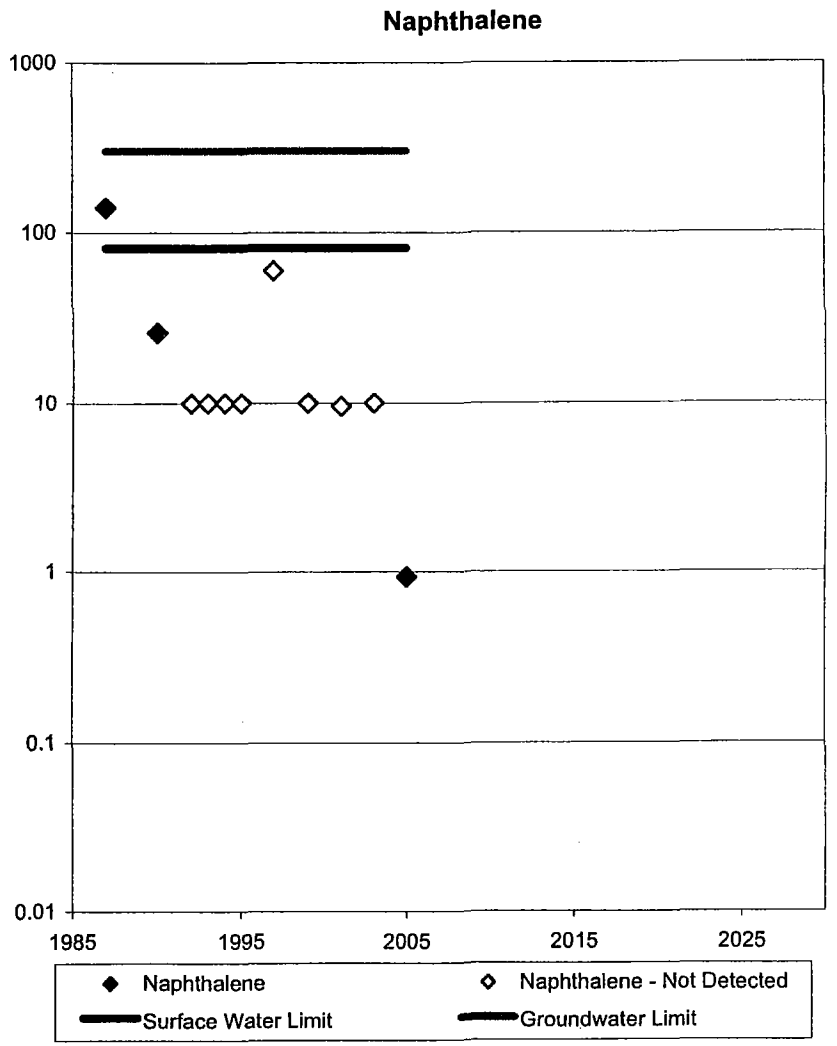

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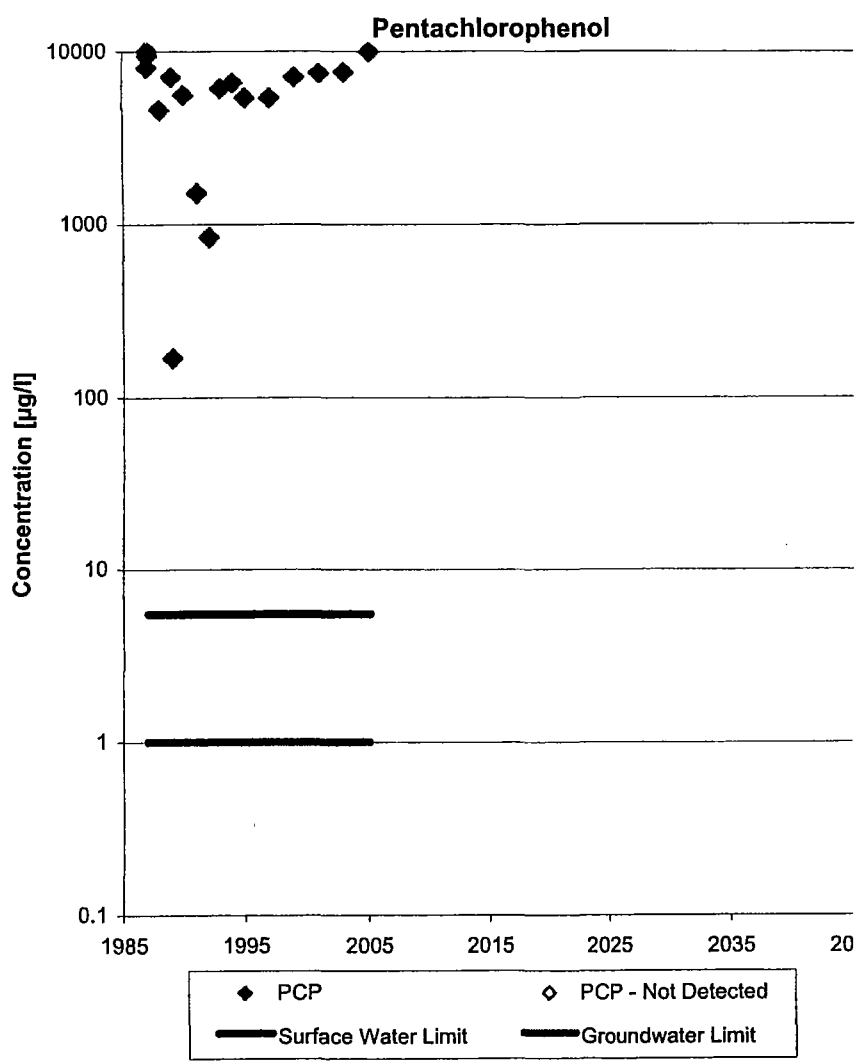

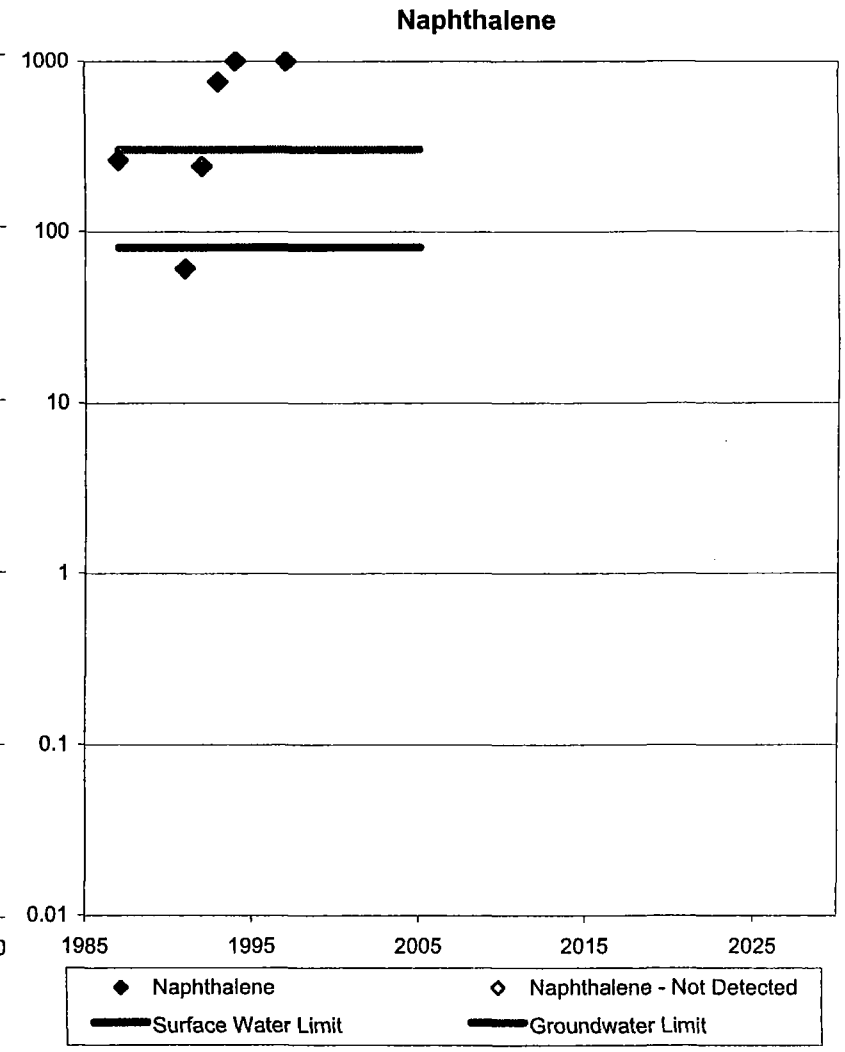

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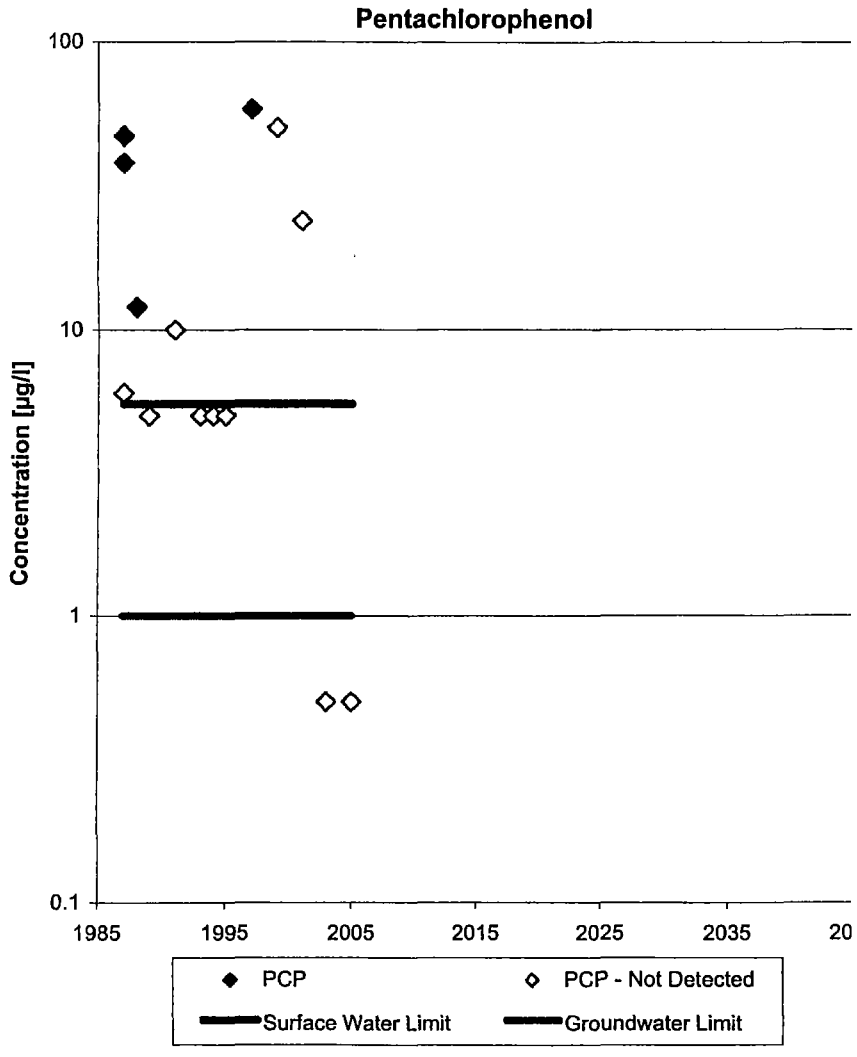

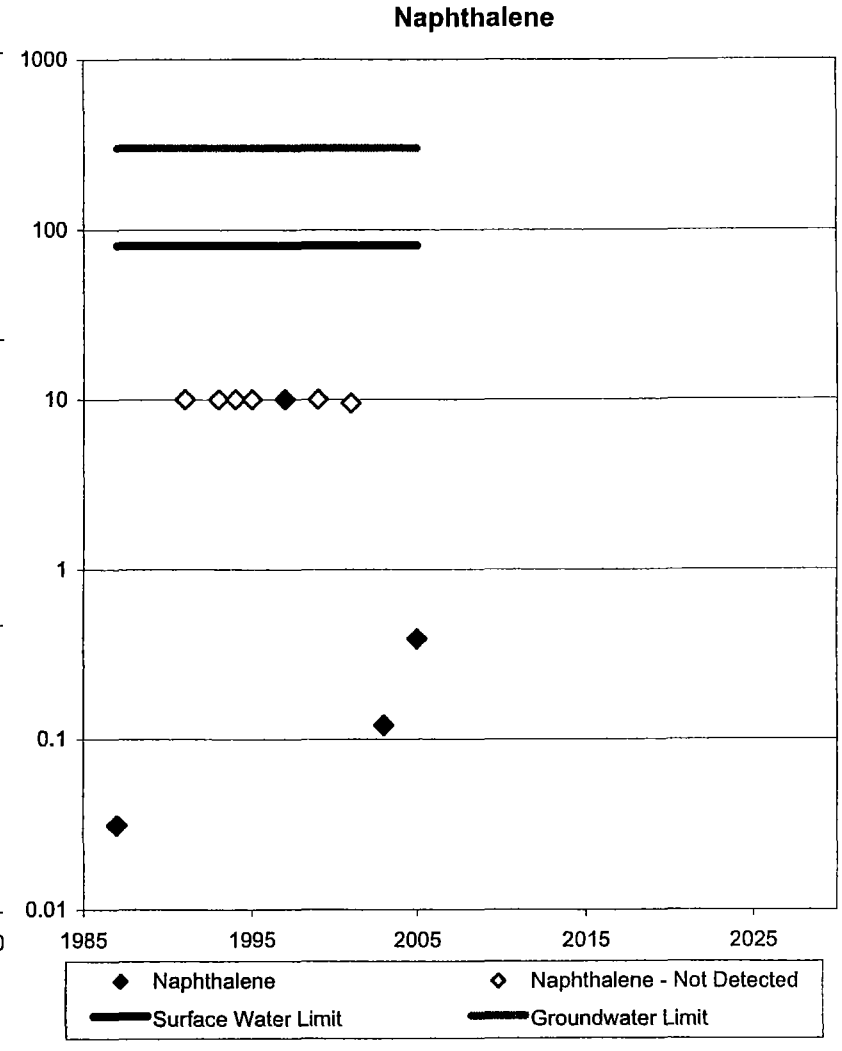

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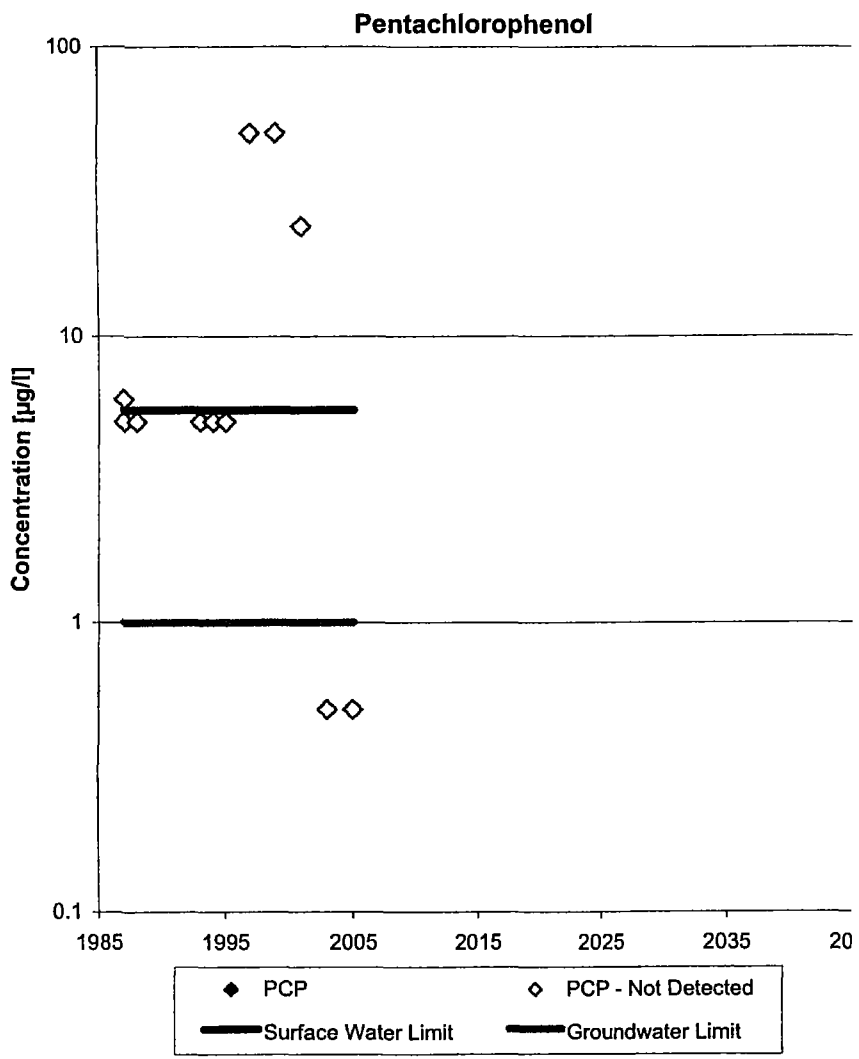

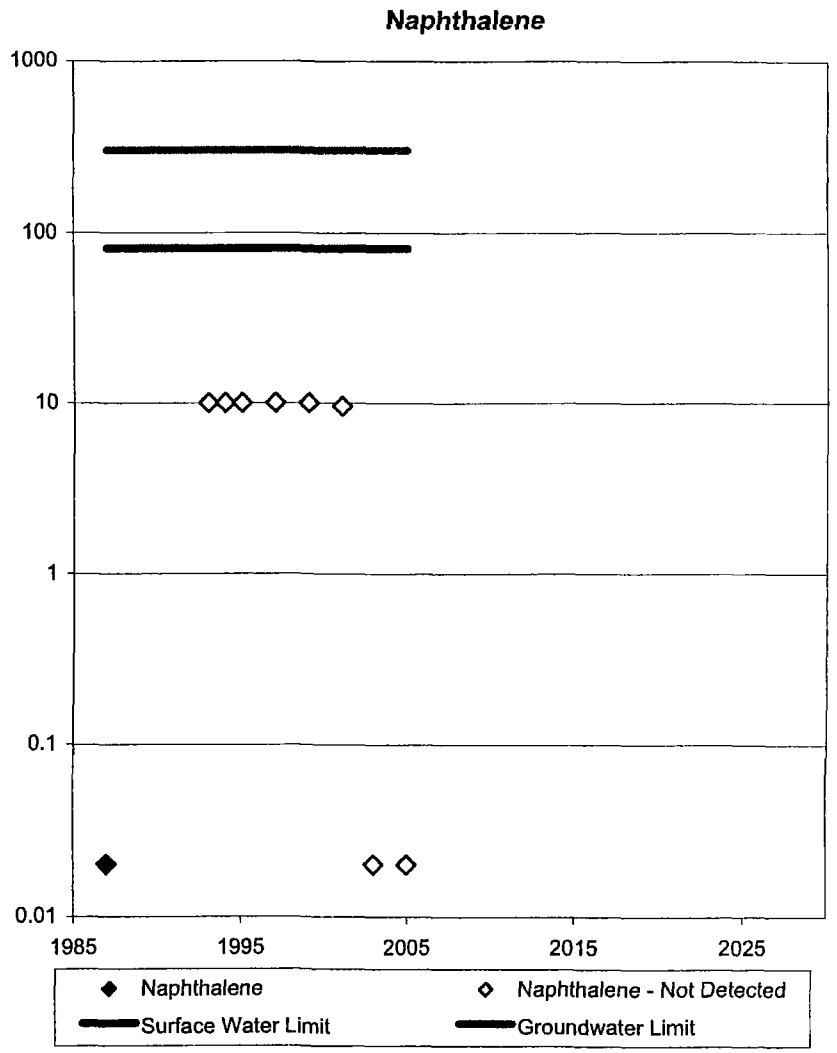

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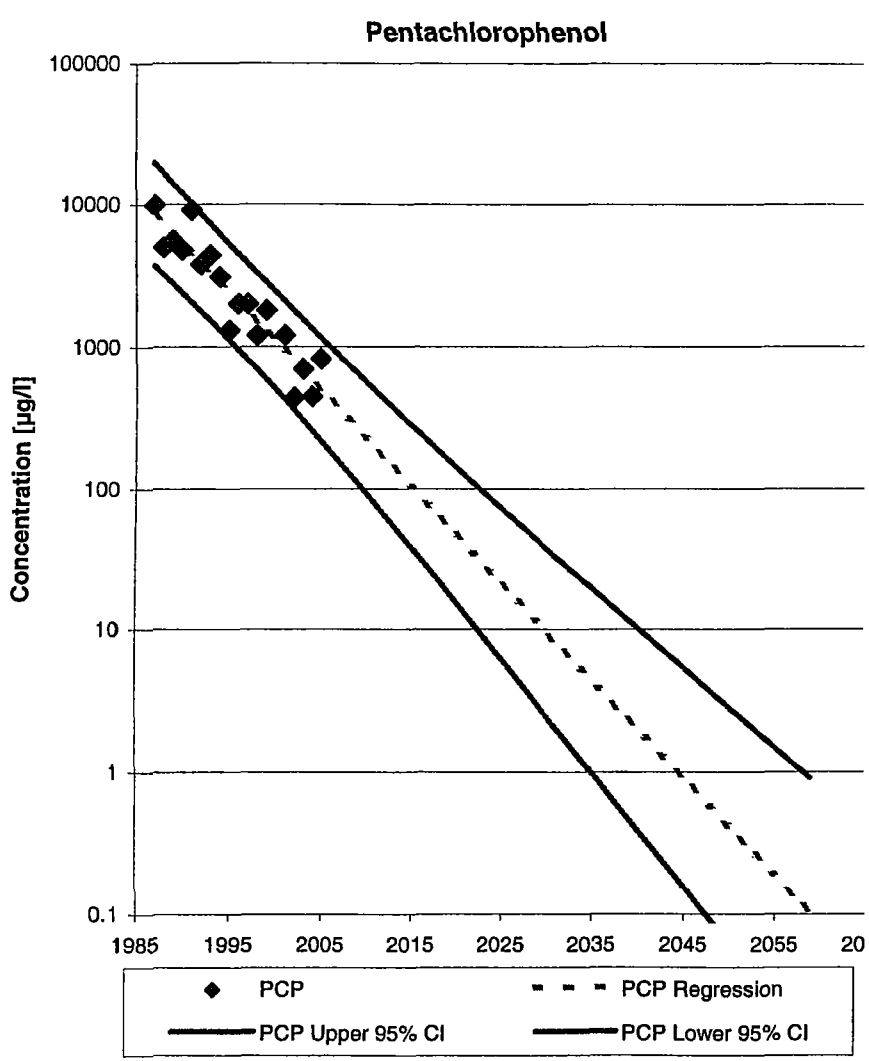

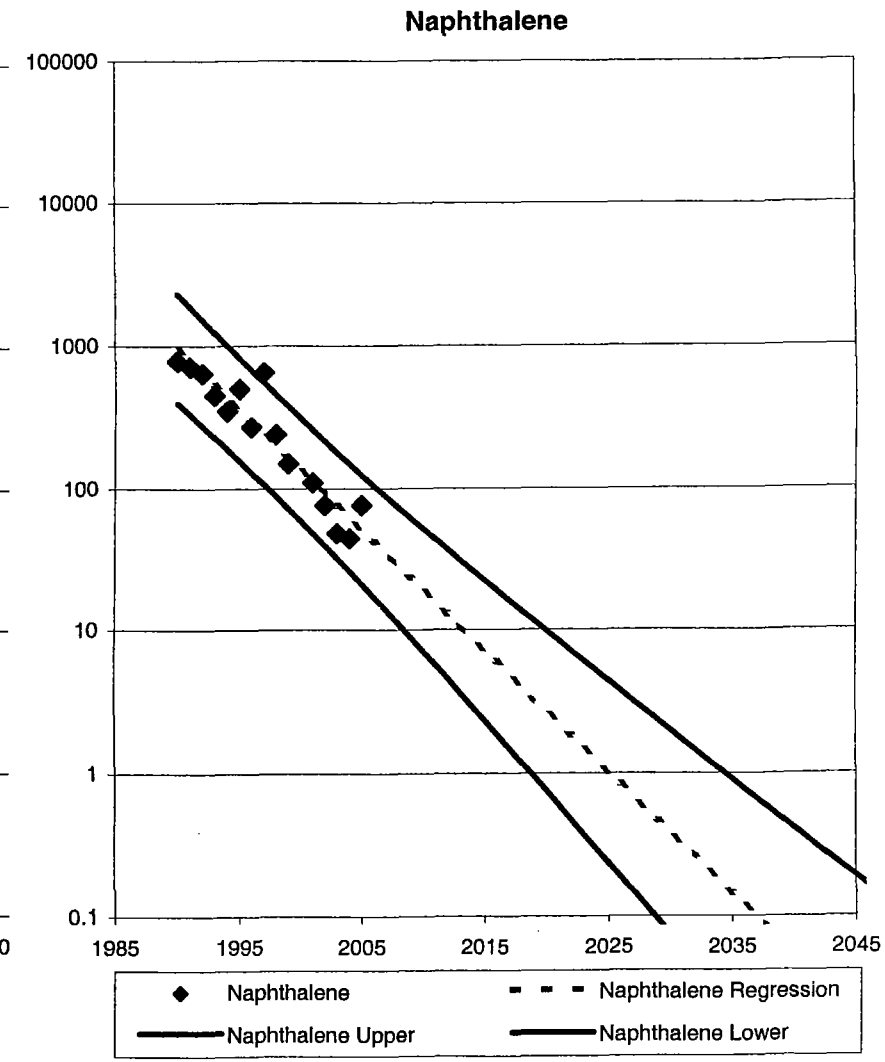

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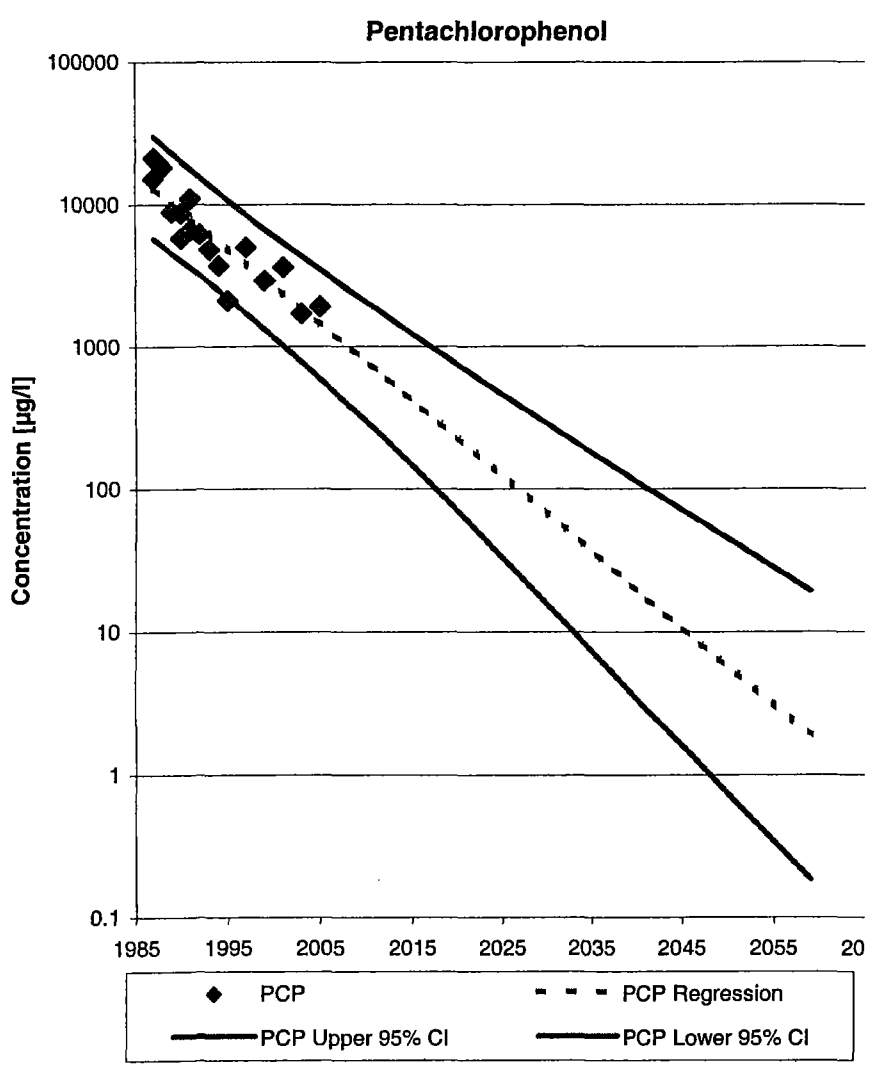

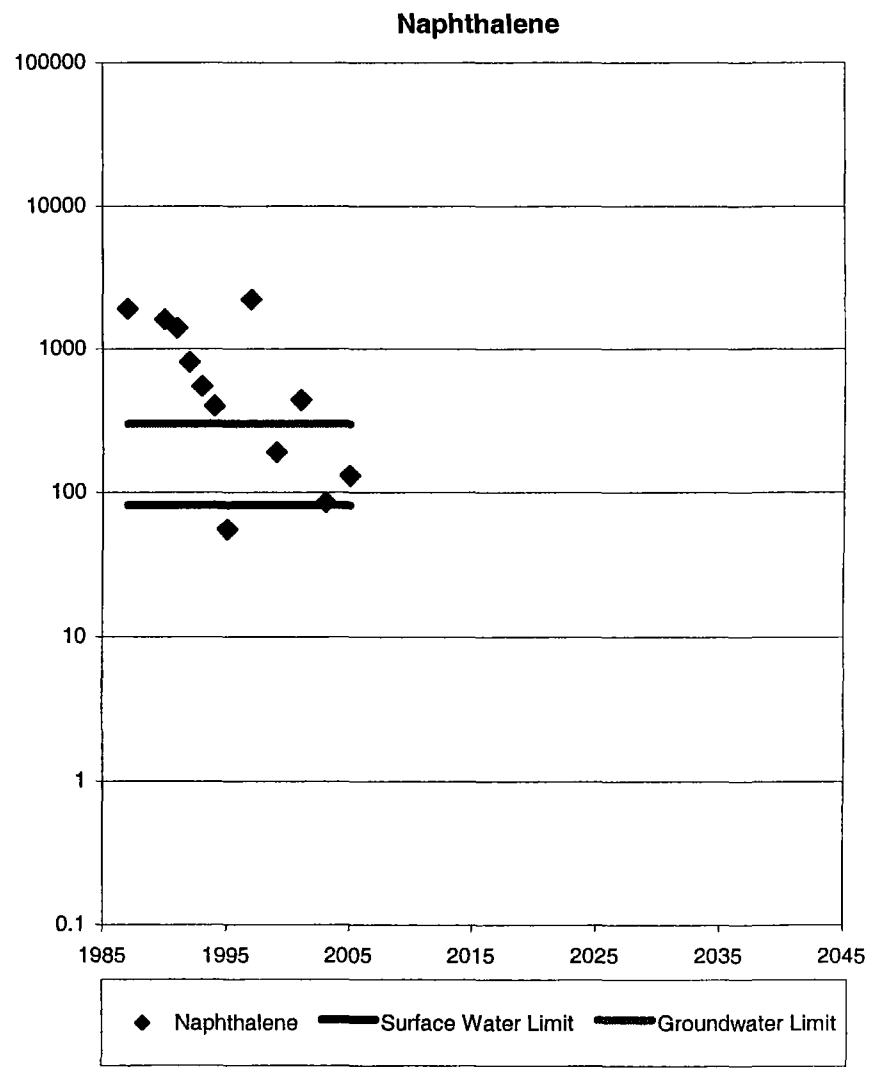

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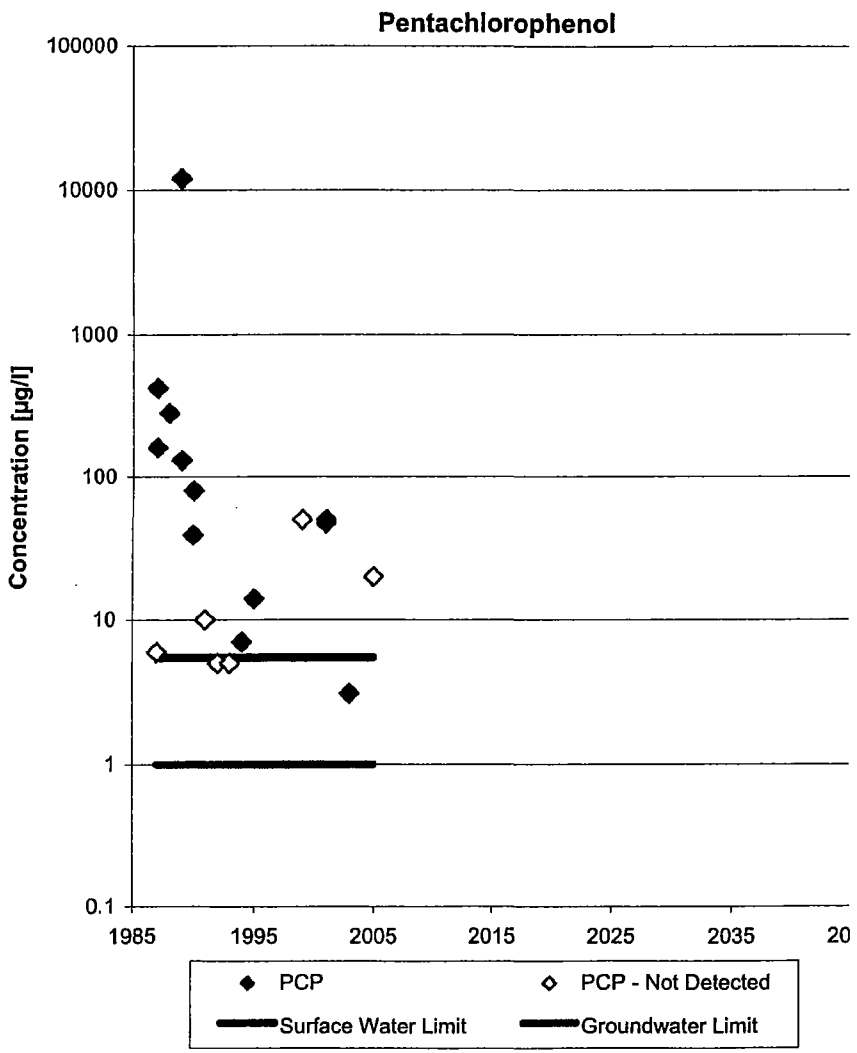

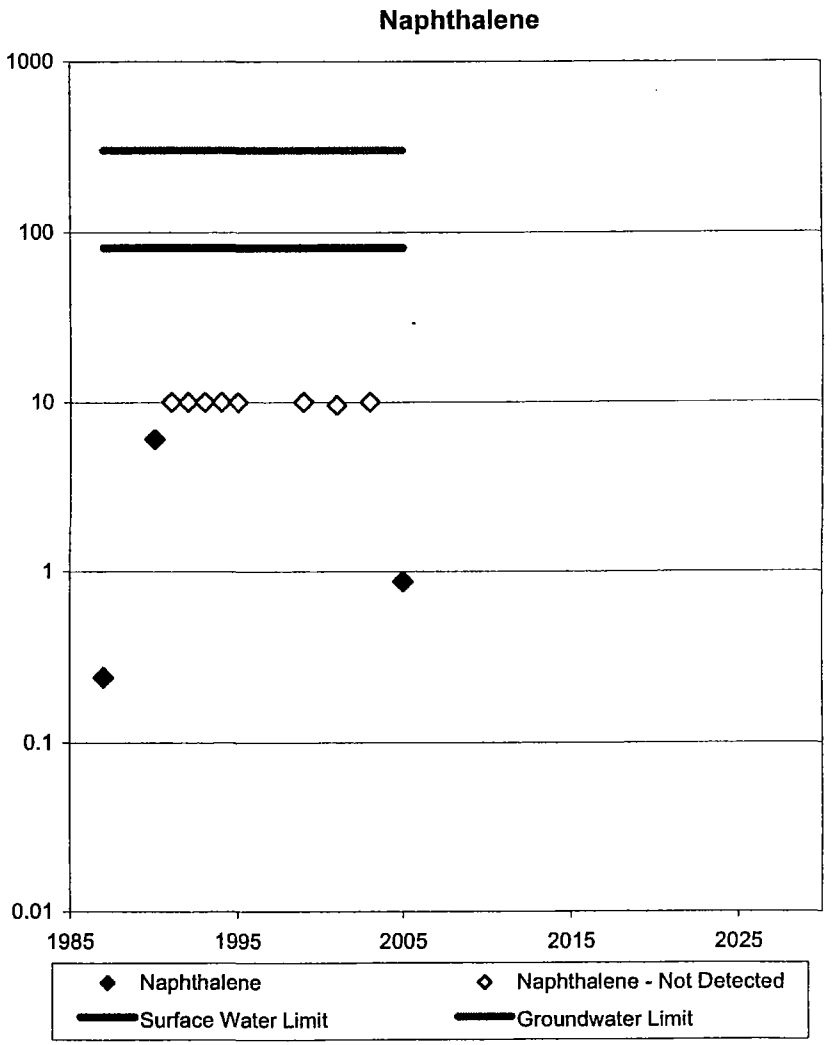

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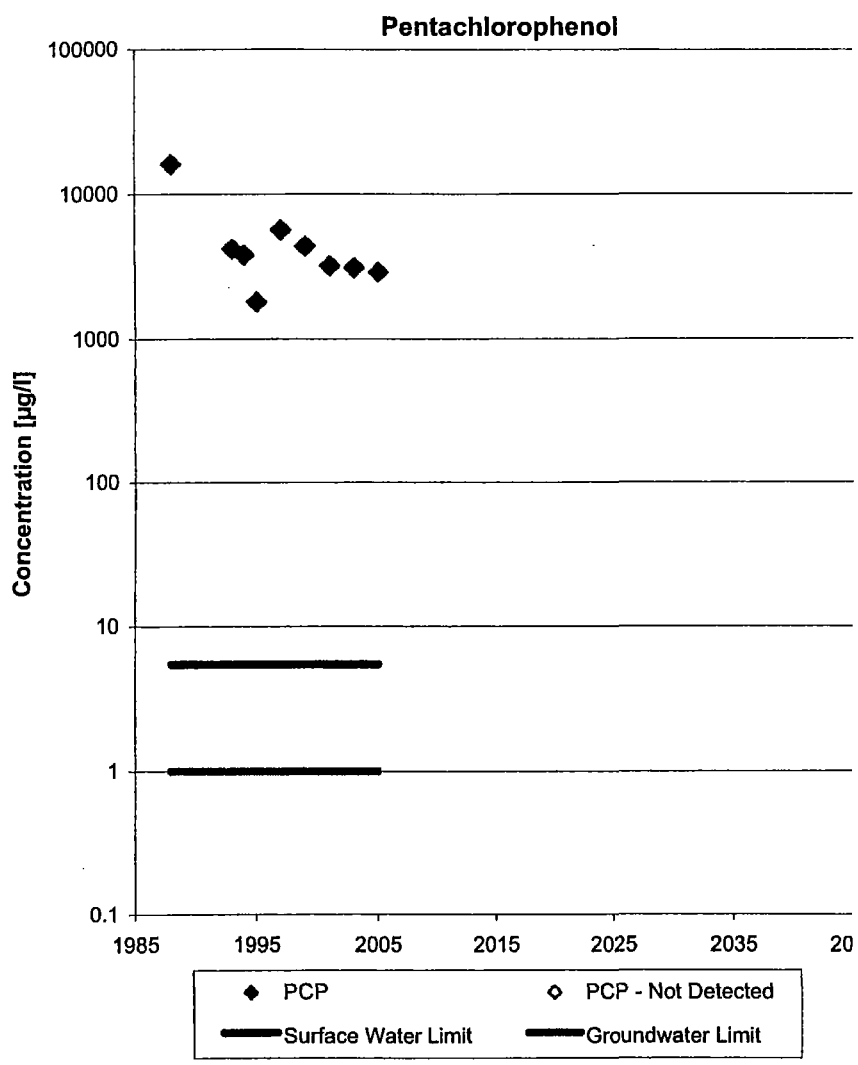

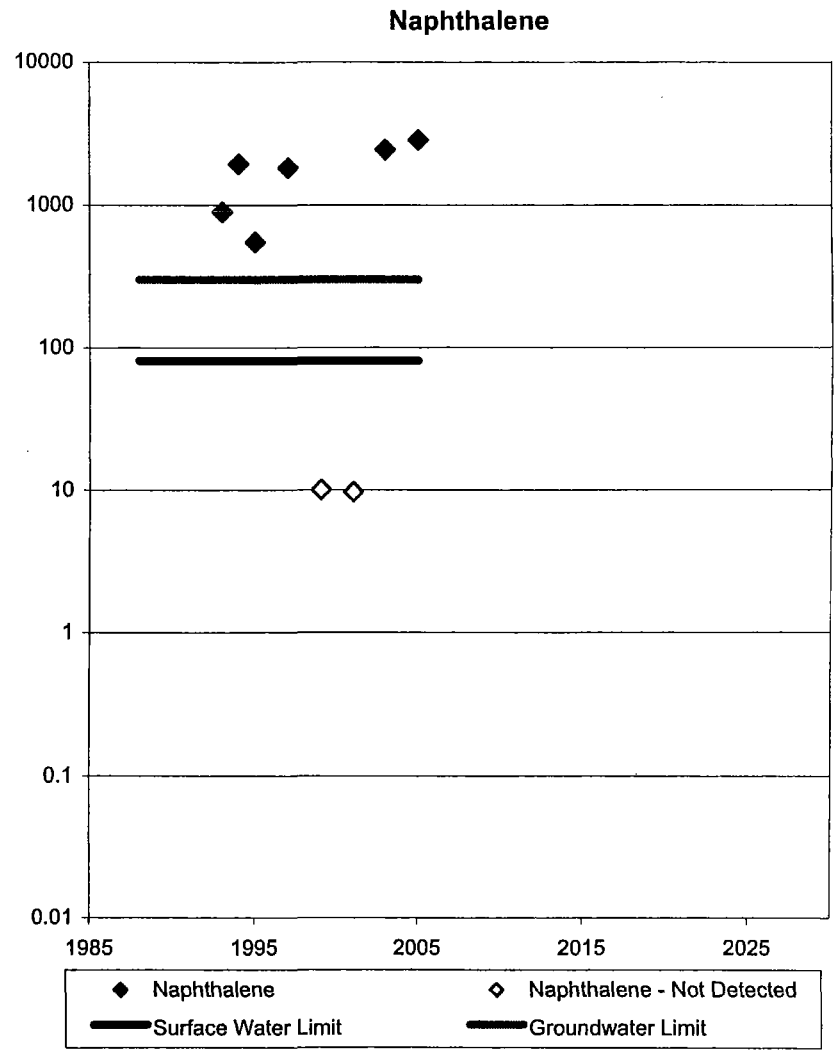

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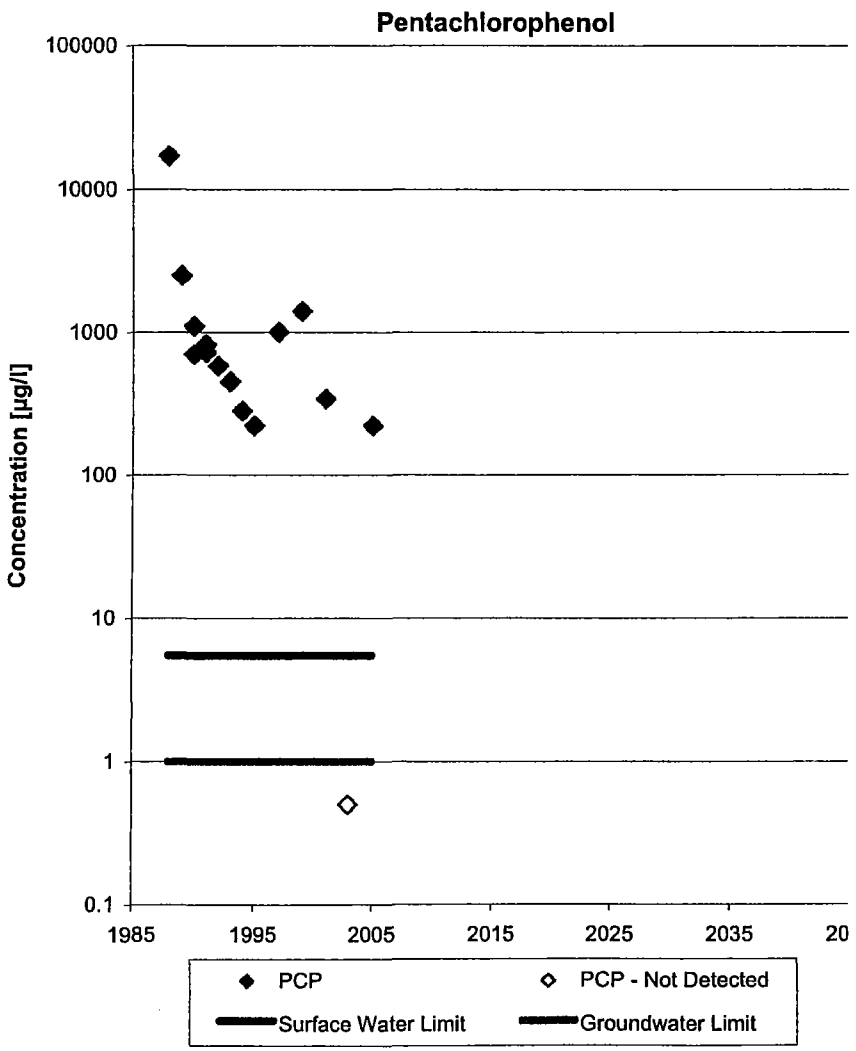

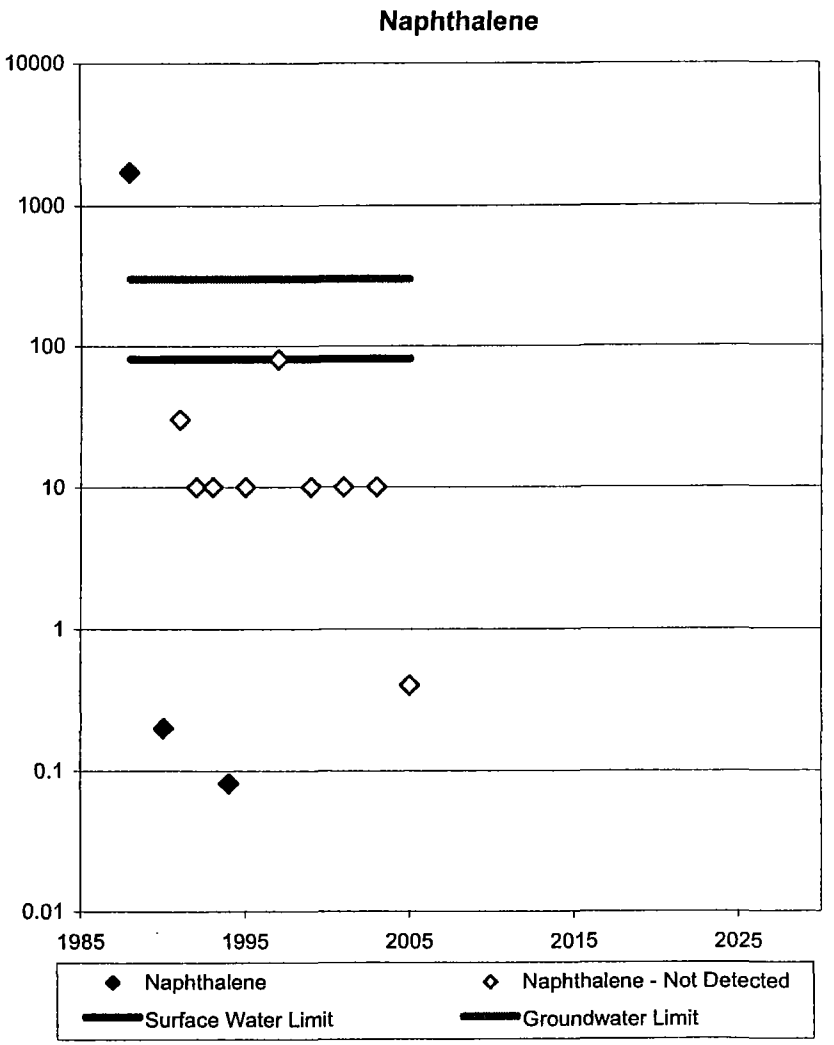
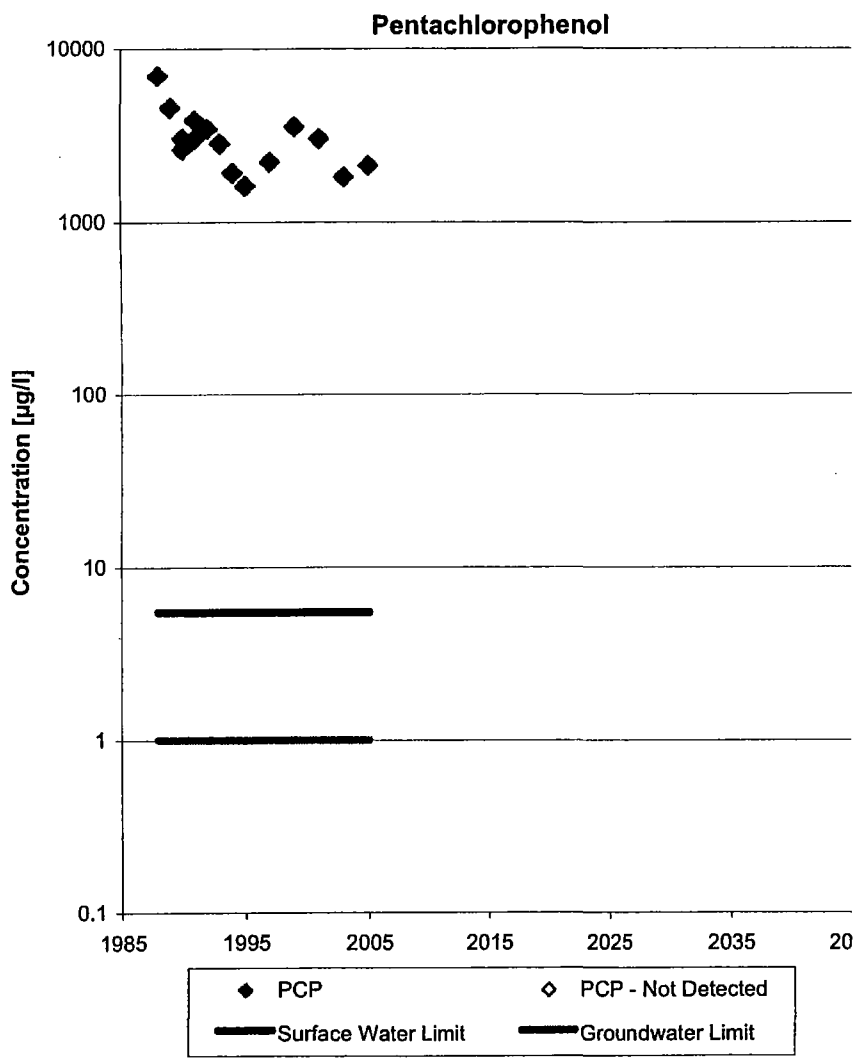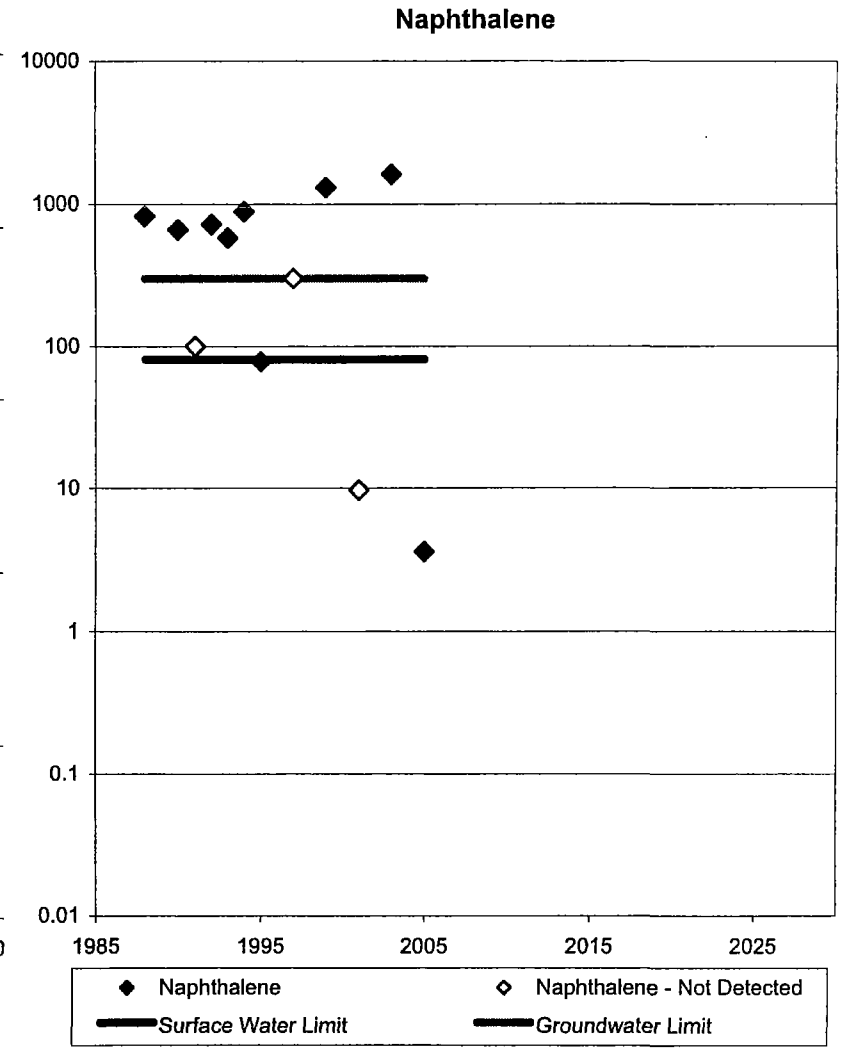
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