City of Seattle
Seattle Department of Transportation
Peter Hahn, Director

August 21, 2012

Ms. Donna Musa
Department of Ecology -Northwest Regional Office
3190 – 160th Avenue SE
Bellevue, WA 98008-5452

Re: Marine Lumber Services
7915 5th Avenue South
Seattle, WA 98108

Dear Ms. Musa:

In accordance with the Model Toxics Control Act, WAC 173-340-300 site discovery and reporting requirements, the Seattle Department of Transportation (SDOT) has prepared this letter to notify the Washington State Department of Ecology (Ecology) of contaminant concentrations exceeding the Model Toxics Control Act (MTCA) in the right-of-way adjacent to the Marine Lumber Services (MLS) property located at 7915 5th Ave South. Concentrations of arsenic were detected above MTCA Method A clean up levels in soil samples collected during a source control investigation by Seattle Public Utilities (SPU). Samples were collected because visible staining of suspected wood preservative was observed on pavement beneath lumber storage piles at the property. The wood preservative staining was suspected to have leached from the nearby lumber storage piles and runoff from this site flows onto the right-of-way along S. Monroe St. (see photos 1-4).

Marine Lumber Services main property yard (525 S. Chicago Street) is identified on Ecology's Confirmed and Suspected Contaminated Sites list (Cleanup Site ID 8993). The Marine Lumber Services operations include three properties: the main property offices and storage yard (525 S. Chicago Street), the South Yard (7915 5th Ave. South) and a second storage yard (454 S. Kenyon Street). SPU collected samples on and adjacent to the South Yard along S. Monroe St.

In 2008-2009, SPU collected soil samples at four locations in the shoulder along the north side of S. Monroe St. where surface water runoff from the Marine Lumber Services (MLS) storage yard entered the right-of-way (sample RCB159), as well as at locations approximately 50 feet east and west of RCB159 (RCB273, RCB274 [field split of RCB273], and RCB275). Soil samples were collected at depths of 0 inches, 0-3 inches, and 3-12 inches. SPU also collected a surface dirt sample (CB137) from the pavement at the storage yard where storm water flow exits the property and where sediment had accumulated (see

photo #5). Sampling locations are shown on Figure 1. During the sampling activities, MLS was storing treated wood within the yard.

Metals (arsenic, copper, lead, mercury, and zinc), total petroleum hydrocarbons, polycyclic aromatic hydrocarbons (PAHs), phthalates, polychlorinated biphenyls (PCBs) and semi-volatile organic compounds (sVOCs) were detected in the samples (Table 1). Arsenic concentrations exceeded the MTCA Method A cleanup level in the soil samples, ranging from 198 to 950 mg/kg in the upper 0 to 3 inches and from 22 to 260 mg/kg in the 3 to 12 inch samples. Although there is no MTCA Method A cleanup level for copper, the copper concentrations in the 0-3 inch samples (232-8,370 mg/kg) were higher than SPU has found in most other source tracing samples collected in the right-of-way as part of its source control program in the Lower Duwamish Waterway (85 mg/kg median concentration). Elevated levels of arsenic (710 mg/kg) and copper (4,930 mg/kg) were also detected in sample CB137. Surface runoff from the former MLS treated wood south storage yard onto the adjacent right of way is the suspected source of the elevated concentrations of arsenic and copper in the right-of-way soil samples.

On November 15, 2011, Ecology issued Amended Administrative Order No. 8862 requiring MLS to initiate a cleanup of copper, zinc, and arsenic contaminated sediments on the north side of S. Monroe Street.

On June 27, 2012, MLS submitted a Remedial Action Work Plan to SDOT for review as supporting documentation for Street Use permit No. 180562 (Environmental Partners, Inc., 2012). The permit was requested for the excavation and removal of copper, zinc and arsenic-contaminated soils from within the right of way. A copy of the work plan is attached for reference.

The work plan describes activities to excavate contaminated soils in a 10 ft by 100 ft area along the southern property right of way frontage on S. Monroe Street; although SPU data indicate that arsenic and copper contamination extends beyond the property frontage.

If you have any questions or need further information, please do not hesitate to contact me by phone at (206) 684-3751 or email at Jennifer.anderson@seattle.gov.

Sincerely,

Jennifer S. Anderson
Sr. Environmental Analyst

Attachments:

Attachment 1: Source Control Investigation Photographs
Attachment 2: Sampling Location Map
Attachment 3: Analytical Data Table
Attachment 4: Laboratory Analytical Report
Attachment 5: Remedial Action Plan, Environmental Partners, Inc., July, 2012

cc:

Robert Wright, Ecology, Northwest Regional Office
Russell E. Olsen, Ecology, Northwest Regional Office
Mark Mazzola, Seattle Department of Transportation
Beth Schmoyer, Seattle Public Utilities
Thomas C. Morin, Environmental Partners, Inc.

Photos 1-4: Visual staining of onsite pavement.

Photo 1

Photo 2

Photo 3

Photo 4

Photo 5: Sample collection at CB137

Photo 5

Lower Duwamish Waterway

Figure 1: 7915 S Monroe St

Legend

Utilities
- Storm drain
- Sanitary sewer
- Combined sewer
- King County interceptor

Structures
- Catch basin
- Catch basin - Lg. inlet
- Inlet (street drain)
- Sand box
- Maintenance hole

Source tracing samples
- Onsite catch basin
- ROW catch basin
- Inline grab
- Sediment trap
- Soil
- Street/surface dirt

0.2 0 0.2 Miles

Produced by the City of Seattle

marine_lumber_sample_loc.shp

470
7800
525
546
S KENYON ST
7915
7901
327
526
5TH AVE S
7TH AVE S
CB137
RCB275
RCB273
RCB159
S MONROE ST
RCB170
550
8000
543
8001
521

Table 1: SPU source tracing samples in the vicinity of 7915 5th Ave S site (dry weight).
Red = Field split sample

Sample ID	SQS/ LAET[b]	CSL/ 2LAET[c]	MTCA Method A (mg/kg)	EPI CUL[e]	RCB159	CB137	RCB170	RCB159-0	RCB159-3	RCB159-12	RCB273-0	RCB273-3	RCB273-12	RCB-274-0	RCB-274-3	RCB-274-12	RCB275-0	RCB275-3	RCB275-12
Lab Ref					OD13	OS71	PA69	SX83	SX83	SX83	SX83	SX83	SX83	SX83	SX83	SX83	SX83	SX83	SX83
Sample Type[d]					Soil	Dirt	CB	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Outfall					7th Ave S SD	7th Ave S SD	7th Ave S SD	7th Ave S SD	7th Ave S SD	7th Ave S SD	7th Ave S SD	7th Ave S SD	7th Ave S SD	7th Ave S SD	7th Ave S SD	7th Ave S SD	7th Ave S SD	7th Ave S SD	7th Ave S SD
Date					12/05/08	03/27/09	05/28/09	05/20/11	05/20/11	05/20/11	05/20/11	05/20/11	05/20/11	05/20/11	05/20/11	05/20/11	05/20/11	05/20/11	05/20/11
Total solids (%)					61.2	75.6	42.2	59.0	62.3	74.4	66.2	81.1	91.9	69.1	78.0	89.5	78.4	67.3	91.1
TOC (%)					8.55	4.03	7.16	11.90	9.24	2.33	5.97	6.99	1.04	6.05	4.00	4.57	10.10	11.90	2.29
Metals (mg/kg DW)																			
Arsenic	*57*	*93*	*20*	*20*	***750***	***710*** J	***36*** J	***474***	***950***	***260***	***198***	***210***	***22***	***195***	***280***	***10***	***544***	***430***	***38***
Copper	390	390	na	3,200	**4,520**	**4,930** J	**161** J	**3,240**	**8,370**	**2,110**	**410**	**232**	**26**	**391**	**205**	**19**	**2,730**	**1,890**	**419**
Lead	450	530	250		***280***	**118** J	**200** J	**176**	**105**	**20**	**50**	**20**	**6**	**66**	**26**	**5**	***1,040***	***995***	**129**
Mercury	0.41	0.59	2		**0.27**	**0.22** J	**0.08** J	**0.27**	**0.26**	**0.13**	**0.19**	**0.13**	**0.05**	**0.19**	**0.10**	**0.08**	**0.20**	**0.17**	**0.11**
Zinc	410	960	na	24,000	**1,490**	**1,950** J	**289** J	**825**	**1,660**	**594**	**468**	**341**	**55**	**454**	**347**	**40**	**938**	**733**	**128**
Total petroleum hydrocarbons (mg/kg DW)																			
TPH -diesel	2,000		2,000		**440**	**640**	**480**	**220**	**230**	63 U	67 U	61 U	55 U	69 U	59 U	55 U	**510**	**560**	**160**
TPH-oil	2,000		2,000		***3,000***	***4,900***	***3,200***	**1,500**	**1,900**	**420**	**340**	**250**	110 U	**550**	**120**	110 U	***3,700***	***2,900***	**610**
LPAH (ug/kg DW)																			
Acenaphthene	500	500			190 U	140 U	230 U	98 U	190 U	99 U	94 U	93 U	18 U	94 U	19 U	19 U	190 U	200 U	98 U
Acenaphthylene	1,300	1,300			190 U	140 U	230 U	98 U	190 U	99 U	94 U	93 U	18 U	94 U	19 U	19 U	190 U	200 U	98 U
Anthracene	960	960			190 U	140 U	230 U	98 U	190 U	99 U	94 U	93 U	18 U	94 U	19 U	19 U	190 U	200 U	98 U
Fluorene	540	540			190 U	140 U	230 U	98 U	190 U	99 U	94 U	93 U	18 U	94 U	19 U	19 U	190 U	200 U	98 U
Naphthalene	2,100	2,100	5		190 U	140 U	230 U	98 U	190 U	99 U	94 U	93 U	18 U	94 U	19 U	19 U	190 U	200 U	98 U
Phenanthrene	1,500	1,500			190 U	**130** J	**180** J	**98**	190 U	99 U	94 U	93 U	**19**	94 U	**15** J	**13** J	**100** J	200 U	**54** J
Total LPAH	5,200	5,200			190 U	**130** J	**180** J	**98**	190 U	99 U	94 U	93 U	**19**	**94**	**15** J	**13** J	**100** J	200 U	**54** J
HPAH (ug/kg DW)																			
Benzo(a)anthracene	1,300	1,600			190 U	140 U	**140** J	**59** J	190 U	99 U	94 U	93 U	18 U	94 U	19 U	19 U	**170** J	200 U	98 U
Benzo(a)pyrene	1,600	1,600	0.1		190 U	140 U	**180** J	**78** J	*96* J	99 U	94 U	93 U	18 U	94 U	**14** J	19 U	**250**	**200**	**78** J
Total benzofluoranthenes	3,200	3,600			**300**	**280** J	**400** J	**140**	**210**	99 U	**80** J	93 U	18 U	**75** J	**28**	19 U	**300**	**230**	**78** J
Benzo(b)fluoranthene					**300**	**120** J	**200** J												
Benzo(g,h,i)perylene	670	720			190 U	**110** J	**140** J	**250**	**370**	**74** J	**99**	93 U	**10** J	**94**	**39**	19 U	**670**	**510**	**170**
Benzo(k)fluoranthene					190 U	**160**	**200** J												
Chrysene	1,400	2,800			**280**	**220**	**510**	**210**	**290**	**64** J	**76** J	93 U	**9** J	**66** J	**23**	19 U	**570**	**420**	**88** J
Dibenz(a,h)anthracene	230	230			190 U	140 U	230 U	98 U	190 U	99 U	94 U	93 U	18 U	94 U	19 U	19 U	190 U	200 U	**98** U
Fluoranthene	1,700	2,500			**190**	**280**	**380**	**160**	**150** J	99 U	**61** J	93 U	18 U	**56** J	**25**	**10** J	**290**	**210**	**93** J
Indeno(1,2,3-cd)pyrene	600	690			190 U	140 U	230 U	98 U	**96** J	99 U	94 U	93 U	18 U	94 U	19 U	19 U	**150** J	200 U	**49** J
Pyrene	2,600	3,300			190 U	**250**	**260**	**170**	**150** J	99 U	**71** J	93 U	**10** J	**61** J	**25**	**9** J	**460**	**320**	**110**
Total HPAH	12,000	17,000			**1,070**	**1,420**	**2,410** J	**1,067** J	**1,362** J	**138** J	**387** J	93 U	**29** J	**352** J	**154** J	**19** J	**2,860** J	**1,890**	**666** J
Phthalates (ug/kg dw)																			
Bis(2-ethylhexyl)phthalate	1,300	1,900			**710**	**1,900**	**2,200** B	**990** B	**1,200** B	**240** B	**300** B	93 U	**31** B	**290** B	**120** B	**23** B	**2,300** B	**1,700** B	**98** B
Butylbenzylphthalate	63	900			190 U	**140**	230 U	**83** J	190 U	99 U	94 U	93 U	18 U	94 U	**12** J	19 U	**450**	**4,900**	98 U
Diethylphthalate	200				190 U	140 U	230 U	98 U	190 U	99 U	94 U	93 U	45 U	94 U	19 U	19 U	190 U	200 U	98 U
Dimethylphthalate	71	160			190 U	140 U	**310**	98 U	190 U	99 U	94 U	93 U	18 U	94 U	19 U	19 U	**180** J	**130** J	98 U
Di-n-butylphthalate	1,400	1,400			190 U	140 U	230 U	98 U	190 U	99 U	94 U	93 U	18 U	94 U	19 U	19 U	190 U	200 U	98 U
Di-n-octyl phthalate	6,200				190 U	**130** J	**340**	98 U	190 U	99 U	94 U	93 U	18 U	94 U	19 U	19 U	190 U	200 U	98 U
PCBs (ug/kg dw)																			
Aroclor 1016					59 U	20 U	38 U	20 U	20 U	18 U	20 U	19 U	20 U	20 U	19 U	18 U	20 U	20 U	19 U
Aroclor 1221					59 U	20 U	38 U	20 U	20 U	18 U	20 U	19 U	20 U	20 U	19 U	18 U	20 U	20 U	19 U
Aroclor 1232					59 U	20 U	38 U	20 U	20 U	18 U	20 U	19 U	20 U	20 U	19 U	18 U	20 U	20 U	19 U
Aroclor 1242					59 U	20 U	38 U	20 U	20 U	18 U	20 U	19 U	20 U	20 U	19 U	18 U	20 U	20 U	19 U
Aroclor 1248					59 U	20 U	**41**	49 Y	30 Y	18 U	49 Y	19 U	20 U	69 Y	19 U	18 U	75 Y	49 Y	19 U
Aroclor 1254					**77**	**32**	**58**	**130**	**77**	**29**	**140**	**74**	**22**	**220**	**50**	**21**	**210**	**120**	**80**
Aroclor 1260					**68**	20 U	**110** J	41	**50**	**29**	**25**	**27**	20 U	**41**	19 U	18 U	**70**	**55**	**68**
Total PCBs	130	1,000	1,000		**145**	**32**	**209** J	**171**	**127**	**58**	**165**	**101**	**22**	**261**	**50**	**21**	**280**	**175**	**148**
Other organic compounds (ug/kg dw)																			
1,2,4-Trichlorobenzene	31	51			190 U	140 U	230 U	98 U	190 U	99 U	94 U	93 U	18 U	94 U	19 U	19 U	190 U	200 U	98 U
1,2-Dichlorobenzene	35	50			190 U	140 U	230 U	98 U	190 U	99 U	94 U	93 U	18 U	94 U	19 U	19 U	190 U	200 U	98 U
1,3-Dichlorobenzene					190 U	140 U	230 U	98 U	190 U	99 U	94 U	93 U	18 U	94 U	19 U	19 U	190 U	200 U	98 U
1,4-Dichlorobenzene	110	110			190 U	140 U	230 U	98 U	190 U	99 U	94 U	93 U	18 U	94 U	19 U	19 U	190 U	200 U	98 U
1-Methylnaphthalene								98 U	190 U	99 U	94 U	93 U	**17** J	94 U	19 U	19 U	190 U	200 U	98 U
2,2'-Oxybis(1-chloropropane)					190 U	140 U	230 U	98 U	190 U	99 U	94 U	93 U	18 U	94 U	19 U	19 U	190 U	200 U	98 U

Table 1: SPU source tracing samples in the vicinity of 7915 5th Ave S site (dry weight).
Red = Field split sample

Sample ID	SQS/ LAET[b]	CSL/ 2LAET[c]	MTCA Method A (mg/kg)	EPI CUL[e]	RCB159	CB137	RCB170	RCB159-0	RCB159-3	RCB159-12	RCB273-0	RCB273-3	RCB273-12	RCB-274-0	RCB-274-3	RCB-274-12	RCB275-0	RCB275-3	RCB275-12
Lab Ref					OD13	OS71	PA69	SX83	SX83	SX83	SX83	SX83	SX83	SX83	SX83	SX83	SX83	SX83	SX83
Sample Type[d]					Soil	Dirt	CB	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Outfall					7th Ave S	7th Ave S	7th Ave S	7th Ave S	7th Ave S	7th Ave S	7th Ave S	7th Ave S	7th Ave S	7th Ave S	7th Ave S	7th Ave S	7th Ave S	7th Ave S	7th Ave S
					SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Date					12/05/08	03/27/09	05/28/09	05/20/11	05/20/11	05/20/11	05/20/11	05/20/11	05/20/11	05/20/11	SX83 05/20/11	SX83 05/20/11	SX83 05/20/11	SX83 05/20/11	SX83 05/20/11
2,4,5-Trichlorophenol					970 U	700 U	1,200 U	490 U	960 U	500 U	470 U	460 U	91 U	470 U	97 U	93 U	950 U	990 U	490 U
2,4,6-Trichlorophenol					970 U	700 U	1,200 U	490 U	960 U	500 U	470 U	460 U	91 U	470 U	97 U	93 U	950 U	990 U	490 U
2,4-Dichlorophenol					970 U	700 U	1,200 U	490 U	960 U	500 U	470 U	460 U	180 U	470 U	97 U	93 U	950 U	990 U	490 U
2,4-Dimethylphenol[a]	29	29			190 U	140 U	230 U	98 U	190 U	99 U	94 U	93 U	36 U	94 U	19 U	19 U	190 U	200 U	98 U
2,4-Dinitrophenol					1,900 U	1,400 U	2,300 U	1,000 U	2,000 U	1,100 U	1,000 U	990 U	770 U	1,000 U	210 U	200 U	2,000 U	2,100 U	1,000 U
2,4-Dinitrotoluene					970 U	700 U	1,200 U	490 U	960 U	500 U	470 U	460 U	91 U	470 U	97 U	93 U	950 U	990 U	490 U
2,6-Dinitrotoluene					970 U	700 U	1,200 U	490 U	960 U	500 U	470 U	460 U	91 U	470 U	97 U	93 U	950 U	990 U	490 U
2-Chloronaphthalene					190 U	140 U	230 U	98 U	190 U	99 U	94 U	93 U	18 U	94 U	19 U	19 U	190 U	200 U	98 U
2-Chlorophenol					190 U	140 U	230 U	98 U	190 U	99 U	94 U	93 U	18 U	94 U	19 U	19 U	190 U	200 U	98 U
2-Methylnaphthalene	670	670			190 U	140 U	230 U	98 U	190 U	99 U	94 U	93 U	**19**	94 U	19 U	19 U	190 U	200 U	98 U
2-Methylphenol[a]	63	63			190 U	140 U	230 U	98 U	190 U	99 U	94 U	93 U	18 U	94 U	19 U	19 U	190 U	200 U	98 U
2-Nitroaniline					970 U	700 U	1,200 U	490 U	960 U	500 U	470 U	460 U	91 U	470 U	97 U	93 U	950 U	990 U	490 U
2-Nitrophenol					970 U	700 U	1,200 U	490 U	960 U	500 U	470 U	460 U	91 U	470 U	97 U	93 U	950 U	990 U	490 U
3,3'-Dichlorobenzidine					970 U	700 U	1,200 U	490 U	960 U	500 U	470 U	460 U	140 UJ	470 U	97 U	93 U	950 U	990 U	490 U
3-Nitroaniline					970 U	700 U	1,200 U	490 U	960 U	500 U	470 U	460 U	91 U	470 U	97 U	93 U	950 U	990 U	490 U
4,6-Dinitro-2-methylphenol					1,900 U	1,400 U	2,300 U	980 U	1,900 U	990 U	940 U	930 U	180 U	940 U	190 U	190 U	1,900 U	2,000 U	980 U
4-Bromophenyl-phenylether					190 U	140 U	230 U	98 U	190 U	99 U	94 U	93 U	18 U	94 U	19 U	19 U	190 U	200 U	98 U
4-Chloro-3-methylphenol					970 U	700 U	1,200 U	490 U	960 U	500 U	470 U	460 U	91 U	470 U	97 U	93 U	950 U	990 U	490 U
4-Chloroaniline					970 U	700 U	1,200 U	490 U	960 U	500 U	470 U	460 U	240 U	470 U	97 U	93 U	950 U	990 U	490 U
4-Chlorophenyl-phenylether					190 U	140 U	230 U	98 U	190 U	99 U	94 U	93 U	18 U	94 U	19 U	19 U	190 U	200 U	98 U
4-Methylphenol[a]	670	670			190 U	140 U	230 U	**54** J	190 U	99 U	94 U	93 U	36 U	94 U	19 U	19 U	190 U	200 U	98 U
4-Nitroaniline					970 U	700 U	1,200 U	490 U	960 U	500 U	470 U	460 U	91 U	470 U	97 U	93 U	950 U	990 U	490 U
4-Nitrophenol					970 U	700 U	1,200 U	490 U	960 U	500 U	470 U	460 U	91 U	470 U	97 U	93 U	950 U	990 U	490 U
Benzoic acid[a]	650	650			1,900 U	**1,000** J	2,300 U	**940** J	**1,700** J	990 U	**370** J	930 U	360 U	**440** J	**150** J	190 U	**340** J	**690** J	980 U
Benzyl alcohol[a]	57	73			190 U	140 U	230 U	**3,700**	**1,600**	**140**	**1,500**	**320**	18 U	**2,000**	**250**	19 U	**110** J	**280**	98 U
bis(2-Chloroethoxy) methane					190 U	140 U	230 U	98 U	190 U	99 U	94 U	93 U	18 U	94 U	19 U	19 U	190 U	200 U	98 U
Bis-(2-chloroethyl) ether					190 U	140 U	230 U	98 U	190 U	99 U	94 U	93 U	18 U	94 U	19 U	19 U	190 U	200 U	98 U
Carbazole					190 U	140 U	230 U	98 U	190 U	99 U	94 U	93 U	18 U	94 U	19 U	19 U	190 U	200 U	98 U
Dibenzofuran	540	540			190 U	140 U	230 U	98 U	190 U	99 U	94 U	93 U	18 U	94 U	19 U	19 U	190 U	200 U	98 U
Hexachlorobenzene	22	70			190 U	140 U	230 U	98 U	190 U	99 U	94 U	93 U	18 U	94 U	19 U	19 U	190 U	200 U	98 U
Hexachlorobutadiene	11	120			190 U	140 U	230 U	98 U	190 U	99 U	94 U	93 U	91 U	94 U	19 U	19 U	190 U	200 U	98 U
Hexachlorocyclopentadiene					970 U	700 U	1,200 U	490 UJ	960 UJ	500 UJ	470 UJ	460 UJ	360 UJ	470 UJ	97 UJ	93 UJ	950 UJ	990 UJ	490 UJ
Hexachloroethane					190 U	140 U	230 U	98 U	190 U	99 U	94 U	93 U	18 U	94 U	19 U	19 U	190 U	200 U	98 U
Isophorone					190 U	140 U	230 U	98 U	190 U	99 U	94 U	93 U	18 U	94 U	19 U	19 U	190 U	200 U	98 U
Nitrobenzene					190 U	140 U	230 U	98 U	190 U	99 U	94 U	93 U	18 U	94 U	19 U	19 U	190 U	200 U	98 U
n-Nitroso-di-n-propylamine					970 U	700 U	1,200 U	98 U	190 U	99 U	94 U	93 U	18 U	94 U	19 U	19 U	190 U	200 U	98 U
N-Nitrosodiphenylamine	28	40			190 U	140 U	230 U	98 U	190 U	99 U	94 U	93 U	18 U	94 U	19 U	19 U	190 U	200 U	98 U
Pentachlorophenol[a]	360	690			970 U	700 U	1,200 U	490 UJ	960 UJ	500 UJ	470 UJ	460 UJ	180 UJ	470 UJ	97 UJ	93 UJ	950 UJ	990 UJ	490 UJ
Phenol[a]	420	1,200			190 U	**270**	230 U	**230**	**260**	99 U	**71** J	93 U	18 U	**75** J	**27**	19 U	**100** J	**150** J	98 U

a. Sediment management standards based on dry weight concentration.
b. Sediment quality standard/lowest apparent effects threshold
c. Cleanup screening level/second lowest apparent effects threshold
Bold = Compound detected in sample.

J Value is an estimate
U Target analyte not detected at the reported concentration
R Analytical result is rejected and cannot be used.
Y Analyte is not detected at or above the reported concentration. The reporting limit is raised due to chromatographic interference. Y flag is equivalent to U flag with a raised reporting limit.

d. RCB = Right-of-way catch basin RCB274 is field split of RCB273
CB = Onsite catch basin
Inline = Inline grab sample
Dirt = Dirt from pavement surface
Soil = Right-of-way soil sample (not from catch basin). Surface sample unless otherwise noted (Samples labeled with "-3" indicate 0-3 inch composite, "-12" indicate 3-12 inch composite

e. Cleanup levels proposed by Marine Lumber (EPI 2012)
Exceeds SQS/LAET
Exceeds CSL/2LAET
Exceeds MTCA Method A Standards

Analytical Resources, Incorporated
Analytical Chemists and Consultants

16 June 2011

Beth Schmoyer
SPU
Key Tower
700 5th Ave, Ste. 4900
P.O. Box 34018
Seattle, Washington 98104

RE: Client Project: LDW Source Tracing
ARI Job No. SX83

Dear Beth:

Please find enclosed the original chain of custody record and the final results for the samples from the project referenced above. Twelve sediment samples were received on May 20, 2011. The samples were analyzed for SVOAs, PCBs, NWTPH-Dx, TOC, total metals and grain size as requested.

Problems associated with these analyses are discussed in the case narrative.

A copy of this package will remain on file at ARI. Should you have any questions or need additional information, please contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

Mark D. Harris
Project Manager
206/695-6210
markh@arilabs.com

Enclosures

cc: Brian Robinson, SPU
Mingta Lin, Pyron
File SX83

MDH/bc

4611 South 134th Place, Suite 100 • Tukwila WA 98168 • **206-695-6200** • **206-695-6201** fax

SX83

CHAIN OF CUSTODY RECORD

Sample Collection by:
Taylor Associates, Inc./TEC Inc.
Contact: James Packman
Tel: 206-267-1400
Email: jjpackman@tecinc.com

Client:
Beth Schmoyer
Seattle Public Utilities
PO Box 34018
Seattle, WA 98124-4018
Tel: 206-386-1199
Email: beth.schmoyer@seattle.gov

Laboratory:
Analytical Resources, Inc.
4611 S. 134th Pl., Tukwila, WA
Contact: Mark Harris
Tel: 206-695-6210

Page: 1 of 1
Project: SPU LDW Source Tracing
ARI proj #: _____

Seattle Public Utilities

Analysis Required: **listed in order of priority**

Sample ID	Date Collected	Time Collected	Composite or Grab	Number of containers	Matrix	PCBs, 8082	Arsenic, 6010	Mercury, 7471	Copper, 6010	Lead, 6010	Zinc, 6010	SVOCs, 8270	TOC, 415.1	A/S NWTPH-Dx	Grain size, PSEP sieve	Dioxin archive	Notes
RCB273-052011-0	5/20/11	10:45	GRAB	4	Sediment	X	X	X	X	X	X	X	X	X	X	X	archive for dioxins analyses
RCB273-052011-3		10:55				X	X	X	X	X	X	X	X	X	X	X	
RCB273-052011-12		11:05				X	X	X	X	X	X	X	X	X	X	X	
RCB274-052011-0		10:50				X	X	X	X	X	X	X	X	X	X	X	
RCB274-052011-3		11:00				X	X	X	X	X	X	X	X	X	X	X	
RCB274-052011-12		11:10				X	X	X	X	X	X	X	X	X	X	X	
RCB159-052011-0		12:00				X	X	X	X	X	X	X	X	X	X	X	
RCB159-052011-3		12:10				X	X	X	X	X	X	X	X	X	X	X	
RCB159-052011-12		12:20				X	X	X	X	X	X	X	X	X	X	X	
RCB275-052011-0		12:35				X	X	X	X	X	X	X	X	X	X	X	
RCB275-052011-3		12:40				X	X	X	X	X	X	X	X	X	X	X	
RCB275-052011-12		12:50				X	X	X	X	X	X	X	X	X	X	X	

Comments/Special Notes:
Send invoice and results to client address above.

If sample volume is insufficient for all analyses requested, then analyze in order listed (PCBs first and Grain Size last).

*archive for dioxins analyses

Relinquished by:	Ian Sahlberg	Relinquished by:
Signature		Signature
Company	TEC	Company
Date/Time	5/20/11 14:10	Date/Time
Received by:		Received by:
Signature	A. Volgardsen	Signature
Company	ARI	Company
Date/Time	5/20/11 1410	Date/Time

SX83 - SX83

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: SPU

Project Name: SPU LDW Source Tracing

COC No(s): _____ (NA)

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Assigned ARI Job No: SXB3

Tracking No: _____ (NA)

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler?	YES	(NO)
Were custody papers included with the cooler?	(YES)	NO
Were custody papers properly filled out (ink, signed, etc.)	(YES)	NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)..... 1.8 ____ ____ ____ ____

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: 90941619

Cooler Accepted by: AV Date: 5/20/11 Time: 1410

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler?		YES	(NO)
What kind of packing material was used? ... Bubble Wrap (Wet Ice) Gel Packs (Baggies) Foam Block Paper Other: _____			
Was sufficient ice used (if appropriate)?	NA	(YES)	NO
Were all bottles sealed in individual plastic bags?		YES	(NO)
Did all bottles arrive in good condition (unbroken)?		(YES)	NO
Were all bottle labels complete and legible?		(YES)	NO
Did the number of containers listed on COC match with the number of containers received?		(YES)	NO
Did all bottle labels and tags agree with custody papers?		(YES)	NO
Were all bottles used correct for the requested analyses?		(YES)	NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)...	(NA)	YES	NO
Were all VOC vials free of air bubbles?	(NA)	YES	NO
Was sufficient amount of sample sent in each bottle?		(YES)	NO
Date VOC Trip Blank was made at ARI.....	(NA)		

Was Sample Split by ARI : (NA) YES Date/Time:_____ Equipment:_____ Split by:_____

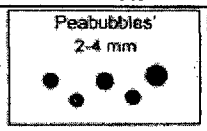
Samples Logged by: AV Date: 5/20/11 Time: 1600

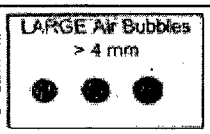
***** Notify Project Manager of discrepancies or concerns *****

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

By: Date:





Small → "sm"
Peabubbles → "pb"
Large → "lg"
Headspace → "hs"

SXB3 : 000003

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Case Narrative

Client: SPU
Project: LDW Source Tracing
ARI Job Number: SX83
Matrix: Sediment

Date: 16 June 2011

SVOA Analysis

Several samples were pre-diluted 1:5 prior to their initial analysis due to the dark color of the extracts.

The percent recovery for surrogate, 2-fluorophenol, was low following the initial analysis of sample RCB275-052011-12. Since the percent recoveries for all surrogates were within established QC limits for the lab QC samples, it was concluded that the sample matrix was the cause of the low surrogate recovery. No corrective actions were taken.

PCB Analysis

This analysis proceeded without incident of note.

NWTPH-Dx Analysis

This analysis proceeded without incident of note.

TOC Analysis

This analysis proceeded without incident of note.

Metals Analysis

This analysis proceeded without incident of note.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Client: Seattle Public Utilities **ARI Job No.:** SX83

Client Project: SPU LDW Source Tracing

Case Narrative

1. Twelve samples were submitted for grain size analysis according to Puget Sound Estuary Protocol (PSEP) methodology on May 20, 2011.
2. The samples were run in a single batch and one sample from this job, RCB159-052011-3, was chosen for triplicate analysis by the client. The triplicate data is reported on the QA summary.
3. Most samples contained woody or other organic matter, which may have broken down during the sieving process, affecting grain size analysis.
4. The data is provided in summary tables and plots.
5. There were no other noted anomalies in this project.

Approved by: Elizabeth Gobee Date: June 3, 2011
Technician

Sample ID Cross Reference Report

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: SX83
Client: Seattle Public Utilities
Project Event: N/A
Project Name: SPU LDW Source Tracing

	Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1.	RCB273-052011-0	SX83A	11-11407	Sediment	05/20/11 10:45	05/20/11 14:10
2.	RCB273-052011-3	SX83B	11-11408	Sediment	05/20/11 10:55	05/20/11 14:10
3.	RCB273-052011-12	SX83C	11-11409	Sediment	05/20/11 11:05	05/20/11 14:10
4.	RCB274-052011-0	SX83D	11-11410	Sediment	05/20/11 10:50	05/20/11 14:10
5.	RCB274-052011-3	SX83E	11-11411	Sediment	05/20/11 11:00	05/20/11 14:10
6.	RCB274-052011-12	SX83F	11-11412	Sediment	05/20/11 11:10	05/20/11 14:10
7.	RCB159-052011-0	SX83G	11-11413	Sediment	05/20/11 12:00	05/20/11 14:10
8.	RCB159-052011-3	SX83H	11-11414	Sediment	05/20/11 12:10	05/20/11 14:10
9.	RCB159-052011-12	SX83I	11-11415	Sediment	05/20/11 12:20	05/20/11 14:10
10.	RCB275-052011-0	SX83J	11-11416	Sediment	05/20/11 12:35	05/20/11 14:10
11.	RCB275-052011-3	SX83K	11-11417	Sediment	05/20/11 12:40	05/20/11 14:10
12.	RCB275-052011-12	SX83L	11-11418	Sediment	05/20/11 12:50	05/20/11 14:10

Printed 05/20/11

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Data Reporting Qualifiers

Effective 2/14/2011

Inorganic Data

U — Indicates that the target analyte was not detected at the reported concentration

* — Duplicate RPD is not within established control limits

B — Reported value is less than the CRDL but ≥ the Reporting Limit

N — Matrix Spike recovery not within established control limits

NA — Not Applicable, analyte not spiked

H — The natural concentration of the spiked element is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible

L — Analyte concentration is ≤5 times the Reporting Limit and the replicate control limit defaults to ±1 RL instead of the normal 20% RPD

Organic Data

U — Indicates that the target analyte was not detected at the reported concentration

* — Flagged value is not within established control limits

B — Analyte detected in an associated Method Blank at a concentration greater than one-half of ARI's Reporting Limit or 5% of the regulatory limit or 5% of the analyte concentration in the sample.

J — Estimated concentration when the value is less than ARI's established reporting limits

D — The spiked compound was not detected due to sample extract dilution

E — Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.

Q — Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20%Drift or minimum RRF).

S Indicates an analyte response that has saturated the detector. The calculated concentration is not valid; a dilution is required to obtain valid quantification of the analyte

NA The flagged analyte was not analyzed for

NR Spiked compound recovery is not reported due to chromatographic interference

NS The flagged analyte was not spiked into the sample

M Estimated value for an analyte detected and confirmed by an analyst but with low spectral match parameters. This flag is used only for GC-MS analyses

M2 The sample contains PCB congeners that do not match any standard Aroclor pattern. The PCBs are identified and quantified as the Aroclor whose pattern most closely matches that of the sample. The reported value is an estimate.

N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"

Y The analyte is not detected at or above the reported concentration. The reporting limit is raised due to chromatographic interference. The Y flag is equivalent to the U flag with a raised reporting limit.

EMPC Estimated Maximum Possible Concentration (EMPC) defined in EPA Statement of Work DLM02.2 as a value "calculated for 2,3,7,8-substituted isomers for which the quantitation and /or confirmation ion(s) has signal to noise in excess of 2.5, but does not meet identification criteria" **(Dioxin/Furan analysis only)**

C The analyte was positively identified on only one of two chromatographic columns. Chromatographic interference prevented a positive identification on the second column

P The analyte was detected on both chromatographic columns but the quantified values differ by ≥40% RPD with no obvious chromatographic interference

X Analyte signal includes interference from polychlorinated diphenyl ethers. **(Dioxin/Furan analysis only)**

Z Analyte signal includes interference from the sample matrix or perfluorokerosene ions. **(Dioxin/Furan analysis only)**

Geotechnical Data

A The total of all fines fractions. This flag is used to report total fines when only sieve analysis is requested and balances total grain size with sample weight.

F Samples were frozen prior to particle size determination

SM Sample matrix was not appropriate for the requested analysis. This normally refers to samples contaminated with an organic product that interferes with the sieving process and/or moisture content, porosity and saturation calculations

SS Sample did not contain the proportion of "fines" required to perform the pipette portion of the grain size analysis

W Weight of sample in some pipette aliquots was below the level required for accurate weighting

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: RCB273-052011-0
SAMPLE

Lab Sample ID: SX83A
LIMS ID: 11-11407
Matrix: Sediment
Data Release Authorized:
Reported: 06/14/11

QC Report No: SX83-Seattle Public Utilities
Project: SPU LDW Source Tracing
NA
Date Sampled: 05/20/11
Date Received: 05/20/11

Date Extracted: 06/01/11
Date Analyzed: 06/10/11 16:06
Instrument/Analyst: NT10/YZ
GPC Cleanup: Yes

Sample Amount: 10.6 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 5.00
Percent Moisture: 26.5%

CAS Number	Analyte	RL	Result
108-95-2	**Phenol**	**94**	**71 J**
111-44-4	Bis-(2-Chloroethyl) Ether	94	< 94 U
95-57-8	2-Chlorophenol	94	< 94 U
541-73-1	1,3-Dichlorobenzene	94	< 94 U
106-46-7	1,4-Dichlorobenzene	94	< 94 U
100-51-6	**Benzyl Alcohol**	**94**	**1,500**
95-50-1	1,2-Dichlorobenzene	94	< 94 U
95-48-7	2-Methylphenol	94	< 94 U
108-60-1	2,2'-Oxybis(1-Chloropropane)	94	< 94 U
106-44-5	4-Methylphenol	94	< 94 U
621-64-7	N-Nitroso-Di-N-Propylamine	94	< 94 U
67-72-1	Hexachloroethane	94	< 94 U
98-95-3	Nitrobenzene	94	< 94 U
78-59-1	Isophorone	94	< 94 U
88-75-5	2-Nitrophenol	470	< 470 U
105-67-9	2,4-Dimethylphenol	94	< 94 U
65-85-0	**Benzoic Acid**	**940**	**370 J**
111-91-1	bis(2-Chloroethoxy) Methane	94	< 94 U
120-83-2	2,4-Dichlorophenol	470	< 470 U
120-82-1	1,2,4-Trichlorobenzene	94	< 94 U
91-20-3	Naphthalene	94	< 94 U
106-47-8	4-Chloroaniline	470	< 470 U
87-68-3	Hexachlorobutadiene	94	< 94 U
59-50-7	4-Chloro-3-methylphenol	470	< 470 U
91-57-6	2-Methylnaphthalene	94	< 94 U
77-47-4	Hexachlorocyclopentadiene	470	< 470 U
88-06-2	2,4,6-Trichlorophenol	470	< 470 U
95-95-4	2,4,5-Trichlorophenol	470	< 470 U
91-58-7	2-Chloronaphthalene	94	< 94 U
88-74-4	2-Nitroaniline	470	< 470 U
131-11-3	Dimethylphthalate	94	< 94 U
208-96-8	Acenaphthylene	94	< 94 U
99-09-2	3-Nitroaniline	470	< 470 U
83-32-9	Acenaphthene	94	< 94 U
51-28-5	2,4-Dinitrophenol	1,000	< 1,000 U
100-02-7	4-Nitrophenol	470	< 470 U
132-64-9	Dibenzofuran	94	< 94 U
606-20-2	2,6-Dinitrotoluene	470	< 470 U
121-14-2	2,4-Dinitrotoluene	470	< 470 U
84-66-2	Diethylphthalate	94	< 94 U
7005-72-3	4-Chlorophenyl-phenylether	94	< 94 U
86-73-7	Fluorene	94	< 94 U
100-01-6	4-Nitroaniline	470	< 470 U
534-52-1	4,6-Dinitro-2-Methylphenol	940	< 940 U

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: RCB273-052011-0
SAMPLE

Lab Sample ID: SX83A
LIMS ID: 11-11407
Matrix: Sediment
Date Analyzed: 06/10/11 16:06

QC Report No: SX83-Seattle Public Utilities
Project: SPU LDW Source Tracing
NA

CAS Number	Analyte	RL	Result
86-30-6	N-Nitrosodiphenylamine	94	< 94 U
101-55-3	4-Bromophenyl-phenylether	94	< 94 U
118-74-1	Hexachlorobenzene	94	< 94 U
87-86-5	Pentachlorophenol	470	< 470 U
85-01-8	Phenanthrene	94	< 94 U
86-74-8	Carbazole	94	< 94 U
120-12-7	Anthracene	94	< 94 U
84-74-2	Di-n-Butylphthalate	94	< 94 U
206-44-0	**Fluoranthene**	**94**	**61 J**
129-00-0	**Pyrene**	**94**	**71 J**
85-68-7	Butylbenzylphthalate	94	< 94 U
91-94-1	3,3'-Dichlorobenzidine	470	< 470 U
56-55-3	Benzo(a)anthracene	94	< 94 U
117-81-7	**bis(2-Ethylhexyl)phthalate**	**94**	**300 B**
218-01-9	**Chrysene**	**94**	**76 J**
117-84-0	Di-n-Octyl phthalate	94	< 94 U
50-32-8	Benzo(a)pyrene	94	< 94 U
193-39-5	Indeno(1,2,3-cd)pyrene	94	< 94 U
53-70-3	Dibenz(a,h)anthracene	94	< 94 U
191-24-2	**Benzo(g,h,i)perylene**	**94**	**80 J**
90-12-0	1-Methylnaphthalene	94	< 94 U
TOTBFA	**Total Benzofluoranthenes**	**94**	**99**

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	49.0%	2-Fluorobiphenyl	60.0%
d14-p-Terphenyl	65.0%	d4-1,2-Dichlorobenzene	48.0%
d5-Phenol	50.7%	2-Fluorophenol	46.7%
2,4,6-Tribromophenol	62.7%	d4-2-Chlorophenol	49.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS
Page 1 of 2

Sample ID: RCB273-052011-3
SAMPLE

Lab Sample ID: SX83B
LIMS ID: 11-11408
Matrix: Sediment
Data Release Authorized:
Reported: 06/14/11

QC Report No: SX83-Seattle Public Utilities
Project: SPU LDW Source Tracing
NA
Date Sampled: 05/20/11
Date Received: 05/20/11

Date Extracted: 06/01/11
Date Analyzed: 06/10/11 16:40
Instrument/Analyst: NT10/YZ
GPC Cleanup: Yes

Sample Amount: 10.8 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 5.00
Percent Moisture: 19.1%

CAS Number	Analyte	RL	Result
108-95-2	Phenol	93	< 93 U
111-44-4	Bis-(2-Chloroethyl) Ether	93	< 93 U
95-57-8	2-Chlorophenol	93	< 93 U
541-73-1	1,3-Dichlorobenzene	93	< 93 U
106-46-7	1,4-Dichlorobenzene	93	< 93 U
100-51-6	**Benzyl Alcohol**	**93**	**320**
95-50-1	1,2-Dichlorobenzene	93	< 93 U
95-48-7	2-Methylphenol	93	< 93 U
108-60-1	2,2'-Oxybis(1-Chloropropane)	93	< 93 U
106-44-5	4-Methylphenol	93	< 93 U
621-64-7	N-Nitroso-Di-N-Propylamine	93	< 93 U
67-72-1	Hexachloroethane	93	< 93 U
98-95-3	Nitrobenzene	93	< 93 U
78-59-1	Isophorone	93	< 93 U
88-75-5	2-Nitrophenol	460	< 460 U
105-67-9	2,4-Dimethylphenol	93	< 93 U
65-85-0	Benzoic Acid	930	< 930 U
111-91-1	bis(2-Chloroethoxy) Methane	93	< 93 U
120-83-2	2,4-Dichlorophenol	460	< 460 U
120-82-1	1,2,4-Trichlorobenzene	93	< 93 U
91-20-3	Naphthalene	93	< 93 U
106-47-8	4-Chloroaniline	460	< 460 U
87-68-3	Hexachlorobutadiene	93	< 93 U
59-50-7	4-Chloro-3-methylphenol	460	< 460 U
91-57-6	2-Methylnaphthalene	93	< 93 U
77-47-4	Hexachlorocyclopentadiene	460	< 460 U
88-06-2	2,4,6-Trichlorophenol	460	< 460 U
95-95-4	2,4,5-Trichlorophenol	460	< 460 U
91-58-7	2-Chloronaphthalene	93	< 93 U
88-74-4	2-Nitroaniline	460	< 460 U
131-11-3	Dimethylphthalate	93	< 93 U
208-96-8	Acenaphthylene	93	< 93 U
99-09-2	3-Nitroaniline	460	< 460 U
83-32-9	Acenaphthene	93	< 93 U
51-28-5	2,4-Dinitrophenol	990	< 990 U
100-02-7	4-Nitrophenol	460	< 460 U
132-64-9	Dibenzofuran	93	< 93 U
606-20-2	2,6-Dinitrotoluene	460	< 460 U
121-14-2	2,4-Dinitrotoluene	460	< 460 U
84-66-2	Diethylphthalate	93	< 93 U
7005-72-3	4-Chlorophenyl-phenylether	93	< 93 U
86-73-7	Fluorene	93	< 93 U
100-01-6	4-Nitroaniline	460	< 460 U
534-52-1	4,6-Dinitro-2-Methylphenol	930	< 930 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: RCB273-052011-3
SAMPLE

Lab Sample ID: SX83B
LIMS ID: 11-11408
Matrix: Sediment
Date Analyzed: 06/10/11 16:40

QC Report No: SX83-Seattle Public Utilities
Project: SPU LDW Source Tracing
NA

CAS Number	Analyte	RL	Result
86-30-6	N-Nitrosodiphenylamine	93	< 93 U
101-55-3	4-Bromophenyl-phenylether	93	< 93 U
118-74-1	Hexachlorobenzene	93	< 93 U
87-86-5	Pentachlorophenol	460	< 460 U
85-01-8	Phenanthrene	93	< 93 U
86-74-8	Carbazole	93	< 93 U
120-12-7	Anthracene	93	< 93 U
84-74-2	Di-n-Butylphthalate	93	< 93 U
206-44-0	Fluoranthene	93	< 93 U
129-00-0	Pyrene	93	< 93 U
85-68-7	Butylbenzylphthalate	93	< 93 U
91-94-1	3,3'-Dichlorobenzidine	460	< 460 U
56-55-3	Benzo(a)anthracene	93	< 93 U
117-81-7	bis(2-Ethylhexyl)phthalate	93	< 93 U
218-01-9	Chrysene	93	< 93 U
117-84-0	Di-n-Octyl phthalate	93	< 93 U
50-32-8	Benzo(a)pyrene	93	< 93 U
193-39-5	Indeno(1,2,3-cd)pyrene	93	< 93 U
53-70-3	Dibenz(a,h)anthracene	93	< 93 U
191-24-2	Benzo(g,h,i)perylene	93	< 93 U
90-12-0	1-Methylnaphthalene	93	< 93 U
TOTBFA	Total Benzofluoranthenes	93	< 93 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	44.0%	2-Fluorobiphenyl	56.0%
d14-p-Terphenyl	61.0%	d4-1,2-Dichlorobenzene	45.0%
d5-Phenol	44.0%	2-Fluorophenol	43.3%
2,4,6-Tribromophenol	60.7%	d4-2-Chlorophenol	46.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: RCB273-052011-12
SAMPLE

Lab Sample ID: SX83C
LIMS ID: 11-11409
Matrix: Sediment
Data Release Authorized:
Reported: 06/14/11

QC Report No: SX83-Seattle Public Utilities
Project: SPU LDW Source Tracing
NA
Date Sampled: 05/20/11
Date Received: 05/20/11

Date Extracted: 06/01/11
Date Analyzed: 06/10/11 17:15
Instrument/Analyst: NT10/YZ
GPC Cleanup: Yes

Sample Amount: 11.0 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Percent Moisture: 9.5%

CAS Number	Analyte	RL	Result
108-95-2	Phenol	18	< 18 U
111-44-4	Bis-(2-Chloroethyl) Ether	18	< 18 U
95-57-8	2-Chlorophenol	18	< 18 U
541-73-1	1,3-Dichlorobenzene	18	< 18 U
106-46-7	1,4-Dichlorobenzene	18	< 18 U
100-51-6	Benzyl Alcohol	18	< 18 U
95-50-1	1,2-Dichlorobenzene	18	< 18 U
95-48-7	2-Methylphenol	18	< 18 U
108-60-1	2,2'-Oxybis(1-Chloropropane)	18	< 18 U
106-44-5	4-Methylphenol	36	< 36 U
621-64-7	N-Nitroso-Di-N-Propylamine	18	< 18 U
67-72-1	Hexachloroethane	18	< 18 U
98-95-3	Nitrobenzene	18	< 18 U
78-59-1	Isophorone	18	< 18 U
88-75-5	2-Nitrophenol	91	< 91 U
105-67-9	2,4-Dimethylphenol	36	< 36 U
65-85-0	Benzoic Acid	360	< 360 U
111-91-1	bis(2-Chloroethoxy) Methane	18	< 18 U
120-83-2	2,4-Dichlorophenol	180	< 180 U
120-82-1	1,2,4-Trichlorobenzene	18	< 18 U
91-20-3	Naphthalene	18	< 18 U
106-47-8	4-Chloroaniline	240	< 240 U
87-68-3	Hexachlorobutadiene	91	< 91 U
59-50-7	4-Chloro-3-methylphenol	91	< 91 U
91-57-6	**2-Methylnaphthalene**	**18**	**19**
77-47-4	Hexachlorocyclopentadiene	360	< 360 U
88-06-2	2,4,6-Trichlorophenol	91	< 91 U
95-95-4	2,4,5-Trichlorophenol	91	< 91 U
91-58-7	2-Chloronaphthalene	18	< 18 U
88-74-4	2-Nitroaniline	91	< 91 U
131-11-3	Dimethylphthalate	18	< 18 U
208-96-8	Acenaphthylene	18	< 18 U
99-09-2	3-Nitroaniline	91	< 91 U
83-32-9	Acenaphthene	18	< 18 U
51-28-5	2,4-Dinitrophenol	770	< 770 U
100-02-7	4-Nitrophenol	91	< 91 U
132-64-9	Dibenzofuran	18	< 18 U
606-20-2	2,6-Dinitrotoluene	91	< 91 U
121-14-2	2,4-Dinitrotoluene	91	< 91 U
84-66-2	Diethylphthalate	45	< 45 U
7005-72-3	4-Chlorophenyl-phenylether	18	< 18 U
86-73-7	Fluorene	18	< 18 U
100-01-6	4-Nitroaniline	91	< 91 U
534-52-1	4,6-Dinitro-2-Methylphenol	180	< 180 U

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: RCB273-052011-12**
 SAMPLE

Lab Sample ID: SX83C
LIMS ID: 11-11409
Matrix: Sediment
Date Analyzed: 06/10/11 17:15

QC Report No: SX83-Seattle Public Utilities
Project: SPU LDW Source Tracing
NA

CAS Number	Analyte	RL	Result
86-30-6	N-Nitrosodiphenylamine	18	< 18 U
101-55-3	4-Bromophenyl-phenylether	18	< 18 U
118-74-1	Hexachlorobenzene	18	< 18 U
87-86-5	Pentachlorophenol	180	< 180 U
85-01-8	**Phenanthrene**	**18**	**19**
86-74-8	Carbazole	18	< 18 U
120-12-7	Anthracene	18	< 18 U
84-74-2	Di-n-Butylphthalate	18	< 18 U
206-44-0	Fluoranthene	18	< 18 U
129-00-0	**Pyrene**	**18**	**10 J**
85-68-7	Butylbenzylphthalate	18	< 18 U
91-94-1	3,3'-Dichlorobenzidine	140	< 140 U
56-55-3	Benzo(a)anthracene	18	< 18 U
117-81-7	**bis(2-Ethylhexyl)phthalate**	**23**	**31 B**
218-01-9	**Chrysene**	**18**	**9.1 J**
117-84-0	Di-n-Octyl phthalate	18	< 18 U
50-32-8	Benzo(a)pyrene	18	< 18 U
193-39-5	Indeno(1,2,3-cd)pyrene	18	< 18 U
53-70-3	Dibenz(a,h)anthracene	18	< 18 U
191-24-2	Benzo(g,h,i)perylene	18	< 18 U
90-12-0	**1-Methylnaphthalene**	**18**	**17 J**
TOTBFA	**Total Benzofluoranthenes**	**18**	**10 J**

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	58.8%	2-Fluorobiphenyl	62.8%
d14-p-Terphenyl	77.4%	d4-1,2-Dichlorobenzene	59.0%
d5-Phenol	52.9%	2-Fluorophenol	53.2%
2,4,6-Tribromophenol	73.9%	d4-2-Chlorophenol	56.1%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: RCB274-052011-0**
Page 1 of 2 **SAMPLE**

Lab Sample ID: SX83D
LIMS ID: 11-11410
Matrix: Sediment
Data Release Authorized:
Reported: 06/14/11

QC Report No: SX83-Seattle Public Utilities
Project: SPU LDW Source Tracing
NA
Date Sampled: 05/20/11
Date Received: 05/20/11

Date Extracted: 06/01/11
Date Analyzed: 06/10/11 18:57
Instrument/Analyst: NT10/YZ
GPC Cleanup: Yes

Sample Amount: 10.7 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 5.00
Percent Moisture: 29.4%

CAS Number	Analyte	RL	Result
108-95-2	**Phenol**	**94**	**75 J**
111-44-4	Bis-(2-Chloroethyl) Ether	94	< 94 U
95-57-8	2-Chlorophenol	94	< 94 U
541-73-1	1,3-Dichlorobenzene	94	< 94 U
106-46-7	1,4-Dichlorobenzene	94	< 94 U
100-51-6	**Benzyl Alcohol**	**94**	**2,000**
95-50-1	1,2-Dichlorobenzene	94	< 94 U
95-48-7	2-Methylphenol	94	< 94 U
108-60-1	2,2'-Oxybis(1-Chloropropane)	94	< 94 U
106-44-5	4-Methylphenol	94	< 94 U
621-64-7	N-Nitroso-Di-N-Propylamine	94	< 94 U
67-72-1	Hexachloroethane	94	< 94 U
98-95-3	Nitrobenzene	94	< 94 U
78-59-1	Isophorone	94	< 94 U
88-75-5	2-Nitrophenol	470	< 470 U
105-67-9	2,4-Dimethylphenol	94	< 94 U
65-85-0	**Benzoic Acid**	**940**	**440 J**
111-91-1	bis(2-Chloroethoxy) Methane	94	< 94 U
120-83-2	2,4-Dichlorophenol	470	< 470 U
120-82-1	1,2,4-Trichlorobenzene	94	< 94 U
91-20-3	Naphthalene	94	< 94 U
106-47-8	4-Chloroaniline	470	< 470 U
87-68-3	Hexachlorobutadiene	94	< 94 U
59-50-7	4-Chloro-3-methylphenol	470	< 470 U
91-57-6	2-Methylnaphthalene	94	< 94 U
77-47-4	Hexachlorocyclopentadiene	470	< 470 U
88-06-2	2,4,6-Trichlorophenol	470	< 470 U
95-95-4	2,4,5-Trichlorophenol	470	< 470 U
91-58-7	2-Chloronaphthalene	94	< 94 U
88-74-4	2-Nitroaniline	470	< 470 U
131-11-3	Dimethylphthalate	94	< 94 U
208-96-8	Acenaphthylene	94	< 94 U
99-09-2	3-Nitroaniline	470	< 470 U
83-32-9	Acenaphthene	94	< 94 U
51-28-5	2,4-Dinitrophenol	1,000	< 1,000 U
100-02-7	4-Nitrophenol	470	< 470 U
132-64-9	Dibenzofuran	94	< 94 U
606-20-2	2,6-Dinitrotoluene	470	< 470 U
121-14-2	2,4-Dinitrotoluene	470	< 470 U
84-66-2	Diethylphthalate	94	< 94 U
7005-72-3	4-Chlorophenyl-phenylether	94	< 94 U
86-73-7	Fluorene	94	< 94 U
100-01-6	4-Nitroaniline	470	< 470 U
534-52-1	4,6-Dinitro-2-Methylphenol	940	< 940 U

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: RCB274-052011-0
SAMPLE

Lab Sample ID: SX83D
LIMS ID: 11-11410
Matrix: Sediment
Date Analyzed: 06/10/11 18:57

QC Report No: SX83-Seattle Public Utilities
Project: SPU LDW Source Tracing
NA

CAS Number	Analyte	RL	Result
86-30-6	N-Nitrosodiphenylamine	94	< 94 U
101-55-3	4-Bromophenyl-phenylether	94	< 94 U
118-74-1	Hexachlorobenzene	94	< 94 U
87-86-5	Pentachlorophenol	470	< 470 U
85-01-8	Phenanthrene	94	< 94 U
86-74-8	Carbazole	94	< 94 U
120-12-7	Anthracene	94	< 94 U
84-74-2	Di-n-Butylphthalate	94	< 94 U
206-44-0	**Fluoranthene**	**94**	**56 J**
129-00-0	**Pyrene**	**94**	**61 J**
85-68-7	Butylbenzylphthalate	94	< 94 U
91-94-1	3,3'-Dichlorobenzidine	470	< 470 U
56-55-3	Benzo(a)anthracene	94	< 94 U
117-81-7	**bis(2-Ethylhexyl)phthalate**	**94**	**290 B**
218-01-9	**Chrysene**	**94**	**66 J**
117-84-0	Di-n-Octyl phthalate	94	< 94 U
50-32-8	Benzo(a)pyrene	94	< 94 U
193-39-5	Indeno(1,2,3-cd)pyrene	94	< 94 U
53-70-3	Dibenz(a,h)anthracene	94	< 94 U
191-24-2	**Benzo(g,h,i)perylene**	**94**	**75 J**
90-12-0	1-Methylnaphthalene	94	< 94 U
TOTBFA	**Total Benzofluoranthenes**	**94**	**94**

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	45.0%	2-Fluorobiphenyl	54.0%
d14-p-Terphenyl	61.0%	d4-1,2-Dichlorobenzene	42.0%
d5-Phenol	43.3%	2-Fluorophenol	42.0%
2,4,6-Tribromophenol	53.3%	d4-2-Chlorophenol	45.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS
Page 1 of 2

Sample ID: RCB274-052011-3
SAMPLE

Lab Sample ID: SX83E
LIMS ID: 11-11411
Matrix: Sediment
Data Release Authorized:
Reported: 06/14/11

QC Report No: SX83-Seattle Public Utilities
Project: SPU LDW Source Tracing
NA
Date Sampled: 05/20/11
Date Received: 05/20/11

Date Extracted: 06/01/11
Date Analyzed: 06/10/11 19:32
Instrument/Analyst: NT10/YZ
GPC Cleanup: Yes

Sample Amount: 10.3 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Percent Moisture: 16.6%

CAS Number	Analyte	RL	Result
108-95-2	**Phenol**	**19**	**27**
111-44-4	Bis-(2-Chloroethyl) Ether	19	< 19 U
95-57-8	2-Chlorophenol	19	< 19 U
541-73-1	1,3-Dichlorobenzene	19	< 19 U
106-46-7	1,4-Dichlorobenzene	19	< 19 U
100-51-6	**Benzyl Alcohol**	**19**	**250**
95-50-1	1,2-Dichlorobenzene	19	< 19 U
95-48-7	2-Methylphenol	19	< 19 U
108-60-1	2,2'-Oxybis(1-Chloropropane)	19	< 19 U
106-44-5	4-Methylphenol	19	< 19 U
621-64-7	N-Nitroso-Di-N-Propylamine	19	< 19 U
67-72-1	Hexachloroethane	19	< 19 U
98-95-3	Nitrobenzene	19	< 19 U
78-59-1	Isophorone	19	< 19 U
88-75-5	2-Nitrophenol	97	< 97 U
105-67-9	2,4-Dimethylphenol	19	< 19 U
65-85-0	**Benzoic Acid**	**190**	**150 J**
111-91-1	bis(2-Chloroethoxy) Methane	19	< 19 U
120-83-2	2,4-Dichlorophenol	97	< 97 U
120-82-1	1,2,4-Trichlorobenzene	19	< 19 U
91-20-3	Naphthalene	19	< 19 U
106-47-8	4-Chloroaniline	97	< 97 U
87-68-3	Hexachlorobutadiene	19	< 19 U
59-50-7	4-Chloro-3-methylphenol	97	< 97 U
91-57-6	2-Methylnaphthalene	19	< 19 U
77-47-4	Hexachlorocyclopentadiene	97	< 97 U
88-06-2	2,4,6-Trichlorophenol	97	< 97 U
95-95-4	2,4,5-Trichlorophenol	97	< 97 U
91-58-7	2-Chloronaphthalene	19	< 19 U
88-74-4	2-Nitroaniline	97	< 97 U
131-11-3	Dimethylphthalate	19	< 19 U
208-96-8	Acenaphthylene	19	< 19 U
99-09-2	3-Nitroaniline	97	< 97 U
83-32-9	Acenaphthene	19	< 19 U
51-28-5	2,4-Dinitrophenol	210	< 210 U
100-02-7	4-Nitrophenol	97	< 97 U
132-64-9	Dibenzofuran	19	< 19 U
606-20-2	2,6-Dinitrotoluene	97	< 97 U
121-14-2	2,4-Dinitrotoluene	97	< 97 U
84-66-2	Diethylphthalate	19	< 19 U
7005-72-3	4-Chlorophenyl-phenylether	19	< 19 U
86-73-7	Fluorene	19	< 19 U
100-01-6	4-Nitroaniline	97	< 97 U
534-52-1	4,6-Dinitro-2-Methylphenol	190	< 190 U

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: RCB274-052011-3
SAMPLE

Lab Sample ID: SX83E
LIMS ID: 11-11411
Matrix: Sediment
Date Analyzed: 06/10/11 19:32

QC Report No: SX83-Seattle Public Utilities
Project: SPU LDW Source Tracing
NA

CAS Number	Analyte	RL	Result
86-30-6	N-Nitrosodiphenylamine	19	< 19 U
101-55-3	4-Bromophenyl-phenylether	19	< 19 U
118-74-1	Hexachlorobenzene	19	< 19 U
87-86-5	Pentachlorophenol	97	< 97 U
85-01-8	**Phenanthrene**	**19**	**15 J**
86-74-8	Carbazole	19	< 19 U
120-12-7	Anthracene	19	< 19 U
84-74-2	Di-n-Butylphthalate	19	< 19 U
206-44-0	**Fluoranthene**	**19**	**25**
129-00-0	**Pyrene**	**19**	**25**
85-68-7	**Butylbenzylphthalate**	**19**	**12 J**
91-94-1	3,3'-Dichlorobenzidine	97	< 97 U
56-55-3	Benzo(a)anthracene	19	< 19 U
117-81-7	**bis(2-Ethylhexyl)phthalate**	**19**	**120 B**
218-01-9	**Chrysene**	**19**	**23**
117-84-0	Di-n-Octyl phthalate	19	< 19 U
50-32-8	**Benzo(a)pyrene**	**19**	**14 J**
193-39-5	Indeno(1,2,3-cd)pyrene	19	< 19 U
53-70-3	Dibenz(a,h)anthracene	19	< 19 U
191-24-2	**Benzo(g,h,i)perylene**	**19**	**28**
90-12-0	1-Methylnaphthalene	19	< 19 U
TOTBFA	**Total Benzofluoranthenes**	**19**	**39**

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	55.8%	2-Fluorobiphenyl	63.6%
d14-p-Terphenyl	73.0%	d4-1,2-Dichlorobenzene	54.0%
d5-Phenol	52.9%	2-Fluorophenol	51.1%
2,4,6-Tribromophenol	73.2%	d4-2-Chlorophenol	55.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: RCB274-052011-12
SAMPLE

Lab Sample ID: SX83F
LIMS ID: 11-11412
Matrix: Sediment
Data Release Authorized:
Reported: 06/14/11

QC Report No: SX83-Seattle Public Utilities
Project: SPU LDW Source Tracing
NA
Date Sampled: 05/20/11
Date Received: 05/20/11

Date Extracted: 06/01/11
Date Analyzed: 06/10/11 20:06
Instrument/Analyst: NT10/YZ
GPC Cleanup: Yes

Sample Amount: 10.7 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Percent Moisture: 11.5%

CAS Number	Analyte	RL	Result
108-95-2	Phenol	19	< 19 U
111-44-4	Bis-(2-Chloroethyl) Ether	19	< 19 U
95-57-8	2-Chlorophenol	19	< 19 U
541-73-1	1,3-Dichlorobenzene	19	< 19 U
106-46-7	1,4-Dichlorobenzene	19	< 19 U
100-51-6	Benzyl Alcohol	19	< 19 U
95-50-1	1,2-Dichlorobenzene	19	< 19 U
95-48-7	2-Methylphenol	19	< 19 U
108-60-1	2,2'-Oxybis(1-Chloropropane)	19	< 19 U
106-44-5	4-Methylphenol	19	< 19 U
621-64-7	N-Nitroso-Di-N-Propylamine	19	< 19 U
67-72-1	Hexachloroethane	19	< 19 U
98-95-3	Nitrobenzene	19	< 19 U
78-59-1	Isophorone	19	< 19 U
88-75-5	2-Nitrophenol	93	< 93 U
105-67-9	2,4-Dimethylphenol	19	< 19 U
65-85-0	Benzoic Acid	190	< 190 U
111-91-1	bis(2-Chloroethoxy) Methane	19	< 19 U
120-83-2	2,4-Dichlorophenol	93	< 93 U
120-82-1	1,2,4-Trichlorobenzene	19	< 19 U
91-20-3	Naphthalene	19	< 19 U
106-47-8	4-Chloroaniline	93	< 93 U
87-68-3	Hexachlorobutadiene	19	< 19 U
59-50-7	4-Chloro-3-methylphenol	93	< 93 U
91-57-6	2-Methylnaphthalene	19	< 19 U
77-47-4	Hexachlorocyclopentadiene	93	< 93 U
88-06-2	2,4,6-Trichlorophenol	93	< 93 U
95-95-4	2,4,5-Trichlorophenol	93	< 93 U
91-58-7	2-Chloronaphthalene	19	< 19 U
88-74-4	2-Nitroaniline	93	< 93 U
131-11-3	Dimethylphthalate	19	< 19 U
208-96-8	Acenaphthylene	19	< 19 U
99-09-2	3-Nitroaniline	93	< 93 U
83-32-9	Acenaphthene	19	< 19 U
51-28-5	2,4-Dinitrophenol	200	< 200 U
100-02-7	4-Nitrophenol	93	< 93 U
132-64-9	Dibenzofuran	19	< 19 U
606-20-2	2,6-Dinitrotoluene	93	< 93 U
121-14-2	2,4-Dinitrotoluene	93	< 93 U
84-66-2	Diethylphthalate	19	< 19 U
7005-72-3	4-Chlorophenyl-phenylether	19	< 19 U
86-73-7	Fluorene	19	< 19 U
100-01-6	4-Nitroaniline	93	< 93 U
534-52-1	4,6-Dinitro-2-Methylphenol	190	< 190 U

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: RCB274-052011-12
SAMPLE

Lab Sample ID: SX83F
LIMS ID: 11-11412
Matrix: Sediment
Date Analyzed: 06/10/11 20:06

QC Report No: SX83-Seattle Public Utilities
Project: SPU LDW Source Tracing
NA

CAS Number	Analyte	RL	Result
86-30-6	N-Nitrosodiphenylamine	19	< 19 U
101-55-3	4-Bromophenyl-phenylether	19	< 19 U
118-74-1	Hexachlorobenzene	19	< 19 U
87-86-5	Pentachlorophenol	93	< 93 U
85-01-8	**Phenanthrene**	**19**	**13 J**
86-74-8	Carbazole	19	< 19 U
120-12-7	Anthracene	19	< 19 U
84-74-2	Di-n-Butylphthalate	19	< 19 U
206-44-0	**Fluoranthene**	**19**	**10 J**
129-00-0	**Pyrene**	**19**	**9.3 J**
85-68-7	Butylbenzylphthalate	19	< 19 U
91-94-1	3,3'-Dichlorobenzidine	93	< 93 U
56-55-3	Benzo(a)anthracene	19	< 19 U
117-81-7	**bis(2-Ethylhexyl)phthalate**	**19**	**23 B**
218-01-9	Chrysene	19	< 19 U
117-84-0	Di-n-Octyl phthalate	19	< 19 U
50-32-8	Benzo(a)pyrene	19	< 19 U
193-39-5	Indeno(1,2,3-cd)pyrene	19	< 19 U
53-70-3	Dibenz(a,h)anthracene	19	< 19 U
191-24-2	Benzo(g,h,i)perylene	19	< 19 U
90-12-0	1-Methylnaphthalene	19	< 19 U
TOTBFA	Total Benzofluoranthenes	19	< 19 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	51.2%	2-Fluorobiphenyl	55.4%
d14-p-Terphenyl	66.2%	d4-1,2-Dichlorobenzene	53.2%
d5-Phenol	46.1%	2-Fluorophenol	48.8%
2,4,6-Tribromophenol	63.3%	d4-2-Chlorophenol	49.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS
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Sample ID: RCB159-052011-0
SAMPLE

Lab Sample ID: SX83G
LIMS ID: 11-11413
Matrix: Sediment
Data Release Authorized:
Reported: 06/14/11

QC Report No: SX83-Seattle Public Utilities
Project: SPU LDW Source Tracing
NA
Date Sampled: 05/20/11
Date Received: 05/20/11

Date Extracted: 06/01/11
Date Analyzed: 06/10/11 20:40
Instrument/Analyst: NT10/YZ
GPC Cleanup: Yes

Sample Amount: 10.2 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 5.00
Percent Moisture: 36.8%

CAS Number	Analyte	RL	Result
108-95-2	**Phenol**	**98**	**230**
111-44-4	Bis-(2-Chloroethyl) Ether	98	< 98 U
95-57-8	2-Chlorophenol	98	< 98 U
541-73-1	1,3-Dichlorobenzene	98	< 98 U
106-46-7	1,4-Dichlorobenzene	98	< 98 U
100-51-6	**Benzyl Alcohol**	**98**	**3,700**
95-50-1	1,2-Dichlorobenzene	98	< 98 U
95-48-7	2-Methylphenol	98	< 98 U
108-60-1	2,2'-Oxybis(1-Chloropropane)	98	< 98 U
106-44-5	**4-Methylphenol**	**98**	**54 J**
621-64-7	N-Nitroso-Di-N-Propylamine	98	< 98 U
67-72-1	Hexachloroethane	98	< 98 U
98-95-3	Nitrobenzene	98	< 98 U
78-59-1	Isophorone	98	< 98 U
88-75-5	2-Nitrophenol	490	< 490 U
105-67-9	2,4-Dimethylphenol	98	< 98 U
65-85-0	**Benzoic Acid**	**980**	**940 J**
111-91-1	bis(2-Chloroethoxy) Methane	98	< 98 U
120-83-2	2,4-Dichlorophenol	490	< 490 U
120-82-1	1,2,4-Trichlorobenzene	98	< 98 U
91-20-3	Naphthalene	98	< 98 U
106-47-8	4-Chloroaniline	490	< 490 U
87-68-3	Hexachlorobutadiene	98	< 98 U
59-50-7	4-Chloro-3-methylphenol	490	< 490 U
91-57-6	2-Methylnaphthalene	98	< 98 U
77-47-4	Hexachlorocyclopentadiene	490	< 490 U
88-06-2	2,4,6-Trichlorophenol	490	< 490 U
95-95-4	2,4,5-Trichlorophenol	490	< 490 U
91-58-7	2-Chloronaphthalene	98	< 98 U
88-74-4	2-Nitroaniline	490	< 490 U
131-11-3	Dimethylphthalate	98	< 98 U
208-96-8	Acenaphthylene	98	< 98 U
99-09-2	3-Nitroaniline	490	< 490 U
83-32-9	Acenaphthene	98	< 98 U
51-28-5	2,4-Dinitrophenol	1,000	< 1,000 U
100-02-7	4-Nitrophenol	490	< 490 U
132-64-9	Dibenzofuran	98	< 98 U
606-20-2	2,6-Dinitrotoluene	490	< 490 U
121-14-2	2,4-Dinitrotoluene	490	< 490 U
84-66-2	Diethylphthalate	98	< 98 U
7005-72-3	4-Chlorophenyl-phenylether	98	< 98 U
86-73-7	Fluorene	98	< 98 U
100-01-6	4-Nitroaniline	490	< 490 U
534-52-1	4,6-Dinitro-2-Methylphenol	980	< 980 U

Lab Sample ID: SX83G
LIMS ID: 11-11413
Matrix: Sediment
Date Analyzed: 06/10/11 20:40

QC Report No: SX83-Seattle Public Utilities
Project: SPU LDW Source Tracing
NA

CAS Number	Analyte	RL	Result
86-30-6	N-Nitrosodiphenylamine	98	< 98 U
101-55-3	4-Bromophenyl-phenylether	98	< 98 U
118-74-1	Hexachlorobenzene	98	< 98 U
87-86-5	Pentachlorophenol	490	< 490 U
85-01-8	**Phenanthrene**	**98**	**98**
86-74-8	Carbazole	98	< 98 U
120-12-7	Anthracene	98	< 98 U
84-74-2	Di-n-Butylphthalate	98	< 98 U
206-44-0	**Fluoranthene**	**98**	**160**
129-00-0	**Pyrene**	**98**	**170**
85-68-7	**Butylbenzylphthalate**	**98**	**83 J**
91-94-1	3,3'-Dichlorobenzidine	490	< 490 U
56-55-3	**Benzo(a)anthracene**	**98**	**59 J**
117-81-7	**bis(2-Ethylhexyl)phthalate**	**98**	**990 B**
218-01-9	**Chrysene**	**98**	**210**
117-84-0	Di-n-Octyl phthalate	98	< 98 U
50-32-8	**Benzo(a)pyrene**	**98**	**78 J**
193-39-5	Indeno(1,2,3-cd)pyrene	98	< 98 U
53-70-3	Dibenz(a,h)anthracene	98	< 98 U
191-24-2	**Benzo(g,h,i)perylene**	**98**	**140**
90-12-0	1-Methylnaphthalene	98	< 98 U
TOTBFA	**Total Benzofluoranthenes**	**98**	**250**

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	52.0%	2-Fluorobiphenyl	63.0%
d14-p-Terphenyl	64.0%	d4-1,2-Dichlorobenzene	49.0%
d5-Phenol	46.7%	2-Fluorophenol	41.3%
2,4,6-Tribromophenol	32.7%	d4-2-Chlorophenol	46.0%

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Sample ID: RCB159-052011-3
SAMPLE

Lab Sample ID: SX83H
LIMS ID: 11-11414
Matrix: Sediment
Data Release Authorized:
Reported: 06/14/11

QC Report No: SX83-Seattle Public Utilities
Project: SPU LDW Source Tracing
NA
Date Sampled: 05/20/11
Date Received: 05/20/11

Date Extracted: 06/01/11
Date Analyzed: 06/10/11 21:15
Instrument/Analyst: NT10/YZ
GPC Cleanup: Yes

Sample Amount: 10.4 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 10.0
Percent Moisture: 42.6%

CAS Number	Analyte	RL	Result
108-95-2	**Phenol**	**190**	**260**
111-44-4	Bis-(2-Chloroethyl) Ether	190	< 190 U
95-57-8	2-Chlorophenol	190	< 190 U
541-73-1	1,3-Dichlorobenzene	190	< 190 U
106-46-7	1,4-Dichlorobenzene	190	< 190 U
100-51-6	**Benzyl Alcohol**	**190**	**1,600**
95-50-1	1,2-Dichlorobenzene	190	< 190 U
95-48-7	2-Methylphenol	190	< 190 U
108-60-1	2,2'-Oxybis(1-Chloropropane)	190	< 190 U
106-44-5	4-Methylphenol	190	< 190 U
621-64-7	N-Nitroso-Di-N-Propylamine	190	< 190 U
67-72-1	Hexachloroethane	190	< 190 U
98-95-3	Nitrobenzene	190	< 190 U
78-59-1	Isophorone	190	< 190 U
88-75-5	2-Nitrophenol	960	< 960 U
105-67-9	2,4-Dimethylphenol	190	< 190 U
65-85-0	**Benzoic Acid**	**1,900**	**1,700 J**
111-91-1	bis(2-Chloroethoxy) Methane	190	< 190 U
120-83-2	2,4-Dichlorophenol	960	< 960 U
120-82-1	1,2,4-Trichlorobenzene	190	< 190 U
91-20-3	Naphthalene	190	< 190 U
106-47-8	4-Chloroaniline	960	< 960 U
87-68-3	Hexachlorobutadiene	190	< 190 U
59-50-7	4-Chloro-3-methylphenol	960	< 960 U
91-57-6	2-Methylnaphthalene	190	< 190 U
77-47-4	Hexachlorocyclopentadiene	960	< 960 U
88-06-2	2,4,6-Trichlorophenol	960	< 960 U
95-95-4	2,4,5-Trichlorophenol	960	< 960 U
91-58-7	2-Chloronaphthalene	190	< 190 U
88-74-4	2-Nitroaniline	960	< 960 U
131-11-3	Dimethylphthalate	190	< 190 U
208-96-8	Acenaphthylene	190	< 190 U
99-09-2	3-Nitroaniline	960	< 960 U
83-32-9	Acenaphthene	190	< 190 U
51-28-5	2,4-Dinitrophenol	2,000	< 2,000 U
100-02-7	4-Nitrophenol	960	< 960 U
132-64-9	Dibenzofuran	190	< 190 U
606-20-2	2,6-Dinitrotoluene	960	< 960 U
121-14-2	2,4-Dinitrotoluene	960	< 960 U
84-66-2	Diethylphthalate	190	< 190 U
7005-72-3	4-Chlorophenyl-phenylether	190	< 190 U
86-73-7	Fluorene	190	< 190 U
100-01-6	4-Nitroaniline	960	< 960 U
534-52-1	4,6-Dinitro-2-Methylphenol	1,900	< 1,900 U

Lab Sample ID: SX83H
LIMS ID: 11-11414
Matrix: Sediment
Date Analyzed: 06/10/11 21:15

QC Report No: SX83-Seattle Public Utilities
Project: SPU LDW Source Tracing
NA

CAS Number	Analyte	RL	Result
86-30-6	N-Nitrosodiphenylamine	190	< 190 U
101-55-3	4-Bromophenyl-phenylether	190	< 190 U
118-74-1	Hexachlorobenzene	190	< 190 U
87-86-5	Pentachlorophenol	960	< 960 U
85-01-8	Phenanthrene	190	< 190 U
86-74-8	Carbazole	190	< 190 U
120-12-7	Anthracene	190	< 190 U
84-74-2	Di-n-Butylphthalate	190	< 190 U
206-44-0	**Fluoranthene**	**190**	**150 J**
129-00-0	**Pyrene**	**190**	**150 J**
85-68-7	Butylbenzylphthalate	190	< 190 U
91-94-1	3,3'-Dichlorobenzidine	960	< 960 U
56-55-3	Benzo(a)anthracene	190	< 190 U
117-81-7	**bis(2-Ethylhexyl)phthalate**	**190**	**1,200 B**
218-01-9	**Chrysene**	**190**	**290**
117-84-0	Di-n-Octyl phthalate	190	< 190 U
50-32-8	**Benzo(a)pyrene**	**190**	**96 J**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**190**	**96 J**
53-70-3	Dibenz(a,h)anthracene	190	< 190 U
191-24-2	**Benzo(g,h,i)perylene**	**190**	**210**
90-12-0	1-Methylnaphthalene	190	< 190 U
TOTBFA	**Total Benzofluoranthenes**	**190**	**370**

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	58.0%	2-Fluorobiphenyl	64.0%
d14-p-Terphenyl	66.0%	d4-1,2-Dichlorobenzene	54.0%
d5-Phenol	49.3%	2-Fluorophenol	41.3%
2,4,6-Tribromophenol	44.0%	d4-2-Chlorophenol	50.7%

ANALYTICAL RESOURCES INCORPORATED

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Sample ID: RCB159-052011-12
SAMPLE

Lab Sample ID: SX83I
LIMS ID: 11-11415
Matrix: Sediment
Data Release Authorized:
Reported: 06/14/11

QC Report No: SX83-Seattle Public Utilities
Project: SPU LDW Source Tracing
NA
Date Sampled: 05/20/11
Date Received: 05/20/11

Date Extracted: 06/01/11
Date Analyzed: 06/10/11 21:49
Instrument/Analyst: NT10/YZ
GPC Cleanup: Yes

Sample Amount: 10.1 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 5.00
Percent Moisture: 23.0%

CAS Number	Analyte	RL	Result
108-95-2	Phenol	99	< 99 U
111-44-4	Bis-(2-Chloroethyl) Ether	99	< 99 U
95-57-8	2-Chlorophenol	99	< 99 U
541-73-1	1,3-Dichlorobenzene	99	< 99 U
106-46-7	1,4-Dichlorobenzene	99	< 99 U
100-51-6	**Benzyl Alcohol**	**99**	**140**
95-50-1	1,2-Dichlorobenzene	99	< 99 U
95-48-7	2-Methylphenol	99	< 99 U
108-60-1	2,2'-Oxybis(1-Chloropropane)	99	< 99 U
106-44-5	4-Methylphenol	99	< 99 U
621-64-7	N-Nitroso-Di-N-Propylamine	99	< 99 U
67-72-1	Hexachloroethane	99	< 99 U
98-95-3	Nitrobenzene	99	< 99 U
78-59-1	Isophorone	99	< 99 U
88-75-5	2-Nitrophenol	500	< 500 U
105-67-9	2,4-Dimethylphenol	99	< 99 U
65-85-0	Benzoic Acid	990	< 990 U
111-91-1	bis(2-Chloroethoxy) Methane	99	< 99 U
120-83-2	2,4-Dichlorophenol	500	< 500 U
120-82-1	1,2,4-Trichlorobenzene	99	< 99 U
91-20-3	Naphthalene	99	< 99 U
106-47-8	4-Chloroaniline	500	< 500 U
87-68-3	Hexachlorobutadiene	99	< 99 U
59-50-7	4-Chloro-3-methylphenol	500	< 500 U
91-57-6	2-Methylnaphthalene	99	< 99 U
77-47-4	Hexachlorocyclopentadiene	500	< 500 U
88-06-2	2,4,6-Trichlorophenol	500	< 500 U
95-95-4	2,4,5-Trichlorophenol	500	< 500 U
91-58-7	2-Chloronaphthalene	99	< 99 U
88-74-4	2-Nitroaniline	500	< 500 U
131-11-3	Dimethylphthalate	99	< 99 U
208-96-8	Acenaphthylene	99	< 99 U
99-09-2	3-Nitroaniline	500	< 500 U
83-32-9	Acenaphthene	99	< 99 U
51-28-5	2,4-Dinitrophenol	1,100	< 1,100 U
100-02-7	4-Nitrophenol	500	< 500 U
132-64-9	Dibenzofuran	99	< 99 U
606-20-2	2,6-Dinitrotoluene	500	< 500 U
121-14-2	2,4-Dinitrotoluene	500	< 500 U
84-66-2	Diethylphthalate	99	< 99 U
7005-72-3	4-Chlorophenyl-phenylether	99	< 99 U
86-73-7	Fluorene	99	< 99 U
100-01-6	4-Nitroaniline	500	< 500 U
534-52-1	4,6-Dinitro-2-Methylphenol	990	< 990 U

Lab Sample ID: SX83I
LIMS ID: 11-11415
Matrix: Sediment
Date Analyzed: 06/10/11 21:49

QC Report No: SX83-Seattle Public Utilities
Project: SPU LDW Source Tracing
NA

CAS Number	Analyte	RL	Result
86-30-6	N-Nitrosodiphenylamine	99	< 99 U
101-55-3	4-Bromophenyl-phenylether	99	< 99 U
118-74-1	Hexachlorobenzene	99	< 99 U
87-86-5	Pentachlorophenol	500	< 500 U
85-01-8	Phenanthrene	99	< 99 U
86-74-8	Carbazole	99	< 99 U
120-12-7	Anthracene	99	< 99 U
84-74-2	Di-n-Butylphthalate	99	< 99 U
206-44-0	Fluoranthene	99	< 99 U
129-00-0	Pyrene	99	< 99 U
85-68-7	Butylbenzylphthalate	99	< 99 U
91-94-1	3,3'-Dichlorobenzidine	500	< 500 U
56-55-3	Benzo(a)anthracene	99	< 99 U
117-81-7	**bis(2-Ethylhexyl)phthalate**	**99**	**240 B**
218-01-9	**Chrysene**	**99**	**64 J**
117-84-0	Di-n-Octyl phthalate	99	< 99 U
50-32-8	Benzo(a)pyrene	99	< 99 U
193-39-5	Indeno(1,2,3-cd)pyrene	99	< 99 U
53-70-3	Dibenz(a,h)anthracene	99	< 99 U
191-24-2	Benzo(g,h,i)perylene	99	< 99 U
90-12-0	1-Methylnaphthalene	99	< 99 U
TOTBFA	**Total Benzofluoranthenes**	**99**	**74 J**

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	49.0%	2-Fluorobiphenyl	58.0%
d14-p-Terphenyl	63.0%	d4-1,2-Dichlorobenzene	51.0%
d5-Phenol	40.7%	2-Fluorophenol	31.3%
2,4,6-Tribromophenol	37.3%	d4-2-Chlorophenol	40.0%

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PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: RCB275-052011-0
SAMPLE

Lab Sample ID: SX83J
LIMS ID: 11-11416
Matrix: Sediment
Data Release Authorized:
Reported: 06/14/11

QC Report No: SX83-Seattle Public Utilities
Project: SPU LDW Source Tracing
NA
Date Sampled: 05/20/11
Date Received: 05/20/11

Date Extracted: 06/01/11
Date Analyzed: 06/10/11 22:23
Instrument/Analyst: NT10/YZ
GPC Cleanup: Yes

Sample Amount: 10.5 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 10.0
Percent Moisture: 30.5%

CAS Number	Analyte	RL	Result
108-95-2	**Phenol**	**190**	**100 J**
111-44-4	Bis-(2-Chloroethyl) Ether	190	< 190 U
95-57-8	2-Chlorophenol	190	< 190 U
541-73-1	1,3-Dichlorobenzene	190	< 190 U
106-46-7	1,4-Dichlorobenzene	190	< 190 U
100-51-6	**Benzyl Alcohol**	**190**	**110 J**
95-50-1	1,2-Dichlorobenzene	190	< 190 U
95-48-7	2-Methylphenol	190	< 190 U
108-60-1	2,2'-Oxybis(1-Chloropropane)	190	< 190 U
106-44-5	4-Methylphenol	190	< 190 U
621-64-7	N-Nitroso-Di-N-Propylamine	190	< 190 U
67-72-1	Hexachloroethane	190	< 190 U
98-95-3	Nitrobenzene	190	< 190 U
78-59-1	Isophorone	190	< 190 U
88-75-5	2-Nitrophenol	950	< 950 U
105-67-9	2,4-Dimethylphenol	190	< 190 U
65-85-0	**Benzoic Acid**	**1,900**	**340 J**
111-91-1	bis(2-Chloroethoxy) Methane	190	< 190 U
120-83-2	2,4-Dichlorophenol	950	< 950 U
120-82-1	1,2,4-Trichlorobenzene	190	< 190 U
91-20-3	Naphthalene	190	< 190 U
106-47-8	4-Chloroaniline	950	< 950 U
87-68-3	Hexachlorobutadiene	190	< 190 U
59-50-7	4-Chloro-3-methylphenol	950	< 950 U
91-57-6	2-Methylnaphthalene	190	< 190 U
77-47-4	Hexachlorocyclopentadiene	950	< 950 U
88-06-2	2,4,6-Trichlorophenol	950	< 950 U
95-95-4	2,4,5-Trichlorophenol	950	< 950 U
91-58-7	2-Chloronaphthalene	190	< 190 U
88-74-4	2-Nitroaniline	950	< 950 U
131-11-3	**Dimethylphthalate**	**190**	**180 J**
208-96-8	Acenaphthylene	190	< 190 U
99-09-2	3-Nitroaniline	950	< 950 U
83-32-9	Acenaphthene	190	< 190 U
51-28-5	2,4-Dinitrophenol	2,000	< 2,000 U
100-02-7	4-Nitrophenol	950	< 950 U
132-64-9	Dibenzofuran	190	< 190 U
606-20-2	2,6-Dinitrotoluene	950	< 950 U
121-14-2	2,4-Dinitrotoluene	950	< 950 U
84-66-2	Diethylphthalate	190	< 190 U
7005-72-3	4-Chlorophenyl-phenylether	190	< 190 U
86-73-7	Fluorene	190	< 190 U
100-01-6	4-Nitroaniline	950	< 950 U
534-52-1	4,6-Dinitro-2-Methylphenol	1,900	< 1,900 U

Lab Sample ID: SX83J
LIMS ID: 11-11416
Matrix: Sediment
Date Analyzed: 06/10/11 22:23

QC Report No: SX83-Seattle Public Utilities
Project: SPU LDW Source Tracing
NA

CAS Number	Analyte	RL	Result
86-30-6	N-Nitrosodiphenylamine	190	< 190 U
101-55-3	4-Bromophenyl-phenylether	190	< 190 U
118-74-1	Hexachlorobenzene	190	< 190 U
87-86-5	Pentachlorophenol	950	< 950 U
85-01-8	**Phenanthrene**	**190**	**100 J**
86-74-8	Carbazole	190	< 190 U
120-12-7	Anthracene	190	< 190 U
84-74-2	Di-n-Butylphthalate	190	< 190 U
206-44-0	**Fluoranthene**	**190**	**290**
129-00-0	**Pyrene**	**190**	**460**
85-68-7	**Butylbenzylphthalate**	**190**	**450**
91-94-1	3,3'-Dichlorobenzidine	950	< 950 U
56-55-3	**Benzo(a)anthracene**	**190**	**170 J**
117-81-7	**bis(2-Ethylhexyl)phthalate**	**190**	**2,300 B**
218-01-9	**Chrysene**	**190**	**570**
117-84-0	Di-n-Octyl phthalate	190	< 190 U
50-32-8	**Benzo(a)pyrene**	**190**	**250**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**190**	**150 J**
53-70-3	Dibenz(a,h)anthracene	190	< 190 U
191-24-2	**Benzo(g,h,i)perylene**	**190**	**300**
90-12-0	1-Methylnaphthalene	190	< 190 U
TOTBFA	**Total Benzofluoranthenes**	**190**	**670**

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	54.0%	2-Fluorobiphenyl	64.0%
d14-p-Terphenyl	68.0%	d4-1,2-Dichlorobenzene	50.0%
d5-Phenol	42.7%	2-Fluorophenol	38.7%
2,4,6-Tribromophenol	41.3%	d4-2-Chlorophenol	48.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS
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Sample ID: RCB275-052011-3
SAMPLE

Lab Sample ID: SX83K
LIMS ID: 11-11417
Matrix: Sediment
Data Release Authorized:
Reported: 06/14/11

QC Report No: SX83-Seattle Public Utilities
Project: SPU LDW Source Tracing
NA
Date Sampled: 05/20/11
Date Received: 05/20/11

Date Extracted: 06/01/11
Date Analyzed: 06/10/11 22:57
Instrument/Analyst: NT10/YZ
GPC Cleanup: Yes

Sample Amount: 10.1 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 10.0
Percent Moisture: 33.3%

CAS Number	Analyte	RL	Result
108-95-2	**Phenol**	**200**	**150 J**
111-44-4	Bis-(2-Chloroethyl) Ether	200	< 200 U
95-57-8	2-Chlorophenol	200	< 200 U
541-73-1	1,3-Dichlorobenzene	200	< 200 U
106-46-7	1,4-Dichlorobenzene	200	< 200 U
100-51-6	**Benzyl Alcohol**	**200**	**280**
95-50-1	1,2-Dichlorobenzene	200	< 200 U
95-48-7	2-Methylphenol	200	< 200 U
108-60-1	2,2'-Oxybis(1-Chloropropane)	200	< 200 U
106-44-5	4-Methylphenol	200	< 200 U
621-64-7	N-Nitroso-Di-N-Propylamine	200	< 200 U
67-72-1	Hexachloroethane	200	< 200 U
98-95-3	Nitrobenzene	200	< 200 U
78-59-1	Isophorone	200	< 200 U
88-75-5	2-Nitrophenol	990	< 990 U
105-67-9	2,4-Dimethylphenol	200	< 200 U
65-85-0	**Benzoic Acid**	**2,000**	**690 J**
111-91-1	bis(2-Chloroethoxy) Methane	200	< 200 U
120-83-2	2,4-Dichlorophenol	990	< 990 U
120-82-1	1,2,4-Trichlorobenzene	200	< 200 U
91-20-3	Naphthalene	200	< 200 U
106-47-8	4-Chloroaniline	990	< 990 U
87-68-3	Hexachlorobutadiene	200	< 200 U
59-50-7	4-Chloro-3-methylphenol	990	< 990 U
91-57-6	2-Methylnaphthalene	200	< 200 U
77-47-4	Hexachlorocyclopentadiene	990	< 990 U
88-06-2	2,4,6-Trichlorophenol	990	< 990 U
95-95-4	2,4,5-Trichlorophenol	990	< 990 U
91-58-7	2-Chloronaphthalene	200	< 200 U
88-74-4	2-Nitroaniline	990	< 990 U
131-11-3	**Dimethylphthalate**	**200**	**130 J**
208-96-8	Acenaphthylene	200	< 200 U
99-09-2	3-Nitroaniline	990	< 990 U
83-32-9	Acenaphthene	200	< 200 U
51-28-5	2,4-Dinitrophenol	2,100	< 2,100 U
100-02-7	4-Nitrophenol	990	< 990 U
132-64-9	Dibenzofuran	200	< 200 U
606-20-2	2,6-Dinitrotoluene	990	< 990 U
121-14-2	2,4-Dinitrotoluene	990	< 990 U
84-66-2	Diethylphthalate	200	< 200 U
7005-72-3	4-Chlorophenyl-phenylether	200	< 200 U
86-73-7	Fluorene	200	< 200 U
100-01-6	4-Nitroaniline	990	< 990 U
534-52-1	4,6-Dinitro-2-Methylphenol	2,000	< 2,000 U

Lab Sample ID: SX83K
LIMS ID: 11-11417
Matrix: Sediment
Date Analyzed: 06/10/11 22:57

QC Report No: SX83-Seattle Public Utilities
Project: SPU LDW Source Tracing
NA

CAS Number	Analyte	RL	Result
86-30-6	N-Nitrosodiphenylamine	200	< 200 U
101-55-3	4-Bromophenyl-phenylether	200	< 200 U
118-74-1	Hexachlorobenzene	200	< 200 U
87-86-5	Pentachlorophenol	990	< 990 U
85-01-8	Phenanthrene	200	< 200 U
86-74-8	Carbazole	200	< 200 U
120-12-7	Anthracene	200	< 200 U
84-74-2	Di-n-Butylphthalate	200	< 200 U
206-44-0	**Fluoranthene**	**200**	**210**
129-00-0	**Pyrene**	**200**	**320**
85-68-7	**Butylbenzylphthalate**	**200**	**4,900**
91-94-1	3,3'-Dichlorobenzidine	990	< 990 U
56-55-3	Benzo(a)anthracene	200	< 200 U
117-81-7	**bis(2-Ethylhexyl)phthalate**	**200**	**1,700 B**
218-01-9	**Chrysene**	**200**	**420**
117-84-0	Di-n-Octyl phthalate	200	< 200 U
50-32-8	**Benzo(a)pyrene**	**200**	**200**
193-39-5	Indeno(1,2,3-cd)pyrene	200	< 200 U
53-70-3	Dibenz(a,h)anthracene	200	< 200 U
191-24-2	**Benzo(g,h,i)perylene**	**200**	**230**
90-12-0	1-Methylnaphthalene	200	< 200 U
TOTBFA	**Total Benzofluoranthenes**	**200**	**510**

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	60.0%	2-Fluorobiphenyl	66.0%
d14-p-Terphenyl	72.0%	d4-1,2-Dichlorobenzene	62.0%
d5-Phenol	45.3%	2-Fluorophenol	40.0%
2,4,6-Tribromophenol	49.3%	d4-2-Chlorophenol	49.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS
Page 1 of 2

Sample ID: RCB275-052011-12
SAMPLE

Lab Sample ID: SX83L
LIMS ID: 11-11418
Matrix: Sediment
Data Release Authorized:
Reported: 06/14/11

QC Report No: SX83-Seattle Public Utilities
Project: SPU LDW Source Tracing
NA
Date Sampled: 05/20/11
Date Received: 05/20/11

Date Extracted: 06/01/11
Date Analyzed: 06/10/11 23:32
Instrument/Analyst: NT10/YZ
GPC Cleanup: Yes

Sample Amount: 10.2 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 5.00
Percent Moisture: 8.3%

CAS Number	Analyte	RL	Result
108-95-2	Phenol	98	< 98 U
111-44-4	Bis-(2-Chloroethyl) Ether	98	< 98 U
95-57-8	2-Chlorophenol	98	< 98 U
541-73-1	1,3-Dichlorobenzene	98	< 98 U
106-46-7	1,4-Dichlorobenzene	98	< 98 U
100-51-6	Benzyl Alcohol	98	< 98 U
95-50-1	1,2-Dichlorobenzene	98	< 98 U
95-48-7	2-Methylphenol	98	< 98 U
108-60-1	2,2'-Oxybis(1-Chloropropane)	98	< 98 U
106-44-5	4-Methylphenol	98	< 98 U
621-64-7	N-Nitroso-Di-N-Propylamine	98	< 98 U
67-72-1	Hexachloroethane	98	< 98 U
98-95-3	Nitrobenzene	98	< 98 U
78-59-1	Isophorone	98	< 98 U
88-75-5	2-Nitrophenol	490	< 490 U
105-67-9	2,4-Dimethylphenol	98	< 98 U
65-85-0	Benzoic Acid	980	< 980 U
111-91-1	bis(2-Chloroethoxy) Methane	98	< 98 U
120-83-2	2,4-Dichlorophenol	490	< 490 U
120-82-1	1,2,4-Trichlorobenzene	98	< 98 U
91-20-3	Naphthalene	98	< 98 U
106-47-8	4-Chloroaniline	490	< 490 U
87-68-3	Hexachlorobutadiene	98	< 98 U
59-50-7	4-Chloro-3-methylphenol	490	< 490 U
91-57-6	2-Methylnaphthalene	98	< 98 U
77-47-4	Hexachlorocyclopentadiene	490	< 490 U
88-06-2	2,4,6-Trichlorophenol	490	< 490 U
95-95-4	2,4,5-Trichlorophenol	490	< 490 U
91-58-7	2-Chloronaphthalene	98	< 98 U
88-74-4	2-Nitroaniline	490	< 490 U
131-11-3	Dimethylphthalate	98	< 98 U
208-96-8	Acenaphthylene	98	< 98 U
99-09-2	3-Nitroaniline	490	< 490 U
83-32-9	Acenaphthene	98	< 98 U
51-28-5	2,4-Dinitrophenol	1,000	< 1,000 U
100-02-7	4-Nitrophenol	490	< 490 U
132-64-9	Dibenzofuran	98	< 98 U
606-20-2	2,6-Dinitrotoluene	490	< 490 U
121-14-2	2,4-Dinitrotoluene	490	< 490 U
84-66-2	Diethylphthalate	98	< 98 U
7005-72-3	4-Chlorophenyl-phenylether	98	< 98 U
86-73-7	Fluorene	98	< 98 U
100-01-6	4-Nitroaniline	490	< 490 U
534-52-1	4,6-Dinitro-2-Methylphenol	980	< 980 U

Lab Sample ID: SX83L
LIMS ID: 11-11418
Matrix: Sediment
Date Analyzed: 06/10/11 23:32

QC Report No: SX83-Seattle Public Utilities
Project: SPU LDW Source Tracing
NA

CAS Number	Analyte	RL	Result
86-30-6	N-Nitrosodiphenylamine	98	< 98 U
101-55-3	4-Bromophenyl-phenylether	98	< 98 U
118-74-1	Hexachlorobenzene	98	< 98 U
87-86-5	Pentachlorophenol	490	< 490 U
85-01-8	**Phenanthrene**	**98**	**54 J**
86-74-8	Carbazole	98	< 98 U
120-12-7	Anthracene	98	< 98 U
84-74-2	Di-n-Butylphthalate	98	< 98 U
206-44-0	**Fluoranthene**	**98**	**93 J**
129-00-0	**Pyrene**	**98**	**110**
85-68-7	Butylbenzylphthalate	98	< 98 U
91-94-1	3,3'-Dichlorobenzidine	490	< 490 U
56-55-3	Benzo(a)anthracene	98	< 98 U
117-81-7	**bis(2-Ethylhexyl)phthalate**	**98**	**98 B**
218-01-9	**Chrysene**	**98**	**88 J**
117-84-0	Di-n-Octyl phthalate	98	< 98 U
50-32-8	**Benzo(a)pyrene**	**98**	**78 J**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**98**	**49 J**
53-70-3	Dibenz(a,h)anthracene	98	< 98 U
191-24-2	**Benzo(g,h,i)perylene**	**98**	**78 J**
90-12-0	1-Methylnaphthalene	98	< 98 U
TOTBFA	**Total Benzofluoranthenes**	**98**	**170**

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	51.0%	2-Fluorobiphenyl	59.0%
d14-p-Terphenyl	65.0%	d4-1,2-Dichlorobenzene	51.0%
d5-Phenol	40.0%	2-Fluorophenol	28.7%
2,4,6-Tribromophenol	34.7%	d4-2-Chlorophenol	40.0%

ANALYTICAL RESOURCES INCORPORATED

SW8270 SEMIVOLATILES SOIL/SEDIMENT SURROGATE RECOVERY SUMMARY

Matrix: Sediment

QC Report No: SX83-Seattle Public Utilities
Project: SPU LDW Source Tracing

Client ID	NBZ	FBP	TPH	DCB	PHL	2FP	TBP	2CP	TOT OUT
RCB273-052011-0	49.0%	60.0%	65.0%	48.0%	50.7%	46.7%	62.7%	49.3%	0
RCB273-052011-3	44.0%	56.0%	61.0%	45.0%	44.0%	43.3%	60.7%	46.7%	0
MB-060111	51.6%	54.4%	74.0%	50.6%	46.4%	46.8%	56.1%	48.8%	0
LCS-060111	57.4%	61.6%	78.6%	58.6%	55.6%	54.5%	65.1%	56.0%	0
LCSD-060111	53.2%	56.6%	71.0%	54.2%	50.5%	50.0%	59.5%	50.0%	0
RCB273-052011-12	58.8%	62.8%	77.4%	59.0%	52.9%	53.2%	73.9%	56.1%	0
RCB273-052011-12 MS	55.0%	61.2%	72.2%	56.0%	52.8%	52.3%	70.9%	53.3%	0
RCB273-052011-12 MSD	53.4%	61.2%	73.4%	53.0%	50.1%	50.0%	70.5%	51.6%	0
RCB274-052011-0	45.0%	54.0%	61.0%	42.0%	43.3%	42.0%	53.3%	45.3%	0
RCB274-052011-3	55.8%	63.6%	73.0%	54.0%	52.9%	51.1%	73.2%	55.6%	0
RCB274-052011-12	51.2%	55.4%	66.2%	53.2%	46.1%	48.8%	63.3%	49.3%	0
RCB159-052011-0	52.0%	63.0%	64.0%	49.0%	46.7%	41.3%	32.7%	46.0%	0
RCB159-052011-3	58.0%	64.0%	66.0%	54.0%	49.3%	41.3%	44.0%	50.7%	0
RCB159-052011-12	49.0%	58.0%	63.0%	51.0%	40.7%	31.3%	37.3%	40.0%	0
RCB275-052011-0	54.0%	64.0%	68.0%	50.0%	42.7%	38.7%	41.3%	48.0%	0
RCB275-052011-3	60.0%	66.0%	72.0%	62.0%	45.3%	40.0%	49.3%	49.3%	0
RCB275-052011-12	51.0%	59.0%	65.0%	51.0%	40.0%	28.7%*	34.7%	40.0%	1

	LCS/MB LIMITS	QC LIMITS
(NBZ) = d5-Nitrobenzene	(30-160)	(30-160)
(FBP) = 2-Fluorobiphenyl	(30-160)	(30-160)
(TPH) = d14-p-Terphenyl	(30-160)	(30-160)
(DCB) = d4-1,2-Dichlorobenzene	(30-160)	(30-160)
(PHL) = d5-Phenol	(30-160)	(30-160)
(2FP) = 2-Fluorophenol	(30-160)	(30-160)
(TBP) = 2,4,6-Tribromophenol	(30-160)	(30-160)
(2CP) = d4-2-Chlorophenol	(30-160)	(30-160)

Prep Method: SW3546
Log Number Range: 11-11407 to 11-11418

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS
Page 1 of 2

Sample ID: RCB273-052011-12
MS/MSD

Lab Sample ID: SX83C
LIMS ID: 11-11409
Matrix: Sediment
Data Release Authorized:
Reported: 06/14/11

QC Report No: SX83-Seattle Public Utilities
Project: SPU LDW Source Tracing

Date Sampled: 05/20/11
Date Received: 05/20/11

Date Extracted MS/MSD: 06/01/11

Date Analyzed MS: 06/10/11 17:49
MSD: 06/10/11 18:23
Instrument/Analyst MS: NT10/YZ
MSD: NT10/YZ
GPC Cleanup: Yes

Sample Amount MS: 11.0 g-dry-wt
MSD: 11.0 g-dry-wt
Final Extract Volume MS: 1.0 mL
MSD: 1.0 mL
Dilution Factor MS: 1.00
MSD: 1.00
Percent Moisture: 9.5 %

Analyte	Sample	MS		Spike Added-MS	MS Recovery	MSD		Spike Added-MSD	MSD Recovery	RPD
Phenol	< 18.1 U	325		453	71.7%	308		455	67.7%	5.4%
Bis-(2-Chloroethyl) Ether	< 18.1 U	274		453	60.5%	262		455	57.6%	4.5%
2-Chlorophenol	< 18.1 U	319		453	70.4%	297		455	65.3%	7.1%
1,3-Dichlorobenzene	< 18.1 U	258		453	57.0%	249		455	54.7%	3.6%
1,4-Dichlorobenzene	< 18.1 U	264		453	58.3%	250		455	54.9%	5.4%
Benzyl Alcohol	< 18.1 U	297		453	65.6%	281		455	61.8%	5.5%
1,2-Dichlorobenzene	< 18.1 U	266		453	58.7%	260		455	57.1%	2.3%
2-Methylphenol	< 18.1 U	297		453	65.6%	285		455	62.6%	4.1%
2,2'-Oxybis(1-Chloropropane	< 18.1 U	225		453	49.7%	216		455	47.5%	4.1%
4-Methylphenol	< 36.3 U	615		906	67.9%	595		909	65.5%	3.3%
N-Nitroso-Di-N-Propylamine	< 18.1 U	253		453	55.8%	251		455	55.2%	0.8%
Hexachloroethane	< 18.1 U	264		453	58.3%	246		455	54.1%	7.1%
Nitrobenzene	< 18.1 U	268		453	59.2%	264		455	58.0%	1.5%
Isophorone	< 18.1 U	299		453	66.0%	289		455	63.5%	3.4%
2-Nitrophenol	< 90.7 U	1010		1360	74.3%	979		1360	72.0%	3.1%
2,4-Dimethylphenol	< 36.3 U	227		453	50.1%	235		455	51.6%	3.5%
Benzoic Acid	< 363 U	964		2490	38.7%	1040		2500	41.6%	7.6%
bis(2-Chloroethoxy) Methane	< 18.1 U	273		453	60.3%	268		455	58.9%	1.8%
2,4-Dichlorophenol	< 181 U	1190	Q	1360	87.5%	1160	Q	1360	85.3%	2.6%
1,2,4-Trichlorobenzene	< 18.1 U	289		453	63.8%	285		455	62.6%	1.4%
Naphthalene	< 18.1 U	296		453	65.3%	285		455	62.6%	3.8%
4-Chloroaniline	< 245 U	488		1360	35.9%	499		1360	36.7%	2.2%
Hexachlorobutadiene	< 90.7 U	299		453	66.0%	285		455	62.6%	4.8%
4-Chloro-3-methylphenol	< 90.7 U	1130		1360	83.1%	1100		1360	80.9%	2.7%
2-Methylnaphthalene	19.1	313		453	64.9%	306		455	63.1%	2.3%
Hexachlorocyclopentadiene	< 363 U	196	JQ	1360	14.4%	217	JQ	1360	16.0%	10.2%
2,4,6-Trichlorophenol	< 90.7 U	1130		1360	83.1%	1110		1360	81.6%	1.8%
2,4,5-Trichlorophenol	< 90.7 U	1210		1360	89.0%	1190		1360	87.5%	1.7%
2-Chloronaphthalene	< 18.1 U	296		453	65.3%	295		455	64.8%	0.3%
2-Nitroaniline	< 90.7 U	1090		1360	80.1%	1090		1360	80.1%	0.0%
Dimethylphthalate	< 18.1 U	330		453	72.8%	332		455	73.0%	0.6%
Acenaphthylene	< 18.1 U	300		453	66.2%	305		455	67.0%	1.7%
3-Nitroaniline	< 90.7 U	840		1360	61.8%	908		1360	66.8%	7.8%
Acenaphthene	< 18.1 U	312		453	68.9%	311		455	68.4%	0.3%
2,4-Dinitrophenol	< 771 U	996		2490	40.0%	1080		2500	43.2%	8.1%
4-Nitrophenol	< 90.7 U	1000		1360	73.5%	1020		1360	75.0%	2.0%
Dibenzofuran	< 18.1 U	333		453	73.5%	339		455	74.5%	1.8%
2,6-Dinitrotoluene	< 90.7 U	1100		1360	80.9%	1100		1360	80.9%	0.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: RCB273-052011-12**
 MS/MSD

Lab Sample ID: SX83C QC Report No: SX83-Seattle Public Utilities
LIMS ID: 11-11409 Project: SPU LDW Source Tracing
Matrix: Sediment
Date Analyzed MS: 06/10/11 17:49
MSD: 06/10/11 18:23

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
2,4-Dinitrotoluene	< 90.7 U	1100	1360	80.9%	1150	1360	84.6%	4.4%
Diethylphthalate	< 45.4 U	351	453	77.5%	352	455	77.4%	0.3%
4-Chlorophenyl-phenylether	< 18.1 U	318	453	70.2%	328	455	72.1%	3.1%
Fluorene	< 18.1 U	327	453	72.2%	340	455	74.7%	3.9%
4-Nitroaniline	< 90.7 U	1120	1360	82.4%	1110	1360	81.6%	0.9%
4,6-Dinitro-2-Methylphenol	< 181 U	1590	2490	63.9%	1640	2500	65.6%	3.1%
N-Nitrosodiphenylamine	< 18.1 U	303	453	66.9%	315	455	69.2%	3.9%
4-Bromophenyl-phenylether	< 18.1 U	327	453	72.2%	327	455	71.9%	0.0%
Hexachlorobenzene	< 18.1 U	341	453	75.3%	344	455	75.6%	0.9%
Pentachlorophenol	< 181 U	809 Q	1360	59.5%	932 Q	1360	68.5%	14.1%
Phenanthrene	19.1	357	453	74.6%	375	455	78.2%	4.9%
Carbazole	< 18.1 U	411	453	90.7%	416	455	91.4%	1.2%
Anthracene	< 18.1 U	312	453	68.9%	329	455	72.3%	5.3%
Di-n-Butylphthalate	< 18.1 U	347	453	76.6%	363	455	79.8%	4.5%
Fluoranthene	< 18.1 U	373	453	82.3%	391	455	85.9%	4.7%
Pyrene	10.0 J	361	453	77.5%	378	455	80.9%	4.6%
Butylbenzylphthalate	< 18.1 U	369	453	81.5%	383	455	84.2%	3.7%
3,3'-Dichlorobenzidine	< 136 U	261	1360	19.2%	267	1360	19.6%	2.3%
Benzo(a)anthracene	< 18.1 U	348	453	76.8%	356	455	78.2%	2.3%
bis(2-Ethylhexyl)phthalate	30.9 B	352 B	453	70.9%	385 B	455	77.8%	9.0%
Chrysene	9.1 J	360	453	77.5%	365	455	78.2%	1.4%
Di-n-Octyl phthalate	< 18.1 U	290	453	64.0%	321	455	70.5%	10.1%
Benzo(a)pyrene	< 18.1 U	319	453	70.4%	333	455	73.2%	4.3%
Indeno(1,2,3-cd)pyrene	< 18.1 U	357	453	78.8%	377	455	82.9%	5.4%
Dibenz(a,h)anthracene	< 18.1 U	354	453	78.1%	375	455	82.4%	5.8%
Benzo(g,h,i)perylene	< 18.1 U	358	453	79.0%	377	455	82.9%	5.2%
1-Methylnaphthalene	17.2 J	310	453	64.6%	302	455	62.6%	2.6%
Total Benzofluoranthenes	10.0 J	732	906	79.7%	773	909	83.9%	5.4%

Reported in µg/kg (ppb)
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS
Page 1 of 2

Sample ID: RCB273-052011-12
MATRIX SPIKE

Lab Sample ID: SX83C
LIMS ID: 11-11409
Matrix: Sediment
Data Release Authorized:
Reported: 06/14/11

QC Report No: SX83-Seattle Public Utilities
Project: SPU LDW Source Tracing
NA
Date Sampled: 05/20/11
Date Received: 05/20/11

Date Extracted: 06/01/11
Date Analyzed: 06/10/11 17:49
Instrument/Analyst: NT10/YZ
GPC Cleanup: Yes

Sample Amount: 11.0 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Percent Moisture: 9.5%

CAS Number	Analyte	RL	Result
108-95-2	Phenol	18	---
111-44-4	Bis-(2-Chloroethyl) Ether	18	---
95-57-8	2-Chlorophenol	18	---
541-73-1	1,3-Dichlorobenzene	18	---
106-46-7	1,4-Dichlorobenzene	18	---
100-51-6	Benzyl Alcohol	18	---
95-50-1	1,2-Dichlorobenzene	18	---
95-48-7	2-Methylphenol	18	---
108-60-1	2,2'-Oxybis(1-Chloropropane)	18	---
106-44-5	4-Methylphenol	36	---
621-64-7	N-Nitroso-Di-N-Propylamine	18	---
67-72-1	Hexachloroethane	18	---
98-95-3	Nitrobenzene	18	---
78-59-1	Isophorone	18	---
88-75-5	2-Nitrophenol	91	---
105-67-9	2,4-Dimethylphenol	36	---
65-85-0	Benzoic Acid	360	---
111-91-1	bis(2-Chloroethoxy) Methane	18	---
120-83-2	2,4-Dichlorophenol	180	---
120-82-1	1,2,4-Trichlorobenzene	18	---
91-20-3	Naphthalene	18	---
106-47-8	4-Chloroaniline	240	---
87-68-3	Hexachlorobutadiene	91	---
59-50-7	4-Chloro-3-methylphenol	91	---
91-57-6	2-Methylnaphthalene	18	---
77-47-4	Hexachlorocyclopentadiene	360	---
88-06-2	2,4,6-Trichlorophenol	91	---
95-95-4	2,4,5-Trichlorophenol	91	---
91-58-7	2-Chloronaphthalene	18	---
88-74-4	2-Nitroaniline	91	---
131-11-3	Dimethylphthalate	18	---
208-96-8	Acenaphthylene	18	---
99-09-2	3-Nitroaniline	91	---
83-32-9	Acenaphthene	18	---
51-28-5	2,4-Dinitrophenol	770	---
100-02-7	4-Nitrophenol	91	---
132-64-9	Dibenzofuran	18	---
606-20-2	2,6-Dinitrotoluene	91	---
121-14-2	2,4-Dinitrotoluene	91	---
84-66-2	Diethylphthalate	45	---
7005-72-3	4-Chlorophenyl-phenylether	18	---
86-73-7	Fluorene	18	---
100-01-6	4-Nitroaniline	91	---
534-52-1	4,6-Dinitro-2-Methylphenol	180	---

Lab Sample ID: SX83C
LIMS ID: 11-11409
Matrix: Sediment
Date Analyzed: 06/10/11 17:49

QC Report No: SX83-Seattle Public Utilities
Project: SPU LDW Source Tracing
NA

CAS Number	Analyte	RL	Result
86-30-6	N-Nitrosodiphenylamine	18	---
101-55-3	4-Bromophenyl-phenylether	18	---
118-74-1	Hexachlorobenzene	18	---
87-86-5	Pentachlorophenol	180	---
85-01-8	Phenanthrene	18	---
86-74-8	Carbazole	18	---
120-12-7	Anthracene	18	---
84-74-2	Di-n-Butylphthalate	18	---
206-44-0	Fluoranthene	18	---
129-00-0	Pyrene	18	---
85-68-7	Butylbenzylphthalate	18	---
91-94-1	3,3'-Dichlorobenzidine	140	---
56-55-3	Benzo(a)anthracene	18	---
117-81-7	bis(2-Ethylhexyl)phthalate	23	---
218-01-9	Chrysene	18	---
117-84-0	Di-n-Octyl phthalate	18	---
50-32-8	Benzo(a)pyrene	18	---
193-39-5	Indeno(1,2,3-cd)pyrene	18	---
53-70-3	Dibenz(a,h)anthracene	18	---
191-24-2	Benzo(g,h,i)perylene	18	---
90-12-0	1-Methylnaphthalene	18	---
TOTBFA	Total Benzofluoranthenes	18	---

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	55.0%	2-Fluorobiphenyl	61.2%
d14-p-Terphenyl	72.2%	d4-1,2-Dichlorobenzene	56.0%
d5-Phenol	52.8%	2-Fluorophenol	52.3%
2,4,6-Tribromophenol	70.9%	d4-2-Chlorophenol	53.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: RCB273-052011-12
MATRIX SPIKE DUPLICATE

Lab Sample ID: SX83C
LIMS ID: 11-11409
Matrix: Sediment
Data Release Authorized:
Reported: 06/14/11

QC Report No: SX83-Seattle Public Utilities
Project: SPU LDW Source Tracing
NA
Date Sampled: 05/20/11
Date Received: 05/20/11

Date Extracted: 06/01/11
Date Analyzed: 06/10/11 18:23
Instrument/Analyst: NT10/YZ
GPC Cleanup: Yes

Sample Amount: 11.0 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Percent Moisture: 9.5%

CAS Number	Analyte	RL	Result
108-95-2	Phenol	18	---
111-44-4	Bis-(2-Chloroethyl) Ether	18	---
95-57-8	2-Chlorophenol	18	---
541-73-1	1,3-Dichlorobenzene	18	---
106-46-7	1,4-Dichlorobenzene	18	---
100-51-6	Benzyl Alcohol	18	---
95-50-1	1,2-Dichlorobenzene	18	---
95-48-7	2-Methylphenol	18	---
108-60-1	2,2'-Oxybis(1-Chloropropane)	18	---
106-44-5	4-Methylphenol	36	---
621-64-7	N-Nitroso-Di-N-Propylamine	18	---
67-72-1	Hexachloroethane	18	---
98-95-3	Nitrobenzene	18	---
78-59-1	Isophorone	18	---
88-75-5	2-Nitrophenol	91	---
105-67-9	2,4-Dimethylphenol	36	---
65-85-0	Benzoic Acid	360	---
111-91-1	bis(2-Chloroethoxy) Methane	18	---
120-83-2	2,4-Dichlorophenol	180	---
120-82-1	1,2,4-Trichlorobenzene	18	---
91-20-3	Naphthalene	18	---
106-47-8	4-Chloroaniline	240	---
87-68-3	Hexachlorobutadiene	91	---
59-50-7	4-Chloro-3-methylphenol	91	---
91-57-6	2-Methylnaphthalene	18	---
77-47-4	Hexachlorocyclopentadiene	360	---
88-06-2	2,4,6-Trichlorophenol	91	---
95-95-4	2,4,5-Trichlorophenol	91	---
91-58-7	2-Chloronaphthalene	18	---
88-74-4	2-Nitroaniline	91	---
131-11-3	Dimethylphthalate	18	---
208-96-8	Acenaphthylene	18	---
99-09-2	3-Nitroaniline	91	---
83-32-9	Acenaphthene	18	---
51-28-5	2,4-Dinitrophenol	770	---
100-02-7	4-Nitrophenol	91	---
132-64-9	Dibenzofuran	18	---
606-20-2	2,6-Dinitrotoluene	91	---
121-14-2	2,4-Dinitrotoluene	91	---
84-66-2	Diethylphthalate	46	---
7005-72-3	4-Chlorophenyl-phenylether	18	---
86-73-7	Fluorene	18	---
100-01-6	4-Nitroaniline	91	---
534-52-1	4,6-Dinitro-2-Methylphenol	180	---

Lab Sample ID: SX83C
LIMS ID: 11-11409
Matrix: Sediment
Date Analyzed: 06/10/11 18:23

QC Report No: SX83-Seattle Public Utilities
Project: SPU LDW Source Tracing
NA

CAS Number	Analyte	RL	Result
86-30-6	N-Nitrosodiphenylamine	18	---
101-55-3	4-Bromophenyl-phenylether	18	---
118-74-1	Hexachlorobenzene	18	---
87-86-5	Pentachlorophenol	180	---
85-01-8	Phenanthrene	18	---
86-74-8	Carbazole	18	---
120-12-7	Anthracene	18	---
84-74-2	Di-n-Butylphthalate	18	---
206-44-0	Fluoranthene	18	---
129-00-0	Pyrene	18	---
85-68-7	Butylbenzylphthalate	18	---
91-94-1	3,3'-Dichlorobenzidine	140	---
56-55-3	Benzo(a)anthracene	18	---
117-81-7	bis(2-Ethylhexyl)phthalate	23	---
218-01-9	Chrysene	18	---
117-84-0	Di-n-Octyl phthalate	18	---
50-32-8	Benzo(a)pyrene	18	---
193-39-5	Indeno(1,2,3-cd)pyrene	18	---
53-70-3	Dibenz(a,h)anthracene	18	---
191-24-2	Benzo(g,h,i)perylene	18	---
90-12-0	1-Methylnaphthalene	18	---
TOTBFA	Total Benzofluoranthenes	18	---

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	53.4%	2-Fluorobiphenyl	61.2%
d14-p-Terphenyl	73.4%	d4-1,2-Dichlorobenzene	53.0%
d5-Phenol	50.1%	2-Fluorophenol	50.0%
2,4,6-Tribromophenol	70.5%	d4-2-Chlorophenol	51.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: LCS-060111**
Page 1 of 2 **LCS/LCSD**

Lab Sample ID: LCS-060111 QC Report No: SX83-Seattle Public Utilities
LIMS ID: 11-11409 Project: SPU LDW Source Tracing
Matrix: Sediment
Data Release Authorized:
Reported: 06/14/11 Date Received: 05/20/11

Date Sampled: 05/20/11

Date Extracted LCS/LCSD: 06/01/11 Sample Amount LCS: 10.0 g
LCSD: 10.0 g
Date Analyzed LCS: 06/10/11 14:23 Final Extract Volume LCS: 1.0 mL
LCSD: 06/10/11 14:57 LCSD: 1.0 mL
Instrument/Analyst LCS: NT10/YZ Dilution Factor LCS: 1.00
LCSD: NT10/YZ LCSD: 1.00
GPC Cleanup: Yes Percent Moisture: NA

Analyte	LCS		Spike Added-LCS	LCS Recovery	LCSD		Spike Added-LCSD	LCSD Recovery	RPD
Phenol	356		500	71.2%	334		500	66.8%	6.4%
Bis-(2-Chloroethyl) Ether	294		500	58.8%	281		500	56.2%	4.5%
2-Chlorophenol	333		500	66.6%	314		500	62.8%	5.9%
1,3-Dichlorobenzene	284		500	56.8%	267		500	53.4%	6.2%
1,4-Dichlorobenzene	269		500	53.8%	271		500	54.2%	0.7%
Benzyl Alcohol	297		500	59.4%	277		500	55.4%	7.0%
1,2-Dichlorobenzene	285		500	57.0%	277		500	55.4%	2.8%
2-Methylphenol	292		500	58.4%	277		500	55.4%	5.3%
2,2'-Oxybis(1-Chloropropane)	244		500	48.8%	236		500	47.2%	3.3%
4-Methylphenol	631		1000	63.1%	591		1000	59.1%	6.5%
N-Nitroso-Di-N-Propylamine	257		500	51.4%	248		500	49.6%	3.6%
Hexachloroethane	284		500	56.8%	269		500	53.8%	5.4%
Nitrobenzene	297		500	59.4%	279		500	55.8%	6.2%
Isophorone	317		500	63.4%	299		500	59.8%	5.8%
2-Nitrophenol	1100		1500	73.3%	1040		1500	69.3%	5.6%
2,4-Dimethylphenol	118		500	23.6%	100		500	20.0%	16.5%
Benzoic Acid	1620		2750	58.9%	1490		2750	54.2%	8.4%
bis(2-Chloroethoxy) Methane	297		500	59.4%	276		500	55.2%	7.3%
2,4-Dichlorophenol	1240	Q	1500	82.7%	1140	Q	1500	76.0%	8.4%
1,2,4-Trichlorobenzene	307		500	61.4%	287		500	57.4%	6.7%
Naphthalene	306		500	61.2%	296		500	59.2%	3.3%
4-Chloroaniline	763		1500	50.9%	736		1500	49.1%	3.6%
Hexachlorobutadiene	309		500	61.8%	298		500	59.6%	3.6%
4-Chloro-3-methylphenol	1170		1500	78.0%	1120		1500	74.7%	4.4%
2-Methylnaphthalene	320		500	64.0%	306		500	61.2%	4.5%
Hexachlorocyclopentadiene	434	Q	1500	28.9%	424	Q	1500	28.3%	2.3%
2,4,6-Trichlorophenol	1090		1500	72.7%	1040		1500	69.3%	4.7%
2,4,5-Trichlorophenol	1220		1500	81.3%	1150		1500	76.7%	5.9%
2-Chloronaphthalene	311		500	62.2%	298		500	59.6%	4.3%
2-Nitroaniline	1180		1500	78.7%	1130		1500	75.3%	4.3%
Dimethylphthalate	361		500	72.2%	346		500	69.2%	4.2%
Acenaphthylene	320		500	64.0%	309		500	61.8%	3.5%
3-Nitroaniline	1060		1500	70.7%	1030		1500	68.7%	2.9%
Acenaphthene	322		500	64.4%	305		500	61.0%	5.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: LCSD-060111
LCS/LCSD

Lab Sample ID: LCS-060111
LIMS ID: 11-11409
Matrix: Sediment
Date Analyzed LCS: 06/10/11 14:23
LCSD: 06/10/11 14:57

QC Report No: SX83-Seattle Public Utilities
Project: SPU LDW Source Tracing

Analyte	LCS		Spike Added-LCS	LCS Recovery	LCSD		Spike Added-LCSD	LCSD Recovery	RPD
2,4-Dinitrophenol	1280		2750	46.5%	1190		2750	43.3%	7.3%
4-Nitrophenol	1080		1500	72.0%	1020		1500	68.0%	5.7%
Dibenzofuran	341		500	68.2%	324		500	64.8%	5.1%
2,6-Dinitrotoluene	1180		1500	78.7%	1130		1500	75.3%	4.3%
2,4-Dinitrotoluene	1220		1500	81.3%	1160		1500	77.3%	5.0%
Diethylphthalate	386		500	77.2%	367		500	73.4%	5.0%
4-Chlorophenyl-phenylether	330		500	66.0%	305		500	61.0%	7.9%
Fluorene	335		500	67.0%	311		500	62.2%	7.4%
4-Nitroaniline	1260		1500	84.0%	1250		1500	83.3%	0.8%
4,6-Dinitro-2-Methylphenol	1930		2750	70.2%	1900		2750	69.1%	1.6%
N-Nitrosodiphenylamine	288		500	57.6%	267		500	53.4%	7.6%
4-Bromophenyl-phenylether	346		500	69.2%	327		500	65.4%	5.6%
Hexachlorobenzene	350		500	70.0%	328		500	65.6%	6.5%
Pentachlorophenol	947	Q	1500	63.1%	901	Q	1500	60.1%	5.0%
Phenanthrene	375		500	75.0%	356		500	71.2%	5.2%
Carbazole	453		500	90.6%	435		500	87.0%	4.1%
Anthracene	328		500	65.6%	314		500	62.8%	4.4%
Di-n-Butylphthalate	390		500	78.0%	377		500	75.4%	3.4%
Fluoranthene	394		500	78.8%	388		500	77.6%	1.5%
Pyrene	410		500	82.0%	382		500	76.4%	7.1%
Butylbenzylphthalate	425		500	85.0%	403		500	80.6%	5.3%
3,3'-Dichlorobenzidine	630		1500	42.0%	623		1500	41.5%	1.1%
Benzo(a)anthracene	392		500	78.4%	372		500	74.4%	5.2%
bis(2-Ethylhexyl)phthalate	386	B	500	77.2%	371	B	500	74.2%	4.0%
Chrysene	389		500	77.8%	380		500	76.0%	2.3%
Di-n-Octyl phthalate	305		500	61.0%	313		500	62.6%	2.6%
Benzo(a)pyrene	336		500	67.2%	325		500	65.0%	3.3%
Indeno(1,2,3-cd)pyrene	413		500	82.6%	399		500	79.8%	3.4%
Dibenz(a,h)anthracene	403		500	80.6%	394		500	78.8%	2.3%
Benzo(g,h,i)perylene	410		500	82.0%	390		500	78.0%	5.0%
1-Methylnaphthalene	321		500	64.2%	301		500	60.2%	6.4%
Total Benzofluoranthenes	815		1000	81.5%	781		1000	78.1%	4.3%

Semivolatile Surrogate Recovery

	LCS	LCSD
d5-Nitrobenzene	57.4%	53.2%
2-Fluorobiphenyl	61.6%	56.6%
d14-p-Terphenyl	78.6%	71.0%
d4-1,2-Dichlorobenzene	58.6%	54.2%
d5-Phenol	55.6%	50.5%
2-Fluorophenol	54.5%	50.0%
2,4,6-Tribromophenol	65.1%	59.5%
d4-2-Chlorophenol	56.0%	50.0%

Reported in µg/kg (ppb)
RPD calculated using sample concentrations per SW846.

4B

SEMIVOLATILE METHOD BLANK SUMMARY

BLANK NO.

SY42MBS1

Lab Name: ANALYTICAL RESOURCES INC

Client: SEATTLE PUBLIC UTILITIES

Instrument ID: NT10

Project: SPU LDW SOURCE TRACING

Lab File ID: SY42MB

Date Extracted: 06/01/11

Instrument ID: NT10

Date Analyzed: 06/10/11

Matrix: SOLID

Time Analyzed: 1349

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	SY42LCSS1	SY42LCSS1	SY42SB	06/10/11
02	SY42LCSDS1	SY42LCSDS1	SY42SBD	06/10/11
03	RCB273-052011-0	SX83A	SX83A5	06/10/11
04	RCB273-052011-3	SX83B	SX83B5	06/10/11
05	RCB273-052011-12	SX83C	SX83C	06/10/11
06	RCB273-052011-1	SX83CMS	SX83CMS	06/10/11
07	RCB273-052011-1	SX83CMSD	SX83CMSD	06/10/11
08	RCB274-052011-0	SX83D	SX83D5	06/10/11
09	RCB274-052011-3	SX83E	SX83E	06/10/11
10	RCB274-052011-12	SX83F	SX83F	06/10/11
11	RCB159-052011-0	SX83G	SX83G5	06/10/11
12	RCB159-052011-3	SX83H	SX83H5	06/10/11
13	RCB159-052011-12	SX83I	SX83I5	06/10/11
14	RCB275-052011-0	SX83J	SX83J5	06/10/11
15	RCB275-052011-3	SX83K	SX83K5	06/10/11
16	RCB275-052011-12	SX83L	SX83L5	06/10/11
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FORM IV SV

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS
Page 1 of 2

Sample ID: MB-060111
METHOD BLANK

Lab Sample ID: MB-060111
LIMS ID: 11-11409
Matrix: Sediment
Data Release Authorized:
Reported: 06/14/11

QC Report No: SX83-Seattle Public Utilities
Project: SPU LDW Source Tracing
NA
Date Sampled: NA
Date Received: NA

Date Extracted: 06/01/11
Date Analyzed: 06/10/11 13:49
Instrument/Analyst: NT10/YZ
GPC Cleanup: Yes

Sample Amount: 10.0 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Percent Moisture: NA

CAS Number	Analyte	RL	Result
108-95-2	Phenol	20	< 20 U
111-44-4	Bis-(2-Chloroethyl) Ether	20	< 20 U
95-57-8	2-Chlorophenol	20	< 20 U
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
108-60-1	2,2'-Oxybis(1-Chloropropane)	20	< 20 U
106-44-5	4-Methylphenol	40	< 40 U
621-64-7	N-Nitroso-Di-N-Propylamine	20	< 20 U
67-72-1	Hexachloroethane	20	< 20 U
98-95-3	Nitrobenzene	20	< 20 U
78-59-1	Isophorone	20	< 20 U
88-75-5	2-Nitrophenol	100	< 100 U
105-67-9	2,4-Dimethylphenol	40	< 40 U
65-85-0	Benzoic Acid	400	< 400 U
111-91-1	bis(2-Chloroethoxy) Methane	20	< 20 U
120-83-2	2,4-Dichlorophenol	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	Naphthalene	20	< 20 U
106-47-8	4-Chloroaniline	270	< 270 U
87-68-3	Hexachlorobutadiene	100	< 100 U
59-50-7	4-Chloro-3-methylphenol	100	< 100 U
91-57-6	2-Methylnaphthalene	20	< 20 U
77-47-4	Hexachlorocyclopentadiene	400	< 400 U
88-06-2	2,4,6-Trichlorophenol	100	< 100 U
95-95-4	2,4,5-Trichlorophenol	100	< 100 U
91-58-7	2-Chloronaphthalene	20	< 20 U
88-74-4	2-Nitroaniline	100	< 100 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
99-09-2	3-Nitroaniline	100	< 100 U
83-32-9	Acenaphthene	20	< 20 U
51-28-5	2,4-Dinitrophenol	850	< 850 U
100-02-7	4-Nitrophenol	100	< 100 U
132-64-9	Dibenzofuran	20	< 20 U
606-20-2	2,6-Dinitrotoluene	100	< 100 U
121-14-2	2,4-Dinitrotoluene	100	< 100 U
84-66-2	Diethylphthalate	50	< 50 U
7005-72-3	4-Chlorophenyl-phenylether	20	< 20 U
86-73-7	Fluorene	20	< 20 U
100-01-6	4-Nitroaniline	100	< 100 U
534-52-1	4,6-Dinitro-2-Methylphenol	200	< 200 U

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: MB-060111
METHOD BLANK

Lab Sample ID: MB-060111
LIMS ID: 11-11409
Matrix: Sediment
Date Analyzed: 06/10/11 13:49

QC Report No: SX83-Seattle Public Utilities
Project: SPU LDW Source Tracing
NA

CAS Number	Analyte	RL	Result
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
101-55-3	4-Bromophenyl-phenylether	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	200	< 200 U
85-01-8	Phenanthrene	20	< 20 U
86-74-8	Carbazole	20	< 20 U
120-12-7	Anthracene	20	< 20 U
84-74-2	Di-n-Butylphthalate	20	< 20 U
206-44-0	Fluoranthene	20	< 20 U
129-00-0	Pyrene	20	< 20 U
85-68-7	Butylbenzylphthalate	20	< 20 U
91-94-1	3,3'-Dichlorobenzidine	150	< 150 U
56-55-3	Benzo(a)anthracene	20	< 20 U
117-81-7	**bis(2-Ethylhexyl)phthalate**	**25**	**21 J**
218-01-9	Chrysene	20	< 20 U
117-84-0	Di-n-Octyl phthalate	20	< 20 U
50-32-8	Benzo(a)pyrene	20	< 20 U
193-39-5	Indeno(1,2,3-cd)pyrene	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	20	< 20 U
191-24-2	Benzo(g,h,i)perylene	20	< 20 U
90-12-0	1-Methylnaphthalene	20	< 20 U
TOTBFA	Total Benzofluoranthenes	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	51.6%	2-Fluorobiphenyl	54.4%
d14-p-Terphenyl	74.0%	d4-1,2-Dichlorobenzene	50.6%
d5-Phenol	46.4%	2-Fluorophenol	46.8%
2,4,6-Tribromophenol	56.1%	d4-2-Chlorophenol	48.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD
Page 1 of 1

Sample ID: RCB273-052011-0
SAMPLE

Lab Sample ID: SX83A
LIMS ID: 11-11407
Matrix: Sediment
Data Release Authorized:
Reported: 06/15/11

QC Report No: SX83-Seattle Public Utilities
Project: SPU LDW Source Tracing

Date Sampled: 05/20/11
Date Received: 05/20/11

Date Extracted: 06/01/11
Date Analyzed: 06/11/11 15:24
Instrument/Analyst: ECD7/PKC
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 12.7 g-dry-wt
Final Extract Volume: 12.5 mL
Dilution Factor: 1.00
Silica Gel: Yes

Percent Moisture: 26.5%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	20	< 20 U
53469-21-9	Aroclor 1242	20	< 20 U
12672-29-6	Aroclor 1248	49	< 49 Y
11097-69-1	**Aroclor 1254**	**20**	**140**
11096-82-5	**Aroclor 1260**	**20**	**25**
11104-28-2	Aroclor 1221	20	< 20 U
11141-16-5	Aroclor 1232	20	< 20 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	60.5%
Tetrachlorometaxylene	64.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD
Page 1 of 1

Sample ID: RCB273-052011-3
SAMPLE

Lab Sample ID: SX83B
LIMS ID: 11-11408
Matrix: Sediment
Data Release Authorized:
Reported: 06/15/11

QC Report No: SX83-Seattle Public Utilities
Project: SPU LDW Source Tracing

Date Sampled: 05/20/11
Date Received: 05/20/11

Date Extracted: 06/01/11
Date Analyzed: 06/11/11 15:46
Instrument/Analyst: ECD7/PKC
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 13.5 g-dry-wt
Final Extract Volume: 12.5 mL
Dilution Factor: 1.00
Silica Gel: Yes

Percent Moisture: 19.1%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	19	< 19 U
53469-21-9	Aroclor 1242	19	< 19 U
12672-29-6	Aroclor 1248	19	< 19 U
11097-69-1	**Aroclor 1254**	**19**	**74**
11096-82-5	**Aroclor 1260**	**19**	**27**
11104-28-2	Aroclor 1221	19	< 19 U
11141-16-5	Aroclor 1232	19	< 19 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	89.1%
Tetrachlorometaxylene	83.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD
Page 1 of 1

Sample ID: RCB273-052011-12
SAMPLE

Lab Sample ID: SX83C
LIMS ID: 11-11409
Matrix: Sediment
Data Release Authorized: B
Reported: 06/15/11

QC Report No: SX83-Seattle Public Utilities
Project: SPU LDW Source Tracing

Date Sampled: 05/20/11
Date Received: 05/20/11

Date Extracted: 06/01/11
Date Analyzed: 06/11/11 16:09
Instrument/Analyst: ECD7/PKC
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 12.7 g-dry-wt
Final Extract Volume: 12.5 mL
Dilution Factor: 1.00
Silica Gel: Yes

Percent Moisture: 9.5%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	20	< 20 U
53469-21-9	Aroclor 1242	20	< 20 U
12672-29-6	Aroclor 1248	20	< 20 U
11097-69-1	**Aroclor 1254**	**20**	**22**
11096-82-5	Aroclor 1260	20	< 20 U
11104-28-2	Aroclor 1221	20	< 20 U
11141-16-5	Aroclor 1232	20	< 20 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	77.2%
Tetrachlorometaxylene	79.4%

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ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD
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Sample ID: RCB274-052011-0
SAMPLE

Lab Sample ID: SX83D
LIMS ID: 11-11410
Matrix: Sediment
Data Release Authorized:
Reported: 06/15/11

QC Report No: SX83-Seattle Public Utilities
Project: SPU LDW Source Tracing

Date Sampled: 05/20/11
Date Received: 05/20/11

Date Extracted: 06/01/11
Date Analyzed: 06/11/11 16:32
Instrument/Analyst: ECD7/PKC
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 12.7 g-dry-wt
Final Extract Volume: 12.5 mL
Dilution Factor: 1.00
Silica Gel: Yes

Percent Moisture: 29.4%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	20	< 20 U
53469-21-9	Aroclor 1242	20	< 20 U
12672-29-6	Aroclor 1248	69	< 69 Y
11097-69-1	**Aroclor 1254**	**20**	**220**
11096-82-5	**Aroclor 1260**	**20**	**41**
11104-28-2	Aroclor 1221	20	< 20 U
11141-16-5	Aroclor 1232	20	< 20 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	96.1%
Tetrachlorometaxylene	76.2%

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ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD
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Sample ID: RCB274-052011-3
SAMPLE

Lab Sample ID: SX83E
LIMS ID: 11-11411
Matrix: Sediment
Data Release Authorized:
Reported: 06/15/11

QC Report No: SX83-Seattle Public Utilities
Project: SPU LDW Source Tracing

Date Sampled: 05/20/11
Date Received: 05/20/11

Date Extracted: 06/01/11
Date Analyzed: 06/11/11 16:55
Instrument/Analyst: ECD7/PKC
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 12.9 g-dry-wt
Final Extract Volume: 12.5 mL
Dilution Factor: 1.00
Silica Gel: Yes

Percent Moisture: 16.6%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	19	< 19 U
53469-21-9	Aroclor 1242	19	< 19 U
12672-29-6	Aroclor 1248	19	< 19 U
11097-69-1	**Aroclor 1254**	**19**	**50**
11096-82-5	Aroclor 1260	19	< 19 U
11104-28-2	Aroclor 1221	19	< 19 U
11141-16-5	Aroclor 1232	19	< 19 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	84.1%
Tetrachlorometaxylene	84.1%

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ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD
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Sample ID: RCB274-052011-12
SAMPLE

Lab Sample ID: SX83F
LIMS ID: 11-11412
Matrix: Sediment
Data Release Authorized:
Reported: 06/15/11

QC Report No: SX83-Seattle Public Utilities
Project: SPU LDW Source Tracing

Date Sampled: 05/20/11
Date Received: 05/20/11

Date Extracted: 06/01/11
Date Analyzed: 06/11/11 17:17
Instrument/Analyst: ECD7/PKC
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 13.8 g-dry-wt
Final Extract Volume: 12.5 mL
Dilution Factor: 1.00
Silica Gel: Yes

Percent Moisture: 11.5%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	18	< 18 U
53469-21-9	Aroclor 1242	18	< 18 U
12672-29-6	Aroclor 1248	18	< 18 U
11097-69-1	**Aroclor 1254**	**18**	**21**
11096-82-5	Aroclor 1260	18	< 18 U
11104-28-2	Aroclor 1221	18	< 18 U
11141-16-5	Aroclor 1232	18	< 18 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	73.0%
Tetrachlorometaxylene	73.8%

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SX83:00075

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD
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Sample ID: RCB159-052011-0
SAMPLE

Lab Sample ID: SX83G
LIMS ID: 11-11413
Matrix: Sediment
Data Release Authorized:
Reported: 06/15/11

QC Report No: SX83-Seattle Public Utilities
Project: SPU LDW Source Tracing

Date Sampled: 05/20/11
Date Received: 05/20/11

Date Extracted: 06/01/11
Date Analyzed: 06/11/11 17:40
Instrument/Analyst: ECD7/PKC
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 12.7 g-dry-wt
Final Extract Volume: 12.5 mL
Dilution Factor: 1.00
Silica Gel: Yes

Percent Moisture: 36.8%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	20	< 20 U
53469-21-9	Aroclor 1242	20	< 20 U
12672-29-6	Aroclor 1248	49	< 49 Y
11097-69-1	**Aroclor 1254**	**20**	**130**
11096-82-5	**Aroclor 1260**	**20**	**41**
11104-28-2	Aroclor 1221	20	< 20 U
11141-16-5	Aroclor 1232	20	< 20 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	86.6%
Tetrachlorometaxylene	66.5%

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ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD
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Sample ID: RCB159-052011-3
SAMPLE

Lab Sample ID: SX83H
LIMS ID: 11-11414
Matrix: Sediment
Data Release Authorized:
Reported: 06/15/11

QC Report No: SX83-Seattle Public Utilities
Project: SPU LDW Source Tracing

Date Sampled: 05/20/11
Date Received: 05/20/11

Date Extracted: 06/01/11
Date Analyzed: 06/11/11 18:48
Instrument/Analyst: ECD7/PKC
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 12.7 g-dry-wt
Final Extract Volume: 12.5 mL
Dilution Factor: 1.00
Silica Gel: Yes

Percent Moisture: 42.6%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	20	< 20 U
53469-21-9	Aroclor 1242	20	< 20 U
12672-29-6	Aroclor 1248	30	< 30 Y
11097-69-1	**Aroclor 1254**	**20**	**77**
11096-82-5	**Aroclor 1260**	**20**	**50**
11104-28-2	Aroclor 1221	20	< 20 U
11141-16-5	Aroclor 1232	20	< 20 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	156%
Tetrachlorometaxylene	83.5%

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ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD
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Sample ID: RCB159-052011-12
SAMPLE

Lab Sample ID: SX83I
LIMS ID: 11-11415
Matrix: Sediment
Data Release Authorized:
Reported: 06/15/11

QC Report No: SX83-Seattle Public Utilities
Project: SPU LDW Source Tracing

Date Sampled: 05/20/11
Date Received: 05/20/11

Date Extracted: 06/01/11
Date Analyzed: 06/11/11 19:11
Instrument/Analyst: ECD7/PKC
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 13.6 g-dry-wt
Final Extract Volume: 12.5 mL
Dilution Factor: 1.00
Silica Gel: Yes

Percent Moisture: 23.0%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	18	< 18 U
53469-21-9	Aroclor 1242	18	< 18 U
12672-29-6	Aroclor 1248	18	< 18 U
11097-69-1	**Aroclor 1254**	**18**	**29**
11096-82-5	**Aroclor 1260**	**18**	**29**
11104-28-2	Aroclor 1221	18	< 18 U
11141-16-5	Aroclor 1232	18	< 18 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	111%
Tetrachlorometaxylene	82.4%

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ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD
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Sample ID: RCB275-052011-0
SAMPLE

Lab Sample ID: SX83J
LIMS ID: 11-11416
Matrix: Sediment
Data Release Authorized:
Reported: 06/15/11

QC Report No: SX83-Seattle Public Utilities
Project: SPU LDW Source Tracing

Date Sampled: 05/20/11
Date Received: 05/20/11

Date Extracted: 06/01/11
Date Analyzed: 06/11/11 19:34
Instrument/Analyst: ECD7/PKC
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 12.5 g-dry-wt
Final Extract Volume: 12.5 mL
Dilution Factor: 1.00
Silica Gel: Yes

Percent Moisture: 30.5%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	20	< 20 U
53469-21-9	Aroclor 1242	20	< 20 U
12672-29-6	Aroclor 1248	75	< 75 Y
11097-69-1	**Aroclor 1254**	**20**	**210**
11096-82-5	**Aroclor 1260**	**20**	**70**
11104-28-2	Aroclor 1221	20	< 20 U
11141-16-5	Aroclor 1232	20	< 20 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	64.5%
Tetrachlorometaxylene	72.0%

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ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD
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Sample ID: RCB275-052011-3
SAMPLE

Lab Sample ID: SX83K
LIMS ID: 11-11417
Matrix: Sediment
Data Release Authorized:
Reported: 06/15/11

QC Report No: SX83-Seattle Public Utilities
Project: SPU LDW Source Tracing

Date Sampled: 05/20/11
Date Received: 05/20/11

Date Extracted: 06/01/11
Date Analyzed: 06/11/11 19:57
Instrument/Analyst: ECD7/PKC
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 12.8 g-dry-wt
Final Extract Volume: 12.5 mL
Dilution Factor: 1.00
Silica Gel: Yes

Percent Moisture: 33.3%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	20	< 20 U
53469-21-9	Aroclor 1242	20	< 20 U
12672-29-6	Aroclor 1248	49	< 49 Y
11097-69-1	**Aroclor 1254**	**20**	**120**
11096-82-5	**Aroclor 1260**	**20**	**55**
11104-28-2	Aroclor 1221	20	< 20 U
11141-16-5	Aroclor 1232	20	< 20 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	66.6%
Tetrachlorometaxylene	72.1%

FORM I

SX83:00090

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD
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Sample ID: RCB275-052011-12
SAMPLE

Lab Sample ID: SX83L
LIMS ID: 11-11418
Matrix: Sediment
Data Release Authorized:
Reported: 06/15/11

QC Report No: SX83-Seattle Public Utilities
Project: SPU LDW Source Tracing

Date Sampled: 05/20/11
Date Received: 05/20/11

Date Extracted: 06/01/11
Date Analyzed: 06/11/11 20:19
Instrument/Analyst: ECD7/PKC
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 12.9 g-dry-wt
Final Extract Volume: 12.5 mL
Dilution Factor: 1.00
Silica Gel: Yes

Percent Moisture: 8.3%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	19	< 19 U
53469-21-9	Aroclor 1242	19	< 19 U
12672-29-6	Aroclor 1248	19	< 19 U
11097-69-1	**Aroclor 1254**	**19**	**80**
11096-82-5	**Aroclor 1260**	**19**	**68**
11104-28-2	Aroclor 1221	19	< 19 U
11141-16-5	Aroclor 1232	19	< 19 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	99.9%
Tetrachlorometaxylene	88.2%

FORM I

ANALYTICAL RESOURCES INCORPORATED

SW8082/PCB SOIL/SEDIMENT SURROGATE RECOVERY SUMMARY

Matrix: Sediment

QC Report No: SX83-Seattle Public Utilities
Project: SPU LDW Source Tracing

Client ID	DCBP % REC	DCBP LCL-UCL	TCMX % REC	TCMX LCL-UCL	TOT OUT
RCB273-052011-0	60.5%	30-160	64.2%	30-160	0
RCB273-052011-3	89.1%	30-160	83.2%	30-160	0
RCB273-052011-12	77.2%	30-160	79.4%	30-160	0
RCB274-052011-0	96.1%	30-160	76.2%	30-160	0
RCB274-052011-3	84.1%	30-160	84.1%	30-160	0
RCB274-052011-12	73.0%	30-160	73.8%	30-160	0
RCB159-052011-0	86.6%	30-160	66.5%	30-160	0
RCB159-052011-3	156%	30-160	83.5%	30-160	0
RCB159-052011-12	111%	30-160	82.4%	30-160	0
RCB275-052011-0	64.5%	30-160	72.0%	30-160	0
RCB275-052011-3	66.6%	30-160	72.1%	30-160	0
MB-060111	75.6%	30-160	67.4%	30-160	0
LCS-060111	77.2%	30-160	66.5%	30-160	0
LCSD-060111	76.2%	30-160	67.5%	30-160	0
RCB275-052011-12	99.9%	30-160	88.2%	30-160	0
RCB275-052011-12 MS	104%	30-160	84.8%	30-160	0
RCB275-052011-12 MSD	104%	30-160	84.4%	30-160	0

PSDDA Control Limits
Prep Method: SW3546
Log Number Range: 11-11407 to 11-11418

FORM-II SW8082

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD
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Sample ID: RCB275-052011-12
MS/MSD

Lab Sample ID: SX83L
LIMS ID: 11-11418
Matrix: Sediment
Data Release Authorized:
Reported: 06/15/11

QC Report No: SX83-Seattle Public Utilities
Project: SPU LDW Source Tracing

Date Sampled: 05/20/11
Date Received: 05/20/11

Date Extracted MS/MSD: 06/01/11

Sample Amount MS: 12.9 g-dry-wt
MSD: 12.9 g-dry-wt

Date Analyzed MS: 06/11/11 20:42
MSD: 06/11/11 21:05

Final Extract Volume MS: 12 mL
MSD: 12 mL

Instrument/Analyst MS: ECD7/PKC
MSD: ECD7/PKC

Dilution Factor MS: 1.00
MSD: 1.00

GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Silica Gel: Yes

Percent Moisture: 8.3%

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Aroclor 1016	< 19.4 U	79.2	97.9	80.9%	79.3	97.6	81.2%	0.1%
Aroclor 1260	68.3	140	97.9	73.2%	134	97.6	67.3%	4.4%

Results reported in µg/kg (ppb)
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD
Page 1 of 1

Sample ID: RCB275-052011-12
MATRIX SPIKE

Lab Sample ID: SX83L
LIMS ID: 11-11418
Matrix: Sediment
Data Release Authorized:
Reported: 06/15/11

QC Report No: SX83-Seattle Public Utilities
Project: SPU LDW Source Tracing

Date Sampled: 05/20/11
Date Received: 05/20/11

Date Extracted: 06/01/11
Date Analyzed: 06/11/11 20:42
Instrument/Analyst: ECD7/PKC
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 12.9 g-dry-wt
Final Extract Volume: 12.5 mL
Dilution Factor: 1.00
Silica Gel: Yes

Percent Moisture: 8.3%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	19	---
53469-21-9	Aroclor 1242	19	< 19 U
12672-29-6	Aroclor 1248	19	< 19 U
11097-69-1	**Aroclor 1254**	**19**	**90**
11096-82-5	Aroclor 1260	19	---
11104-28-2	Aroclor 1221	19	< 19 U
11141-16-5	Aroclor 1232	19	< 19 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	104%
Tetrachlorometaxylene	84.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD
Page 1 of 1

Sample ID: RCB275-052011-12
MATRIX SPIKE DUP

Lab Sample ID: SX83L
LIMS ID: 11-11418
Matrix: Sediment
Data Release Authorized:
Reported: 06/15/11

QC Report No: SX83-Seattle Public Utilities
Project: SPU LDW Source Tracing

Date Sampled: 05/20/11
Date Received: 05/20/11

Date Extracted: 06/01/11
Date Analyzed: 06/11/11 21:05
Instrument/Analyst: ECD7/PKC
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 12.9 g-dry-wt
Final Extract Volume: 12.5 mL
Dilution Factor: 1.00
Silica Gel: Yes

Percent Moisture: 8.3%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	19	---
53469-21-9	Aroclor 1242	19	< 19 U
12672-29-6	Aroclor 1248	19	< 19 U
11097-69-1	**Aroclor 1254**	**19**	**88**
11096-82-5	Aroclor 1260	19	---
11104-28-2	Aroclor 1221	19	< 19 U
11141-16-5	Aroclor 1232	19	< 19 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	104%
Tetrachlorometaxylene	84.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD
Page 1 of 1

Sample ID: LCS-060111
LCS/LCSD

Lab Sample ID: LCS-060111
LIMS ID: 11-11418
Matrix: Sediment
Data Release Authorized:
Reported: 06/15/11

QC Report No: SX83-Seattle Public Utilities
Project: SPU LDW Source Tracing

Date Sampled: NA
Date Received: NA

Date Extracted LCS/LCSD: 06/01/11

Date Analyzed LCS: 06/11/11 13:53
LCSD: 06/11/11 14:15
Instrument/Analyst LCS: ECD7/PKC
LCSD: ECD7/PKC
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount LCS: 12.5 g-dry-wt
LCSD: 12.5 g-dry-wt
Final Extract Volume LCS: 12.5 mL
LCSD: 12.5 mL
Dilution Factor LCS: 1.00
LCSD: 1.00
Silica Gel: Yes

Percent Moisture: NA

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Aroclor 1016	86.8	101	85.9%	87.0	101	86.1%	0.2%
Aroclor 1260	95.1	101	94.2%	92.5	101	91.6%	2.8%

PCB Surrogate Recovery

	LCS	LCSD
Decachlorobiphenyl	77.2%	76.2%
Tetrachlorometaxylene	66.5%	67.5%

Results reported in µg/kg (ppb)
RPD calculated using sample concentrations per SW846.

PCB METHOD BLANK SUMMARY

BLANK NO.

SX83MBS1

Lab Name: ANALYTICAL RESOURCES INC

Client: SPU

ARI Job No.: SX83

Project: SPU LDW SOURCE TRACI

Lab Sample ID: SX83MBS1

Lab File ID: 0609A122

Date Extracted: 06/01/11

Matrix: SOLID

Date Analyzed: 06/11/11

Instrument ID: ECD7

Time Analyzed: 1330

GC Columns: ZB5/ZB35

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED
01	SX83LCSS1	SX83LCSS1	06/11/11
02	SX83LCSDS1	SX83LCSDS1	06/11/11
03	RCB273-052011-0	SX83A	06/11/11
04	RCB273-052011-3	SX83B	06/11/11
05	RCB273-052011-12	SX83C	06/11/11
06	RCB274-052011-0	SX83D	06/11/11
07	RCB274-052011-3	SX83E	06/11/11
08	RCB274-052011-12	SX83F	06/11/11
09	RCB159-052011-0	SX83G	06/11/11
10	RCB159-052011-3	SX83H	06/11/11
11	RCB159-052011-12	SX83I	06/11/11
12	RCB275-052011-0	SX83J	06/11/11
13	RCB275-052011-3	SX83K	06/11/11
14	RCB275-052011-12	SX83L	06/11/11
15	RCB275-052011-1 MS	SX83LMS	06/11/11
16	RCB275-052011-1 MSD	SX83LMSD	06/11/11

ALL RUNS ARE DUAL COLUMN

FORM IV PCB

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD
Page 1 of 1

Sample ID: MB-060111
METHOD BLANK

Lab Sample ID: MB-060111
LIMS ID: 11-11418
Matrix: Sediment
Data Release Authorized:
Reported: 06/15/11

QC Report No: SX83-Seattle Public Utilities
Project: SPU LDW Source Tracing

Date Sampled: NA
Date Received: NA

Date Extracted: 06/01/11
Date Analyzed: 06/11/11 13:30
Instrument/Analyst: ECD7/PKC
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 12.5 g
Final Extract Volume: 12.5 mL
Dilution Factor: 1.00
Silica Gel: Yes

Percent Moisture: NA

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	20	< 20 U
53469-21-9	Aroclor 1242	20	< 20 U
12672-29-6	Aroclor 1248	20	< 20 U
11097-69-1	Aroclor 1254	20	< 20 U
11096-82-5	Aroclor 1260	20	< 20 U
11104-28-2	Aroclor 1221	20	< 20 U
11141-16-5	Aroclor 1232	20	< 20 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	75.6%
Tetrachlorometaxylene	67.4%

FORM I

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD by GC/FID-Silica and Acid Cleaned
Page 1 of 2
Matrix: Sediment

QC Report No: SX83-Seattle Public Utilities
Project: SPU LDW Source Tracing

Data Release Authorized: MW
Reported: 06/10/11

ARI ID	Sample ID	Extraction Date	Analysis Date	EFV DL	Range	RL	Result
SX83A	RCB273-052011-0	05/31/11	06/07/11	10.0	Diesel	67	< 67 U
11-11407	HC ID: **MOTOR OIL**		FID9	1.0	**Motor Oil**	**130**	**340**
					o-Terphenyl		88.6%
SX83B	RCB273-052011-3	05/31/11	06/07/11	10.0	Diesel	61	< 61 U
11-11408	HC ID: **MOTOR OIL**		FID9	1.0	**Motor Oil**	**120**	**250**
					o-Terphenyl		90.0%
SX83C	RCB273-052011-12	05/31/11	06/07/11	10.0	Diesel	55	< 55 U
11-11409	HC ID: ---		FID9	1.0	Motor Oil	110	< 110 U
					o-Terphenyl		91.0%
SX83D	RCB274-052011-0	05/31/11	06/07/11	10.0	Diesel	69	< 69 U
11-11410	HC ID: **MOTOR OIL**		FID9	1.0	**Motor Oil**	**140**	**550**
					o-Terphenyl		85.5%
SX83E	RCB274-052011-3	05/31/11	06/07/11	10.0	Diesel	59	< 59 U
11-11411	HC ID: **MOTOR OIL**		FID9	1.0	**Motor Oil**	**120**	**120**
					o-Terphenyl		83.5%
SX83F	RCB274-052011-12	05/31/11	06/07/11	10.0	Diesel	55	< 55 U
11-11412	HC ID: ---		FID9	1.0	Motor Oil	110	< 110 U
					o-Terphenyl		91.6%
SX83G	RCB159-052011-0	05/31/11	06/07/11	10.0	**Diesel**	**78**	**220**
11-11413	HC ID: **DRO/MOTOR OIL**		FID9	1.0	**Motor Oil**	**160**	**1500**
					o-Terphenyl		89.7%
SX83H	RCB159-052011-3	05/31/11	06/07/11	10.0	**Diesel**	**86**	**230**
11-11414	HC ID: **DRO/MOTOR OIL**		FID9	1.0	**Motor Oil**	**170**	**1900**
					o-Terphenyl		88.6%
SX83I	RCB159-052011-12	05/31/11	06/07/11	10.0	Diesel	63	< 63 U
11-11415	HC ID: **MOTOR OIL**		FID9	1.0	**Motor Oil**	**130**	**420**
					o-Terphenyl		88.3%
SX83J	RCB275-052011-0	05/31/11	06/07/11	10.0	**Diesel**	**71**	**510**
11-11416	HC ID: **DRO/MOTOR OIL**		FID9	1.0	**Motor Oil**	**140**	**3700**
					o-Terphenyl		88.5%
SX83K	RCB275-052011-3	05/31/11	06/07/11	10.0	**Diesel**	**73**	**560**
11-11417	HC ID: **DRO/MOTOR OIL**		FID9	1.0	**Motor Oil**	**150**	**2900**
					o-Terphenyl		90.2%
MB-053111	Method Blank	05/31/11	06/07/11	10.0	Diesel	50	< 50 U
11-11418	HC ID: ---		FID9	1.0	Motor Oil	100	< 100 U
					o-Terphenyl		96.2%
SX83L	RCB275-052011-12	05/31/11	06/08/11	10.0	**Diesel**	**54**	**160**
11-11418	HC ID: **DRO/MOTOR OIL**		FID9	1.0	**Motor Oil**	**110**	**610**
					o-Terphenyl		94.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD by GC/FID-Silica and Acid Cleaned
Page 2 of 2
Matrix: Sediment

QC Report No: SX83-Seattle Public Utilities
Project: SPU LDW Source Tracing

Data Release Authorized:
Reported: 06/10/11

ARI ID	Sample ID	Extraction Date	Analysis Date	EFV DL	Range	RL	Result

Reported in mg/kg (ppm)

EFV-Effective Final Volume in mL.
DL-Dilution of extract prior to analysis.
RL-Reporting limit.

Diesel quantitation on total peaks in the range from C12 to C24.
Motor Oil quantitation on total peaks in the range from C24 to C38.
HC ID: DRO/RRO indicate results of organics or additional hydrocarbons in ranges are not identifiable.

ANALYTICAL RESOURCES INCORPORATED

CLEANED TPHD SURROGATE RECOVERY SUMMARY

Matrix: Sediment

QC Report No: SX83-Seattle Public Utilities
Project: SPU LDW Source Tracing

Client ID	OTER	TOT OUT
RCB273-052011-0	88.6%	0
RCB273-052011-3	90.0%	0
RCB273-052011-12	91.0%	0
RCB274-052011-0	85.5%	0
RCB274-052011-3	83.5%	0
RCB274-052011-12	91.6%	0
RCB159-052011-0	89.7%	0
RCB159-052011-3	88.6%	0
RCB159-052011-12	88.3%	0
RCB275-052011-0	88.5%	0
RCB275-052011-3	90.2%	0
MB-053111	96.2%	0
LCS-053111	104%	0
RCB275-052011-12	94.6%	0
RCB275-052011-12 MS	106%	0
RCB275-052011-12 MSD	98.8%	0

	LCS/MB LIMITS	QC LIMITS
(OTER) = o-Terphenyl	(59-134)	(43-137)

Prep Method: SW3546
Log Number Range: 11-11407 to 11-11418

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
NWTPHD by GC/FID-Silica and Acid Cleaned **Sample ID: RCB275-052011-12**
Page 1 of 1 **MS/MSD**

Lab Sample ID: SX83L
LIMS ID: 11-11418
Matrix: Sediment
Data Release Authorized:
Reported: 06/10/11

QC Report No: SX83-Seattle Public Utilities
Project: SPU LDW Source Tracing

Date Sampled: 05/20/11
Date Received: 05/20/11

Date Extracted MS/MSD: 05/31/11

Date Analyzed MS: 06/08/11 00:37
MSD: 06/08/11 00:59
Instrument/Analyst MS: FID/MS
MSD: FID/MS

Sample Amount MS: 9.26 g-dry-wt
MSD: 9.26 g-dry-wt
Final Extract Volume MS: 10 mL
MSD: 10 mL
Dilution Factor MS: 1.0
MSD: 1.0
Percent Moisture: 8.3%

Range	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Diesel	157	1510	1620	83.5%	1530	1620	84.8%	1.3%

TPHD Surrogate Recovery

	MS	MSD
o-Terphenyl	106%	98.8%

Results reported in mg/kg
RPD calculated using sample concentrations per SW846.

SAMPLE RESULTS-CONVENTIONALS
SX83-Seattle Public Utilities

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 06/13/11

Project: SPU LDW Source Tracing
Event: NA
Date Sampled: 05/20/11
Date Received: 05/20/11

Client ID: RCB273-052011-0
ARI ID: 11-11407 SX83A

Analyte	Date	Method	Units	RL	Sample
Total Solids	05/26/11 052611#1	EPA 160.3	Percent	0.01	66.70
Total Organic Carbon	06/08/11 060811#1	Plumb,1981	Percent	0.200	5.66

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
SX83-Seattle Public Utilities

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 06/13/11

Project: SPU LDW Source Tracing
Event: NA
Date Sampled: 05/20/11
Date Received: 05/20/11

Client ID: RCB273-052011-3
ARI ID: 11-11408 SX83B

Analyte	Date	Method	Units	RL	Sample
Total Solids	05/26/11 052611#1	EPA 160.3	Percent	0.01	81.10
Total Organic Carbon	06/08/11 060811#1	Plumb,1981	Percent	0.222	6.99

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
SX83-Seattle Public Utilities

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 06/13/11

Project: SPU LDW Source Tracing
Event: NA
Date Sampled: 05/20/11
Date Received: 05/20/11

Client ID: RCB273-052011-12
ARI ID: 11-11409 SX83C

Analyte	Date	Method	Units	RL	Sample
Total Solids	05/26/11 052611#1	EPA 160.3	Percent	0.01	91.90
Total Organic Carbon	06/08/11 060811#1	Plumb,1981	Percent	0.020	1.04

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
SX83-Seattle Public Utilities

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 06/13/11

Project: SPU LDW Source Tracing
Event: NA
Date Sampled: 05/20/11
Date Received: 05/20/11

Client ID: RCB274-052011-0
ARI ID: 11-11410 SX83D

Analyte	Date	Method	Units	RL	Sample
Total Solids	05/26/11 052611#1	EPA 160.3	Percent	0.01	69.10
Total Organic Carbon	06/08/11 060811#1	Plumb,1981	Percent	0.020	6.05

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
SX83-Seattle Public Utilities

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 06/13/11

Project: SPU LDW Source Tracing
Event: NA
Date Sampled: 05/20/11
Date Received: 05/20/11

Client ID: RCB274-052011-3
ARI ID: 11-11411 SX83E

Analyte	Date	Method	Units	RL	Sample
Total Solids	05/26/11 052611#1	EPA 160.3	Percent	0.01	78.00
Total Organic Carbon	06/08/11 060811#1	Plumb,1981	Percent	0.020	4.00

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
SX83-Seattle Public Utilities

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 06/13/11

Project: SPU LDW Source Tracing
Event: NA
Date Sampled: 05/20/11
Date Received: 05/20/11

Client ID: RCB274-052011-12
ARI ID: 11-11412 SX83F

Analyte	Date	Method	Units	RL	Sample
Total Solids	05/26/11 052611#1	EPA 160.3	Percent	0.01	89.50
Total Organic Carbon	06/08/11 060811#1	Plumb,1981	Percent	0.020	4.57

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
SX83-Seattle Public Utilities

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 06/13/11

Project: SPU LDW Source Tracing
Event: NA
Date Sampled: 05/20/11
Date Received: 05/20/11

Client ID: RCB159-052011-0
ARI ID: 11-11413 SX83G

Analyte	Date	Method	Units	RL	Sample
Total Solids	05/26/11 052611#1	EPA 160.3	Percent	0.01	59.00
Total Organic Carbon	06/08/11 060811#1	Plumb,1981	Percent	0.020	11.9

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
SX83-Seattle Public Utilities

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 06/13/11

Project: SPU LDW Source Tracing
Event: NA
Date Sampled: 05/20/11
Date Received: 05/20/11

Client ID: RCB159-052011-3
ARI ID: 11-11414 SX83H

Analyte	Date	Method	Units	RL	Sample
Total Solids	05/26/11 052611#1	EPA 160.3	Percent	0.01	62.30
Total Organic Carbon	06/08/11 060811#1	Plumb,1981	Percent	0.020	9.24

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
SX83-Seattle Public Utilities

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 06/13/11

Project: SPU LDW Source Tracing
Event: NA
Date Sampled: 05/20/11
Date Received: 05/20/11

Client ID: RCB159-052011-12
ARI ID: 11-11415 SX83I

Analyte	Date	Method	Units	RL	Sample
Total Solids	05/26/11 052611#1	EPA 160.3	Percent	0.01	74.40
Total Organic Carbon	06/08/11 060811#1	Plumb,1981	Percent	0.020	2.33

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
SX83-Seattle Public Utilities

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 06/13/11

Project: SPU LDW Source Tracing
Event: NA
Date Sampled: 05/20/11
Date Received: 05/20/11

Client ID: RCB275-052011-0
ARI ID: 11-11416 SX83J

Analyte	Date	Method	Units	RL	Sample
Total Solids	05/26/11 052611#1	EPA 160.3	Percent	0.01	78.40
Total Organic Carbon	06/08/11 060811#1	Plumb,1981	Percent	0.020	10.1

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
SX83-Seattle Public Utilities

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 06/13/11

Project: SPU LDW Source Tracing
Event: NA
Date Sampled: 05/20/11
Date Received: 05/20/11

Client ID: RCB275-052011-3
ARI ID: 11-11417 SX83K

Analyte	Date	Method	Units	RL	Sample
Total Solids	05/26/11 052611#1	EPA 160.3	Percent	0.01	67.30
Total Organic Carbon	06/08/11 060811#1	Plumb,1981	Percent	0.020	11.9

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
SX83-Seattle Public Utilities

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 06/13/11

Project: SPU LDW Source Tracing
Event: NA
Date Sampled: 05/20/11
Date Received: 05/20/11

Client ID: RCB275-052011-12
ARI ID: 11-11418 SX83L

Analyte	Date	Method	Units	RL	Sample
Total Solids	05/26/11 052611#1	EPA 160.3	Percent	0.01	91.10
Total Organic Carbon	06/08/11 060811#1	Plumb,1981	Percent	0.020	2.29

RL Analytical reporting limit
U *Undetected at reported detection limit*

MS/MSD RESULTS-CONVENTIONALS
SX83-Seattle Public Utilities

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 06/13/11

Project: SPU LDW Source Tracing
Event: NA
Date Sampled: 05/20/11
Date Received: 05/20/11

Analyte	Date	Units	Sample	Spike	Spike Added	Recovery
ARI ID: SX83A Client ID: RCB273-052011-0						
Total Organic Carbon	06/08/11	Percent	5.66	47.0	35.4	116.7%

REPLICATE RESULTS-CONVENTIONALS
SX83-Seattle Public Utilities

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 06/13/11

Project: SPU LDW Source Tracing
Event: NA
Date Sampled: 05/20/11
Date Received: 05/20/11

Analyte	Date	Units	Sample	Replicate(s)	RPD/RSD
ARI ID: SX83A Client ID: RCB273-052011-0					
Total Solids	05/26/11	Percent	66.70	66.70 65.10	1.4%
Total Organic Carbon	06/08/11	Percent	5.66	5.04 7.22	18.8%

LAB CONTROL RESULTS-CONVENTIONALS
SX83-Seattle Public Utilities

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 06/13/11

Project: SPU LDW Source Tracing
Event: NA
Date Sampled: NA
Date Received: NA

Analyte/Method	QC ID	Date	Units	LCS	Spike Added	Recovery
Total Organic Carbon Plumb,1981	ICVL	06/08/11	Percent	0.104	0.100	104.0%

METHOD BLANK RESULTS-CONVENTIONALS
SX83-Seattle Public Utilities

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 06/13/11

Project: SPU LDW Source Tracing
Event: NA
Date Sampled: NA
Date Received: NA

Analyte	Date	Units	Blank
Total Solids	05/26/11	Percent	< 0.01 U
Total Organic Carbon	06/08/11	Percent	< 0.020 U

STANDARD REFERENCE RESULTS-CONVENTIONALS
SX83-Seattle Public Utilities

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 06/13/11

Project: SPU LDW Source Tracing
Event: NA
Date Sampled: NA
Date Received: NA

Analyte/SRM ID	Date	Units	SRM	True Value	Recovery
Total Organic Carbon NIST 1941B	06/08/11	Percent	3.02	2.99	101.0%

From: Anderson, Jennifer
To: "thomm@epi-wa.com"
Cc: Meehan, Maureen; Schmoyer, Beth; Minas, Yohannes
Subject: Marine Lumber
Date: Friday, August 03, 2012 10:00:00 AM

Thom,

Thank you for meeting with Yohannes, Beth and myself on Monday to discuss our comments on the Remedial Action Work Plan (RAWP) that was submitted with your street use permit. The RAWP describes activities to remove arsenic, copper and zinc contaminated soils within the right of way to comply with Ecology Order 8862. The workplan describes the limited removal of soil within a 100 foot by 10 foot area that runs the length of the southern property boundary. No excavation activities are planned beyond this area.

The City agrees with the overall approach presented in the workplan, however, we disagree with limiting excavation activities to a pre-designated area. We requested in our comments that excavation activities proceed until contaminants are removed to cleanup levels even if this requires extending the excavation to the street and adjacent property frontage. Under MTCA Marine Lumber Services (MLS) is responsible for any contamination that originated from its site and has come to be located in the right of way ("ROW"). Therefore, any such contamination originating from MLS property and left in the ROW will ultimately be MLS's responsibility to remediate, and the City does not waive any of its rights or claims that it may have regarding such contamination.

In addition, MTCA requires that the City formally report the finding of contamination in the right of way to Ecology's toxics cleanup program and the City will be issuing notification promptly.

We also request the following for the project;

1. MLS will provide SDOT with access to the work area at any time MLS is conducting remedial activities in right of way.

2. MLS shall give at least 3 days notice to SDOT prior to collecting any samples in the right of way and shall provide SDOT with opportunity to collect split samples, duplicates or its own samples.

3. The City (SDOT and SPU) shall be copied on reports documenting the clean up activities in the right of way including documentation of the proper disposal of excavated soils and/or other waste materials.

4. Copies of analytical data for waste characterization, soil characterization protocol, manifests and any other documentation that supports the disposal of contaminated materials shall be provided to SDOT no later than 30 days after completion of the remedial action.

5. The excavation should be lined with geotextile fabric to prevent infiltration of fines from the excavation margins and overlying fill from entering the ballast material.

7. As we have communicated to you previously, once the cleanup is completed, the City does not intend to accept restrictions to right of way, such as the placement of an environmental covenant.

Please contact Yohannes for additional information regarding the issuance of your Street Use permit. If you have any questions or would like to discuss the conditions in further detail, please don't hesitate to contact me.

Thanks and have a great weekend,

Jennifer

JENNIFER S. ANDERSON
Sr. Environmental Analyst
Seattle Department of Transportation
Capital Projects & Roadway Structures Division
700 Fifth Avenue, Suite 3900
PO Box 34996
Seattle, WA 98124-4996

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http://www.seattle.gov

ENVIRONMENTAL PARTNERS INC

Remedial Action Work Plan - Marine Lumber Service South Yard

City of Seattle Right-of-Way
Northeast Corner of 5th Ave S. and S. Monroe St.
Seattle, Washington 98108

Prepared For:

Mr. Todd Marker
Marine Lumber Service, Inc.
525 S. Chicago St.
Seattle, WA 98108

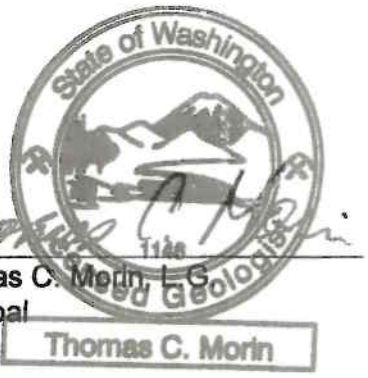
June 29, 2012

Prepared By:

Environmental Partners, Inc.
295 N.E. Gilman Blvd., Suite 201
Issaquah, Washington 98027
(425) 395-0010

Adam Morine, P.E.
Senior Engineer

Thomas C. Morin, L.G.
Principal



Project Number: 59401.3

TABLE OF CONTENTS

1.0 INTRODUCTION

Environmental Partners, Inc. (EPI) is pleased to submit this Remedial Action Work Plan (RAWP) for an area immediately south of the Marine Lumber Service (MLS) South Yard. The South Yard is covered under the Washington Department of Ecology Industrial Stormwater General Permit (ISGP) No. WAR011741B. Ecology issued Amended Administrative Order No. 8862 to MLS. In a subsequent Settlement Agreement, dated April 10, 2012 between Ecology and MLS, Ecology required that MLS provide the Seattle Department of Transportation (SDOT) with a RAWP by June 30, 2012 for cleanup of copper, zinc and arsenic on the north side of South Monroe Street approximately 100 feet east of 5th Avenue S. This RAWP is being provided to SDOT in fulfillment of that requirement.

MLS stored lumber treated with inorganic compounds at the South Yard. Ecology concluded those inorganic compounds impacted shallow soils immediately south of the South Yard property boundary. The RAWP documented herein is intended to serve as an Independent Cleanup that fully addresses copper, zinc, and arsenic impacts in a manner consistent with the Model Toxics Control Act (RCW 70.105D) and its implementing regulation (WAC 173-340) (collectively MTCA).

The MLS South Yard remedial action includes a cleanup action for soil located in the Seattle Department of Transportation (SDOT) Right-of-Way (ROW) at the northeast corner of South Monroe Street and 5th Avenue South, in Seattle, Washington (Figures 1 and 2) (Area of Concern). The Area of Concern is directly adjacent to the south end of the MLS South Yard (Figures 2 and 3).

In preparation of this RAWP, EPI met with representatives of the City of Seattle, Seattle Public Utilities, and Ecology at the South Yard. EPI understands that the City of Seattle will review the RAWP coincident with MLS' application for a street use permit to implement the RAWP. A street use permit is required because MLS does not control the impacted areas and can only undertake the RAWP with the consent of the landowner, the City of Seattle.

This RAWP presents the objectives, methodology, and technical approach for conducting a cleanup action to address the impacts to shallow soil within the Area of Concern. This remedial action will be conducted as an Independent Cleanup in accordance with WAC 173-340.

The objectives of this RAWP are to:

- Provide an overview of the history of the South Yard, investigative activities, and findings within the Area of Concern.
- Provide a description of the methodology and technical basis for the proposed soil remediation within the Area of Concern;
- Provide a detailed description of the individual components of the cleanup action and how they will be conducted; and
- Provide a general description of the compliance monitoring approach.

1.1 Background

The South Yard has been used by MLS for storage of both treated and untreated lumber since the 1980s, and it is entirely covered with asphalt. The treated lumber was treated with the preservative Ammoniacal Copper Zinc Arsenate (ACZA), also known by its trade name, Chemonite. The preservative was applied off-site by the Conrad Forest Products Company of North Bend, Oregon. The chemical application contains a 2:1:1 ratio of copper oxide, zinc oxide, and arsenic pentoxide, respectively. Uncovered lumber appears to have leached ACZA and, via surface water runoff, has impacted surface soils immediately south of the South Yard.

Sources for the stormwater included stormwater falling directly onto the yard and stormwater flowing onto the yard from 5th Avenue to the west and South Kenyon Street to the north. The stormwater flows southeast across the South Yard and exits the South Yard into the gravel ROW on the north side of South Monroe Street. South Monroe Street is also gravel covered.

In 2009, Seattle Public Utilities (SPU) collected soil samples at the surface, 0-3 inches below ground surface (bgs), and at 12 inches bgs within the Area of Concern. The analytical results indicated that concentrations for arsenic, copper, and zinc were above potentially applicable cleanup levels immediately south of the South Yard. Table 1 below summarizes the sample designation and analytical results for the samples collected in this area. The sample locations are indicated on Figure 3.

No treated lumber is currently stored at the South Yard and MLS has modified its Stormwater Pollution Prevention Plan (SWPPP) accordingly. The surface of the South Yard has been pressure washed and has been resealed with an asphaltic sealant. Any impacts to the Area of Concern that historically resulted from treated lumber storage on the South Yard cannot reoccur.

1.2 Work Plan Organization

The remaining sections of this Work Plan are organized as follows:

- Section 2.0 provides a description of the site conditions including COCs and applicable cleanup levels;
- Section 3.0 provides a description of the methodology and technical basis for implementation of the selected remedial alternative;
- Section 4.0 provides a detailed description of the individual components of the remedial alternative; and,
- Section 5.0 provides the limitations to this RAWP.

2.0 SITE CONDITIONS

The media of concern is the top one-foot of shallow soil. Surface conditions at the Area of Concern generally consist of 6 inches of loose gravel and interstitial silt which overlays more densely compacted gravel and soil fill. Stormwater generally infiltrates into the gravels within the Area of Concern during storm events. During high intensity storm events water can pond in the Area of Concern.

For purposes of this RAWP, the potential exposure pathways in the Area of Concern are surface water (stormwater) with potential aquatic exposure and direct contact with soils. The aquatic exposure by stormwater is addressed through compliance with the ISGP. Surface water exposures are not discussed further in this RAWP.

Potential and direct exposure within the Area of Concern will be addressed through direct excavation of impacted soil to an appropriate cleanup level and replacement of those soils with an appropriate uncontaminated fill material.

2.1 Detected Contaminants and Selected Cleanup Levels

Sampling performed by SPU indicated that the surface soils within the Area of Concern have been impacted by arsenic, copper, and zinc. For the purposes of this RAWP, the contaminants of concern (COCs) for the Area of Concern are arsenic, copper, and zinc. Table 1 below presents a summary of the sample names, the depths at which the samples were collected, the concentrations of the target analytes at locations within the Area of Concern and a comparison to potentially applicable cleanup levels for those constituents in soils. The analytical data were provided to EPI in a letter from Mr. Brian Robinson of SPU entitled: *Results from the Environmental Compliance Inspection: Corrective Actions Required*, dated April 15, 2009. Figure 3 depicts the City's sample locations within the Area of Concern.

Table 1
Summary of Maximum Detected COCs and Potentially Applicable Cleanup Standards (mg/kg)
Marine Lumber Services, Inc. – South Yard, Seattle, WA

Sample No.	Depth (inches)	Arsenic	Copper	Zinc
RCB159-0	0	**474**	**3,240**	825
RCB159-3	3	**950**	**8,370**	1,660
RCB159-12	12	**260**	2,110	594
RCB273-0	0	**214**	417	463
RCB273-3	3	**210**	232	341
RCB273-12	12	22	26	55
MTCA Method A Soil Cleanup Level for Unrestricted Land Uses	--	20	--	--
MTCA Method B(a)	--	--	3,200	24,000

Bold indicates concentration is above a MTCA Method A or Method B cleanup level.

(a) – Based on protection from direct exposure under a residential use scenario.

The selected cleanup levels for the RAWP are a combination of the MTCA Method A and B Soil Cleanup Levels. The use of these cleanup levels is highly conservative for the following reasons:

- The Area of Concern is located within a public ROW in a heavily industrialized area. Industrial Soil cleanup levels could be applied to the remedial action but the residential use cleanup levels have been selected.
- The Area of Concern is a significant distance from surface water and the Area of Concern is required to be in compliance with the ISGP.

The selected cleanup levels are:

- Arsenic – 20 mg/kg
- Copper – 3,200 mg/kg
- Zinc – 24,000 mg/kg

3.0 METHODOLOGY

The selected remedial alternative for the Area of Concern includes direct excavation of impacted soil with off-site disposal. The selection of this remedial alternative is based on the following:

- The likely depth and lateral extent of COCs is limited;
- The COCs are shallow and readily accessible to direct excavation; and
- Excavation is practicable, highly effective, and its effectiveness is quantifiable through direct sampling.

Implementation of this remedial strategy will include the following elements:

- Review and comment of this RAWP by the City of Seattle, with a copy provided to Ecology;
- Obtaining a Street Use Permit from the Seattle Department of Transportation (SDOT) for performing the work within the ROW;
- Excavation and off-site disposal of soil containing COCs at concentrations above the applicable cleanup levels, performance and confirmational sampling within the Area of Concern and analysis to demonstrate attainment of the cleanup levels within the Area of Concern;
- Site restoration; and,
- Preparation and submittal of a report and the City of Seattle upon attainment of cleanup levels at the point(s) of compliance for affected media.

The soil excavation will take place along the south end of the South Yard in the ROW of South Monroe Street at the location indicated on Figure 3. The excavation will start at the south fence of the South Yard and extend south approximately 10 feet south into the ROW. The depth of excavation is expected to be approximately 12 to 24 inches below the elevation of the northern edge of the roadway.

The limits of practicability for the removal of soil with concentrations exceeding their respective cleanup levels within the proposed excavation area are primarily defined by the South Yard fence line to the north, the MLS eastern property boundary of the South Yard to the east, South Monroe Street to the south, and the 5th Ave S. ROW to the west (Figure 3).

No excavation will be conducted within the City of Seattle Street. It may be necessary to widen the remedial excavation to the north onto the MLS property based on performance sampling and geotechnical considerations. The Area of Concern previously contained City of Seattle street trees. The root structure for those trees has damaged the MLS pavement and MLS may take the opportunity of the RAWP implementation to remove the roots and resurface the southern portion of its property.

4.0 TECHNICAL APPROACH

The following sections provide detailed descriptions of the activities that will be completed during the soil remediation at the subject property.

4.1 Permitting

The remediation project will be permitted by the City of Seattle. A Street Use Permit will be obtained for this project. The anticipated area impacted by the excavation activities within the ROW is approximately 10 feet wide by 100 feet long, or about 1,000 square feet. Prior to excavation, the area of concern will be surveyed to determine the exact location of the ROW. The excavation will be barricaded and a traffic control plan will be prepared and implemented as part of the SDOT Street Use Permit.

There are no permits required for off-site disposal of contaminated soil. However, prior to excavation, soil samples will be collected and profiled for transportation of the material to an off-site disposal facility. Transportation activities will comply with the requirements of the Washington Department of Transportation.

The work hours and hauling periods will comply with the Street Use Permit and the project will comply with requirements for street cleaning, truck cleaning, or scaling as applicable, prior to transport.

While no permits are required for worker health and safety issues, on-site activities involving the handling of contaminated soil must comply with the provisions of the Washington Industrial Safety and Health Act (WISHA) and the Code of Federal Regulations (CFR) subpart 1910.120 that governs Hazardous Waste Operations and Emergency Response (HAZWOPER). Occupational exposures by on-site workers will be monitored as a component of on-site Health and Safety monitoring. A site-specific Health and Safety Plan will be prepared and reviewed by all site workers prior to the beginning of work. Based on the information available to date, the excavated soils are not anticipated to be hazardous.

4.2 Site Preparation

Prior to any excavation, site preparation will be necessary. Site preparation activities will comply with the requirements of the SDOT Street Use Permit and will be subject to periodic inspection by City personnel. The Street Use Permit may require such items as traffic control, signage, protective fencing, limiting ingress and egress, and protection of catch basins from runoff.

The One-Call public utility locating service will be contacted at least 48 hours prior to the beginning of the excavation activities to check for subsurface public utilities. In addition, a private utility locating service will be utilized to check for private utilities.

4.3 Excavation and Soil Handling

Prior to excavation a total of four soil samples will be collected from the Area of Concern and submitted for analysis of arsenic, copper, and zinc and other specific analyses required by the selected disposal facility. Those analytical results will be used for preapproval of the excavation soils by the waste disposal facility prior to beginning excavation. All soil disposal will be in accordance with applicable regulations and with the acceptance criteria of the selected disposal facility.

Excavation will be performed primarily using a small track-mounted excavator. Other equipment may include rubber-tired backhoes, front-end loaders, vibratory rollers, or other machinery appropriate to project circumstances for excavation and backfilling. Soils will be direct-loaded into either roll-off bins or trucks and transported to the approved disposal facility. If necessary, water will be used for dust suppression. It is not anticipated that ground water will be encountered during the remedial activities.

The expected excavation area, shown in Figure 3, is rectangular in shape encompassing about 1,000 square feet. The planned excavation depth is approximately 24 inches deep. The total excavation volume is expected to be approximately 75 cubic yards. The actual limit of vertical remedial excavation will be determined through compliance sampling and those limits will be documented and presented in a report documenting the results of the remedial actions. At no point will the lateral extent of the excavation extend into the City streets.

The excavation will be barricaded and secured overnight while awaiting analytical results from the fixed base laboratory for the performance samples. Other requirements for site security that may be contained within the Right of Way or Street Use permits will also be met.

4.4 Compliance Monitoring

Compliance monitoring is intended to fulfill the requirements of Sections 410, 740, 810, and 820 of the MTCA Cleanup Regulations (WAC 173-340). The following sections present the activities that will be performed for the components of compliance monitoring during implementation of the remedial activities.

4.4.1 Protection Monitoring

Protection monitoring is intended to confirm that human health and the environment are protected during implementation of the remedial action (WAC 173-340-410(a)). Protection monitoring of human health will be performed through the implementation of a Health and Safety Plan (HASP) prepared in accordance with the requirements of the Occupational Safety and Health Administration (OSHA) and the WISHA standards for hazardous waste site operations (29 CFR 1910.120 and WAC 296-62 Part P). The HASP will pertain only to those activities relating to handling and management of contaminated soils and related hazards, and will have no relation to any other phases of the project.

The HASP will establish the general health and safety practices for EPI personnel performing the remedial action and will be provided to the on-site contractors for their information. EPI will not be responsible for the health and safety of other on-site personnel. EPI is not the general contractor for

this project and does not control the jobsite. However, EPI will be available to advise other on-site workers on the health and safety measures that EPI personnel will be using. EPI will share all of its monitoring data and will advise other workers when EPI personnel are upgrading or modifying their level of personal protective equipment (PPE). The HASP will also be provided to subcontractor personnel for informational purposes. Implementation of this level of on-site health and safety monitoring meets the requirements of WAC 173-340-410(1)(a) for the following reasons:

- Site access will be limited to authorized personnel;
- The field monitoring and mitigation measures called for in the HASP are protective of on-site worker health and safety and should therefore also be adequate to protect the health of workers potentially occupying nearby buildings;
- Conditions imposed on the remedial action contractors by applicable federal and state regulations and laws require that specific measures be taken to prevent the occurrence of discharges that may pose a threat to human health or the environment (e.g., surface water runoff, earth moving equipment dragout, wind-blown dust emissions). These same regulations also require that contingency plans be prepared and implemented in the event of an accidental discharge of contaminants (e.g., overturned haul truck). Work will be conducted in accordance with applicable OSHA and WISHA regulations. Contractors on this project will be required to develop and implement their own health and safety procedures in accordance with applicable laws and regulations; and
- Soil excavation activities associated with this project will be of a relatively short duration (i.e., 1 to 3 days) and health risks associated with long-term exposures to on-site contaminants are not a concern. Considering the protection measures and monitoring called for during soil excavation, the risk of non-workers being subjected to appreciable short-term chemical exposure will be negligible.

The HASP will also provide the standards for upgrading personal protective equipment and the air monitoring equipment to be used.

4.4.2 Performance Monitoring

Performance monitoring is used to determine whether and where the remedial action has attained the desired cleanup levels (WAC 173-340-410(1)(b)). During the cleanup action, performance monitoring will consist of collecting and analyzing soil samples from the sidewalls and bottom of the remedial excavation to demonstrate compliance with the selected cleanup levels presented in Section 2.1.

The final lateral limits of the remedial excavation will be determined solely by either a) the attainment of the selected cleanup level as demonstrated by quantitative laboratory analytical results or b) the limits of practicability such as encroachment into the City of Seattle ROW.

As stipulated in MTCA (WAC 173-340-740(7)), in determining compliance with any particular cleanup level it is necessary to demonstrate that:

(i) No single sample concentration is greater than two times the soil cleanup level;
(ii) Less than 10 percent of the sample concentrations exceed the soil cleanup level; and
(iii) The true proportion of samples that do not exceed the soil cleanup level shall not be less than 95 percent using a Type I error level of 0.05.

The COCs within the Area of Concern are not readily discernable with field screening methods. As a result, the excavation will be guided by the quantitative laboratory analyses and the limits of practicability.

Final performance soil samples will be collected from the terminal sidewalls and bottom of the excavation. At a minimum, one sidewall performance sample will be collected from each excavation sidewall or for each 20 linear feet of excavation sidewall, whichever is greater.

At a minimum, one performance sample will be collected for each 200 square feet of excavation bottom. The approximate locations of bottom samples are identified in Figure 3. If a COC is detected at concentrations above the selected cleanup level at the bottom of the excavation, the excavation will be deepened by 6 inches within a ten-by-ten foot square area around the impacted sample, and the area will be resampled. This process will be repeated until compliance with the selected cleanup levels can be demonstrated. Excavation areas more than 24 inches deeper than the surrounding excavation bottom will also have excavation sidewall samples as described above.

The approximate sample locations based on complete excavation within the Area of Concern are indicated on Figure 3. Compliance sampling locations will be clearly labeled on final report figures and sample names will contain a suffix indicating the sample depth and whether the sample was from an excavation sidewall or excavation bottom. For example, a sidewall sample collected from the southern side of the excavation at a depth of 12 inches might be named SW-SouthX-12 and a bottom sample might be named B-X-24, with "X" being an alphanumeric designation and the "12" or "24" indicating the sample depth in inches.

Performance samples will be submitted for selected analysis of the following COCs:

- Total arsenic, copper, and zinc using EPA Method 200.7/6010C

All soil samples will be collected in pre-cleaned, laboratory-supplied glass jars directly from the excavation sidewall or bottom. Soil samples will be collected with stainless steel spoons and bowls and all samples will be thoroughly homogenized prior to being placed in an 8 ounce glass jar supplied by the analytical laboratory. No composite samples will be collected for performance monitoring purposes. Any reusable sampling equipment will be decontaminated prior to use.

EPI on-site personnel will document field activities in a field notebook. This notebook will document pertinent field activities as well as the times, dates, identification numbers, and sampling locations of performance (and other) samples. This field notebook will also contain notations of pertinent observations, protection monitoring measurements, and any other observations deemed important by

the field personnel. All entries will be made in ink and each page will be dated. Photographs will be taken of unusual circumstances encountered during excavation and noted in the field notebook.

4.5 Site Restoration

After the final limits of the excavation have been reached, site restoration will begin. Placement of backfill materials will preferably be performed during dry weather to prevent the upward pumping of silty soils within the interstitial spaces of the more permeable base-layer backfill soils.

The bottom of the excavation will receive six to twelve inches of 2" to 4" quarry spalls to facilitate the infiltration of stormwater in the Area of Concern. A layer of geotextile such as Mirafi® will be placed over the quarry spalls to prevent interstitial clogging from the overlying finer grained fill soils. The remainder of the excavation will be backfilled in 6- to 12-inch loose lifts with SDOT-approved shoulder ballast aggregate meeting the 2011 edition City of Seattle Standard Specifications For Road, Bridge, and Municipal Construction standard 9-03.9(2). Soils will be compacted using a vibratory roller or vibratory plate appropriate for the project. Analytical data for copper, zinc, and arsenic of the imported aggregate backfill materials will either be provided by the materials supplier, or the material will be sampled and submitted for analysis prior to placement. The data will be reviewed prior to the placement to confirm that the imported aggregate materials meet the selected cleanup levels.

4.6 Independent Cleanup Action Report

An *Independent Cleanup Action Report* (ICAR) will be prepared upon completion of the activities described herein. The ICAR will document the activities performed during the remedial excavation, the results of the remedial activities and related sampling and analysis, and the conclusions supported by those results. The ICAR will include the following:

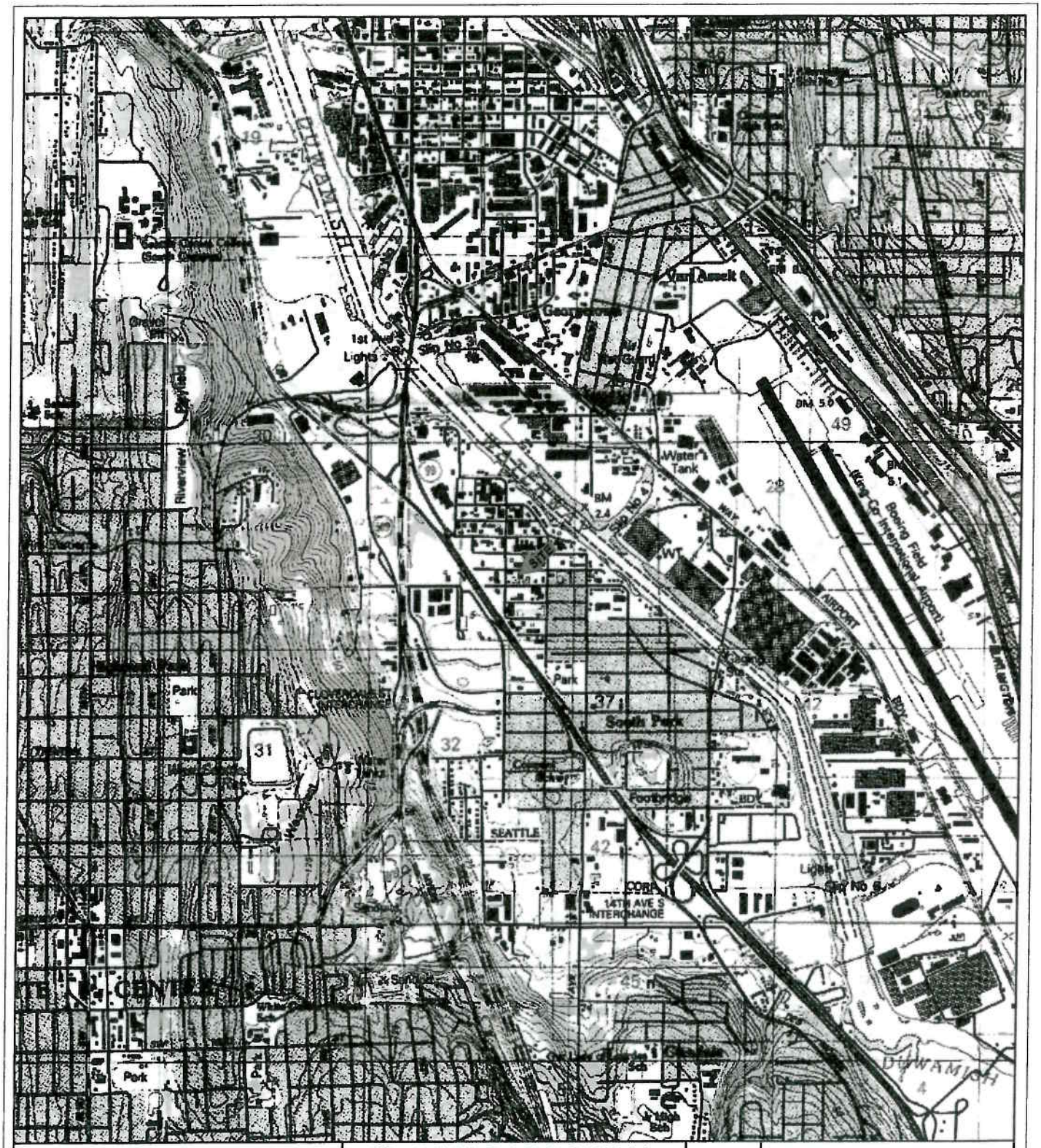
- A narrative description of the scope of work performed;
- A discussion of the performance monitoring results and compliance with applicable cleanup standards (levels and point of compliance);
- Tabulated summaries of field screening results and analytical data;
- A map showing the final limits of the soil excavation and soil sampling locations;
- A tabulated summary of soil disposal volumes;
- A printed copy of analytical laboratory reports;
- Copies of treatment facility tipping receipts; and
- Any other information pertinent to the implementation of the soil remediation.

5.0 LIMITATIONS

To the extent that preparation of this RAWP has required the application of best professional judgment and the application of scientific principles, certain results of this work have been based on subjective interpretation. We make no warranties express or implied, including and without limitation, warranties as to merchantability or fitness for a particular purpose. The information provided in this RAWP is not to be construed as legal advice.

4812-9789-1087, v. 2

Figures



KEY:

SOURCE: USGS 7.5 MINUTE QUADRANGLE (TOPOGRAPHIC)

SEATTLE SOUTH, WASHINGTON
1977

REVISED 1983

SCALE = 1:25,000

ENVIRONMENTAL PARTNERS INC
295 NE Gilman Boulevard, Suite 201
Issaquah, Washington 98027

FIGURE 1

GENERAL VICINITY MAP

PROJECT	59401.1		
PREPARED FOR	MARINE LUMBER SERVICE		
LOCATION	525 S. CHICAGO ST. SEATTLE, WASHINGTON		
SHEET	DRAWN BY	REVIEWED BY	DATE
1 of 1	ARM	ELC	03/05/10

STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

Northwest Regional Office • 3190 160th Avenue SE • Bellevue, Washington 98008-5452 • (425) 649-7000

NOV 15 2011

Mr. Todd Marker
Marine Lumber Service, Inc
P.O. Box 80964
Seattle, WA 98108

Amended Order Docket No.	8862
Immediate Action Order Docket No.	7247
Site Location	5th Avenue South, between S. Kenyon Street and S. Monroe Street, referenced as the South Yard in association with the NPDES permitted site located at: 525 South Chicago Street, Seattle, WA 98108

Re: Amendment to Immediate Action Order No. 7247

Dear Mr. Marker:

The Department of Ecology (Ecology) has issued the enclosed amended Administrative Order (Order) requiring Marine Lumber Service, Inc. to comply with:

- Chapter 90.48 Revised Code of Washington (RCW) – Water Pollution Control
- Chapter 173-226 Washington Administrative Code (WAC) – Waste Discharge General Permit Program
- Industrial Stormwater General Permit Number WAR011741

If you have questions please contact Robert Wright at (425) 649-7060 or rowr461@ecy.wa.gov.

Sincerely,

Kevin C. Fitzpatrick
Section Manager
Water Quality Program
Northwest Regional Office

Enclosures: Amended Administrative Order Docket No. 8862

By Registered Mail RB 336 146 456 US

cc: Larry Altose, Ecology PRO
Raman Iyer, Ecology
Robert Wright, Ecology
Cyma Tupas, Ecology
Josh Klimek, Ecology-HQ
Central Files: Marine Lumber Service, Inc., Permit No. WAR-011741; WQ 9.7

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

IN THE MATTER OF AN ADMENDED ADMINISTRATIVE ORDER AGAINST Marine Lumber Service, Inc Mr. Todd Marker	)	AMENDED ADMINISTRATIVE ORDER DOCKET NO. 8862 IMMEDIATE ACTION ORDER DOCKET NO. 7247

To: Mr. Todd Marker
Marine Lumber Service, Inc.
P.O. Box 80964
Seattle, WA 98108

Amended Order Docket No.	8862
Order Docket No.	7247
Site Location	5th Avenue South, between S. Kenyon Street and S. Monroe Street, referenced as the South Yard in association with the NPDES permitted site located at: 525 South Chicago Street, Seattle, WA 98108

The Department of Ecology (Ecology) has issued this amended Administrative Order (Order) Docket No. 8862 to amend Immediate Action Order Docket No. 7247 dated January 25, 2010 issued to Marine Lumber Service, Inc. (Marine Lumber).

This Amended Order describes the corrective actions required at the location known as Marine Lumber Service, Inc. (South Yard) located at 5th Avenue South, between S. Kenyon Street and S. Monroe Street, in association with the NPDES permitted site located at 525 South Chicago Street, Seattle, WA 98108.

ADMINISTRATIVE ORDER AMENDMENTS

Immediate Action Order No. 7247 Background

On January 25, 2010 Ecology issued Immediate Action Order No. 7247 to Marine Lumber which required them to take the following actions:

- Submit to Ecology within 45 days upon receipt of the Order, a source control plan for preventing the discharge of copper, arsenic, zinc, and other associated pollutants from the outside treated lumber storage area referenced as the South Yard of the facility.

- Submit to Ecology within 45 days upon receipt of the Order, an updated copy of the Stormwater Pollution Prevention Plan (SWPPP) for the facility.

- Effective the first quarter of 2010, add arsenic to the permit required sampling parameters.

Marine Lumber Service, Inc. Response:

On March 19, 2010, Ecology Marine Lumber submitted a Source Control Action Plan and the SWPPP to Ecology. Discharge Monitoring Reports (DMRs) were also received for 2010 and the 1st quarter of 2011.

Ecology's determination that violations have occurred is based on the violations listed below.

Violations and associated corrective actions

Violations description

During the 4 quarters of 2010 and 1st quarter of 2011 monitoring periods, Marine Lumber only conducted sampling for 2 out 5 quarters. Proper sampling and analysis for 1st, 2nd and 3rd quarters of 2010 were not conducted. The analysis conducted during 4th quarter 2010 and 1st quarter 2011 reported values for copper, arsenic and zinc in µg/L when in fact the values were actually mg/L, which is 1000 times higher. For these monitoring periods, benchmarks for turbidity, zinc copper and arsenic were exceeded. Permit Condition S5. establishes benchmark values and monitoring requirements. Benchmark means a pollutant concentration used as a permit threshold, below which a pollutant is considered unlikely to cause a water quality violation, and above which it may. When pollutant concentrations exceed benchmarks, corrective action requirements identified in Permit Condition S8. take effect. Permit Condition S10. requires that discharges not cause or contribute to a violation of surface water quality standards.

Corrective Actions under Permit Condition S8 are based on discharge sample results for the 4 quarters of 2010. Marine Lumber only conducted sampling during one of the 4 quarters of 2010. The discharge sample analysis conducted in the 4th quarter of 2010 and 1st quarter of 2011 revealed values 1000 times higher than the benchmarks. If proper sampling and reporting had been conducted for all 4 quarters of 2010, provided evidence indicates that Level 3 corrective actions would have been triggered under Permit Condition S8. Level 3 corrective actions would have required stormwater treatment to be installed at Marine Lumber by September 30, 2011. Stormwater treatment was not implemented.

Corrective actions required:

For these reasons and in accordance with RCW *90.48.120(2)* it is ordered that Marine Lumber Service, Inc. take the following actions. These actions are required at the location known as Marine Lumber Service, Inc. located at 5th Avenue South, between S. Kenyon Street and S. Monroe Street (South Yard), in association with the NPDES permitted site located at: 525 South Chicago Street, Seattle, WA 98108.

Immediately upon receipt of this Amended Order, Marine Lumber Service, Inc. must:

- Advise Ecology on the status of complying with the Level 3 Corrective Action in Annual Reports, as required by Permit Condition S9.B.
- Implement all necessary Level 1 and Level 2 Corrective Actions by December 31, 2011.
- Collect and analyze at least 1 stormwater discharge sample for 6 consecutive months starting December 2011 for copper, zinc and arsenic, install and have operational stormwater treatment system that is designed with the goal of achieving the applicable benchmark value(s) no later than September 30, 2012, if benchmark numbers are exceeded during one or more of the months.
- Establish an Ecology-approved sampling location at the South Yard.
- Resubmit DMRs for 4th quarter 2010 and 1st quarter 2011 with the correct units for zinc, copper and arsenic by November 30, 2011.

- Initiate a clean-up of copper, zinc and arsenic contaminated sediments on the north side of South Monroe Street approximately 100 feet east of 5th Avenue S. in coordination with Jennifer Anderson, Senior Environmental Analyst, City of Seattle Department of Transportation, before December 31, 2012.

No other condition or requirement of Immediate Order Docket No. 7247 is hereby affected by this amendment.

FAILURE TO COMPLY WITH THIS ORDER

Failure to comply with this Order may result in the issuance of civil penalties or other actions, whether administrative or judicial, to enforce the terms of this Order.

YOUR RIGHT TO APPEAL

You have a right to appeal this Order to the Pollution Control Hearing Board (PCHB) within 30 days of the date of receipt of this Order. The appeal process is governed by Chapter 43.21B RCW and Chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2).

To appeal you must do both of the following within 30 days of the date of receipt of this Order:

- File your appeal and a copy of this Order with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours.
- Serve a copy of your appeal and this Order on Ecology in paper form - by mail or in person. (See addresses below.) E-mail is not accepted.

You must also comply with other applicable requirements in Chapter 43.21B RCW and Chapter 371-08 WAC.

Your appeal alone will not stay the effectiveness of this Order. Stay requests must be submitted in accordance with RCW 43.21B.320.

ADDRESS AND LOCATION INFORMATION

Street Addresses	Mailing Addresses
Department of Ecology Attn: Appeals Processing Desk 300 Desmond Drive SE Lacey, WA 98503 **Pollution Control Hearings Board** 1111 Israel Road SW STE 301 Tumwater, WA 98501	**Department of Ecology** Attn: Appeals Processing Desk PO Box 47608 Olympia, WA 98504-7608 **Pollution Control Hearings Board** PO Box 40903 Olympia, WA 98504-0903

CONTACT INFORMATION

Please direct all questions about this Order to:

Robert Wright
Department of Ecology
Northwest Regional Office
3190 160th Ave. SE
Bellevue, WA 98008
Phone: (425) 649-7060
Email: rwri461@ecy.wa.gov

MORE INFORMATION

Pollution Control Hearings Board Website
www.eho.wa.gov/Boards_PCHB.aspx

Chapter 43.21B RCW - Environmental and Land Use Hearings Office – Pollution Control Hearings Board
http://apps.leg.wa.gov/RCW/default.aspx?cite=43.21B

Chapter 371-08 WAC – Practice and Procedure
http://apps.leg.wa.gov/WAC/default.aspx?cite=371-08

Chapter 34.05 RCW - Administrative Procedure Act
http://apps.leg.wa.gov/RCW/default.aspx?cite=34.05

Laws: www.ecy.wa.gov/laws-rules/ecyrcw.html

Rules: www.ecy.wa.gov/laws-rules/ecywac.html

SIGNATURE

Kevin C. Fitzpatrick
Section Manager
Water Quality Program
Northwest Regional Office

November 15, 2011
Date