CITY OF PORTLAND
ENVIRONMENTAL SERVICES
1120 SW Fifth Avenue, Room 1000, Portland, Oregon 97204-1912 ▪ Sam Adams, Commissioner ▪ Dean Marriott, Director

TECHNICAL MEMORANDUM No. OF53A-1

City Outfall Basin 53A
Upland Source Control Investigation

TO: Heidi Blischke, DEQ, Northwest Region Cleanup & Portland Harbor Section

FROM: Dawn Sanders, City of Portland, Bureau of Environmental Services
Linda Scheffler, City of Portland, Bureau of Environmental Services

COPIES: Rod Struck, DEQ, Northwest Region Cleanup & Portland Harbor Section
Debbie Deetz Silva, Oregon Steel Mills
Kristine Koch, EPA, Office of Environmental Cleanup
Bruce Brody-Heine, GSI

DATE: November 30, 2005

SUBJECT: **Dry-Weather Flow and Inline Solids Sampling, City Outfall Basin 53A Stormwater Conveyance System**

Introduction

This technical memorandum summarizes the results of the City of Portland (City) Bureau of Environmental Services' (BES) source control investigation of dry-weather flow and inline solids entering the Outfall Basin 53A stormwater conveyance system. Outfall Basin 53A collects stormwater from North Rivergate Boulevard, North Ramsey Boulevard, and portions of adjoining properties. Several of the properties connected to the conveyance system are listed Oregon Department of Environmental Quality (DEQ) upland Portland Harbor cleanup sites. The City is concerned that contaminants from these upland cleanup sites may be conveyed into the City's stormwater collection system. This investigation, conducted in June and July 2005, is part of the City's ongoing source control program associated with the Portland Harbor City of Portland Outfalls Project. The City is submitting these investigation results pursuant to the August 13, 2003, Intergovernmental Agreement (IGA) between DEQ and the City.

Purpose and Objectives

The purpose of this source control investigation is to evaluate whether inline solids and dry-weather flow discharged to the City's conveyance system are respectively transporting polychlorinated biphenyls (PCBs) and mercury to the Willamette River. Specific objectives of the City's Outfall Basin 53A investigation are described below.

Inline Solids Investigation

The City's stormwater collection system receives runoff from portions of the Oregon Steel Mills (OSM) property. According to the DEQ Environmental Cleanup Site Information (ECSI) Database Site Summary Report and file for OSM (ECSI Site #141), PCBs have been detected in soil on the OSM property (DEQ, 2005). Because PCBs also have been detected in sediments near Outfall 53A (Integral, 2005), the City sampled inline solids in the OSM stormwater lateral (where it connects to the City conveyance system) to evaluate this site as a potential source of PCBs. Also, OSM has proposed discharge of additional site stormwater to the City system as part of redevelopment plans. This information will be useful to determine potential issues that need to be addressed as part of that redevelopment.

Dry-Weather Flow Investigation

The objective of the City's dry-weather flow sampling in the Outfall 53A stormwater conveyance system is to identify potential sources of mercury detected during the Illicit Discharge Elimination Program (IDEP) dry-weather flow sampling conducted at Outfall 53A in September 2002. The IDEP sample, collected in support of the City's MS4 stormwater permit, had a mercury concentration of 0.031 μg/L, which exceeds the DEQ Freshwater Chronic Ambient Water Quality Criteria of 0.012 μg/L. In July 2005, the City collected dry-weather flow samples from Outfall 53A and three upstream locations in the conveyance system, to identify subbasins that may include a mercury source.

Background

Figure 1 shows the location of the Outfall 53A stormwater conveyance system. The system consists of three branches and associated catchment systems that drain to a 48-inch-diameter concrete pipe main. The main extends from the intersection of North Rivergate Boulevard and North Ramsey Boulevard (node AAA179) to the outfall (OF53A). Three lines enter the 48-inch-diameter main at node AAA179: a 36-inch-diameter pipe drains the northern portion of the outfall basin, a 24-inch-diameter pipe drains the eastern area, and a 42-inch-diameter pipe drains the southern portion of the basin.

Field Activities

Inline Solids Sampling

The City sampling team obtained a sample of inline solids at 1:50 p.m. on June 21, 2005. No measurable precipitation occurred at the site on the sampling day. Approximately 0.05 inches of precipitation was recorded at a nearby rain gauge during the 2 days before the inline solids sampling.

The crew entered manhole AAA171, at the northern end of the stormwater line along North Rivergate Boulevard. The line contained standing water and some cemented fine-grained solids (see Attachment A, Photo 1). These solids were collected from the OSM stormwater lateral line approximately 12 inches upstream of manhole AAA171, using a stainless steel spoon and bowl in accordance with BES Field Operations Standard

Operating Procedures (SOPs). The solids were then broken up and placed in jars. The sampling crew noted a slight sheen on the water in the line at the time of sampling. Notes from the field sampling are provided in Attachment B.

Dry-Weather Flow Sampling

The City sampling team obtained four dry-weather flow samples between approximately 9:00 and 9:15 a.m. on July 28, 2005. The dry-weather flow sampling locations are shown in Figure 2. No measurable precipitation occurred at the site on the sampling day. Approximately 0.05 inches of precipitation was recorded during the 5 days before the dry-weather flow sampling.

The sampling team accessed the sampling locations for three of the water samples through stormwater manhole AAA179. At this manhole, the dry-weather flow from each of the three different incoming lines was sampled: the 36-inch-diameter pipe to the north, the 24-inch-diameter pipe to the east, and the 42-inch-diameter pipe from the south. Samples were collected by filling a decontaminated stainless steel beaker with water flowing out of each line and then decanting each sample into a bottle, in accordance with BES Field Operations SOPs. The sampling crew noted that the sampled discharge water was slightly turbid, although free of color and odors. The fourth water sample was collected at Outfall 53A. This sample was collected by filling a bottle directly with water flowing from the pipe outlet. The sampling crew noted that this sample also was slightly turbid, although free of color and odor. Photographs of the three dry-weather flow sample locations accessed through node AAA179 are included in Attachment A. Notes from the field sampling are provided in Attachment B.

Summary of Results

The inline solids sample was analyzed for PCBs and the dry-weather flow samples were analyzed for total mercury. Table 1 lists the chemical analytical results for the inline solids sample and Table 2 lists the results for the inline dry-weather flow samples. The results of the Outfall Basin 53A investigation are summarized as follows:

- Two PCB Aroclors, 1254 and 1260, were detected in the inline solids sample; the reported concentration of Aroclor 1254 (50.4 µg/Kg) exceeded the most stringent Portland Harbor Joint Source Control Strategy (JSCS) screening level of 10 µg/Kg (DEQ/EPA, 2005). The concentrations of Aroclor 1260 and total PCBs were less than the most stringent JSCS screening levels.
- Two of the four dry-weather flow samples contained detectable concentrations of total (unfiltered) mercury- at the northern and southern branches of the conveyance system. Mercury was not detected in the sample from the eastern branch, nor from the outfall sample. The detected mercury concentrations were less than the most stringent DEQ/EPA JSCS screening level (0.012 µg/L). The highest concentration of mercury (0.0079 µg/L) was detected in the sample obtained from the northern stormwater line.

Conclusions and Recommendations

Analytical results for the inline solids sample from the OSM lateral indicate that PCBs are being discharged to the City stormwater conveyance on North Rivergate Boulevard. The detected contaminants are consistent with the contaminants of interest (COI) observed at the adjacent DEQ Cleanup site. The City requests that DEQ require OSM to further investigate their site conditions to ascertain the source and migration pathway of PCBs to the City stormwater conveyance system, and to identify appropriate control mechanisms to address this source.

The results of dry-weather flow sampling indicate that mercury is present in dry-weather flow from portions of the outfall basin that discharge to the northern and southern branches of the Outfall 53A stormwater line, located along North Rivergate Boulevard. The concentrations of mercury are less than the most stringent JSCS screening level values and also less than the 2002 IDEP sample. Therefore, it is uncertain if mercury is of concern for this outfall. The City requests that DEQ consider mercury when identifying COIs at upland cleanup sites in these areas of City Outfall Basin 53A. The City will continue to evaluate mercury under dry-weather conditions.

References

DEQ. 2005. DEQ Site Summary Report – Details for ECSI Site No. 141. DEQ Environmental Cleanup Site Information (ECSI) Database. Accessed November 2005. http://www.deq.state.or.us/wmc/ecsi/ecsidetail.asp?seqnbr=141.

DEQ/EPA. 2005. Portland Harbor Joint Source Control Strategy, Interim Final, dated September 2005.

Integral. 2005. Portland Harbor RI/FS, Round 2A Sediment Site Characterization Report. Prepared for the Lower Willamette Group.

Tables
Table 1 – *Summary of Chemical Analytical Results, Inline Solids Sampling*
Table 2 – *Summary of Chemical Analytical Results, Inline Dry-Weather Flow Sampling*

Figures
Figure 1 – *Outfall 53A Inline Solids Sampling, Total PCBs*
Figure 2 – *Outfall 53A Dry-Weather Flow Sampling, Total Mercury*

Attachments
Attachment A – *Field Photographs*
Attachment B - *Field Notes*
Attachment C - *Laboratory Results*

Table 1
Summary of Chemical Analytical Results
Inline Solids Sampling
North Rivergate Boulevard - City Outfall Basin 53A

Class	Analyte	Units	Inline Solids IL-22B-AAJ653-0605 6/21/2005	JSCS Screening Level (Most Stringent)
Polychlorinated Biphenyls (PCBs) (EPA 8020)				
	PCB 1016	µg/Kg	10.9 UJ	420 (6)
	PCB 1221	µg/Kg	10.9 UJ	--
	PCB 1232	µg/Kg	10.9 UJ	--
	PCB 1242	µg/Kg	10.9 UJ	2 (6)
	PCB 1248	µg/Kg	10.9 UJ	4 (6)
	PCB 1254	µg/Kg	50.4 J	10 (6)
	PCB 1260	µg/Kg	34.6 J	200 (5)
	Total PCBs	µg/Kg	85.0 J	676 (5)

Notes:

All units in micrograms per kilogram (µg/Kg) dry weight

JSCS - Portland Harbor Joint Source Control Strategy (DEQ/EPA Interim Final September 2005)

J = The analyte was detected at concentrations above the MRL but is considered an estimate

UJ = The analyte was not detected above the the reported sample quantification limit; the quantitation limit is estimated

(5) MacDonald PEC and other SQV's Screening level for Soil/Catch Basin Sediment

(6) DEQ 2001 Bioaccumulative Sediment SLV's Screening level for Soil/Catch Basin Sediment

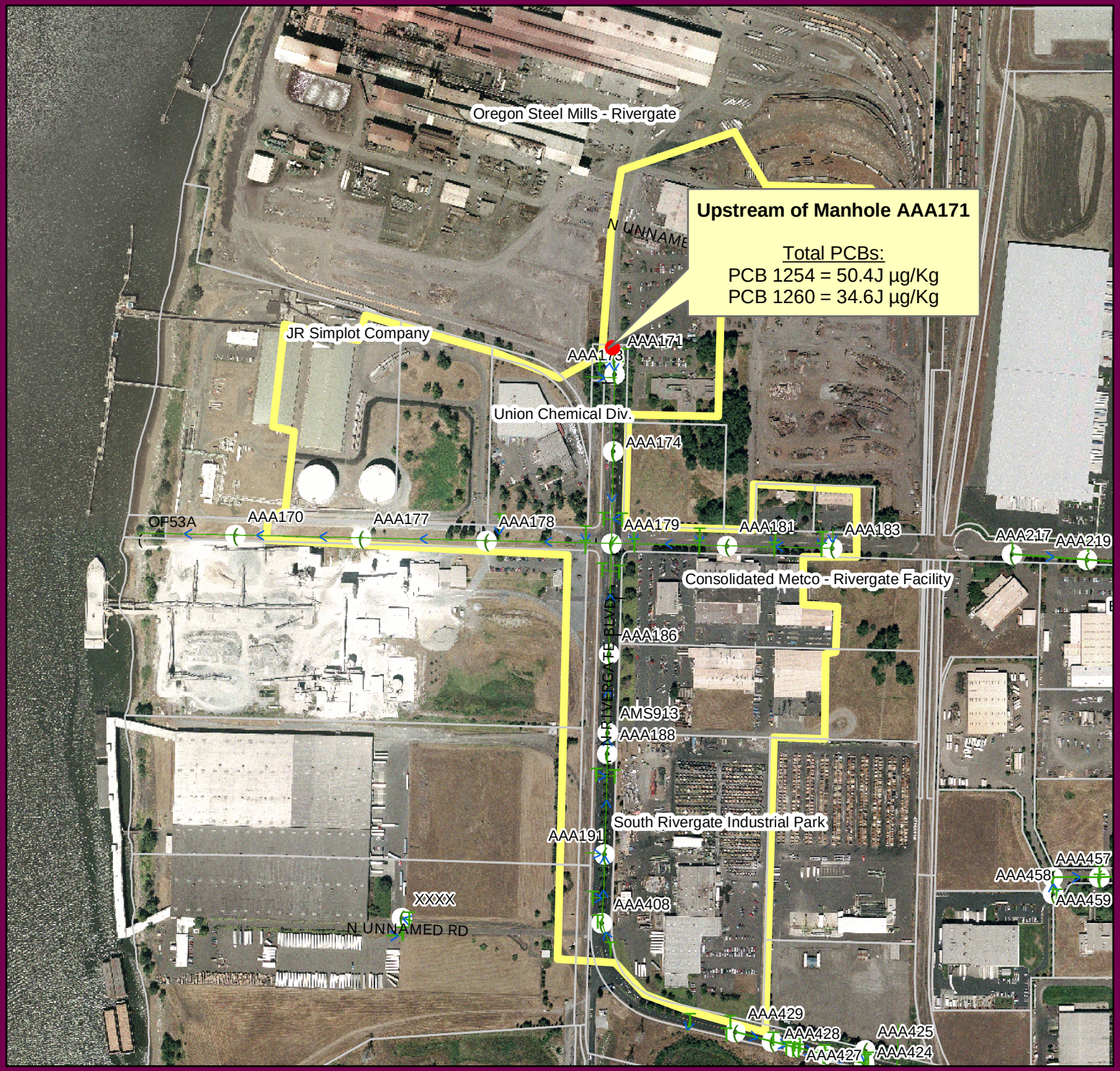
-- No JSCS screening level available

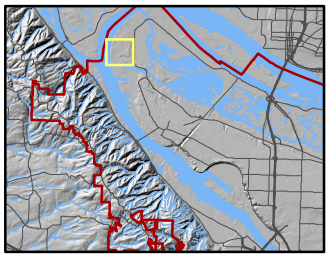
Table 2
Summary of Chemical Analytical Results
Inline Dry-Weather Flow Sampling
City Outfall Basin 53A

Class	Analyte	Units	Inline Water IL-22B-AAA179-0705N 7/28/2005	Inline Water IL-22B-AAA179-M0705-E 7/28/2005	Inline Water IL-22B-AAA179-0705-S 7/28/2005	Inline Water IL-22B-AAA169-0705 7/28/2005	JSCS Screening Level (Most Stringent)
Total Mercury (EPA 200.8)							
	Mercury	µg/L	0.0079	0.002 U	0.0021	0.002 U	0.012 [2c]

Notes:

All units in micrograms per Liter (µg/L)
U = None detected - Value shown is the reporting limit
Method Reporting Limit (MRL) = 0.002
JSCS - Portland Harbor Joint Source Control Strategy (DEQ/EPA Interim Final September 2005)
[2c] DEQ's 2004 AWQC Screening Level for Water - Ecological Receptors (Chronic)





Legend

- Storm Inlets
- Storm Pipe
- Manhole
- Taxlots
- 53A Basin Boundary
- Sample Location

0 250 500 1000 Feet

Note: Only detected constituents are shown.

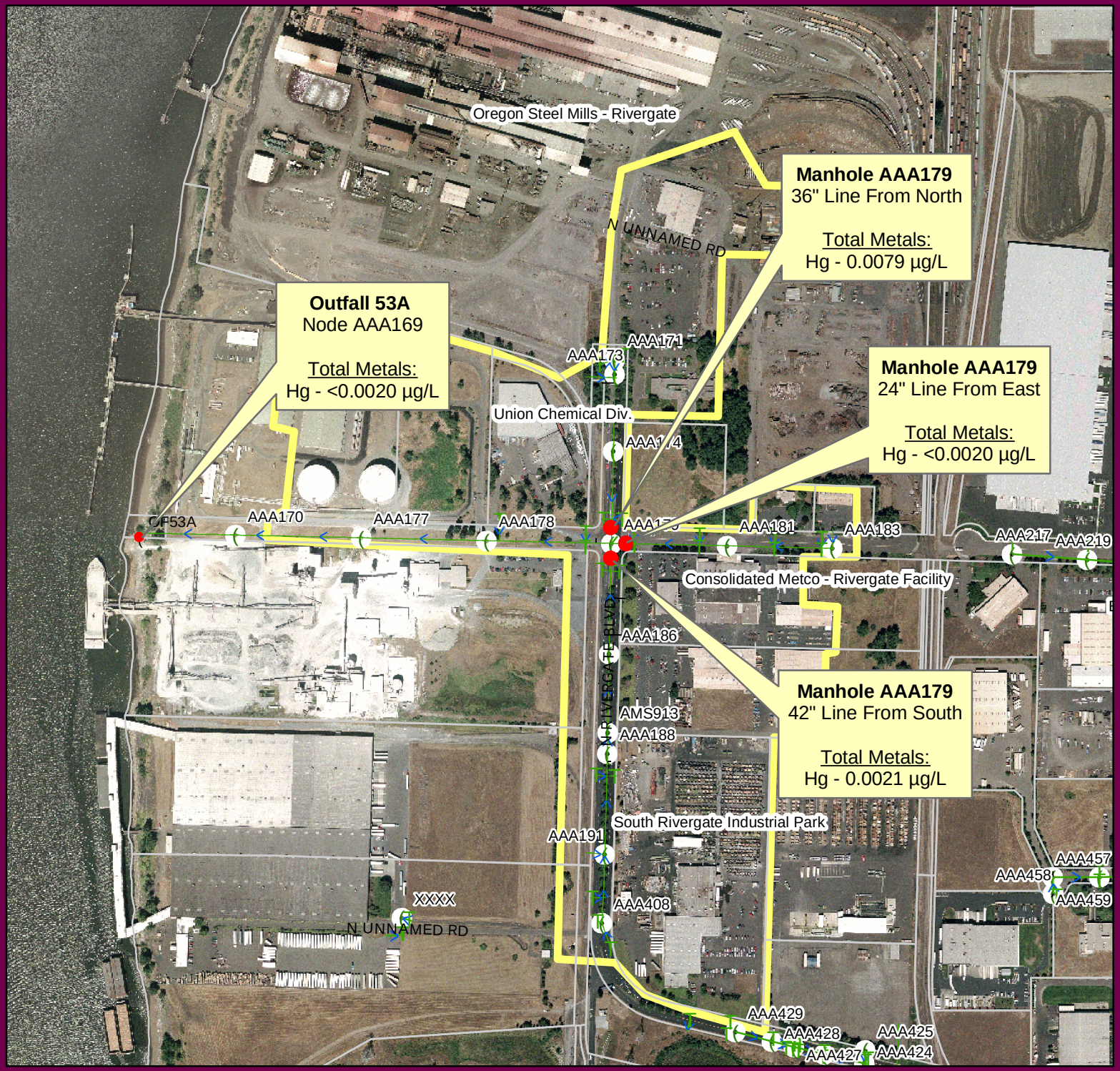
J = Estimated value

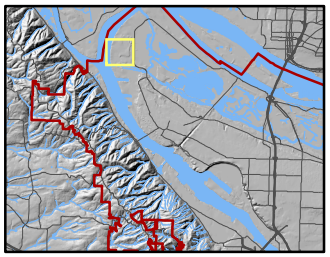
µg/Kg = micrograms/Kilogram

DEQ Environmental Cleanup Sites (ECSI) sites shown on map

Figure 1
Outfall 53A Inline Solids Sampling
Total PCBs
Sample Date: 6/21/2005

Source: City of Portland BES Aerial photo 2004	Environmental Services City of Portland 1120 SW Fifth Avenue, Room 1000 Portland Oregon, 97204-1912
File Name: s:\gis\outfalls\outfalls_53A\ of53a_pcb.mxd	**Program Manager:** Dawn Sanders Portland Harbor Superfund
Sheet No. 1 OF 1	**Date Printed:** 10/11/2005 **Prepared by:** Sara Gardner





Legend

- Storm Inlets
- Storm Pipe
- Manhole
- Taxlots
- 53A Basin Boundary
- Sample Location

0 250 500 1000 Feet

µg/L = micrograms/Liter

DEQ Environmental Cleanup Sites (ECSI) sites shown on map

Figure 2
Outfall 53A Dry-Weather
Flow Sampling
Total Mercury
Sample Date: 7/28/2005

Source: City of Portland BES Aerial photo 2004	Environmental Services City of Portland 1120 SW Fifth Avenue, Room 1000 Portland Oregon, 97204-1912
File Name: s:\gis\outfalls\outfalls_53A\ of53a_sampling062105.mxd	**Program Manager:** Dawn Sanders Portland Harbor Superfund
Sheet No. 1 OF 1	**Date Printed:** 11/9/2005 **Prepared by:** Sara Gardner

Attachment A:
Field Photographs

Photo 1 (June, 2005). Sampling location for inline solids during June 2005. Sample location was upstream of manhole AAA171 on North Rivergate Boulevard. These fine-grained, cemented solids were collected and analyzed for PCBs.

Photo 2 (July, 2005). Incoming line from north, sampled for dry-weather flow at the intersection of North Ramsey Boulevard and North Rivergate Boulevard (node AAA179).

Photo 3 (July, 2005). Incoming line from east, sampled for dry-weather flow at the intersection of North Ramsey Boulevard and North Rivergate Boulevard (node AAA179).

Photo 4 (July, 2005). Incoming line from south, sampled for dry-weather flow at the intersection of North Ramsey Boulevard and North Rivergate Boulevard (node AAA179).

Attachment B
Field Notes

City of Portland
Environmental Services

DAILY FIELD REPORT

Page 1 of 3

Project INLINE SEDIMENT SAMPLING Project No. 1020.001

Location NW FRONT AVE Date 6-21-05

Subject FIELD NOTES By MJH

7:30 PREPARE EQUIPMENT FOR TODAYS SAMPLING EVENT. STAINLESS STEEL SPOONS + BUCKETS. DECONNED PER SOP 2.0 BY MJS.

ASSEMBLE SAMPLE BOTTLES, COC'S, PAPERWORK. TODAYS WORK WILL INCLUDE 1 WATER SAMPLE + MULTIPLE SED SAMPLE.

8:30 DJH NOTIFIES L. SCHEFFER THAT WE ARE PROCEEDING TO FIRST SAMPLE SITE.

9:00 ARRIVE AT 5904 NW 61ST (MH 653). SET UP TRAFFIC CONTROL. MH IS IN MIDDLE OF ROAD.

9:10 DJH ENTERS MH TO INSPECT SAMPLING LOCATION.

9:15 REPORTS PRESENCE OF 0.5 GPM COMING FROM LATERAL 85' UP FROM MH MH653.

0920 DJH BEGINS TO COLLECT SAMPLE FROM ABOVE LOCATION USING S.S. BEAKER.

0945 RELINQUISH WATER SAMPLE TO PETE. FOR PETE TO DELIVER TO THE LAB.

0951 MOVE TO AMW705. THIS IS A CATCH BASIN ABOUT 20' TO THE NORTH OF THE ROAD.

1000 COLLECTED SEDIMENT FROM CATCH BASIN.

1012 MOVE TO MH 879. WATER IN CATCH BASIN.

Attachments

City of Portland
Environmental Services

DAILY FIELD REPORT

Project INLINE SEDIMENT SAMPLING
Location NW RDY
Subject FIELD NOTES

Project No. 1020.001
Date 6-21-05
By MJM

1020 SAMPLE COLLECTED FROM CATCH BASIN. WATER IN C.B. SANDY SEDIMENTS IN C.B. SANDY SEDS OBSERVED IN AREA AROUND C.B.

1031 MOVE TO AND 878. THIS IS ANOTHER CB NORTH OF THE AREA AS FRONTAGE ROAD. NO S OF SOME MAIN TRUCKS. GENTLEMAN WALKS UP TO US AND TALKS W/ LINDA, LARRY?

1038 SAMPLE COLLECTED FROM CATCH BASIN. LOTS OF CRAWDZ

1121 ARRIVE AT SWAN ISLAND. START AT AAQ004 BECAUSE IT HAS AN ALTERNATE. DSP ENTER MH. RIVER BACKED UP. NO SEDIMENTS IN ANY OF THE LINES AT THIS LOCATION.

1147 MOVE TO MH AAQ003. DSP LOGGERS. WATER 5' DOWN AT THIS LOCATION. NO SEDS IN THE BOTTOM.

1155 AAQ118 - COULD NOT GET MH OPEN - DESPITE BEST EFFORTS

1210 AAQ005 - NOT FLOODED. THERE IS MINOR FLOW AT THIS LOCATION. DID NOT ENTER

Attachments

City of Portland
Environmental Services

DAILY FIELD REPORT

Project IN LINE SED SAMP Project No. 1020.007

Location _____ Date 6-21-05

Subject FIELD NOTES By MJJ

1210 BASIN M3 - DUE TO LACK OF SUCCESS WE ARE SUSPENDING OPS HERE TODAY. WILL RETURN LATER IN THE SUMMER WHEN RIVER LEVELS ARE LOWER AND TMT ACAIP

1220 PETE ENTERS AA2003. MINOR FLOW. NO SEDIMENTS 48" DIA LINE

1230 LUNCH

1:30 ARRIVE AT OREGON STEEL MILLS. NOISE AM 111 STANDING WATER IN THE LINE SEDIMENT ALSO PRESENT. SEDIMENT IS A CEMENTED FINE SEDS.

1425 SAMPLES RETURNED TO DWPL + SUBMITTED TO LAB UNDER CHAIN OF CUSTODY. SAMPLES HAVE BEEN IN COOLER COOLER ALL DAY

Attachments

CITY OF PORTLAND

ENVIRONMENTAL SERVICES

Water Pollution control Laboratory
6543 N. Burlington Ave.,
Portland, OR 97203-5452

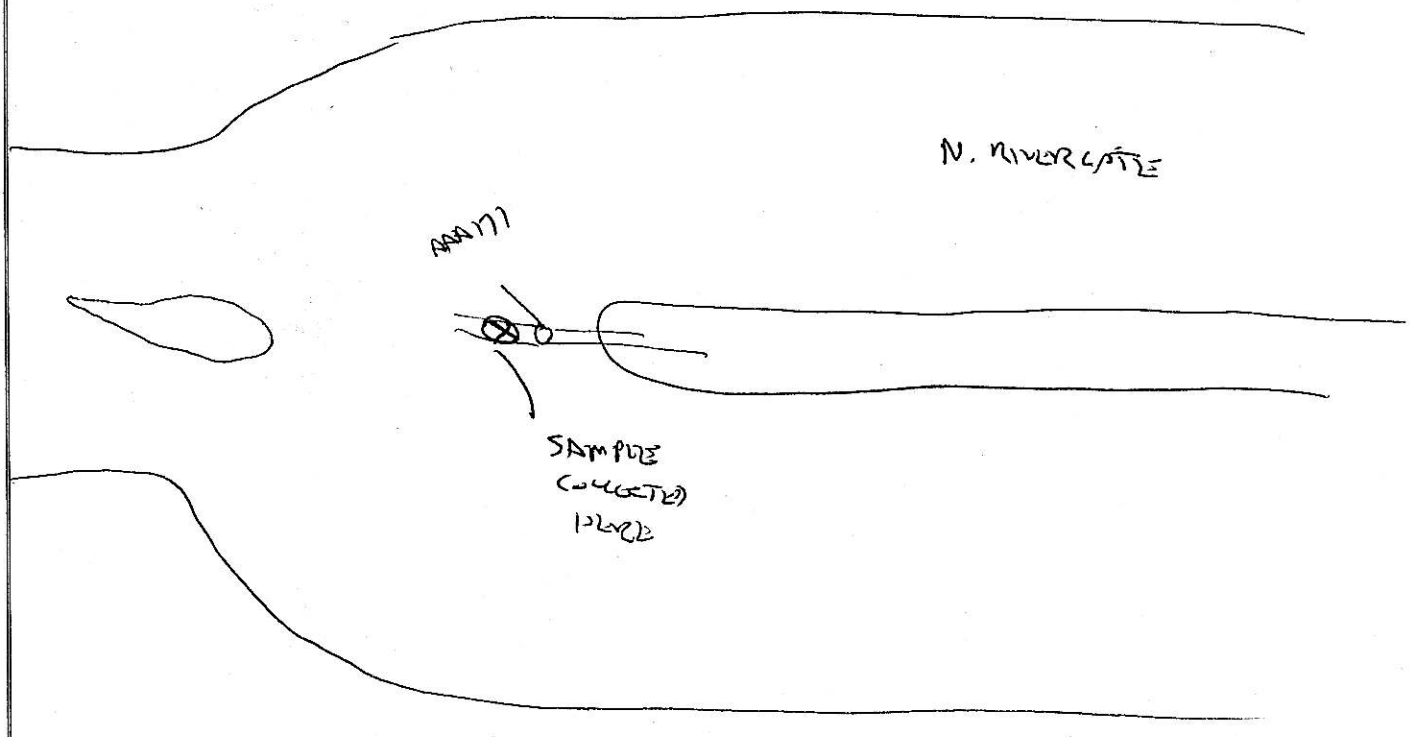
PORTLAND HARBOUR INLINE SEDIMENT SAMPLING - 1020.001
FIELD DATA SHEET

Date: 6-21-05	Time: 1337	Current Weather conditions: 4 CLOUDS 70's
Sampling Team Present: DJH | MJP | PJA		
Basin:	Node: DAA 171	Subbasin:
Address: N. RIVERGATE		

SECTION 1 - PRE-SAMPLING VISUAL OBSERVATION REPORT

Describe any flowing or standing water observed in the line?	2" OF STAGNANT WATER IN THE LINE
Does river appear to back up to this location? Describe rate/color/odor of flow:	NO
Are sediments observed in the line?	YES
Is there enough sediment in the line to collect a sample?	YES
Describe lateral extent and depth of sampleable sediments present in the line:	WELDED LINE FINE GRAINED PRECIPITATE?) ON FLOOR OF PIPE UP + DOWN OF MH

SITE DIAGRAM: Include street intersections/laterals/MH's/driveways cuts and extent of solids accumulation



SECTION 2 - SAMPLE COLLECTION REPORT

Node: AAA171

Sampling Equipment:	SS SPOON + S.S. BOWLS
Equipment Decontamination process:	Per FOps SOP 70.1a (circled) Other (Describe)
Sample date: 6-21-05	Sample time: 1350
Sample Identification: (IL-XX-NNNNNN-mmyy)	IL-53A - AAA171 - 0605
Sample location: (number of feet from node of entry)	12" UPSTREAM OF AAA171
Sample collection technique:	SEDIMENTS COLLECTED W/ SS SPOON INTO SS BOWL
Color of sample:	DK BROWN
Texture/Particle size:	SEDIMENT COMES IN WELDED CHUNKS OF FINE MATERIAL CEMENTED
Visual or olfactory evidence of contamination:	SLIGHT SHEEN ON WATER
Depth of solids in area where sample collected:	2" - 3"
Amount and type of debris:	
Compositing notes:	SAMPLE BROKEN UP AND PUT INTO JARS

Sample Jars Collected

If not enough sample to fill all of the jars, then fill jars in this order:				
	Metals			
	PAHs/SVOCs			
	PCBs			
	TPH (two jars)			
	TOC			

Duplicate sample collected?	NO
Duplicate sample fictitious identification # on COC:	—
Samples placed in chilled cooler? (Y)N	
Samples delivered to lab? (Y)N	Lab ID Number: FO 050674
Describe any deviations from standard procedures:	

SECTION 3 - PHOTOGRAPH LOG

Photograph Log	In-Pipe sample location	
	Homogenized sample	

City of Portland
Environmental Services

DAILY FIELD REPORT

Page 1 of

Project PORTLAND HARBOR INLINE SED SAMP
Project No. 1080.001
Location
Date 7/28/05
Subject FIELD NOTES
By MJH/JJM

0650 ARRIVE AT N RAMSEY & N. ALIVERATE. BASIN 53 A
ENTER MH AA0179 DIFFERENT THAN ON MAP.
THIS IS A 36", 24', 42" AND A CAPPED 42"
LINE COMING IN, AND A 48" OUT.
JJM SAMPLES FROM TOE 3 INCOMING LINES

1002 ARRIVE AT M3
AA0203 IS flooded w Willamette River water
No samples collected

AA0004 - Good Flow
1020 AU collects water from flume SMH #02
1024 JJM collects water from 18" line into AA0004
1036 @ AA0005 MJH enters MH to collect grab from upstream side. Flow is moving towards the river
1034 AU observes no flow in AA0118. No samples collected

1110 AT DAM 64
20" is DRY No Sample collected
1126 36" sampled
1128 64 sampled

1150 at AA0933

Attachments

City of Portland
Environmental Services

DAILY FIELD REPORT

Page 2 of 2

Project PDX HARBOR INLINE SED SAMP
Project No. 1020-001
Location
Date 7/28/05
Subject SEED NOTES
By MJH

1500 ALL SAMPLES HAVE BEEN PLACED IN CHILLED COOLERS UPON COLLECTION

1523 Samples submitted to WPCL lab under chain of custody

Attachments

CITY OF PORTLAND
ENVIRONMENTAL SERVICES
Water Pollution control Laboratory
6543 N. Burlington Ave.,
Portland, OR 97203-5452

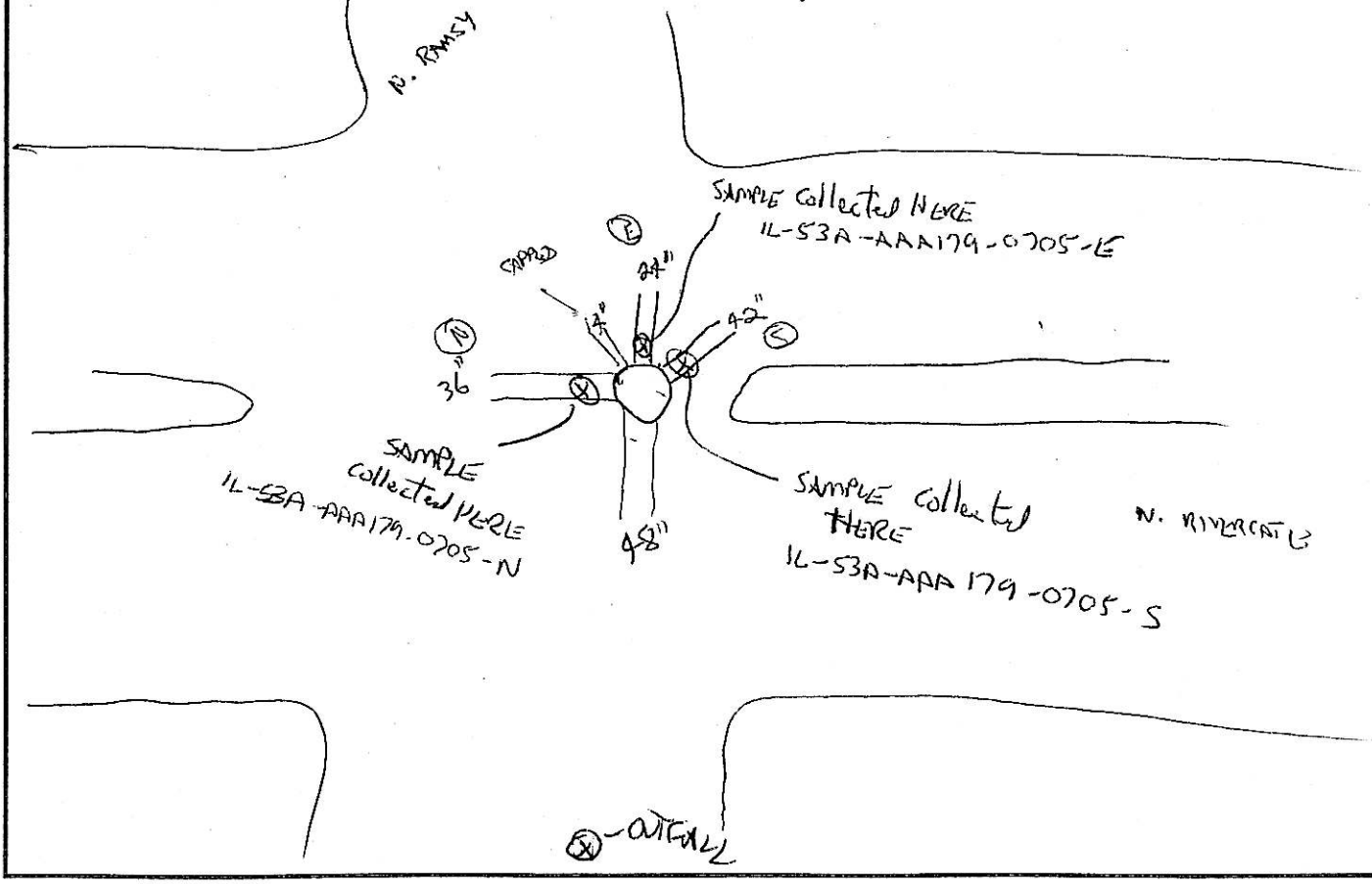
PORTLAND HARBOUR INLINE SEDIMENT SAMPLING - 1020.001
FIELD DATA SHEET

Date: 7/28	Time: 0859	Current Weather conditions: SUNNY 80's
Sampling Team Present:		
Basin: 53A	Node: AAA179	Subbasin:
Address: N RAMSEY + N. BASIN		

SECTION 1 - PRE-SAMPLING VISUAL OBSERVATION REPORT

Describe any flowing or standing water observed in the line?	YES
Does river appear to back up to this location? Describe rate/color/odor of flow:	NO
Are sediments observed in the line?	YES. LT BROWN GW LIQUIFIABLE (SEE BELOW)
Is there enough sediment in the line to collect a sample?	24" - YES ~~42"~~ NO 36"
Describe lateral extent and depth of sample-able sediments present in the line:	N/A

SITE DIAGRAM: Include street intersections/laterals/MH's/driveways cuts and extent of solids accumulation



SECTION 2 - SAMPLE COLLECTION REPORT

Node: AAA 179

Sampling Equipment:	SS BEAKER USED TO collect WATER THEN DECANTED INTO PRENASPED NALGENE SAMPLE BOTTLES
Equipment Decontamination process:	Per FOps SOP 70.1a Other (Describe)
Sample date: 7/28/05	Sample time: N – 0915 E – 0920 S – 0925
Sample Identification: (IL-XX-NNNNNN-mmyy)	IL-53A-AAA 179-0705-N FO 050779 IL-53A-AAA 179-0705-E FO 050780 IL-53A-AAA 179.0705-S FO 050781
Sample location: (number of feet from node of entry)	
Sample collection technique:	SEE ABOVE
Color of sample:	CLEAR, SLIGHTLY TURBID
Texture/Particle size:	N/A
Visual or olfactory evidence of contamination:	NO
Depth of solids in area where sample collected:	N/A
Amount and type of debris:	N/A
Compositing notes:	N/A

Sample Jars Collected

If not enough sample to fill all of the jars, then fill jars in this order:				
	Metals			
	PAHs/SVOCs			
	PCBs			
	TPH (two jars)			
	TOC			

Duplicate sample collected?	NO
Duplicate sample fictitious identification # on COC:	—
Samples placed in chilled cooler? Y/N	
Samples delivered to lab? Y/N	Lab ID Number:
Describe any deviations from standard procedures:	

SECTION 3 - PHOTOGRAPH LOG

Photograph Log	In-Pipe sample location	
	Homogenized sample	

CITY OF PORTLAND
ENVIRONMENTAL SERVICES
Water Pollution control Laboratory
6543 N. Burlington Ave.,
Portland, OR 97203-5452

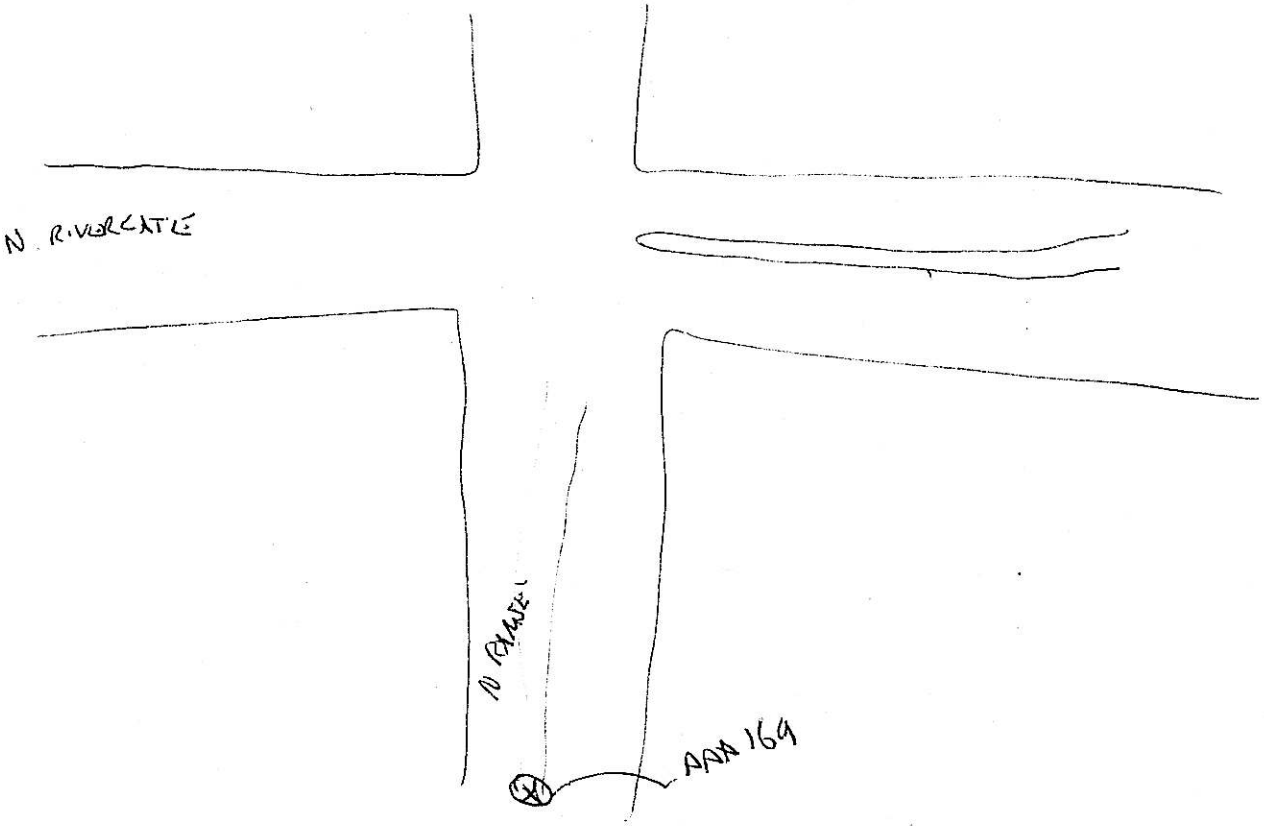
PORTLAND HARBOUR INLINE SEDIMENT SAMPLING - 1020.001
FIELD DATA SHEET

Date: 7/28/05	Time: 0915	Current Weather conditions: SUNNY 80's
Sampling Team Present: MJH | JJM | AD		
Basin: 53A	Node: AAA 169	Subbasin:
Address: OUTFALL 53A		

SECTION 1 - PRE-SAMPLING VISUAL OBSERVATION REPORT

Describe any flowing or standing water observed in the line?	WATER FLOWING OUT OF LINE
Does river appear to back up to this location? Describe rate/color/odor of flow:	NO
Are sediments observed in the line?	
Is there enough sediment in the line to collect a sample?	N/A (WATER - YES)
Describe lateral extent and depth of sample-able sediments present in the line:	—

SITE DIAGRAM: Include street intersections/laterals/MH's/driveways cuts and extent of solids accumulation



SECTION 2 - SAMPLE COLLECTION REPORT

Node: AAA 169

Sampling Equipment:	SAMPLE CONTAINER FILLED DIRECTLY FROM PIPE
Equipment Decontamination process:	~~PelFOps SOP 7013a~~ N/A Other (Describe)
Sample date: 7/28/08	Sample time: 0912
Sample Identification: (IL-XX-NNNNNN-mmyy)	IL-53A-AAA169-0705 PO 050782
Sample location: (number of feet from node of entry)	AT OUTFALL
Sample collection technique:	SAMPLE CONTAINER FILLED DIRECTLY
Color of sample:	SLIGHTLY TURBID
Texture/Particle size:	—
Visual or olfactory evidence of contamination:	NO
Depth of solids in area where sample collected:	—
Amount and type of debris:	—
Compositing notes:	—

Sample Jars Collected

If not enough sample to fill all of the jars, then fill jars in this order:	Metals			
	PAHs/SVOCs			
	PCBs			
	TPH (two jars)			
	TOC			

Duplicate sample collected?	
Duplicate sample fictitious identification # on COC:	
Samples placed in chilled cooler? Y/N	
Samples delivered to lab? Y/N	Lab ID Number:
Describe any deviations from standard procedures:	

SECTION 3 - PHOTOGRAPH LOG

Photograph Log	In-Pipe sample location	
	Homogenized sample	

Attachment C
Laboratory Results

Groundwater Solutions, Inc.
55 SW Yamhill Street, Suite 400 Portland, Oregon 97204
ph: 503.239.8799 fx: 503.239.8940 e: groundwatersolutions.com

Laboratory Data QA/QC Review
Upland Source Control Investigation
City Outfall Basin 53A

To: File

From: Bruce Brody-Heine, RG – GSI

Robyn Cook, GSI

Date: November 8, 2005

This memorandum presents a quality assurance/quality control (QA/QC) review of the laboratory data generated during source control investigation sampling and analyses recently conducted by the City of Portland (City) in Outfall Basin 53A. The results of the sampling and analysis are presented in the November 2005, Technical Memorandum No. OF 53A-1.

The laboratory analysis for these Source Control program samples were completed by the City's BES laboratory and a subcontracted laboratory. The following analyses were conducted by each laboratory:

- BES Laboratory
  - Total Mercury (EPA Method 200.8)
- STL Laboratory
  - PCBs (EPA Method 8082)

Attachment C of the Technical Memorandum No. OF 53A-1 presents the BES laboratory LIMS summary report for all analyses associated with this Outfall Basin investigation and the subcontracted laboratory's data reports. Subcontracted laboratories frequently receive batches of samples related to several BES sampling projects. Only the analytical results (and QA/QC pages) pertinent to this Outfall Basin investigation memorandum are provided with the subcontractor's reports.

This QA/QC review is based upon the available documentation supplied with each laboratory package. The QA/QC review of the analytical data consisted of reviewing the following for each laboratory report:

- Chain-of-custody complete and correct
- Analysis within holding times

- Chemicals of interest in method blanks
- Surrogate recoveries within accuracy control limits
- Laboratory blank spike recoveries within accuracy control limits
- Laboratory blank spike duplicate results within analytical precision control limits
- Matrix spike recoveries within accuracy control limits
- Matrix spike duplicate results within analytical precision control limits

The results of the laboratory report QA/QC review are presented below.

Chain-of-Custody

The chain-of-custody forms showed continuous custody of the samples from the field to the BES laboratory. The chain-of-custody procedures were adequate and sample integrity was maintained through the sample collection and delivery process.

Analysis Holding Times

Polychlorinated biphenyls (PCB) Analyses
All samples exceeded the holding time for extraction (14 days - EPA protocol for 8082) by 8 days. Consequently, these data are qualified as estimated by placing a "J" flag next to the detected compounds and quantitation limits are qualified as estimates with a "UJ" flag. The samples were analyzed within the required holding times.

Total Mercury Analyses
All samples were extracted and analyzed within the required holding times.

Method Blanks

Method blanks were processed during the laboratory analysis of PCBs. No PCBs were detected in the method blanks.

Surrogate Recoveries

Surrogate recoveries of tetrachloro-m-xylene and decachlorobiphenyl (DCB) were completed during the laboratory analysis of PCBs. Surrogate recoveries of tetrachloro-m-xylene were within laboratory control limits for PCB analyses. DCB surrogate recoveries were outside of quality control acceptance limits for PCB analyses. Because the DCB surrogate recovery was within EPA guidelines, no data were qualified.

Surrogate recoveries met quality control acceptance limits for the metals analysis.

Laboratory Control Sample Duplicates

Laboratory blank spike duplicates and laboratory matrix spike duplicates were processed during the laboratory analyses of PCBs and metals. For PCBs, the relative percent difference (RPD)

between the laboratory blank spikes and the laboratory blank spikes duplicate were within laboratory control limits. The RPD between the laboratory matrix spikes and the laboratory matrix spike duplicates were outside laboratory control limits for the PCB analysis. Matrix interference was indicated based on acceptable blank spike recoveries. The relative percent difference (RPD) between both the laboratory blank and matrix spikes and the laboratory blank and matrix spikes duplicates were within laboratory control limits for metals analysis.

Matrix Spike Recoveries

Matrix spikes were processed during the laboratory analyses of PCBs and metals. The matrix spike recoveries were within laboratory control limits for both PCBs and metals analyses.

Water Pollution Control Laboratory
6543 N. Burlington Ave.
Portland, Oregon 97203-4552
(503) 823-5696

City of Portland Chain-of-Custody

Bureau of Environmental Services

Date: 6-21-05
Page: 1 of 1
Collected By: MJH | DJL
PHA

Project Name: PORTLAND HARBOR INLINE SAMP
File Number: 1020.001 **Matrix:** SEDIMENT

OUTFALL 53A CHAIN-OF-CUSTODY

Requested Analyses

WPCL Sample I.D.	Location	Point Code	Sample Date	Sample Time	Sample Type	General: PCBs	General						Metals				Field Comments
FO 050674	IL-53A-AAA171-0605 9891 N RAMSY BLVD	53A_1	6-21-05	1350	C	●											
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.	Relinquished By: 4.
Signature: [signature] Time: 1426	Signature: Time:	Signature: Time:	Signature: Time:
Printed Name: MICHOLE HAUSLER Date: 6-21-05	Printed Name: Date:	Printed Name: Date:	Printed Name: Date:
Received By: 1.	**Received By:** 2.	**Received By:** 3.	**Received By:** 4.
Signature: [signature] Time: 1426	Signature: Time:	Signature: Time:	Signature: Time:
Printed Name: C-Christensen Date: 6/21/05	Printed Name: Date:	Printed Name: Date:	Printed Name: Date:

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 6/21/2005 13:50 **System ID** AJ06024 **Sample ID** **FO050674**

Page: 1

Proj./Company Name: PORTLAND HARBOR INLINE SAMP
Address/Location: IL-53A-AAA171-0605

9891 N RAMSEY BLVD

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 53A_1
IMS File/Invoice #: 1020.001

Date Received: 6/21/2005
Sample Status: COMPLETE AND VALIDATED

Sample Type: GRAB
Sample Matrix: SEDIMENT
Collected By: MJH/DJH

Comments: QA/QC: Unless otherwise noted, all analytical QA/QC criteria were met for this sample including holding times, calibration, me thod blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable.

Test Parameter	Result	Units	MRL	Method
POLYCHLORINATED BIPHENYLS (PCB)				
PCB 1016	<10.9	µg/Kg dry wt	10.9	EPA 8082
PCB 1221	<10.9	µg/Kg dry wt	10.9	EPA 8082
PCB 1232	<10.9	µg/Kg dry wt	10.9	EPA 8082
PCB 1242	<10.9	µg/Kg dry wt	10.9	EPA 8082
PCB 1248	<10.9	µg/Kg dry wt	10.9	EPA 8082
PCB 1254	50.4	µg/Kg dry wt	10.9	EPA 8082
PCB 1260	34.6	µg/Kg dry wt	10.9	EPA 8082

End of Report for Sample ID: FO050674

6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656

Report Date: 8/29/2005

Validated By: Signature on File

Water Pollution Control Laboratory
6543 N. Burlington Ave.
Portland, Oregon 97203-4552
(503) 823-5696

City of Portland Chain-of-Custody

Bureau of Environmental Services

Date: 7/28/05
Page: 1 of 1
Collected By: MJH/JJM/AD

Project Name: PORTLAND HARBOR INLINE SAMP
File Number: 1020.001 Matrix: OTHER

OUTFALL 53A

Requested Analyses

WPCL Sample I.D.	Location	Point Code	Sample Date	Sample Time	Sample Type	General	Metals: Total Mercury	Field Comments
FO 050779	IL-53A-AAA179-0705-N N RIVERGATE & RAMSEY	53A_2W	7/28/05	0915	G		●	
	~~IL-53A-AAA179-0705-NE~~ N RIVERGATE & RAMSEY	53A_3W			G		●	LINE WAS CLOGGED UP. NO SAMPLE
FO 050780	IL-53A-AAA179-M0705-E N RIVERGATE & RAMSEY	53A_4W	7/28/05	0920	G		●	
FO 050781	IL-53A-AAA179-0705-S N RIVERGATE & RAMSEY	53A_5W	↓	0925	G		●	
FO 050782	IL-53A-AAA169-0705 OUTFALL 53A	53A_6W	↓	0912	G		●	

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.	Relinquished By: 4.
Signature:	Time: 1523	Signature: Time:	Signature: Time:	Signature: Time:
Printed Name: MICHAEL HAUSER	Date: 7-28-05	Printed Name: Date:	Printed Name: Date:	Printed Name: Date:
Received By: 1.	**Received By:** 2.	**Received By:** 3.	**Received By:** 4.
Signature:	Time: 1523	Signature: Time:	Signature: Time:	Signature: Time:
Printed Name: KRIS DENNIS	Date: 7/28/05	Printed Name: Date:	Printed Name: Date:	Printed Name: Date:

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 7/28/2005 9:15 **System ID** AJ07228 **Sample ID** **FO050779**

Page: 1

Proj./Company Name: PORTLAND HARBOR INLINE SAMP
Address/Location: IL-53A-AAA179-0705-N
N RIVERGATE & RAMSEY

Date Received: 7/28/2005
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 53A_2W
IMS File/Invoice #: 1020.001

Sample Type: GRAB
Sample Matrix: OTHER
Collected By: MJH/JJM

Comments: QA/QC: Unless otherwise noted, all analytical QA/QC criteria were met for this sample including holding times, calibration, met hod blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as a pplicable.

Test Parameter	Result	Units	MRL	Method
METALS				
MERCURY	0.0079	µg/L	0.002	EPA 200.8

End of Report for Sample ID: FO050779

6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656

Report Date: 8/10/2005

Validated By: Signature on File

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 7/28/2005 9:20 **System ID** AJ07229 **Sample ID** **FO050780**

Page: 1

Proj./Company Name: PORTLAND HARBOR INLINE SAMP
Address/Location: IL-53A-AAA179-0705-E
N RIVERGATE & RAMSEY

Date Received: 7/28/2005
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 53A_4W
IMS File/Invoice #: 1020.001

Sample Type: GRAB
Sample Matrix: OTHER
Collected By: MJH/JJM

Comments: QA/QC: Unless otherwise noted, all analytical QA/QC criteria were met for this sample including holding times, calibration, met hod blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as a pplicable.

Test Parameter	Result	Units	MRL	Method
METALS				
MERCURY	<0.0020	µg/L	0.002	EPA 200.8

End of Report for Sample ID: FO050780

6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656

Report Date: 8/10/2005

Validated By: Signature on File

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 7/28/2005 9:25 **System ID** AJ07230 **Sample ID** **FO050781**

Page: 1

Proj./Company Name: PORTLAND HARBOR INLINE SAMP
Address/Location: IL-53A-AAA179-0705-S
N RIVERGATE & RAMSEY

Date Received: 7/28/2005
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 53A_5W
IMS File/Invoice #: 1020.001

Sample Type: GRAB
Sample Matrix: OTHER
Collected By: MJH/JJM

Comments: QA/QC: Unless otherwise noted, all analytical QA/QC criteria were met for this sample including holding times, calibration, met hod blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as a pplicable.

Test Parameter	Result	Units	MRL	Method
METALS				
MERCURY	0.0021	µg/L	0.002	EPA 200.8

End of Report for Sample ID: FO050781

6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656

Report Date: 8/10/2005

Validated By: Signature on File

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 7/28/2005 9:12 **System ID** AJ07231 **Sample ID** **FO050782**

Page: 1

Proj./Company Name: PORTLAND HARBOR INLINE SAMP
Address/Location: IL-53A-AAA169-0705
OUTFALL 53A

Date Received: 7/28/2005
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 53A_6W
IMS File/Invoice #: 1020.001

Sample Type: GRAB
Sample Matrix: OTHER
Collected By: MJH/JJM

Comments: QA/QC: Unless otherwise noted, all analytical QA/QC criteria were met for this sample including holding times, calibration, met hod blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as a pplicable.

Test Parameter	Result	Units	MRL	Method
METALS				
MERCURY	<0.0020	µg/L	0.002	EPA 200.8

End of Report for Sample ID: FO050782

6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656

Report Date: 8/10/2005

Validated By: Signature on File

STL Seattle
5755 8th Street East
Tacoma, WA 98424

Tel: 253 922 2310
Fax: 253 922 5047
www.stl-inc.com

TRANSMITTAL MEMORANDUM

DATE: November 7, 2005

TO: Howard Holmes
North Creek Analytical
9405 S. W. Nimbus Ave.
Beaverton, OR 97008

PROJECT: P5F0947

REPORT NUMBER: 128669

TOTAL NUMBER OF PAGES: _____

Enclosed are the test results for four samples received at STL Seattle on June 24, 2005.

Analytical Narrative 8082 analysis: The percent recoveries of DCB (surrogate) for samples 128669-1 through 128669-3 and the quality control parameters were outside of quality control acceptance limits. The spiking solution probable become concentrated. New surrogate spiking solution will be prepared for future sample batches.

The report consists of this transmittal memo, analytical results, quality control reports, a copy of the chain-of-custody, a list of data qualifiers and analytical narrative when applicable, and a copy of any requested raw data.

Should there be any questions regarding this report, please contact me at (253) 922-2310.

Sincerely,

Tom Coyner
Project Manager

STL Seattle

Sample Identification:

Lab. No.	Client ID	Date/Time Sampled	Matrix
128669-1	P5F0947-02	06-21-05 13:50	solid
128669-2	P5F0947-03	06-21-05 10:00	solid
128669-3	P5F0947-04	06-21-05 10:20	solid
128669-4	P5F0947-05	06-21-05 10:38	solid

STL Seattle
5755 8th Street East
Tacoma, WA 98424

Tel: 253 922 2310
Fax: 253 922 5047
www.stl-inc.com

TRANSMITTAL MEMORANDUM

DATE: November 7, 2005

TO: Howard Holmes
North Creek Analytical
9405 S. W. Nimbus Ave.
Beaverton, OR 97008

PROJECT: P5F0947

REPORT NUMBER: 128669

TOTAL NUMBER OF PAGES: _____

Enclosed are the test results for four samples received at STL Seattle on June 24, 2005.

Analytical Narrative 8082 analysis: The percent recoveries of DCB (surrogate) for samples 128669-1 through 128669-3 and the quality control parameters were outside of quality control acceptance limits. The spiking solution probable become concentrated. New surrogate spiking solution will be prepared for future sample batches.

The report consists of this transmittal memo, analytical results, quality control reports, a copy of the chain-of-custody, a list of data qualifiers and analytical narrative when applicable, and a copy of any requested raw data.

Should there be any questions regarding this report, please contact me at (253) 922-2310.

Sincerely,

Tom Coyner
Project Manager

STL Seattle

Sample Identification:

Lab. No.	Client ID	Date/Time Sampled	Matrix
128669-1	P5F0947-02	06-21-05 13:50	solid
128669-2	P5F0947-03	06-21-05 10:00	solid
128669-3	P5F0947-04	06-21-05 10:20	solid
128669-4	P5F0947-05	06-21-05 10:38	solid

STL Seattle

Client Name:	North Creek Analytical
Client ID:	P5F0947-02
Lab ID:	128669-01
Date Received:	6/24/2005
Date Prepared:	7/13/2005
Date Analyzed:	7/18/2005
% Solids	86.95
Dilution Factor	1

PCBs by EPA Method 8082

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
Tetrachloro-m-xylene	95.5		60	123
Decachlorobiphenyl	139	N	65	126

Sample results are on a dry weight basis.

Analyte		**Result (mg/kg)**	**RL**	**Flags**
Aroclor 1016	ND		0.0109	
Aroclor 1221	ND		0.0109	
Aroclor 1232	ND		0.0109	
Aroclor 1242	ND		0.0109	
Aroclor 1248	ND		0.0109	
Aroclor 1254		0.0504	0.0109	
Aroclor 1260		0.0346	0.0109	

STL Seattle

Lab ID:	Method Blank - PB0981
Date Received:	-
Date Prepared:	7/13/2005
Date Analyzed:	7/18/2005
% Solids	
Dilution Factor	1

PCBs by EPA Method 8082

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
Tetrachloro-m-xylene	97.8		60	123
Decachlorobiphenyl	130	N	65	126

Sample results are on an as received basis.

Analyte	**Result (mg/kg)**	**RL**	**Flags**
Aroclor 1016	ND	0.01	
Aroclor 1221	ND	0.01	
Aroclor 1232	ND	0.01	
Aroclor 1242	ND	0.01	
Aroclor 1248	ND	0.01	
Aroclor 1254	ND	0.01	
Aroclor 1260	ND	0.01	

STL Seattle

Blank Spike/Blank Spike Duplicate Report

Lab ID:	PB0981
Date Prepared:	7/13/2005
Date Analyzed:	7/18/2005
QC Batch ID:	PB0981

PCBs by EPA Method 8082

Compound Name	Blank Result (mg/kg)	Spike Amount (mg/kg)	BS Result (mg/kg)	BS % Rec.	BSD Result (mg/kg)	BSD % Rec.	RPD	Flag
Aroclor 1242	0	0.1	0.102	102	0.106	106	3.8	
Aroclor 1260	0	0.1	0.105	105	0.106	106	0.95	

STL Seattle

Matrix Spike/Matrix Spike Duplicate Report

Client Sample ID:	P5F0947-03
Lab ID:	128669-02
Date Prepared:	7/13/2005
Date Analyzed:	7/18/2005
QC Batch ID:	PB0981

PCBs by EPA Method 8082

Compound Name	Sample Result (mg/kg)	Spike Amount (mg/kg)	MS Result (mg/kg)	MS % Rec.	MSD Result (mg/kg)	MSD % Rec.	RPD	Flag
Aroclor 1242	0	0.109	0.15	137	0.153	142	3.6	X7
Aroclor 1260	0.068	0.109	0.169	92.1	0.188	111	19	X7

SEVERN TRENT STL

STL Seattle
5755 8th Street East
Tacoma, WA 98424

Tel: 253 922 2310
Fax: 253 922 5047
www.stl-inc.com

DATA QUALIFIERS AND ABBREVIATIONS

B1: This analyte was detected in the associated method blank. The analyte concentration was determined not to be significantly higher than the associated method blank (less than ten times the concentration reported in the blank).

B2: This analyte was detected in the associated method blank. The analyte concentration in the sample was determined to be significantly higher than the method blank (greater than ten times the concentration reported in the blank).

C1: Second column confirmation was performed. The relative percent difference value (RPD) between the results on the two columns was evaluated and determined to be < 40%.

C2: Second column confirmation was performed. The RPD between the results on the two columns was evaluated and determined to be > 40%. The higher result was reported unless anomalies were noted.

C3: Second analysis confirmation was performed. The relative percent difference value (RPD) between the results on the two columns was evaluated and determined to be $\leq$ 30%.

C4: Second analysis confirmation was performed. The RPD between the results on the two columns was evaluated and determined to be > 30%. The original analysis was reported unless anomalies were noted.

M: GC/MS confirmation was performed. The result derived from the original analysis was reported.

D: The reported result for this analyte was calculated based on a secondary dilution factor.

E: The concentration of this analyte exceeded the instrument calibration range and should be considered an estimated quantity.

J: The analyte was analyzed for and positively identified, but the associated numerical value is an estimated quantity.

MCL: Maximum Contaminant Level

MDL: Method Detection Limit

RL: Reporting Limit

N: See analytical narrative

ND: Not Detected

X1: Contaminant does not appear to be "typical" product. Elution pattern suggests it may be _____.

X2: Contaminant does not appear to be "typical" product.

X3: Identification and quantitation of the analyte or surrogate was complicated by matrix interference.

X4: RPD for duplicates was outside advisory QC limits. The sample was re-analyzed with similar results. The sample matrix may be nonhomogeneous.

X4a: RPD for duplicates outside advisory QC limits due to analyte concentration near the method practical quantitation limit/detection limit.

X5: Matrix spike recovery was not determined due to the required dilution.

X6: Recovery and/or RPD values for matrix spike(/matrix spike duplicate) outside advisory QC limits. Sample was re-analyzed with similar results.

X7: Recovery and/or RPD values for matrix spike(/matrix spike duplicate) outside advisory QC limits. Matrix interference may be indicated based on acceptable blank spike recovery and/or RPD.

X7a: Recovery and/or RPD values for this spiked analyte outside advisory QC limits due to high concentration of the analyte in the original sample.

X8: Surrogate recovery was not determined due to the required dilution.

X9: Surrogate recovery outside advisory QC limits due to matrix interference.

000016

11720 North Creek Pkwy N Suite 400, Bothell, WA 98011-8244 425-420-9200 FAX 420-9210
11922 E 1st Ave, Spokane, WA 99206-5302 509-924-9200 FAX 924-9290
9405 SW Nimbus Ave, Beaverton, OR 97008-7145 503-906-9200 FAX 906-9210 [X]
20332 Empire Ave, Ste F1, Bend, OR 97701-5712 541-383-9310 FAX 382-7588
2000 W International Airport Rd Ste A10, Anchorage, AK 99502-1119 907-563-9200 FAX 563-9210

CHAIN OF CUSTODY REPORT

Work Order #: P5F0947

NCA CLIENT: City of Portland

REPORT TO: Jennifer Shackelford

ADDRESS:

PHONE: FAX:

INVOICE TO: Charles Lytle

P.O. NUMBER: 40567

PROJECT NAME: Portland Harbor

PROJECT NUMBER:

SAMPLED BY:

TURNAROUND REQUEST (in Business Days *)

Organic & Inorganic Analyses: [X] STD. | 7 | 5 | 4 | 3 | 2 | 1 | <1

Petroleum Hydrocarbon Analyses: 5 STD. | 4 | 3 | 2 | 1 | <1

OTHER Specify:

* Turnaround Requests less than standard may incur Rush Charges.

	CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	Pests/PCBs 8081/8082	Herbs EPA 8151	PCBs 8082 Low Level	MATRIX (W, S, O)	# OF CONT.	LOCATION / COMMENTS	NCA WO ID
1	F0050657	6/21/05 0928	X	X		W	2		
2	674	1350			X	S	2		
3	675	1000	X			S	2		
4	676	1020	X			S	2		
5	677	1038	X			S	2		
6									
7									
8									
9									
10									

PRESERVATIVE

REQUESTED ANALYSES

RELEASED BY: Masha Faroqui DATE: 6/22/05

PRINT NAME: Masha Faroqui FIRM: City of Portland TIME: 1:30

RECEIVED BY: Bob E DATE: 6/22/05

PRINT NAME: Bob E FIRM: NCA TIME:

RELEASED BY: Bob E DATE: 6/22/05

PRINT NAME: Bob E FIRM: NCA TIME: 14:30

RECEIVED BY: Camille Fukushima DATE: 6/22/05

PRINT NAME: Camille Fukushima FIRM: NCA TIME: 1430

ADDITIONAL REMARKS: Water Pests/PCBs are sent to GERG for analysis. Soil Pests/PCBs and PCBs are sent to STL-Seattle for analysis. Only water Herbs are to be analyzed at NCA.

TEMP: 1.0

PAGE 1 OF 1

21000 COC REV 09/04

SUBCONTRACT ORDER

North Creek Analytical - Portland

P5F0947

128669

SENDING LABORATORY:

North Creek Analytical - Portland
9405 SW Nimbus Ave.
Beaverton, OR 97008
Phone: (503) 906-9200
Fax: (503) 906-9210
Project Manager: Howard Holmes

RECEIVING LABORATORY:

Severn Trent Laboratories - Tacoma
5755 8th Street East
Tacoma, WA 98424
Phone :253-922-2310
Fax: 253-922-5047

Analysis	Due	Expires	Laboratory ID	Comments
Sample ID: P5F0947-02	**Soil**	**Sampled:06/21/05 13:50**		For City of Portland Low Level Analysis
Solids, Dry Weight	06/29/05 16:00	07/19/05 13:50		
8082 PCB LL	07/07/05 16:00	07/05/05 13:50		
Containers Supplied:				
4 oz. jar (A)	4 oz. jar (B)			
Sample ID: P5F0947-03	**Soil**	**Sampled:06/21/05 10:00**		
Solids, Dry Weight	06/29/05 16:00	07/19/05 10:00		
8081A/8082 Pest/PCB	07/07/05 16:00	07/05/05 10:00		
Containers Supplied:				
4 oz. jar (A)	4 oz. jar (B)			
Sample ID: P5F0947-04	**Soil**	**Sampled:06/21/05 10:20**		
Solids, Dry Weight	06/29/05 16:00	07/19/05 10:20		
8081A/8082 Pest/PCB	07/07/05 16:00	07/05/05 10:20		
Containers Supplied:				
4 oz. jar (A)	4 oz. jar (B)			
Sample ID: P5F0947-05	**Soil**	**Sampled:06/21/05 10:38**		
Solids, Dry Weight	06/29/05 16:00	07/19/05 10:38		
8081A/8082 Pest/PCB	07/07/05 16:00	07/05/05 10:38		
Containers Supplied:				
4 oz. jar (A)	4 oz. jar (B)			

Released By	Date	Received By	Date
[signature]	6-23-05	KR	6/24/05
Released By	Date	Received By	Date