— CITY OF PORTLAND —
ENVIRONMENTAL SERVICES
1120 SW Fifth Avenue, Room 1000, Portland, Oregon 97204 ▪ Dan Saltzman, Commissioner ▪ Dean Marriott, Director

TECHNICAL MEMORANDUM No. OFM1-3

Outfall Basin M-1
Inline Solids Investigation

TO: Karen Tarnow, Oregon Department of Environmental Quality (DEQ)

FROM: Linda Scheffler, City of Portland, Bureau of Environmental Services (BES) LS

COPIES: Mike Romero, DEQ
Kristine Koch, U.S. Environmental Protection Agency (EPA)
Zane Gibson, Western Star Trucks
Julia Fowler, GSI Water Solutions, Inc.

DATE: January 14, 2010

SUBJECT: **Portland Harbor Source Investigation**

Introduction

This technical memorandum summarizes the results of a City of Portland BES source investigation of inline solids in the Outfall Basin M-1 shared stormwater conveyance system. The City collected and analyzed inline solids samples from a manhole and an incoming lateral line to this manhole in October and November 2009, respectively. The purpose of the City sampling and analysis was to determine if discharges to Basin M-1 from the Western Star Truck Plant Portland LLC (formerly Freightliner LLC Truck Manufacturing Plant) Fathom Street outfall are a current source of contaminants to the City conveyance system.

Analytical results indicate that contaminants are migrating from the Western Star Truck Plant stormwater pathway. Concentrations of polychlorinated biphenyls (PCBs), metals (cadmium, chromium, copper, lead, nickel, and zinc), polyaromatic hydrocarbons (PAHs), and bis(2-ethylhexyl) phthalate (BEHP) exceed the Portland Harbor Joint Source Control Strategy (JSCS) toxicity screening level values (DEQ/EPA, 2005, as amended 2007).

This inline solids investigation is part of the City's ongoing Remedial Investigation associated with the Portland Harbor City of Portland Outfalls Project being conducted pursuant to the August 13, 2003, Intergovernmental Agreement (IGA) between DEQ and the City. This investigation supports the following joint City/DEQ objectives for Basin M-1 under the IGA:

- Identify significant sources of contaminants to the outfall; and
- Collect and evaluate sufficient data to determine if source control measures are needed.

The data collected under this investigation contribute to ongoing work by DEQ and the City to characterize and control discharges to the stormwater pathway from the former Freightliner Truck Manufacturing Plant (TMP) located at 6936 N. Fathom Street.

Background

Outfall M-1 discharges to the Swan Island Lagoon on the east side of the Willamette River at approximately river mile 8.5. The stormwater conveyance system includes a 36-inch-diameter line that runs northeast along N. Fathom Street from N. Basin Avenue to the cul-de-sac adjacent to the Freightliner TMP site at 6936 N. Fathom Street (see Figure 1). Manhole AAJ831, located in the Fathom Street cul-de-sac, only receives piped discharges from a 36-inch-diameter lateral line connecting to the Freightliner TMP drainage system.

In 2003, the City collected and analyzed inline solids from manhole AAJ831 as part of a pilot project in Basin M-1 (CH2M Hill, 2005). PCBs, metals, pesticides, BEHP, polycyclic aromatic hydrocarbons (PAHs), and total petroleum hydrocarbons were detected in the sample.

The Freightliner TMP site has been working with the DEQ Cleanup program (DEQ, 2009) to identify and control contaminant sources at this site (Environmental Cleanup Site Inventory No. 2366). A stormwater pathway evaluation work plan was developed for the site in 2006 [Maul Foster & Alongi (MFA), 2006]. Work to date has included data collection and line cleaning in the portion of the system discharging to manhole AAJ831.

Sampling Activities and Analytical Approach

Solids sampling activities were completed on October 6 and November 10, 2009, in accordance with the applicable Standard Operating Procedures included in the City's *Amended Programmatic Sampling and Analysis Plan* for collection of water and solids samples for the City of Portland Outfalls Project (BES, 2007a). Samples were collected by accessing manhole AAJ831 to characterize discharges from the Freightliner TMP site. Locations are described below and are depicted on Figure 1, in photographs provided in Attachment A, and in the field notes provided in Attachment B.

- October 6, 2009: City crews entered manhole AAJ831 to collect one inline solids sample from material observed in the manhole and in the first 12 inches of the 36-inch-diameter storm line discharging downstream of the manhole.
- November 10, 2009: Due to the possibility of incidental overland stormwater flow contribution through the manhole cover, City crews returned to manhole AAJ831 to collect one inline solids sample from material observed 30 inches upstream of the manhole in the incoming 36-inch-diameter lateral line from the Freightliner TMP site.

Inline solids samples were homogenized and submitted to the City's Water Pollution Control Laboratory for PCB, metals, PAH, phthalates, total organic carbon (TOC), and total solids analyses in accordance with the *Amended Programmatic Quality Assurance Project Plan* for the project (BES, 2007b).

Summary of Results

Table 1 summarizes the laboratory analytical results for the City samples relative to the Portland Harbor Joint Source Control Strategy (JSCS) screening level values (SLVs) for bioaccumulation and toxicity (DEQ/EPA, 2005, as amended 2007). The laboratory reports and data review memoranda for the City samples are provided in Attachment C.

The results are summarized as follows:

- **PCBs:** Concentrations of total PCBs in the lateral line and manhole samples (963 and 287 µg/Kg, respectively; see Table 1) indicate that PCBs are being discharged to Basin M-1 from the Freightliner site. Aroclors 1254 and 1260 were detected in the manhole sample. Aroclor 1254 was detected in the lateral line sample, though elevated detection limits may have masked the presence of other Aroclors.
- **Metals:** The results indicate that cadmium, chromium, copper, lead, nickel and zinc are being discharged to the system at concentrations exceeding JSCS toxicity SLVs (see Table 1).
- **PAHs:** With the exception of 2-methylnapthalene and phenanthrene in the lateral line sample, PAH concentrations in the samples were not elevated above SLVs.
- **Phthalates:** BEHP and di-n-octyl phthalate were detected in both samples. BEHP concentrations exceeded JSCS toxicity SLV by an order-of-magnitude.

The analytical results for most contaminants are similar in the two samples. Because samples were collected more than a month apart, and significant rainfall events occurred between the two collection dates, further comparison of the analytical results is not warranted.

Conclusions

The analytical data for the inline solids samples collected by the City in Basin M-1 indicate the presence of uncontrolled sources of PCBs, metals, 2-methylnapthalene, phenanthrene, and BEHP at the Freightliner TMP site. Under DEQ oversight, work is underway at this site to evaluate contaminant discharges via the stormwater pathway. As Freightliner cleaned the majority of the storm system that discharges to the Fathom Street outfall in February 2007, it is not known whether observed concentrations indicate solids contributions from uncleaned portions of the system or contaminant discharges from current operations with stormwater exposures (MFA, 2007). The data presented here should be evaluated along with Freightliner TMP site data to identify areas where additional source control measures are needed.

References

BES. 2007a. Amended Programmatic Sampling and Analysis Plan, City of Portland Outfalls Remedial Investigation/Source Control Measures Project. Prepared by the City of Portland, Bureau of Environmental Services, Portland Harbor Program. August 2007.

BES. 2007b. Amended Programmatic Quality Assurance Project Plan, City of Portland Outfalls Project, Revision to Programmatic Source Control Remedial Investigation Work Plan Appendix D. Prepared by the City of Portland, Bureau of Environmental Services, Portland Harbor Program. August 2007.

CH2M Hill. 2005. Data Evaluation Report. Inline Solids in Basins M-1 and 18. Prepared for the City of Portland, Bureau of Environmental Services, Portland Harbor Source Control Pilot Project by CH2M Hill. December 2005.

DEQ. 2004. DEQ Site Summary Report – Details for ECSI Site No. 2366. DEQ Environmental Cleanup Site Database (ECSI). Accessed December 2009; last apparent update April 2004. http://www.deq.state.or.us/lq/ECSI/ecsidetailfull.asp?seqnbr=2366

DEQ/EPA. 2005. Portland Harbor Joint Source Control Strategy, Final, dated December 2005 (updated July 2007).

MFA. 2006. Revised Stormwater Evaluation Work Plan for Truck Manufacturing Plant, Freightliner LLC, Portland Oregon (DEQ No. WMCVC-NWR-02-02 and ECSI #2366). Maul Foster & Alongi, Inc. April 21, 2006.

MFA. 2007. Results of Pre-Cleanout and Post-Cleanout Stormwater and Storm Line Cleanout Solids Sampling and Analyses, Truck Manufacturing Plant (TMP), Freightliner LLC (DEQ ECSI No. 2366). Maul Foster & Alongi, Inc. May 17, 2007.

Table

Table 1 – *Summary of Chemical Analytical Results, Solids Samples, Outfall Basin M-1*

Figure

Figure 1 – *Basin M-1 – Inline Solids Sampling Locations*

Attachments

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

Table

Table 1
Summary of Chemical Analytical Results
Solids Samples
Outfall Basin M-1

Class	Analyte	Units	Upstream ---------- Downstream Manhole AAJ831 Incoming 36" Line FO096165 11/10/2009	Manhole AAJ831 Outgoing 36" Line FO095980 10/6/2009	JSCS[1] Screening Level Value Toxicity	 Bioaccumulation
Total Organic Carbon (EPA 9060 MOD)						
	TOC	ug/Kg	38.5	28.60	--	--
Total Solids (SM 2540 G)						
	TS	%	77.4	76.0	--	--
Metals (EPA 6020)						
	Arsenic	mg/Kg	3.99	3.12	33	7
	Cadmium	mg/Kg	**33.4**	**20.0**	4.98	1
	Chromium	mg/Kg	165	179	111	--
	Copper	mg/Kg	181	127	149	--
	Lead	mg/Kg	**324**	**260**	128	17
	Mercury	mg/Kg	**0.122**	0.046	1.06	0.07
	Nickel	mg/Kg	52.5	60.1	48.6	--
	Silver	mg/Kg	0.37	0.16	5	--
	Zinc	mg/Kg	813	588	459	--
Polychlorinated Biphenyls Aroclors (PCBs) (EPA 8082)						
	Aroclor 1016	ug/Kg	100 U	10 U	530	--
	Aroclor 1221	ug/Kg	200 U	20 U	--	--
	Aroclor 1232	ug/Kg	100 U	10 U	--	--
	Aroclor 1242	ug/Kg	100 U	10 U	--	--
	Aroclor 1248	ug/Kg	100 U	10 U	1500	--
	Aroclor 1254	ug/Kg	963	166	300	--
	Aroclor 1260	ug/Kg	100 U	121	200	--
	Aroclor 1262	ug/Kg	100 U	10 U	--	--
	Aroclor 1268	ug/Kg	100 U	10 U	--	--
	Total PCBs[2]	ug/Kg	**963**	**287**	676	0.39
Polycyclic Aromatic Hydrocarbons (EPA 8270-SIM)						
	2-Methylnapthalene	ug/Kg	804	412	200	--
	Acenaphthene	ug/Kg	193 U	84.7 U	300	--
	Acenaphthylene	ug/Kg	193 U	84.7 U	200	--
	Anthracene	ug/Kg	193 U	89.1	845	--
	Benzo(a)anthracene	ug/Kg	198	84.7 U	1050	--
	Benzo(a)pyrene	ug/Kg	209	84.7 U	1450	--
	Benzo(b)fluoranthene	ug/Kg	329	109	--	--
	Benzo(g,h,i)perylene	ug/Kg	196	84.7 U	300	--
	Benzo(k)fluoranthene	ug/Kg	193 U	84.7 U	13000	--
	Chrysene	ug/Kg	369	149	1290	--
	Dibenzo(a,h)anthracene	ug/Kg	193 U	84.7 U	1300	--
	Fluoranthene	ug/Kg	775	266	2230	37000
	Fluorene	ug/Kg	360	198	536	--
	Indeno(1,2,3-cd)pyrene	ug/Kg	193 U	84.7 U	100	--
	Naphthalene	ug/Kg	235	169	561	--
	Phenanthrene	ug/Kg	1490	840	1170	--
	Pyrene	ug/Kg	605	266	1520	1900
	Total PAHs[2]	ug/Kg	5570	2498	--	--
Phthalates (EPA 8270-SIM)						
	Bis(2-ethylhexyl) phthalate (BEHP)	ug/Kg	**31700**	**11300**	800	330
	Butyl Benzyl Phthalate	ug/Kg	1930 U	842 U	--	--
	Diethyl phthalate	ug/Kg	1930 U	842 U	600	--
	Dimethyl phthalate	ug/Kg	1930 U	842 U	--	--
	Di-n-butyl phthalate	ug/Kg	1930 U	842 U	100	60
	Di-n-octyl phthalate	ug/Kg	13700	7980	--	--

Notes:

U = The analyte was not detected above the reported sample quantification limi
NA = Not analyzed
-- = No JSCS screening level available
ug/Kg = Micrograms per kilogram
mg/Kg = Milligrams per kilogram
[1]JSCS - Portland Harbor Joint Source Control Strategy (DEQ/EPA Final December 2005, Amended July 2007
[2] Total PCBs and PAHs are calculated by assigning "0" to undetected constituents
= concentration exceeds JSCS Toxicity Screening Level Value
bold = concentration exceeds JSCS Bioaccumulation Screening Level Value

Figure

Legend

- Storm Pipe
- Manhole
- Taxlots
- Outfall Basin M-1
- Inline Solids Sampling Location
- Outfall
- DEQ Environmental Cleanup Site
- NPDES Stormwater Permit

0 100 200 400 Feet

Figure 1
Outfall Basin M-1
2009 Inline Solids
Sampling Locations

File Name: s:\gis\saramisc\ofm1 figure1_basinm1.mxd

Environmental Services
City of Portland
1120 SW Fifth Avenue, Room 1000
Portland Oregon, 97204-3912

Program Manager: Linda Scheffler
Portland Harbor Superfund

Sheet No. 1 OF 1

Date Printed: 01/13/10

Prepared by: Sara Gardner

Attachment A
Field Photographs

October 6, 2009 Solids Sampling

Photo 1. Manhole AAJ831 facing northeast towards Western Star Truck facility at 6936 N. Fathom Street.

Photo 2. Solids sampling location in 36-inch-diameter line discharging from manhole AAJ831.

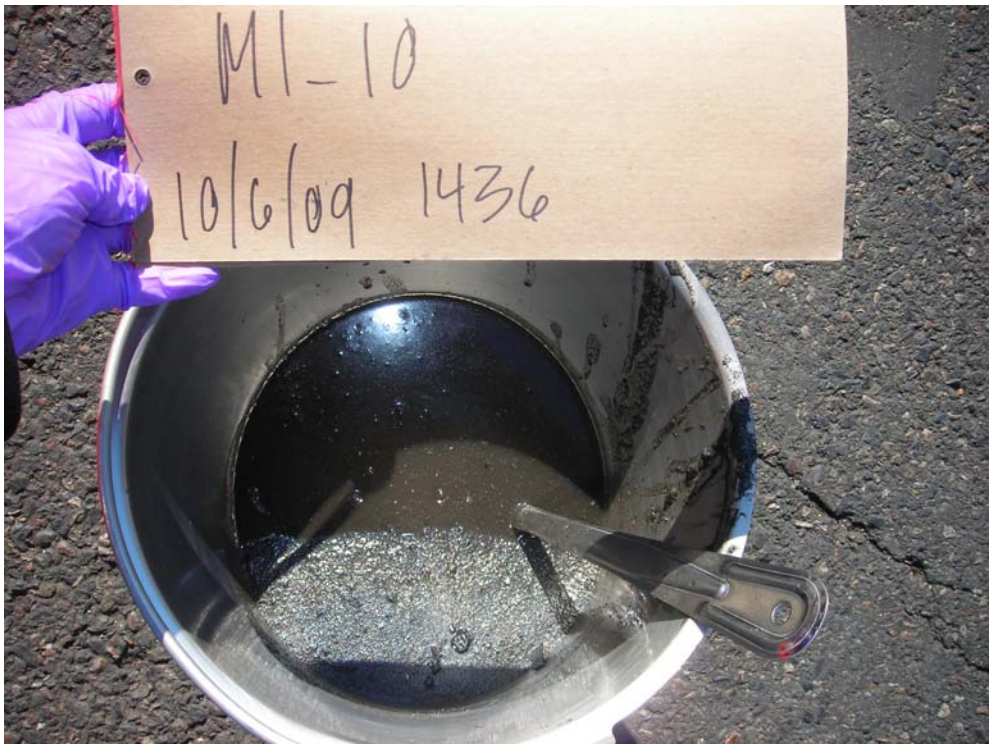


Photo 3. Sample collected from manhole AAJ831 and 36-inch-diameter discharge line.

November 10, 2009 Solids Sampling

Photo 4. Solids sampling location at incoming 36-inch-diameter lateral line to manhole AAJ831.

Photo 5. Sample collected from incoming 36-inch-diameter line at manhole AAJ831.

Attachment B
Field Notes

City of Portland
Environmental Services

DAILY FIELD REPORT

Page 1 of 1

Project Portland Harbor Inline Samp
Project No. 1020.001
Location 3333 NW 35th Avenue / Basin 18 & 44 & M1
Date 10/6/09
Subject Inline Sediment Sampling Activities
By PTB, JXB, ECH

0924 DST ON-SITE 3333 NW 35th Avenue, ABF trucking. Informed ABF of our sampling activities on their property today.
0949 collected sample and filled sample jars at AAX264 and given point code 18-16.

1034 Collected sample and filled sample jars at AAX263 and given point code 18-17.

1124 Collected sample and filled sample jars at AAX262. Attributed point code 18-18.

1214 ARRIVE on-site at Basin 44 node AMQ287. To perform Field Decon Blank and Duplicate at this site.

1246 Performed Field Decon Blank. This node is adjacent to Pacific Power Substation where a diesel crane is currently operating in the assistance of the replacement of insulators as can be seen in the drainage overview photo.
1256 Field Decon Blank completed

1318 Collected sample and filled sample jars at AMQ287. Attributed point code 44-17

1419 ARRIVE on-site at Basin M1 node AAJ831. Worker from Western Star facility informed sampling crew of water test occuring upstream of this node that may increase flow through MH chamber during sampling.
1436 Collected sample and filled sample jars at AAJ831. Attributed point code M1-10. Returned to CWFCL.

Attachments No increased flow was observed during sampling activities.

M1_10

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

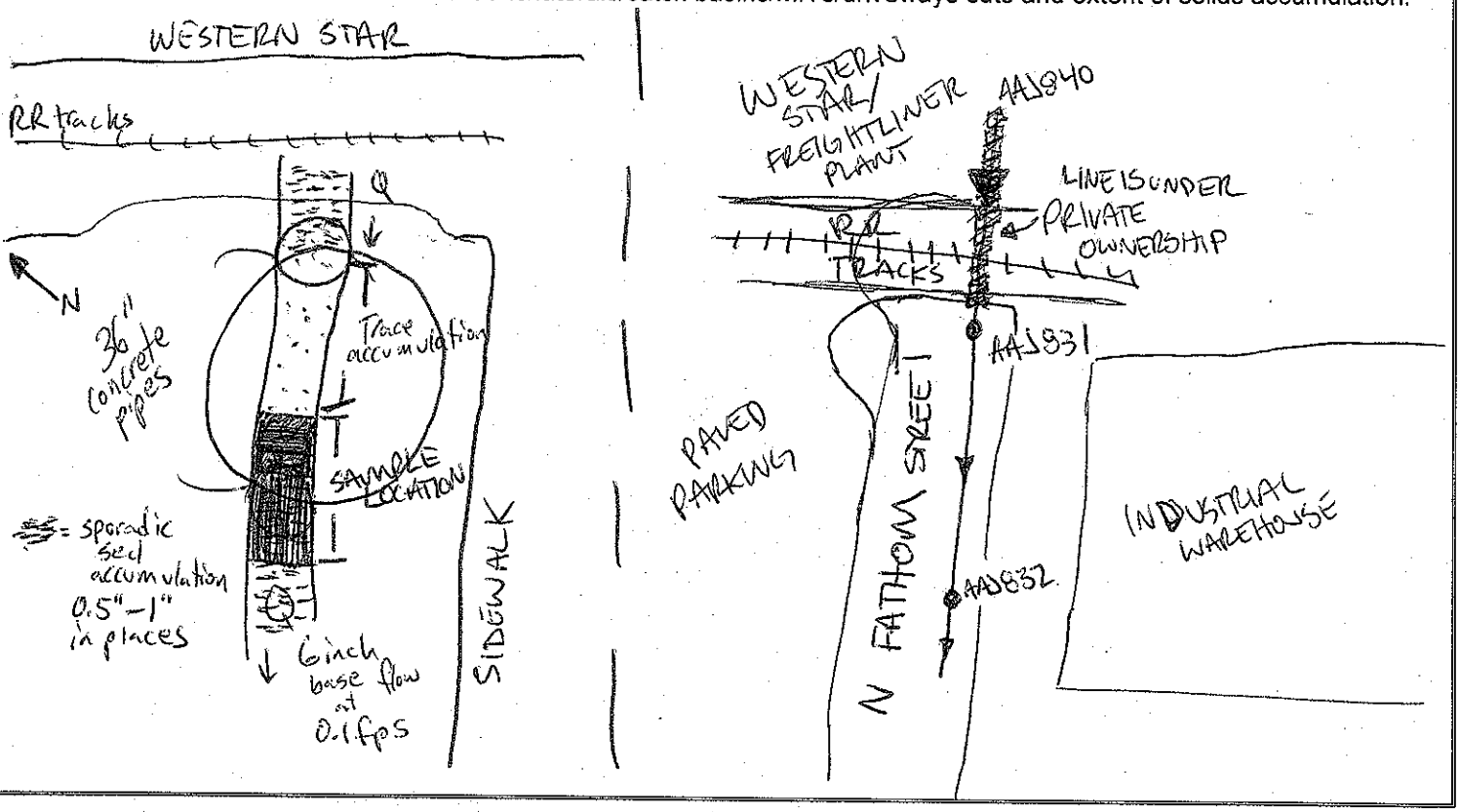
INLINE SEDIMENT SAMPLING FIELD DATA SHEET

Project Name: PORTLAND HARBOR INLINE SAMP			Project Number: 1020.001
Sampling Team: ECH, JXB, PTB	Date: 10/6/09	Arrival Time: 1421	Current Weather Conditions/Last Rain: Sunny / 3 days ago
Basin: M-1	Node: AAJ831		Subbasin: NA
Sampling Location Description/Address: 6936 N Fathom St. Node is at entrance to WESTERN STAR truck manufacturing plant which receives regular truck traffic.			

SECTION 1 - PRE-SAMPLING VISUAL OBSERVATION REPORT

Describe any flowing or standing water observed in the line?	~~Standing~~ Flowing water is present inline at 6" in depth and est ~0.1 fps.
Does river appear to back up to this location? Describe rate/color/odor of flow:	No, river does not appear to back up to this location.
Are sediments observed in the line?	Yes, sediment is sporadically distributed on invert of pipe.
Are sample-able quantities of sediments present in the line?	Yes, sediment ranges from 0.5" to 1" of accumulation
Describe lateral extent of sample-able sediments present in the line:	Sample-able solids are present us and ds of manhole chamber.

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



MI_10

Date: 10/6/09	SECTION 2 - SAMPLE COLLECTION REPORT	Node: AA1831

Sampling Equipment:	X Stainless steel spoon & stainless steel bucket □ Other (Describe)
Equipment Decontamination process:	X Per SOP7.01a □ Other (Describe)
Sample date: 10/6/09 / Sample time: 1436	Sample Identification: (IL-XX-NNNNNN-mmyy) IL-MI-AA1831-1009
Sample location description: (number of feet from node of entry)	From 12" ds of MH chamber to just inside MH chamber
Sample collection technique:	Cross-sectional scoops taken with stainless steel spoon decanting water as the spoon is lifted out of the water.
Describe Color of sample:	VERY dark grey to black
Describe Texture/Particle size:	75% coarse sands, 18% fines, 5% organics, 2% plastics, paint chips, etc.
Describe visual or olfactory evidence of contamination in bulk sediment sample (odor, sheen, discoloration, etc.):	Visible sheen and hydrocarbon odor.
Describe depth of solids in area where sample collected:	Solids ranged in depth from 0.5" to 1"
Describe amount and type of debris in sample:	~~None~~ PTB 2% plastics, paint chips and string
Amount and type of debris removed from final sample:	~~None~~ PTB All debris was attempted to be excluded
Compositing notes:	Homogenized in sample collection bucket using sample collection spoon.
Sample Jars Collected (number, size, full or partial)?	(4) full 4oz. jars

If not enough sample to fill all of the jars, list jars collected and related analytes sampled (as per analyte priority list in work order).				

Lab ID FO095980	Duplicate sample collected? Y (N) Dupe ID
Duplicate sample identification # on COC:	
Any deviations from standard procedures: None	

SECTION 3 - PHOTOGRAPH LOG

Overview of node showing drainage area	0927 looking N, 0928 looking S
Plan view of sediments inline	0925 ds, 0924 us
Homogenized sample (sediment in bowl)	0926
Other?	

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: 10/6/2009

Page: 1 of 1

Collected By: JXB, EXH, PTB

Project Name: PORTLAND HARBOR INLINE SAMP

File Number: 1020.001 Matrix: SEDIMENT

OUTFALL M-1

Requested Analyses

WPCL Sample I.D.	Location	Point Code	Sample Date	Sample Time	Sample Type	Organics: PCB Aroclors - LL	Organics: PAH + Phthalates - LL (TA)	Organics	Organics	Organics	Organics	General: Total Soldis	General: TOC	General	Metals: Total Metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Ag, Zn)	Field Comments
FO095980	IL-M1-AAJ831-1009 6936 N FATHOM ST	M1_10	10/6/09	1436	C	●	●					●	●		●	
2																
3																
4																
5																
6																
7																
8																
9																
10																

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.	Relinquished By: 4.
Signature:	Signature:	Signature:	Signature:
Time: 1550	Time:	Time:	Time:
Printed Name: Peter Bryant	Printed Name:	Printed Name:	Printed Name:
Date: 10/6/09	Date:	Date:	Date:
Received By:	**Received By:** 2.	**Received By:** 3.	**Received By:** 4.
Signature:	Signature:	Signature:	Signature:
Time: 1550	Time:	Time:	Time:
Printed Name: Mackenzie Turk	Printed Name:	Printed Name:	Printed Name:
Date: 10/6/09	Date:	Date:	Date:

M1-11

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

INLINE SEDIMENT SAMPLING FIELD DATA SHEET

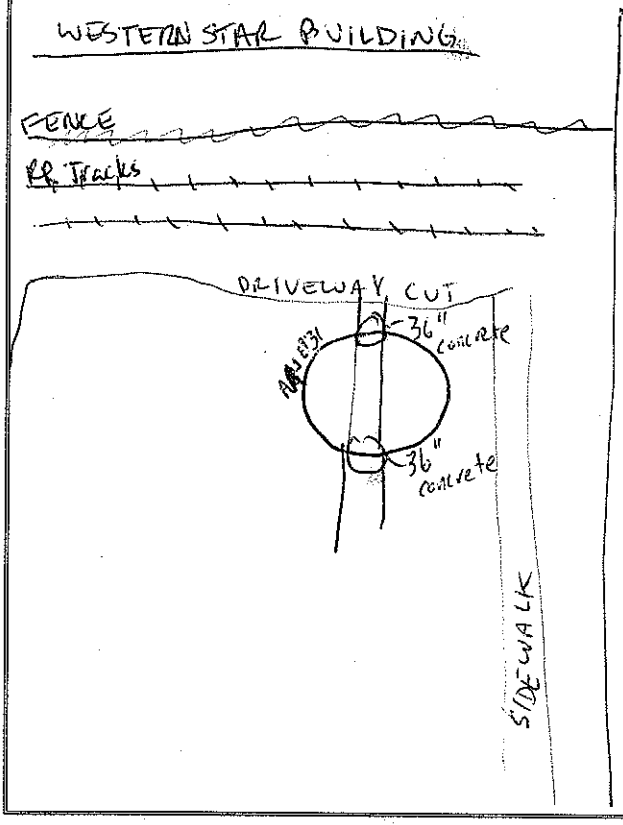
Project Name: Portland Harbor Inline Samp			Project Number: 1020-001
Sampling Team: PTB, JXB	Date: 11/10/09	Arrival Time: 0921	Current Weather Conditions/Last Rain: Clear w/ blue skies/Last rain occured last night
Basin: M1	Node: AA1031		Subbasin: NA

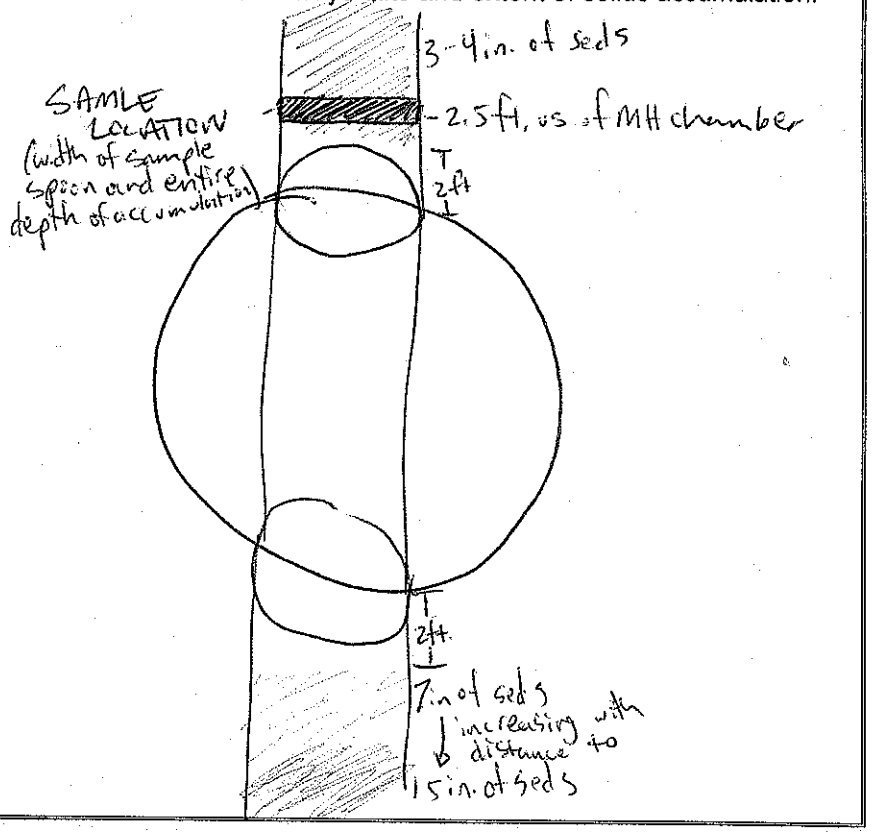
Sampling Location Description/Address: 6936 N Fathom St
MH is located in cul de sac directly in front of Western Star Portland Truck Manufacturing Plant. Semi-trailer parking is located to the NW of the cul de sac.

SECTION 1 - PRE-SAMPLING VISUAL OBSERVATION REPORT

Describe any flowing or standing water observed in the line?	Flowing water is present in-line at 0.5 inches in depth.
Does river appear to back up to this location? Describe rate/color/odor of flow:	No, the river doesnot appear to back up to this location.
Are sediments observed in the line?	Yes, seds are present more-so the further upstrds of mh.
Are sample-able quantities of sediments present in the line?	3-4 in. of sediment deposited us ~ 2ft. from the inlet eop. 7-15in. of seds ds of MH chamber increasing in depth w/ distance from MH
Describe lateral extent of sample-able sediments present in the line:	Sample-able sediments are present both us and ds of MH chamber. ~~PTB~~ ~ 2 ft. us or ds of MH chamber. Work order specifies sample to be taken from upstream side.

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





MI-11

Date: 11/10/09	**SECTION 2 - SAMPLE COLLECTION REPORT**	Node: AAS831

Sampling Equipment:	☒ Stainless steel spoon & stainless steel bucket ☐ Other (Describe)
Equipment Decontamination process:	☒ Per SOP7.01a ☐ Other (Describe)
Sample date: 11/10/09 / Sample time: 0957	Sample Identification: (IL-XX-NNNNNN-mmyy) IL-MI-AAS831-1109-NE
Sample location description: (number of feet from node of entry)	Cross-section of pipe the entire depth of accumulation approx. 2.5 ft us of EOP in MH chamber.
Sample collection technique:	Using stainless steel spoon to scoop seds off pipe floor starting in center and scraping away to sides. Decanting any overlying water.
Describe Color of sample:	Very dark grey, almost black
Describe Texture/Particle size:	98% coarse sands, 1% fine sands & silts, 1% debris (plastics, metal, wood pieces, etc)
Describe visual or olfactory evidence of contamination in bulk sediment sample (odor, sheen, discoloration, etc.):	Sample has apparent sheen on surface and very strong hydrocarbon odor. (sheen is especially colorful & rainbow-like)
Describe depth of solids in area where sample collected:	Solids were 3-4 in. in depth in the sample location area.
Describe amount and type of debris in sample:	~1% of sample was debris (plastics & metals mainly)
Amount and type of debris removed from final sample:	All debris was removed from final sample.
Compositing notes:	Homogenized using sample collection spoon and filled sample jars using fresh decontaminated spoon
Sample Jars Collected (number, size, full or partial)?	5 full 4oz. jars were collected (4 for submittal. 1 in case another analysis is requested)

If not enough sample to fill all of the jars, list jars collected and related analytes sampled (as per analyte priority list in work order).				
FO096165				

Lab ID	Duplicate sample collected? Y/(N) Dupe ID
Duplicate sample identification # on COC:	
Any deviations from standard procedures:	None.

SECTION 3 - PHOTOGRAPH LOG

Overview of node showing drainage area	1340 & 1341
Plan view of sediments inline	1333 - US 1334 - US
Homogenized sample (sediment in bowl)	1339 & 1338
Other?	

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: 11/10/2009

Page: 1 of 1

Collected By: PTB, ECH, JXB

Project Name: PORTLAND HARBOR INLINE SAMP

File Number: 1020.001 Matrix: SEDIMENT

OUTFALL M-1

Requested Analyses

WPCL Sample I.D.	Location	Point Code	Sample Date	Sample Time	Sample Type	Organics: PCB Aroclors - LL	Organics: PAH + Phthalates - LL (TA)	Organics	Organics	Organics	Organics	General: Total Soldis	General: TOC	General	Metals: Total Metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Ag, Zn)	Field Comments
FO096165	IL-M1-AAJ831-1109-NE 6936 N FATHOM ST	M1_11	11/10/09	0957	C	●	●					●	●		●	

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.	Relinquished By: 4.
Signature: [signature] Time: 1533	Signature: Time:	Signature: Time:	Signature: Time:
Printed Name: Peter Bryant Date: 11/10/09	Printed Name: Date:	Printed Name: Date:	Printed Name: Date:
Received By: 1.	**Received By: 2.**	**Received By: 3.**	**Received By: 4.**
Signature: [signature] Time: 1533	Signature: Time:	Signature: Time:	Signature: Time:
Printed Name: [illegible] Date: 11/10/9	Printed Name: Date:	Printed Name: Date:	Printed Name: Date:

Attachment C
Laboratory Results

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GSI Water Solutions, Inc.
55 SW Yamhill Street, Suite 400 Portland, OR 97204
P: 503.239.8799 F: 503.239.8940
info@gsiwatersolutions.com www.gsiwatersolutions.com

Laboratory Data QA/QC Review
Inline Solids Investigation
City Outfall Basin M-1

To: File

From: Julia Fowler, GSI Water Solutions, Inc.

Date: December 8, 2009

This memorandum presents a quality assurance/quality control (QA/QC) review of the laboratory data generated for chemical analysis of inline solids obtained during source control investigation activities conducted in October 2009 by the City of Portland in Outfall Basin M-1 (OF M1).

The laboratory analysis of the OF M1 solids sample was conducted by the City's Bureau of Environmental Services (BES) Water Pollution Control Laboratory (WPCL) and a subcontracted laboratory. The laboratories conducted the analyses listed:

- BES WPCL
    - Total Solids (SM 2540 G)
    - Metals (EPA 6020)
    - Polychlorinated Biphenyl Aroclors (EPA 8082)
- TestAmerica, Inc.
    - Polynuclear Aromatic Hydrocarbons (PAHs) (EPA 8270M-SIM)
    - Phthalates (EPA8270-SIM)
    - Percent Solids (ASTM D2216-80)
    - Total Organic Carbon (TOC) (EPA 9060 MOD)

The WPCL summary report for all analyses associated with this sampling event and the subcontracted laboratory's data report are attached. The WPCL summary report comments that, with some exceptions (included in the following sections below), all analytical QA/QC criteria were met for these samples including holding times, calibration, method blanks, laboratory

control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable.

The following data review is based on the available documentation supplied from the subcontracted laboratory and on exceptions noted in the WPCL summary report. The QA/QC review of the analytical data consisted of reviewing the following for each laboratory report, if available:

- Chain-of-custody for completeness and continuous custody
- Analysis conducted within holding times
- Chemicals of interest detected in method blanks
- Surrogate recoveries within accuracy control limits
- Matrix spike and matrix spike duplicate results within control limits
- Laboratory control sample and duplicate laboratory control sample recoveries within 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. The chain-of-custody procedures were adequate and sample integrity was maintained through the sample collection and delivery process.

Analysis Holding Times

The samples were extracted and analyzed within the acceptable holding times for all analyses.

Method Blanks

Method blanks were processed during the subcontracted laboratory analysis of PAHs, phthalates and TOC. No analytes were detected in the method blanks.

Surrogate Recoveries

Surrogate recoveries were performed during the subcontracted laboratory analysis of PAHs and phthalates. The sample was diluted due to the nature of the sample matrix resulting in surrogate recovery calculations for the phthalate analysis that were not useful. Other surrogate recoveries were within the laboratory control limits.

Matrix Spike/Matrix Spike Duplicates

Matrix spike/matrix spike duplicate (MS/MSD) samples were processed during the subcontracted laboratory analyses of PAHs and phthalates. The MS recoveries for pyrene and benzo(a)pyrene exceeded the laboratory control limits. The MSD recoveries and the relative percent difference between the MS and the MSD for bis(2-ethylhexyl)phthalate and di-n-octyl phthalate were outside control limits. The laboratory took no action because the batch laboratory

control sample percent recoveries and the remaining MS/MDS percent recoveries and relative percent differences were within acceptance limits.

Laboratory Control Samples

Laboratory control samples (LCS) were processed during the subcontracted laboratory analyses of PAHs and phthalate. All LCS percent recoveries were within the laboratory control limits.

Other

The laboratory reporting limits for the PAH and phthalate analyses were raised due to high concentrations of non-target and target analytes, respectively.

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: 10/6/2009

Page: 1 of 1

Collected By: JXB, EXH, PTB

Project Name: PORTLAND HARBOR INLINE SAMP

File Number: 1020.001 Matrix: SEDIMENT

OUTFALL M-1

Requested Analyses

WPCL Sample I.D.	Location	Point Code	Sample Date	Sample Time	Sample Type	Organics: PCB Aroclors - LL	Organics: PAH + Phthalates - LL (TA)	Organics	Organics	Organics	Organics	General: Total Soldis	General: TOC	General	Metals: Total Metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Ag, Zn)	Field Comments
FO095980	IL-M1-AAJ831-1009 6936 N FATHOM ST	M1_10	10/6/09	1436	C	●	●					●	●		●	
2																
3																
4																
5																
6																
7																
8																
9																
10																

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.	Relinquished By: 4.
Signature:	Signature:	Signature:	Signature:
Time: 1550	Time:	Time:	Time:
Printed Name: Peter Bryant	Printed Name:	Printed Name:	Printed Name:
Date: 10/6/09	Date:	Date:	Date:
Received By:	**Received By:** 2.	**Received By:** 3.	**Received By:** 4.
Signature:	Signature:	Signature:	Signature:
Time: 1550	Time:	Time:	Time:
Printed Name: Mackenzie Turk	Printed Name:	Printed Name:	Printed Name:
Date: 10/6/09	Date:	Date:	Date:

City of Portland
Water Pollution Control Laboratory

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

LABORATORY ANALYSIS REPORT

Sample ID: **FO095980** **Sample Collected:** 10/06/09 14:36 **Sample Received:** 10/06/09 **Sample Status:** COMPLETE AND VALIDATED

Proj./Company Name: PORTLAND HARBOR INLINE SAMP
Address/Location: IL-M1-AAJ831-1009
6936 N FATHOM ST
Sample Point Code: M1_10
Sample Type: COMPOSITE
Sample Matrix: SEDIMENT

System ID: AN09584
EID File # : 1020.001
LocCode: PORTHARI
Collected By: JXB/PTB/ECH

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

Test Parameter	Result	Units	MRL	Method	Analysis Date
GENERAL					
TOTAL SOLIDS	76.0	% W/W	0.01	SM 2540 G	10/07/09
METALS					
ARSENIC	3.12	mg/Kg dry wt	0.50	EPA 6020	10/06/09
CADMIUM	20.0	mg/Kg dry wt	0.10	EPA 6020	10/06/09
CHROMIUM	179	mg/Kg dry wt	0.50	EPA 6020	10/06/09
COPPER	127	mg/Kg dry wt	0.25	EPA 6020	10/06/09
LEAD	260	mg/Kg dry wt	0.10	EPA 6020	10/06/09
MERCURY	0.046	mg/Kg dry wt	0.010	EPA 6020	10/06/09
NICKEL	60.1	mg/Kg dry wt	0.25	EPA 6020	10/06/09
SILVER	0.16	mg/Kg dry wt	0.10	EPA 6020	10/06/09
ZINC	588	mg/Kg dry wt	0.50	EPA 6020	10/06/09
GC ANALYSIS					
POLYCHLORINATED BIPHENYLS (PCB)					
Aroclor 1016/1242	<10	µg/Kg dry wt	10	EPA 8082	10/07/09
Aroclor 1221	<20	µg/Kg dry wt	20	EPA 8082	10/07/09
Aroclor 1232	<10	µg/Kg dry wt	10	EPA 8082	10/07/09
Aroclor 1248	<10	µg/Kg dry wt	10	EPA 8082	10/07/09
Aroclor 1254	166	µg/Kg dry wt	10	EPA 8082	10/07/09
Aroclor 1260	121	µg/Kg dry wt	10	EPA 8082	10/07/09
Aroclor 1262	<10	µg/Kg dry wt	10	EPA 8082	10/07/09
Aroclor 1268	<10	µg/Kg dry wt	10	EPA 8082	10/07/09
OUTSIDE ANALYSIS					
TOTAL ORGANIC CARBON	28600	mg/Kg dry wt	100	EPA 9060 MOD	10/15/09
POLYNUCLEAR AROMATICS & PHTHALATES - TA					
Acenaphthene	<84.7	µg/Kg dry wt	84.7	EPA8270M-SIM	10/12/09
Acenaphthylene	<84.7	µg/Kg dry wt	84.7	EPA8270M-SIM	10/12/09
Anthracene	89.1	µg/Kg dry wt	84.7	EPA8270M-SIM	10/12/09
Benzo(a)anthracene	<84.7	µg/Kg dry wt	84.7	EPA8270M-SIM	10/12/09
Benzo(a)pyrene	<84.7	µg/Kg dry wt	84.7	EPA8270M-SIM	10/12/09
Benzo(b)fluoranthene	109	µg/Kg dry wt	84.7	EPA8270M-SIM	10/12/09
Benzo(ghi)perylene	<84.7	µg/Kg dry wt	84.7	EPA8270M-SIM	10/12/09
Benzo(k)fluoranthene	<84.7	µg/Kg dry wt	84.7	EPA8270M-SIM	10/12/09
Bis(2-ethylhexyl) phthalate	11300	µg/Kg dry wt	842	EPA8270M-SIM	10/12/09

Report Date: 11/06/09 **Validated By:**

City of Portland
Water Pollution Control Laboratory

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

LABORATORY ANALYSIS REPORT

Sample ID: **FO095980** **Sample Collected:** 10/06/09 14:36 **Sample Received:** 10/06/09 **Sample Status:** COMPLETE AND VALIDATED

Proj./Company Name: PORTLAND HARBOR INLINE SAMP
Address/Location: IL-M1-AAJ831-1009
6936 N FATHOM ST
Sample Point Code: M1_10
Sample Type: COMPOSITE
Sample Matrix: SEDIMENT

System ID: AN09584
EID File # : 1020.001
LocCode: PORTHARI
Collected By: JXB/PTB/ECH

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

Test Parameter	Result	Units	MRL	Method	Analysis Date
Butyl benzyl phthalate	<842	µg/Kg dry wt	842	EPA8270M-SIM	10/12/09
Chrysene	149	µg/Kg dry wt	84.7	EPA8270M-SIM	10/12/09
Dibenzo(a,h)anthracene	<84.7	µg/Kg dry wt	84.7	EPA8270M-SIM	10/12/09
Diethyl phthalate	<842	µg/Kg dry wt	842	EPA8270M-SIM	10/12/09
Dimethyl phthalate	<842	µg/Kg dry wt	842	EPA8270M-SIM	10/12/09
Di-n-butyl phthalate	<842	µg/Kg dry wt	842	EPA8270M-SIM	10/12/09
Di-n-octyl phthalate	7980	µg/Kg dry wt	842	EPA8270M-SIM	10/12/09
Fluoranthene	266	µg/Kg dry wt	84.7	EPA8270M-SIM	10/12/09
Fluorene	198	µg/Kg dry wt	84.7	EPA8270M-SIM	10/12/09
Indeno(1,2,3-cd)pyrene	<84.7	µg/Kg dry wt	84.7	EPA8270M-SIM	10/12/09
Naphthalene	169	µg/Kg dry wt	84.7	EPA8270M-SIM	10/12/09
Phenanthrene	840	µg/Kg dry wt	84.7	EPA8270M-SIM	10/12/09
Pyrene	266	µg/Kg dry wt	84.7	EPA8270M-SIM	10/12/09

End of Report for Sample ID: FO095980

Report Date: 11/06/09 **Validated By:** JSS

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

PORTLAND, OR 9405 S.W. NIMBUS AVENUE
BEAVERTON, OR 97008-7132
ph: (503) 906.9200 fax: (503) 906.9210

ORELAP#: OR100021

Amended Report

December 24, 2009

Jennifer Shackelford
City of Portland Water Pollution Laboratory
6543 N. Burlington Ave.
Portland, OR 97203

RE: Portland Harbor

Enclosed are the results of analyses for samples received by the laboratory on 10/07/09 12:40. The following list is a summary of the Work Orders contained in this report, generated on 12/24/09 08:58.

If you have any questions concerning this report, please feel free to contact me.

Work Order	Project	ProjectNumber
PSJ0242	Portland Harbor	36238

TestAmerica Portland

Howard Holmes, Project Manager

Amended Report

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PORTLAND, OR 9405 S.W. NIMBUS AVENUE
BEAVERTON, OR 97008-7132
ph: (503) 906.9200 fax: (503) 906.9210

Amended Report

City of Portland Water Pollution Laboratory	Project Name:	**Portland Harbor**	
6543 N. Burlington Ave.	Project Number:	36238	Report Created:
Portland, OR 97203	Project Manager:	Jennifer Shackelford	12/24/09 08:58

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
FO 095974	PSJ0242-01	Soil	10/06/09 09:49	10/07/09 12:40
FO 095975	PSJ0242-02	Soil	10/06/09 10:34	10/07/09 12:40
FO 095976	PSJ0242-03	Soil	10/06/09 11:24	10/07/09 12:40
FO 095977	PSJ0242-04	Soil	10/06/09 13:18	10/07/09 12:40
FO 095978	PSJ0242-05	Soil	10/06/09 13:18	10/07/09 12:40
FO 095979	PSJ0242-06	Water	10/06/09 12:56	10/07/09 12:40
FO 095980	PSJ0242-07	Soil	10/06/09 14:36	10/07/09 12:40

TestAmerica Portland

Howard Holmes, Project Manager

Amended Report

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Amended Report

City of Portland Water Pollution Laboratory	Project Name:	**Portland Harbor**	
6543 N. Burlington Ave.	Project Number:	36238	Report Created:
Portland, OR 97203	Project Manager:	Jennifer Shackelford	12/24/09 08:58

Analytical Case Narrative

TestAmerica - Portland, OR

PSJ0242

Amended Report
2-Methylnaphthalene was added to the 8270 SIM PAH results as requested by Peter Abrams on 12/23/09

TestAmerica Portland

Howard Holmes, Project Manager

Amended Report

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BEAVERTON, OR 97008-7132
ph: (503) 906.9200 fax: (503) 906.9210

Amended Report

City of Portland Water Pollution Laboratory	Project Name:	**Portland Harbor**	
6543 N. Burlington Ave.	Project Number:	36238	Report Created:
Portland, OR 97203	Project Manager:	Jennifer Shackelford	12/24/09 08:58

Polynuclear Aromatic Compounds per EPA 8270M-SIM

TestAmerica Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PSJ0242-07 (FO 095980)		**Soil**			**Sampled: 10/06/09 14:36**					**RL3**
2-Methylnaphthalene	EPA 8270m	**412**	-----	84.7	ug/kg dry	5x	9100355	10/12/09 11:30	10/13/09 20:07	
Acenaphthene	"	ND	-----	84.7	"	"	"	"	"	
Acenaphthylene	"	ND	-----	84.7	"	"	"	"	"	
Anthracene	"	**89.1**	-----	84.7	"	"	"	"	"	
Benzo (a) anthracene	"	ND	-----	84.7	"	"	"	"	"	
Benzo (a) pyrene	"	ND	-----	84.7	"	"	"	"	"	
Benzo (b) fluoranthene	"	**109**	-----	84.7	"	"	"	"	"	
Benzo (ghi) perylene	"	ND	-----	84.7	"	"	"	"	"	
Benzo (k) fluoranthene	"	ND	-----	84.7	"	"	"	"	"	
Chrysene	"	**149**	-----	84.7	"	"	"	"	"	
Dibenzo (a,h) anthracene	"	ND	-----	84.7	"	"	"	"	"	
Fluoranthene	"	**266**	-----	84.7	"	"	"	"	"	
Fluorene	"	**198**	-----	84.7	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	"	ND	-----	84.7	"	"	"	"	"	
Naphthalene	"	**169**	-----	84.7	"	"	"	"	"	
Phenanthrene	"	**840**	-----	84.7	"	"	"	"	"	
Pyrene	"	**266**	-----	84.7	"	"	"	"	"	

Surrogate(s):	*Fluorene-d10*	*94.5%*	*24 - 125 %*	"
	Pyrene-d10	*74.7%*	*41 - 141 %*	"
	Benzo (a) pyrene-d12	*101%*	*38 - 143 %*	"

TestAmerica Portland

Howard Holmes, Project Manager

Amended Report

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

PORTLAND, OR 9405 S.W. NIMBUS AVENUE
BEAVERTON, OR 97008-7132
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Amended Report

City of Portland Water Pollution Laboratory	Project Name: **Portland Harbor**	
6543 N. Burlington Ave.	Project Number: 36238	Report Created:
Portland, OR 97203	Project Manager: Jennifer Shackelford	12/24/09 08:58

Phthalates per EPA 8270-SIM

TestAmerica Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PSJ0242-07 (FO 095980)		**Soil**				**Sampled: 10/06/09 14:36**				**RL7**
Dimethyl phthalate	EPA 8270m	ND	-----	842	ug/kg dry	25x	9100711	10/20/09 16:00	10/22/09 05:11	
Diethyl phthalate	"	ND	-----	842	"	"	"	"	"	
Di-n-butyl phthalate	"	ND	-----	842	"	"	"	"	"	
Butyl benzyl phthalate	"	ND	-----	842	"	"	"	"	"	
Bis(2-ethylhexyl)phthalate	"	**11300**	-----	842	"	"	"	"	"	
Di-n-octyl phthalate	"	**7980**	-----	842	"	"	"	"	"	
Surrogate(s): 2-Fluorobiphenyl				*106%*		*10 - 150 %*			"	***Z3***
p-Terphenyl-d14				*119%*		*10 - 150 %*			"	***Z3***

TestAmerica Portland

Howard Holmes, Project Manager

Amended Report

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THE LEADER IN ENVIRONMENTAL TESTING

PORTLAND, OR 9405 S.W. NIMBUS AVENUE
BEAVERTON, OR 97008-7132
ph: (503) 906.9200 fax: (503) 906.9210

Amended Report

City of Portland Water Pollution Laboratory	Project Name:	**Portland Harbor**	
6543 N. Burlington Ave.	Project Number:	36238	Report Created:
Portland, OR 97203	Project Manager:	Jennifer Shackelford	12/24/09 08:58

Percent Dry Weight (Solids) per ASTM D2216-80

TestAmerica Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PSJ0242-07 (FO 095980)			**Soil**			**Sampled: 10/06/09 14:36**				
% Solids	NCA SOP	**78.8**	-----	0.0100	% by Weight	1x	9100358	10/12/09 07:26	10/12/09 07:26	

TestAmerica Portland

Howard Holmes, Project Manager

Amended Report

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PORTLAND, OR 9405 S.W. NIMBUS AVENUE
BEAVERTON, OR 97008-7132
ph: (503) 906.9200 fax: (503) 906.9210

Amended Report

City of Portland Water Pollution Laboratory	Project Name:	**Portland Harbor**	
6543 N. Burlington Ave.	Project Number:	36238	Report Created:
Portland, OR 97203	Project Manager:	Jennifer Shackelford	12/24/09 08:58

Organic Carbon, Total (TOC)

TestAmerica Connecticut

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PSJ0242-01 (FO 095974)			**Soil**				**Sampled: 10/06/09 09:49**			
Total Organic Carbon - Duplicates	9060	**19000**	*30.0*	100	mg/Kg	1x	32393	10/15/09 21:24	10/15/09 21:24	
PSJ0242-02 (FO 095975)			**Soil**				**Sampled: 10/06/09 10:34**			
Total Organic Carbon - Duplicates	9060	**75400**	*30.0*	100	mg/Kg	1x	32393	10/15/09 21:38	10/15/09 21:38	
PSJ0242-03 (FO 095976)			**Soil**				**Sampled: 10/06/09 11:24**			
Total Organic Carbon - Duplicates	9060	**89200**	*30.0*	100	mg/Kg	1x	32393	10/15/09 21:53	10/15/09 21:53	
PSJ0242-04 (FO 095977)			**Soil**				**Sampled: 10/06/09 13:18**			
Total Organic Carbon - Duplicates	9060	**35500**	*30.0*	100	mg/Kg	1x	32393	10/15/09 22:07	10/15/09 22:07	
PSJ0242-05 (FO 095978)			**Soil**				**Sampled: 10/06/09 13:18**			
Total Organic Carbon - Duplicates	9060	**24600**	*30.0*	100	mg/Kg	1x	32393	10/15/09 22:37	10/15/09 22:37	
PSJ0242-07 (FO 095980)			**Soil**				**Sampled: 10/06/09 14:36**			
Total Organic Carbon - Duplicates	9060	**28600**	*30.0*	100	mg/Kg	1x	32393	10/15/09 22:51	10/15/09 22:51	

TestAmerica Portland

Howard Holmes, Project Manager

Amended Report

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

PORTLAND, OR 9405 S.W. NIMBUS AVENUE
BEAVERTON, OR 97008-7132
ph: (503) 906.9200 fax: (503) 906.9210

Amended Report

City of Portland Water Pollution Laboratory	Project Name: **Portland Harbor**	
6543 N. Burlington Ave.	Project Number: 36238	Report Created:
Portland, OR 97203	Project Manager: Jennifer Shackelford	12/24/09 08:58

Polynuclear Aromatic Compounds per EPA 8270M-SIM - Laboratory Quality Control Results

TestAmerica Portland

QC Batch: 9100355 **Soil Preparation Method: EPA 3550**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (9100355-BLK1)							**Extracted: 10/12/09 11:30**							
Benzo (e) pyrene	EPA 8270m	ND	---	13.3	ug/kg wet	1x	--	--	--	--	--	--	10/12/09 18:35	ID5
2-Methylnaphthalene	"	ND	---	13.3	"	"	--	--	--	--	--	--	"	
Acenaphthene	"	ND	---	13.3	"	"	--	--	--	--	--	--	"	
Acenaphthylene	"	ND	---	13.3	"	"	--	--	--	--	--	--	"	
Anthracene	"	ND	---	13.3	"	"	--	--	--	--	--	--	"	
Benzo (a) anthracene	"	ND	---	13.3	"	"	--	--	--	--	--	--	"	
Benzo (a) pyrene	"	ND	---	13.3	"	"	--	--	--	--	--	--	"	
Benzo (b) fluoranthene	"	ND	---	13.3	"	"	--	--	--	--	--	--	"	
Benzo (ghi) perylene	"	ND	---	13.3	"	"	--	--	--	--	--	--	"	
Benzo (k) fluoranthene	"	ND	---	13.3	"	"	--	--	--	--	--	--	"	ID4
Chrysene	"	ND	---	13.3	"	"	--	--	--	--	--	--	"	
Dibenzo (a,h) anthracene	"	ND	---	13.3	"	"	--	--	--	--	--	--	"	
Fluoranthene	"	ND	---	13.3	"	"	--	--	--	--	--	--	"	
Fluorene	"	ND	---	13.3	"	"	--	--	--	--	--	--	"	
Indeno (1,2,3-cd) pyrene	"	ND	---	13.3	"	"	--	--	--	--	--	--	"	
Naphthalene	"	ND	---	13.3	"	"	--	--	--	--	--	--	"	
Phenanthrene	"	ND	---	13.3	"	"	--	--	--	--	--	--	"	
Pyrene	"	ND	---	13.3	"	"	--	--	--	--	--	--	"	
Surrogate(s):	*Fluorene-d10*	*Recovery:*	*83.5%*		*Limits:*	*24-125%*							*10/12/09 18:35*	
	Pyrene-d10		*96.2%*			*41-141%*							*"*	
	Benzo (a) pyrene-d12		*88.0%*			*38-143%*							*"*	
LCS (9100355-BS1)							**Extracted: 10/12/09 11:30**							
Acenaphthene	EPA 8270m	172	---	13.2	ug/kg wet	1x	--	164	105%	(33-139)	--	--	10/12/09 19:05	
Benzo (a) pyrene	"	173	---	13.2	"	"	--	"	105%	(45-149)	--	--	"	
Pyrene	"	172	---	13.2	"	"	--	"	104%	(39-138)	--	--	"	
Surrogate(s):	*Fluorene-d10*	*Recovery:*	*96.6%*		*Limits:*	*24-125%*							*10/12/09 19:05*	
	Pyrene-d10		*91.8%*			*41-141%*							*"*	
	Benzo (a) pyrene-d12		*94.0%*			*38-143%*							*"*	

TestAmerica Portland

Howard Holmes, Project Manager

Amended Report

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

PORTLAND, OR 9405 S.W. NIMBUS AVENUE
BEAVERTON, OR 97008-7132
ph: (503) 906.9200 fax: (503) 906.9210

Amended Report

City of Portland Water Pollution Laboratory	Project Name: **Portland Harbor**	
6543 N. Burlington Ave.	Project Number: 36238	Report Created:
Portland, OR 97203	Project Manager: Jennifer Shackelford	12/24/09 08:58

Polynuclear Aromatic Compounds per EPA 8270M-SIM - Laboratory Quality Control Results

TestAmerica Portland

QC Batch: 9100355 **Soil Preparation Method: EPA 3550**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Matrix Spike (9100355-MS1)					**QC Source: PSJ0372-03**				**Extracted: 10/12/09 11:30**					
Acenaphthene	EPA 8270m	172	---	137	ug/kg dry	10x	ND	171	101%	(33-139)	--	--	10/12/09 19:34	
Benzo (a) pyrene	"	321	---	137	"	"	54.0	"	156%	(45-149)	--	--	"	M7
Pyrene	"	704	---	137	"	"	101	"	353%	(39-138)	--	--	"	M7
Surrogate(s): Fluorene-d10		*Recovery: 86.2%*			*Limits: 24-125%*								*10/12/09 19:34*	
Pyrene-d10		*86.2%*			*41-141%*								*"*	
Benzo (a) pyrene-d12		*87.8%*			*38-143%*								*"*	
Matrix Spike Dup (9100355-MSD1)					**QC Source: PSJ0372-03**				**Extracted: 10/12/09 11:30**					
Acenaphthene	EPA 8270m	159	---	138	ug/kg dry	10x	ND	172	92.4%	(33-139)	7.75%	(60)	10/12/09 20:03	
Benzo (a) pyrene	"	205	---	138	"	"	54.0	"	87.7%	(45-149)	44.3%	"	"	
Pyrene	"	239	---	138	"	"	101	"	79.9%	(39-138)	98.7%	"	"	R3
Surrogate(s): Fluorene-d10		*Recovery: 84.0%*			*Limits: 24-125%*								*10/12/09 20:03*	
Pyrene-d10		*82.6%*			*41-141%*								*"*	
Benzo (a) pyrene-d12		*84.9%*			*38-143%*								*"*	

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6543 N. Burlington Ave.	Project Number: 36238	Report Created:
Portland, OR 97203	Project Manager: Jennifer Shackelford	12/24/09 08:58

Phthalates per EPA 8270-SIM - Laboratory Quality Control Results

TestAmerica Portland

QC Batch: 9100711 **Soil Preparation Method: EPA 3550**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (9100711-BLK1)									**Extracted: 10/20/09 16:00**					
Dimethyl phthalate	EPA 8270m	ND	---	26.8	ug/kg wet	1x	--	--	--	--	--	--	10/21/09 20:47	
Diethyl phthalate	"	ND	---	26.8	"	"	--	--	--	--	--	--	"	
Di-n-butyl phthalate	"	ND	---	26.8	"	"	--	--	--	--	--	--	"	
Butyl benzyl phthalate	"	ND	---	26.8	"	"	--	--	--	--	--	--	"	
Bis(2-ethylhexyl)phthalate	"	ND	---	26.8	"	"	--	--	--	--	--	--	"	
Di-n-octyl phthalate	"	ND	---	26.8	"	"	--	--	--	--	--	--	"	
Surrogate(s): 2-Fluorobiphenyl		*Recovery: 110%*			*Limits: 10-150%*								*10/21/09 20:47*	
p-Terphenyl-d14		*101%*			*10-150%*								*"*	
LCS (9100711-BS1)									**Extracted: 10/20/09 16:00**					
Dimethyl phthalate	EPA 8270m	122	---	26.8	ug/kg wet	1x	--	133	91.5%	(20-150)	--	--	10/21/09 21:24	
Diethyl phthalate	"	133	---	26.8	"	"	--	"	99.6%	"	--	--	"	
Di-n-butyl phthalate	"	145	---	26.8	"	"	--	"	109%	"	--	--	"	
Butyl benzyl phthalate	"	149	---	26.8	"	"	--	"	112%	"	--	--	"	
Bis(2-ethylhexyl)phthalate	"	148	---	26.8	"	"	--	"	111%	"	--	--	"	
Di-n-octyl phthalate	"	143	---	26.8	"	"	--	"	107%	"	--	--	"	
Surrogate(s): 2-Fluorobiphenyl		*Recovery: 127%*			*Limits: 10-150%*								*10/21/09 21:24*	
p-Terphenyl-d14		*112%*			*10-150%*								*"*	
Matrix Spike (9100711-MS1)					**QC Source: PSJ0657-06**				**Extracted: 10/20/09 16:00**					
Dimethyl phthalate	EPA 8270m	152	---	296	ug/kg dry	10x	ND	147	103%	(10-150)	--	--	10/22/09 22:21	
Diethyl phthalate	"	155	---	296	"	"	ND	"	106%	"	--	--	"	
Di-n-butyl phthalate	"	162	---	296	"	"	ND	"	110%	"	--	--	"	
Butyl benzyl phthalate	"	182	---	296	"	"	37.6	"	98.1%	"	--	--	"	
Bis(2-ethylhexyl)phthalate	"	307	---	296	"	"	95.2	"	144%	"	--	--	"	
Di-n-octyl phthalate	"	141	---	296	"	"	ND	"	95.5%	"	--	--	"	
Surrogate(s): 2-Fluorobiphenyl		*Recovery: 92.8%*			*Limits: 10-150%*								*10/22/09 22:21*	
p-Terphenyl-d14		*93.2%*			*10-150%*								*"*	
Matrix Spike Dup (9100711-MSD1)					**QC Source: PSJ0657-06**				**Extracted: 10/20/09 16:00**					
Dimethyl phthalate	EPA 8270m	149	---	295	ug/kg dry	10x	ND	147	101%	(10-150)	1.92%	(50)	10/22/09 22:57	
Diethyl phthalate	"	216	---	295	"	"	ND	"	147%	"	32.4%	"	"	
Di-n-butyl phthalate	"	160	---	295	"	"	ND	"	109%	"	0.724%	"	"	
Butyl benzyl phthalate	"	205	---	295	"	"	37.6	"	114%	"	11.7%	"	"	
Bis(2-ethylhexyl)phthalate	"	1330	---	295	"	"	95.2	"	841%	"	125%	"	"	M7, R2
Di-n-octyl phthalate	"	269	---	295	"	"	ND	"	183%	"	62.5%	"	"	M7, R2
Surrogate(s): 2-Fluorobiphenyl		*Recovery: 92.1%*			*Limits: 10-150%*								*10/22/09 22:57*	
p-Terphenyl-d14		*91.1%*			*10-150%*								*"*	

TestAmerica Portland

Howard Holmes, Project Manager

Amended Report

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Amended Report

City of Portland Water Pollution Laboratory	Project Name:	**Portland Harbor**	
6543 N. Burlington Ave.	Project Number:	36238	Report Created:
Portland, OR 97203	Project Manager:	Jennifer Shackelford	12/24/09 08:58

Percent Dry Weight (Solids) per ASTM D2216-80 - Laboratory Quality Control Results

TestAmerica Portland

QC Batch: 9100358 **Soil Preparation Method: Dry Weight**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Duplicate (9100358-DUP1)					**QC Source: PSJ0276-02**				**Extracted: 10/12/09 07:26**					
% Solids	NCA SOP	77.4	---	0.0100	% by Weight	1x	77.1	--	--	--	0.388%	(20)	10/12/09 07:26	

TestAmerica Portland

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Amended Report

City of Portland Water Pollution Laboratory	Project Name:	**Portland Harbor**	
6543 N. Burlington Ave.	Project Number:	36238	Report Created:
Portland, OR 97203	Project Manager:	Jennifer Shackelford	12/24/09 08:58

Organic Carbon, Total (TOC) - Laboratory Quality Control Results

TestAmerica Connecticut

QC Batch: 32393 **Soil Preparation Method: NA**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
LCS (220-32393-6)					**QC Source:**					**Extracted: 10/15/09 21:10**				
Total Organic Carbon - Duplicates	9060	3783	30.0	100	mg/Kg	1x	--	3530	107%	(28-172)	--	--	10/15/09 21:10	
Blank (220-32393-7)					**QC Source:**					**Extracted: 10/15/09 21:17**				
Total Organic Carbon - Duplicates	9060	ND	30.0	100	mg/Kg	1x	--	--	--	--	--	--	10/15/09 21:17	

TestAmerica Portland

Howard Holmes, Project Manager

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Amended Report

City of Portland Water Pollution Laboratory	Project Name:	**Portland Harbor**	
6543 N. Burlington Ave.	Project Number:	36238	Report Created:
Portland, OR 97203	Project Manager:	Jennifer Shackelford	12/24/09 08:58

Notes and Definitions

Report Specific Notes:

ID4	-	Benzo(j)fluoranthene coelutes with Benzo(k)fluoranthene. The reported result is a summation of the isomers and the concentration is based on the response factor of Benzo(k)fluoranthene.
ID5	-	Benzo(e)pyrene concentration is based on the response factor of Benzo(a)pyrene, and has not been calibrated independently.
M7	-	The MS and/or MSD were above the acceptance limits. See Blank Spike (LCS).
R2	-	The RPD exceeded the acceptance limit.
R3	-	The RPD exceeded the acceptance limit due to sample matrix effects.
RL3	-	Reporting limit raised due to high concentrations of non-target analytes.
RL7	-	Sample required dilution due to high concentrations of target analyte.
Z3	-	The sample required a dilution due to the nature of the sample matrix. Because of this dilution, the surrogate spike concentration in the sample was reduced to a level where the recovery calculation does not provide useful information.

Laboratory Reporting Conventions:

DET	-	Analyte DETECTED at or above the Reporting Limit. Qualitative Analyses only.
ND	-	Analyte NOT DETECTED at or above the reporting limit (MDL or MRL, as appropriate).
NR/NA	-	Not Reported / Not Available
dry	-	Sample results reported on a Dry Weight Basis. Results and Reporting Limits have been corrected for Percent Dry Weight.
wet	-	Sample results and reporting limits reported on a Wet Weight Basis (as received). Results with neither 'wet' nor 'dry' are reported on a Wet Weight Basis.
RPD	-	RELATIVE PERCENT DIFFERENCE (RPDs calculated using Results, not Percent Recoveries).
MRL	-	METHOD REPORTING LIMIT. Reporting Level at, or above, the lowest level standard of the Calibration Table.
MDL*	-	METHOD DETECTION LIMIT. Reporting Level at, or above, the statistically derived limit based on 40CFR, Part 136, Appendix B. *MDLs are listed on the report only if the data has been evaluated below the MRL. Results between the MDL and MRL are reported as Estimated Results.
Dil	-	Dilutions are calculated based on deviations from the standard dilution performed for an analysis, and may not represent the dilution found on the analytical raw data.
Reporting Limits	-	Reporting limits (MDLs and MRLs) are adjusted based on variations in sample preparation amounts, analytical dilutions and percent solids, where applicable.
Electronic Signature	-	Electronic Signature added in accordance with TestAmerica's *Electronic Reporting and Electronic Signatures Policy.* Application of electronic signature indicates that the report has been reviewed and approved for release by the laboratory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

TestAmerica Portland

Howard Holmes, Project Manager

Amended Report

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

11720 North Creek Pkwy N Suite 400, Bothell, WA 98011-8244 425-420-9200 FAX 420-9210
11922 E. First 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
2000 W International Airport Rd Ste A10, Anchorage, AK 99502-1119 907-563-9200 FAX 563-9210

CHAIN OF CUSTODY REPORT

Work Order #: PSJ0242

CLIENT: City of Portland

REPORT TO:
ADDRESS: Jennifer Shackelford

PHONE: FAX:

PROJECT NAME: Portland Harbor Inline Comp

PROJECT NUMBER:

SAMPLED BY:

INVOICE TO: Charles Lytle

P.O. NUMBER: 36238

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	PRESERVATIVE	REQUESTED ANALYSES: PCB Congeners (4/11/09)	REQUESTED ANALYSES: TOC	REQUESTED ANALYSES: PAH + Perylene (4/11/09)	MATRIX (W, S, O)	# OF CONT.	LOCATION/ COMMENTS	TA WO ID
1 F0095974	10/6/09 0949		X	X		S	2		
2 F0095975	1034		X	X		S	2		
3 F0095976	1124		X	X		S	2		
4 F0095977	1318		X	X		S	2		
5 F0095978	1318		X	X		S	2		
6 F0095979	1256		X			W	1		
7 F0095980	1436			X	X	S	2		
8									
9									
10									

RELEASED BY: Mackenzie Zink FIRM: City of Portland DATE: 10/7/09 TIME: 1205
PRINT NAME:
RELEASED BY: Bob Fong FIRM: TAP DATE: 10/7/09 TIME: 12:40
PRINT NAME: Bob Fong

RECEIVED BY: Bob Fong FIRM: TAP DATE: 10/7/09 TIME: 12:45
PRINT NAME: Bob Fong
RECEIVED BY: Jessica Nyn FIRM: TAP DATE: 10/7/09 TIME: 1240
PRINT NAME: Jessica Nyn

ADDITIONAL REMARKS:

TEMP: 1.4 PAGE OF

TAL-1000(0408)

TestAmerica Portland

Sample Receiving Checklist

Work Order #: PSS0242 Date/Time Received: 10/7/09 1240

Client Name and Project: COC P Portland Harbor

Time Zone:
☐EDT/EST ☐CDT/CST ☐MDT/MST ☑PDT/PST ☐AK ☐OTHER

Unpacking Checks:

Cooler #(s): 1

Temperatures: 1.0 ____ ____ ____ ____

Digi #1 ☐ Digi #2 ☐ IR Gun ☑ (☑Plastic ☐Glass)

Temperature out of Range:

__Not enough or No Ice
__Ice Melted
__W/in 4 Hrs of collection
__Other:_____

Initials: JM

N/A	Yes	No	
☑	☐	☐	1. If ESI client, were temp blanks received? If no, document on NOD.
☑	☐	☐	2. Cooler Seals intact? (N/A if hand delivered) if no, document on NOD.
	☑	☐	3. Chain of Custody present? If no, document on NOD.
	☑	☐	4. Bottles received intact? If no, document on NOD.
	☑	☐	5. Sample is not multiphasic? If no, document on NOD.
	☑	☐	6. Proper Container and preservatives used? If no, document on NOD.
☑	☐	☐	7. pH of all samples checked and meet requirements? If no, document on NOD.
☑	☐	☐	8. Cyanide samples checked for sulfides and meet requirements? If no, notify PM.
☑	☐	☐	9. HF Dilution required?
	☑	☐	10. Sufficient volume provided for all analysis? If no, document on NOD and consult PM before proceeding.
	☑	☐	11. Did chain of custody agree with samples received? If no, document on NOD.
	☑	☐	12. Is the "Sampled by" section of the COC completed?
☑	☐	☐	13. Were VOA/Oil Syringe samples without headspace?
☑	☐	☐	14. Were VOA vials preserved? ☐HCl ☐Sodium Thiosulfate ☐Ascorbic Acid
	☐	☑	15. Did samples require preservation with sodium thiosulfate?
☑	☐	☐	16. If yes to #14, was the residual chlorine test negative? If no, document on NOD.
☑	☐	☐	17. Are dissolved/field filtered metals bottles sediment-free? If no, document on NOD.
☑	☐	☐	18. Is sufficient volume provided for client requested MS/MSD or matrix duplicates? If no, document on NOD and contact PM before proceeding.
☑	☐	☐	19. Are analyses with short holding times received in hold?
	☑	☐	20. Was Standard Turn Around (TAT) requested?
	☑	☐	21. Receipt date(s) < 48 hours past the collection date(s)? If no, notify PM.

TestAmerica Portland

Sample Receiving Checklist

Work Order #: PSJ0242

Login Checks:

Initials: PS

N/A	Yes	No	
	☒	☐	22. Sufficient volume provided for all analysis? If no, document on NOD & contact PM.
☒	☐	☐	23. Sufficient volume provided for client requested MS/MSD or matrix duplicates? If no, document on NOD and contact PM.
	☒	☐	24. Did the chain of custody include "received by" and "relinquished by" signatures, dates and times?
☒	☐	☐	25. Were special log in instructions read and followed?
	☒	☐	26. Were tests logged checked against the COC?
☒	☐	☐	27. Were rush notices printed and delivered?
☒	☐	☐	28. Were short hold notices printed and delivered?
☐	☒	☐	29. Were subcontract COCs printed?
☒	☐	☐	30. Was HF dilution logged?

Labeling and Storage Checks:

Initials: KH

N/A	Yes	No	
☒	☒	☐	31. Were the subcontracted samples/containers put in Sx fridge?
☒	☐	☐	32. Were sample bottles and COC double checked for dissolved/filtered metals?
	☒	☐	33. Did the sample ID, Date, and Time from label match what was logged?
☒	☐	☐	34. Were Foreign sample stickers affixed to each container and containers stored in foreign fridge?
☒	☐	☐	35. Were HF stickers affixed to each container, and containers stored in Sx fridge?
☒	☐	☐	36. Was an NOD for created for noted discrepancies and placed in folder?

Document any problems or discrepancies and the actions taken to resolve them on a Notice of Discrepancy form (NOD).

GSI Water Solutions, Inc.
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P: 503.239.8799 F: 503.239.8940
info@gsiwatersolutions.com www.gsiwatersolutions.com

Laboratory Data QA/QC Review
Inline Solids Investigation
City Outfall Basin M-1

To: File

From: Julia Fowler, GSI Water Solutions, Inc.

Date: December 8, 2009

This memorandum presents a quality assurance/quality control (QA/QC) review of the laboratory data generated for chemical analysis of inline solids obtained during source control investigation activities conducted in November 2009 by the City of Portland in Outfall Basin M-1 (OF M1).

The laboratory analysis of the OF M1 solids sample was conducted by the City's Bureau of Environmental Services (BES) Water Pollution Control Laboratory (WPCL) and a subcontracted laboratory. The laboratories conducted the analyses listed:

- BES WPCL
    - Total Solids (SM 2540 G)
    - Metals (EPA 6020)
    - Polychlorinated Biphenyl Aroclors (EPA 8082)
- TestAmerica, Inc.
    - Polynuclear Aromatic Hydrocarbons (PAHs) (EPA 8270M-SIM)
    - Phthalates (EPA8270-SIM)
    - Percent Solids (ASTM D2216-80)
    - Total Organic Carbon (TOC) (EPA 9060 MOD)

The WPCL summary report for all analyses associated with this sampling event and the subcontracted laboratory's data report are attached. The WPCL summary report comments that, with some exceptions (included in the following sections below), all analytical QA/QC criteria were met for these samples including holding times, calibration, method blanks, laboratory

control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable.

The following data review is based on the available documentation supplied from the subcontracted laboratory and on exceptions noted in the WPCL summary report. The QA/QC review of the analytical data consisted of reviewing the following for each laboratory report, if available:

- Chain-of-custody for completeness and continuous custody
- Analysis conducted within holding times
- Chemicals of interest detected in method blanks
- Surrogate recoveries within accuracy control limits
- Matrix spike and matrix spike duplicate results within control limits
- Laboratory control sample and duplicate laboratory control sample recoveries within 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. The chain-of-custody procedures were adequate and sample integrity was maintained through the sample collection and delivery process.

Analysis Holding Times

The samples were extracted and analyzed within the acceptable holding times for all analyses.

Method Blanks

Method blanks were processed during the subcontracted laboratory analysis of PAHs, phthalates and TOC. No analytes were detected in the method blanks.

Surrogate Recoveries

Surrogate recoveries were performed during the subcontracted laboratory analysis of PAHs and phthalates. The sample was diluted due to the nature of the sample matrix resulting in surrogate recovery calculations for the phthalate analysis that were not useful. Other surrogate recoveries were within the laboratory control limits.

Matrix Spike/Matrix Spike Duplicates

Matrix spike/matrix spike duplicate (MS/MSD) samples were processed during the subcontracted laboratory analyses of PAHs. The MS recovery for pyrene was above the laboratory control limit. The laboratory took no action because the batch laboratory control sample percent recoveries and the remaining MS percent recoveries were within acceptance limits. All MS/MSD relative percent differences were within control criteria.

Laboratory Control Samples

Laboratory control samples (LCS) were processed during the subcontracted laboratory analyses of PAHs, phthalate and TOC. All of the LCS percent recoveries were within the laboratory control limits.

Other

The laboratory reporting limits for the PAH and phthalate analyses were raised due to high concentrations of non-target and target analytes, respectively.

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: 11/10/2009

Page: 1 of 1

Collected By: PTB, ECH, JXB

Project Name: PORTLAND HARBOR INLINE SAMP

File Number: 1020.001 Matrix: SEDIMENT

OUTFALL M-1

Requested Analyses

WPCL Sample I.D.	Location	Point Code	Sample Date	Sample Time	Sample Type	Organics: PCB Aroclors - LL	Organics: PAH + Phthalates - LL (TA)	Organics	Organics	Organics	Organics	General: Total Soldis	General: TOC	General	Metals: Total Metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Ag, Zn)	Field Comments
FO096165	IL-M1-AAJ831-1109-NE 6936 N FATHOM ST	M1_11	11/10/09	0957	C	●	●					●	●		●	

Relinquished By: 1.
Signature: [signature] Time: 1533
Printed Name: Peter Bryant Date: 11/10/09

Received By: 1.
Signature: [signature] Time: 1533
Printed Name: [illegible] Date: 11/10/09

Relinquished By: 2.
Signature: Time:
Printed Name: Date:

Received By: 2.
Signature: Time:
Printed Name: Date:

Relinquished By: 3.
Signature: Time:
Printed Name: Date:

Received By: 3.
Signature: Time:
Printed Name: Date:

Relinquished By: 4.
Signature: Time:
Printed Name: Date:

Received By: 4.
Signature: Time:
Printed Name: Date:

City of Portland
Water Pollution Control Laboratory

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

LABORATORY ANALYSIS REPORT

Sample ID: **FO096165** **Sample Collected:** 11/10/09 09:57 **Sample Received:** 11/10/09 **Sample Status:** COMPLETE AND VALIDATED

Proj./Company Name: PORTLAND HARBOR INLINE SAMP
Address/Location: IL-M1-AAJ831-1109-NE
6936 N FATHOM ST NE OF MANHOLE
Sample Point Code: M1_11
Sample Type: COMPOSITE
Sample Matrix: SEDIMENT

System ID: AN10854
EID File # : 1020.001
LocCode: PORTHARI
Collected By: PTB/ECH/JXB

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

Test Parameter	Result	Units	MRL	Method	Analysis Date
GENERAL					
TOTAL SOLIDS	77.4	% W/W	0.01	SM 2540 G	11/19/09
METALS					
ARSENIC	3.99	mg/Kg dry wt	0.50	EPA 6020	11/18/09
CADMIUM	33.4	mg/Kg dry wt	0.10	EPA 6020	11/18/09
CHROMIUM	165	mg/Kg dry wt	0.50	EPA 6020	11/18/09
COPPER	181	mg/Kg dry wt	0.25	EPA 6020	11/18/09
LEAD	324	mg/Kg dry wt	0.10	EPA 6020	11/18/09
MERCURY	0.122	mg/Kg dry wt	0.010	EPA 6020	11/18/09
NICKEL	52.5	mg/Kg dry wt	0.25	EPA 6020	11/18/09
SILVER	0.37	mg/Kg dry wt	0.10	EPA 6020	11/18/09
ZINC	813	mg/Kg dry wt	0.50	EPA 6020	11/18/09
GC ANALYSIS					
POLYCHLORINATED BIPHENYLS (PCB)					
Aroclor 1016/1242	<100	µg/Kg dry wt	100	EPA 8082	11/17/09
Aroclor 1221	<200	µg/Kg dry wt	200	EPA 8082	11/17/09
Aroclor 1232	<100	µg/Kg dry wt	100	EPA 8082	11/17/09
Aroclor 1248	<100	µg/Kg dry wt	100	EPA 8082	11/17/09
Aroclor 1254	963	µg/Kg dry wt	100	EPA 8082	11/17/09
Aroclor 1260	<100	µg/Kg dry wt	100	EPA 8082	11/17/09
Aroclor 1262	<100	µg/Kg dry wt	100	EPA 8082	11/17/09
Aroclor 1268	<100	µg/Kg dry wt	100	EPA 8082	11/17/09
OUTSIDE ANALYSIS					
TOTAL ORGANIC CARBON	38500	mg/Kg dry wt	50	EPA 9060 MOD	11/18/09
POLYNUCLEAR AROMATICS & PHTHALATES - TA					
Acenaphthene	<193	µg/Kg dry wt	193	EPA8270M-SIM	11/16/09
Acenaphthylene	<193	µg/Kg dry wt	193	EPA8270M-SIM	11/16/09
Anthracene	<193	µg/Kg dry wt	193	EPA8270M-SIM	11/16/09
Benzo(a)anthracene	198	µg/Kg dry wt	193	EPA8270M-SIM	11/16/09
Benzo(a)pyrene	209	µg/Kg dry wt	193	EPA8270M-SIM	11/16/09
Benzo(b)fluoranthene	329	µg/Kg dry wt	193	EPA8270M-SIM	11/16/09
Benzo(ghi)perylene	196	µg/Kg dry wt	193	EPA8270M-SIM	11/16/09
Benzo(k)fluoranthene	<193	µg/Kg dry wt	193	EPA8270M-SIM	11/16/09
Bis(2-ethylhexyl) phthalate	31700	µg/Kg dry wt	1930	EPA8270M-SIM	11/16/09

Report Date: 12/01/09 **Validated By:**

City of Portland
Water Pollution Control Laboratory

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

LABORATORY ANALYSIS REPORT

Sample ID: **FO096165** **Sample Collected:** 11/10/09 09:57 **Sample Received:** 11/10/09 **Sample Status:** COMPLETE AND VALIDATED

Proj./Company Name: PORTLAND HARBOR INLINE SAMP
Address/Location: IL-M1-AAJ831-1109-NE
6936 N FATHOM ST NE OF MANHOLE
Sample Point Code: M1_11
Sample Type: COMPOSITE
Sample Matrix: SEDIMENT

System ID: AN10854
EID File # : 1020.001
LocCode: PORTHARI
Collected By: PTB/ECH/JXB

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

Test Parameter	Result	Units	MRL	Method	Analysis Date
Butyl benzyl phthalate	<1930	µg/Kg dry wt	1930	EPA8270M-SIM	11/16/09
Chrysene	369	µg/Kg dry wt	193	EPA8270M-SIM	11/16/09
Dibenzo(a,h)anthracene	<193	µg/Kg dry wt	193	EPA8270M-SIM	11/16/09
Diethyl phthalate	<1930	µg/Kg dry wt	1930	EPA8270M-SIM	11/16/09
Dimethyl phthalate	<1930	µg/Kg dry wt	1930	EPA8270M-SIM	11/16/09
Di-n-butyl phthalate	<1930	µg/Kg dry wt	1930	EPA8270M-SIM	11/16/09
Di-n-octyl phthalate	13700	µg/Kg dry wt	1930	EPA8270M-SIM	11/16/09
Fluoranthene	775	µg/Kg dry wt	193	EPA8270M-SIM	11/16/09
Fluorene	360	µg/Kg dry wt	193	EPA8270M-SIM	11/16/09
Indeno(1,2,3-cd)pyrene	<193	µg/Kg dry wt	193	EPA8270M-SIM	11/16/09
Naphthalene	235	µg/Kg dry wt	193	EPA8270M-SIM	11/16/09
Phenanthrene	1490	µg/Kg dry wt	193	EPA8270M-SIM	11/16/09
Pyrene	605	µg/Kg dry wt	193	EPA8270M-SIM	11/16/09

End of Report for Sample ID: FO096165

Report Date: 12/01/09 **Validated By:**

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

PORTLAND, OR 9405 S.W. NIMBUS AVENUE
BEAVERTON, OR 97008-7132
ph: (503) 906.9200 fax: (503) 906.9210

ORELAP#: OR100021

Amended Report

December 24, 2009

Jennifer Shackelford
City of Portland Water Pollution Laboratory
6543 N. Burlington Ave.
Portland, OR 97203

RE: Portland Harbor

Enclosed are the results of analyses for samples received by the laboratory on 11/12/09 14:50. The following list is a summary of the Work Orders contained in this report, generated on 12/24/09 09:00.

If you have any questions concerning this report, please feel free to contact me.

Work Order	Project	ProjectNumber
PSK0394	Portland Harbor	36238

TestAmerica Portland

Howard Holmes, Project Manager

Amended Report

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Amended Report

City of Portland Water Pollution Laboratory	Project Name:	**Portland Harbor**	
6543 N. Burlington Ave.	Project Number:	36238	Report Created:
Portland, OR 97203	Project Manager:	Jennifer Shackelford	12/24/09 09:00

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
FO 096165	PSK0394-01	Soil	11/10/09 09:57	11/12/09 14:50

TestAmerica Portland

Howard Holmes, Project Manager

Amended Report

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Amended Report

City of Portland Water Pollution Laboratory	Project Name:	**Portland Harbor**	
6543 N. Burlington Ave.	Project Number:	36238	Report Created:
Portland, OR 97203	Project Manager:	Jennifer Shackelford	12/24/09 09:00

Analytical Case Narrative

TestAmerica - Portland, OR

PSK0394

Amended Report
2-Methylnaphthalene was added to the 8270 SIM PAH results as requested by Peter Abrams on 12/23/09

TestAmerica Portland

Howard Holmes, Project Manager

Amended Report

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Amended Report

City of Portland Water Pollution Laboratory	Project Name: **Portland Harbor**	
6543 N. Burlington Ave.	Project Number: 36238	Report Created:
Portland, OR 97203	Project Manager: Jennifer Shackelford	12/24/09 09:00

Polynuclear Aromatic Compounds per EPA 8270M-SIM

TestAmerica Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PSK0394-01 (FO 096165)		**Soil**				**Sampled: 11/10/09 09:57**				**RL3**
2-Methylnaphthalene	EPA 8270m	**804**	-----	482	ug/kg dry	25x	9110506	11/16/09 11:40	11/17/09 17:54	
Acenaphthene	"	ND	-----	193	"	10x	"	"	11/18/09 13:06	
Acenaphthylene	"	ND	-----	193	"	"	"	"	"	
Anthracene	"	ND	-----	193	"	"	"	"	"	
Benzo (a) anthracene	"	**198**	-----	193	"	"	"	"	"	
Benzo (a) pyrene	"	**209**	-----	193	"	"	"	"	"	
Benzo (b) fluoranthene	"	**329**	-----	193	"	"	"	"	"	
Benzo (ghi) perylene	"	**196**	-----	193	"	"	"	"	"	
Benzo (k) fluoranthene	"	ND	-----	193	"	"	"	"	"	
Chrysene	"	**369**	-----	193	"	"	"	"	"	
Dibenzo (a,h) anthracene	"	ND	-----	193	"	"	"	"	"	
Fluoranthene	"	**775**	-----	193	"	"	"	"	"	
Fluorene	"	**360**	-----	193	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	"	ND	-----	193	"	"	"	"	"	
Naphthalene	"	**235**	-----	193	"	"	"	"	"	
Phenanthrene	"	**1490**	-----	193	"	"	"	"	"	
Pyrene	"	**605**	-----	193	"	"	"	"	"	
Surrogate(s): Fluorene-d10			*107%*			*24 - 125 %*				"
Pyrene-d10			*77.8%*			*41 - 141 %*				"
Benzo (a) pyrene-d12			*122%*			*38 - 143 %*				"

TestAmerica Portland

Howard Holmes, Project Manager

Amended Report

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Amended Report

City of Portland Water Pollution Laboratory	Project Name: **Portland Harbor**	
6543 N. Burlington Ave.	Project Number: 36238	Report Created:
Portland, OR 97203	Project Manager: Jennifer Shackelford	12/24/09 09:00

Phthalates per EPA 8270-SIM

TestAmerica Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PSK0394-01 (FO 096165)			**Soil**			**Sampled: 11/10/09 09:57**				**RL7**
Dimethyl phthalate	EPA 8270m	ND	-----	1930	ug/kg dry	50x	9110506	11/16/09 11:40	11/18/09 11:24	
Diethyl phthalate	"	ND	-----	1930	"	"	"	"	"	
Di-n-butyl phthalate	"	ND	-----	1930	"	"	"	"	"	
Butyl benzyl phthalate	"	ND	-----	1930	"	"	"	"	"	
Bis(2-ethylhexyl)phthalate	"	**31700**	-----	1930	"	"	"	"	"	
Di-n-octyl phthalate	"	**13700**	-----	1930	"	"	"	"	"	
Surrogate(s): 2-Fluorobiphenyl				*NR*		*10 - 150 %*			"	***Z3***
p-Terphenyl-d14				*NR*		*10 - 150 %*			"	***Z3***

TestAmerica Portland

Howard Holmes, Project Manager

Amended Report

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Amended Report

City of Portland Water Pollution Laboratory	Project Name:	**Portland Harbor**	
6543 N. Burlington Ave.	Project Number:	36238	Report Created:
Portland, OR 97203	Project Manager:	Jennifer Shackelford	12/24/09 09:00

Percent Dry Weight (Solids) per ASTM D2216-80

TestAmerica Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PSK0394-01 (FO 096165)			**Soil**				**Sampled: 11/10/09 09:57**			
% Solids	NCA SOP	**68.4**	-----	0.0100	% by Weight	1x	9110501	11/16/09 08:20	11/16/09 08:20	

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Howard Holmes, Project Manager

Amended Report

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Amended Report

City of Portland Water Pollution Laboratory	Project Name:	**Portland Harbor**	
6543 N. Burlington Ave.	Project Number:	36238	Report Created:
Portland, OR 97203	Project Manager:	Jennifer Shackelford	12/24/09 09:00

Organic Carbon, Total (TOC)

TestAmerica Connecticut

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PSK0394-01 (FO 096165)			**Soil**				**Sampled: 11/10/09 09:57**			
Total Organic Carbon - Duplicates	9060	**38500**	*30.0*	100	mg/Kg	1x	33512	11/18/09 23:45	11/18/09 23:45	

TestAmerica Portland

Howard Holmes, Project Manager

Amended Report

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PORTLAND, OR 9405 S.W. NIMBUS AVENUE
BEAVERTON, OR 97008-7132
ph: (503) 906.9200 fax: (503) 906.9210

Amended Report

City of Portland Water Pollution Laboratory	Project Name: **Portland Harbor**	
6543 N. Burlington Ave.	Project Number: 36238	Report Created:
Portland, OR 97203	Project Manager: Jennifer Shackelford	12/24/09 09:00

Polynuclear Aromatic Compounds per EPA 8270M-SIM - Laboratory Quality Control Results

TestAmerica Portland

QC Batch: 9110506 **Soil Preparation Method: EPA 3550**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (9110506-BLK1)							**Extracted: 11/16/09 11:40**							
2-Methylnaphthalene	EPA 8270m	ND	---	13.3	ug/kg wet	1x	--	--	--	--	--	--	11/17/09 16:56	
Acenaphthene	"	ND	---	13.3	"	"	--	--	--	--	--	--	"	
Acenaphthylene	"	ND	---	13.3	"	"	--	--	--	--	--	--	"	
Anthracene	"	ND	---	13.3	"	"	--	--	--	--	--	--	"	
Benzo (a) anthracene	"	ND	---	13.3	"	"	--	--	--	--	--	--	"	
Benzo (a) pyrene	"	ND	---	13.3	"	"	--	--	--	--	--	--	"	
Benzo (b) fluoranthene	"	ND	---	13.3	"	"	--	--	--	--	--	--	"	
Benzo (ghi) perylene	"	ND	---	13.3	"	"	--	--	--	--	--	--	"	
Benzo (k) fluoranthene	"	ND	---	13.3	"	"	--	--	--	--	--	--	"	
Chrysene	"	ND	---	13.3	"	"	--	--	--	--	--	--	"	
Dibenzo (a,h) anthracene	"	ND	---	13.3	"	"	--	--	--	--	--	--	"	
Fluoranthene	"	ND	---	13.3	"	"	--	--	--	--	--	--	"	
Fluorene	"	ND	---	13.3	"	"	--	--	--	--	--	--	"	
Indeno (1,2,3-cd) pyrene	"	ND	---	13.3	"	"	--	--	--	--	--	--	"	
Naphthalene	"	ND	---	13.3	"	"	--	--	--	--	--	--	"	
Phenanthrene	"	ND	---	13.3	"	"	--	--	--	--	--	--	"	
Pyrene	"	ND	---	13.3	"	"	--	--	--	--	--	--	"	
Surrogate(s): Fluorene-d10		*Recovery: 67.6%*			*Limits: 24-125%*								*11/17/09 16:56*	
Pyrene-d10		*90.9%*			*41-141%*								*"*	
Benzo (a) pyrene-d12		*94.9%*			*38-143%*								*"*	
LCS (9110506-BS1)							**Extracted: 11/16/09 11:40**							
Acenaphthene	EPA 8270m	164	---	13.3	ug/kg wet	1x	--	165	99.2%	(33-139)	--	--	11/17/09 17:25	
Benzo (a) pyrene	"	168	---	13.3	"	"	--	"	102%	(45-149)	--	--	"	
Pyrene	"	198	---	13.3	"	"	--	"	120%	(39-138)	--	--	"	
Surrogate(s): Fluorene-d10		*Recovery: 69.8%*			*Limits: 24-125%*								*11/17/09 17:25*	
Pyrene-d10		*108%*			*41-141%*								*"*	
Benzo (a) pyrene-d12		*91.1%*			*38-143%*								*"*	
Matrix Spike (9110506-MS1)					**QC Source: PSK0394-01**		**Extracted: 11/16/09 11:40**							
Acenaphthene	EPA 8270m	320	---	386	ug/kg dry	20x	114	240	86.0%	(33-139)	--	--	11/23/09 09:56	
Benzo (a) pyrene	"	467	---	386	"	"	209	"	107%	(45-149)	--	--	"	
Pyrene	"	994	---	386	"	"	605	"	162%	(39-138)	--	--	"	M7
Surrogate(s): Fluorene-d10		*Recovery: 75.7%*			*Limits: 24-125%*								*11/23/09 09:56*	*Z3*
Pyrene-d10		*105%*			*41-141%*								*"*	
Benzo (a) pyrene-d12		*116%*			*38-143%*								*"*	

TestAmerica Portland

Howard Holmes, Project Manager

Amended Report

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

PORTLAND, OR 9405 S.W. NIMBUS AVENUE
BEAVERTON, OR 97008-7132
ph: (503) 906.9200 fax: (503) 906.9210

Amended Report

City of Portland Water Pollution Laboratory	Project Name: **Portland Harbor**	
6543 N. Burlington Ave.	Project Number: 36238	Report Created:
Portland, OR 97203	Project Manager: Jennifer Shackelford	12/24/09 09:00

Polynuclear Aromatic Compounds per EPA 8270M-SIM - Laboratory Quality Control Results

TestAmerica Portland

QC Batch: 9110506 **Soil Preparation Method: EPA 3550**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Matrix Spike Dup (9110506-MSD1)					**QC Source: PSK0394-01**			**Extracted: 11/16/09 11:40**						
Acenaphthene	EPA 8270m	285	---	391	ug/kg dry	20x	114	243	70.5%	(33-139)	11.6%	(60)	11/18/09 12:37	
Benzo (a) pyrene	"	384	---	391	"	"	209	"	72.0%	(45-149)	19.4%	"	"	
Pyrene	"	722	---	391	"	"	605	"	47.9%	(39-138)	31.7%	"	"	
Surrogate(s):	*Fluorene-d10*	*Recovery:*	*94.1%*		*Limits:*	*24-125%*							*11/18/09 12:37*	
	Pyrene-d10		*81.4%*			*41-141%*							*"*	
	Benzo (a) pyrene-d12		*97.1%*			*38-143%*							*"*	

TestAmerica Portland

Howard Holmes, Project Manager

Amended Report

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ph: (503) 906.9200 fax: (503) 906.9210

Amended Report

City of Portland Water Pollution Laboratory	Project Name:	**Portland Harbor**	
6543 N. Burlington Ave.	Project Number:	36238	Report Created:
Portland, OR 97203	Project Manager:	Jennifer Shackelford	12/24/09 09:00

Phthalates per EPA 8270-SIM - Laboratory Quality Control Results

TestAmerica Portland

QC Batch: 9110506 **Soil Preparation Method: EPA 3550**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (9110506-BLK1)									**Extracted: 11/16/09 11:40**					
Dimethyl phthalate	EPA 8270m	ND	---	26.7	ug/kg wet	1x	--	--	--	--	--	--	11/18/09 10:13	
Diethyl phthalate	"	ND	---	26.7	"	"	--	--	--	--	--	--	"	
Di-n-butyl phthalate	"	ND	---	26.7	"	"	--	--	--	--	--	--	"	
Butyl benzyl phthalate	"	ND	---	26.7	"	"	--	--	--	--	--	--	"	
Bis(2-ethylhexyl)phthalate	"	ND	---	26.7	"	"	--	--	--	--	--	--	"	
Di-n-octyl phthalate	"	ND	---	26.7	"	"	--	--	--	--	--	--	"	
Surrogate(s): 2-Fluorobiphenyl		*Recovery: 79.6%*			*Limits: 10-150%*								*11/18/09 10:13*	
p-Terphenyl-d14		*104%*			*10-150%*								*"*	
LCS (9110506-BS1)									**Extracted: 11/16/09 11:40**					MNR
Dimethyl phthalate	EPA 8270m	130	---	26.6	ug/kg wet	1x	--	132	98.2%	(20-150)	--	--	11/18/09 10:48	
Diethyl phthalate	"	138	---	26.6	"	"	--	"	105%	"	--	--	"	
Di-n-butyl phthalate	"	153	---	26.6	"	"	--	"	116%	"	--	--	"	
Butyl benzyl phthalate	"	156	---	26.6	"	"	--	"	118%	"	--	--	"	
Bis(2-ethylhexyl)phthalate	"	165	---	26.6	"	"	--	"	125%	"	--	--	"	
Di-n-octyl phthalate	"	158	---	26.6	"	"	--	"	119%	"	--	--	"	
Surrogate(s): 2-Fluorobiphenyl		*Recovery: 76.8%*			*Limits: 10-150%*								*11/18/09 10:48*	
p-Terphenyl-d14		*87.7%*			*10-150%*								*"*	

TestAmerica Portland

Howard Holmes, Project Manager

Amended Report

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BEAVERTON, OR 97008-7132
ph: (503) 906.9200 fax: (503) 906.9210

Amended Report

City of Portland Water Pollution Laboratory	Project Name:	**Portland Harbor**	
6543 N. Burlington Ave.	Project Number:	36238	Report Created:
Portland, OR 97203	Project Manager:	Jennifer Shackelford	12/24/09 09:00

Percent Dry Weight (Solids) per ASTM D2216-80 - Laboratory Quality Control Results

TestAmerica Portland

QC Batch: 9110501 **Soil Preparation Method: Dry Weight**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Duplicate (9110501-DUP1)					**QC Source: PSK0351-01**				**Extracted: 11/16/09 08:20**					
% Solids	NCA SOP	73.3	---	0.0100	% by Weight	1x	73.1	--	--	--	0.273%	(20)	11/16/09 08:20	
Duplicate (9110501-DUP2)					**QC Source: PSK0351-02**				**Extracted: 11/16/09 08:20**					
% Solids	NCA SOP	72.1	---	0.0100	% by Weight	1x	72.4	--	--	--	0.415%	(20)	11/16/09 08:20	

TestAmerica Portland

Howard Holmes, Project Manager

Amended Report

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Amended Report

City of Portland Water Pollution Laboratory	Project Name:	**Portland Harbor**	
6543 N. Burlington Ave.	Project Number:	36238	Report Created:
Portland, OR 97203	Project Manager:	Jennifer Shackelford	12/24/09 09:00

Organic Carbon, Total (TOC) - Laboratory Quality Control Results

TestAmerica Connecticut

QC Batch: 33512 **Soil Preparation Method: NA**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
LCS (220-33512-5)					**QC Source:**					**Extracted: 11/18/09 21:54**				
Total Organic Carbon - Duplicates	9060	3839	30.0	100	mg/Kg	1x	--	3530	109%	(28-172)	--	--	11/18/09 21:54	
Blank (220-33512-6)					**QC Source:**					**Extracted: 11/18/09 22:00**				
Total Organic Carbon - Duplicates	9060	ND	30.0	100	mg/Kg	1x	--	--	--	--	--	--	11/18/09 22:00	

TestAmerica Portland

Howard B. Holmes

Howard Holmes, Project Manager

Amended Report

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

PORTLAND, OR 9405 S.W. NIMBUS AVENUE
BEAVERTON, OR 97008-7132
ph: (503) 906.9200 fax: (503) 906.9210

Amended Report

City of Portland Water Pollution Laboratory	Project Name:	**Portland Harbor**	
6543 N. Burlington Ave.	Project Number:	36238	Report Created:
Portland, OR 97203	Project Manager:	Jennifer Shackelford	12/24/09 09:00

Notes and Definitions

Report Specific Notes:

M7	-	The MS and/or MSD were above the acceptance limits. See Blank Spike (LCS).
MNR	-	No results were reported for the MS/MSD. The sample used for the MS/MSD required dilution due to the sample matrix. Because of this, the spike compounds were diluted below the detection limit.
RL3	-	Reporting limit raised due to high concentrations of non-target analytes.
RL7	-	Sample required dilution due to high concentrations of target analyte.
Z3	-	The sample required a dilution due to the nature of the sample matrix. Because of this dilution, the surrogate spike concentration in the sample was reduced to a level where the recovery calculation does not provide useful information.

Laboratory Reporting Conventions:

DET	-	Analyte DETECTED at or above the Reporting Limit. Qualitative Analyses only.
ND	-	Analyte NOT DETECTED at or above the reporting limit (MDL or MRL, as appropriate).
NR/NA	-	Not Reported / Not Available
dry	-	Sample results reported on a Dry Weight Basis. Results and Reporting Limits have been corrected for Percent Dry Weight.
wet	-	Sample results and reporting limits reported on a Wet Weight Basis (as received). Results with neither 'wet' nor 'dry' are reported on a Wet Weight Basis.
RPD	-	RELATIVE PERCENT DIFFERENCE (RPDs calculated using Results, not Percent Recoveries).
MRL	-	METHOD REPORTING LIMIT. Reporting Level at, or above, the lowest level standard of the Calibration Table.
MDL*	-	METHOD DETECTION LIMIT. Reporting Level at, or above, the statistically derived limit based on 40CFR, Part 136, Appendix B. *MDLs are listed on the report only if the data has been evaluated below the MRL. Results between the MDL and MRL are reported as Estimated Results.
Dil	-	Dilutions are calculated based on deviations from the standard dilution performed for an analysis, and may not represent the dilution found on the analytical raw data.
Reporting Limits	-	Reporting limits (MDLs and MRLs) are adjusted based on variations in sample preparation amounts, analytical dilutions and percent solids, where applicable.
Electronic Signature	-	Electronic Signature added in accordance with TestAmerica's *Electronic Reporting and Electronic Signatures Policy.* Application of electronic signature indicates that the report has been reviewed and approved for release by the laboratory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

TestAmerica Portland

Howard Holmes, Project Manager

Amended Report

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

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9405 SW Nimbus Ave,Beaverton, OR 97008-7145 503-906-9200 FAX 906-9210 X
2000 W International Airport Rd Ste A10, Anchorage, AK 99502-1119 907-563-9200 FAX 563-9210

CHAIN OF CUSTODY REPORT

Work Order #: PSK0394

CLIENT: City of Portland

REPORT TO: Jennifer Shackelford
ADDRESS:

PHONE: FAX:

PROJECT NAME: Portland Harbor Inline Sampler
PROJECT NUMBER:

SAMPLED BY:

INVOICE TO: Charles Lytle

P.O. NUMBER: 36238

TURNAROUND REQUEST
in Business Days *

Organic & Inorganic Analyses: ~~10~~ 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	PRESERVATIVE	REQUESTED ANALYSES											MATRIX (W, S, O)	# OF CONT.	LOCATION/ COMMENTS	TA WO ID
			PAH (Pathlight Low Level)	TOC														
1	F00961165	11/10/9 0957	X	X											S	2		
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		

RELEASED BY:		FIRM: City of Portland	DATE: 11/12/9	RECEIVED BY:		FIRM: TAP	DATE: 11/12/9
PRINT NAME:	Rona Kluch		TIME: 11:55	PRINT NAME:	Bob F		TIME: 11:55
RELEASED BY:		FIRM: TAP	DATE: 11/12/9	RECEIVED BY:		FIRM: TAP	DATE: 11/12/9
PRINT NAME:	Bob F		TIME: 14:50	PRINT NAME:	Jessica M		TIME: 14:50

ADDITIONAL REMARKS:
* Same levels as VIC project

TEMP: 3.8 PAGE OF

TAL-1000(0408)

TestAmerica Portland

Sample Receiving Checklist

Work Order #: PSK0394 Date/Time Received: 11/12/09 1450

Client Name and Project: COP Portland Harbor

Time Zone:

☐EDT/EST ☐CDT/CST ☐MDT/MST ☑PDT/PST ☐AK ☐OTHER

Unpacking Checks:

Cooler #(s): 1

Temperatures: 3.9

Digi #1 ☐ Digi #2 ☐ IR Gun ☑ (☐Plastic ☑Glass)

Temperature out of Range:

__Not enough or No Ice

__Ice Melted

__W/in 4 Hrs of collection

__Other:_____

Initials: JM

N/A	Yes	No	
☑	☐	☐	1. If ESI client, were temp blanks received? If no, document on NOD.
☑	☐	☐	2. Cooler Seals intact? (N/A if hand delivered) if no, document on NOD.
	☑	☐	3. Chain of Custody present? If no, document on NOD.
	☑	☐	4. Bottles received intact? If no, document on NOD.
	☑	☐	5. Sample is not multiphasic? If no, document on NOD.
	☑	☐	6. Proper Container and preservatives used? If no, document on NOD.
☑	☐	☐	7. pH of all samples checked and meet requirements? If no, document on NOD.
☑	☐	☐	8. Cyanide samples checked for sulfides and meet requirements? If no, notify PM.
☑	☐	☐	9. HF Dilution required?
	☑	☐	10. Sufficient volume provided for all analysis? If no, document on NOD and consult PM before proceeding.
	☑	☐	11. Did chain of custody agree with samples received? If no, document on NOD.
	☑	☐	12. Is the "Sampled by" section of the COC completed?
☑	☐	☐	13. Were VOA/Oil Syringe samples without headspace?
☑	☐	☐	14. Were VOA vials preserved? ☐HCl ☐Sodium Thiosulfate ☐Ascorbic Acid
	☐	☑	15. Did samples require preservation with sodium thiosulfate?
☑	☐	☐	16. If yes to #14, was the residual chlorine test negative? If no, document on NOD.
☑	☐	☐	17. Are dissolved/field filtered metals bottles sediment-free? If no, document on NOD.
☑	☐	☐	18. Is sufficient volume provided for client requested MS/MSD or matrix duplicates? If no, document on NOD and contact PM before proceeding.
☑	☐	☐	19. Are analyses with short holding times received in hold?
	☑	☐	20. Was Standard Turn Around (TAT) requested?
	☑	☐	21. Receipt date(s) < 48 hours past the collection date(s)? If no, notify PM.

TestAmerica Portland

Sample Receiving Checklist

Work Order #: PS40394

Login Checks:

Initials: PS

N/A	Yes	No	
	☑	☐	22. Sufficient volume provided for all analysis? If no, document on NOD & contact PM.
☑	☐	☐	23. Sufficient volume provided for client requested MS/MSD or matrix duplicates? If no, document on NOD and contact PM.
	☑	☐	24. Did the chain of custody include "received by" and "relinquished by" signatures, dates and times?
☑	☐	☐	25. Were special log in instructions read and followed?
	☑	☐	26. Were tests logged checked against the COC?
☑	☐	☐	27. Were rush notices printed and delivered?
☑	☐	☐	28. Were short hold notices printed and delivered?
☐	☑	☐	29. Were subcontract COCs printed?
☑	☐	☐	30. Was HF dilution logged?

Labeling and Storage Checks:

Initials: PS

N/A	Yes	No	
☐	☑	☐	31. Were the subcontracted samples/containers put in Sx fridge?
☑	☐	☐	32. Were sample bottles and COC double checked for dissolved/filtered metals?
	☑	☐	33. Did the sample ID, Date, and Time from label match what was logged?
☑	☐	☐	34. Were Foreign sample stickers affixed to each container and containers stored in foreign fridge?
☑	☐	☐	35. Were HF stickers affixed to each container, and containers stored in Sx fridge?
☑	☐	☐	36. Was an NOD for created for noted discrepancies and placed in folder?

Document any problems or discrepancies and the actions taken to resolve them on a Notice of Discrepancy form (NOD).