APPENDIX B SEDIMENT CORE LOGS



Lower Duwamish Waterway Sediment Core Log Key

Visual Sediment Descriptions consist of the following:

Moisture content, density/consistency (estimated based on visual observation), color, (Munsell Number), minor constituent (>30%) MAJOR CONSTITUENT/GROUP NAME with minor constituents (<30%). Amount and shape of minor constituents (e.g., wood, shells) followed by major constituent structure. Sheen and odor.

Example: wet, soft, olive green (GLEY 1, 5/10Y) clayey SILT, little sand, moderate shell fragments, and trace twigs and rootlets. Silt texture is uniform, slightly compressible, massive, blocky, and of low plasticity. Slight hydrocarbon (HC)-like odor and trace sheen.

Sediment Core Log Layout: recovered versus In situ depths

Recovered = measured in the lab, actual sediment contained in the core tube

in situ = calculated from recovered length and percent recovery, depths are expanded to match the drive interval and in situ conditions

Example of Sediment Core Log layout:

Heading	Recovered Depth (ft.)	Recovered Interval and Sample #	% Recovery (depth in ft)	Analysis	PID Measurement (on sediment surface)	Sediment Description	Comments	in-Situ Depth (ft)
Category	Recovered	Recovered	Recovered	Recovered	Recovered	Recovered (in situ depth)	Recovered	In Situ

Sediment Description Terminology:

Moisture and Density:

	Moisture Content	
Dry		Little perceptible moisture
	Damp	Some perceptible moisture, probably below optimum
	Moist	Probably near optimum moisture content, no visible water
	Wet	Visible free water, probably above optimum

Density/Consistency

Soil density and consistency are estimated based on visual observations and are presented in the core logs

Density: Visual Core Drive Penetration

SAND or	GRAVEL	SILT or CLAY	
Density	Visual	Consistency	
Very loose	freefall	Very soft	
Loose	easy penentration	Soft	
Medium dense	moderate penentration	Medium stiff	
Dense	hard penentration	Stiff	
Very dense	refusal	Very Stiff/Hard	

Major and Minor Constituents and Structure:

MAJOR and Minor Constituent % (by weight)

WAJON AND WIND	Constituent % (by wi	eigin)
Core Log	s Percent	Field Logs
Trace (clay, silt, etc.) 05	not identified
Few (clay, silt, etc.)	5-15	Slightly (clayey, silty, etc.)
Little (clay, silt, etc.)	15-30	Clayey, silty, sandy, gravelly
Clayey, silty, sandy, GROUP NAME	gravelly 30-50	Very (clayey, silty, sandy, etc.)
GROUP NAME	> 50	GROUP NAME

Other Minor Constituents: % (by volume)

(i.e., shells, wood, organics, plastic, non-native debris)

Trace	0-5
Scattered	5-10
Moderate	10-30
Substantial	30-50
GROUP NAME	> 50

Structure	
Stratified	Alternating layers of varied material/color at least 1/4" thick
Laminated	Alternating layers of varied material/color at least 1/4 mm thick
Blocky	Cohesive soil that can be broken down into smaller lumps
Spongy	Organic and compressible nature
Lensed	Inclusion of thin discontinuous layers of different sediment
Homogenous/Massive	Same color and appearance throughout
Fibrous	Stringy or rope like structure
Seam	1/16 to 1/2" thick
Layer	greater than 1/2" thick
Interbedded	Multiple beds within a unit
Rolls Easily	Play-dough like (plasticity observation)
Angular	Sharp edges
Subangular	Rounded edges
Subrounded	Well-rounded edges
Rounded	Smoothed, no edges

Sheen Test- Visual Description

Additional Remarks:

Sheen Test- % coverage Odor Descriptions

trace
slight
moderate
strong
HC = Hydrocarbon
H2S = Hydrogen Sulfide
M. Janes Market Market and J. J.

No odor or sheep observed unless noted

	encen rear /r verong	-
	S.T. = Sheen test visual	analysis
ı	none, trace slight sheen	<2
ı	slight sheen	2-15
ı	moderate sheen	15-40

moderate to heavy 40-70 >70 heavy

Comments TV = represents Torvane shear stress measurements made on intact core in kg/cm2. GT = represents depth of GeoTech sample collected in 2- or 3-inch push tubes. PID measurements made in breathing zone directly above (1/2") open sediment core.

multicolored

metallic gray-colored semi-circular and multicolored

long and flowing shape

Contacts: expressed as sharp, transitional, or gradational

***************************************	color or minor change
	major sediment change
_	depositional change

Core Acceptance Guidelines

- 1. Desired drive depth is reached.
- Core recovery is greater than 70%.
- Core tube appears intact (no signs of blocking, bending).
- Minimal sediment loss out the top or bottom (minimal winnowing).
 - General Notes Stratigraphic Unit

() = logger observations r = recent la = lower alluvium

[] = inferred from other logs ua = upper alluvium fv = fluvial (lower alluvium variant)

= Length Other Sediment Descriptions Used

Agglomerate Fused-appearance, often vesicular Clast/inclusion Non-fused appearance

rainbow

metallic

florets streaks

Xenoclasts Clasts that have been moved Fresh No visible sign of decomposition or discoloration Winnowed Loss of fines Settled but intact Slumped

Pockets/balls Semicircular to circular inclusion/deposit Mass of unidentified material Chunky

REMARKS section

Drive notes express penetration depths.

*Classification of sediment on core logs is based on visual field and laboratory observations which include density/consistency, grain size, and plasticity Plasticity estimates should not be construed to imply laboratory testing unless presented herein. Unified Soil Classification System ASTM D-2487 and Visual-manual classification method ASTM D-2488 for the description and identification of soils were used as an identification guide. Descriptions were compared to grain size and Atterburg imit results where applicable

			7			Core Log Key SEDIMENT LITHOLOGY	•	Sheet 1 of 2	
Ī	Project: LDW RI/FS					Water Body Type: Lower Duwamish Waterway	Tube Length (ft):		
	Project #: PORS5-18220-511					Water Elevation (ft)/Tide: xxx	Penetration Depth (ft): xxx		
Ŀ	Client:	LDWG				Water Depth (ft): xxx	Sample Quality: xxx Recovery in ft (%): xx		
	Collect	tion Date	xxx			Mudline Elevation (ft): xxx			
						N./LAT: xxx E./LONG: xxx	Process Date: xxx	xxx	
						Horiz. Datum: xxx (ft) Vert. Datum: xxx (ft)	Process Method: xxx		
Ľ	Operat	tor: xxx		T	1	Method/Tube ID: xxx	Logged By: xxx		
	Becovered Depth (ft)	Recov.interval & Sample	% Recovery (interval)	Chemical Analysis	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log	
	-0	SAMPLE-0-1				OH: ORGANIC SILT/CLAY: Organic clays or organic silts of medium to high plasticity. CL: CLAY: Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, and lean clays.		0-	
	-2 -3	E-1-2 CDW-SAMPLE-2-4	<u> </u>			OL: ORGANIC SILT: Organic silts and organic silt- clays of low plasticity. MH: SILT: Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.		Stratigraphic unit	
	-4	X X X X X X X X X X X X X X X X X X X	,			SAND BLAST GRIT: Sand blast grit with interbeds of silt, over 50% of matrix is non-native material.		X X X X X X X X X X X X X X X X X X X	
+ + + + + + + + + + + + + + + + + + + +	-6	APLE-4-6	,			ML: SILT: Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity. SM: SAND: Silty sands, sand-silt mixtures.		6-	
T	he BF7	TEC Group	n. Inc	Π,	Romarko	Sadiment descriptions (lithology) based on USOS AS			
1	011 SW	V Klickitat	Way, Suit	e 207		Sediment descriptions (lithology) based on USCS AS	Calcula	ted Recovery	
P	hone: (WA 9813 (206) 624-	9349	-		Standard Classification of Soil for Engineering Purpo			
F	ax: (20	6) 624-283	19	-		nified Soil Classification System) and ASTM D2488-93 Standard Practice xx /xx = xx %			
				1	or Descri	ption and Identification of Soils (Visual-Manual Procei	aure).		

	RET		Core Log Key SEDIMENT LITHOLOGY		Sheet 2 of 2	
	Project: LDW RI/FS		Water Body Type: Lower Duwamish Waterway	Tube Length (ft): xxx		
	Project #: PORS5-18220-511		Water Elevation (ft)/Tide: xxx	Penetration Depth (ft): xxx Sample Quality: xxx		
	Client: LDWG		Water Depth (ft): xxx			
	Collection Date: xxx	******	Mudline Elevation (ft): xxx	Recovery in ft (%):	xx	
	Contractor: xxx		N./LAT: xxx E./LONG: xxx	Process Date: xxx		
	Vessel: xxx		Horiz. Datum: xxx (ft) Vert. Datum: xxx (ft)	Process Method: x	(XX	
	Operator: xxx		Method/Tube ID: xxx	Logged By: xxx		
	Recovered Depth (ft) Recov.Interval & Sample % Recovery (interval) Chemical Analysis	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log	
	LDW-SAMPLE-6-8 ———————————————————————————————————		SP: SAND: Poorly graded sands or gravelly sands, little to no fines.		7-	
	B LDW-SAMPLE		SW: SAND: Well graded sands or gravelly sands, little to no fines.		8	
	-8-10 		SP- SM: Sand with interbeds of silt.		stratigraphic	
	TO CONTRACT LDW-SAN		SP-SC: Sand with interbeds of silt and pockets of clay.			
	W-SAMPLE-10-12		SP-SM: Sand with silt pockets.			
	SAMPLE-12-13		GP: GRAVEL: Poorly graded gravels or gravel sand mixtures. End of core @ 13.0'. Driven to refusal.			
	The RETEC Group, Inc.	Domontes	Codiment descriptions (litheless) based on 1000 10		13	
	1011 SW Klickitat Way, Suite 207		Sediment descriptions (lithology) based on USCS AS	Calcula	ted Recovery	
	Seattle, WA 98134-1162 Phone: (206) 624-9349		Standard Classification of Soil for Engineering Purpos		-	
	Fax: (206) 624-2839		oil Classification System) and ASTM D2488-93 Standa		xx = xx %	
1		for Descri	ption and Identification of Soils (Visual-Manual Proceed	iure).		

				Sediment Core Lo	og	Sheet 1 of 1
	Project: LDW RI	/FS		Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	16.1
	Project #: PORS	55-18220-51	I	Water Elevation (ft)/Tide: 8.1	Penetration Depth (ft): 6.6	
Client: LDWG				Water Depth (ft): 25.3	Sample Quality: G	ood
	Collection Date:	2/8/06		Mudline Elevation (ft): -15.7	Recovery in ft (%):	6.0 (91)
	Contractor: MCS	Environme	ntal, Inc.	N./LAT: 211282 E./LONG: 1266316	Process Date: 2/9/	06
	Vessel: MCS ba	ırge		Horiz, Datum: NAD 83 N Vert. Datum: MLLW	Process Method: (Cut tube
	Operator: Gary	Maxwell		Method/Tube ID: Diver Impact Core/4" sq AI	Logged By: N. Ba	cher
Recovered Depth (ft) Recov.Interval & Sample % Recovery (interval) Chemical Analysis PID Measurement			Analysis PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log
	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	97% (0-3) PCE SVC Met TBT Hg 100% (3-5) 100% (3-5) PCE 89% (5-6.6)	OC als	ML: (0.0-0.2) wet, soft, greenish gray (GLEY 1, 5/10 Y), SILT, little sand, moderate shell fragments, and trace twigs and rootlets. MH: (0.2-1.3) moist, medium soft, black (GLEY1 2.5N) SILT, few sand, trace wood, and rootlets. Very slight H2S-like odor. @ 0.6' 1/2" gray CLAY seam @ 0.7' piece of bark 3" x 1.5" L @ 0.9-1.1' Layer of wet, medium dense, gray (GLEY1 4/N) fine SAND, few silt. Sand grains are multicolored (black and white). MH: (1.3-2.8) moist, medium stiff, black (GLEY1 2.5/N) SILT and scattered wood fragments. Moderate H2S-like odor. @ 1.6' trace shells SM: (2.8-6.6) moist, medium dense, very dark gray (GLEY1 3/N) fine to medium SAND, few silt. Sand grains are multicolored (orange, red, white) and grade to medium to coarse @ 4.9'. @ 3.4' 1/2" round clay pocket @ 3.8' grades to trace silt	@ 0.2' TV = 0.6 kg/cm2 Transitional Contact GT @ 1.6' @1.9' TV = 0.5 kg/cm2 Sharp Contact GT @ 3.1' @ 3.6' TV = 0.7 kg/cm2 Below 4.6' core is slightly winnowed (~5%) from edge of tube @ 5.1' TV = 0.5 kg/cm2	0
1011 SW Klickitat Way, Suite 207				Drive Notes: slowed (6.2-3.4'), refusal (6.6').	Sample Length	ted Recovery //Penetration Length: 6.6 = 91 %

					33	Sediment Core Lo	og	Sheet 1 of 2		
	Project: LDW	RI/	FS			Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	16.1		
	Project #: PC	RS	5-18220)-511		Water Elevation (ft)/Tide: 7.4	Penetration Depth	(ft): 13.1		
	Client: LDW0	à				Water Depth (ft): 31.4	Sample Quality: G	ood		
	Collection Da	te: 2	2/9/06			Mudline Elevation (ft): -23.7 Recovery in ft (%): 13.1 (100)				
	Contractor: M	cs	Enviror	nmental,	Inc.	N./LAT: 211196 E./LONG: 1267032	06			
	Vessel: MCS	bar	ge			Horiz. Datum: NAD 83 N Vert. Datum: MLLW	Process Method: (Cut tube		
	Operator: Ga	ry N	ňaxwell	<u> </u>	_	Method/Tube ID: Diver Impact Core/4" sq A!	Logged By: N. Ba	cher, A. Fitzpatrick		
	Rec Rec	& Sample	% Recovery (interval)	Chemical Analysis	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log		
	2 3 3 4 4 5 5	\langle LDW-SC2-0-2 \longrightarrow \langle LDW-SC2-2-4 \longrightarrow \langle LDW-SC2-4-6 \longrightarrow $ $ \langle LDW-SC2-4-6 \longrightarrow $ $ $ $ $ $ $ $ LDW-SC2-4-6 \longrightarrow $	47% (0-1) 100% (1-2) 100% (2-5)	PCB SVOC Metals Hg Pesticide SVOC Metals Hg Pesticide	0	SM: (0.0-1.2) wet, loose, black (GLEY 1, 2.5/N) SAND, little silt. © 0.7-0.9' wood fragments and subrounded gravel up to 1" L OL: (1.2-2.4) wet, soft to medium stiff, light gray (2.5Y, 7/1), ORGANIC SILT, few sand and clay. Trace scattered shell fragments, moderate H2S-like odor that decreases with depth, and trace sheen. Horizontal banding of black and gray clay seams in 1/2" bands. Clay has some plasticity. OL: (2.4-4.1) wet, medium stiff, light gray (2.5Y, 7/1), ORGANIC SILT, few clay. Silt texture is homogenous and of medium plasticity. Slight H2S-like odor and trace HC-like sheen. / OL: (4.1-4.3) wet, stiff, light gray (2.5Y, 7/1) to dark gray (2.5Y, 4/1) seams of SILT and rock flour and chunky balls of hard SILT (80% anthropogenic). Trace wood and minor sand seams with wood up to 3". Trace sheen and black streaks associated with hard silt.	Transitional Contact PID bag @ 0.9' = 0.0 Sheen Test @ 1.0: 50% rainbow w/ scattered 1/2' florets @ 1.5' TV = 0.3 kg/cm2 Transitional Contact GT @ 2.9' @ 3.2' TV = 0.4 kg/cm2 Sharp Contact Transitional Contact @ 4.3' TV = 0.5 kg/cm2 GT @ 4.7' Wet test @ 5.0' = gray silt melts away when wetted- no integrity, flour/ash-like @ 5.7' TV = 1.8 kg/cm2	- recent		
ſ			Ino			Dubus Materia, function (O.P.)	<u> </u>	<u> </u>		
-	The RETEC Gro	tat W	/ay, Suit	e 207		Drive Notes: freefall (0.5'), easy (2.2'), moderate (4.9	Calcula	ted Recovery		
-	Seattle, WA 98 Phone: (206) 62	4-93		-), penetration goal reached. One drive attempt	Sample Length	/Penetration Length:		
	Fax: (206) 624-2	2839		<u>m</u>	nade at s	tation. Core catcher was intact.	13.1/	13.1 = 100 %		

	3				Sediment Core Lo	og	Sheet 2 of 2	!
Project	: LDW R	/FS			Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	16.1	
	t #: POR		-511		Water Elevation (ft)/Tide: 7.4	Penetration Depth	(ft): 13.1	
Client:	LDWG	_	_		Water Depth (ft): 31.4	Sample Quality: G	iood	
Collect	tion Date:	2/9/06			Mudline Elevation (ft): -23.7	Recovery in ft (%):	13.1 (100)	
Contra	ctor: MCS	Enviror	mental,	Inc.	N./LAT: 211196 E./LONG: 1267032	Process Date: 2/9/	06	
Vessel	: MCS ba	arge			Horiz. Datum: NAD 83 N Vert. Datum: MLLW	Process Method:	Cut tube	
Operat	tor: Gary	Maxwell			Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: N. Ba	cher, A. Fitzpat	rick
Recovered Depth (ft)	Recov.Interval & Sample	% Recovery (interval)	Chemical Analysis	PłD Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Lo	g
9 10 11	-SC2-6-8	92% (9-10.6) 80% (10.6-11.6	PCB SVOC Metals	0 0		@ 7.4' TV = 0.5 kg/cm2 Sharp Moisture Contact Core catcher is wedged @ 8.4 to 9.0' @ 9.5' TV = 3.5 kg/cm2 @ 10.5' TV = 2.0 kg/cm2 Sharp Contact @ 11.5' TV = 1.0 kg/cm2 Transitional Contact	non-native —	9
<u>13</u>	13.1	100% (12-13)			Bottom 6" is very fine SAND, few silt in core shoe.			13
		,			End of core at 13.1'.)		1

Remarks: Drive Notes: freefall (0.5'), easy (2.2'), moderate (4.9'), hard (13.1'), penetration goal reached. One drive attempt

Calculated Recovery
Sample Length/Penetration Length:
13.1/13.1 = 100 %

Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.

made at station. Core catcher was intact.

1 RET		Sediment Core Lo	Og Sheet 1 of 2		
Project: LDW RI/FS		Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	16.1	
Project #: PORS5-18220-511		Water Elevation (ft)/Tide: 7.9	Penetration Depth	(ft): 8.5	
Client: LDWG		Water Depth (ft): 57.0	Sample Quality: G	ood	
Collection Date: 2/9/06		Mudline Elevation (ft): -49.3	8.5 (83)		
Contractor: MCS Environmenta	al, Inc.	N./LAT: 210648 E./LONG: 1266431	Process Date: 2/9/	06	
Vessel: MCS barge		Horiz. Datum: NAD 83 N Vert. Datum: MLLW	Process Method: (Cut tube	
Operator: Gary Maxwell		Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: N. Ba	cher, A. Fitzpatrick	
Recovered Depth (ft) Recov.Interval & Sample % Recovery (interval) Chemical Analysis	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log	
93% PCB SVOC Metals Hg TBT 130% (1-2) 130% (2-5) 130% (2-5) 130% (1-2)	0	SM: (0.0-1.6) moist, medium dense, very dark gray (10YR, 3/1) fine SAND, few silt, and scattered wood fragments. Sand is multicolored (orange, red, white). © 0.9' 1" thick SILT lens SP- SM: (1.6-5.1) moist to wet, medium dense, very dark gray (2.5Y, 3/1) fine to medium SAND interbedded with 1/2" to 3" thick SILT layers. Sand grains are multicolored and coarsen downward. Scattered wood fragments up to 1"L. Moderate H2S-like odor to 4.0'. © 1.6' 1" thick SILT lens © 2.4' 1.5" thick SILT lens © 2.7' 3"L x 1"W thin wood fragment © 3.1' 3" thick SILT lens © 4.0' Slight H2S-like odor to 4.6' © 4.2' 1/2" thick SILT lens SP- SM: (5.1-10.2) damp, dense, greenish black (GLEY 1, 4/10Y), medium SAND interbedded with SILT. Silt interbeds are frequent, horizontal, range from 1/2" to 2" thick and are spaced every 0.3'. Small, scattered wood fragments at bottom of core (7.0' to 8.0').	GT @ 0.7' @ 0.9' TV = 0.2 kg/cm2 Sharp Contact GT @ 1.8' @ 3.0' TV = 0.4 kg/cm2 Gradational Contact: less water @ 4.9' TV = 0.2 kg/cm2	- upper alluvium → - lower alluvium — lower alluvium alluvium — lower alluvium alluvium al	
The RETEC Group, Inc. 1011 SW Klickitat Way, Suite 207		Drive Notes: easy (5.0'), moderate (7.0'), , refusal (8.7'). One drive attempt made at station.	Sample Length	ted Recovery //Penetration Length: 10.2 = 83 %	

á		Ţ)				Sediment Core Louis LDW-SC-3 (R1)	og	Sheet 2 of 2
Pr	oject:	LDV	V RI	FS			Water Body Type: Lower Duwamish Waterway	Tube Length (ft): 1	16.1
P	oject	#: P	ORS	5-18220	-511		Water Elevation (ft)/Tide: 7.9	Penetration Depth	(ft): 8.5
CI	ient:	LDW	G				Water Depth (ft): 57.0	Sample Quality: G	ood
C	Collection Date: 2/9/06						Mudline Elevation (ft): -49.3	Recovery in ft (%):	8.5 (83)
C	Contractor: MCS Environmental, Inc.						N./LAT: 210648 E./LONG: 1266431	Process Date: 2/9/	06
Ve	essel:	MCS	s ba	rge			Horiz, Datum: NAD 83 N Vert, Datum: MLLW	Process Method: 0	Cut tube
0	perate	or: G	ary I	Maxwell			Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: N. Ba	cher, A. Fitzpatrick
Recovered	Depth (ft)	Recov.Interval	& Sample	% Recovery (interval)	Chemical Analysis	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log
8			-SC3-6-8>	70% (7-8) 80% (8-9)			 @ 7.0' wood fragments, elongated @ 7.2' 1.5" thick SILT lens @ 7.9' 1" thick SILT lens @ 8.1' small wood fragment End of core at 8.5'. Driven to refusal. 	@ 7.3' TV = 0.6 kg/cm2 Not sampled below 8.0'.	8-
-	0			83% (9-10.2)					10

The RETEC Group, Inc. 1011 SW Klickitat Way, Suite 207	Remarks: Drive Notes: easy (5.0'), moderate (7.0'),	Calculated Recovery
Seattle, WA 98134-1162 Phone: (206) 624-9349	hard (7.8'), refusal (8.7'). One drive attempt made at station.	Sample Length/Penetration Length:
Fax: (206) 624-2839		8.5 / 10.2 = 83 %

		3	•	les section		Sediment Core Lo	og	Sheet 1 of 2		
	Project	t: LDW RI	/FS			Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	16.1		
	Project	t#: PORS	5-18220)-511		Water Elevation (ft)/Tide: 7.9	Penetration Depth (ft): 9.0			
	Client:	LDWG				Water Depth (ft): 41.9	Sample Quality: Not indicated			
	Collect	tion Date:	2/9/06			Mudline Elevation (ft): -34.0	Recovery in ft (%):	7.7 (85)		
	Contra	ictor: MCS	Enviro	nment	al, Inc.	N./LAT: 210597 E./LONG: 1266933	Process Date: 2/9/	/06		
	Vessel	: MCS ba	rge			Horiz, Datum: NAD 83 N Vert, Datum: MLLW	Process Method:	Cut tube		
	Operat	tor: Gary	Maxwell	<u> </u>	1	Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: N. Ba	cher		
	Recovered Depth (ft)	Recov.Interval & Sample	% Recovery (interval)	Chemical	PID	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log		
	0 	LDW-SC4-0-1 LDW-	92% (0-2)	PCB SVOC Metals Hg TBT		SM: (0.0-0.3) wet, very loose, dark greenish gray (GLEY 1, 4/10Y) SILTY SAND, trace subrounded gravel up to 1/2", trace shells and rootlets. OL: (0.3-1.4) moist, medium stiff, black (GLEY 1, 2.5/N) ORGANIC SILT, little sand, trace angular gravel up to 1/2", and trace rootlets and twigs. Silt has medium plasticity.	Sharp Contact GT @ 0.4' @ 0.6' TV = 0.4 kg/cm2	recent		
		DW-SC3-1-2	115% (2-4)	PCB SVOC Metals Hg TBT		GP: (1.4-1.8) wet, medium dense, dark greenish gray (GLEY 1, 4/5G) GRAVEL, little silt and sand. Gravel is subangular and up to 2.5" in diameter. Trace HC-like odor and sheen.	Sharp Contact @ 2.1'TV = 0.4			
+++++++++++++++++++++++++++++++++++++++	3	IDW-SC3-24		PCB SVOC Metals Hg TBT		OL: (1.8-2.5) moist, medium soft, black (GLEY 1, 2.5/N) ORGANIC SILT, trace sand. Slight to moderate H2S-like odor and trace HC-like sheen. SP-SM: (2.5-3.3) moist, medium dense, very dark brown (10YR, 2/2) fine SAND interbedded with lenses of gray CLAYEY SILT. Lenses are irregular and up to 3" thick. Moderate wood fragments, twigs, and rootlets increase toward basal contact.	kg/cm2 Sharp Contact	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		
	—4 	C::Q::Q::Q::Q::Q::Q::Q::Q::Q::Q::Q::Q::Q	92% (4-6)	РСВ	0	greenish gray (GLEY 1, 3/10GY) fine to medium SAND with scattered 1/2" pockets of clay and 1" lenses of gray silt, and scattered wood fragments. Sand is multicolored (orange, red, white) and grades to medium grained below 5.5'. @ 4.7' 1/4" clay pocket @ 5.0' 1/2" clay pocket	@ 4.5' TV = 0.5 kg/cm2			
	- 6	→ ← LDW-SC	85% (6-7)			@ 5.4' 1/2" gray silt lens @ 6.4' 1" clay pocket		lower alluvium		
						Drive Notes: moderate (7.5"), hard (9.0"),	0-1	ted Decement		
		V Klickitat \ WA 98134				.0'). Two drive attempts made at station.		ted Recovery		
	Phone: ((206) 624-9 6) 624-2839	349			ther was intact.		ngth/Penetration Length:		
	(2.01	-, , 2000					7.7 /9.0 = 85 %			

				•			Sediment Core Lo	og	Sheet 2 of 2
F	Project: LDW RI/FS						Water Body Type: Lower Duwamish Waterway	6.1	
F	Project #: PORS5-18220-511						Water Elevation (ft)/Tide: 7.9	Penetration Depth	(ft): 9.0
(Clien	it: LDV	/G				Water Depth (ft): 41.9	Sample Quality: No	ot indicated
(Colle	ction D	ate:	2/9/06			Mudline Elevation (ft): -34.0	Recovery in ft (%):	7.7 (85)
(Cont	ractor:	MCS	Enviror	nmental,	Inc.	N./LAT: 210597 E./LONG: 1266933	Process Date: 2/9/6	06
١	/ess	el: MC	S ba	rge			Horiz, Datum: NAD 83 N Vert, Datum: MLLW	Process Method: 0	cut tube
(Oper	ator: C	ary	Maxwell			Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: N. Bac	cher
	Hecovered	Depth (ft) Recov.Interval	& Sample	% Recovery (interval)	Chemical Analysis	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log
	7 8 8		3-6-7.7>	60% - (7-8) - 60% - (8-9)		0	SP- SM: (7.2-9.0) moist, dense, gray fine SAND interbedded with SiLT. Interbeds are 1/8" thick, spaced 1/4" apart from 6.9' to 7.2', and scattered lenses 1/4" thick. End of core at 7.7'. Driven to refusal.	Transitional Contact @ 7.2' TV = 0.6 kg/cm2	7—

The RETEC Group, Inc. 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134-1162 Phone: (206) 624-9349 Fax: (206) 624-2839 Remarks: Drive Notes: refusal (9.0'). Two drive Core catcher was intact.

Remarks: Drive Notes: moderate (7.5'), hard (9.0'), refusal (9.0'). Two drive attempts made at station.

Calculated Recovery
Sample Length/Penetration Length:

7.7 /9.0 = 85 %

					237 SO 708 209 209	EC	Sediment Core LDW-SC-5 (R2)				
	Project:	LDV	V RI/	'FS			Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	16.1		
	Project	#: P(ORS	5-18220	-511		Water Elevation (ft)/Tide: 7.7	Penetration Depth	Penetration Depth (ft): 7.3		
L	Client:	LDW	G				Water Depth (ft): 19.7	Sample Quality: (Good		
	Collecti	on Da	ate: 2	2/9/06			Mudline Elevation (ft): -10.4	Recovery in ft (%)	Recovery in ft (%): 6.2 (85)		
L	Contrac	ctor: N	/CS	Environ	menta	al, Inc.	N./LAT: 210543 E./LONG: 1266048	Process Date: 2/1	0/06		
	Vessel:	MCS	3 ba	rge			Horiz. Datum: NAD 83 N Vert. Datum: MLLW	Process Method:	Cut tube		
-	Operato		ary i	Maxwell		-	Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: N. Ba	acher, A. Fitzpatrick		
	Recovered Depth (ft)	Recov.Interval	& Sample	% Recovery (interval)	Chemical	PID	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log		
	0 1	1 1 1 1 1 1 1 1 1	LDW-SC5-0-1	82% (0-1) 96%	PCB SVOC Metals Hg		OL: (0.0-1.0) moist, medium stiff, black (2.5Y, 2.5/ SILT, trace sand. Mottled appearance. Scattered rootlets, twigs, and shell fragments, and trace worm and worm tubes. SM: (1.0-1.2) moist, medium dense, dark gray (2.5	GT @ 0.6'	0		
† † † † † † † † † † † † † † † † † † †	-2		LDW-SC5-1-2.2	(1-2)	PCB SVOC Metals Hg		4/1) fine to medium SAND, trace silt and trace shell fragments. Sand grains are multcolored (orange, tred, white). SM: (1.2-1.5) moist, medium dense, dark gray (2.5' 4/1) SAND, little silt, abundant shell fragments, and strong H2S-like odor.	Transitional Contact	upper alluvium		
	-3		< LDW-SC5-2	950		9.1	ML: (1.5-2.4) moist, soft, dark gray (2.5Y, 4/1) GRAVELLY SILT, trace sand. Gravels are rounder and up to 1.5" diameter. Substantial shell fragmen barnacles on gravels, and strong H2S-like odor.		3 111		
+ + +	-4		C5-2.2-4 -> <	(2-5)	IPCB SVOC Metals Hg	,	SP- SM: (2.4-7.3) moist, medium dense, very dark greenish gray (GLEY 1, 3/10Y) medium SAND interbedded with SILT, scattered to 3.7'. Scattered small shells and slight H2S-like odor. @ 2.4' lens of SILT with shells @ 2.7' pocket of SILT @ 3.6' lens of SILT with shells and wood fragment	GT @ 3.1' @ 3.4' TV = 0.38 kg/cm2	4-		
	5		LDW-SC5 4 6	77%		0	@ 5.0' becomes dense	@ 4.7' TV = 0.3 kg/cm2	ower alluvium		
+	-6		\	(5-6.4)			@ 5.3' 1 piece of 1" subrounded black gravel (basalt-like)	Slumped from 5.9- 6.2"; material is still present.	6		
+++++++++++++++++++++++++++++++++++++++	(6.4-7.3)						End of core at 6.2'. Driven to refusal. Note: Chemistry interval recorded as 4-6 ft but samples were collected to 6.2 ft. Graphic expressed depth of sample collection; sample name matches project nomenclature.	S	7-		
	The RET 1011 SW Seattle, \ Phone: (Fax: (206	Klick WA 9: 206) 6	itat V 8134 24-9	Way, Suit -1162 349	e 207	modera made a	s: Drive Notes: freefall (0.5'), easy (5.0.'), te (6.3'), hard (7.3'), refusal (7.3'). Two drive attempt station. Core catcher was intact. EPA oversight ap-	Sample Lengt	ated Recovery th/Penetration Length: /7.3 = 85 %		

	200	7				g som		Sediment Core Lo	og	Sheet 1 of 2
	Project:	LDV	V RI/	FS				Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	16.1
	Project	#: P0	ORS	5-18220	-511			Water Elevation (ft)/Tide: NA	Penetration Depth	(ft): 11.0
	Client:	LDW	G					Water Depth (ft): 8.6	Sample Quality: G	lood
	Collection	on Da	ate: 2	2/9/06				Mudline Elevation (ft): -33.0	Recovery in ft (%):	8.6 (77)
	Contrac	ctor: N	ICS	Enviror	ment	al, In	c.	N./LAT: 209838 E./LONG: 1266285	Process Date: 2/10	0/06
	Vessel:	MCS	S ba	rge				Horiz. Datum: NAD 83 N Vert. Datum: MLLW	Process Method: (Cut tube
	Operato		ary f	Maxwell	T			Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: N. Ba	cher, A. Fitzpatrick
	Recovered Depth (ft)	Recov.Interval	& Sample	% Recovery (interval)	Chemical	Sierje C	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log
			← LDW-SC6-0-2 →	100% (0-2.6)	PCB SVOC Metals Hg		0	OL: (0.0-0.4) wet, very soft, olive (5Y, 4/3) ORGANIC SILT. Scattered twigs and trace worm tubes. OL: (0.4-4.8) wet, soft to medium stiff, greenish black (GLEY 1, 2.5/5G) ORGANIC SILT, little sand and scattered wood fragments. Silt texture is homogenous, of moderate plasticity, increases in stiffness with depth, and decreases in sand content with depth. Slight H2S-like odor.	Transitional Contact @ 0.7 TV = 0.5 kg/cm2 GT @ 1.1' @ 1.7' TV = 0.8 kg/cm2	
	-3		LDW-SC6-2-4.5	100% (2.6-4.7)	PCB SVOC Metals Hg	:	0	@ 3.4' 2" pocket of soft, stiff, gray SILT	GT @ 3.2' @ 3.5' TV = 0.7 kg/cm2	S TECCHIT
	— 5		——→ ← LDW-SC6-4.	71% (4.7-6.8)			0	SM: (4.8-8.8) moist, medium dense, very dark gray (10YR, 3/1) SAND, trace silt. Sand is multicolored (orange, red, white) with fining upward sequences; silt is non-layered with stiff clasts and abrupt edges (xenoclasts). Scattered debris (brick fragments). @ 4.5' grades to fine sand	Sharp Contact @ 4.9'TV = 1.2 kg/cm2	
+ + + + + + + + + + + + + + + + + + + +	- 6		5-6 →					@ 5.4' grades to coarse to medium sand @ 6.0' grades to medium sand	Bag @ 5.7' (debris) Bag @ 6.0' (sand clast with odor)	6—
1			- LDW					@ 6.4' grades to medium to fine sand	@ 6.5' TV = 0.5 kg/cm2	upper all
	The RETEC Group, Inc. 1011 SW Klickitat Way, Suite 207							Drive Notes: easy (2.6'), moderate (8.8'), hard (10.0'),	Calcula	ted Recovery
	Seattle, V	VA 98	3134-	1162	201	refu	sal (11	.0'). One drive attempt made at station.		/Penetration Length:
	Phone: (2 Fax: (206					Core	e catch	ner was intact.		11.0 = 78 %

			Sediment Core L	og	Sheet 2 of 2
Project: LDW RI/FS			Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	16.1
Project #: PORS5-1	3220-511		Water Elevation (ft)/Tide: NA	Penetration Depth	(ft): 11.0
Client: LDWG			Water Depth (ft): 8.6	Sample Quality: G	lood
Collection Date: 2/9/	06		Mudline Elevation (ft): -33.0	Recovery in ft (%):	8.6 (77)
Contractor: MCS En	/ironmental,	Inc.	N./LAT: 209838 E./LONG: 1266285	Process Date: 2/10	0/06
Vessel: MCS barge			Horiz. Datum: NAD 83 N Verl. Datum: MLLW	Process Method: 6	Cut tube
Operator: Gary Max	well		Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: N. Ba	cher, A. Fitzpatrick
Recovered Depth (ft) Recov.Interval & Sample % Recovery	(interval) Chemical Analysis	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log
8 SC6-8-8-8-8-8-8-8-8-8-8-8-8-8-8-8-8-8-8-8	7% 3-10)	0	@ 7.1' grades to coarse to medium sand @ 7.4' grades to medium sand @ 7.5' scattered brick fragments to 1/8" L, coarse quartz sand present SM: (8.8-11.0) Grading to moist, dense, medium SAND. No layers or hard silt clasts; more rounded coarse quartz grains than above. One intact half shell 1" L. End of core at 8.6'. Driven to refusal.	Bag @ 7.0' (brick fragment, 1/2" shell) Gradational Contact Last 0.1' of core is slightly winnowed	vium 8— lower alluvium 10—

The RETEC Group, Inc.
1011 SW Klickitat Way, Suite 207
Seattle, WA 98134-1162
Phone: (206) 624-2839

Remarks: Drive Notes: easy (2.6'), moderate (8.8'), hard (10.0'),
refusal (11.0'). One drive attempt made at station.
Core catcher was intact.

Remarks: Drive Notes: easy (2.6'), moderate (8.8'), hard (10.0'),
refusal (11.0'). One drive attempt made at station.
Core catcher was intact.

8.6 /11.0 = 78 %

					Sediment Core Lo				
Project: LD	W RI	/FS			Water Body Type: Lower Duwamish Waterway	Tube Length (ft):			
Project #: !	PORS	5-18220)-511		Water Elevation (ft)/Tide: 6.7	Penetration Depth	(ft): 11.0		
Client: LD	WG				Water Depth (ft): 34.8	iood			
Collection I	Date:	2/10/06			Mudline Elevation (ft): -27.1	8.7 (79)			
Contractor	MCS	Enviro	nmenta	l, Inc.	N./LAT: 209605 E./LONG: 1266850	Process Date: 2/10	0/06		
Vessel: M	CS ba	rge			Horiz, Datum; NAD 83 N Vert, Datum; MLLW	Process Method:	Cut tube		
Operator:		Maxwel	l		Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: A. Fit	zpatrick		
Recovered Depth (ft) Recov.interval	& Sample	% Recovery (interval)	Chemical	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log		
-1 I	LDW-SC7-0-1	100% (0-0.6) 92% (0.6-1)	PCB SVOC Metals Hg Pesticio	0 les	ML: (0.0-0.5) wet, very soft, black (GLEY 1, 2.5/N) ORGANIC SILT, trace clay. Scattered wood fragments, trace worms and rootlets. OL: (0.5-1.8) very wet, very soft, very dark greenish gray (GLEY 1, 3/10Y) SANDY ORGANIC SILT. Scattered 1/2" rounded gravel.	Transitional Contact @ 0.5' TV = 0.2 kg/cm2 GT @ 0.9'	recent \(\square \text{uppe}		
-2 .	SC7-1-1.7 \	56% (1-4)	PCB SVOC Metals Hg Pesticio TBT PCB SVOC Metals Hg Pesticio	0	SP: (1.8-3.5) moist, loose to medium dense, dark greenish gray (GLEY 1, 4/5GY) very fine to fine SAND. Sand grains are uniform, multicolored (orange, red, white), and grade to coarse with depth.	Sharp Contact	upper alluvium \rightarrow		
	27-1.7-4 ————————————————————————————————————		₹BT		SP-SM: (3.5-7.1) moist, dense, dark greenish gray (GLEY 1, 4/5GY) medium SAND, trace gravel, and trace scattered greenish-gray (GLEY1, 5/5GY) silt pockets at top 1/2" of unit and increasing in size and abundance (up to 4" L) toward basal contact. Gravel is scattered, well rounded, and 1 to 4" in diameter.	GT @ 2.6' @ 3.2' TV = 0.3 kg/cm2 @ 3.5' TV = 0.7 kg/cm2	3		
-4 15 15 15 15 15 15 15 1	- LDW-:	119% (4-6)		0	@ 4.0¹ Gravel ends and silt pockets increase to substantial. Silt pockets are subrounded, hard, and up to 4" in diameter.	Bag @ 4.0 to 6.0' (silt clasts)	lower alluvium		
The RETEC (1011 SW Klick Seattle, WA Phone: (206)	Group, kitat V 98134 624-9	Vay, Suit -1162 349	e 207 -	nard (10.7	Drive Notes: freefall (0.6'), moderate (9.4'), "), refusal (11'). One drive attempt made at station.	Sample Length	ited Recovery		
Fax: (206) 62	4-2839)	-	Core sho	e was 50% full of sand.	8.7 /	8.7 /11.0 = 79 %		

3	-			Sediment Core Lo	og	Sheet 2 of 2		
Project: LDW RI	/FS			Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	6.1	_	
Project #: PORS	S5-18220	-511		Water Elevation (ft)/Tide: 6.7 Penetration Depth (ft): 11.0				
Client: LDWG				Water Depth (ft): 34.8	Sample Quality: G	ood		
Collection Date:	2/10/06			Mudline Elevation (ft): -27.1	Recovery in ft (%):	8.7 (79)		
Contractor: MCS	Environ	mental,	Inc.	N./LAT: 209605 E./LONG: 1266850	Process Date: 2/10	0/06		
Vessel: MCS ba	rge			Horiz. Datum: NAD 83 N Vert. Datum: MLLW	Process Method: (Cut tube		
Operator: Gary	Maxwell	· · · ·	1	Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: A. Fitz	zpatrick		
Recovered Depth (ft) Recov.Interval	% Recovery (interval)	Chemical Analysis	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log	9	
CDW-SC7-6.5-8 → SC7-8-8.7 SC7-8-8.7	38% (6-9)		0	SM: (7.1-11.0) moist, dense, dark greenish gray (GLEY 1, 4/5GY) medium SAND interbedded with fine SAND, trace silt (fluvial-looking). End of core at 8.7'. Driven to refusal.	@ 7.1' TV = 0.5 kg/cm2 @ 8.7 to 8.9' Core is winnowed and was not sampled. Shoe is 50% of same material as above.	图 图 图 图	7 - 10 - 10 - 10 - 10	
11	33% (10-11)						11	

The RETEC Group, Inc. 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134-1162	Remarks: Drive Notes: freefall (0.6'), moderate (9.4'), hard (10.7'), refusal (11'). One drive attempt made at station.	Calculated Recovery Sample Length/Penetration Length:
Phone: (206) 624-9349 Fax: (206) 624-2839	Core shoe was 50% full of sand.	8.7 /11.0 = 79 %

	A						Sediment Core Lo	og	Sheet 1 of 2
	Pro	ject: Ll	DW RI	/FS			Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	6.1
	Pro	ject #:	PORS	5-18220	0-511		Water Elevation (ft)/Tide: 7.3	Penetration Depth	(ft): 14.6
	Clie	ent: LD	WG				Water Depth (ft): 46.5	Sample Quality: G	ood
	Col	lection	Date:	2/10/06			Mudline Elevation (ft): -39.1	Recovery in ft (%):	10.0 (68)
	Cor	ntractor	: MCS	Enviro	nmenta	al, Inc.	N./LAT: 209589 E./LONG: 1266614	Process Date: 2/10)/06
	Ves	ssel: M	CS ba	rge			Horiz. Datum: NAD 83 N Vert. Datum: MLLW	Process Method: (Cut tube
	Ope	erator:	Gary	Maxwell	ı		Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: A. Fitz	zpatrick
	Recovered	Depth (ft)	& Sample	% Recovery (interval)	Chemical	PID	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log
	_0 _1		LDW-SC8-0-1 LDW	73% (0-1)	PCB SVOC Metals Hg Pestici		ML: (0-0.4) very wet, soft, olive gray (5Y, 4/2) SILT. OL: (0.4-1.1) wet, soft, mottled black (2.5Y, 2.5/1) ORGANIC SILT, moderate wood fragments up to 4" L, and scattered shell fragments. OL: (1.1-4.8) wet, medium stiff, black (2.5Y, 2.5/1)	Transitional Contact GT @ 0.9' Bag @ 1.2' (orange	0
+++++++++++++++++++++++++++++++++++++++	2	mappe during strate strates strates strates	LDW-SC8-1-2	100% (1-5)	SVOC Metals Hg Pestici		ORGANIC SILT, little clay interbedded with fine- medium black SAND. Silt texture is uniform, slightly compressible and of medium plasticity. Scattered rootlets and moderate to strong H2S-like odor.	agglomerate) @ 1.5' TV = 0.6 kg/cm2	
	3	*** **** ***	LDW-SC8-2-4>		PCB SVOC Metals Hg Pestici			kg/cm2 GT @ 3'	3 - 1
	—4		LDW-SC8-4-6 -	100% (5-7)	PCB SVOC Metals Hg	0	OL: (4.8-11.8) Grades to moist, medium stiff, black (2.5Y, 2.5/1) ORGANIC SILT, little clay interbedded with fine-medium black SAND. Silt texture is stiffer than above due to decreased water content. @ 4.8 to 5.0' 2" layer of wet, black (2.5Y, 4/2) SAND	Gradational Contact: less water Bag @ 4.8' (black chunk) @ 5' TV = 0.56 kg/cm2	26nt
	6				9		@ 5.6' 2" layer of black SAND, moderate wood fragments, trace sheen florets, faint HC-like odor	@ 5.8' PID Bag = 0	6
	7	CHARLE STATE STATE STATE OF	- LDW-SC8-6-8 —	81% (7-10)	PCB SVOC Metals Hg	0	@ 6.4' end of sand interbeds	@ 6.6' TV = 0.84 kg/cm2	7
+	- - - 8						@ 7 .0 to 8.0' possible HC-like odor		
		RETEC			202	Remark	s: Drive Notes: freefall (0.8'), easy-moderate (4.8'),	Calcula	ted Recovery
	Seat	tle, WA	98134	Nay, Suit -1162		easy (9.	6'), moderate (14.6'), penetration goal reached. One driv		/Penetration Length:
	Phor	ne: (206 (206) 6	624-9	349	- 1		made at station. Core catcher was intact but inverted.		-
	, ux.	(200) 0	_7-203	,		- utempt	made at station. One catcher was much but inverted.		14.6 = 68 %

3			Sediment Core L LDW-SC-8 (R1)	og	Sheet 2 of 2
Project: LDW RIA	/FS		Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	16.1
Project #: PORS	5-18220-511		Water Elevation (ft)/Tide: 7.3	Penetration Depth	(ft): 14.6
Client: LDWG			Water Depth (ft): 46.5	Sample Quality: G	ood
Collection Date:	2/10/06		Mudline Elevation (ft): -39.1	Recovery in ft (%):	10.0 (68)
Contractor: MCS	Environmental,	inc.	N./LAT: 209589 E./LONG: 1266614	Process Date: 2/10)/06
Vessel: MCS ba	rge		Horiz, Datum: NAD 83 N Vert. Datum: MLLW	Process Method: (Cut tube
Operator: Gary I	Maxwell		Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: A. Fitz	patrick
Recovered Depth (ft) Recov.Interval	% Recovery (interval) Chemical Analysis	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log
9 LDW-SC8-8-10 11 12 12 14	PCB SVOC Metals Hg	0	CL: (11.4-11.8) wet, stiff, greenish gray (GLEY 1, 6/1) CLAY. ML: (11.8-14.6) wet, stiff, black(2.5Y, 2.5/1) SILT. End of core at 10.0'.	Ø 8.4' TV = 0.4 kg/cm2	### ### #### #########################

Remarks: Drive Notes: freefall (0.8'), easy-moderate (4.8'), easy (9.6'), moderate (14.6'), penetration goal reached. One drive attempt made at station. Core catcher was intact but inverted.

Calculated Recovery
Sample Length/Penetration Length:

10.0/14.6 = 68 %

	RETU		Sediment Core Lo	og	Sheet 1 of 2
	Project: LDW RI/FS		Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	16.1
	Project #: PORS5-18220-511		Water Elevation (ft)/Tide: -1.6	Penetration Depth	(ft): 12.9
	Client: LDWG		Water Depth (ft): 30.0	Sample Quality: G	ood
	Collection Date: 2/13/06		Mudline Elevation (ft): -31.6	Recovery in ft (%):	8.5 (66)
	Contractor: MCS Environmental,	inc.	N./LAT: 208919 E./LONG: 1266863	Process Date: 2/13	3/06
	Vessel: MCS barge		Horiz. Datum: NAD 83 N Vert. Datum: MLLW	Process Method: (Cut tube
	Operator: Gary Maxwell		Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: N. Ba	cher, A. Fitzpatrick
	Recovered Depth (ft) Recov.Interval & Sample % Recovery (interval) Chemical Analysis	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log
T++++++++	PCB SVOC Metals Hg Pesticide:	0	SM: (0.0-0.6') wet, loose, greenish black (GLEY 1, 2.5/10GY) fine to medium SAND, few silt grading to black SANDY SILT. Scattered wood fragments and rootlets, moderate H2S-like odor.	@ 0.4' TV = 0.6 kg/cm2	
++++	78% (0-2) PCB		OL: (0.6-1.3) wet, medium stiff, black (GLEY 1, 2.5/N) ORGANIC SILT. Scattered wood fragments and strong H2S-like odor.	GT @ 0.9' Transitional Contact	recent
+ + + + + + + + + + + + + + + + + + + 		0	OL: (1.3-2.6) wet, medium stiff, black (GLEY 1, 2.5/N) ORGANIC SILT. Silt texture is uniform, compressible, and of low plasticity. Moderate scattered rootlets and trace HC-like odor from 1.5' to 2.6'.	@ 1.4' TV = 0.4 kg/cm2	2
	TDW-SS SVOC Metals	0	SM: (2.6-7.7) damp, loose to medium dense, very dark brown (10YR, 2/2) fine to medium SAND, little silt interbedded with SAND and substantial (40-60%) WOOD layers. Uniform, alternating layers of sand and wood about 2" thick. Scattered wet, soft, fresh wood fragments up to 1"L and rootlets.	G 1 0 2.0	3-
+	70% (4-6)			@ 3.8' TV = 0.4 kg/cm2	4-
++++++++	- LDW-SC9-4-6,4 -	0		@ 4.6' TV = 0.5 kg/cm2	- upper alluvium —
-	30% (6-8)			Sharp Contact	6
+	-7	0	CL: (7.7-12.9) moist, stiff, bluish gray (GLEY 2, 6/1) SILTY CLAY. 1" black colored convex layers of clay uniformly spaced, homogenous, highly plastic, no textural difference between clay unit and layers.	@ 6.9' TV = 0.2 kg/cm2	7—
	The RETEC Group, Inc.	emarks:	Drive Notes: freefall (1.9'), easy (7.9'), moderate (12.9')	9'),	and December
	1011 SW Klickitat Way, Suite 207		i. One drive attempt made at station. Core was intact	Calcula	ted Recovery
	Phone: (206) 624-9349		empty. Water elevation and mudline values were		12.9 = 66 %
	—		pased on bathymetry.		12.3 = 00 70

A RETI		Sediment Core Louis LDW-SC-9 (R1)	og	Sheet 2 of 2
Project: LDW RI/FS		Water Body Type: Lower Duwamish Waterway	Tube Length (ft): 1	6.1
Project #: PORS5-18220-511		Water Elevation (ft)/Tide: -1.6	Penetration Depth	(ft): 12.9
Client: LDWG		Water Depth (ft): 30.0	Sample Quality: G	ood
Collection Date: 2/13/06		Mudline Elevation (ft): -31.6	Recovery in ft (%):	8.5 (66)
Contractor: MCS Environmental,	Inc.	N./LAT: 208919 E./LONG: 1266863	Process Date: 2/13	3/06
Vessel: MCS barge		Horiz, Datum: NAD 83 N Vert. Datum: MLLW	Process Method: (Cut tube
Operator: Gary Maxwell		Method/Tube iD: Diver Impact Core/4" sq Al	Logged By: N. Ba	cher, A. Fitzpatrick
Recovered Depth (ft) Recov.Interval & Sample % Recovery (interval) Chemical Analysis	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log
8 29% (8-10)		End of core at 8.5' Note: Chemistry interval recorded as 6.4-8.4 ft but sample was collected to bottom of core at 8.5 ft. Graphic expresses depth of sample collection; sample name matches project nomenclature.		8
10 58% (10-12)				lower altuvium ?
12 80% (12-12.9)				12

The RETEC Group, Inc. 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134-1162 Phone: (206) 624-9349 Fax: (206) 624-2839 Remarks: Drive Notes: freefall (1.9'), easy (7.9'), moderate (12.9'), no refusal. One drive attempt made at station. Core was intact but shoe was empty. Water elevation and mudline values were adjusted based on bathymetry.

| Calculated Recovery Sample Length/Penetration Length: | 8.5 / 12.9 = 66 %

	A RETEC	Sediment Core Lo	Sheet 1 of 2
	Project: LDW RI/FS	Water Body Type: Lower Duwamish Waterway	Tube Length (ft): 16.1
	Project #: PORS5-18220-511	Water Elevation (ft)/Tide: 6.8	Penetration Depth (ft): 10.6
	Client: LDWG	Water Depth (ft): 24.6	Sample Quality: Good
	Collection Date: 2/10/06	Mudline Elevation (ft): -17.3	Recovery in ft (%): 8.9 (83)
	Contractor: MCS Environmental, Inc.	N./LAT: 208776 E./LONG: 1267167	Process Date: 2/10/06
	Vessel: MCS barge	Horiz, Datum: NAD 83 N Vert. Datum: MLLW	Process Method: Cut tube
	Operator: Gary Maxwell	Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: A. Fitzpatrick
	Recovered Depth (ft) Recov.Interval & Sample % Recovery (interval) Chemical Analysis PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depth (ft) Comments In-situ Depth (ft) Comments Depth (ft)
	82% SVOC (0-0.6) Metals Hg Pesticides	MH: (0.0-0.05) very wet, very soft, brown SILT. GP: (0.05-0.7) wet, loose, greenish gray (GLEY 1, 4/5GY) GRAVEL, few sand and silt. Gravel is 1/2", subrounded, pea gravel-like; sand grains are white and black. Moderate scattered wood and very small shell fragments.	GT @ 0.9'
	D PCB SVOC Metals Hg Pesticides 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	OL: (0.7-4.1) wet, medium stiff, black (GLEY 1, 2.5/N) ORGANIC SILT, little sand and clay. Scattered rootlets, moderate H2S-like odor, trace shell fragments and hairlets. Silt texture uniform, slightly compressible, of high plasticity, and with less water with depth.	@ 1.2' TV = 0.5 kg/cm2
		@ 3.4' one mussell shell fragment	kg/cm2 GT @ 2.9'
	LDW-SC10-14-55 PCB SVOC Hg	OH: (4.1-5) wet, stiff, greenish gray (GLEY 1, 5/5GY) CLAY, little silt. Clay texture is uniform, massive, and of high plasticity.	Sharp Contact @ 4.5' TV = 0.4 kg/cm2
1	LDW-SC10-5-6	OL: (5-6) moist to wet, stiff, very dark greenish gray (GLEY 1, 3/10Y) SILT, few clay interbedded with fine SAND layers ~1.5" thick. Moderate wood fragments, plant material, and scattered peat pockets about 1" diameter decreasing with depth.	kg/cm2 Sharp Contact @ 5.4' TV = 0.5 kg/cm2 Chara Contact
	80% (5.8-7.8)	SP- SM: (6-10.6) moist, dense, very dark greenish gray (GLEY 1, 3/10Y) medium SAND interbedded with 1/8" thick gray SILT seams (fluvial-looking). Sand coarsens with depth. Scattered wood fragments.	© 6.3' TV = 0.8 kg/cm2
	The RETEC Group, Inc.	s: Drive Notes: freefall (0.6'), easy (7.8'), moderate (9.8')	Calculated Recovery
	1011 SW Klickitat Way, Suite 207 Seattle, WA 98134-1162 hard (10	.6'), refusal (10.6'). One drive attempt made at station.	Sample Length/Penetration Length:
	Phone: (206) 624-9349	cher was 50% full with partial winnowing. Core tube	8.8 /10.6 = 83 %
	was inta		

	Sediment Core Lo	og	Sheet 2 of 2
Project: LDW RI/FS	Water Body Type: Lower Duwamish Waterway	Tube Length (ft): 1	16.1
Project #: PORS5-18220-511	Water Elevation (ft)/Tide: 6.8	Penetration Depth	(ft): 10.6
Client: LDWG	Water Depth (ft): 24.6	Sample Quality: G	ood
Collection Date: 2/10/06	Mudline Elevation (ft): -17.3	Recovery in ft (%):	8.9 (83)
Contractor: MCS Environmental, Inc.	N./LAT: 208776 E./LONG: 1267167	Process Date: 2/10	0/06
Vessel: MCS barge	Horiz. Datum: NAD 83 N Vert. Datum: MLLW	Process Method: (Cut tube
Operator: Gary Maxwell	Method/Tube ID: Diver Impact Core/4" sq AI	Logged By: A. Fitz	patrick
Recovered Depth (tt) Recov.Interval & Sample % Recovery (interval) Chemical Analysis PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log
7	End of core @ 8.9'. Driven to refusal.	7.7' to 8.5' some slumping Core is winnowed from 8.0' to 8.9' and was not sampled.	10 - 10 -

Remarks: Drive Notes: freefall (0.6'), easy (7.8'), moderate (9.8'), hard (10.6'), refusal (10.6'). One drive attempt made at station. Core catcher was 50% full with partial winnowing. Core tube was intact.

Calculated Recovery Sample Length/Penetration Length:

8.8 / 10.6 = 83 %

		7			ana i	g ggas Gast		Sediment Core Lo	og	Sheet 1 of 1	
	Project:	LDV	/ RI/	FS				Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	16.1	
	Project	#: P0	ORS	5-18220)-511			Water Elevation (ft)/Tide: 5.3	Penetration Depth	(ft): 5.9	
	Client:	LDW	G					Water Depth (ft): 8.6	Sample Quality: 0	book	
	Collecti	on Da	ate: 2	2/13/06				Mudline Elevation (ft): -5.1	Recovery in ft (%):	5.0 (85)	
	Contrac	tor: N	ıcs	Enviro	nment	al, lı	nc.	N./LAT: 208291 E./LONG: 1265908	Process Date: 2/1	3/06	
	Vessel:	MCS	s ba	rge				Horiz, Datum: NAD 83 N Vert. Datum: MLLW	Process Method:	Cut tube	
	Operato	or: G	ary I	Maxwell	<u> </u>			Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: N. Ba	cher, A. Fitzpatr	ick
	Recovered Depth (ft)	Recov.Interval	& Sample	% Recovery (interval)	Chemical	Alialysis	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log	ı
			SC11-0-0.8 $\left\langle$ LDW-SC11-0.8-2 \rightarrow $\left\langle$ LDW-SC11-2-3.4 \rightarrow SC11-3.4-4.1 LDW-SC11-4.1-5	79% (3-5)	PCB SVOC Metals Hg PCB SVOC Metals Hg PCB SVOC Metals Hg		0	ML: (0.0-0.9) wet, soft, black (2.5 YR, 2.5/N) SILT, little sand. Texture is non-homogenous (jumbled) with substantial wood fragments and debris. Debris includes red chips (possibly paint), plastic, leather, glass shards, and wood chips with strong H2S-like odor. SM: (0.9-4.1) moist to wet, medium dense, very dark gray (10YR, 3/1) SILTY FINE SAND. Silt decreases with depth. Texture is homogenous. GP: (4.1-4.9) wet, loose, dark gray (10YR, 4/1) GRAVEL, little silt and sand. Gravel is 2" in diameter and subrounded and percentage decreases with depth. Moderate small shell fragments. CL: (4.9-5.9) damp, very hard, olive yellow (5Y, 6/4), mottled CLAY (possible glacial sequence), little silt. Massive, no layering, low plasticity. End of core at 5.0'. Driven to refusal.	Core catcher found at 0.8' Bag @ 0.7' (red chips, debris) GT @ 0.9' @ 1.2' TV = 0.8 kg/cm2 Transitional Contact Transitional Contact	← recent → ← upper alluvium — りつくつく	2 4 4 5 5 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6
+++				67% (5.6-5.9)						vium ?	Ţ Ţ
	The RETI 1011 SW	EC Gr	oup,	Inc.	0 207	Rei	marks:	Drive Notes: moderate (4.6), moderate to hard (5.6')	Caicula	ited Recovery	
	Seattle, V	VA 98	:134-	1162	e 207	har	'd (5.9')	, refusal (5.9'). One drive attempt made at station.		n/Penetration Len	gth:
	Phone: (2 Fax: (206							her was intact and 100% full. Difficult extraction.	<u> </u>	/5.9 = 85 %	
	,									00 /0	

							\$\dag{b}	Sediment Core Lo	og	Sheet 1 of 2
	Projec	t: LDW	RI/	FS				Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	16.1
	Projec	ct #: PC	RS	5-18220	-511			Water Elevation (ft)/Tide: 2.8	Penetration Depth	(ft): 9.6
	Client	: LDW	<u> </u>					Water Depth (ft): 13.7	Sample Quality: G	iood
	Collec	ction Da	te: 2	2/16/06				Mudline Elevation (ft): -7.5	Recovery in ft (%):	8.7 (91)
	Contra	actor: N	CS	Enviror	nmenta	al, Inc.		N./LAT: 208217 E./LONG: 1266577	Process Date: 2/10	6/06
-	Vesse	el: MCS	baı	rge				Horiz, Datum: NAD 83 N Vert. Datum: MLLW	Process Method:	Cut tube
-	Opera		ry N	/laxwell				Method/Tube ID: Diver Impact Core/4" sq_Al	Logged By: L.McI	Kee
	Recovered Depth (#)	Recov.Interval	& Sample	% Recovery (interval)	Chemical	Old	Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log
	-0 -1		CDW-SC12-0-2		PCB SVOC Metals Hg TBT	0	>	ML: (0.0-0.1) wet, very soft, olive brown (2.5Y, 4/3) SILT. OL: (0.1-2.6) wet, medium stiff, black (2.5Y, 2.5/1) ORGANIC SILT, few sand. Silt texture is uniform, slightly compressible, massive, blocky, and of low plasticity. Abundant rootlets and wood fragments, scattered shell fragments up to 1/2" and plant matter. Moderate H2S-like odor. @ 1.0' wood fragments up to 0.5'L.	GT @ 0.9' @ 1.3' TV = 0.5 kg/cm2	o Trecent
+	2 3	and the case of th	> \ LDW-SC12-2-4	100% (0-4)	PCB SVOC Metals Hg TBT	0	-	@ 2.0' strong H2S-like odor OL: (2.6-6.0) moist, stiff, gray (2.5Y, 5/1) CLAYEY ORGANIC SILT interbedded with moist, medium stiff, black (2.5, 2.5/1) SILT, few sand. Scattered wood fragments and strong H2S-like odor. Grades to stiff with depth.	Transitional Contact GT @ 2.9' @ 3.4' TV = 0.2 kg/cm2	
**************************************	4 5		-> < LDW-SC12-4-6.7	89% (4-5)	PCB Hg	0		@ 5.0' wood fragments up to 3" L	@ 5.4' TV = 0.6 kg/cm2 Transitional Contact	4
1 1 1 1	-6			93% (5-7)	,			ML: (6.0-6.9) moist, medium stiff, dark greenish gray (GLEY 1, 4/10Y) SILT interbedded with up to 3" thick layers of sandy SILT, wood fragments up to 2" L, and mild H2S-like odor.	Transmonal Contact	6
7	he RE	TEC Gro	oup,	inc. /ay, Suit	202	Remar	ks:	Drive Notes: easy (6.9'), moderate (7.6'), hard (9.6'),	Calcula	ted Recovery
5	Seattle,	, WA 98	134-	1162		refusal	l (9.	6'). One drive attempt made at station. Core		/Penetration Length:
		(206) 62 (26) 624-7			- 1			as intact and 83% full.	8.7 /	9.6 = 91 %

				Sediment Core Lo	og	Sheet 2 of 2
Project: LDW RI	/FS			Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	16.1
Project #: PORS	5-18220	-511		Water Elevation (ft)/Tide: 2.8	Penetration Depth	(ft): 9.6
Client: LDWG				Water Depth (ft): 13.7	Sample Quality: 6	ood
Collection Date:	2/16/06			Mudline Elevation (ft): -7,5	Recovery in ft (%):	8.7 (91)
Contractor: MCS	Enviror	mental,	Inc.	N./LAT: 208217 E./LONG: 1266577	Process Date: 2/1	6/06
Vessel: MCS ba	rge			Horiz. Datum: NAD 83 N Vert. Datum: MLLW	Process Method:	Cut tube
Operator: Gary	Maxwell			Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: L.Mc	Kee
Recovered Depth (ft) Recov.Interval & Sample	% Recovery (interval)	Chemical Analysis	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log
7 LDW-SC12-6,7-8.7>	83% (7-8) 70% (8-9)	PCB Hg	0	SP-SC: (6.9-9.6) moist, medium stiff, very dark greenish gray (GLEY 1, 3/1) SAND with clasts and layers of olive gray SILT up to 1/2" L. Sand grains are multicolored; silt is moist, slightly compressible, and rolls easily. Pockets of subrounded 1/2" peat at 8.0' to basal contact. End of core at 8.7'. Driven to refusal.	Sharp Contact @ 7.0' TV = 0.7 kg/cm2 @ 8.2' TV = 0.8 kg/cm2	Compared to the control of the con
-9	80% (9-9.6)			Note: Chemistry interval recorded as 6.7-8.7 ft but was collected at top of sand at 6.6 ft. Graphic expresses depth of sample collection; sample name matches project nomenclature.		

Remarks: Drive Notes: easy (6.9'), moderate (7.6'), hard (9.6'),

refusal (9.6'). One drive attempt made at station. Core

catcher was intact and 83% full.

Calculated Recovery

Sample Length/Penetration Length:

8.7 / 9.6 = 91 %

	RETE	Sediment Core Lo	Sheet 1 of 2
F	Project: LDW RI/FS	Water Body Type: Lower Duwamish Waterway	Tube Length (ft): 16.1
3	Project #: PORS5-18220-511	Water Elevation (ft)/Tide: 4.8	Penetration Depth (ft): 12.5
(Client: LDWG	Water Depth (ft): 16.5	Sample Quality: Good
4	Collection Date: 2/13/06	Mudline Elevation (ft): -10.7	Recovery in ft (%): 9.9 (79)
4	Contractor: MCS Environmental, Inc	. N./LAT: 207096 E./LONG: 1267585	Process Date: 2/13/06
L	Vessel: MCS barge	Horiz. Datum: NAD 83 N Vert. Datum: MLLW	Process Method: Cut tube
(Operator: Gary Maxwell	Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: N. Bacher, A. Fitzpatrick
	Recovered Depth (ft) Recov.Interval & Sample % Recovery (interval) Chemical Analysis	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments In-situ for Recovered Depth (ft) Depths & Graphic Log
	-1	SW: (0.0-0.2) wet, loose, greenish black (GLEY 1, 2.5/10GY) medium to coarse SAND, trace silt and gravel. Scattered shell fragments. SM: (0.2-1.3) moist, medium dense, very dark greenish gray (GLEY 1, 3/1) SAND, little silt, and moderate wood, twigs, and rootlets. Moderate to strong H2S-like odor.	Sharp Contact GT @ 0.9' @ 1.0' TV = 0.3 kg/cm2
┦ ╍╋╍╇╍╇╍╇╍╇╍╋╍╋╍╋╸╋╸╋	-2 Hg	OL: (1.3-3.1) moist, medium stiff, very dark greenish grey (GLEY 1, 3/1) ORGANIC SILT, few sand and moderate wood, twigs, and rootlets. Trace H2S-like odor and very slight HC-like odor from 2.5' to 3.0'.	@ 2.4'TV = 0.4 kg/cm2
	-3 LDW-SC SVOC Metals Hg	SM: (3.1-5.9) moist, medium dense, very dark greenish gray (GLEY 1, 3/1) fine to medium SAND, trace silt. SAND grains are multicolored (orange, red, white). Scattered thin silt layers/pockets, and rootlets. From 4.1' to 4.5', a layer of SILTY SAND with substantial wood fragments and slight H2S-like odor.	Sharp Contact
	-5	SP- SM: (5.9-12.5) moist, medium dense, very dark grayish brown (10YR, 3/2) fine SAND interbedded with 1" to 2" thick, moist, medium stiff, very dark greenish gray SILT, few sand. Sand grains are multicolored (orange, red, white). Trace scattered rootlets. @ 5.5' to 6.0' layer of shredded wood with fibrous, peaty material, and slight H2S-like odor	@ 4.9' TV = 0.4 kg/cm2 Transitional Contact 6
T		arks: Drive Notes: easy (5.2'), moderate (10.4'), hard (12.5"	
1	011 SW Klickitat Way, Suite 207		Calculated necovery
P	Phone: (206) 624-9349	tration goal reached. One drive attempt made at station.	Sample Length/Penetration Length:
1	Fax: (206) 624-2839 Core	catcher was intact.	9.9 / 12.5 = 79 %

1			Sediment Core Low-sc-13 (R1)	og	Sheet 2 of 2
Project: LDW RI/FS			Water Body Type: Lower Duwamish Waterway	Tube Length (ft): 1	6.1
Project #: PORS5-			Water Elevation (ft)/Tide: 4.8	Penetration Depth	(ft): 12.5
Client: LDWG			Water Depth (ft): 16.5	Sample Quality: G	ood
Collection Date: 2/1	13/06		Mudline Elevation (ft): -10.7	Recovery in ft (%):	9.9 (79)
Contractor: MCS Er	nvironmental, I	nc.	N./LAT: 207096 E./LONG: 1267585	Process Date: 2/13	3/06
Vessel: MCS barge	e		Horiz. Datum: NAD 83 N Vert. Datum: MLLW	Process Method: (Cut tube
Operator: Gary Ma	ixwell		Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: N. Ba	cher, A. Fitzpatrick
Recovered Depth (ft) Recov.interval & Sample	% Hecovery (interval) Chemical Analysis	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log
-9	75% (7-9) 82% (9-10) 80% 10-11)	0	End of core at 9.9'.	@ 8.5' TV = 0.7 kg/cm2 Core slightly winnowed from 9.5-9.9'	

The RETEC Group, inc.
1011 SW Klickitat Way, Suite 207
Seattle, WA 98134-1162
Phone: (206) 624-2839

Remarks: Drive Notes: easy (5.2'), moderate (10.4'), hard (12.5'),
penetration goal reached. One drive attempt made at station.

Core catcher was intact.

				- 2			Sediment Core Lo	og	Sheet 1 of 2		
	Project: LDW RI/FS W						Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	16.1		
	Proj	ect#: P	ORS	5-18220	D-511		Water Elevation (ft)/Tide: 6.7	Penetration Depth	Penetration Depth (ft): 12.6		
	Clie	nt: LDV	/G	_	_		Water Depth (ft): 46.0	Sample Quality: G	good	_	
	Colle	ection D	ate:	2/13/06			Mudline Elevation (ft): -36.8	Recovery in ft (%):	11.6 (92)	_	
	Con	tractor:	MCS	Enviro	nmental,	, Inc.	N./LAT: 207055 E./LONG: 1267397	Process Date: 2/1:	3/06	_	
	Ves	sel: MC	S ba	rge			Horiz. Datum: NAD 83 N Vert. Datum: MLLW	Process Method:	Cut tube	_	
ļ	Ope		ary l	Maxwell	l	1	Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: N. Ba	cher	_	
	ند	Depth (ft) Recov.Interval	& Sample	% Recovery (interval)	Chemical Analysis	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log		
			$\left. \left\langle \text{LDW-SC14-0-1.4} \rightarrow \right \text{ 1.4-2.0} \right \left\langle \text{LDW-SC14-2-4.1} \rightarrow \right \left\langle \text{LDW-SC14-4.1-6} \rightarrow \right$	100% (0-2) 100% (2-2.4) 100% (2.4-4)	PCB SVOC Metals Hg Pesticide TBT PCB SVOC Metals Hg Pesticide TBT PCB SVOC Metals Hg Pesticide TBT	0	SM: (0.0-0.3) wet, loose, dark greenish gray (GLEY 1, 4/10Y) SAND, few silt. Scattered shell fragments and intact shells. OL: (0.3-3.7) wet, medium soft, black (GLEY 1, 2.5/N) ORGANIC SILT. Grades to more competent with a blocky texture with depth. Trace organics, twigs, rootlets, wood fragments, 1/16" sheen florets, and very trace HC-like odor. @ 0.5' 1" thick lens of moist, medium dense, brown fine SAND @ 1.4' color changes to mottled, grayish black, trace sheen noted below this depth ML: (3.7-4.1) moist, soft, dark gray (2.5Y, 4/1) SILT, little clay. Trace horizontal black mottling. ML: (4.1-8.7) moist, medium stiff, black (GLEY 1, 2.5N) SILT with scattered 1/2" brown sand pockets and discontinuous mottled gray silt lenses to 8.0'. Silt has blocky texture. Scattered organics, twigs, rootlets, and wood fibers. Trace 1/16" sheen florets and very trace HC-like odor to 6.0'.	@ 0.6' TV = 0.1 kg/cm2 GT @ 1.0' GT @ 3.0' @ 3.4' TV = 0.3 kg/cm2 Transitional Contact Transitional Contact	recent 2 2 3 4 4 5 5		
		RETEC G			 	emarks:	Drive Notes: freefall (1.8'), easy (9.0'), moderate (12.7	").		7	
	1011		citat V	Vay, Suit	te 207		on goal reached. One drive attempt made at station.	Calcula	ated Recovery n/Penetration Length		
	Phon	e: (206) (24-9	349	 		her was intact.		/12.6 = 92 %		
Fax: (206) 624-2839 Core cato					-	ore cale	THE THE STREET		12.0 = 92 76		

			Sediment Core Lo	og	Sheet 2 of 2
Project: LDW RI/FS			Water Body Type: Lower Duwamish Waterway	Tube Length (ft): 1	6.1
Project #: PORS5-1822	0-511		Water Elevation (ft)/Tide: 6.7	Penetration Depth (ft): 12.6
Client: LDWG			Water Depth (ft): 46.0	Sample Quality: Go	ood
Collection Date: 2/13/06			Mudline Elevation (ft): -36.8	Recovery in ft (%):	11.6 (92)
Contractor: MCS Enviro	nmental, l	nc.	N./LAT: 207055 E./LONG: 1267397	Process Date: 2/13	/06
Vessel: MCS barge			Horiz, Datum: NAD 83 N Vert. Datum: MLLW	Process Method: C	ut tube
Operator: Gary Maxwe	ı		Method/Tube iD: Diver Impact Core/4" sq Al	Logged By: N. Bac	her
Recovered Depth (ft) Recov.Interval & Sample % Recovery (interval)	Chemical Analysis	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log
-7 DW-SC14-6-8.7 - DW-SC	PCB Hg	0	© 7.0' 1.5" thick layer of grayish brown SILT, few sand © 7.7' 1" thick layer of brown fine SAND SP- SM: (8.7-9.5) moist, [medium dense], very dark grayish brown (2.5Y, 3/2) fine SAND interbedded with grayish olive SILT, few clay. Color is mottled. Trace organics, rootlets, and wood fragments up to 4" L (transitional unit).	@ 7.0' TV = 0.7 kg/cm2	8 9-
-10 LDW-SC14-8. 74% (9-11) -10 -11 67% (11-12.6	PCB Hg		SP: (9.5-12.6) moist, medium dense, very dark grayish brown (2.5Y, 3/2) fine SAND, trace silt. Sand grains are multicolored (orange, red, white) and grade to medium at 11.0'. Scattered organics, twigs, and rootlets. End of core at 11.6'. Note: Chemistry interval recorded as 8.7 ft but samples were collected above and below lithology transition at 8.6 ft. Graphic expresses depth of	Slight winnowing in sand below 10.3' @ 11.0' TV = 0.4 kg/cm2	lower alliuvium

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Remarks: Drive Notes: freefall (1.8'), easy (9.0'), moderate (12.7'),
penetration goal reached. One drive attempt made at station.

Core catcher was intact.

Core catcher was intact.

Calculated Recovery
Sample Length/Penetration Length:
11.6/12.6 = 92 %

A RETECTION							903s	Sediment Core Lo				
Project: LDW RI/FS								Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	16.1		
	Project	#: P	ORS	5-18220)-511			Water Elevation (ft)/Tide: 6.6	Penetration Depth	etration Depth (ft): 12.7		
	Client:	LDW	G					Water Depth (ft): 37.8	Sample Quality: Good			
	Collecti	ion D	ate: 2	2/16/06				Mudline Elevation (ft): -27.9	Recovery in ft (%):	10.1 (80)		
	Contrac	ctor: I	vics	Enviror	nment	al, Inc.		N./LAT: 206821 E./LONG: 1267821	Process Date: 2/17	7/06		
	Vessel:	МС	S bar	rge				Horiz. Datum: NAD 83 N Vert. Datum: MLLW	Process Method:	Cut tube		
	Operati	or: G	ary N	/laxwell		,		Method/Tube ID: Diver Impact Core/4" sq AI	Logged By: L.McI	Kee		
	Recovered Depth (ft)	Recov.Interval	& Sample	% Recovery (interval)	Chemical	PID	Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log		
	—0 · · · · · · · · · · · · · · · · · · ·		LDW-SC15-0-1 LDW	80% (0-1)	PCB SVOC Metals Hg TBT PCB SVOC	•	0	ML: (0.0-0.4) wet, very soft, olive brown (2.5Y, 4/3) SILT, few sand. OL: (0.4-2.0) moist to wet, (medium stiff), black (2.5Y, 2.5/1) ORGANIC SILT. Silt texture is uniform, slightly compressible, massive, and blocky. Scattered rootlets, wood fragments up to 0.4' L, and worms and worm tubes in top 0.8'.	Transitional Contact GT @ 0.9' Sheen Test @ 1.0': no sheen	O Trecent		
1			LDW-SC15-1-2		Metals Hg TBT		0	@ 1.2' to 2.0' trace HC-like florets up to 1/2" L	@ 1.5' TV = 0.3 kg/cm2			
	3		LDW-SC15-2-4	100% (1-3) 86% (3-5)	PCB SVOC Metals Hg TBT	•	0	OL: (2.0-8.2) moist, medium stiff, black (2.5Y, 2.5/1) ORGANIC SILT interbedded with 0.1' thick pockets and 0.5' thick layers of mottled, dark greenish gray (GLEY 1, 4/10Y) SILT, little clay and scattered wood fragments. Interbedded silt texture is uniform, slightly compressible, and rolls easily. Scattered 1/2" L sheen florets from 2.0' to 6.7'.	Transitional Contact @ 2.5' TV = 0.5 kg/cm2 GT @ 2.9'			
	—4 —5 —6		\rightarrow $\left\langle$	57% (5-7)	PCB	•	000	@ 5.1' 6" L wood fragment	Sheen Test @ 4.0': no sheen @ 4.7' TV = 0.1 kg/cm2	upper alluvium		
	The RET				e 207	Rema	rks:	Drive Notes: freefall (1.0'), moderate (7.0'), hard (12.7	'), Calcula	ted Recovery		
	Seattle, \	NA 9	8134-	1162	6 201	refusa	al (12	.7'). One drive attempt made at station.		/Penetration Length:		
	Phone: (206)					Core	catch	ner was intact but slightly winnowed.		12.7 = 80 %		
,,												

				Sediment Core Lo	og	Sheet 2 of 2
Project: LDW R	/FS			Water Body Type: Lower Duwamish Waterway	Tube Length (ft): 1	6.1
Project #: PORS	55-18220	-511		Water Elevation (ft)/Tide: 6.6	Penetration Depth	(ft): 12.7
Client: LDWG				Water Depth (ft): 37.8	Sample Quality: G	ood
Collection Date:	2/16/06			Mudline Elevation (ft): -27.9	Recovery in ft (%):	10.1 (80)
Contractor: MCS	Enviror	mental,	Inc.	N./LAT: 206821 E./LONG: 1267821	Process Date: 2/17	//06
Vessel: MCS ba	ırge			Horiz, Datum: NAD 83 N Vert. Datum: MLLW	Process Method: (Cut tube
Operator: Gary	Maxwell			Method/Tube ID: Diver Impact Core/4" sq AI	Logged By: L.McK	(ee
Recovered Depth (ft) Recov.Interval & Sample	% Recovery (interval)	Chemical	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log
SC15-8-8 \\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	87% (7-8) 80% (8-9) 70% (9-10)	РСВ	0	SM: (8.2-8.7) Alternating 1" thick layers of very fine SAND and SILT, little clay (transitional unit). SP: (8.7-12.7) moist, medium dense, very dark greenish gray SAND with convex layers. SAND is multicolored (orange, red, white) and coarsens downward. @ 9.7' 1/2", subrounded, green-gray SILT pockets (xenoclasts) End of core at 10.1'. Driven to refusal.	Transitional Contact @ 7.0' TV = 0.8 kg/cm2 Sharp Contact @ 8.8' TV = 0.8 kg/cm2	9- lower alluvius 11
-11	60% (10-12) 73% (12-12.7)					alluvium 11-

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Remarks: Drive Notes: freefall (1.0'), moderate (7.0'), hard (12.7'),
refusal (12.7'). One drive attempt made at station.
Core catcher was intact but slightly winnowed.

A RETEC						Sediment Core Lo	g	Sheet 1 of 2	
Project: LDW RI/FS						Water Body Type: Lower Duwamish Waterway	Tube Length (ft): 16.1		
Ī	Project #:	PORS	5-18220	-511		Water Elevation (ft)/Tide: 8.3	Penetration Depth	(ft): 13.5	
Ì	Client: LD	WG				Water Depth (ft): 32.3	Sample Quality: G	ood	
	Collection	Date:	2/13/06			Mudline Elevation (ft): -24.6	Recovery in ft (%):	10.8 (80)	
Ī	Contractor	MCS	Enviror	menta	al, Inc.	N./LAT: 206669 E./LONG: 1267959	Process Date: 2/14	1/06	
ĺ	Vessel: M	CS ba	rge			Horiz. Datum: NAD 83 N Vert. Datum: MLLW	Process Method: 0	Cut tube	
	Operator:	Gary l	Maxwell			Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: N. Ba	cher, L.McKee	
	Recovered Depth (ft)	& Sample	% Recovery (interval)	Chemical	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log	
<u></u>		LDW-SC16-0-2	76% (0-1)	PCB SVOC Metals Hg	0	ML: (0.0-0.3) wet, very soft, olive gray, SILT, few sand and trace shell fragments. MH: (0.3-2.2) moist to wet, medium soft, black (GLEY 1, 2.5/N) SILT. Scattered twigs, rootlets, and worm tubes from 0.8' to 2.0'. © 0.5' 3/4" piece of thin, white plastic (garbage bag) © 1.3' to 2.0' trace 1/16" sheen florets	Transitional Contact GT @ 0.8'	o - i - i - i - i - i - i - i - i - i -	
		→	100% (1-4)			MH: (2.2-3.2) moist, soft, dark greenish gray (GLEY 2, 4/10G) SILT, little clay. Scattered horizontal, thin, black seams of SILT, little clay.	Sharp Contact GT @ 2.5'		
	4	016-2-4>	100% (4-6)	PCB SVOC Metals Hg	0	ML: (3.2-7.4) moist, medium stiff, black (GLEY 1 2.5/N) SILT, few clay. Trace gravel from 3.3' to 3.4'. Grading to silt below 4.0'. Silt texture is blocky. Scattered wood fragments, twigs, and rootlets. Slightly mottled SILT, few clay and 1/4" to 1/2" silt inclusions from 5.0' to basal contact. @ 4.0' to 7.4' trace HC-like odor and sheen	Sharp Contact @ 3.b' TV = 1.5 kg/cm2		
	—5	LDW-SC16-4-6>		PCB SVOC Metals Hg	0		@ 5.0' TV = 0.8 kg/cm2	upper alluvium —	
	The RETEC			e 207	Remarks	: Drive Notes: freefall (3.8'), easy (8.1'), easy to moder	ate, Calcula	ated Recovery	
	Seattle, WA Phone: (206	98134	-1162		(13.5'), pe	enetration goal reached. One drive attempt made at	Sample Length	n/Penetration Length:	
	Fax: (206) 6				station.	Core catcher was intact and 100% full with a silty plug.	10.8	13.5 = 80 %	

A RETEC						Sediment Core Lo	og	Sheet 2 of 2		
Ī	Project:	LDW R	I/FS			Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	ube Length (ft): 16.1		
Ī	Project	#: POR	S5-18220)-511		Water Elevation (ft)/Tide: 8.3	Penetration Depth	(ft): 13.5		
-	Client:	LDWG				Water Depth (ft): 32.3	Sample Quality: G	ood		
ľ	Collecti	on Date:	2/13/06			Mudline Elevation (ft): -24.6	Recovery in ft (%):	10.8 (80)		
	Contrac	tor: MCS	S Enviror	nmental,	Inc.	N./LAT: 206669 E./LONG: 1267959	Process Date: 2/14	1/06		
	Vessel:	MCS ba	arge			Horiz, Datum: NAD 83 N Vert, Datum: MLLW	Process Method: (Cut tube		
	Operato	or: Gary	Maxwell			Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: N. Ba	cher, L.McKee		
	Recovered Depth (ft)	Recov.Interval & Sample	% Recovery (interval)	Chemical Analysis	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log		
┙┎╏┙╬╬╏┩┩┩╇╇╬╇╇╇╇╇╇╇╇╇╇╇╇╇╇╇╇╇╇╇╇╇╇╇╇╇╇╇╇╇	7 8 10	SC16-6-8	85% (8-10)	PCB SVOC Metals Hg	0	SP-SC: (7.4-13.5) moist, medium dense, very dark gray (10YR, 3,1) fine SAND mottled with pockets of SILT, few sand. Sand grains are multicolored (orange, red, white) and coarsen with depth. Scattered wood fragments. @ 8.5' medium SAND with moderate wood fragments @ 9.5' Unit grades to alternating 1/8" to 1/4" thick interbeds of very dark gray fine SAND and gray SILT. End of core at 10.8'.	Sharp Contact © 9.0' TV = 0.8 kg/cm2	ower alluvium	8	
	-13							0	13—	

Remarks: Drive Notes: freefall (3.8'), easy (8.1'), easy to moderate, (13.5'), penetration goal reached. One drive attempt made at

station. Core catcher was intact and 100% full with a silty plug.

Calculated Recovery

Sample Length/Penetration Length:

10.8/13.5 = 80 %

	RET		Sediment Core Lo				
	Project: LDW RI/FS		Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	14.0	_	
	Project #: PORS5-18220-511		Water Elevation (ft)/Tide: NA	Penetration Depth	(ft): 13.0		
	Client: LDWG		Water Depth (ft): 20.0	Sample Quality: G	Good		
	Collection Date: 2/23/06		Mudline Elevation (ft): -15.1	Recovery in ft (%):	8.6 (66)		
	Contractor: MSS		N./LAT: 47 33.3761 E./LONG: 122 20.3911	Process Date: 2/24	4/06		
	Vessel: R/V Nancy Anne		Horiz, Datum: NAD 83 N Vert. Datum: MLLW	Process Method: 0	Cut tube		
	Operator: Bill Jaworski	_	Method/Tube ID: Vibracorer/3.5" round Al	Logged By: L.Mcl	Kee, C.Brackett	_	
	Recovered Depth (ft) Recov.Interval & Sample % Recovery (interval) Chemical Analysis	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log		
	LDW-SC17-0-1 LDW-SC17-1-2 C	0	ML: (0.0-0.9) wet, soft, olive brown (2.5Y, 4/3) SILT, little sand. OL: (0.9-12.3) damp to wet, medium stiff, black (2.5Y, 2.5/1) ORGANIC SILT, few sand and scattered layers of moist, medium stiff, dark grayish brown (2.5Y, 4/2) ORGANIC SILT, little clay. Silt texture is uniform, slightly compressible, massive, blocky, and of low plasticity. Trace pockets of peat and subrounded gravel with HC-like odor. Scattered shell fragments, rootlets, layers of wood and abundant debris with HC-like odor. ② 1.4' to 1.8' A layer of shell fragments, rootlets, and wood fragments up to 1" L, with a 2" piece of red, crumbly conglomerate, slight HC-like odor and rainbow sheen. ② 2.4' A 0.2' thick layer of shell fragments, rootlets, and wood fragments up to 1" L, 1-1/4" x 1/8" anthropogenic conglomerate with strong HC-like odor and sheen, 7" piece of plastic (tape), and a piece of subrounded multicolored glass 1/2" L. ② 3.2' to 4.5' A 2" piece of foliated red chip (possibly paint), 0.6' piece of plastic (tape), and wood fragment 0.5 x 0.2'. Slight to strong HC-like odor, rainbow streaks and florets up to 1/4" in diameter.	Winnowing @ 0.2' (70%) Transitional Contact @ 0.9' TV = 0.02 kg/cm2 GT @ 1.2' @ 1.8' TV = 0.1 kg/cm2 GT @ 2.3' Bag @ 2.6' (1/2" subrounded glass) Bag @ 3.2' (2" foliated red chip)		0 1 2 3 4 4 7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
1	The RETEC Group inc	Domonto:	Drive Notes freefall (7.01)			\neg^{T}	
	1011 SW Klickitat Way, Suite 207		Drive Notes: freefall (7.0'), moderate (10.0'), easy to		ted Recovery		
	Phone: (206) 624-9349 -		(14.0'), penetration goal reached. Five drive attempts		/Penetration Lengtl	n:	
	-		tation. Station re-occupied with vibracore. Rainbow s		13.0 = 66 %		
		and strong	g HC-like odor on sidewalls from 2.0' to 6.0'. ua = upp	er alluvium			

43-RETEC						Sediment Core Lo	og	Sheet 2 of 2
P	roiect:	LDW RI	/FS			Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	14.0
		#: PORS)-511		Water Elevation (ft)/Tide: NA	Penetration Depth	(ft): 13.0
С	lient:	LDWG				Water Depth (ft): 20.0	Sample Quality: G	ood
С	ollecti	on Date:	2/23/06			Mudline Elevation (ft): -15.1	Recovery in ft (%):	8.6 (66)
С	ontrac	ctor: MSS	_			N./LAT: 47 33.3761 E./LONG: 122 20.3911	Process Date: 2/24	1/06
٧	essel:	R/V Nar	ncy Ann	e		Horiz, Datum; NAD 83 N Vert, Datum; MLLW	Process Method: (Cut tube
С	perato	or: Bill Ja	aworski			Method/Tube ID: Vibracorer/3.5" round Ai	Logged By: L.Mcl	Kee, C.Brackett
Becovered	Depth (ft)	Recov.interval & Sample	% Recovery (interval)	Chemical	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log
	7 9 10 111	DW-SC17-6-8.2		PCB SVOC Metals Hg		@ 7.0' to 8.1' Wood fragments, 1 piece of 0.1' L subrounded gravel, 1" peat pocket, and foliated red chips (possibly paint) with slight to moderate HC-like odor. SM: (12.3-13.0) damp, medium dense, dark gray (GLEY 1, 3/N) fine SAND and layers of black SILT. SAND grains are multicolored (orange, red, white). SILT has slight HC-like odor. Trace debris at basal contact (foliated red chips; transitional unit). End of core @ 8.6'. Note: Chemistry interval recorded as 8.2 ft but sample was collected to the bottom of the core at 8.6 ft. Graphic expresses depth of sample collection; sample name matches project nomenclature.	Transitional Contact	9

Remarks: Drive Notes: freefall (7.0'), moderate (10.0'), easy to

Calculated Recovery

moderate (14.0'), penetration goal reached. Five drive attempts

Sample Length/Penetration Length:

made at station. Station re-occupied with vibracore. Rainbow sheen

8.6 / 13.0 = 66 %

and strong HC-like odor on sidewalls from 2.0' to 6.0'. ua = upper alluvium

	1 RETEC	Sediment Core Log LDW-SC-18 (R1)					
Ì	Project: LDW RI/FS	Water Body Type: Lower Duwamish Waterway	Tube Length (ft): 16.1				
	Project #: PORS5-18220-511	Water Elevation (ft)/Tide: 4.6	Penetration Depth (ft): 11.8				
	Client: LDWG	Water Depth (ft): 27.6	Sample Quality: Good				
	Collection Date: 2/16/06	Mudline Elevation (ft): -19.4	Recovery in ft (%): 10.7 (91)				
	Contractor: MCS Environmental, Inc.	N./LAT: 206336 E./LONG: 1267929	Process Date: 2/17/06				
	Vessel: MCS barge	Horiz. Datum: NAD 83 N Vert. Datum: MLLW	Process Method: Cut tube				
	Operator: Gary Maxwell	Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: L.McKee				
	Recovered Depth (ft) Recov.Interval & Sample % Recovery (interval) Chemical Analysis PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths In-situ Depth (ft) & Graphic Log				
	0	ML: (0.0-0.1) wet, soft, olive brown (2.5Y, 4/3) SILT, few sand. SP- SM: (0.1-3.8) damp to moist, [medium dense], black (2.5Y, 2.5/1) fine SAND interbedded with distinct layers of moist, soft, dark greenish gray (GLEY 1, 4/10Y) SILT up to 0.2' thick. SAND grains are well sorted and multicolored (orange, red, white). Scattered trace debris (glass). @ 0.8' glass shard 0.2' L	Sharp Contact Bag @ 0.8' (glass shard) GT @ 1.2'				
	2	@ 1.5' subangular rock 0.3' L	GT @ 3.2' Transitional Contact				
	LDW-SC 18-4 (4-7)	ML: (3.8-6.2) damp, soft, dark greenish gray (GLEY 1, 4/10Y) SILT, few sand interbedded with 0.05' thick layers of damp, medium dense, black (2.5Y, 2.5/1) very fine to fine SAND. SILT texture is slightly compressible and of low plasticity.	4-1				
	(4-7)	@ 5.5' scattered shell fragments SP- SM: (6.2-9.6) wet, medium dense, black (2.5Y,	Transitional Contact				
	6 LDW.	2.5/1) very fine SAND alternating with layers of dark greenish gray (GLEY 1, 4/10Y) SILT, little clay.	6-				
	The RETEC Group, Inc.	: Drive Notes: freefall (0.8'), moderate (9.8'), moderate	to Calculated Recovery				
1	1011 SW Klickitat Way, Suite 207 Seattle, WA 98134-1162 hard (10.	3'), hard (11.8'), refusal (11.8'). One drive attempt made					
	Phone: (206) 624-9349	. Core catcher was intact and 100% full. No	10.7/11.8 = 91 %				
	' '	ne measurements recorded. r = recent					

		7		78		Sediment Core Lo	og	Sheet 2 of 2
Pi	roject:	LDW RI/	FS			Water Body Type: Lower Duwamish Waterway	Tube Length (ft): 1	6.1
Р	roject	#: PORS	5-18220	-511		Water Elevation (ft)/Tide: 4.6	Penetration Depth	(ft): 11.8
С	lient: I	LDWG				Water Depth (ft): 27.6	Sample Quality: G	ood
C	ollection	on Date:	2/16/06			Mudline Elevation (ft): -19.4	Recovery in ft (%):	10.7 (91)
С	ontrac	tor: MCS	Environ	mental,	Inc.	N./LAT: 206336 E./LONG: 1267929	Process Date: 2/17	//06
٧	essel:	MCS ba	rge			Horiz. Datum: NAD 83 N Vert. Datum: MLLW	Process Method: (Cut tube
0	perato	r: Gary l	vaxwell			Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: L.Mck	(ee
Becovered	Depth (ft)	Recov.Interval & Sample	% Recovery (interval)	Chemical Analysis	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log
	7	SC18-6-8	91% (9-10) 90% (10-11) 60% (11-11.8)		0	© 8.6' 1" thick layer of wood fragments up to 3/4" L SP- SM: (9.6-11.8) moist, dense, black (2.5Y, 2.5/1) fine SAND, few silt and layers of dark greenish gray (GLEY 1, 4/10Y) SILT, few sand. Layers alternate every 0.1', are tightly spaced, and are convex in shape from 9.9' to 10.7'. End of core at 10.7'. Driven to refusal.		10

Remarks: Drive Notes: freefall (0.8'), moderate (9.8'), moderate to hard (10.8'), hard (11.8'), refusal (11.8'). One drive attempt made

at station. Core catcher was intact and 100% full. No

torvane measurements recorded. r = recent

Calculated Recovery Sample Length/Penetration Length:

10.7/11.8 = 91 %

di			\				Sediment Core Lo	og	Sheet 1 of 2
Pro	ject:	LD	N RI/	FS			Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	14.0
Pro	ject #	#: P	ors	5-18220	-511		Water Elevation (ft)/Tide: NA	Penetration Depth	(ft): 13.0
Clie	ent: L	_DW	/G				Water Depth (ft): 34.6	Sample Quality: G	ood
Col	llectio	on D	ate: 2	2/24/06			Mudfine Elevation (ft): -25.3	Recovery in ft (%):	11.9 (92)
Cor	ntrac	tor:	MSS				N./LAT: 47 33.3172 E./LONG: 122 20.7486	Process Date: 2/24	1/06
Ves	ssel:	R/V	Nan	cy Anne	e		Horiz, Datum: NAD 83 N Vert. Datum: MLLW	Process Method: (Cut tube
Opi	erato	r: B	ill Ja	worski			Method/Tube ID: Vibracorer/3.5" round Alum	Logged By: L.Mcl	Kee, C.Brackett
Recovered	Depth (ft)	Recov.Interval	& Sample	% Recovery (interval)	Chemical	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log
2			LDW-SC19-0-1 LDW-SC19-1-2 < LDW-SC19-2-4		PCB SVOC Metals Hg Dioxins Furans PCB SVOC Metals Hg Dioxins Furans PCB	0	OL: (0.0-7.5') moist to damp, medium stiff, black (2.5Y, 2.5/1) ORGANIC SILT, few sand with mottled olive-brown ORGANIC SILT, little clay. SILT texture is slightly compressible and of low plasticity. Scattered wood fragments up to 3" L, rootlets and shell fragments, trace worms and worm tubes in top 0.7', and slight H2S-like odor. @ 1.9' rainbow sheen florets up to 1/4" and wood fragments up to 1" L	@ 0.9' TV = 0.1 kg/cm2 GT @ 2.2' @ 2.6' TV = 0.2 kg/cm2 GT @ 3.1' @ 3.7' TV = 0.2 kg/cm2	0
			∥ ∻ ∣ roup,				: Drive Notes: freefall (6.0'), moderate (6.5'), easy (13.	D'), Galarria	tod Boons:
1011	SW	Klic		Vay, Suite	e 207		on goal reached. Five drive attempts made at station.	Calcula	ted Recovery /Penetration Length:
Phor	ne: (2	06) (324-93	349		-	<u> </u>		-
rax:	(206)	024	-2839				e-occupied with vibracore. Core catcher was intact		13.0 = 92 %
						intact but	empty. Rainbow sheen on sidewalls from 0.8' to 7.0'.		

	Ki (3				Sediment Core Lo	og	Sheet 2 of 2
	Project:	LDW Ri	FS			Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	14.0
	Project	#: PORS	5-18220	-511		Water Elevation (ft)/Tide: NA	Penetration Depth	(ft): 13.0
Ì	Client: I	LDWG				Water Depth (ft): 34.6	Sample Quality: G	ood
	Collection	on Date:	2/24/06			Mudline Elevation (ft): -25.3	Recovery in ft (%):	11.9 (92)
	Contrac	tor: MSS				N./LAT: 47 33.3172 E./LONG: 122 20.7486	Process Date: 2/24	1/06
	Vessel:	R/V Nar	cy Anne	-		Horiz, Datum: NAD 83 N Vert. Datum: MLLW	Process Method: 6	Cut tube
	Operato	or: Bill Ja	worski			Method/Tube ID: Vibracorer/3.5" round Alum	Logged By: L.Mcl	Kee, C.Brackett
	Recovered Depth (ft)	Recov.Interval & Sample	% Recovery (interval)	Chemical Analysis	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log
	—7 —8 ——9 ——10 ——11 ——12	← LDW-SC19-7-9 → ← LDW-SC19-9-11.9 → →		PCB	0	SW: (7.5-8.1) [wet, dense] black (2.5Y, 2.5/1) SAND, little gravel. Gravel is subrounded to subangular up to 1" diameter. Slight H2S-like odor. ML: (8.1-9.2) [moist to damp, medium stiff,] black (2.5Y, 2.5/1) SILT interbedded with gray-brown very fine SAND. / ML: (9.2-9.7) [damp, medium stiff,] very dark greenish gray (GLEY 1, 3/1) SILT, little clay and 1/2" diameter peat pocket. Silt texture is slightly compressible and of low plasticity. SW: (9.7-13.0) moist, medium dense, medium grading to fine SAND, little gravel. Sand grains are multicolored (orange, red, white). Gravel is subrounded up to 1/4" in diameter.	Transitional Contact Transitional Contact Sharp Contact	7—————————————————————————————————————

Remarks: <u>Drive Notes: freefall (6.0'), moderate (6.5'), easy (13.0'), penetration goal reached.</u> Five drive attempts made at station.

Station re-occupied with vibracore. Core catcher was intact

intact but empty. Rainbow sheen on sidewalls from 0.8' to 7.0'.

Calculated Recovery
Sample Length/Penetration Length:

11.9/13.0 = 92 %

					Sediment Core Lo	g	Sheet 1 of 2	
Project: LD	W RI	FS			Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	16.1	_
Project #: I	PORS	5-18220)-511		Water Elevation (ft)/Tide: 7.4	Penetration Depth	(ft): 12.6	
Client: LDV	NG				Water Depth (ft): 43.5	Sample Quality: G	lood	
Collection [Date: :	2/15/06			Mudline Elevation (ft): -33.9	Recovery in ft (%):	10.0 (79)	
Contractor:	MCS	Enviro	nmental	, Inc.	N./LAT: 206177 E./LONG: 1267735	Process Date: 2/1	5/06	_
Vessel: MC	CS ba	rge			Horiz. Datum: NAD 83 N Vert. Datum: MLLW	Process Method:	Cut tube	_
Operator: (Gary I	Maxwell	l		Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: L.McI	Kee	
Recovered Depth (ft) Recov.Interval	& Sample	% Recovery (interval)	Chemical Analysis	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log	
	← LDW-SC20-0-2 →	100% (0-4)	PCB SVOC Metals Hg Pesticide TBT Dioxins/ Furans		ML: (0.0-0.1) moist, soft, olive brown (2.5Y, 4/3) SILT, few sand. OL: (0.1-2.1) moist, [medium stiff], black (2.5Y, 2.5/1) ORGANIC SILT with trace subrounded gravel up to 0.6" diameter. Scattered rootlets, leaf and wood fragments up to 2" L. Slight HC-like sheen and moderate HC-like odor.	Transitional Contact GT @ 0.9' @ 1.1' TV = 0.2 kg/cm2		
-2	C LDW-SC20-2-4 C LDW-SC20-4-6 C	95% (4-8)	PCB SVOC Metals Hg Pesticide TBT Dioxins/ Furans	0	OL: (2.1-3.7) moist, [medium stiff,] black (2.5Y, 2.5/1) ORGANIC SILT, few sand interbedded with 0.6" thick seams of convex, moist, stiff, gray (2.5Y, 5/1) SILT, little clay. Slight rainbow sheen and HC-like odor to 3.5 feet. ② 2.5' layer of moist, dense, black, fine SAND OL: (3.7-4.1) moist, medium stiff, very dark greenish gray (GLEY 1, 3/1), SILT, little clay. Slight H2S-like odor. ML: (4.1-12.6) moist, [stiff,] black (2.5Y, 2.5/1) SILT, few fine sand. Silt texture is uniform, slightly compressible, massive, blocky, low plasticity, and rolls easily. Trace small shell fragments up to 0.6" in diameter.	Transitional Contact GT @ 2.9' @ 3.9' TV = 0.2 kg/cm2	recent	; ;
The RETEC (1011 SW Kild	kitat V	Vay, Suit	te 207 F	Remarks:	Drive Notes: freefall (0.2'), moderate (12.6'), penetrat	<u>ion</u> Calcula	eted Recovery	
Seattle, WA Phone: (206)	98134-	1162		joal reach	ned. One drive attempt made at station.	Sample Length	n/Penetration Length	n;
Fax: (206) 62			0	ore catc	her was 50% full.	10.0/	12.6 = 79 %	
			-					

)			7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	Sediment Core Lo	og	Sheet 2 of 2
Projec	ct: LDW	/ RI/F	s			Water Body Type: Lower Duwamish Waterway	Tube Length (ft): 1	6.1
Proje	ct #: PC	DRS5	-18220	-511		Water Elevation (ft)/Tide: 7.4	Penetration Depth	(ft): 12.6
Client	t: LDW(G				Water Depth (ft): 43.5	Sample Quality: G	ood
Collec	ction Da	te: 2	/15/06			Mudline Elevation (ft): -33.9	Recovery in ft (%):	10.0 (79)
Contr	actor: N	ics i	Environ	mental,	lnc.	N./LAT: 206177 E./LONG: 1267735	Process Date: 2/15	5/06
Vesse	el: MCS	bar	ge			Horiz. Datum: NAD 83 N Vert. Datum: MLLW	Process Method: 0	Cut tube
Opera	ator: Ga	ary M	laxwell		,	Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: L.Mck	Kee
Recovered	Deptin (iii) Recov.Interval	& Sample	% Recovery (interval)	Chemical Analysis	PtD Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log
9 11 12		SC20-6-8	72% (8-10) 57% 10-12.6)	PCB Dioxins/ Furans	0	End of core at 10.0'.		upper alluvium — 11— 11— 11— 11— 11— 11— 11— 11— 11—

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Fax: (206) 624-2839

Remarks: Drive Notes: freefall (0.2'), moderate (12.6'), penetration
goal reached. One drive attempt made at station.

Core catcher was 50% full.

					300 (T) 300 (T) 300 (T)	Sediment Core Lo	og	Sheet 1 of 2
	Project: LD '	W RI	/FS			Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	16.1
	Project #: P	ORS	5-18220)-511		Water Elevation (ft)/Tide: 5.9	Penetration Depth	(ft): 12.7
	Client: LDV	/G				Water Depth (ft): 34.1	Sample Quality: G	Good
	Collection D	ate:	2/14/06			Mudline Elevation (ft): -28.5	Recovery in ft (%):	11.3 (89)
	Contractor:	MCS	Enviro	nmenta	al, Inc.	N./LAT: 206167 E./LONG: 1267486	Process Date: 2/1	5/06
	Vessel: MC	S ba	rge			Horiz. Datum: NAD 83 N Vert. Datum: MLLW	Process Method:	Cut tube
ļ	Operator: G	ary	1			Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: A. Fit	zpatrick, L.McKee
	Recovered Depth (ft) Recov.Interval	& Sample	% Recovery (interval)	Chemical	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log
	-1	LDW-SC21-0-1 LDW-SC21-1-2	100% (0-0.5) 100% (0.5-3)	PCB SVOC Metals Hg PCB SVOC Metals Hg	0	ML: (0.0-0.5) moist, medium stiff, olive brown (2.5Y, 4/3) fine SANDY SILT. OL: (0.5-5.1) moist, medium stiff, black (2.5Y, 2.5/1) ORGANIC SILT, trace fine sand. Silt texture is uniform, slightly compressible, massive, and of low plasticity. Scattered wood fragments and slight H2S-like odor.	Transitional Contact @ 0.8' TV = 0.4 kg/cm2 GT @ 1.1'	
	-2 	← LDW-SC21-2-4 →	100% (3-6)	PCB SVOC Metals Hg	0	@ 3.6' 2" layer of fine sand @ 4.5' moderate H2S-like odor	GT @ 2.2°	recent
+ + + + + + + + + + + + + + + + + + + +	-5	LDW-SC21-4-6.2		РСВ	o	/ ML: (5.1-6.5) moist, medium stiff, black (2.5Y, 2.5/1) \ SILT, few sand with clasts and layers of moist, stiff, gray (2.5Y, 5/1) medium SILT, little clay up to 0.1' L. Scattered layers of moist, black fine sand (transitional unit).	Transitional Contact @ 5.6' TV = 0.6 kg/cm2	5
	-6	\rightarrow \leftarrow LDW				SP- SM: (6.5-10.1) moist, dense, grayish brown (2.5Y, 5/2) medium to fine SAND interbedded with layers of black SANDY SILT. Scattered wood fragments up to 4" L and scattered wood layers up to	Sharp Contact	6
1	The RETEC G 1011 SW Klick Seattle, WA S Phone: (206) 6 Fax: (206) 624	kitat 1 8134 524-9	Nay, Suit -1162 349	e 207	(10.0'), ha	Drive Notes: freefall (0.5'), easy to moderate (8.0'), nrd (12.7'), penetration goal reached. One drive attemptation. Core catcher was empty with 0.2' lost from bo	t Sample Length	ted Recovery /Penetration Length:

13-R		Sediment Core Lo	og	Sheet 2 of 2
Project: LDW RI/FS	_	Water Body Type: Lower Duwamish Waterway	Tube Length (ft): 1	6.1
Project #: PORS5-18220)-511	Water Elevation (ft)/Tide: 5.9	Penetration Depth	(ft): 12.7
Client: LDWG		Water Depth (ft): 34.1	Sample Quality: G	ood
Collection Date: 2/14/06		Mudline Elevation (ft): -28.5	Recovery in ft (%):	
Contractor: MCS Enviror	nmental, Inc.	N./LAT: 206167 E./LONG: 1267486	Process Date: 2/15	
Vessel: MCS barge		Horiz, Datum: NAD 83 N Vert. Datum: MLLW	Process Method: 0	Cut tube
Operator: Gary Maxwell	_	Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: A. Fitz	patrick, L.McKee
Recovered Depth (ft) Recov.Interval & Sample , Recovery (interval)	Chemical Analysis PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log
-9 LDW-SC21-0-1-1-0-1-1-3 57% -12	PCB	2" thick. Grades to coarse SAND and trace wood at basal contact. SP: (10.1-12.7) moist, dense, very dark greenish gray (GLEY 1, 3/1) medium SAND with multicolored grains (white, red, orange). Scattered wood layers up to 0.1' thick with orange-brown shredded wood fragments. @ 11.0' non-lumbered wood piece End of core at 11.3'.	@ 9.5' TV = 0.9 kg/cm2 Transitional Contact	upper alluvium 8-

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Remarks: Drive Notes: freefall (0.5'), easy to moderate (8.0'), moderate,

(10.0'), hard (12.7'), penetration goal reached. One drive attempt

made at station. Core catcher was empty with 0.2' lost from bottom.

Calculated Recovery

Sample Length/Penetration Length:

11.3/ 12.7 = 89 %

RETE		Sediment Core Lo	o g	Sheet 1 of 2
Project: LDW RI/FS	Water Bo	ndy Type: Lower Duwamish Waterway	Tube Length (ft):	16.1
Project #: PORS5-18220-511	Water Ele	evation (ft)/Tide: 9.1	Penetration Depth	(ft): 9.3
Client: LDWG	Water De	epth (ft): 12	Sample Quality: G	ood
Collection Date: 2/13/06	_	Elevation (ft): -3.4	Recovery in ft (%):	7.7 (83)
Contractor: MCS Environmental, Inc	N./LAT:	205908 E./LONG: 1268174	Process Date: 2/14	1/06
Vessel: MCS barge	Horiz. Da	tum: NAD 83 N Vert. Datum: MLLW	Process Method: (
Operator: Gary Maxwell		ube ID: Diver Impact Core/4" sq Al	Logged By: N. Ba	cher, L.McKee
Recovered Depth (ft) Recov.Interval & Sample % Recovery (interval) Chemical Analysis	Measurement (In-si	Sediment Description Classification Scheme: USCS Contacts are recovered depth tu depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log
DW-SC22-0-1.1 DW-SC22-0-1.1 DW-SC22-1.1-1 DW-SC22-1.1-1 DW-SC22-1.1-1 DW-SC22-1.1-1 DW-SC22-1.1-1 DW-SC22-1.1-1	(10/YR, 4 are multi (brick fra woody S / SM: (1.3 (GLEY 1 moderate are multi creosote	-1.3) wet, loose, dark yellowish brown 4/4) medium SAND, few silt. Sand grains colored (orange, red, white). Trace debris gments) and 1" diameter pocket of brown ILT (possibly peat). -2.0) moist, medium dense, greenish black y, 2.5/10Y) medium SAND, few silt and e wood fragments up to 1.5" L. Sand grains colored (orange, red, white). Moderate -like sheen from 0.9' to 1.1' and moderate staining and odor to 1.1'.	GT @ 0.7' Transitional Contact Transitional Contact GT @ 1.9'	
DW SC PCB SVOC Metals Hg Hg Hg Hg Hg Hg Hg H	(GLEY 1, of gray S multicolo medium fragment Trace po	(2.0-9.3) moist, medium dense, black (2.5/N) fine SAND with pockets and lenses ilLT, few sand up to 1/2" L. Sand grains are red (red, orange, white) and grade to below 6.5'. Trace scattered debris (brick) and trace wood fragments up to 2" L. ckets of brown peaty silt up to 1/2" diameter.	@ 3.0' TV = 0.6 kg/cm2	3 - 4 - 4 - 4 - 4 - 4 - 4 - 4 - 4 - 4 -
	0 @ 5.1' tra material	ace 1/4" diameter pocket of brown peaty	@ 5.0' TV = 0.7 kg/cm2 Winnowing from 5.7' to 6.9'.	upper alluvium
The RETEC Group, Inc. Rem	rks: Drive No	tes: no freefall, easy (7.0'), moderate (8.0'),	Oplanta	ted Decovers
1011 SW Klickitat Way, Suite 207		9.3'). One drive attempt made at station.		ted Recovery /Penetration Length:
Phone: (206) 624-9349 Fax: (206) 624-2839	/,	/ witte witelije made at station		
				9.3 = 83 %

A		7					Sediment Core Lo	og	Sheet 2 of 2
Pro	ject:	LDW	RI/	FS			Water Body Type: Lower Duwamish Waterway	Tube Length (ft): 1	16.1
Pro	ject	#: PO	RS	5-18220	-511		Water Elevation (ft)/Tide: 9.1	Penetration Depth	(ft): 9.3
Clie	ent:	LDWG	à				Water Depth (ft): 12	Sample Quality: G	ood
Co	llecti	ion Dat	te: 2	2/13/06			Mudline Elevation (ft): -3.4	Recovery in ft (%):	7.7 (83)
Co	ntrac	ctor: M	cs	Environ	mental,	inc.	N./LAT: 205908 E./LONG: 1268174	Process Date: 2/14	1/06
Ve	ssel:	MCS	ba	rge			Horiz. Datum: NAD 83 N Vert. Datum: MLLW	Process Method: (Cut tube
Ор	erate	or: Ga	ry N	/laxwell		,	Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: N. Ba	cher, L.McKee
Recovered	Depth (ft)	Recov.Interval	& Sample	% Recovery (interval)	Chemical Analysis	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log
8			22-6-7.7>	76% (7-8)		0	End of core at 7.7'. Driven to refusal.	@ 7.0' TV = 0.4 kg/cm2	7—

The RETEC Group, Inc. 1011 SW Klickitat Way, Suite 207	Remarks: Drive Notes: no freefall, easy (7.0'), moderate (8.0'),	Calculated Recovery
	hard (9.0'), refusal (9.3'). One drive attempt made at station.	Sample Length/Penetration Length:
Fax: (206) 624-2839		7.7 /9.3 = 83 %

						Sediment Core Lo	og	Sheet 1 of 2
Project	t; LD\	N RI/	FS			Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	16.1
Project	t#: P	ORS	5-18220	0-511		Water Elevation (ft)/Tide: 2.1	Penetration Depth	(ft): 12.4
Client:	LDW	G				Water Depth (ft): 23.2	Sample Quality: G	iood
Collect	tion D	ate: :	2/16/06			Mudline Elevation (ft): -18.7	Recovery in ft (%):	10.7 (86)
Contra	ctor: I	VICS	Enviro	nmenta	l, Inc.	N./LAT: 205418 E./LONG: 1268229	Process Date: 2/17	7/06
Vessel	I: MC	S ba	rge			Horiz. Datum: NAD 83 N Vert. Datum: MLLW	Process Method:	Cut tube
Operat		ary I	/laxwell	1	<u> </u>	Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: L.McI	Kee
Recovered Depth (ft)	Recov.Interval	& Sample	% Recovery (interval)	Chemical	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log
-0 -1 -2 -3			94% (0-1)	PCB SVOC Metals Hg Pesticid TBT PCB SVOC Metals Hg Pesticid TBT	0	ML: (0.0-0.5) wet, very soft, offive brown (2.5Y, 4/3) SILT and trace debris (piece of concrete). OL: (0.5-5.3) moist, medium stiff, black (2.5Y, 2.5/1) ORGANIC SILT with trace shell and wood fragments. Silt texture is uniform, slightly compressible, massive, blocky, and of low plasticity. Slight H2S-like odor. Scattered layers of very dark greenish gray (GLEY 1, 3/1) SILT, little clay up to 3" thick. © 1.8' 4" thick layer of stiff, black SILT, little sand and few gravel up to 1/2" in diameter	@ 0.0 to 1.0' Sheen Test: no sheen Transitional Contact GT @ 0.9' @ 0.9' TV = 0.6 kg/cm2 @ 1.0 to 2.0' Sheen Test: no sheen GT @ 2.9' @ 2.9' TV = 0.6 kg/cm2 @ 4.4' TV = 0.3 kg/cm2	- recent
5		LDW-SC23-4-6>				ML: (5.3 -6.4) moist, [medium stiff,] very dark greenish gray (GLEY 1, 3/5GY) SILT, few clay. Silt texture is slightly compressible and rolls easily. Slight H2S-like odor.		
6		CDW-	100% (5-7)	PCB	0	OL: (6.4-9.6) [moist, medium stiff] very dark greenish gray (GLEY 1, 3/5GY) ORGANIC SILT, trace clay. Silt texture is slightly compressible, rolls well. Slight H2S-like odor.		
The RET				1	Remarks	: Drive Notes: freefall (1.6'), easy (10.4'), moderate (12	2.4'), Calcula	ted Recovery
Seattle,	WA 9	8134-		te 207		on goal reached. One drive attempt made at station.	Calcula	/Penetration Length:
Phone: (20 Fax: (20				-		had restricted maneuverability due to freezing.		12.4 = 86 %
				-				

			Sediment Core Lo	og	Sheet 2 of 2
Project: LDW RI/	/FS		Water Body Type: Lower Duwamish Waterway	Tube Length (ft): 1	6.1
Project #: PORS			Water Elevation (ft)/Tide: 2.1	Penetration Depth	(ft): 12.4
Client: LDWG			Water Depth (ft): 23.2	Sample Quality: G	ood
Collection Date:	2/16/06		Mudline Elevation (ft): -18.7	Recovery in ft (%):	10.7 (86)
Contractor: MCS	Environmental,	lnc.	N./LAT: 205418 E./LONG: 1268229	Process Date: 2/17	7/06
Vessel: MCS ba	rge		Horiz, Datum: NAD 83 N Vert. Datum: MLLW	Process Method: 0	Cut tube
Operator: Gary !	Maxwell		Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: L.Mck	(ee
Recovered Depth (tt) Recov.Interval	% Recovery (interval) Chemical Analysis	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	<i>In-situ</i> Depth (ft) & Graphic Log
SC23.6.8 ——>	85% (7-9) PCB 85% (9-10)	0	ML: (9.6-12.4) moist, medium stiff, gray (2.5Y, 5/1) SILT, few clay and chunky clay balls. Scattered wood and shell fragments up to 1" L and [slight] H2S- like odor. End of core at 10.7'. Driven to refusal.	@ 7.0' TV = 0.8 kg/cm2 Transitional Contact Not sampled below 10.2'.	## 10 - 12 - 12 - 12 - 12 - 12 - 12 - 12 -

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Remarks: Drive Notes: freefall (1.6'), easy (10.4'), moderate (12.4'), penetration goal reached. One drive attempt made at station.

Torvane had restricted maneuverability due to freezing.

Calculated Recovery Sample Length/Penetration Length: 10.7/12.4 = 86 %

43 RETEC						Sediment Core Log LDW-SC-24 (R1)				
Project: LDW RI/FS						Water Body Type: Lower Duwamish Waterway		Tube Length (ft): 16.1		
						Water Elevation (ft)/Tide: 6.1	Penetration Depth	pth (ft): 12.2		
						Water Depth (ft): 26.3	Sample Quality: G			
	Collecti	on Date:	2/17/06			Mudline Elevation (ft): -20.4	Recovery in ft (%):	11.8 (97)		
	Contrac	ctor: MCS	Enviror	nmenta	l, Inc.	N./LAT: 205130 E./LONG: 1267860	Process Date: 2/17			
Vessel: MCS barge						Horiz. Datum: NAD 83 N Vert. Datum: MLLW	Process Method: (
	Operato	or: Gary I	Maxwell		1	Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: L.McI	⟨ee		
	Recovered Depth (ft)	Recov.Interval & Sample	% Recovery (interval)	Chemical Analysis	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log		
	0 - - - - - -	LDW-SC24-0-1	65% (0-1)	PCB SVOC Metals Hg	0	OL: (0.0-1.3) wet, soft, black (2.5Y, 2.5/1) ORGANIC SILT, little sand and few wood fragments less than 1/2". Abundant worms.	GT @ 0.9' Gradational Contact	recent 1		
	2	LDW-SC24-1-2 <	100% (1-2)	PCB SVOC Metals Hg	0	SP-SM: (1.1-3.4) damp, [medium dense], black (2.5Y, 2.5/1) fine SAND interbedded with 1" thick layers and pockets of wet, medium stiff, dark greenish gray (GLEY 1, 4/10Y) SILT, few sand. Sand grains are multicolored (orange, red, white).	@1.3' TV = 0.2 kg/cm2	→ Upper alluvium		
	3	LDW-SC24-2		PCB SVOC	0		GT @ 2.8'	3-		
+++++++++++++++++++++++++++++++++++++++	4	24 <u>\</u>	100% (2-5)	Metals Hg		SM: (3.3-9.4) damp, dense, black (2.5Y, 2.5/1) medium SAND with scattered thin layers up to 1/4" thick of dark greenish gray (GLEY 1 4/10Y) SILT, few clay that decrease with depth. Scattered wood fragments up to 0.2" L. Grades to lower unit.	Sharp Contact © 3.6' TV = 0.4 kg/cm2	4		
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	5	— LDW-SC24-4-6 ——————————————————————————————————	100%		0	@ 6.0' to 7.0' slight H2S-like odor	@ 5.4' TV = 0.6 kg/cm2	5- 6-		
The RETEC Group, Inc. 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134-1162 Phone: (206) 624-9349 Remarks: hard (12.2)				te 207	hard (12.2	Drive Notes: freefall (1.0'), easy (7.0'), moderate (11.2'), penetration goal reached. One drive attempt made Core catcher was 100 % full.	Sample Lengti	ted Recovery n/Penetration Length:		

,		7		513 E		Sediment Core Lo	og	Sheet 2 of 2
Р	roject:	LDW RI	FS			Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	
Р	roject :	#: PORS	5-18 <u>22</u> 0	-511		Water Elevation (ft)/Tide: 6.1	Penetration Depth	(ft): 12.2
C	lient: I	LDWG				Water Depth (ft): 26.3	Sample Quality: G	ood
C	ollectio	on Date:	2/17/06			Mudline Elevation (ft): -20.4	Recovery in ft (%):	11.8 (97)
С	ontrac	tor: MCS	Environ	mental,	Inc.	N./LAT: 205130 E./LONG: 1267860	Process Date: 2/17	7/06
٧	essel:	MCS ba	rge			Horiz, Datum: NAD 83 N Vert, Datum: MLLW	Process Method: (Cut tube
0	perato	r: Gary I	Maxwell			Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: L.Mc	(ee
Recovered	Depth (ft)	Recov.interval & Sample	% Recovery (interval)	Chemical Analysis	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log
**************************************	10	SC24-6-8 → ← LDW-SC24-8-10 →	90% (9-10) 91% (10-11) 80% (11-12.2)		0	SP- SM: (9.4-12.2) [damp, dense, black (2.5Y, 2.5/1) medium SAND] with frequent, thin, seams of dark greenish gray (GLEY 1, 4/10Y) SILT, few clay. Silt layers are convex from 9.2' to basal contact.	@ 7.0' TV = 0.5 kg/cm2 @ 9.0' TV = 0.5 kg/cm2 Transitional Contact Core not sampled below 10.0'.	9—————————————————————————————————————

The RETEC Group, Inc.
1011 SW Klickitat Way, Suite 207
Seattle, WA 98134-1162
Phone: (206) 624-9349
Fax: (206) 624-2839

Remarks: Drive Notes: freefall (1.0'), easy (7.0'), moderate (11.0'),
hard (12.2'), penetration goal reached. One drive attempt made
at station. Core catcher was 100 % full.

Calculated Recovery
Sample Length/Penetration Length:
11.8/12.2 = 97 %

						Sediment Core Lo	og	Sheet 1 of 2	
	Project: LD	W RI	/FS			Water Body Type: Lower Duwamish Waterway	Tube Length (ft):		
	Project #: P	ORS	5-18220)-511		Water Elevation (ft)/Tide: 18.7	Penetration Depth (ft): 10.3		
	Client: LDV	/G				Water Depth (ft): 18.7	Sample Quality: G	Good	
	Collection D	ate:	2/17/06			Mudline Elevation (ft): -15.2	Recovery in ft (%):	9.1 (88)	
	Contractor:	MCS	Enviro	nment	al, Inc.	N./LAT: 204751 E./LONG: 1267980	Process Date: 2/1	8/06	
	Vessel: MC	S ba	rge			Horiz, Datum: NAD 83 N Vert. Datum: MLLW	Process Method:	Cut tube	
-	Operator: 0	ary l	1	 		Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: L.Mcl	Kee	_
	Depth (ft) Recov.interval	& Sample	% Recovery (interval)	Chemical	PID	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log	
	-0 -1 -2 -3 -4	LDW-SC25-0-1 LDW-SC25-1-2 C	67% (0-1) 100% (1-3) 100% (3-5)	PCB SVOC Metals Hg TBT PCB SVOC Metals Hg TBT	0	ML: (0.0-0.4) very wet, very soft, black (2.5Y, 2.5/1) SILT, few sand and trace wood fragments up to 4" L. Trace leaf stems and worms. OL: (0.4-5.5) wet, soft to medium stiff, black (2.5Y, 2.5/1) ORGANIC SILT with substantial wood fragments up to 1.2" L. Silt texture is uniform, compressible, blocky, and of low plasticity. Substantial 4" L layers of shredded wood fragments. Wood matter increases from 4.0' to basal contact. @ 1.8' clear glass shard and black clast 1" in diameter @ 2.0' slight H2S-like odor ML: (5.5-6.6) moist, medium stiff, black (2.5Y, 2.5/1) SILT with scattered small, stiff, gray SILT clasts up to 1/2" diameter and trace medium SAND pockets 1" in diameter. Moderate rootlets, twigs, and organics. SP-SM: (6.6-8.6) moist to wet, medium dense, black (2.5Y, 2.5/1) medium SAND, few silt with scattered pockets of soft, gray CLAY, little silt up to 2"	GT @ 1.4' @1.8' TV = 0.2 kg/cm² 1.8' (black clast) GT @ 3.2' @ 3.6' TV = 0.4 kg/cm²	Fecent	
++1-	: 🗷	PW-				diameter.	@ 6.6' TV = 0.3 kg/cm2	- LLL ppe ·	_ _ _
	The RETEC G 1011 SW Klich Seattle, WA S Phone: (206) Fax: (206) 624	kitat V 18134 1824-9	Vay, Suit ·1162 349	e 207	hard (10	s: Drive Notes: freefall (1.5'), easy (7.0'), moderate (9.0' .3'), refusal (10.3'). Two drive attempts made at station tcher was 80% full. Slight slumping below 8.3'.	. Sample Length	nted Recovery n/Penetration Length / 10.3 = 88 %	: :

	7					Sediment Core Lo	og	Sheet 2 of 2
Project:	: LDW	RI/FS				Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	16.1
Project	#: PO I	RS5-1	8220	-511		Water Elevation (ft)/Tide: 18.7	Penetration Depth	(ft): 10.3
Client:	LDWG	i				Water Depth (ft): 18.7	Sample Quality: G	iood
Collecti	ion Dat	e: 2/17	7/06			Mudline Elevation (ft): -15.2	Recovery in ft (%):	9.1_(88)
Contrac	ctor: MC	CS En	viror	m <u>ent</u> al,	Inc.	N./LAT: 204751 E./LONG: 1267980	Process Date: 2/1	8/06
Vessel:	: MCS	barge				Horiz, Datum: NAD 83 N Vert, Datum: MLLW	Process Method:	Cut tube
Operat	or: Gar	y Max	well			Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: L.McI	Kee
Recovered Depth (ft)	Recov.Interval	% Recovery	(interval)	Chemical Analysis	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log
7 8 9	1883	LDW-SC25-8-9.1	9% 7-9) 0% -10)	PCB Metals TBT	0	SP: (8.6-10.3) moist to wet, medium dense, black (2.5, 2.5/1) grading to greenish black (GLEY 1, 2.5/1) medium SAND. Sand grains are multicolored (orange, red, white) and well sorted. End of core at 9.1'. Driven to refusal.	@ 7.9' TV = 0.2 kg/cm2	r alluvium — 9-

Remarks: Drive Notes: freefall (1.5'), easy (7.0'), moderate (9.0'),

hard (10.3'), refusal (10.3'). Two drive attempts made at station.

Core catcher was 80% full. Slight slumping below 8.3'.

Calculated Recovery

Sample Length/Penetration Length:

9.1 /10.3 = 88 %

Sheet 1 of 3 **Sediment Core Log** RETEC LDW-SC-26 (R1) Tube Length (ft): 16.1 Project: LDW RI/FS Water Body Type: Lower Duwamish Waterway Project #: PORS5-18220-511 Water Elevation (ft)/Tide: 18.7 Penetration Depth (ft): 14.6 Client: LDWG Water Depth (ft): 35.4 Sample Quality: Good Collection Date: 2/22/06 Mudline Elevation (ft): -26 Recovery in ft (%): 12.3 (84) N./LAT: 204479 E./LONG: 1268157 Contractor: MCS Environmental, Inc. Process Date: 2/22/06 Horiz. Datum: NAD 83 N Vert. Datum: MLLW Vessel: MCS barge Process Method: Cut tube Operator: Gary Maxwell Method/Tube ID: Diver Impact Core/4" sq AI Logged By: L.McKee PtD Measurement Recov.Interva Analysis Sediment Description Recovered Depth (ft) Sample (interval) Comments In-situ Classification Scheme: USCS Depth (ft) for Recovered Contacts are recovered depth & Graphic Log Depths (In-situ depth interval in feet with parentheses) OL: (0.0-0.6) wet, soft, olive brown (2.5Y, 4/3) ORGANIC SILT, few sand and trace worms. LDW-SC26-0-1 PĆB svoc Metals 0 81% Hg (0-1)Transitional Contact TĔT OL: (0.6-5.3) wet, soft, black (2.5YR, 2.5/1) Dioxins/ ORGANIC SILT, few sand and little olive-gray Furans mottled SILT, little clay. Silt texture is slightly @ 0.9' TV = 0.8compressible and of low plasticity. Trace rootlets, kg/cm2 shell fragments, and wood fragments up to 1.2" L. LDW-SC26-1-2 PCB SVOC Metals 0 GT @ 1.5' Hg TBT Dioxins/ Furans @ 1.9' TV = 0.3 93% kg/cm2 (1-3)recent PCB 0 @ 3.0' TV = 0.4 svoc kg/cm2 Metals ltět Dioxins/ Furans @ 4.5' wood fragments with 1 mm rainbow sheen florets GT @ 3.9 100% (3-5)LDW-SC26-4-6 Sharp Contact @ 5.0' TV = 0.2 0 SM: (5.3-6.6) wet, medium dense, black (2.5Y, kg/cm2 2.5/1), medium SAND, few silt. The RETEC Group, Inc. 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134-1162 Phone: (206) 624-9349 Remarks: Drive Notes: freefall (1.0'), easy (5.0'), moderate (14.6'), **Calculated Recovery** penetration goal reached. One drive attempt made at station. Sample Length/Penetration Length: Fax: (206) 624-2839 Core catcher was 50% full. Rainbow HC-like sheen on sidewalls at 12.3/14.6 = 84 % 4.6'. Sampled 58' off station around barge.

			Sediment Core Lo	og	Sheet 2 of 3	
Project: LDW RI/FS			Water Body Type: Lower Duwamish Waterway	Tube Length (ft): 16.1		
Project #: PORS5-1			Water Elevation (ft)/Tide: 18.7	Penetration Depth (ft): 14.6		
Client: LDWG		_	Water Depth (ft): 35.4	Sample Quality: G	Sample Quality: Good	
Collection Date: 2/2	22/06		Mudline Elevation (ft): -26	Recovery in ft (%):		
Contractor: MCS Er		al. Inc.	N./LAT: 204479 E./LONG: 1268157	Process Date: 2/22	, ,	
Vessel: MCS barge		,	Horiz. Datum: NAD 83 N Vert. Datum: MLLW	Process Method: (
Operator: Gary Ma			Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: L.Mck		
	>	Analysis PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log	
-> \	75% (5-7) PCB SVOC Metal Hg TBT Dioxin Furar	s ns/	SW: (6.6-7.7) [moist, dense,] black (2.5Y, 2.5/1) SAND, few gravel. [Sand is medium and multicolored (orange, red, white)]. Gravel is subangular and 1/4" diameter. Few seams of black SILT with wood fragments and rootlets. Strong HC-like odor and sheen on sand and gravel. GP: (7.7-9.1) moist, dense, black (2.5Y, 2.5/1) SANDY GRAVEL. Gravel is mostly subangular conglomerate with scattered 1/2 mm orange flecks (anthropogenic) attached. Large gravels have HC-like sheen. Scattered debris. @ 7.6' 1" L foliated chips (possibly paint) @ 7.8' 1" L amber glass SP-SC: (9.1-13.1) [moist, medium dense,] black (2.5Y, 2.5/1) medium SAND interbedded with layers of [medium stiff,] black SILT and scattered pockets of olive-gray SILT, little clay. Few 2" thick layers of black SILT. Scattered debris.	Transitional Contact @ 6.5' TV = 0.0 kg/cm2 Bag @ 7.6' (1* chips) Sharp Contact		
0.:: 0.:: 0.:: 0.:: 0.::	75% 9-11)		@ 9.4' bronze/brass 3/8" nut @ 10.6' 6" x 1" plastic strips and metal clamp, slight HC-like odor, and 1/4" rainbow sheen florets	@ 9.0' TV = 0.7 kg/cm2 Bag @ 10.6' (1" plastic strips and		
75% PCB (10-13) Metals			SP-SM: (13.1-14.6) moist, medium dense, very dark greenish gray (GLEY1, 3/1) fine SAND with pockets Drive Notes: freefall (1.0'), easy (5.0'), moderate (14.	VaiCula	ted Recovery	
Seattle, WA 98134-11 Phone: (206) 624-9349		·	on goal reached. One drive attempt made at station.		/Penetration Length:	
Fax: (206) 624-2839		Core cate	her was 50% full. Rainbow HC-like sheen on sidewall	sat 12.3/	14.6 = 84 %	
		4.6'. Sam	mpled 58' off station around barge.			

3 RETE	Sediment Core Lo	Sheet 3 of 3
Project: LDW RI/FS	Water Body Type: Lower Duwamish Waterway	Tube Length (ft): 16.1
Project #: PORS5-18220-511	Water Elevation (ft)/Tide: 18.7	Penetration Depth (ft): 14.6
Client: LDWG	Water Depth (ft): 35.4	Sample Quality: Good
Collection Date: 2/22/06	Mudline Elevation (ft): -26	Recovery in ft (%): 12.3 (84)
Contractor: MCS Environmental, In	N./LAT: 204479 E./LONG: 1268157	Process Date: 2/22/06
Vessel: MCS barge	Horiz. Datum: NAD 83 N Vert. Datum: MLLW	Process Method: Cut tube
Operator: Gary Maxwell	Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: L.McKee
Recovered Depth (ft) Recov.interval & Sample % Recovery (interval) Chemical Analysis	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths In-situ Depth (ft) & Graphic Log
12	of olive- gray SILT, little clay. SAND grades to very coarse with multicolored grains (orange, red, white) toward basal contact. Pockets of silt are up to 4" diameter with scattered wood and shell fragments. Strong H2S-like odor. End of core at 12.3'. Note: Chemistry interval recorded as 11.1-12.1 ft. but sample was collected to bottom of core at 12.3 ft. Graphic expresses depth of sample collection; sample name matches project nomenclature.	@ 11.6' TV = 0.2 kg/cm2 Bottom 0.3' winnowed. Dept

Remarks: Drive Notes: freefall (1.0'), easy (5.0'), moderate (14.6'), penetration goal reached. One drive attempt made at station.

Core catcher was 50% full. Rainbow HC-like sheen on sidewalls at 4.6'. Sampled 58' off station around barge.

Calculated Recovery
Sample Length/Penetration Length:

12.3/14.6 = 84 %

	RET		Sediment Core Lo	og	Sheet 1 of 2	
F	Project: LDW RI/FS		Water Body Type: Lower Duwamish Waterway	Tube Length (ft): 16.1		
L	Project #: PORS5-18220-511		Water Elevation (ft)/Tide: 6.8	Penetration Depth (ft): 11.2		
L	Client: LDWG		Water Depth (ft): 20.0	Sample Quality: G	300d	
L	Collection Date: 2/14/06		Mudline Elevation (ft): -10.5	Recovery in ft (%):	9.5 (85)	
⊢	Contractor: MCS Environmental,	Inc.	N./LAT: 204441	Process Date: 2/14		
\vdash	Vessel: MCS barge		Horiz. Datum: NAD 83 N Vert. Datum: MLLW	Process Method: (
Ľ	Operator: Gary Maxwell	1 =	Method/Tube ID: Diver Impact Core/4" sq AI	Logged By: L.Mcl	Kee, N. Bacher	
	Recovered Depth (ft) Recov.Interval & Sample % Recovery (interval) Chemical Analysis	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log	
	-0 -1 -1 -1 -1 -2 -3 -4 -4 -4 -4 -4 -4 -5 -6 -6 -7 -7 -7 -7 -7 -7 -7 -7	0	OL: (0.0-4.6) wet, soft to medium stiff, black (GLEY 1, 2.5/N) grading to very dark greenish gray (GLEY 1, 3/5GY) ORGANIC SILT, few sand. Scattered shells, rootlets, and wood fragments up to 3" L and trace wood layers up to 5" thick. Moderate H2S-like odor. Silt becomes stiffer with depth. SP-SM: (4.6-9.1) moist, medium dense, very dark gray (10VR 3/1) fine SAND, few silt interhedded with	GT @ 0.9' @ 1.0' TV = 0.3 kg/cm2 GT @ 2.5' @ 3.0' TV = 0.6 kg/cm2	0 — 1 — 1 — 1 — 1 — 1 — 1 — 1 — 1 — 1 —	
# 1	-5 -5 -6 -6 -5 -5 -6 -6 -5 -5 -6 -6 -5 -5 -5 -6 -5 -5 -6 -6 -6 -5 -5 -5 -6 -6 -6 -6 -6 -6 -6 -6 -6 -6 -6 -6 -6	0	gray (10YR, 3/1) fine SAND, few silt interbedded with scattered convex layers of very dark grayish brown (2.5Y, 3/2) SILT, few sand, trace silt pockets, and trace subrounded gravel. SAND is multicolored (orange, red, white). Scattered wood fragments.	@ 5.5' TV = 0.7 kg/cm2 @ 6.5' TV = 0.6 kg/cm2	upper at	
	The RETEC Group, Inc.	Remarks:	Drive Notes: freefall (1.0'), moderate (5.0'), hard (11.2	P), Calouin	ited Recovery	
	011 SW Klickitat Way, Suite 207		1.2'). One drive attempt made at station.	Galcula	n/Penetration Length:	
F	Phone: (206) 624-9349 Fax: (206) 624-2839				/11.2 = 85 %	
					30 /	

,	A RETEC						Sediment Core Lo	og	Sheet 2 of 2			
Pi	roject:	LDW	RI/FS				Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	Tube Length (ft): 16.1			
-							Water Elevation (ft)/Tide: 6.8	Penetration Depth	(ft): 11.2			
С	lient:	LDWG					Water Depth (ft): 20.0	Sample Quality: G	ood			
С	ollecti	on Dat	e: 2/14/0	3			Mudline Elevation (ft): -10.5	Recovery in ft (%):	9.5 (85)			
С	ontrac	otor: MC	CS Envir	nment	al, Ir	nc.	N./LAT: 204441 E./LONG: 1268518	Process Date: 2/14	4/06			
V	essel:	MCS	barge				Horiz, Datum; NAD 83 N Vert. Datum: MLLW	Process Method: (Cut tube			
0	perato	or: Gar	ry Maxwe	ell			Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: L.McI	L.McKee, N. Bacher			
Berowered	Depth (ft)	Recov.interval	% Sample % Recovery (interval)	Chemical	on frame	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Lo	g		
	7		:27-6-7.8>			0	@ 7.5' 1" wood layer with substantial wood	Core catcher found @ 6.5',	luvium —	7—		
+ + + + + + + + + + + + + + + + + + + +	3		73% (7-10			0	SP: (9.1-11.2) moist, dense, very dark grayish brown (2.5Y, 3/2) medium SAND with trace wood fragments. Sand grains are multicolored (orange, red, white).	Depositional Contact @ 8.5' TV = 0.6 kg/cm2		8		
 	9	•	8-9.5				End of core at 9.5'. Driven to refusal.	@ 9.0' TV = 0.8 kg/cm2	\(\frac{1}{1}\)	9		
+ + + + + + + + + + + + + + + + + + + +	10		100% (10-11						lower alluvium –	10		
‡	11		ľ							11		

The RETEC Group, Inc. 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134-1162	Remarks: Drive Notes: freefall (1.0'), moderate (5.0'), hard (11.2'), refusal (11.2'). One drive attempt made at station.	Calculated Recovery Sample Length/Penetration Length:
Phone: (206) 624-9349 Fax: (206) 624-2839		9.5 /11.2 = 85 %
	<u> </u>	-

RET	EC	Sediment Core Lo	og	Sheet 1 of 2			
Project: LDW RI/FS		Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	14.0	_		
Project #: PORS5-18220-511		Water Elevation (ft)/Tide: NA	Penetration Depth (ft): 13.0				
Client: LDWG		Water Depth (ft): 38.5	Sample Quality: G	Good			
Collection Date: 2/24/06		Mudline Elevation (ft): -30.6	Recovery in ft (%):	12.6 (92)	_		
Contractor: MSS		N./LAT: 47 32.933 E./LONG: 122 20.4721	Process Date: 2/25	5/06	_		
Vessel: R/V Nancy Anne		Horiz, Datum: NAD 83 N Vert. Datum: MLLW	Process Method: (Cut tube	_		
Operator: Bill Jaworski		Method/Tube ID: Vibracorer/3.5" round Al	Logged By: L.McKee, C.Brackett				
Recovered Depth (ft) Recov.Interval & Sample % Recovery (interval) Chemical Analysis	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log			
PCB SVOC Metals Hg TBT Dioxins Furans PCB SVOC Metals Hg TBT Dioxins Furans	0	OL: (0.0-0.6) wet, soft, brown (7.5YR, 4/3) ORGANIC SILT, few sand. OL: (0.6-5.8) moist, medium stiff, mottled black and very dark greenish gray (GLEY 1, 3/1) SILT, few sand and clay. Scattered rootlets, wood, worms, and shell fragments up to 3" L. Silt grades to stiff; texture is slightly compressible, uniform, massive, blocky, and of low plasticity.	Tranistional Contact @ 1.0' TV = 0.1 kg/cm2 @ 1.6' TV = 0.3 kg/cm2 GT @ 2.0' @ 3.1' TV = 0.4 kg/cm2 GT @ 3.9'	recent			
FCB SVOC Metals Hg TBT	0	SAND BLAST GRIT: (5.8-12.8) wet, loose, black with metallic, shiny surface. Sand blast grit (80%) interbedded with 2" to 3" thick layers of wet, medium stiff, black (2.5Y, 2.5/1) SILT grading to very dark greenish gray (GLEY 1, 3/1) SILT, little clay. Sand blast grit is well sorted, coarse-grained, and has a metallic surface color and a moderate to strong HC-like odor. Scattered debris associated with sand blast grit.	Sharp Contact Bag @ 6.5' (2" chips)				
The RETEC Group, Inc. 1011 SW Klickitat Way, Suite 207	Remarks:	Drive Notes: freefall (5.0'), easy (6.0'), very easy (9.0')), hard Calcula	ted Recovery			
Seattle, WA 98134-1162	(11.0'), eas	sy (13.0'), penetration goal reached. Five drive attempt		/Penetration Length	າ:		
Phone: (206) 624-9349 Fax: (206) 624-2839	made at s	tation. Core catcher was intact and 100% full.	11.9/	13.0 = 92 %			
	Rainbow s	ainbow sheen on sidewalls from 4.0' to 11.3'. ua= upper alluvium					
					- 1		

Project #: PORS5-18220-511 Water Elevation (ft)/Tide: NA Pen Client: LDWG Water Depth (ft): 38.5 Sam Collection Date: 2/24/06 Contractor: MSS N./LAT: 47 32.933 E./LONG: 122 20.4721 Proc Vessel: R/V Nancy Anne Operator: Bill Jaworski Method/Tube ID: Vibracorer/3.5" round Al Logi Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses) © 5.6' 2" foliated chips (possibly paint) @ 6.25' anthropogenic conglomerates (asphalt-like) up to 0.3' L @ 6.5' 2" foliated red and green chips (possibly paint) forettup to	Sheet 2 of 2	
Client: LDWG Collection Date: 2/24/06 Mudline Elevation (ft): -30.6 Contractor: MSS Vessel: R/V Nancy Anne Operator: Bill Jaworski Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses) Policy (1) (1) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2	ube Length (ft): 14.0	
Collection Date: 2/24/06 Contractor: MSS N/LAT: 47 32.933 E./LONG: 122 20.4721 Proc Vessel: R/V Nancy Anne Operator: Bill Jaworski Method/Tube ID: Vibracorer/3.5" round Al Logi Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses) O 3' L @ 6.5' 2" foliated chips (possibly paint) @ 6.25' anthropogenic conglomerates (asphalt-like) up to 0.3' L @ 6.5' 2" foliated red and green chips (possibly paint) @ 8.3' 1" foliated red chips (possibly paint) @ 8.3' 1" foliated red chips (possibly paint)	enetration Depth (ft): 13.0	
Collection Date: 2/24/06 Contractor: MSS N./LAT: 47 32.933 E./LONG: 122 20.4721 Proc. Vessel: R/V Nancy Anne Operator: Bill Jaworski Method/Tube ID: Vibracorer/3.5" round Al Logi Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses) O 3' L @ 6.5' 2" foliated chips (possibly paint) @ 6.25' anthropogenic conglomerates (asphalt-like) up to 0.3' L @ 6.5' 2" foliated red and green chips (possibly paint) @ 8.3' 1" foliated red chips (possibly paint) @ 8.3' 1" foliated red chips (possibly paint)	ample Quality: Good	
Vessel: R/V Nancy Anne Horiz. Datum: NAD 83 N Vert. Datum: MLLW Proceed of the content of	ecovery in ft (%): 12.6 (92)	
Operator: Bill Jaworski Method/Tube ID: Vibracorer/3.5" round Al Logs Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses) © 5.6' 2" foliated chips (possibly paint) © 6.25' anthropogenic conglomerates (asphalt-like) up to 0.3' L © 6.5' 2" foliated red and green chips (possibly paint) © 6.5' 2" foliated red and green chips (possibly paint) © 8.3' 1" foliated red chips (possibly paint) © 8.3' 1" foliated red chips (possibly paint)	rocess Date: 2/25/06	\
Operator: Bill Jaworski Method/Tube ID: Vibracorer/3.5" round Al Logo Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses) © 5.6 2" foliated chips (possibly paint) © 6.25 anthropogenic conglomerates (asphalt-like) up to 0.3' L © 6.5' 2" foliated red and green chips (possibly paint) © 6.5' 2" foliated red and green chips (possibly paint) © 6.5' 2" foliated red and green chips (possibly paint) © 8.3' 1" foliated red chips (possibly paint)	rocess Method: Cut tube	
@ 5.6 2" foliated chips (possibly paint) @ 6.25' anthropogenic conglomerates (asphalt-like) up to 0.3' L @ 6.5' 2" foliated red and green chips (possibly paint) 8	ogged By: L.McKee, C.Brackett	
@ 6.25' anthropogenic conglomerates (asphalt-like) up to 0.3' L @ 6.5' 2" foliated red and green chips (possibly paint) 8 X X X X X X X X X X X X	Comments for Recovered Depths In-situ Depth (ft) & Graphic Log	
	6.5' Sheen Test: nbow sheen rets and streaks to 2" L. 8.0' TV = 0.1 cm2 A A A A A A A A A A A A A	9-11-11-11-11-11-11-11-11-11-11-11-11-11
SP- SM: (12.8-13.0) damp, medium dense, very dark gray (GLEY 1, 3/N) fine SAND interbedded with moist, medium stiff, black SILT, little sand. Sand grains are multicolored (orange, red, white). End of core at 12.6'. Refusal reached with diver impact core at 7.0 feet. Station re-occupied with	arp Contact	12-

Remarks: Drive Notes: freefall (5.0'), easy (6.0'), very easy (9.0'), hard

Calculated Recovery

(11.0'), easy (13.0'), penetration goal reached. Five drive attempts

Sample Length/Penetration Length:

made at station. Core catcher was intact and 100% full.

11.9/13.0 = 92 %

Rainbow sheen on sidewalls from 4.0' to 11.3'. ua= upper alluvium

	RETEC	Sediment Core Log LDW-SC-29 (R2) Sheet 1 of 1				
ı	Project: LDW RI/FS	Water Body Type: Lower Duwamish Waterway	Tube Length (ft): 16.1			
	Project #: PORS5-18220-511	Water Elevation (ft)/Tide: 9.9	Penetration Depth (ft):	(ft): 6.1		
	Client: LDWG	Water Depth (ft): 14.1	Sample Quality: Poor			
	Collection Date: 2/21/06	Mudline Elevation (ft): -4.2	Recovery in ft (%): 3.6	3.6 (59)		
	Contractor: MCS Environmental, Inc.	N./LAT: 204054 E./LONG: 1268061	Process Date: 2/21/06			
	Vessel: MCS barge	Horiz. Datum; NAD 83 N Vert. Datum: MLLW	Process Method: Cut to	ube		
	Operator: Gary Maxwell	Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: L.McKee			
	Recovered Depth (ft) Recov.Intervai & Sample % Recovery (intervai) Chemical Analysis PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths &	<i>In-situ</i> Depth (ft) Graphic Log		
	O PCB SVOC Metals Hg Dioxins/ Furans 1	OL: (0.0-0.6) wet to moist, soft, black (2.5Y, 2.5/1) ORGANIC SILT, few sand. ML: (0.6-1.8) moist, soft, black (2.5Y, 2.5/1) SILT interbedded with 2" thick layers of moist, dense, black, medium SAND and pockets of very dark greenish gray (GLEY 1, 3/1) SILT, little clay up to 1/2" diameter. Sand grains are multicolored (orange, red, white). SP: (1.8-6.1) moist, dense, black (2.5Y, 2.5/1) medium SAND. Sand grains are multicolored (orange, red, white). © 2.6' pockets of olive-gray clayey silt up to 1/2" in diameter End of core at 3.6'. Driven to refusal.	Sharp Contact GT @ 0.7' GT @ 0.9' Transitional Contact Winnowing @ 1.2' to 2.0' (70%), 2.0' to 2.8' (30%), 2.8' to 3.3' (10%)			
***	6			6-		
	The RETEC Group, Inc. Remarks:	Drive Notes: freefall (3.0'), hard (6.1'), refusal (6.1').	Calculated I	Recovery		
	1011 SW Klickitat Way, Suite 207 Seattle, WA 98134-1162 Two drive	attempts made at station. Core catcher was 60% full		- 1		
	Phone: (206) 624-9349	ne measurements taken. Difficult intertidal access.		= 59 %		
	10 101 14	The state of the s		- 00 ,0		

RET		Sediment Core Lo)g	Sheet 1 of 1
Project: LDW RI/FS		Water Body Type: Lower Duwamish Waterway	Tube Length (ft): 1	16.1
Project #: PORS5-18220-511		Water Elevation (ft)/Tide: 3.5	Penetration Depth	(ft): 6.9
Client: LDWG		Water Depth (ft): 18	Sample Quality: G	ood
Collection Date: 2/14/06		Mudline Elevation (ft): -12.2	Recovery in ft (%):	5.9 (86)
Contractor: MCS Environmental	l, Inc.	N./LAT: 203576 E./LONG: 1268785	Process Date: 2/14	1/06
Vessel: MCS barge		Horiz. Datum: NAD 83 N Vert. Datum: MLLW	Process Method: (Cut tube
Operator: Gary Maxwell		Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: L.Mck	Kee, N.Bacher
Recovered Depth (ft) Recov.Interval & Sample % Recovery (interval) Chemical Analysis	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log
97% 1	0	SM: (0.0-0.2) wet, dense, very dark greenish gray (GLEY 1, 4/10Y) fine SAND, few silt. SP: (0.2-2.7) moist, dense, black (2.5Y, 2.5/1) fine to medium SAND, few gravel, grading to fine to medium sand below 1.2 feet. Gravel is subrounded and up to 3.5" in diameter with barnacle scars. Trace wood fragments up to 2" L. SP-SM: (2.7-3.4) moist, dense, dark gray (2.5Y, 4/1) fine to medium SAND with angular 3" diameter pockets of moist, stiff, [very dark greenish gray (GLEY 1, 4/10Y)] SILT. Sand grains are multicolored (orange, red, white, transitional unit). SP-SM: (3.4-6.9) moist, dense, black (2.5Y, 2/1) very fine SAND interbedded with layers of moist, stiff, dark grey (2.5Y, 4/1) SILT, few sand. Sand is well sorted. Trace wood fragments less than 1" L.	GT @ 1.4' @ 1.5' TV = 0.4 kg/cm2 Sharp Contact @ 3.0' TV = 1.1 kg/cm2 Transitional Contact GT @ 3.4'	recent
100% (6-6.9)	0	End of core at 5.9'. Driven to refusal.	Core catcher @ 4.7'. @ 5.0' TV = 0.9 kg/cm2	upper alluvium ? ———————————————————————————————————
1011 SW Klickitat Way, Suite 207		Drive Notes: freefall (0.7'), easy (5.0'), moderate-hard, refusal (6.9'). Two drive attempts made at station.	Sample Length	ted Recovery /Penetration Length: 6.9 = 86 %

	43 RET		Sediment Core Lo	og	Sheet 1 of 1	
Ì	Project: LDW RI/FS		Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	16.1	_
	Project #: PORS5-18220-511		Water Elevation (ft)/Tide: NA	Penetration Depth	(ft): 7.5	
	Client: LDWG		Water Depth (ft): 35.3	Sample Quality: G	ood	
	Collection Date: 2/16/06		Mudline Elevation (ft): -31.7	Recovery in ft (%):	5.9 (79)	_
	Contractor: MCS Environment	al, Inc.	N./LAT: 203092 E./LONG: 1268934	Process Date: 2/17	7/06	_
Ī	Vessel: MCS barge		Horiz, Datum; NAD 83 N Vert, Datum; MLLW	Process Method: (Cut tube	_
	Operator: Gary Maxwell		Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: L.Mc	(ee	
	Recovered Depth (tt) Recov.Interval & Sample % Recovery (interval) Chemical	PID	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log	
	DE COMPTE DE COM	ides 0	OL: (0.0-0.7) wet, soft, olive brown (2.5Y, 4/3) ORGANIC SILT, few sand. Trace worms. OL: (0.7-2.8) moist, soft, black (2.5Y, 2.5/1) ORGANIC SILT, trace sand, and scattered wood fragments.	Transitional Contact GT @ 0.8'	recent	
	LDW-SC31-1-2.8 PCB SVOC Metals Hg Pestic TBT	0	© 2.3' trace subangular gravel up to 2" L SM: (2.8-3.0) moist, dense, black SAND pocketed and layered with soft, black ORGANIC SILT. (transitional unit) SP: (3.0-5.3) moist, dense, black (2.5Y, 2.5/1) medium SAND. Sand grains are multicolored (orange, red, white).	GT ® 2.7' Sharp Contact		
	50% to 50% (6-7.5)	0	/ ML: (5.3-5.8) moist to damp, stiff, dark greenish gray (GLEY 1, 4/10Y) SILT, little clay and sand, trace subrounded gravel up to 1" L. SP- SM: (5.8-7.5) moist, [dense], black (2.5Y, 2.5/1) SAND interbedded with 1" thick convex layers of damp, stiff, dark greenish gray (GLEY 1, 4/10Y) CLAYEY SILT (alternating bands). Sand grains are multicolored (orange, red, white) and grade finer to basal contact. Bottom of core at 5.9'. Driven to refusal.	Gradational Contact Gradational Contact	ower alluvium 5-	
-						1
1	The RETEC Group, Inc. 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134-1162 Phone: (206) 624-9349 Fax: (206) 624-2839	hard (7.5'	Drive Notes: freefall (2.0'), easy (6.0'), moderate (7.0'), refusal (7.5'). One drive attempt made at station. her was empty. Difficult core extraction.	Sample Length	ated Recovery h/Penetration Length:	:

								Sediment Core Lo	og	Sheet 1 of 2
F	roject	: LDV	V RI/	'FS				Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	
Į.	Project	t#: P	ORS	5-18220	0-511			Water Elevation (ft)/Tide: 8.6	Penetration Depth	(ft): 12.7
_ (Client:	LDW	G					Water Depth (ft): 25.6	Sample Quality: G	lood
	Collect	ion Da	ate: 2	2/10/06				Mudline Elevation (ft): -17.2	Recovery in ft (%):	11.2 (88)
	Contra	ctor: N	ACS	Enviro	nmenta	al, Inc.		N./LAT: 202959 E./LONG: 1269344	Process Date: 2/1	1/06
	/essel	: MC	ba	rge				Horiz, Datum; NAD 83 N Vert. Datum; MLLW	Process Method:	Cut tube
(Operat	or: G	ary I	Maxwel.	<u> </u>			Method/Tube ID: Diver Impact Core/4" sq AI	Logged By: N.Bae	cher, A.Fitzpatrick
L	Recovered Depth (ft)	Recov.Interval	& Sample	% Recovery (interval)	Chemical	PID	Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log
	-1		LDW-SC32-0-1 LDW	84% (0-3)	PCB SVOC Metals Hg		0	OL: (0.0-0.4) wet, very soft, dark olive brown (2.5Y, 3/3) ORGANIC SILT, little sand. OL: (0.4-0.9) moist, medium stiff, black (2.5Y, 2.5/1) ORGANIC SILT, few sand. Trace twigs, rootlets, and worms. GP: (0.9-1.2) wet, loose, black (2.5Y, 2.5/1)	Transitional Contact @ 0.4 TV = 0.4 kg/cm2 Sharp Contact GT @ 1.1'	
	2		LDW-SC32-1-2 <		PCB SVOC Metals Hg		0	GRAVEL, little silt and sand. Slight HC-like odor. MH: (1.2-3.1) wet, medium stiff, dark gray (2.5Y, 4/4) SILT, few to little clay, trace 1/2" diameter pockets of SAND. Sand pockets are slightly mottled and have thin black streaks. Trace twigs and rootlets. Trace to slight HC-like sheen florets up to 1/8" and moderate HC-like odor. ② 2.5' 1" diameter piece of gravel SM: (3.1-5.1) wet, medium dense, black (2.5Y, 2.5/1) medium SAND interbedded with dark olive brown (2.5Y, 3/3) SILT. Sand is multicolored (orange, red, white). Trace wood fragments up to 4" L. Slight HC-like sheen florets up to 1/8" and moderate HC-like odor.	@ 2.5' TV = 0.1 kg/cm2 Transitional Contact GT @ 3.3'	7 recent 2—
	5		LDW-SC32-4-5.2	100% (3-5)			0	4.8' end of sheen SP- SM: (5.1-7.2) moist, medium dense, very dark greenish gray (GLEY 1, 3/5GY) alternating 2" thick layers of SILT, SAND and silty SAND (banded). Trace rootlets and wood up to 2" L. 6.4' 2" diameter clast of hard, light gray clay	@ 4.5' TV = 0.4 kg/cm2 Transitional Contact @ 5.7' TV = 1.1 kg/cm2	upper alluvium
	he RET			Inc. Vay, Suit	te 207	Rema	ırks:	Drive Notes: freefall (2.0'), easy (8.0'), moderate (10.0	<u>''), </u>	ited Recovery
S	eattle, hone: (WA 9	3134-	1162		hard ((12.7	'), refusal (12.7'). One drive attempt made at station.		n/Penetration Length:
F	ax: (20	6) 624	2839)					11.2/	/12.7 = 88 %

	7				Sediment Core Lo	og	Sheet 2 of 2
Project	t: LDW RI	/FS			Water Body Type: Lower Duwamish Waterway	Tube Length (ft): 1	6.1
Projec	t#: PORS	5-18220	-511		Water Elevation (ft)/Tide: 8.6	Penetration Depth	(ft): 12.7
Client:	LDWG				Water Depth (ft): 25.6	Sample Quality: G	ood
Collec	tion Date:	2/10/06			Mudline Elevation (ft): -17.2	Recovery in ft (%):	11.2 (88)
Contra	actor: MCS	Environ	mental,	lnc.	N./LAT: 202959 E./LONG: 1269344	Process Date: 2/11	/06
Vessel	l: MCS ba	rge			Horiz. Datum: NAD 83 N Vert. Datum: MLLW	Process Method: (Cut tube
Opera	tor: Gary I	Maxwell			Method/Tube ID: Diver Impact Core/4" sq AI	Logged By: N.Bac	her, A.Fitzpatrick
Recovered Depth (ft)	Recov.interval & Sample	% Recovery (interval)	Chemical Analysis	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log
8	2-8	(7-9)	PCB SVOC	0	SP-SM: (7.2-12.7) moist, medium dense, very dark greenish gray (GLEY 1, 3/5GY) medium to coarse SAND, abundant silt clasts (rip-up clasts), trace sand, and silt interbeds. Sand is multicolored (orange, red, white). Grading coarser with depth.	@ 6.9' TV = 0.9 - kg/cm2 - transitional Contact	7— 7— 8— 8— 8— 8— 9—
11	-8-10 ——> LDW-SC32-10-11 M	(9-11) 87% (11-11.8) 73% (11.8- 12.7)		0	9.1-10.0' fresh wood 10.0' 1/8" diameter quartz grains to basal contact End of core at 11.2' Driven to refusal.	@ 9.2' TV = 0.6 kg/cm2 Slumping @ 11.2' to end of core.	lower alluvium

The RETEC Group, Inc.
1011 SW Klickitat Way, Suite 207
Seattle, WA 98134-1162
Phone: (206) 624-2839

Remarks: Drive Notes: freefall (2.0'), easy (8.0'), moderate (10.0'),
hard (12.7'), refusal (12.7'). One drive attempt made at station.

Calculated Recovery
Sample Length/Penetration Length:
11.2/12.7 = 88 %

	(ET		Sediment Core Lo	og	Sheet 1 of 2
Project: LDW RI/FS	}		Water Body Type: Lower Duwamish Waterway	Tube Length (ft): 1	6.1
Project #: PORS5-1	8220-511		Water Elevation (ft)/Tide: 8.4	Penetration Depth	(ft): 13.1
Client: LDWG			Water Depth (ft): 24.1	Sample Quality: G	ood
Collection Date: 2/1	0/06		Mudline Elevation (ft): -14.7	Recovery in ft (%):	10.2 (78)
Contractor: MCS En	vironment	al, Inc.	N./LAT: 202056 E./LONG: 1269267	Process Date: 2/11	/06
Vessel: MCS barge	:		Horiz. Datum: NAD 83 N Vert. Datum: MLLW	Process Method: (Cut tube
Operator: Gary Max	xwell		Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: N.Bac	her, A.Fitzpatrick
Recovered Depth (ft) Recov.Interval & Sample % Recovery	(interval) Chemical	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log
LDW-SC33-0-2	00% PCB SVOC Metals Hg PCB SVOC Metals Hg PCB SVOC Metals Hg	0	OL: (0.0-0.3) wet, soft, dark greenish gray (GLEY 1, 4/1) ORGANIC SILT, little sand, trace clay and rootlets. OH: (0.3-1.8) moist, medium stiff, black (GLEY 1, 2.5/N) ORGANIC SILT, little sand, trace worms. @ 1.3': 5" layer of wet, medium dense, black, coarse SAND, little silt, trace gravel. Trace to moderate H2S-like odor and trace black sheen. OL: (1.8-2.8) moist, medium stiff, very dark greenish gray (GLEY 1, 3/1) ORGANIC SILT, little clay and sand. Trace rootlets. Moderate H2S-like odor. @ 1.4' pale yellow (5Y, 7/4) fibrous clast with strong H2S-like odor - clast disintegrates when rolled ML/OH: (2.8-10.0) moist, medium stiff, black (2.5Y, 2.5/1) SILT to ORGANIC SILT, trace clay, sand, gravel, wood, and shell fragments. Trace 5" thick layers of silt, trace sand. Slight H2S-like odor. Trace debris (glass, metal).	Transitional Contact @ 0.9' TV = 0.6 kg/cm² 1.0' Transitional Contact Bag @ 1.9' (twine) @ 2.5' TV = 0.5 kg/cm² GT @ 3.0' Bag @ 3.2' (possible shell)	0
6 LDW.	PCB SVOC Metals 76% 5-7)	0	@ 4.4-5.0' shiny layer of SAND with wood, abundant shell fragments, 1/2" angular debris (1/4" silvery, shiny, metal chunk) and slight HC-like odor to 7.7' @ 5.7': glass shard (top of soda bottle) @ 6.0': no debris observed below 6.0'.	@ 5.0' TV = 0.6 kg/cm2 Bag @ 5.5' (chunks) Bag @ 5.6' (silver chunk) Bag @ 5.7' (glass shard)	\$\frac{1}{2}\$\$ \$\frac
The RETEC Group, Inc 1011 SW Klickitat Way		Remarks:	Drive Notes: freefall (0.6'), easy (9.0'), moderate (13.1	<u>'),</u> Calcula	ted Recovery
Seattle, WA 98134-116 Phone: (206) 624-9349	62	penetratio	on goal reached. Two drive attempts made at station.	Sample Length	/Penetration Length:
Fax: (206) 624-2839		Core catc	her was empty. Core tip smashed and side walls scor	red. 10.2/	13.1 = 78 %
		Field repli	cate is SC-201.	-	

	Z	•				Sediment Core Lo	og	Sheet 2 of	2
Project	: LD\	N RI	/FS			Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	16.1	
			5-18220	-511		Water Elevation (ft)/Tide: 8.4	Penetration Depth	(ft): 13.1	
Client:			_			Water Depth (ft): 24.1	Sample Quality: G	ood	
Collect	tion D	ate:	2/10/06			Mudline Elevation (ft): -14.7	Recovery in ft (%):	10.2 (78)	
Contra	ctor: 1	MCS	Enviror	mental,	Inc.	N./LAT: 202056 E./LONG: 1269267	Process Date: 2/11		
Vessel	: MC	S ba	rge			Horiz, Datum: NAD 83 N Vert. Datum: MLLW	Process Method: (Cut tube	
			Maxwell			Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: N.Bac	her, A.Fitzpat	rick
Recovered Depth (ft)	Recov.Interval	& Sample	% Recovery (interval)	Chemical Analysis	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft & Graphic L)
7		SC33-6-8 ——	81% (7-9)				@ 7.0' TV = 0.1 kg/cm2	upper:	7-
-8 -9		→	70% (9-11)	PCB SVOC	0	SM: (10-13.1) moist, medium dense, dark grayish brown (2.5Y, 4/2) SAND, little silt, grading to trace silt below 9.5 feet. Sand grains are multicolored (orange, red, white) and well sorted. Scattered rootlets (transitional unit to lower alluvium).	Transitional Contact © 9.0' TV = 0.1 kg/cm2	upper alluvium	8-
10		<u></u>				End of core at 10.2'.	Sampled to 10.0'.	<u> </u>	10 -
-11			45% (11-13.1)					lower alluvium	11-
12								wium	12
13									13.

Remarks: Drive Notes: freefall (0.6'), easy (9.0'), moderate (13.1'), penetration goal reached. Two drive attempts made at station.

Core catcher was empty. Core tip smashed and side walls scored.

Field replicate is SC-201.

Calculated Recovery

Sample Length/Penetration Length:

10.2/13.1 = 78 %

					Sediment Core Lo	og	Sheet 1 of 2
Project: LDW	/ RI/FS				Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	
Project #: PC	DRS5-1	8220-51	1		Water Elevation (ft)/Tide: 9.1	Penetration Depth	(ft): 12.2
Client: LDW	G				Water Depth (ft): 23.7	Sample Quality: G	bood
Collection Da	te: 2/1	7/06			Mudline Elevation (ft): -14.5	Recovery in ft (%):	9.3 (76)
Contractor: N	ICS En	vironme	ental, l	nc.	N./LAT: 202014 E./LONG: 1268831	Process Date: 2/1	8/06
Vessel: MCS					Horiz. Datum: NAD 83 N Vert. Datum: MLLW	Process Method:	Cut tube
Operator: Ga				-	Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: A.Fitz	zpatrick, C.Brackett
Depth (ft) Recov.Interval	& Sample % Recovery	(interval)	Analysis	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log
	V-SC34-0-1	Me Hg	OC tals	0	ML: (0.0-0.7) wet, medium stiff, dark olive brown (2.5Y, 3/3) SILT, little gravel, trace sand. Substantial wood fragments. OL: (0.7-3.8) moist, medium stiff, black (2.5Y, 2.5/1) ORGANIC SILT with substantial organic matter (twigs, leaves, stems, pine needles, shredded wood,	Transitional Contact	
		Me Hg	OC tals	0	wood fragments). Silt texture is slightly compressible, uniform, with moderate to low plasticity, and grading to unit below. Trace debris. @ 1.3' plastic zip-tie		
	LDW-SC34-2-4	Me Hg	OC tals	0		Town World Coulon	
4	<u>+</u>		·	0	ML: (3.8-7.2) moist, medium stiff, black (2.5Y, 2.5/1) SILT with scattered organic matter interbedded in 8" thick layers with very dark grayish brown (2.5Y, 3/2) fine SAND with moderate small shell fragments. Sand layers grade coarser (medium) with depth below 5.0'. Trace debris (glass) @ 3.4' glass shard	Transitional Contact Bag @ 3.4' (glass shard)	
 5		00% 5-7)					5-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1
-6	→			0	SM: (7.2-11.3) damp, dense, very dark greenish gray (GLEY 1, 3/1) slightly mottled medium SAND, trace gravel, silt, and 1-2" thick layers of dark brown	Sharp Contact	6-1
The RETEC Gr 1011 SW Klick			Re	marks:	Drive Notes: freefall (1.5'), easy (12.2'), penetration	Calcula	ated Recovery
Seattle, WA 98	3134-116	62		al react	ned. Two drive attempts made at station. Core		n/Penetration Length:
Phone: (206) 6: Fax: (206) 624-			ca	tcher w	as 100% full. No torvane or geotechnical samples	9.3	/12.2 = 76 %
			tak	en due	to frozen core. Field replicate of SC-203.		

1	7			Sediment Core Low-SC-34 (R2)	og	Sheet 2 of 2
Project: LDW F	RI/FS			Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	16.1
Project #: POF		-511		Water Elevation (ft)/Tide: 9.1	Penetration Depth	(ft): 12.2
Client: LDWG	_			Water Depth (ft): 23.7	Sample Quality: G	ood
Collection Date	: 2/17/06			Mudline Elevation (ft): -14.5	Recovery in ft (%):	9.3 (76)
Contractor: MC	S Enviror	mental, l	Inc.	N./LAT: 202014 E./LONG: 1268831	Process Date: 2/18	3/06
Vessel: MCS b	arge			Horiz. Datum: NAD 83 N Vert. Datum: MLLW	Process Method:	Cut tube
Operator: Gary	Maxwell			Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: A.Fitz	patrick, C.Brackett
Recovered Depth (ft) Recov.Interval & Sample	% Recovery (interval)	Chemical Analysis	PtD Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log
-7 CONVOCATOR 1 1 1 1 1 1 1 1 1	(7-9) <u>/</u>		0	SILT and scattered hard clay clasts. Sand is multicolored (orange, red, white) with quartz grains, slightly mottled. Trace debris (brick, glass). GP: (11.3-12.2) damp, dense, very dark greenish gray (GLEY 1, 3/1) SANDY GRAVEL with trace stiff, light gray, silt clasts up to 2". Gravel is angular and up to 2" in diameter. End of core at 9.3'. Note: Chemistry interval recorded as 9.4 ft. but sample was collected at bottom of core at 9.3 ft. Graphic expresses depth of sample collection; sample name matches project nomenclature.	Bag @ 7.9' (small brick fragment) Bag @ 8.7' (amber glass shard) Sharp Contact	upper alluvium 9— 10— 11— 11— 11— 11— 11— 11— 11— 11— 11

Remarks: Drive Notes: freefall (1.5'), easy (12.2'), penetration goal reached. Two drive attempts made at station. Core catcher was 100% full. No torvane or geotechnical samples

Calculated Recovery
Sample Length/Penetration Length:

9.3 / 12.2 = 76 %

taken due to frozen core. Field replicate of SC-203.

	A RETE	Sediment Core Lo	Og Sheet 1 of 2
	Project: LDW RI/FS	Water Body Type: Lower Duwamish Waterway	Tube Length (ft): 16.1
	Project #: PORS5-18220-511	Water Elevation (ft)/Tide: 6.7	Penetration Depth (ft): 10.2
	Client: LDWG	Water Depth (ft): 21.2	Sample Quality: Good
	Collection Date: 2/14/06	Mudline Elevation (ft): -13.8	Recovery in ft (%): 8.3 (81)
	Contractor: MCS Environmental, Inc	N./LAT: 201602 E./LONG: 1269260	Process Date: 2/15/06
L	Vessel: MCS barge	Horiz. Datum: NAD 83 N Vert. Datum: MLLW	Process Method: Cut tube
-	Operator: Gary Maxwell	Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: L.McKee, A.Fitzpatrick
	Recovered Depth (ft) Recov.Interval & Sample % Recovery (interval) Chemical Analysis	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments In-situ for Recovered Depth (ft) Depths & Graphic Log
	100% (0-1) SVOC Metals Hg 100% (1-4) PCB SVOC Metals Hg 100% (1-4) PCB SVOC Metals Hg 100% (1-4) PCB SVOC Metals Hg	OL: (0.0-0.7) wet, soft, olive brown (2.5Y, 4/3) ORGANIC SILT, few sand. OL: (0.7-4.2) moist, soft, black (2.5Y, 2.5/1) ORGANIC SILT, little clay, trace pockets of SILT. Silt texture is slightly compressible, blocky, uniform, and of low plasticity. Scattered worms, rootlets, and wood fragments up to 2" L. Slight H2S-like odor toward basal contact.	Transitional Contact GT @ 0.9' @ 0.9' TV = 0.2 kg/cm2
+++++++++++++++++++++++++++++++++++++++	76% (4-6)	ML: (4.2-5.5) moist, medium stiff, black (2.5Y, 2.5/1) SILT, few sand, 1/2" layers and pockets of gray (2.5Y, 5/1) SILT, little clay. Slight H2S-like odor.	Transitional Contact
+	LDW-SC35-4,9-6 ← 73% (6-8)	SP: (5.5-10.2) [moist, dense], very dark greenish gray (GLEY 1, 3/1) fine SAND, trace gravel and 2" thick convex layers of olive gray silt. Sand grains are multicolored (orange, red, white); gravel is subrounded to subangular and is up to 2" L. Trace debris (concrete). @ 5.3' to 5.9' concrete fragments	Sharp Contact Bag @ 5.3' (4" piece concrete) @ 5.9 TV = 0.5 kg/cm2
	The RETEC Group, Inc. 1011 SW Klickitat Way, Suite 207	ks: Drive Notes: freefall (0.8'), easy (3.7)', moderate (8.0), hard Calculated Recovery
1	Seattle, WA 98134-1162 (10.2	refusal (10.2'). Two drive attempts made at this station.	_
	Phone: (206) 624-9349	p crushed, but full.	8.3 / 10.2 = 81 %
		<u> </u>	

4		1)			n ()	Sediment Core Lo	og	Sheet 2 of 2
Proje	ect: L	LDW	RI/F	-s			Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	16.1
Proj	ect #:	: PC	R\$5	5-18220-	-511		Water Elevation (ft)/Tide: 6.7	Penetration Depth	(ft): 10.2
Clie	Client: LDWG Collection Date: 2/14/06					Water Depth (ft): 21.2	Sample Quality: G	ood	
Coll						Mudline Elevation (ft): -13.8	Recovery in ft (%):	8.3 (81)	
Con	tracto	or: M	CS I	Environ	mental,	Inc.	N./LAT: 201602 E./LONG: 1269260	Process Date: 2/15	5/06
Ves	sel: I	MCS	bar	ge			Horiz. Datum: NAD 83 N Vert. Datum: MLLW	Process Method: (Cut tube
Ope	rator	: Ga	ry M	laxwell			Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: L.Mcl	Kee, A.Fitzpatrick
Recovered	Depth (ft)	Recov.Interval	& Sample	% Recovery (interval)	Chemical Analysis	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log
8 9 9 10			SC36-6-8 ——————————————————————————————————	50% (8-10) 100% 10-10.2)			End of core at 8.3'. Driven to refusal.	Sampled to 8.0'.	10 10 10 10 10 10 10 10

The RETEC Group, Inc. 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134-1162 Phone: (206) 624-2839 Remarks: Drive Notes: freefall (0.8'), easy (3.7)', moderate (8.0'), hard Calculated Recovery Sample Length/Penetration Length:

Core tip crushed, but full. Sample Length/Penetration Length:

8.3 / 10.2 = 81 %

		7			Sediment Core Lo	og	Sheet 1 of 2
	Project: LDW R	I/FS			Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	
	Project #: POR	S5-18220-	511		Water Elevation (ft)/Tide: 2.9	Penetration Depth	(ft): 12.3
	Client: LDWG				Water Depth (ft): 17.4	Sample Quality: G	
-	Collection Date				Mudline Elevation (ft): -12.3	Recovery in ft (%):	
-	Contractor: MC		nental,	Inc.	N./LAT: 201490 E./LONG: 1269988	Process Date: 2/10	
-	Vessel: MCS b				Horiz. Datum: NAD 83 N Vert. Datum: MLLW	Process Method:	
-	Operator: Gary			<u> </u>	Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: L.McI	Cee, A.Fitzpatrick
	Depth (ft) Recov.interval & Sample	% Recovery (interval)	Chemical Analysis	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log
	-0	_	PCB SVOC Metals Hg TBT PCB SVOC Metals	0	OL: (0.0-0.4) wet, soft, olive brown (2.5Y, 4/3) ORGANIC SILT, few sand, trace worms. OL: (0.4-3.6) wet, medium stiff, black (2.5Y, 2.5/1) ORGANIC SILT. Scattered wood fragments up to 2" L, small shell fragments, and rootlets decreasing with depth. Silt texture is slightly compressible, blocky, massive, and of low plasticity. Slight H2S-like odor.	Transitional Contact @ 0.9' TV = 1.4 kg/cm2	1—————————————————————————————————————
	-2 N	84% F (2-5) S	Hg TBT PCB SVOC Metals Hg TBT	0	@ 2.0' 1/2" thick layer of medium sand	GT @2.1'	recent
	4				ML: (3.6-6.2) wet, medium stiff, dark greenish gray (GLEY 1, 4/10Y) SILT, little sand, interbedded with 3" thick layers of greenish black (GLEY 1, 4/10Y) ORGANIC SILT (banded), scattered rootlets and twigs. (transitional unit) @ 4.9' whole clam shell 1" L	Transitional Contact @ 3.9' TV = 1.1 kg/cm2	### ### ### ### ### ### #### #########
	10W-8C36-4-6	(5-0)		0	MH: (6.2-9.8) moist to wet, medium stiff, dark greenish gray (GLEY 1, 4/10Y), SILT. Silt texture is homogenous. Scattered rootlets.	Transitional Contact © 5.9' TV = 1 kg/cm2	6— upper alluv
	The RETEC Grou 1011 SW Klickital Seattle, WA 9813 Phone: (206) 624- Fax: (206) 624-28	Way, Suite 4-1162 9349	207 <u>h</u>	ard (12.3	Drive Notes: freefall (0.4'), easy (3.0'), moderate (11.0'), refusal (12.3'). One drive attempt made at station. her was 50% full. Feild replicate of SC-202.	Sample Lengti	ated Recovery n/Penetration Length: / 12.3 = 83 %

	3				Sediment Core Lo	og	Sheet 2 of 2
Proje	ect: LDW RI	/FS			Water Body Type: Lower Duwamish Waterway	Tube Length (ft): 1	6.1
	ect #: PORS		-511		Water Elevation (ft)/Tide: 2.9	Penetration Depth	(ft): 12.3
Clien	nt: LDWG				Water Depth (ft): 17.4	Sample Quality: G	ood
Colle	ection Date:	2/15/06			Mudline Elevation (ft): -12.3	Recovery in ft (%):	10.2 (83)
Cont	ractor: MCS	Environ	mental, l	Inc.	N./LAT: 201490 E./LONG: 1269988	Process Date: 2/16	/06
Vess	el: MCS ba	rge			Horiz, Datum: NAD 83 N Vert. Datum: MLLW	Process Method: (Cut tube
Oper	rator: Gary I	Maxwell			Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: L.Mck	ee, A.Fitzpatrick
Recovered	Depth (ft) Recov.interval & Sample	% Recovery (interval)	Chemical Analysis	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth Interval in feet with parentheses)	Comments for Recovered Depths	<i>In-situ</i> Depth (ft) & Graphic Log
—7	SC36-6-8	85% (8-10)		0	@ 7.4' 5" thick layer of black SILT, few clay SP- SM: (9.8-12.3) moist to damp, [dense], very dark greenish gray (GLEY 1, 3/1) fine SAND with	@ 7.8' TV = 0.9 kg/cm2 Transitional Contact	I
9	LDW-SC36-8-10				uniform 1" thick layers of alternating very fine SAND, little silt and SILT. Banded layers are slightly convex. Sand grains are multi-colored (red, white, orange) and grade to medium sand at basal contact. Trace wood fragments up to 3".	@ 9.0' TV = 0.9 kg/cm2	9-
10		69% (10-11)			End of core at 10.2'. Driven to refusal.	Slight winnowing from 10.0-10.2' Sampled to 10.0'.	10 -
— 11		75% (11-12.3)					er alluvium
12							12-

The RETEC Group, Inc. 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134-1162 Phone: (206) 624-2839

Remarks: Drive Notes: freefall (0.4'), easy (3.0'), moderate (11.0'), hard (12.3'), refusal (12.3'). One drive attempt made at station.

Core catcher was 50% full. Feild replicate of SC-202.

Calculated Recovery Sample Length/Penetration Length: 10.2/12.3 = 83 %

		7			Sediment Core Lo	og	Sheet 1 of 2	
	Project: LDW RI/FS				Water Body Type: Lower Duwamish Waterway	Tube Length (ft): 16.1		
	Project #: PO	Project #: PORS5-18220-511			Water Elevation (ft)/Tide: 8.2	Penetration Depth (ft): 8,6 Sample Quality: Good Recovery in ft (%): 6.9 (80) Process Date: 2/22/06 Process Method: Cut tube		
	Client: LDWG				Water Depth (ft): 19.8			
	Contractor: MCS Environmental, Inc.				Mudline Elevation (ft): -11.4			
				ıl, Inc.	N./LAT: 201435 E./LONG: 1270690			
					Horiz, Datum: NAD 83 N Vert. Datum: MLLW			
	Operator: Gar	ry Maxwel	II.		Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: L.McKee		
	Depth (ff) Recov.Interval	% Recovery (interval)	Chemical	PID	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log	
	O	LDW-SC37-0-1	PCB SVOC Metals Hg	0	OL: (0.0-0.3) wet, soft, olive brown (2.5Y, 4/3) ORGANIC SILT, few sand. OL: (0.3-3.2) moist, medium stiff, black (2.5Y, 2.5/1) ORGANIC SILT, few layers of olive gray silt, little clay and black fine to medium sand, little silt. Silt texture is slightly compressible, [massive, blocky], and of low plasticity. Trace debris and scattered	Transitional Contact @ 0.4' TV = 0.2 kg/cm2 GT @ 0.9'		
	1.1.1.1	100% (1-3) (1-3)	PCB SVOC Metals Hg	0	wood fragments.	Bag @ 1.5' (copper wire) @ 1.9' TV = 0.1 kg/cm2		
	3	LDW-SC37-2-4 (3-4)	SVOC Metals Hg		ML: (3.2-6.3) moist, medium stiff, black (2.5Y, 2.5/1) SILT, layers of moist, dense, black, fine sand and trace 2" L clasts of SILT, little clay. Abundant black conglomerates up to 2" L (anthropogenic, asphaltlike; 35%). Moderate metallic and rainbow sheen florets up to 1" L and moderate HC-like odor associated with sand from 3.0' to 5.3'. Trace wood fragments up to 3" L (10%).	GT @ 2.2' Transitional Contact @ 3.6' TV = 0.5		
	-4	80% (4-6)		0		kg/cm2 Bag @ 3.9' (1/2- vesicular, 1/2- metallic, shiny, fused conglomerate)	4 + + + + + + + + + + + + + + + + + + +	
+	-5	-5.3 → ← L			SP: (6.3-8.6) moist, medium dense, black (2.5Y, 2.5/1) SAND, few 1" L green-gray silt clasts. Sand grains are multicolored (red, white, orange).	@ 5.0' TV = 1.3 kg/cm2 Slumping in sand below 5.2'	Jvium	
The RETEC Group, Inc. Remarks					Drive Notes: freefall (1.4'), easy (3.0'), moderate (6.5'),			
1011 SW Klickitat Way, Suite 207 Seattle, WA 98134-1162 Phone: (206) 624-9349 Fax: (206) 624-2839					6'), refusal (8.6'). One drive attempt made at station. Core Sample Length/Penetration Length:			
rainbow sheen florets along sidewalls from 0.5' to 4.0' up to 1/2" diameter.								

						Sediment Core Lo	Sediment Core Log LDW-SC-37 (R1)			
Project	t: LDV	V RI/	FS			Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	16.1		
Project	t#: P0	ors	5-18220)-511		Water Elevation (ft)/Tide: 8.2	Penetration Depth	(ft): 8.6		
Client:	: LDW	G				Water Depth (ft): 19.8	Sample Quality: G	lood		
Collect	tion Da	ate: 2	2/22/06			Mudline Elevation (ft): -11.4	Recovery in ft (%):	6.9 (80)		
Contra	actor: N	/ICS	Enviror	nmental,	Inc.	N./LAT: 201435 E./LONG: 1270690	Process Date: 2/2	2/06		
Vessel	l: MCS	S bai	rge			Horiz, Datum: NAD 83 N Vert, Datum: MLLW	Process Method:	Cut tube		
Operat	tor: G	ary N	/laxwell			Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: L.McI	Kee		
Recovered Depth (ft)	Recov.interval	& Sample	% Recovery (interval)	Chemical Analysis	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log		
6 7		DW-SC37-5.3-6.9>	75% (6-8)	PCB SVOC Metals	0	End of core at 6.9'. Driven to refusal.		6·		
-8			78% (8-8.6)					lower alluvium		

Remarks: Drive Notes: freefall (1.4'), easy (3.0'), moderate (6.5'),

Calculated Recovery

hard (8.6'), refusal (8.6'). One drive attempt made at station. Core Sample Length/Penetration Length: catcher was 100% full. Steep slope and pier pilings in area. Scattered

6.9 / 8.6 = 80 %

rainbow sheen florets along sidewalls from 0.5' to 4.0' up to 1/2" diameter.

A RETI		Sediment Core Loudent Core Loud	•	Sheet 1 of 1		
Project: LDW RI/FS		Water Body Type: Lower Duwamish Waterway Tube Length (ft): 16.1				
Project #: PORS5-18220-511		Water Elevation (ft)/Tide: 9.8 Penetration Depth (ft): 5.6				
Client: LDWG		Water Depth (ft): 6.6	iood			
Collection Date: 2/20/06		Mudline Elevation (ft): +3.4	Recovery in ft (%):	3.8 (68)		
Contractor: MCS Environmental,	Inc.	N./LAT: 200959 E./LONG: 1269745	Process Date: 2/2	1/06		
Vessel: MCS barge		Horiz, Datum: NAD 83 N Vert. Datum: MLLW	Process Method:	Cut tube		
Operator: Gary Maxwell		Method/Tube ID: Diver Impact Core/4" sq. Al	Logged By: L.McI	Kee, A.Fitzpatrick		
Recovered Depth (ft) Recov.Interval & Sample % Recovery (interval) Chemical Analysis	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log		
PCB SVOC Metals	0	OL: (0.0-1.2) wet, medium stiff, mottled black (2.5Y, 2.5/1) SILT. Trace wood fragments up to 4" L. Silt texture is slightly compressible and of low plasticity. Slight H2S-like odor.	GT @ 0.3' @ 0.5' TV = 0.1 kg/cm2	recent —		
DW SVOC Metals Hg (0-3)	0	ML: (1.2-2.5) wet, medium stiff, dark brown (7.5Y, 3/2) SILT, 1" thick layer of fine sand. Silt is slightly jumbled and grades to black. Trace wood fragments and rootlets up to 1.5" L.	@ 1.5' TV = 1.1 kg/cm2			
DD PCB SVOC Metals Hg	0	ML: (2.5-3.8) wet, medium stiff, black (2.5Y, 2.5/1) SILT, scattered seams of medium sand from 1/8" to 1/2" thick. Moderate to heavy HC-like rainbow sheen and odor concentrated in sand seams. Greasy texture.	@ 2.0' to 3.0' Sheen Test = heavy rainbow sheen (100%) @ 2.5' TV = 0.7 kg/cm2	upper alluvium -		
75% Metals (3-4)		SP: (3.8-5.6) wet, loose, very dark greenish gray (GLEY 1, 3/1) medium SAND, trace 1/2" diameter silt pockets and scattered wood fragments up to 1" L. Sand is well sorted.	Sharp Contact	3		
63% (4-5)		End of R1 core at 3.1'. Driven to refusal at 4.5'. End of R2 core at 3.8'. Driven to refusal at 5.6'. Sample 3-3.3' collected from R2. Other samples from R1, collected closer to shore.	Core 20% winnowed below 3.3'. Not sampled below 3.3'.	4		
75% R2 (5-5.6)				lower alluvium		
The RETEC Group, Inc.	emarks:	Drive Notes: no freefall, easy (3'), moderate (4'), hard	d (5.6'), Colouis	ted Pacavery		
1011 SW Klickitat Way, Suite 207 Seattle, WA 98134-1162 re		6'). Two drive attempts made at station. Core tip crus	/ Calcula	ted Recovery /Penetration Length:		
Phone: (206) 624-9349		ombined: 0-3' (R1) and 3-3.8' (R2). Header notes are fr		5.6 = 68 %		
]		1 1st Ave Bridge and R2 from 20' further downslope; t		U.U UQ /0		
<u>"</u>			agged saild diff.			

		7					Sediment Core Lo	<u></u>			
	Project	: LDV	V RI/	FS			Water Body Type: Lower Duwamish Waterway	Tube Length (ft): 16.1			
	Project	#: P	ORS	5-18220	-511		Water Elevation (ft)/Tide: 5.3	(ft): 12.4			
	Client:	LDW	G				Water Depth (ft): 9.8	Sample Quality: G	iood		
	Collect	ion D	ate: 2	2/15/06			Mudline Elevation (ft): -5	Recovery in ft (%):	9.2 (74)		
	Contra	ctor: 1	иcs	Enviror	nmental	l, Inc.	N./LAT: 200657 E./LONG: 1270056	Process Date: 2/10	6/06		
	Vessel	: MC	S ba	rge			Horiz. Datum: NAD 83 N Vert. Datum: MLLW	Process Method:	Cut tube		
	Operat	or: G	ary l	/laxwell			Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: L.McI	Kee		
	Recovered Depth (ft)	Recov.Interval	& Sample	% Recovery (interval)	Chemical Analysis	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log		
4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	0		LDW-SC39-0-1 LI	100% (0-1)	PCB SVOC Metals Hg Pesticid TBT Dioxins/ Furans FCB		OL: (0.0-0.4) very wet, very soft, olive brown (2.5Y, 4/3) ORGANIC SILT, few sand. SP-SC: (0.4-2.5) moist, dense, very dark greenish gray (GLEY 1, 3/1) gravelly medium SAND. Sand is multicolored (orange, red, white); gravel is subrounded up to 2" L. Trace debris to 3.0' (brick fragments).	Transitional Contact			
	2	0.0	LDW-SC39-1-2	82%	SVOC Metals Hg Pesticid TBT Dioxins/ Furans		@ 1.3' brick fragment 2" L	Bag @ 1.3' (brick fragment)	0 0 0 0		
	-3		LDW-SC39-2-4	(1-3)	PCB SVOC Metals Hg Pesticid TBT Dioxins/ Furans		SM: (2.5-3.9) moist, dense, very dark greenish gray (GLEY 1, 3/1) medium SAND, little gravel, scattered interbeds of moist, stiff, black (2.5Y, 2.5/1) ORGANIC SILT, trace clay. Silt texture is slightly compressible, blocky, massive, and of low plasticity. Trace shell fragments, (transitional unit). OL: (3.9-7.5) moist, stiff, black (2.5Y, 2.5/1)	Transitional Contact Transitional Contact	Q Q Q Q Q Q Q Q Q Q Q Q Q Q Q Q Q Q Q		
	—4 —5	1	> < LDW-SC39-4-6	93% (3-5)	PCB	0	ORGANIC SILT. Silt texture is uniform, slightly compressible, blocky, massive, and of low plasticity. Trace rootlets and wood fragments up to 5" L.		4		
	—6	AN (1990)	5 ——> K—————————————————————————————————	72% (5-9)			ML: (7.5-10.3) moist, stiff, dark greenish gray (GLEY 1, 4/10Y) SILT , scattered 1" thick interbeds of moist, dense, black (2.5Y, 2.5/1) fine to medium		6		
	The RET	EC G	oup.	inc.		Remarks	Drive Notes: no freefall, easy (1.0'), moderate (9.0'), h	nard			
	1011 SW Seattle, 1	/ Klick	itat V	Vay, Suit	e 207		netration goal reached. One drive attempt made at st	Calcula	rted Recovery		
	Phone: (206) 6	24-93	349	1 -		· · · · · · · · · · · · · · · · · · ·		- I		
	Fax: (206	0) 024	-2839		-		her was 100% full. Difficult core extraction. No torval	ne 9.2 /	/12.4 = 74 %		
					1	neasurer	nents taken.				

13 RE		Sediment Core Lo	og	Sheet 2 of 2
Project: LDW RI/FS		Water Body Type: Lower Duwamish Waterway	Tube Length (ft): 1	6.1
Project #: PORS5-18220-51	1	Water Elevation (ft)/Tide: 5.3	Penetration Depth	(ft): 12.4
Client: LDWG		Water Depth (ft): 9.8	Sample Quality: G	ood
Collection Date: 2/15/06		Mudline Elevation (ft): -5	Recovery in ft (%):	9.2 (74)
Contractor: MCS Environme	ntal, Inc.	N./LAT: 200657 E./LONG: 1270056	Process Date: 2/16	6/06
Vessel: MCS barge		Horiz. Datum: NAD 83 N Vert. Datum: MLLW	Process Method: (Cut tube
Operator: Gary Maxwell		Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: L.McF	(ee
Recovered Depth (tt) Recov.Interval & Sample % Recovery (interval) Chemical	Analysis PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	<i>In-situ</i> Depth (ft) & Graphic Log
71% (9-10) 74% (10-12.4)	0	SP- SM: (10.3-12.4) moist, dense, very dark greenish gray (GLEY 1, 43/1) fine to medium SAND with alternating (banded) layers of very fine SAND, few silt and SILT. End of core at 9.2'.	Transitional Contact Winnowing @ 9.2 to 9.3'	9

Remarks: Drive Notes: no freefall, easy (1.0'), moderate (9.0'), hard

Calculated Recovery

(12.4'), penetration goal reached. One drive attempt made at station. Sample Length/Penetration Length:

Core catcher was 100% full. Difficult core extraction. No torvane

9.2 / 12.4 = 74 %

measurements taken.

		7			Sediment Core Log LDW-SC-40 (R3)			
-	Project: LDW F	RI/FS			Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	14.0	
ľ	Project #: POR	S5-18220	-511		Water Elevation (ft)/Tide: NA Penetration Depth (ft): 13.0			
Ì	Client: LDWG				Water Depth (ft): 10.4	Sample Quality: G	lood	_
Ì	Collection Date	: 2/23/06			Mudline Elevation (ft): -1.0	Recovery in ft (%):	10.0 (77)	
İ	Contractor: MS	s			N./LAT: 200339 E./LONG: 1270298	Process Date: 2/24	4/06	_
Ì	Vessel: R/V Na	ancy Anne	e		Horiz, Datum: NAD 83 N Vert, Datum: MLLW	Process Method:	Cut tube	_
İ	Operator: Bill	Jaworski			Method/Tube ID: Vibracore/3.5" round Al	Logged By: L.McI	Kee, C.Brackett	
	Depth (ft) Recov.Interval & Sample	% Recovery (interval)	Chemical Analysis	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log	
	-1 -2 -2 -2 -2 -2 -2 -2 -2 -2 -2 -2 -2 -2		PCB SVOC Metals Hg Pesticides Dioxins/ Furans PCB SVOC Metals Hg Pesticides Dioxins/ Furans		SP: (0.0-0.5) damp, medium dense, brown (7.5YR, 4/2) medium SAND. Sand grains are multicolored (orange, red, white). OL: (0.5-1.7) moist, soft, black (2.5YR, 2.5/1) ORGANIC SILT, little sand layers (2") alternating with layers (3") of moist, medium stiff, dark gray (GLEY 1, 4/N) SILT, few sand. Organic silt has scattered shell and wood fragments up to 1/2" L. Grades to sand at basal contact. SW: (1.7-13.0) moist, medium dense, brown (7.5Y,R, 4/2) medium to coarse SAND. Sand grains are multicolored (orange, red, white) and coarsen towards basal contact (from 6.0' to 10.0'). Slight H2S-like odor from 4' to 8'. @ 1.5' to 1.9': layer of SAND, little subrounded	@ 0.2' TV ≈ 0 kg/cm2 Tranistional Contact @ 0.7' TV = 0.3 kg/cm2 GT @ 1.2' Sharp Contact @ 2.2' TV = 0 kg/cm2 GT @ 2.5'	upper alluvium — >	2
	6	TOW SCAP 24 TOWN	PCB SVOC Metals Hg Pesticide: Dioxins/ Furans	0	gravel up to 1" L. Scattered brick fragments up to 1" L. @ 4.4' color changes to very dark gray sand	@ 3.0' TV = 0.1 kg/cm2 Oxidation @ 0.0' to 4.0'.		3-4
	The RETEC Grou 1011 SW Klickita	ıt Way, Suit	te 207		Drive Notes: no freefall , easy (13.0'), penetration go	Calcula	nted Recovery	
	Seattle, WA 9813 Phone: (206) 624	34-1162		eached.	Three drive attempts made at station. Station re-occu	upied Sample Lengtl	n/Penetration Lengt	h:
	Fax: (206) 624-28		w	ith vibra	acore after MCS drives. Core catcher was empty	10.0	/13.0 = 77 %	
			(0	.5' sedi	ment loss).			

	7	7 🚶			Sediment Core Lo	og	Sheet 2 of 2
Proje	ect: LDW R	II/FS			Water Body Type: Lower Duwamish Waterway	Tube Length (ft): 1	4.0
	ect #: POR		-511		Water Elevation (ft)/Tide: NA	Penetration Depth	(ft): 13.0
	nt: LDWG				Water Depth (ft): 10.4	Sample Quality: G	ood
_	ection Date	: 2/23/06			Mudline Elevation (ft): -1.0	Recovery in ft (%):	10.0 (77)
	tractor: MS				N./LAT: 200339 E./LONG: 1270298	Process Date: 2/24	
Vess	el: R/V Na	ncy Anne	•		Horiz. Datum: NAD 83 N Vert. Datum: MLLW	Process Method: (Cut tube
	rator: Bill J	_ -			Method/Tube ID: Vibracore/3.5" round Al	Logged By: L.Mck	(ee, C.Brackett
	Depth (ft) Recov.Interval & Sample	% Recovery (interval)	Chemical Analysis	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log
8 11 11 12 13	SC40-8-8 ——————————————————————————————————			0	End of core at 10.0'.		lower alluvium

Remarks: Drive Notes: no freefall, easy (13.0'), penetration goal

reached. Three drive attempts made at station. Station re-occupied Sample Length/Penetration Length:

with vibracore after MCS drives. Core catcher was empty

(0.5' sediment loss).

		7			1000 PR 1000		3	Sediment Core Lo	og	Sł	heet 1 of 2	}
r	Project:	LD\	V RI/	FS				Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	16.1	1	
	Project				-511			Water Elevation (ft)/Tide: 8.9	Penetration Depth (ft): 11.6			
	Client:	LDW	'G					Water Depth (ft): 15.6	Sample Quality: G	000	d	
ľ	Collection	on D	ate: 2	2/20/06				Mudline Elevation (ft): -6.5	Recovery in ft (%):	7.	.9 (66)	
Ī	Contrac	tor: I	vics	Enviror	ment	al, Inc.		N./LAT: 200294 E./LONG: 1271170	Process Date: 2/21			
-	Vessel:							Horiz, Datum: NAD 83 N Vert, Datum: MLLW	Process Method: (Cut	tube	
-	Operato							Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: L.Mcl			
	Recovered Depth (ft)	Recov.Interval	& Sample	% Recovery (interval)	Chemical	Old	Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths		<i>In-situ</i> Depth (ft) & Graphic Log	
	-0 -1 -2 -3		$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	83% (0-1) 100% (1-3) 100% (3-5)	PCB SVOC Metals Hg Dioxin Furans PCB SVOC Metals Hg Dioxin Furans PCB SVOC Metals Hg Dioxin Furans PCB SVOC Metals Hg Dioxin Furans PCB SVOC Metals Hg Dioxin Furans PCB SVOC Metals Hg Dioxin Furans PCB Dioxin Furans PCB Dioxin Furans PCB SVOC	s/s s/s s/s s/s s/s s/s		OL: (0.0-0.6) very wet, very soft, olive brown (2.5Y, 4/3) ORGANIC SILT, few sand. OL: (0.6-7.9) moist, soft to medium stiff, black (2.5Y, 2./1) ORGANIC SILT, few sand, interbedded with trace 1" to 3" thick layers of moist, soft, very dark greenish gray (GLEY 1, 3/1) SILT, little clay. Organic silt texture is uniform, slightly compressible, massive, blocky, and of low plasticity. Scattered rootlets, wood fragments up to 4" L, and trace shell fragments up to 1/2" L. Scattered 1/2" L sheen florets at depth.	@ 0.0' to 0.5' Sheen Test = no sheen Transitional Contact GT @ 1.2' @ 1.2' TV = 0.4 kg/cm2 GT @ 3.2' @ 3.5' TV = 0.2 kg/cm2 Slight winnowing @ 3.9' to 4.2' @ 5.3' TV = 0.4 kg/cm2	<pre> recent</pre>		3 4 5
+					<u> </u>	_			<u> </u>			- [†]
	The RETE 1011 SW				e 207	Remai	rks:	Drive Notes: freefall (2.0'), easy (11.6'), penetration g	oal Calcula	ted	l Recovery	
	Seattle, V	VA 9	8134-	1162		reache	ed.	One drive attempt made at station. Scattered HC-like	Sample Length	/Pe	enetration Ler	ngth:
						sheen	flor	ets along sidewalls from 4.0' to 5.4'.	7.7 /	11.	.6 = 66 %	
Fax: (206) 624-2839 sheen fi						I- I-		all wines				

RE		Sediment Core Lo	og	Sheet 2 of 2
Project: LDW RI/FS	_	Water Body Type: Lower Duwamish Waterway	Tube Length (ft): 1	6.1
Project #: PORS5-18220-	 511	Water Elevation (ft)/Tide: 8.9	Penetration Depth	(ft): 11.6
Client: LDWG		Water Depth (ft): 15.6	ood	
Collection Date: 2/20/06		Mudline Elevation (ft): -6.5	Recovery in ft (%):	7.9 (66)
Contractor: MCS Environr	nental, Inc.	N./LAT: 200294 E./LONG: 1271170	Process Date: 2/21	/06
Vessel: MCS barge		Horiz. Datum: NAD 83 N Vert. Datum: MLLW	Process Method: 0	Cut tube
Operator: Gary Maxwell		Method/Tube ID: Diver Impact Core/4" sq Ai	Logged By: L.McK	(ee
Recovered Depth (ft) Recov. Interval & Sample % Recovery (interval)	Chemical Analysis PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	<i>In-situ</i> Depth (ft) & Graphic Log
70% (8-10)	PCB 0	ML: (7.9-8.3) moist, soft, very dark greenish gray (GLEY 1 3/1) SILT, little clay. SP- SM: (8.3-10.9) damp, medium stiff, bluish gray (GLEY 2, 5/10B) SILT, few sand layers grading to fine SAND layers interbedded with black SILT (transitional unit). SP: (10.9-11.6) damp, medium dense, bluish gray (GLEY 2, 5/10B) fine SAND. Lost 0.2' of sand. End of core at 7.9'.	@ 6.6' TV = 0.5 kg/cm2 Transitional Contacts Sharp Contact	

				22 E		Sediment Core Lo	og	Sheet 1 of 3		
ĺ	Project: LD	W RI	'FS			Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	16.1		
Ì	Project #: P	ORS	5-18220)-511	,	Water Elevation (ft)/Tide: 8.8	Penetration Depth (ft): 15.9			
	Client: LDV	/G				Water Depth (ft): 20.2	Sample Quality: G	iood		
	Collection D	ate:	2/8/06			Mudline Elevation (ft): -11.9	Recovery in ft (%);	12.8 (79)		
	Contractor:	MCS	Enviro	nment	al, Inc.	N./LAT: 199898 E./LONG: 1271361	Process Date: 2/8/	/06		
	Vessel: MC	S ba	rge			Horiz. Datum: NAD 83 N Vert. Datum: MLLW	Process Method:	Cut tube		
	Operator: 6	ary f	Viaxwell	<u> </u>		Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: N. Ba	cher		
	Depth (ft) Recov. Interval	& Sample	% Recovery (interval)	Chemical	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log		
	1	LDW-SC42-0-1	100% (0-5)	PCB SVOC Metais Hg		OL: (0.0-0.2) very wet, very soft, very dark greenish gray (GLEY 1, 3/10Y) ORGANIC SILT, few sand and trace twigs. OL: (0.2-4.0) moist, medium stiff, black (GLEY 1, 2.5/N) ORGANIC SILT, few sand and clay. Scattered rootlets, shredded wood, and wood fibers. Less sand with depth. Trace H2S-like odor.	Transitional Contact © 0.7' TV = 0.3 kg/cm2 GT © 0.9'			
	-2	LDW-SC42-1-2		PCB SVOC Metais Hg PCB SVOC Metais Hg	0	@3.4' a distinct 3" thick layer of moist, soft, dark greenish gray SILT with scattered rootlets, fibers, shells, and black sheen	@ 1.3' TV = 0.5 kg/cm2	Recent		
+	-4	-> <			0	ML: (4-5.6) moist, medium stiff, black (GLEY 1, 2.5/N) SILT, few clay, grading to SILT; trace sand at basal contact. Trace rootlets and wood fibers. Sand grains are multicolored (orange, red, white).	Transitional Contact @ 4.3' TV = 0.5 kg/cm2	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		
	The RETEC G				Remark	s: Drive Notes: freefall (0.0'), easy (2.4'), moderate (15.5)'),	ted Decrees		
	1011 SW Klic Seattle, WA §			e 207		ion goal reached. Two drive attempts made at station.	Calcula	ted Recovery //Penetration Length:		
	Phone: (206) Fax: (206) 624	624-9	349		-	cher was empty, but natural plug as described by boat				
	. un. (200) UZ	. 2005	•			id in shoe.	12.8	/15.9 = 81 %		
-1					THE Sal	u iii ənve.				

	KET		Sediment Core Log LDW-SC-42 (R2) Sheet 2 of 3				
Project: LDW RI/F	s		Water Body Type: Lower Duwamish Waterway	Tube Length (ft): 1	6.1		
Project #: PORS5-	-18220-511		Water Elevation (ft)/Tide: 8.8	Penetration Depth (ft): 15.9			
Client: LDWG			Water Depth (ft): 20.2	Sample Quality: Good			
Collection Date: 2/	8/06		Mudline Elevation (ft): -11.9	Recovery in ft (%):	12.8 (79)		
Contractor: MCS E	nvironment	al, inc.	N./LAT: 199898 E./LONG: 1271361	Process Date: 2/8/	06		
Vessel: MCS barg			Horiz. Datum: NAD 83 N Vert. Datum: MLLW	Process Method: 0	Cut tube		
Operator: Gary Ma			Method/Tube ID: Diver Impact Core/4" sq AI	Logged By: N. Bac	cher		
Recovered Depth (ft) Recov.interval & Sample	% Recovery (interval) Chemical	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log		
-6	85% (5-8)		SM: (5.6-7.5) moist to wet, medium dense, dark greenish gray (GLEY 2, 4/10G) medium SAND, little gravel and silt. Sand grains are multicolored (orange, red, white). Gravel is rounded and up to 2" diameter.	Sharp Contact @ 5.7' TV = 0.5 kg/cm2	6		
- LDW-SC42-6-8		0	ML: (7.5-11.8) moist, medium stiff, black (GLEY 1, 2.5/N) SILT, little clay, grading to SILT, few gravel. Black sheen from 8' to to basal contact.	@ 7.5' TV = 1 kg/cm2	7—		
→ (LDW/s	70% (8-13)				8-1		
4SC42-8-10		0		@ 9.5' TV = 0.9 kg/cm2	- up		
10			ML: (11.8-13.8) moist, medium stiff, dark greenish gray (GLEY 1, 4/10Y) SILT with 1/8" to 1/4" thick seams of pale olive gray CLAY spaced every half foot. Trace debris.		upper alluvium		
LDW-S			@ 11.0' piece of thin plastic (resting ontop of core; location qualified)				
The RETEC Group, In	nc. I	Romarke	Drive Notes: freefall (0.0'), easy (2.4'), moderate (15.5))			
1011 SW Klickitat Wa Seattle, WA 98134-1	ay, Suite 207			Calculat	ed Recovery		
Phone: (206) 624-934			in goal reached. Two drive attempts made at station.		Penetration Length:		
Fax: (206) 624-2839		Fine sand	her was empty, but natural plug as described by boat	<u>crew.</u> 12.8/	15.9 = 81 %		

		Sediment Core Lo	og	Sheet 3 of 3
Project: LDW RI/FS		Water Body Type: Lower Duwamish Waterway	Tube Length (ft): 1	
Project #: PORS5-18220-511		Water Elevation (ft)/Tide: 8.8	Penetration Depth	(ft): 15.9
Client: LDWG	•	Water Depth (ft): 20.2	Sample Quality: G	ood
Collection Date: 2/8/06		Mudline Elevation (ft): -11.9	Recovery in ft (%):	
Contractor: MCS Environmen	tal, Inc.	N./LAT: 199898 E./LONG: 1271361	Process Date: 2/8/	
Vessel: MCS barge		Horiz, Datum: NAD 83 N Vert, Datum: MLLW	Process Method: (Cut tube
Operator: Gary Maxwell		Method/Tube ID: Diver Impact Core/4" sq AI	Logged By: N. Bae	cher
Recovered Depth (ft) Recov.interval & Sample % Recovery (interval) Chemical	Analysis PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log
C42-10-12	0	ML: (13.8-15.0) [moist, medium stiff], dark greenish gray (GLEY 1, 4/10Y) SILT, little clay.	Transitional Contact	11 —
- 12 		SP: (15.0-15.9) damp, medium dense, dark greenish gray (GLEY 1, 4/5GY) fine SAND, few silt with trace fine, horizontal, black streaks. End of core at 12.8'.	Core not sampled below 12.0'	12
— 14 67% (14-15.9) — 15				14

Remarks: Drive Notes: freefall (0.0'), easy (2.4'), moderate (15.9'),

penetration goal reached. Two drive attempts made at station.

Calculated Recovery
Sample Length/Penetration Length:

Core catcher was empty, but natural plug as described by boat crew.

12.8/15.9 = 81 %

Fine sand in shoe.

		7		R			Sediment Core Log LDW-SC-43 (R3)			
ľ	Project:	LDV	V RI/	FS			Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	16.1	
_	Project)-511		Water Elevation (ft)/Tide: 3.9	Penetration Depth	(ft): 15.9	
ſ	Client:	LDW	G				Water Depth (ft): 11.1	Sample Quality: G	ood	
T	Collecti	on D	ate: 2	2/22/06			Mudline Elevation (ft): -6.8	Recovery in ft (%):	9.8 (62)	
T	Contrac	ctor: N	лсs	Enviro	nmenta	ıl, Inc.	N./LAT: 199287 E./LONG: 1271846	Process Date: 2/2:		
T	Vessel:	MCS	S ba	rge			Horiz, Datum: NAD 83 N Vert, Datum: MLLW	Process Method: (Cut tube	
- 1-	Operato						Method/Tube ID: Diver Impact Core/4" sq AI	Logged By: L.Mcl	Kee	
	Recovered Depth (ft)	Recov.Intervaí	& Sample	% Recovery (interval)	Chemical	PID	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log	
╸ ╴ ╴╴ ╸╸╸╸╸╸╸╸╸╸╸╸╸╸╸╸╸╸╸╸╸╸╸╸╸╸╸╸╸╸			← LDW-SC43-0-2 → ← LDW-SC43-2-4 → ← LDW-SC43-4-6 → →	100% (0-0.5) 69% (0.5-3) 78% (3-7)	PCB SVOC Metals Hg	0	OL: (0.0-0.1) very wet, very soft, yellowish red (5YR, 4/6) ORGANIC SILT, little sand. OL: (0.1-0.7) moist, medium stiff, black (2.5Y, 2.5/1) ORGANIC SILT, little sand. Silt texture is uniform, slightly compressible, blocky, massive, and of low plasticity. ML: (0.7-3.8) moist, soft to medium stiff, gray (2.5Y, 5/1) SILT, little clay, interbedded with 1" thick, moist, medium dense, black (2.5Y, 2.5/1) fine to medium SAND. Silt texture is slightly compressible, of low plasticity, and rolls easily. Sand grains are multicolored (orange, red, white). Trace gray (7.5YR, 5/1) pockets of SILT, little clay up to 1/2" L. SP- SM: (3.8-11.9) moist, medium dense, gray (7.5YR, 5/1) fine to medium SAND, grading to medium sand below 4.0', interbedded with 1" thick, moist, soft to medium stiff, gray (2.5Y, 5/1) SILT. Trace layers of moist, dense, dark gray brown, well sorted, fine sand.	Transitional Contact Transitional Contact GT @ 0.9' @ 0.9' TV = 1.04 kg/cm2	recent 1 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	
	The RET					Remarks:	Drive Notes: freefall (0.5'), easy (7.0'), moderate (13.0	r'), hard	tad Bassus	
1	1011 SW Seattle, V	Klick	itat V	Vay, Suit	e 207		netration goal reached. Core catcher was half full.	Calcula	ted Recovery //Penetration Length:	
F	Phone: (2 Fax: (206	206) 6	24-93	349			measurments taken from R2. 1/2" HC-like sheen		_	
1	ах: (206	024	-2039				rets on sidewalls from 8.5' to 8.9'	9.8 /	15.9 = 62 %	
- 1						chaan tiai	rets on sidewalls from 8 5' to 8 9'			

		7	7				Sediment Core Log LDW-SC-43 (R3)						
Project: LDW RI/FS							Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	16.1				
ľ	Project :			220-511			Water Elevation (ft)/Tide: 3.9	Penetration Depth (ft): 15.9					
ļ	Client: I						Water Depth (ft): 11.1	Sample Quality: Good					
Ì	Collection	on Date	e: 2/22/0)6			Mudline Elevation (ft): -6.8 Recovery in ft (%): 9.8 (62)						
Ì	Contrac				tal. Ir	nc.	N./LAT: 199287 E./LONG: 1271846	Process Date: 2/23					
t	Vessel:						Horiz, Datum: NAD 83 N Vert. Datum: MLLW	Process Method: (
ŀ	Operato			rell			Method/Tube ID: Diver Impact Core/4" sq Ai	Logged By: L.Mc					
	Recovered Depth (ft)	Recov.Interval & Sample	Recovery		Analysis	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log				
┙╏╗╬╬╸┩┩┩╇╇╇╇╇╇╇╇╇╇╇╇╇╇╇╇╇╇╇╇╇╇╇╇╇╇╇╇╇╇╇╇╇		LIVE COLORD	755	6 1)		0	© 8' 1" thick layer of coarse SAND SW: (11.9-15.9) damp, stiff, black (2.5Y, 2.5/1), medium to coarse SAND, grading to coarse sand at basal contact. End of core at 9.8'.	Winnowing @ 8.5' to 8.9'. Sharp Contact	upper alluvium 7				
	The RET	EC Grou	ıp, Inc.	<u>-</u>	Rei	marks·	Drive Notes: freefall (0.5'), easy (7.0'), moderate (13.0						
	1011 SW Seattle, V	Klickita	t Way, S		1			Calcula	ted Recovery				
	Phone: (2	206) 624	-9349		1 `	,. .	netration goal reached. Core catcher was half full.		/Penetration Length:				
	Fax: (206	624-28	339		I —		neasurments taken from R2. 1/2" HC-like sheen	9.8 /	15.9 = 62 %				
					she	een flor	s on sidewalls from 8.5' to 8.9'.						

4		ETI		Sediment Core L LDW-SC-43 (R3)	og	Sheet 3 of 3
Project: LD	W RI/FS			Water Body Type: Lower Duwamish Waterway	Tube Length (ft): -	16.1
Project #: F		20-511		Water Elevation (ft)/Tide: 3.9	(ft): 15.9	
Client: LDV	VG			Water Depth (ft): 11.1	ood	
Collection [Date: 2/22/0	3		Mudline Elevation (ft): -6.8	Recovery in ft (%):	9.8 (62)
Contractor:	MCS Envir	onmental,	Inc.	N./LAT: 199287 E./LONG: 1271846	Process Date: 2/23	3/06
Vessel: MC	CS barge			Horiz. Datum; NAD 83 N Vert. Datum: MLLW	Process Method:	Cut tube
Operator: (Gary Maxw	ell		Method/Tube ID: Diver Impact Core/4" sq Ai	Logged By: L.McI	
Recovered Depth (ft) Recov.Interval	& Sample % Recovery (interval)	Chemical	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log
—13 —14 —15	26% (13-15					lower alluvium

The RETEC Group, Inc. 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134-1162 Phone: (206) 624-9349 Fax: (206) 624-2839 Remarks: Drive Notes: freefall (0.5'), easy (7.0'), moderate (13.0'), hard (14.0'), penetration goal reached. Core catcher was half full. Torvane measurments taken from R2. 1/2" HC-like sheen sheen florets on sidewalls from 8.5' to 8.9'.

Calculated Recovery

Sample Length/Penetration Length:

9.8 / 15.9 = 62 %

	A RETEC	Sediment Core Log LDW-SC-44 (R2)	Sheet 1 of 2		
	Project: LDW RI/FS	Water Body Type: Lower Duwamish Waterway	ube Length (ft): 16.1		
	Project #: PORS5-18220-511	Water Elevation (ft)/Tide: 10.0	Penetration Depth (ft): 11.7		
	Client: LDWG	Water Depth (ft): 12.0 S	Sample Quality: Good		
	Collection Date: 2/21/06		Recovery in ft (%): 5.8 (50)		
	Contractor: MCS Environmental, Inc.	N./LAT: 198925 E./LONG: 1272230 P	Process Date: 2/21/06		
	Vessel: MCS barge	Horiz. Datum: NAD 83 N Vert. Datum: MLLW P	Process Method: Cut tube		
	Operator: Gary Maxwell	Method/Tube ID: Driver Impact Core/4" sq Al L	ogged By: L.McKee, A.Fitzpatrick		
	ш,	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments In-situ for Recovered Depth (ft) Depths & Graphic Log		
	SVOC Metals Hg 1	OL: (0.4-4.8) moist, soft, black (2.5Y, 2.5/1) ORGANIC SILT with 1" thick layers of fine SAND, medium SAND, and SILT, little clay. Trace rootlets, wood and shell fragments. © 2.4' abundant 1" L glass shards SP- SM: (4.8-6.2) moist, dense, brown (7.5YR, 4/2) medium SAND, little gravel, interbedded with SILT. Gravel is subangular; sand grains are multicolored (orange, red, white) (transitional unit). © 3.3' 6" L subangular concrete conglomerate (anthropogenic)	ansitional Contact T @ 0.9' 1.2' TV = 0.9 y/cm2 2.6' TV = 0.6 y/cm2 ansitional Contact 3.2' TV = 0.6 y/cm2 ansitional Contact T @ 3.9' 3.3' (piece of inglomerate) ansitional Contact T @ 3.9' 5		
1	The PETEC Group Inc.	des Date Nation (1/0 cm			
	1011 SW Klickitat Way, Suite 207	rks: Drive Notes: freefall (3.0'), moderate (7.0'), hard (11.7'),	Calculated Recovery		
	Phone: (206) 624-9349	Il (11.7'). Two drive attempts made at station.	Sample Length/Penetration Length:		
	Fax: (206) 624-2839 Core	her was 66% full. 5.8 /11.7 = 50 %			

1			Sediment Core L LDW-SC-44 (R2)					
Project: LDW RI	/FS		Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	16.1			
Project #: PORS	55-18220-511		Water Elevation (ft)/Tide: 10.0	Penetration Depth	(ft): 11.7			
Client: LDWG			Water Depth (ft): 12.0	Sample Quality: G	le Quality: Good			
Collection Date:	2/21/06		Mudline Elevation (ft): -2.1					
Contractor: MCS	Environment	al, Inc.	N./LAT: 198925 E./LONG: 1272230	Process Date: 2/2	1/06			
vessel: MCS ba	rge		Horiz, Datum: NAD 83 N Vert. Datum: MLLW	Process Method:	Cut tube			
Operator: Gary	Maxwell		Method/Tube ID: Driver Impact Core/4" sq Ai	Logged By: L.McI	Logged By: L.McKee, A.Fitzpatrick			
Recovered Depth (ft) Recov.Interval	% Recovery (interval) Chemical	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log			
-7 -8 -9 -10	56% (7-9)		·		upper alluvium			
-11	40% (11-11.7)				11			

The RETEC Group, Inc. 1011 SW Klickitat Way, Suite 207	Remarks: Drive Notes: freefall (3.0'), moderate (7.0'), hard (11.7'),	Calculated Recovery		
Seattle, WA 98134-1162 Phone: (206) 624-9349	refusal (11.7'). Two drive attempts made at station.	Sample Length/Penetration Length		
Fax: (206) 624-2839	Core catcher was 66% full.	5.8 /11.7 = 50 %		

							Sediment Core Lo					
į	Project	: LDW	/ RI/	FS			Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	16.1			
	Project	#: PC	ORS	5-18220)-511		Water Elevation (ft)/Tide: 9.2 Penetration Depth (ft): 7.7					
	Client:	LDW	G				Water Depth (ft): 22.7	Sample Quality: Good				
	Collect	ion Da	ate: 2	2/21/06			Mudline Elevation (ft): -13.5	ne Elevation (ft): -13.5 Recovery in ft (%): 6.5 (84)				
	Contra	ctor: N	ics	Enviror	nmenta	l, Inc.	N./LAT: 198588 E./LONG: 1272647	Process Date: 2/2	1/06			
	Vessel	: MCS	baı	rge			Horiz, Datum; NAD 83 N Vert, Datum; MLLW	Process Method: Cut tube				
	Operat	or: Ga	ary N	/laxwell			Method/Tube ID: Driver Impact Core/4" sq AI	Logged By: L.McKee, A.Fitzpatrick				
	Recovered Depth (ft)	Recov.interval	& Sample	% Recovery (interval)	Chemical Analysis	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log			
	0		LDW-SC45-0-1	100% (0-1)	PCB SVOC Metals Hg	0	ML: (0.0-0.3) very wet, very soft, olive brown (2.5Y, 4/3) SILT. ML: (0.3-4.1) moist, medium stiff, black (2.5Y, 2.5/1) SILT, few sand, trace rootlets, wood and shell fragments.	Transitional Contact	1-			
			LDW-SC45-1-2	91% (1-5)	PCB SVOC Metals Hg	0		GT @ 1.1'				
			<		PCB SVOC Metals Hg	0	@ 2.2' scattered rainbow sheen florets to basal contact	@ 1.9' TV = 0.6 kg/cm2	2-			
	—3		LDW-SC45-2-4				@ 3' 1" thick layer of damp, black SAND with multicolored grains oriented transversely	Transitional Contact	upper			
	4		<u>↓</u>				ML: (4.1-4.5) moist, medium stiff, gray (2.5Y, 5/1) SILT, little clay.	@ 3.8' TV = 0.6 kg/cm2 GT @ 3.8'	er alluvium			
1	•		LDW-SC45-4-5			0	MH: (4.5-5.2) moist, medium stiff, black (2.5Y, 2.5/1) SILT, few sand, trace rootlets. Trace debris.	Transitional Contact	m			
	5						@ 4.8' 2" L piece of subrounded anthropogenic conglomerate (concrete)	Bag @ 4.8' (concrete conglomerate)	5-			
	6		.DW-SC45-5-6	71% (5-7.7)	PCB	0	SW: (5.2-7.7) moist, medium dense, black (2.5Y, 2.5/1) medium SAND, few silt and gravel. SAND grains are multicolored (orange, red, white) and grade to coarse near basal contact. Gravel is subrounded up to 1" L.	Sharp Contact © 5.6' TV = 0.7 kg/cm2	6			
	The RET	TEC G	Oun	inc		Romarko	: Drive Notes: freefall (0.8'), easy (5.0'), moderate (7.5')	hard				
	1011 SV	V Klick	itat V	Vay, Suit	te 207			Oblicule	ited Recovery			
	Seattle, Phone:	(206)6	24-9	349	-		usal (7.7'). Three drive attempts made at station. Core		h/Penetration Length:			
	Fax: (20	6) 624	-2839)	-		was 50% full. HC-like rainbow sheen on sidewalls and 6.5 /7.7 = 84 %					
						parting s	eams from 1.8' to 4.2'. r = recent					

13 RETEC	Sediment Core Log LDW-SC-45 (R3) Sheet 2 of 2			
Project: LDW RI/FS	Water Body Type: Lower Duwamish Waterway	Tube Length (ft): 16.1 Penetration Depth (ft): 7.7		
Project #: PORS5-18220-511	Water Elevation (ft)/Tide: 9.2			
Client: LDWG	Water Depth (ft): 22.7	Sample Quality: Good		
Collection Date: 2/21/06	Mudline Elevation (ft): -13.5	Recovery in ft (%): 6.5 (84)		
Contractor: MCS Environmental, Inc.	N./LAT: 198588 E./LONG: 1272647	Process Date: 2/21/06 Process Method: Cut tube		
Vessel: MCS barge	Horiz. Datum: NAD 83 N Vert. Datum: MLLW			
Operator: Gary Maxwell	Method/Tube ID: Driver Impact Core/4" sq Al	Logged By: L.McKee, A.Fitzpatrick		
Recovered Depth (ft) Recov.Interval & Sample % Recovery (interval) Chemical Analysis PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths In-situ Depth (ft) & Graphic Log		
7	End of core at 6.5'. Driven to refusal. Note: R1 core driven closer to shore (-7.2' MLLW) and to refusal at 9.5'; end of recovered core at 5.3'. A heavy petroleum-like sheen and odor observed from 4.5' to 5.3' in a gravel layer and throughout matrix (bottom of core). Trace staining on sidewalls and free phase blebs. A discrete sample collected of this unit at 5.0'.	Sheen test: heavy rainbow sheen and free phase product blebs.		

Remarks: Drive Notes: freefall (0.8'), easy (5.0'), moderate (7.5'), hard

(7.7'), refusal (7.7'). Three drive attempts made at station. Core

catcher was 50% full. HC-like rainbow sheen on sidewalls and

parting seams from 1.8' to 4.2'. r = recent

Calculated Recovery

Sample Length/Penetration Length:

6.5 / 7.7 = 84 %

THE CONTRACTOR OF THE CONTRACT	Sediment Core Log LDW-SC-46 (R1) Tube Logath (ft): 442				
Project: LDW RI/FS	Water Body Type: Lower Duwamish Waterway	Tube Length (ft): 14.0			
Project #: PORS5-18220-511	Water Elevation (ft)/Tide: NA	Penetration Depth (ft): 13.0			
Client: LDWG	Water Depth (ft): 16.8	ample Quality: Good			
Collection Date: 2/24/06	Mudline Elevation (ft): -7.6	Recovery in ft (%): 11.2 (86)			
Contractor: MSS	N./LAT: 198577 E./LONG: 1272117	Process Date: 2/24/06			
Vessel: R/V Nancy Anne	Horiz, Datum: NAD 83 N Vert. Datum: MLLW	Process Method: Cut tube			
Operator: Bill Jaworski	Method/Tube ID: Vibracorer/3.5" round Al	Logged By: L.McKee, C.Brackett			
Recovered Depth (ft) Recov.Interval & Sample % Recovery (interval) Chemical Analysis PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths In-situ Depth (ft) & Graphic Log			
0	OL: (0.0-2.3) wet to moist, medium stiff, black (2.5Y, 2.5/1) ORGANIC SILT, few sand, mottled with medium stiff, very dark greenish gray (GLEY 1, 3/1) SILT, little clay. Trace subrounded gravel, wood and shell fragments, rootlets, and worms. Silt texture is slightly compressible, of low plasticity, and increases in competency towards basal contact.	GT @ 1.1'			
	OL: (2.3-7.9) moist, medium stiff, black (2.5Y, 2.5/1) ORGANIC SILT, little clay, with scattered 1" thick layers of black, fine to medium SAND with multicolored grains (orange, red, white). Silt texture is compressible and blocky. Scattered wood fragments up to 1/2" L and shell fragments up to 2" L. Slight HC-like odor and sheen in upper portion of unit. Trace debris. ② 2.8' 1" shell layer with shells up to 1/2" L and slight HC-like odor and metallic sheen	@ 1.8' TV = 0.3 kg/cm2 Transitional Contact GT @ 2.1'			
DDW-SC46-2-4 PCB SVOC Metals Hg	@ 3.9' shell layer with shells up to 2" L and slight HC-like odor and rainbow sheen	@ 3.2' TV = 0.3 kg/cm2			
- 5	The modern and railibon sheeti	by the state of th			
1011 SW Klickitat Way, Suite 207 Seattle, WA 98134-1162 Phone: (206) 624-9349 goal react	E Drive Notes: freefall (3.5'), easy (13.0'), penetration hed. One drive attempt made at station. Core catcher ty (0.5' sediment loss). Calculated Recovery Sample Length/Penetration Length: 11.2/ 13.0 = 86 %				

	7				Sediment Core Lo						
Project:	LDW RI/I	FS			Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	14.0				
Project #	: PORS	5-18220	-511		Water Elevation (ft)/Tide: NA	Penetration Depth	(ft): 13.0				
Client: L	.DWG				Water Depth (ft): 16.8	Sample Quality: 0	Good				
Collection	n Date: 2	/24/06			Mudline Elevation (ft): -7.6	Recovery in ft (%)	11.2 (86)				
Contract	or: MSS				N./LAT: 198577 E./LONG: 1272117	Process Date: 2/2	Process Date: 2/24/06				
Vessel:	R/V Nane	cy Anne	;		Horiz, Datum: NAD 83 N Vert, Datum: MLLW	Process Method:	Cut tube				
Operator	r: Bill Ja	worski			Method/Tube ID: Vibracorer/3.5" round Al	Logged By: L.Mc	: L.McKee, C.Brackett				
Recovered Depth (ft)	Recov.Interval & Sample	% Recovery (interval)	Chemical Analysis	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-site Depth (& Graphic	ft)			
- 11			ĺ	ĺ	@ 6.9' 2" L piece of plastic	Ī		+			
——————————————————————————————————————	LDW-SC46-6.8-8 ← LDW-SC46-8-10 → LDW-SC46-10-11.2			0	SP: (7.9-13.0) damp, medium dense, brown (7.5YR, 4/2) medium SAND with trace 1-2" pockets of olive gray (GLEY 1, 3/1) SILT, little clay. Trace subrounded gravel up to 2". Grades to very dark greenish gray (GLEY 1, 3/1) medium SAND.	Sharp Contact		9—————————————————————————————————————			
L ₁₃ L							<u> </u> ↓ · · ·	13_+			
The DETE											

The RETEC Group, Inc. 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134-1162 Phone: (206) 624-9349 Fax: (206) 624-2839 was empty (0.5' sediment loss).

Remarks: Drive Notes: freefall (3.5'), easy (13.0'), penetration goal reached. One drive attempt made at station. Core catcher

Calculated Recovery Sample Length/Penetration Length: 11.2/13.0 = 86 %

							Sediment Core Lo							
Project: LDW RI/FS							Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	14.0					
	Project	#: PC	ORS	5-18220	-511		Water Elevation (ft)/Tide: NA	Penetration Depth	(ft): 13.0					
	Client:	LDW	G				Water Depth (ft): 10	Sample Quality: Good						
	Collect	ion Da	ite: 2	2/23/06			Mudline Elevation (ft): -0.4	Recovery in ft (%):						
	Contra	ctor: N	ISS				N./LAT: 197422 E./LONG: 1273340	Process Date: 2/23						
	Vessel:	R/V	Nan	cy Anne	e		Horiz. Datum: NAD 83 N Vert. Datum: MLLW	Process Method:	Cut tube					
	Operat	or: Bi	II Ja	worski			Method/Tube ID: Vibracorer/3.5" round AI	Logged By: L.McI	Cee, C.Brackett					
	Recovered Depth (ft)	Recov.Interval	& Sample	% Recovery (interval)	Chemical Analysis	PID	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log					
+++++++++++++++++++++++++++++++++++++++	- 0		LDW-SC47-0-1		PCB SVOC Metais Hg	0	ML: (0.0-0.1) very wet, very soft, olive brown (2.5Y, 4/3) SILT, few sand. SW: (0.1-0.7) moist, medium dense, brown (7.5YR, 4/2) medium to coarse SAND. Sand grains are multicolored (orange, red, white) and poorly sorted. Scattered rootlets.		recent	0				
	-2		LDW-SC47-1-2 I	79% (0-13)	PCB SVOC Metals Hg	0	OL: (0.7-2.9) moist, medium stiff, black (2.5Y, 2.5/1) ORGANIC SILT, little sand, trace layers of black, coarse SAND. Scattered shell and wood fragments up to 1" L and trace debris. Strong to mild H2S-like odor. @ 1' piece of 2" L anthropogenic conglomerate	GT @ 1.4' @ 1.8' TV = 0.2 kg/cm2	nbbel	2				
	-3		LDW-SC47-2-3		PCB SVOC Metals Hg	0	(concrete) SP- SM: (2.9-3.8) damp, medium dense, black (2.5Y, 2.5/1) medium SAND interbedded with black ORGANIC SILT, few sand.	Sharp Contact @ 2.6' TV = 0.2 kg/cm² GT @ 2.8' Sharp Contact	upper alluvium	3—				
+-+-+-	-4		LDW-SC47-3-4 - LDW		PC8 SVOC Metals Hg	0	SP: (3.8-13.0) damp to moist, dense, brown (7.5YR, 4/2) [medium] SAND, trace 1" thick layers of coarse sand and fine sand. Sand grains are multicolored (orange, red, white), uniform, and well sorted. Grades to very dark greenish gray (GLEY 1, 3/1) fine sand at basal contact. Trace wood fragments up to 1/2" L.	Sharp Contact		4				
	-5 -6		LDW-SC47-4-6> <					Oxidation @ 5.0' to 7.6' @ 5.5 TV = 0.1 kg/cm2		5				
+++++						0				_				
	The RET			, Inc. Nay, Sui	to 207	Remarks	Drive Notes: moderate (8.0'), hard (10.0'), refusal (13	3.0'). Calcula	ated Recovery					
	Seattle,	WA 9	8134	-1162	~~~	Core cato	ther was 50% full. Instrument not reading correctly du		•	th:				
	Phone: (20 Fax: (20					early part	of the drive. Three drive attempts made at station;	10.3	/13.0 = 79 %					
	' ' - ' '					station re	occupied with vibracore.							

	7			Sediment Core Lo						
Project: LDW	RI/FS			Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	14.0				
Project #: POF		-511		Water Elevation (ft)/Tide: NA	Penetration Depth	(ft): 13.0				
Client: LDWG				Water Depth (ft): 10 Sample Quality: Good						
Collection Date	2/23/06			Mudline Elevation (ft): -0.4	Recovery in ft (%):	10.3 (79)				
Contractor: MS	<u> </u>			N./LAT: 197422 E./LONG: 1273340	Process Date: 2/2:	3/06				
Vessel: R/V N	ancy Anne	:		Horiz. Datum: NAD 83 N Vert. Datum: MLLW	Process Method:	Cut tube				
Operator: Bill	Jaworski			Method/Tube ID: Vibracorer/3.5" round Al	Logged By: L.Mcl	Kee, C.Brackett				
Recovered Depth (ft) Recov.Interval		Chemical Analysis	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log				
8	TRIVISOATER		0	@8.9' 2" pocket of green-gray CLAYEY SILT End of core at 10.3'. Driven to refusal.	Not sampled below 10.0'.					

Remarks: Drive Notes: moderate (8.0'), hard (10.0'), refusal (13.0'). Core catcher was 50% full. Instrument not reading correctly during Sample Length/Penetration Length: early part of the drive. Three drive attempts made at station; station re-occupied with vibracore.

Calculated Recovery

10.3/13.0 = 79 %

Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.

		7	7	CONTRACTOR OF THE CONTRACTOR O		Sediment Core Lo				
	Project:	LDW R	I/FS			Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	16.1		
	Project	#: POR	S5-18220)-511		Water Elevation (ft)/Tide: 9.4 Penetration Depth (ft): 6.7				
	Client:	LDWG				Water Depth (ft): 37.4	Sample Quality: G	1000	b	
	Collection	on Date:	2/8/06			Mudline Elevation (ft): -22.3	Recovery in ft (%): 5.8 (86)			
	Contrac	otor: MCS	S Enviror	nmenta	ıl, Inc.	N./LAT: 196658 E./LONG: 127453	Process Date: 2/8/	/06	<u> </u>	
	Vessel:	MCS ba	arge			Horiz, Datum; NAD 83 N Vert, Datum; MLLW	Process Method:	Cut	tube	
	Operato	or: Gary	Maxwell	l		Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: N.Bac	che	r	
	Recovered Depth (ft)	Recov.Interval & Sample	% Recovery (interval)	Chemical	PID	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	8	<i>In-situ</i> Depth (ft) & Graphic Log	
	-0 -1 -2	LDW-SC48-0-1 LDW-SC48-1-2 <		PCB SVOC Metals Hg PCB SVOC Metals Hg	0	ML: (0.0-0.2) very wet, very soft, dark olive gray (5Y, 3/2) SILT, few sand, trace wood fragments, and worms. SW: (0.2-4.5) moist, medium dense, very dark greenish gray (GLEY 1, 3/5GY) fine to medium SAND, few silt. Sand grains are multicolored (orange, red, white). / SP- SM: (4.5-5.5) [moist, medium dense], dark greenish gray (GLEY 1, 4/5GY) fine SAND, little silt to SILT, little sand, thinly interbedded with lick seams of moist. [medium etiff] dark greenish broup.	Sharp Contact @ 0.6' TV = 0.1 kg/cm2 GT @ 0.9' (R1) @ 1.5' TV = 0.1 kg/cm2 GT @ 2.0' (R1) @ 3.0' TV = 0.1 kg/cm2 Transitional Contact	r		3-4-4-
	—5 —6	LDW-SC48-4-5.6>	66%			seams of moist, [medium stiff], dark grayish brown (10YR, 4/2) SILT, little clay. @ 5.0' 0.2' thick layer of medium stiff gray SILT, little clay, trace horizontal black streaks SM: (5.5-6.7) moist, medium dense, dark greenish gray (GLEY 1, 4/5GY) fine SAND, little silt. Sand grains are multicolored (orange, red, white). End of core at 5.8'. Driven to refusal.	@ 4.7' TV = 0.4 kg/cm2 50% winnowing below 5.8'.			5——————————————————————————————————————
	The RETI 1011 SW Seattle, V Phone: (2 Fax: (206	Klickitat NA 98134 206) 624-9	Way, Suit 4-1162 9349	te 207	refusal (6	Drive Notes: freefall (0.2'), easy (6.0'), hard (6.6'), .7'). Two drive attempts made at station. Core	Sample Length	ı/Pe	Recovery enetration Leng	gth:
(200) 02.7 2000									J- /-	

ARETE (Sediment Core Lo	Og Sheet 1 of 2		
Project: LDW RI/FS	Water Body Type: Lower Duwamish Waterway	Tube Length (ft): 16.1		
Project #: PORS5-18220-511	Water Elevation (ft)/Tide: 5,5	Penetration Depth (ft): 14.0		
Client: LDWG	Water Depth (ft): 28.9	Sample Quality: Good		
Collection Date: 2/6/06	Mudline Elevation (ft): -19.8	Recovery in ft (%): 11.4 (81)		
Contractor: MCS Environmental, Inc.	N./LAT: 195851 E./LONG: 1275477	Process Date: 2/6/06		
Vessel: MCS barge	Horiz, Datum: NAD 83 N Vert, Datum: MLLW	Process Method: Cut tube		
Operator: Gary Maxwell	Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: N.Bacher, A.Fitzpatrick		
	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths In-situ Depth (ft) & Graphic Log		
	OL: (0.0-1.1) very wet, soft, greenish black (GLEY 2, 2.5/10GY) ORGANIC SILT, little clay. Trace rootlets and worms. Moderate H2S-like odor. ② 0.7' 3" thick layer of wet, soft, black, silty, WOOD FRAGMENTS (60%), shredded, natural OL: (1.1-4.1) moist to wet, medium stiff, greenish black (GLEY 2, 2.5/10GY) ORGANIC SILT, little clay. Silt texture is homogenous, uniform, slightly compressible, and blocky; trace shell fragments up to 1/2" diameter and rootlets. SP: (4.1-4.4) damp, medium dense, very dark greenish gray (GLEY 1, 3/10GY) fine SAND. Sand grains are multicolored (orange, red, white). Moderate H2S-like odor. MH: (4.4-14.0) moist, medium stiff, greenish black (GLEY 1, 2.5/10Y) grading to black (GLEY 1, 2.5/N) SILT, few clay, with trace 1" thick layers of wood fragments and 1/2" to 6" thick layers of dark greenish gray (GLEY 1, 4/10Y) fine sand. Silt texture is slightly compressible and has a slight H2S-like odor that increases with depth; scattered wood fragments. Increasing stiffness with depth.	© 0.7° TV = 0.6 © 1.5° TV = 0.6 kg/cm2 GT @ 1.9° © 3.0° TV = 0.4 kg/cm2 Sharp Contact Sharp Contact © 5.0° TV = 0.4 kg/cm2		
 PCB PCB		@ 7.0' TV = 0.6 kg/cm2		
The RETEC Group, Inc.	rks: Drive Notes: none taken. One drive attempt made	Calculated Recovery		
1011 SW Klickitat Way, Suite 207 Seattle, WA 98134-1162 at star	tion. Core shoe was 100% full.	Sample Length/Penetration Length:		
Phone: (206) 624-9349 Fax: (206) 624-2839		11.4/14.0 = 81 %		

RETEC	Sediment Core Lo	og	Sheet 2 of 2
Project: LDW RI/FS	Water Body Type: Lower Duwamish Waterway	Tube Length (ft): 1	6.1
Project #: PORS5-18220-511	Water Elevation (ft)/Tide: 5.5	Penetration Depth (ft): 1 <u>4.0</u>
Client: LDWG	Water Depth (ft): 28.9	Sample Quality: Go	ood
Collection Date: 2/6/06	Mudline Elevation (ft): -19.8	Recovery in ft (%):	11.4 (81)
Contractor: MCS Environmental, Inc.	N./LAT: 195851 E./LONG: 1275477	Process Date: 2/6/0	96
Vessel: MCS barge	Horiz, Datum: NAD 83 N Vert, Datum: MLLW	Process Method: C	ut tube
Operator: Gary Maxwell	Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: N.Bacl	her, A.Fitzpatrick
Recovered Depth (ft) Recov.Interval & Sample % Recovery (interval) Chemical Analysis PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	<i>In-situ</i> Depth (ft) & Graphic Log
88% (8-10) PCB 5 10	End of core at 11.4'.	@ 9.0' TV = 0.5 kg/cm2 @ 10.5' TV = 0.5 kg/cm2 Sheen test @ 10.6' = very slight sheen with green irridescence (two 1/16" florets). Not sampled below 11.0'.	upper alluvium 10 11 11 11 11 11 11 11 11 11 11 11 11

The RETEC Group, Inc. 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134-1162 Phone: (206) 624-9349	Remarks: Drive Notes: none taken. One drive attempt made at station. Core shoe was 100% full.	Calculated Recovery Sample Length/Penetration Length:
Fax: (206) 624-2839		11.4/14.0 = 81 %

Project: LDW RI/FS							Sediment Core Lo	og	Sheet 1 of 2
							Water Body Type: Lower Duwamish Waterway	14.0	
	Projec	t#: P(ors	5-18220)-511		Water Elevation (ft)/Tide: NA	Penetration Depth	(ft): 13.0
	Client:	LDW	G				Water Depth (ft): 11.6	Sample Quality: G	lood
	Collec	tion Da	ate: :	2/24/06			Mudline Elevation (ft): -4.0	Recovery in ft (%):	9.8 (75)
	Contra	ctor: N	/ISS				N./LAT: 194871 E./LONG: 1276045	Process Date: 2/24	4/06
	Vesse	: R/V	Nan	cy Anne	е		Horiz, Datum: NAD 83 N Vert. Datum: MLLW	Process Method:	Cut tube
	Opera	tor: Bi	ill Ja	worski			Method/Tube ID: Vibracorer/3.5" round Al	Logged By: L.McI	Kee, C.Brackett
	Recovered Depth (ft)	Recov.interval	& Sample	% Recovery (interval)	Chemical	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log
	0 1	ח יין יין	LDW-SC50-0-1		PCB SVOC Metals Hg	0	ML: (0.0-1.2) wet, soft, black (2.5Y, 2.5/1) SANDY SILT grading to SILTY SAND at basal contact. © 0.9' 2" thick layer of wet, [dense], black (2.5Y, 2.5/1) GRAVEL, subangular, up to 1" diameter with possible 1/4" paint chip.	Transitional Contact @ 0.8' TV = 0.0 kg/cm2	
	- 2		LDW-SC50-1-2	75% (0-13)	PCB SVOC Metals Hg	0	MH: (1.2-2.7) [wet, soft], black (2.5Y, 2.5/1) SILT with some sand and few gravel interbedded and pocketed with very dark greenish gray (GLEY 1, 3/1) SILT, little clay. Scattered subangular gravel. Trace fibrous wood fragments up to 1/4" L. Slight HC-like odor.	GT @ 1.2' @ 1.5' TV = 0.2 kg/cm2	upper alluvium
			← 2-2.8 →		PCB SVOC Metals Hg	0	SM: (2.7-3.7) moist, [medium dense], very dark gray (GLEY 1, 3/N) fine SAND with moderate 1" diameter pockets of moist, medium stiff, black (2.5Y, 2.5/1) SILT, few sand. Trace rootlets, wood fragments, and 1" diameter subangular gravel. Slight H2S-like odor.	Transitional Contact Sharp Contact	/ium
	3		LDW-SC50-2.8-4		PCB SVOC Metals Hg	0	SP: (3.7-13.0) moist, medium dense, very dark greenish gray (GLEY 1, 3/N) medium SAND with few 1" thick layers of coarse sand, trace 2" to 3" diameter pockets of very dark greenish gray (GLEY 1, 3/1) SILT, little clay or black SILT, few sand from 2.8' to 5.5'. Grades to coarse sand at basal contact.	@ 3.2' TV = 0.0 kg/cm2 Salinity collected at 2.0' intervals from 2.8' to 9.8'.	→ · · · · · · · · · · · · · · · · · · ·
	-4 .		← LDW-S			0			
			LDW-SC50-4-6						5
+	-6					0			6
	The RET	TEC Gr	oup,	Inc. Vay, Suit	e 207	Remarks:	Drive Notes: freefall (4.0'), easy (10.0'), hard (13.0'),	Calcula	ted Recovery
	Seattle,	WA 98	3134	1162		penetratio	on goal reached. Three drive attempts made at station		/Penetration Length:
	Phone: Fax: (20					station re	occupied with vibracore. Core catcher was 100% full.	9.8 /	13.0 = 75 %
					[-				

				Sediment Core Lo	 	Sheet 2 of 2
Project: LDW RI	FS			Water Body Type: Lower Duwamish Waterway	Tube Length (ft): 1	
Project #: PORS	5-18220-511	<u></u> _		Water Elevation (ft)/Tide: NA	Penetration Depth	(ft): 13.0
Client: LDWG_				Water Depth (ft): 11.6	Sample Quality: G	
Collection Date:	2/24/06			Mudline Elevation (ft): -4.0	Recovery in ft (%):	9.8 (75)
Contractor: MSS				N./LAT: 194871 E./LONG: 1276045	Process Date: 2/24	/06
Vessel: R/V Nan	cy Anne	_		Horiz. Datum: NAD 83 N Vert. Datum: MLLW	Process Method: (Cut tube
Operator: Bill Ja	worski			Method/Tube ID: Vibracorer/3.5" round Al	Logged By: L.Mck	(ee, C.Brackett
Recovered Depth (ft) Recov.Interval	% Recovery (interval)	Analysis	Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log
-7 -8 -9 -10 -11 -12			0	End of core at 9.8'.		lower alluvium

Remarks: Drive Notes: freefall (4.0'), easy (10.0'), hard (13.0'), penetration goal reached. Three drive attempts made at station; station reoccupied with vibracore. Core catcher was 100% full.

Calculated Recovery
Sample Length/Penetration Length:
9.8 / 13.0 = 75 %

Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.

			Sediment Core Lo LDW-SC-51 (R1)	og	Sheet 1 of 2
	Project: LDW RI/FS		Water Body Type: Lower Duwamish Waterway	16.1	
	Project #: PORS5-18220-511		Water Elevation (ft)/Tide: 9.2	Penetration Depth	(ft): 10.6
	Client: LDWG		Water Depth (ft): 8.5	Sample Quality: fa	ıir
	Collection Date: 2/22/06		Mudline Elevation (ft): 0.8	Recovery in ft (%):	6.1 (58)
	Contractor: MCS Environmental,	Inc.	N./LAT: 194728 E./LONG: 1276135	Process Date: 2/22	2/06
	Vessel: MCS barge		Horiz. Datum: NAD 83 N Vert. Datum: MLLW	Process Method: (
	Operator: Gary Maxwell		Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: L.Mck	Cee
	Recovered Depth (ft) Recov.Interval & Sample % Recovery (interval) Chemical Analysis	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log
	78% PCB SVOC Metals Hg 1	0	ML: (0.0-0.4) very wet, very soft, dark reddish brown (2.5YR, 3/3) SILT, little sand. Scattered HC-like sheen florets and streaks up to 1" L. SW: (0.4-1.7) damp to moist, dense, black (2.5YR, 2.5/1) SAND, little gravel. Gravel is subangular and ranges in size from 1/4" to 1" L. Trace 1" layer of SILT, few sand. SM: (1.7-5.0) damp, medium dense, dark greenish gray (GLEY 1, 4/1) SAND with scattered pockets and 1/2" L seams of black (2.5YR, 2.5/1) SILT, few sand. Scattered 1" to 2" thick layers of GRAVEL or coarse SAND, few gravel. Scattered debris. Moderate HC-like odor. ② 1.8' brick fragment ② 2.0' rock fragment (marble) 0.2' L ② 2.6' 2" thick layer of coarse SAND, few gravel ③ 3.5' 1" thick layer of GRAVEL and moderate amounts of blue-metallic, flat, angular, sharp anthropogenic material. SP: (5.0-10.6) moist, dense, black (2.5YR, 2.5/1) medium SAND with trace 1" thick layers of coarse sand. Sand grains are multicolored (orange, red, white). Trace wood fragments up to 1" L.	Sheen Test = trace HC-like sheen GT @ 1.0' @ 1.1' TV = 0.8 kg/cm2 Transitional Contact Sheen Test = moderate HC-like sheen Bag @ 2.0' (marble) @ 2.4' TV = 0.2 kg/cm2 GT @ 2.5' Sheen Test = trace HC-like sheen Bag @ 3.5' (anthropogenic) Sharp Contact	recent \(\tag{upper alluvium} \)
+	The RETEC Group, Inc. 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134-1162 Phone: (206) 624-9349	efusal (10	Drive Notes: freefall (1.4'), moderate (5.6'), hard (10.6 0.6'). One drive attempt made at station. Core as 50% full.	Sample Length	ted Recovery //Penetration Length:

A RETE	Sediment Core Lo	Sheet 2 of 2
Project: LDW RI/FS	Water Body Type: Lower Duwamish Waterway	Tube Length (ft): 16.1
Project #: PORS5-18220-511	Water Elevation (ft)/Tide: 9.2	Penetration Depth (ft): 10.6
Client: LDWG	Water Depth (ft): 8.5	Sample Quality: fair
Collection Date: 2/22/06	Mudline Elevation (ft): 0.8	Recovery in ft (%): 6.1 (58)
Contractor: MCS Environmental, Inc.	N./LAT: 194728 E./LONG: 1276135	Process Date: 2/22/06
Vessel: MCS barge	Horiz. Datum: NAD 83 N Vert. Datum: MLLW	Process Method: Cut tube
Operator: Gary Maxwell	Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: L.McKee
Recovered Depth (ft) Recov. Interval & Sample % Recovery (interval) Chemical Analysis	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments In-situ for Recovered Depth (ft) Depths & Graphic Log
-6 -7 -8 -9 -44% (9-10.6)	End of core at 6.1'. Driven to refusal.	Not sampled below 5.8' due to winnowing 6— lower alluvium 8— 10—

The RETEC Group, Inc. 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134-1162 Phone: (206) 624-9349 Fax: (206) 624-2839 Remarks: Drive Notes: freefall (1.4'), moderate (5.6'), hard (10.6'),

refusal (10.6'). One drive attempt made at station. Core catcher was 50% full.

Calculated Recovery Sample Length/Penetration Length:

6.1 / 10.6 = 58 %

					53		Sediment Core Lo					
	Project	: LDV	V RI/	'FS			Water Body Type: Lower Duwamish Waterway Tube Length (ft): 16.1					
	Project	#: P	ORS	5-18220	-511		Water Elevation (ft)/Tide: 4	Penetration Depth	(ft): 10.3			
	Client:	LDW	G				Water Depth (ft): 5.8	Sample Quality: fa	air			
	Collect	ion D	ate: 2	2/7/06			Mudline Elevation (ft): 1.3	Recovery in ft (%):	5.9 (57)			
	Contra	ctor: I	vics	Enviror	nmental	, Inc.	N./LAT: 194160 E./LONG: 1276279	Process Date: 2/8/	06			
	Vessel	: MC	S ba	rge			Horiz. Datum: NAD 83 N Vert. Datum: MLLW	Process Method:	Cut tube			
	Operat	or: G	ary I	Viaxwell			Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: N.Bac	oher			
	Recovered Depth (ft)	Recov.Interval	& Sample	% Recovery (interval)	Chemicat Analysis	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log			
	0	1111 1111 1111	LDW-SC52-0-1	68% (0-3)	PCB SVOC Metals Hg	0	ML: (0.0-0.3) very wet, very soft, dark grayish brown (2.5Y, 3/2) SILT, few sand. Trace shredded wood fragments and twigs. OL: (0.3-0.9) moist, medium stiff, dark greenish gray (GLEY 1, 4/10GY) ORGANIC SILT, trace sand. Trace shredded wood fragments. Slight to moderate (H2S-like odor.	Transitional Contact Transitional Contact © 0.8' TV = 2.3 kg/cm2				
	2		LDW-SC52-1-2 (PCB SVOC Metals Hg	0	OL: (0.9-3.2) moist, medium stiff, black (GLEY 1, 2.5N) ORGANIC SILT with trace lenses of CLAY, few silt. Trace shredded wood fragments throughout and 1" thick layer of wood fragments at basal contact. Slight H2S-like odor.	GT @ 1.2' @ 1.6' TV = 1.9 kg/cm2				
	3		LDW-SC52-2-4	71% (3-4)	PCB SVOC Metals Hg	0	SP: (3.2-10.3) moist, medium dense, greenish black (GLEY 1, 2.5/5GY) fine SAND, little silt, grading to coarse sand towards basal contact. Sand grains are muticolored (orange, red, white). Trace wood fragments.	Sharp Contact				
	4			57% (4-6)		o		@ 3.4' TV = 0.5 kg/cm2 GT @ 3.7'				
	—5 						End of core at 5.9'. Driven to refusal.	End of sediment at 4.9'. One foot void (48% recovery)	5			
	The RET					Remarks:	Drive Notes: moderate (4'), hard (10.3'), refusal (10.3'	').	to d Document			
		/ Klick	itat V	Vay, Suit	e 207		ve attempts made at station. One foot of void space	Oulcula	ted Recovery /Penetration Length:			
	Phone:	(206) 6	24-9	349	-				•			
	Fax: (20	0) 024	-2039	,	-		2.0' and 3.0' at silt/sand contact; logged continuously.	5.9 /	10.3 = 57 %			
					18	EPA over	signt.					

		31 (3)	Sediment Core L LDW-SC-52 (R3)	og	Sheet 2 of 2
Project: LDW RI/FS			Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	16.1
Project #: PORS5-182	20-511		Water Elevation (ft)/Tide: 4	Penetration Depth	(ft): 10.3
Client: LDWG			Water Depth (ft): 5.8	Sample Quality: fa	air
Collection Date: 2/7/06			Mudline Elevation (ft): 1.3	Recovery in ft (%):	5.9 (57)
Contractor: MCS Envir	onmental,	Inc.	N./LAT: 194160 E./LONG: 1276279	Process Date: 2/8/	06
essel: MCS barge			Horiz, Datum; NAD 83 N Vert, Datum: MLLW	Process Method:	Cut tube
Operator: Gary Maxw			Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: N.Bac	her
Pecovered Depth (ft) Recov.Interval & Sample % Recovery	Chemical Analysis	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log
-7 -7 46% (7-9 -8					lower alluvium

Remarks: Drive Notes: moderate (4'), hard (10.3'), refusal (10.3').

Three drive attempts made at station. One foot of void space

between 2.0' and 3.0' at silt/sand contact; logged continuously. EPA oversight.

Calculated Recovery

Sample Length/Penetration Length:

5.9 / 10.3 = 57 %

	RETEC	Sediment Core Lo	Sheet 1 of 2
	Project: LDW RI/FS	Water Body Type: Lower Duwamish Waterway	Tube Length (ft): 16.1
	Project #: PORS5-18220-511	Water Elevation (ft)/Tide: 0.8	Penetration Depth (ft): 13.6
	Client: LDWG	Water Depth (ft): 16.3	Sample Quality: NA
	Collection Date: 2/6/06	Mudline Elevation (ft): -12.6	Recovery in ft (%): 11.1(82)
	Contractor: MCS Environmental, Inc.	N./LAT: 192927 E./LONG: 1277458	Process Date: 2/7/06
	Vessel: MCS barge	Horiz, Datum: NAD 83 N Vert. Datum: MLLW	Process Method: Cut tube
	Operator: Gary Maxwell	Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: N.Bacher, A.Fitzpatrick
		Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths In-situ Depth (ft) & Graphic Log
	0	OL: (0.0-0.5) very wet, very soft, black (GLEY 1, 2.5/N) ORGANIC SILT, little sand. Trace rootlets, wood fragments, and worms. OL: (0.5-6.3) wet to moist, soft to medium stiff, black (GLEY 1, 2.5/N) ORGANIC SILT, few clay decreasing downsection (<15%). Trace rootlets and shell fragments. Moderate H2S-like odor.	Transitional Contact
	2		Sheen Test @ 2.0' = no sheen
+	79% (4-6)	SP- SM: (6.3-7.0) moist, medium dense, dark greenish gray (GLEY 1, 4/5GY) fine to medium SAND interbedded with 1/2" thick moist, [medium stiff], greenish gray (GLEY 1, 5/5GY) SILT, [few clay] (transitional unit). @ 5.2' trace possible anthropogenic fibers	@ 4.2' TV = 1.5
	6	SP: (7.0-7.9) moist, medium dense to dense, dark greenish gray (GLEY 1, 4/5GY) medium SAND. Sand grains are multicolored (orange, red, white). Trace small wood, shells, and rootlets. ML: (7.9-9.2) moist, stiff, dark brown (7.5YR, 3/2) SILT, trace sand and clay. Trace small wood fragments at basal contact.	Transitional Contact
	The RETEC Group, Inc. Rema	ks: Drive Notes: none taken. One drive attempt made	Calculated Recovery
1	1011 SW Klickitat Way, Suite 207 Seattle, WA 98134-1162 at stat	ion. Core catcher was 100% full.	Sample Length/Penetration Length:
	Phone: (206) 624-9349 Fax: (206) 624-2839		11.1/13.6 = 82 %
	, , , , , , , , , , , , , , , , , , , ,		

A RET		Sediment Core Lo LDW-SC-53 (R1)	og	Sheet 2 of 2		
Project: LDW RI/FS		Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	16.1		
Project #: PORS5-18220-511		Water Elevation (ft)/Tide: 0.8	Penetration Depth	Penetration Depth (ft): 13.6 Sample Quality: NA		
Client: LDWG		Water Depth (ft): 16.3	Sample Quality: N			
Collection Date: 2/6/06		Mudline Elevation (ft): -12.6	Recovery in ft (%):	11.1(82)		
Contractor: MCS Environment	al, Inc.	N./LAT: 192927 E./LONG: 1277458	Process Date: 2/7/	/06		
Vessel: MCS barge		Horiz. Datum: NAD 83 N Vert. Datum: MLLW	Process Method:	Cut tube		
Operator: Gary Maxwell		Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: N.Bac	cher, A.Fitzpatrick		
Recovered Depth (ft) Recov.Interval & Sample % Recovery (interval) Chemical	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log		
-8	0	SP: (9.2-10.6) moist, dense to medium dense, dark brown (7.5YR, 3/2) fine to medium SAND. Sand grains are multicolored (orange, red, white). Trace small wood fragments at basal contact. ML: (10.6-11.1) moist, medium stiff, dark brown (7.5YR, 3/2) SILT, few sand. SP- SM: (11.1-13.6) moist, medium dense to dense, dark brown (7.5YR, 3/2) fine SAND interbedded with 1" to 4" thick layers of SILT.	@ 7.0' TV = 1.4 kg/cm2 @ 8.2' TV = 0.5 kg/cm2 Transitional Contact @ 9.5' TV = 0.8 kg/cm2 @ 10.4' TV = 0.5 kg/cm2	upper alluvium 9— 10— 10— 11— 13— 13— 13— 13— 13		
The RETEC Group, Inc. 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134-1162 Phone: (206) 624-9349 Fax: (206) 624-2839		Drive Notes: none taken. One drive attempt made Core catcher was 100% full.	Sample Length	ited Recovery n/Penetration Length: / 13.6 = 82 %		

								Sediment Core Log LDW-SC-54 (R3)					
ſ	roj	ject:	LD	W RI/	FS			Water Body Type: Lower Duwamish Waterway	Tube Length (ft):				
L	Pro	ject	#: P	ORS	5-18220)-511		Water Elevation (ft)/Tide: NA	Penetration Depth	(ft): 13.0			
Ŀ	Clie	ent:	LDV	/G				Water Depth (ft): 9.4	Sample Quality: G	iood			
Ŀ	Col	lecti	on D	ate: 2	2/23/06			Mudline Elevation (ft): -0.2	Recovery in ft (%):	10.2 (78)			
Ŀ	Cor	ntrac	tor:	MSS				N./LAT: 192179 E./LONG: 1276342	Process Date: 2/2:	3/06			
Ľ	Ves	ssel:	R/\	Nan	cy Anne	е		Horiz. Datum: NAD 83 N Vert. Datum: MLLW	Process Method:	Cut tube			
_	Оре	erato		ill Ja	worski			Method/Tube ID: Vibracorer/3.5" round Al	Logged By: L.McI	Kee, N.Bacher			
	Recovered	Depth (ft)	Recov.interval	& Sample	% Recovery (interval)	Chemical	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log			
	-0		7~ [LDW-SC54-0-2	83% (0-13)	PCB SVOC Metals Hg Pesticio	0 des	ML: (0.0-0.2) wet, soft, brown (7.5YR, 4/2) SILT, few sand. MH: (0.2-2.9) wet to moist, soft to medium stiff, black (2.5Y, 2.5/1) SILT, few sand mottled with very dark greenish gray (GLEY 1, 3/1) SILT, few sand. Silt texture is slightly compressible, blocky, massive, and of low plasticity. Trace wood fragments up to 3" L and rootlets.	Transitional Contact © 1'TV = 0.1 contact				
	-2 -3		· · · · · · · · · · · · · · · · · · ·	→		PCB SVOC Metals Hg Pesticio	0 des	OL: (2.9-4.8) moist, medium stiff, black (2.5Y, 2.5/1) ORGANIC SILT. Trace 1" thick layer of damp, medium stiff, dark grayish brown (2.5Y, 4/2) SILT, little clay. Trace wood fragments and rootlets.	Transitional Contact GT @ 2.8' @ 3.2' TV = 0.2 kg/cm2	recent 3			
	-4		****	→ ← LDW-SC54-4-5			0	ML: (4.8-6.5) moist, medium stiff, dark grayish brown (2.5Y, 4/2) SILT, few clay and trace 6" L transverse seams of medium SAND. Sand grains are multicolored.	Transitional Contact	4			
 	-5			4-5.5 ->				@ 5.2' to 5.4' SILT, few sand mixed with SILT, little clay	@ 5.1' TV = 0.4 kg/cm2				
	-6			> (LDW-SC54			0	SP: (6.5-13.0) damp, dense, black (2.5Y, 2.5/1) coarse SAND. Sand grains are multicolored (orange, red, white) and grade to medium towards basal contact. Scattered 3" diameter pockets of damp, soft, dark grayish brown (2.5Y, 4/2) SILT, few clay.	Sharp Contact	upper alluvium —> <			
				iroup			Remark	s: Drive Notes: easy to moderate (10.0'), hard (11.0'),	Calcula	ated Recovery			
1	eat	ttie, \	WA !	98134			modera	e (13.0'), penetration goal reached. Three drive attemp		h/Penetration Length:			
				624-9 1-2839				station. Core catcher was 50% full. Station		/13.0 = 78 %			
Fax: (206) 624-2839							re-occupied with vibracore.						

		7					Sediment Core Lo	og	Sheet 2 of 2
F	roject:	LDW	/ RI/	FS			Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	14.0
-	<u> </u>			5-18220	-511	_	Water Elevation (ft)/Tide: NA	Penetration Depth	(ft): 13.0
	lient:						Water Depth (ft): 9.4	Sample Quality: G	iood
	Collecti	on Da	te: 2	2/23/06			Mudline Elevation (ft): -0.2	Recovery in ft (%):	10.2 (78)
(Contrac	ctor: N	ISS				N./LAT: 192179 E./LONG: 1276342	Process Date: 2/2	
Ī	/essel:	R/V	Nan	су Апле	,		Horiz. Datum: NAD 83 N Vert. Datum: MLLW	Process Method:	Cut tube
\vdash				worski			Method/Tube ID: Vibracorer/3.5" round Al	Logged By: L.Mci	Kee, N.Bacher
-	Depth (ft)	<u>la</u>	& Sample	% Recovery (interval)	Chemical Analysis	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log
+++++++++++++++++++++++++++++++++++++++	7 8 9 10 11 12 13		-5.5-8 ————————————————————————————————————			0	End of core at 10.2'.	Not sampled below 10.0'	12 12 13 13 13 14 15 15 15 15 15 15 15

The RETEC Group, Inc.
1011 SW Klickitat Way, Suite 207
Seattle, WA 98134-1162
Phone: (206) 624-9349
Fax: (206) 624-2839

Remarks: Drive Notes: easy to moderate (10.0'), hard (11.0'),
moderate (13.0'), penetration goal reached. Three drive attempts
made at station. Core catcher was 50% full. Station
re-occupied with vibracore.

Calculated Recovery
Sample Length/Penetration Length:
10.2/13.0 = 78 %

		7			1000 Sec. 1903 1000 1000		Sediment Core Lo					
	Project:	LDV	V RI/	/FS			Water Body Type: Lower Duwamish Waterway	Tube Length (ft):				
	Project	#: P	ORS	5-18220)-511		Water Elevation (ft)/Tide: 10.4	Tide: 10.4 Penetration Depth (ft): 11.3				
	Client:	LDW	G				Water Depth (ft): 8.5	Sample Quality: N	IA			
	Collecti	ion Da	ate: :	2/6/06			Mudline Elevation (ft): 1.6 Recovery in ft (%): 6.2 (55					
	Contrac	ctor: N	//CS	Enviro	nmenta	l, Inc.	N./LAT: 190389 E./LONG: 1278266	Process Date: 2/6	/06			
	Vessel:	MC:	S ba	rge			Horiz. Datum: NAD 83 N Vert. Datum: MLLW	Process Method:	Cut tube			
	Operate		ary I	Maxwell	<u> </u>		Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: N.Ba	cher, A.Fitzpatrick			
	Becovered Depth (ft)	Recov.interval	& Sample	% Recovery (interval)	Chemical Analysis	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log			
	0	•	LDW-SC55-0-1	85% (0-1)	PCB SVOC Metals Hg	0	ML: (0.0-0.7) very wet, very soft, greenish black (GLEY 1, 2.5/2.510Y) SILT, trace clay. Trace sheen/black organic streaks and moderate H2S-like odor.		recent			
-	-1	: :		72%	PCB	0	SP: (0.7-1.5) wet, loose, greenish black (GLEY 1, 2.5/10Y) fine SAND. Sand is homogenous.	GT @ 0.9' @ 0.7' TV = 0.0 kg/cm2				
1		•	LDW-SC55-1-2	(1-3)	SVOC Metals Hg		OL: (1.5-1.8) moist, soft, greenish black (GLEY 1, 2.5/10Y) ORGANIC SILT, trace sand.	@ 1.5' TV = 0.8 kg/cm2				
+	-2	· 			PCB	0	SP: (1.8-2.6) moist, medium dense, greenish black (GLEY 2, 2.5/10BG) fine to medium SAND, trace gravel. Sand grains are multicolored (orange, red, white). Trace H2S-like odor.	GT @ 1.8' GT @ 2.1'	upper			
#	-3		LDW-SC55-2-3		SVOC Metais Hg		SP- SM: (2.6-4.0) moist, medium dense, dark greenish gray (GLEY 1, 4/5GY) fine SAND interbedded with 1/4" thick, convex layers of SILT. Sand grains are multicolored (orange, red, white).	@ 2.5' TV = 2.0 kg/cm2	upper alluvium			
	•	•	LDW-SC55-3-4	68% (3-6)		0	SP: (4.0-11.3) moist, medium dense, greenish black (GLEY 2, 10BG) medium to coarse SAND, trace gravel. Sand grains are multicolored (orange, red, white) and grade to fine sand near basal contact Trace 1" thick layers of greenish black (GLEY 2,	Sharp Contact @ 3.3' TV = 1.2 kg/cm2				
+	-4	•	\uparrow			0	10BG) SILT. Trace wood fragments and rootlets. @ 4.6' grades to medium sand	@ 4.3' TV = 1.0 kg/cm2				
+	-5	•	LDW-SC55-4				@ 4.9' abundant wood fragments to 5.6' (75%) @ 5.6' grades to fine sand	GT @ 4.8'	5—			
+		•	4-6 ——					@ 5.7' TV = 0.8				
-	-6	•	\rightarrow	· 45%			End of core at 6.2'. Driven to refusal.	kg/cm2 Slightly winnowed below 6.0'	6—			
				(6-8)								
	The RETI 1011 SW Seattle, V	Klick NA 98	itat V 3134-	Vay, Suit ·1162	e 207		Drive Notes: refusal (11.3). Three drive attempts tation. Abundant logs/wood observed in vicinity.		nted Recovery n/Penetration Length:			
Phone: (206) 624-9349						Wood fou	d in core catcher. 6.2 /11.3 = 55 %					

			Sediment Core L					
Project: LDW RI/I			Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	16.1			
Project #: PORS	5-18220-511		Water Elevation (ft)/Tide: 10.4	Penetration Depth (ft): 11.3 Sample Quality: NA				
Client: LDWG			Water Depth (ft): 8.5					
Collection Date: 2	2/6/06		Mudline Elevation (ft): 1.6	Recovery in ft (%):	6.2 (55)			
Contractor: MCS	Environmental,	Inc.	N./LAT: 190389 E./LONG: 1278266	Process Date: 2/6/	06			
Vessel: MCS bar	ge		Horiz. Datum: NAD 83 N Vert. Datum: MLLW	Process Method: (Cut tube			
Operator: Gary N	Maxwell		Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: N.Bac	her, A.Fitzpatrick			
Recovered Depth (ft) Recov.Interval & Sample	% Recovery (interval) Chemical Analysis	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log			
9 10	50% (8-10) 50% (10-11.3)				lower alluvium			

The RETEC Group, Inc. 1011 SW Klickitat Way, Suite 207	Remarks: Drive Notes: refusal (11.3). Three drive attempts	Calculated Recovery	
Seattle, WA 98134-1162 Phone: (206) 624-9349	made at station. Abundant logs/wood observed in vicinity.	Sample Length/Penetration Length	
Fax: (206) 624-2839	Wood found in core catcher.	6.2 /11.3 = 55 %	
		_	

	REI		Sediment Core Lo	·				
Project: LDW RI/FS	s		Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	16.1			
Project #: PORS5-	-18220-511		Water Elevation (ft)/Tide: 9.6	Penetration Depth	(ft): 10.7			
Client: LDWG			Water Depth (ft): 8.5	Sample Quality: fair				
Collection Date: 2/	7/06		Mudline Elevation (ft): 1.0	5.6 (52)				
Contractor: MCS E	invironment	al, Inc.	N./LAT: 190022 E./LONG: 1277575	Process Date: 2/7/	06			
Vessel: MCS barg	je		Horiz, Datum; NAD 83 N Vert, Datum; MLLW	Process Method: (Cut tube			
Operator: Gary Ma	axwell		Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: N.Bac	her, A.Fitzpatrick			
Recovered Depth (ft) Recov.Interval	% Recovery (interval) (hemical	Analysis PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log			
	100% PĆB (0-0.5) SVOC Metak Hg		MH: (0.0-0.3) very wet, very soft, yellowish red (5YR, 4/6) SILT, trace sand. Trace wood fragments on surface. SW: (0.3-0.6) wet, loose, yellowish red (5YR, 4/6)	@ 0.6' TV = 1.0 kg/cm2 PID measurement @				
	60% (0.5-8) PCB SVOC Metals Hg		GP: (0.6-1.0) wet, loose, black (2.5YR, 2.5/1) GRAVEL, little sand, few silt. Trace 1" thick seam of black SILT, little mottled gray clay. Trace HC-like sheen and slight odor on top of silt. SP: (1.0-3.8) wet, loose, red (2.5YR, 4/6) fine to medium SAND grading to very dark greenish gray (GLEY 1, 3/5G) medium to coarse SAND. Trace shredded wood fragments and larger wood fragments up to 4" L at basal contact. Sand grains are multicolored (orange, red, white).	0.8' in bag Sheen Test @ 0.8' = heavy rainbow sheen with 1/16" florets Oxidation @ 1.0' to 20' @ 1.3' @ 1.5' TV = 0.5 kg/cm2	upper alluvium			
		0	SP- SM: (3.8-10.7) moist, medium dense, very dark greenish gray (GLEY 1, 3/5G) fine to medium SAND, few silt interbedded with 1/8" to 2" thick layers of gray and brown SILT. Scattered layers of wood fragments associated with the silt interbeds. Abundant wood fragments. Below 4.0' SAND becomes fine grained with seams of fine sand and silt, decreasing wood content with depth. End of sediment at 5.6'.	@ 5.0° TV = 0.6 kg/cm2 Material ends at 5.6° due to 1.6° void	4			
The RETEC Group, in 1011 SW Klickitat Wa Seattle, WA 98134-11 Phone: (206) 624-934 Fax: (206) 624-2839	ny, Suite 207 162	drive atte	Drive Notes: easy (5.4'), hard (10.7'), refusal (10.7'). Tempts made at station. Void space in bottom 1.6'; and. r = recent	Sample Length	ted Recovery //Penetration Length:			

				Sediment Core Lo	og	Sheet 2 of 2
Project: LDW RI/	FS			Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	6.1
Project #: PORS	5-18220-5	 511		Water Elevation (ft)/Tide: 9.6	Penetration Depth	(ft): 10.7
Client: LDWG				Water Depth (ft): 8.5	Sample Quality: fa	ir
Collection Date: 2	2/7/06			Mudline Elevation (ft): 1.0	Recovery in ft (%):	5.6 (52)
Contractor: MCS	Environm	nental, l	nc.	N./LAT: 190022 E./LONG: 1277575	Process Date: 2/7/	06
Vessel: MCS bar	ge			Horiz. Datum: NAD 83 N Vert. Datum: MLLW	Process Method: (Cut tube
Operator: Gary N	laxweil			Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: N.Bac	her, A.Fitzpatrick
Recovered Depth (ft) Recov.Interval & Sample	% Recovery (interval)	Chemical Analysis	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log
	70% (8-10)			VOID (material lost out of bottom of core). End of core at 7.2'. Driven to refusal.		Wer alluvium

The RETEC Group, Inc. 1011 SW Klickitat Way, Suite 207	Remarks: Drive Notes: easy (5.4'), hard (10.7'), refusal (10.7'). Thre	Calculated Necovery	
Seattle, WA 98134-1162 Phone: (206) 624-9349	drive attempts made at station. Void space in bottom 1.6';	Sample Length/Penetration Length	
Fax: (206) 624-2839	lost fine sand. r = recent	5.6 / 10.7 = 52 %	

	43-RETEC	Sediment Core Louis LDW-SC-201 (R1)							
	Project: LDW RI/FS	Water Body Type: Lower Duwamish Waterway	Tube Length (ft):						
L	Project #: PORS5-18220-511	Water Elevation (ft)/Tide: 8	Penetration Depth (ft): 13.6						
L	Client: LDWG	Water Depth (ft): 24.0	Sample Quality: Good						
L	Collection Date: 2/10/06	Mudline Elevation (ft): -14.6	Recovery in ft (%):	11.8 (87)					
L	Contractor: MCS Environmental, Inc.	N./LAT: 202052 E./LONG: 1269266	Process Date: 2/11	1/06					
ľ	Vessel: MCS barge	Horiz, Datum: NAD 83 N Vert, Datum: MLLW	Process Method: (Cut tube					
ļ	Operator: Gary Maxwell	Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: N.Bac	her, A.Fitzpatrick					
	ш.	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log					
	-0	OL: (0.0-0.8) wet, medium stiff, dark greenish gray (GLEY 1, 4/1) ORGANIC SILT, little sand, trace gravel. Moderate wood fragments. OL: (0.8-4.0) wet, soft, black (GLEY 1, 2.5/N) ORGANIC SILT, little sand, grading to alternating layers of stiff, black ORGANIC SILT and medium stiff, dark gray (5Y, 3/2) SILT, little clay. Trace sand seams and a 2" diameter rounded gravel with barnacle scars. Trace rootlets, small shell and wood fragments, and piece of brick fragment. Silt is of low plasticity. Trace H2S odor. @ 1.5' a 6" thick layer of dark olive gray clayey SILT OL: (4.0-8.0) moist, medium stiff, black (GLEY 1, 2.5/N)) ORGANIC SILT, little clay. Silt texture is homogenous, blocky, and of moderate plasticity. Scattered HC-like sheen florets with trace HC-like odor up to 6'. @ 4.0' a distinct 2" thick layer of large wood and shell	Transitional Contact Bag @ 0.5' (brick fragment) @ 1.2' TV = 0.5 kg/cm2 @ 3.5' TV = 0.5 kg/cm2 Sharp Contact	0					
	-6 LDW{	fragments up to 4" L with strong H2S-like odor @ 5.6' 2" thick layer of moderate HC-like sheen florets in parting seam	@ 5.3' TV = 0.3 kg/cm2						
7	The RETEC Group, Inc.	s: Drive Notes: freefall (1.0'), moderate (8.0'), easy (13.	6'), Calcula	ted Recovery					
- 9	1011 SW Klickitat Way, Suite 207 Seattle, WA 98134-1162 peneti	tion goal reached. One drive attempt made at station.		/Penetration Length:					
	Phone: (206) 624-9349	-silver film settled over residual sediment in core shoe.		•					
ľ		Orange-silver film settled over residual sediment in core shoe. 11.8/13.6 = 87 %							

	3				Sediment Core Lo						
Proje	ect: LDW RI	/FS			Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	16.1				
Proje	ect#: PORS	5-1822 <u>0</u> -	-511		Water Elevation (ft)/Tide: 8	Penetration Depth (ft): 13.6					
Clien	nt: LDWG				Water Depth (ft): 24.0	Sample Quality: G	lood				
Colle	ection Date:	2/10/06			Mudline Elevation (ft): -14.6	Recovery in ft (%):	11.8 (87)				
Cont	tractor: MCS	Environ	menta	l, Inc.	N./LAT: 202052 E./LONG: 1269266	Process Date: 2/1	1/06				
Vess	sel: MCS ba	rge			Horiz. Datum: NAD 83 N Vert. Datum: MLLW	Process Method:	Cut tube				
Oper	rator: Gary	Maxwell		1	Method/Tube ID: Diver Impact Core/4" sq AI	Logged By: N.Bae	cher, A.Fitzpatrio	ck			
Recovered	Depth (ft) Recov.Interval & Sample	% Recovery (interval)	Chemical Analysis	PID	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log	J			
7	3C201-6-8	90% (10-12)				@ 7.0' TV = 0.6 kg/cm2	50 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	7—			
8	← LDW-SC		PCB SVOC	0	ML: (8.0-11.3) moist, medium stiff, very dark greenish gray (GLEY 1, 3/5GY) SILT, few clay with trace 2" thick interbeds of grayish brown very fine SAND, little silt. Trace rootlets and small shell fragments up to 1/8" L.	Transitional Contact		8			
9	LDW-SC201-8-10	81% (12-13.6)		0		@ 9.0' TV = 1.1 kg/cm2	upper alluvium —	9—			
11	LDW-SC201-10-11.8 ->				SM: (11.3-13.6) moist, medium dense, dark grayish brown (2.5Y, 4/2) fine SAND, little silt, and seams of silt up to 1/8" thick. Sand is well sorted. Trace rootlets and scattered wood fragments. End of core at 11.8'.	@ 10.6' TV = 1.0 - kg/cm2	<u> </u>	11-			
12							lower alluvium	12 —			
The R	RETEC Group	. Inc		Remarks	Drive Notes: freefall (1.0'), moderate (8.0'), easy (13.	E.)					
1011 8	SW Klickitat	Way, Suite	207			Calcula	ited Recovery	ogále -			
Phone	e: (206) 624-9	349	-	-	on goal reached. One drive attempt made at station.		n/Penetration Len	ıgın:			
Fax: (206) 624-283	9] -	_	ilver film settled over residual sediment in core shoe.	11.8/	/13.6 = 87 %				
				Field repl	icate of SC-33. Core shoe empty.						

					Sediment Core Lo	og	Sheet 1 of 2		
	Project: LDW RIA	/FS		•	Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	16.1		
	Project #: PORS	5-18220-	511		Water Elevation (ft)/Tide: 3.8	Penetration Depth (ft): 12.5			
	Client: LDWG				Water Depth (ft): 16.5	Sample Quality: Good			
	Collection Date:	2/15/06			Mudline Elevation (ft): -12.2	Recovery in ft (%):	10.1 (81)		
	Contractor: MCS	Environ	mental,	inc.	N./LAT: 201491 E./LONG: 1269986	Process Date: 2/10	5/06		
	Vessel: MCS ba	rge			Horiz, Datum; NAD 83 N Vert, Datum; MLLW	Process Method: (Cut tube		
	Operator: Gary	Maxwell		-	Method/Tube ID: Diver Impact Core/4" sq AI	Logged By: L.Mc	(ee		
	Recovered Depth (ft) Recov.Interval	% Recovery (interval)	Chemical Analysis	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log		
	-0	(0-1) S	PCB SVOC Metals Hg FBT	0	OL: (0.0-0.4) wet, soft, olive brown (2.5Y, 4/3) ORGANIC SILT, few sand. OL: (0.4-3.7) wet, stiff, black (2.5Y, 2.5/1) ORGANIC SILT. Scattered wood fragments up to 2" L. Silt texture is slightly compressible, massive, blocky, and of low plasticity.	Transitional Contact			
	LDW-SC202-1-2	(1-2) S	PCB SVOC Metals Hg TBT	0	· ·	@ 1.1' TV = 0.6 kg/cm2	- recent		
	LDW-SC202-2	(2-5) S	PCB SVOC Metals Hg TBT	0		GT @2.1'			
	002-2-4				ML: (3.7-5.2) wet, medium stiff, very dark greenish gray (GLEY 1, 4/10Y) SILT, little sand interbedded with 3" thick layers of greenish black (GLEY 1, 4/10Y) ORGANIC SILT with scattered rootlets and wood fragments up to 1" L (transitional unit).	Transitional Contact @ 3.0' TV = 0.6 kg/cm2			
	LDW.S			0	ML: (5.2-10.0) moist, medium stiff, dark greenish gray (GLEY 1, 4/10Y), SILT with scattered rootlets. Silt texture is uniform, massive, and blocky.				
	LDW-SC202-4-6	83% (5-10)				@ 5.0' TV = 1.4 kg/cm2	5		
				0			6		
1	LDW.						upper al		
	The RETEC Group 1011 SW Klickitat V		207 R	emarks:	Drive Notes: freefall (0.1'), easy (5.3'), moderate (11.0	<u>'), </u>	ted Recovery		
	Seattle, WA 98134	-1162		ard (12.5	'), refusal (12.5'). One drive attempt made at station.		n/Penetration Length:		
	Phone: (206) 624-9 Fax: (206) 624-2839		Co	ore catc	her was 75% full. Field replicate of SC-36.	10.1/	12.5 = 81 %		
			-			<u> </u>			

		7)				Sediment Core Lo						
	Project:	LDV	V RI	/FS			Water Body Type: Lower Duwamish Waterway	16.1					
	Project	#: P	ORS	5-18220	-511		Water Elevation (ft)/Tide: 3.8	Penetration Depth	(ft): 12.5				
	Client:	LDW	'G				Water Depth (ft): 16.5	Sample Quality: G	ood				
Ī	Collecti	ion D	ate:	2/15/06			Mudline Elevation (ft): -12.2	Recovery in ft (%):	10.1 (81)				
	Contrac	ctor: I	vics	Environ	mental, l	lnc.	N./LAT: 201491 E./LONG: 1269986	Process Date: 2/16	5/06				
Ī	Vessel:	MC	S ba	rge			Horiz. Datum: NAD 83 N Vert. Datum: MLLW	Process Method: (Cut tube				
Ī	Operate	or: G	ary I	Maxwell			Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: L.McF	(ee				
	Recovered Depth (ft)	Recov.Interval	& Sample	% Recovery (interval)	Chemical Analysis	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log				
	-7 -8		3C202-6-8> <				CD CM: (40.0.40.5) majet [degree] years deal.	@ 7.0' TV = 1.4 kg/cm2	luvium 7—1				
	-9		LDW-SC202-8-10.1 ——		,	o	SP- SM: (10.0-12.5) moist, [dense,] very dark greenish gray (GLEY 1, 3/1) fine SAND with uniform 2" thick layers of alternating very fine SAND and SILT (fluvial-looking). Grades to medium sand at basal contact. Trace wood fragments up to 2" L.	@ 9.0' TV = 1.0 kg/cm2	9				
1	- 10		↓	91% (10-11)			End of core at 10.1'. Driven to refusal.	Winnowing @ 10.0' to 10.1'	10				
++	-11 -12			80% (11-12.5)					lower alluvium				

Remarks: Drive Notes: freefall (0.1'), easy (5.3'), moderate (11.0'),

hard (12.5'), refusal (12.5'). One drive attempt made at station.

Core catcher was 75% full. Field replicate of SC-36.

Calculated Recovery

Sample Length/Penetration Length:

10.1/12.5 = 81 %

		7	7			Sediment Core Lo	og	Sheet 1 of 2			
Ì	Project	: LDW I	RI/FS			Water Body Type: Lower Duwamish Waterway	Tube Length (ft):	16,1			
	Projec	t #: POF	RS5-1822	0-511		Water Elevation (ft)/Tide: 7.8	Penetration Depth	(ft): 12.1			
	Client:	LDWG				Water Depth (ft): 24.4	Sample Quality: G	lood			
	Collect	tion Date	e: 2/17/06			Mudline Elevation (ft): -16.6	Recovery in ft (%):	8.8 (73)			
	Contra	ctor: MC	S Enviro	nmenta	, Inc.	N./LAT: 202013 E./LONG: 1268832	Process Date: 2/1	8/06			
	Vessel	: MCS	oarge			Horiz. Datum: NAD 83 N Vert. Datum: MLLW	Process Method:	Cut tube			
	Operat	tor: Gar	y Maxwel	1		Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: A.Fitz	patrick, N.Bacher			
	Recovered Depth (ft)	Recov.Interval	% Recovery (interval)	Chemical	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log			
	0 1		48% (0-1)	PCB SVOC Metals Hg Pesticid	0 es	OL: (0.0-4.1) very wet, very soft, olive brown SILT over, wet, medium stiff, black (2.5Y, 2.5/1) to dark brown ORGANIC SILT with moderate organic matter (twigs, leaves, stems, pine needles, shredded wood, wood fragments). Silt texture is uniform and slightly compressible. Strong H2S-like odor between 2.0' to 3.0'.	@ 0.7' TV= 0.4 kg/cm2				
	2		100% (1-2)	PCB SVOC Metals Hg Pesticid	0 es	0.5' One piece of plastic 1.0' Two pieces of plastic	@ 1.7' TV= 2.0 kg/cm2				
	3		100% (2-4)	PCB SVOC Metals Hg Pesticid	0 es		@ 2.7' TV= 1.5 kg/cm2 GT @ 3.0'	3			
	—4 —5		91% (4-6)	PCB SVOC	0	SP- SM: (4.1-8.1) moist, dense, black (2.5Y, 2.5/1) fine SAND with 6" thick interbeds of very dark greenish gray (GLEY 1, 3/1) SILT with moderate to substantial organic matter. Sand grains are multicolored (orange, red, white) and grade to coarse to medium sand with silt interbeds. Scattered rootlets, twigs, leaves, small shell fragments and shredded wood up to 2" L. Trace debris.	Sharp Contact @ 4.b' TV≃ 1.9 kg/cm2	5			
	-6		80% (6-8)		0			6			
		TEC Gro			Remarks:	: Drive Notes: freefall (1.5'), easy (12.2'), penetration g	oal Calcula	ated Recovery			
	Seattle,	WA 981		te 207		One drive attempt made at station. Core catcher was		n/Penetration Length:			
	Phone:	(206) 624 6) 624-28	-9349	-		Torvane measurements skewed high. Field replicate		/12.1 = 73 %			
	(20	,		1-	of SC-34.						

3 REIEC				Sediment Core Log LDW-SC-203 (R1) Sheet 2 of 2		
Project: LDW RI/FS				Water Body Type: Lower Duwamish Waterway	Tube Length (ft): 16.1	
Project #: PORS5-18220-511				Water Elevation (ft)/Tide: 7.8	Penetration Depth (ft): 12.1	
Client: LDWG				Water Depth (ft): 24.4	Sample Quality: Good	
Collection Date: 2/17/06				Mudline Elevation (ft): -16.6	Recovery in ft (%): 8.8 (73)	
Contractor: MCS Environmental, Inc.				N./LAT: 202013 E./LONG: 1268832	Process Date: 2/18/06	
Vessel: MCS barge				Horiz, Datum: NAD 83 N Vert, Datum: MLLW	Process Method: Cut tube	
Operator: Gary Maxwell				Method/Tube ID: Diver Impact Core/4" sq Al	Logged By: A.Fitzpatrick, N.Bacher	
Recovered Depth (ft) Recov.interval	% Recovery (interval)	Chemical Analysis	PID Measurement	Sediment Description Classification Scheme: USCS Contacts are recovered depth (In-situ depth interval in feet with parentheses)	Comments for Recovered Depths	In-situ Depth (ft) & Graphic Log
8	56% (8-10) 27% (10-11) 43% (11-12.1)		0	@ 6.6' small brick fragment SM: (8.1-12.1) damp, medium dense, very dark greenish gray (GLEY 1, 3/1) medium SAND, little gravel, few stiff, light gray, clay clasts up to 2" diameter. Gravel is angular and up to 2" diameter. End of core at 8.8'.	Sharp Contact Winnowing @ 7.4' to 8.9'.	upper alluvium 9—

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1011 SW Klickitat Way, Suite 207
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Phone: (206) 624-2839

Remarks: Drive Notes: freefall (1.5'), easy (12.2'), penetration goal reached. One drive attempt made at station. Core catcher was
80% full. Torvane measurements skewed high. Field replicate of SC-34.

Calculated Recovery
Sample Length/Penetration Length:
8.8 /12.1 = 73 %