Appendix J. Boring Logs Used for the LDW Hydrostratigraphy Evaluation

Table J-1. Boring core IDs and references

Boring Core ID in WW Figures	Original ID/ Point name	Boring core ID	Reference	Notes
11457	SD-101	SD-101	Converse (1988)	
11458	SD-102	SD-102	Converse (1988)	
5656	84-2	84-2	Dames & Moore (1984)	
5657	84-3	84-3	Dames & Moore (1984)	
3727	88-3	88-3	Dames & Moore (1988)	
DR171		DR171	Weston (1999)	
DR220		DR220	Weston (1999)	
Sg11b		--		STC DR 2005 (WW and QEA) →have geochronology sediment core figure but not actual logs
Sg7		--		STC DR 2005 (WW and QEA) → have geochronology sediment core figure but not actual logs
58636	12329	12329	GeoEngineers (1988)	
16583	B-2	B-2	GeoEngineers (1995)	
56139	D-440	D-440	Geo/Resource Consultants (1984)	
11693	DB-1	DB-1	Golder Associates (1997)	
7459	B-2	B-2	Hart Crowser (1979)	
SC1 through SC55		SC1 through SC55	Windward and RETEC (2007)	SC44, 46, 52 →RI subsurface core 2006 on maps
SC4-96	4	4	SEA (1996)	
SC2-98	2	2	SEA (1998)	
SC3-98	3	3	SEA (1998)	
SC6-98	6	6	SEA (1998)	
SC7-98	7	7	SEA (1998)	
AV8-9-98		--	SEA (1998)	average of core 8 and 9 -- no log showing ave
SC1-99	1	1	SEA (1998)	
SC5-99	5	5	SEA (2000)	
SC6-99	6	6	SEA (2000)	
SC12-99	12	12	SEA (2000)	
SC13-99	13	13	SEA (2000)	
SC14-99	14	14	SEA (2000)	

Boring Core ID in WW Figures	Original ID/ Point name	Boring core ID	Reference	Notes
SC16-99	16	16	SEA (2000)	
SC17-99	17	17	SEA (2000)	
SC18-99	18	18	SEA (2000)	
58362	CPT-D77-01	CPT-D77-01	SEA (2000)	
11745	B-1	B-1	SPU (2003)	
11746	B-2	B-2	Terra Associates (1999)	
13867	B-1	B-1	Terra Associates (1999)	
13868	B-2	B-2	Twelker (1970)	
SD-217		--		
41218	B1	B1	Twelker (1970)	
41220	B3	B3	Yonemitsu Geological Services (1979)	

Note: Do not have actual log.

References

Converse. 1988. Geotechnical design report, proposed Seventh Avenue South storm sewer, Seattle, Washington. Converse Consultants NW, Seattle, WA.

Dames & Moore. 1984. Supplemental laboratory testing, proposed free election laser facility, South Park site, Seattle, Washington, for the Boeing Aerospace Company. Dames & Moore, Seattle, WA.

Dames & Moore. 1988. Report of geotechnical investigation, Port of Seattle-Terminal 108 site, Seattle, Washington. Prepared for LaFarge Canada, Inc. Dames & Moore, Seattle, WA.

Geo/Resource Consultants. 1984. Renton Effluent Transfer System, King County, Washington. Geo/Resource Consultants, Inc., Seattle, WA.

GeoEngineers. 1988. Resource protection well report, Kenworth Truck Co., Point ID 58636. GeoEngineers, Seattle, WA.

GeoEngineers. 1995. Report: Geotechnical engineering services, liquefaction potential and design criteria, Manson Dock, 5209 East Marginal Way South, Seattle, Washington. GeoEngineers, Inc, Tacoma, WA.

Golder Associates. 1997. Geotechnical evaluation of proposed directional drill bore under the Duwamish River at 8th Avenue South, Seattle, Washington. Golder Associates Inc., Redmond, WA.

Hart Crowser. 1979. Subsurface exploration and geotechnical entineering study for proposed additions to the Seattle finish grinding facility, Kaiser Cement and Gypsum Corporation. Hart Crowser & Associates Inc., Seattle, WA.

SEA. 1996. PSDDA chemical characterization of Duwamish Waterway and upper turning basin. FY97 operations and maintenance dredging. Prepared for US Army Corps of Engineers, Seattle District. Striplin Environmental Associates, Inc., Olympia, WA.

SEA. 1998. PSDDA sediment characterization of Duwamish River navigation channel: FY99 operations and maintenance dredging data report. Prepared for US Army Corps of Engineers, Seattle District. Striplin Environmental Associates, Inc., Olympia, WA.

SEA. 2000. PSDDA sediment characterization of Duwamish River navigation channel: FY2000 operations and maintenance dredging data report. Prepared for US Army Corps of Engineers, Seattle District. Striplin Environmental Associates, Inc., Olympia, WA.

SPU. 2003. Geotechnical report, Duwamish substation, Bank 79 foundation retrofit, Seattle, Washington. Seattle Public Utilities Materials Laboratory, Seattle, WA.

Terra Associates. 1999. Geotechnical report: office/warehouse facility, 5030-1st Avenue South, Seattle, Washington. Terra Associates, Inc., Kirkland, WA.

Twelker N. 1970. Proposed Terminal 107. Materials Laboratory, Seattle Public Utilities, Seattle, WA.

Weston. 1999. Site inspection report, Lower Duwamish River (RK 2.5-11.5), Seattle, Washington. Vol 1-Report and appendices. Prepared for US Environmental Protection Agency, Region 10. Roy F. Weston, Inc., Seattle, WA.

Windward, RETEC. 2007. Lower Duwamish Waterway remedial investigation. Data report: Subsurface sediment sampling for chemical analyses. Prepared for Lower Duwamish Waterway Group. Windward Environmental LLC and The RETEC Group, Inc., Seattle, WA.

Yonemitsu Geological Services. 1979. Proposed warehouse for C.D. Stimson Company. Yonemitsu Geological Services, Seattle, WA.

BORING CORE LOGS

DATE DRILLED: 3/18/88

SUMMARY: BORING NO. SD-101

ELEVATION: 3

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

DEPTH IN FEET	SAMPLE NO.*	SAMPLE	BLOWS/6"	OTHER TESTS**	FIELD MOISTURE % OF DRY WEIGHT	DRY DENSITY PCF	DESCRIPTION	SYMBOL	MOISTURE	CONSISTENCY
0							FILL 5" asphalt SAND; gray-brown, fine to coarse, trace silt	SP	moist	medium dense
	1C		10 11 9		4	96	RECENT ALLUVIUM SAND; gray-brown, fine to coarse, grades to fine to medium, trace silt	SP	moist	medium dense
5	2A		5 6 4	G			becomes wet		wet	
	3C		2 1 3		65	64	ORGANIC SILT; gray- brown, fine, trace peat and wood fragments, laminated with silty sand	OL	wet	very soft
10	4B		push							
	5C		2 2 4				SAND; gray, fine to medium, trace silt	SP	wet	loose
15	6A		5 10 10	G			grades to medium dense			medium dense
	7A		11 12 16				SAND; gray, fine to medium, trace silt	SP	wet	medium dense
20							(continued)			

* A. 2" split-spoon sampler
B. 3" O.D. thin-wall sampler C. 3-1/4" O.D. x 2-1/2" liner
D. 3-1/2" O.D. split barrel sampler X. sample not recovered

** A - Atterberg, C - consolidation, DS - direct shear, G - grain size, T - triaxial, P - permeability

water level
impervious seal
piezometer tip

PROPOSED 7TH AVENUE STORM DRAIN
Seattle, Washington
for URS Consultants

Project No. 87-35192

Converse Consultants Geotechnical Engineering and Applied Sciences

Drawing No. A-14

DATE DRILLED: 3/18/88

SUMMARY: BORING NO. SD-101 (Cont.)

ELEVATION:

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

DEPTH IN FEET	SAMPLE NO.*	SAMPLE	BLOWS/6"	OTHER TESTS**	FIELD MOISTURE % OF DRY WEIGHT	DRY DENSITY PCF	DESCRIPTION	SYMBOL	MOISTURE	CONSISTENCY
20	8A		5 6 7				**RECENT ALLUVIUM** SAND (continued) grades to trace coarse sand	SP	wet	medium dense
25	9C		12 29 19							
30	10A		12 18 16							
35	11C		12 16 20				grades with scattered pumice fragments and silt laminations			
40							Bottom of boring at depth 36.5 feet. 3" PVC monitoring well installed. Slotted screen from 25' to 35', backfilled to 7' with pea gravel, bentonite seal to the surface.			

*A. 2" split-spoon sampler
B. 3" O.D. thin-wall sampler C. 3-1/4" O.D. x 2-1/2" liner
D. 3-1/2" O.D. split barrel sampler X. sample not recovered

**A - Atterberg, C - consolidation, DS - direct shear, G - grain size, T - triaxial, P - permeability

water level
impervious seal
piezometer tip

PROPOSED 7TH AVENUE STORM DRAIN
Seattle, Washington
for URS Consultants

Project No. 87-35192

Drawing No. A-15

Converse Consultants Geotechnical Engineering and Applied Sciences

DATE DRILLED: 3/16/88

SUMMARY: BORING NO. SD-102

ELEVATION: 3

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

DEPTH IN FEET	SAMPLE NO.*	SAMPLE	BLOWS/6"	OTHER TESTS**	FIELD MOISTURE % OF DRY WEIGHT	DRY DENSITY PCF	DESCRIPTION	SYMBOL	MOISTURE	CONSISTENCY
0	1C		2 3 3				**FILL** SAND; gray-brown, fine, thinly bedded with sandy silt, trace wood debris and wire	SP	moist	loose
5	2C		1 1 1		58	61	**RECENT ALLUVIUM** CLAY, gray-brown mottled, trace organics and root holes, laminated with peat	CL	moist	very soft
	3B		push				SILTY SAND; gray-brown, fine to medium	SM	wet	very loose
10	4C		1 3 4				SAND; gray, fine to medium, trace to little silt, with laminations of wood debris	SP	wet	loose
	5A		2 4 6	G						
15	6C		6 9 12							
	7A		5 5 5							
20							SAND (description next page) (continued)			

* A. 2" split-spoon sampler
B. 3" O.D. thin-wall sampler C. 3-1/4" O.D. x 2-1/2" liner D. 3-1/2" O.D. split barrel sampler X. sample not recovered

** A - Atterberg, C - consolidation, DS - direct shear, G - grain size, T - triaxial, P - permeability

water level
impervious seal
piezometer tip

PROPOSED 7TH AVENUE STORM DRAIN
Seattle, Washington
for URS Consultants

Project No. 87-35192

Drawing No. A-16

Converse Consultants Geotechnical Engineering and Applied Sciences

DATE DRILLED: 3/16/88

SUMMARY: BORING NO. SD-102 (Cont.)

ELEVATION:

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

DEPTH IN FEET	SAMPLE NO.*	SAMPLE	BLOWS/6"	OTHER TESTS**	FIELD MOISTURE % OF DRY WEIGHT	DRY DENSITY PCF	DESCRIPTION	SYMBOL	MOISTURE	CONSISTENCY
20	8C		10 12 14				**RECENT ALLUVIUM** SAND; gray, fine to coarse, trace silt, scattered gravel	SW	wet	medium dense
25	9A		7 9 12	G			grades with scattered wood fragments			
30	10C		19 23 34							dense
35	11A		12 15 27							
40							SAND (description next page) (continued)			

* A. 2" split-spoon sampler
B. 3" O.D. thin-wall sampler C. 3-1/4" O.D. x 2-1/2" liner
D. 3-1/2" O.D. split barrel sampler X. sample not recovered

** A - Atterberg, C - consolidation, DS - direct shear, G - grain size, T - triaxial, P - permeability

water level
impervious seal
piezometer tip

PROPOSED 7TH AVENUE STORM DRAIN
Seattle, Washington
for URS Consultants

Project No. 87-35192

Drawing No. A-17

Converse Consultants — Geotechnical Engineering and Applied Sciences

DATE DRILLED: 3/16/88

SUMMARY: BORING NO. SD-102 (Cont.)

ELEVATION:

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

DEPTH IN FEET	SAMPLE NO.*	SAMPLE	BLOWS/6"	OTHER TESTS**	FIELD MOISTURE % OF DRY WEIGHT	DRY DENSITY PCF	DESCRIPTION	SYMBOL	MOISTURE	CONSISTENCY
40	12C		17 22 27				**RECENT ALLUVIUM** SAND; gray, fine to medium, trace silt, and scattered pumice fragments, thinly bedded with laminations of silt, sandy silt with trace wood fragments and scattered gravel grades with scattered layers of low plasticity clay	SP	wet	medium dense to dense
45	13A		5 6 8							
							Bottom of boring at depth 46.5 feet. 3" PVC monitoring well installed. Slotted screen from 35' to 45', backfilled with pea gravel to 4' and bentonite seal to surface.			

* A. 2" split-spoon sampler
B. 3" O.D. thin-wall sampler C. 3-1/4" O.D. x 2-1/2" liner
D. 3-1/2" O.D. split barrel sampler X. sample not recovered

** A - Atterberg, C - consolidation, DS - direct shear, G - grain size, T - triaxial, P - permeability

water level
impervious seal
piezometer tip

PROPOSED 7TH AVENUE STORM DRAIN
Seattle, Washington
for URS Consultants

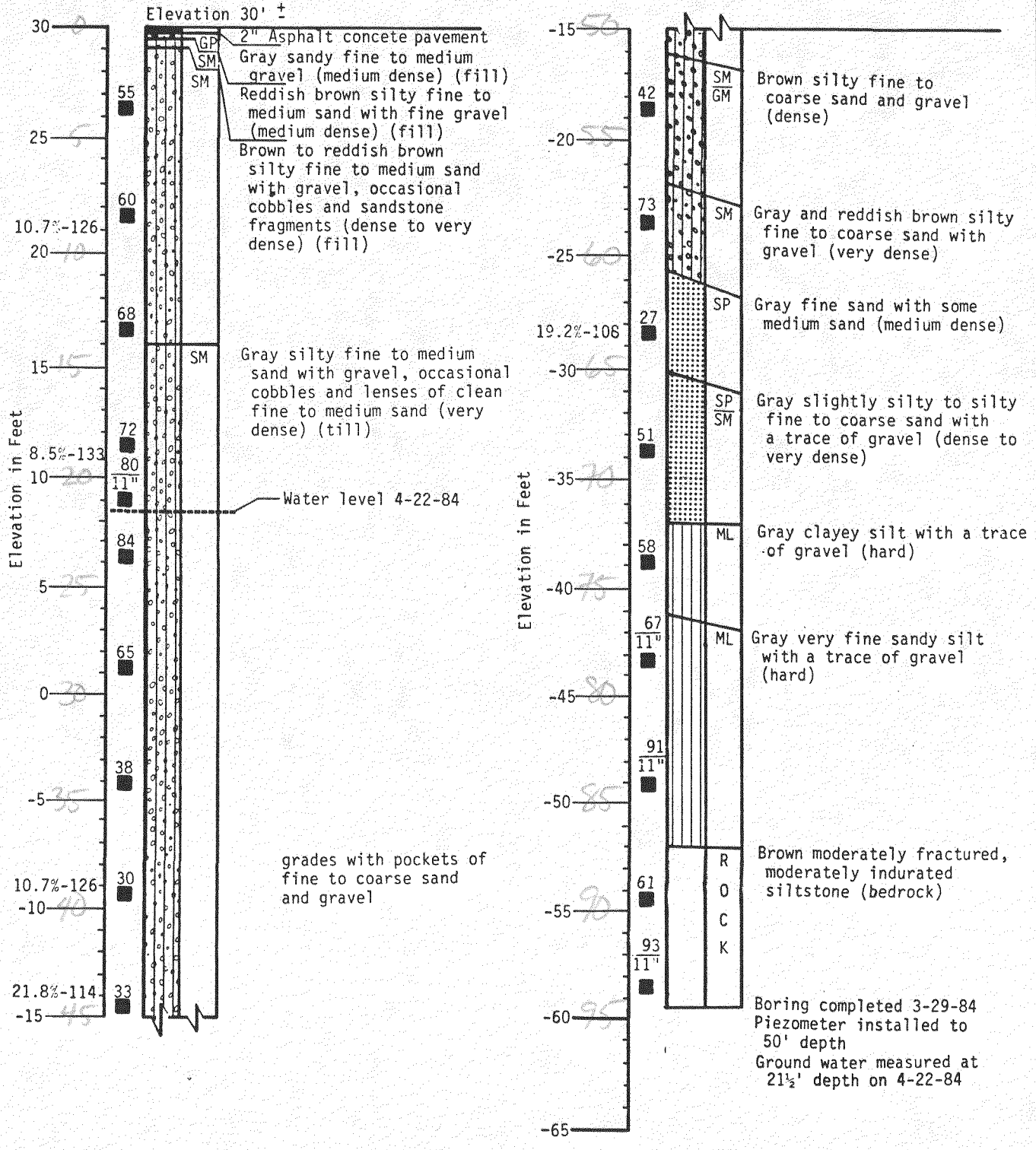
Project No.
87-35192

Drawing No.
A-18

Converse Consultants Geotechnical Engineering and Applied Sciences

RECEIVED

Boring 84-2



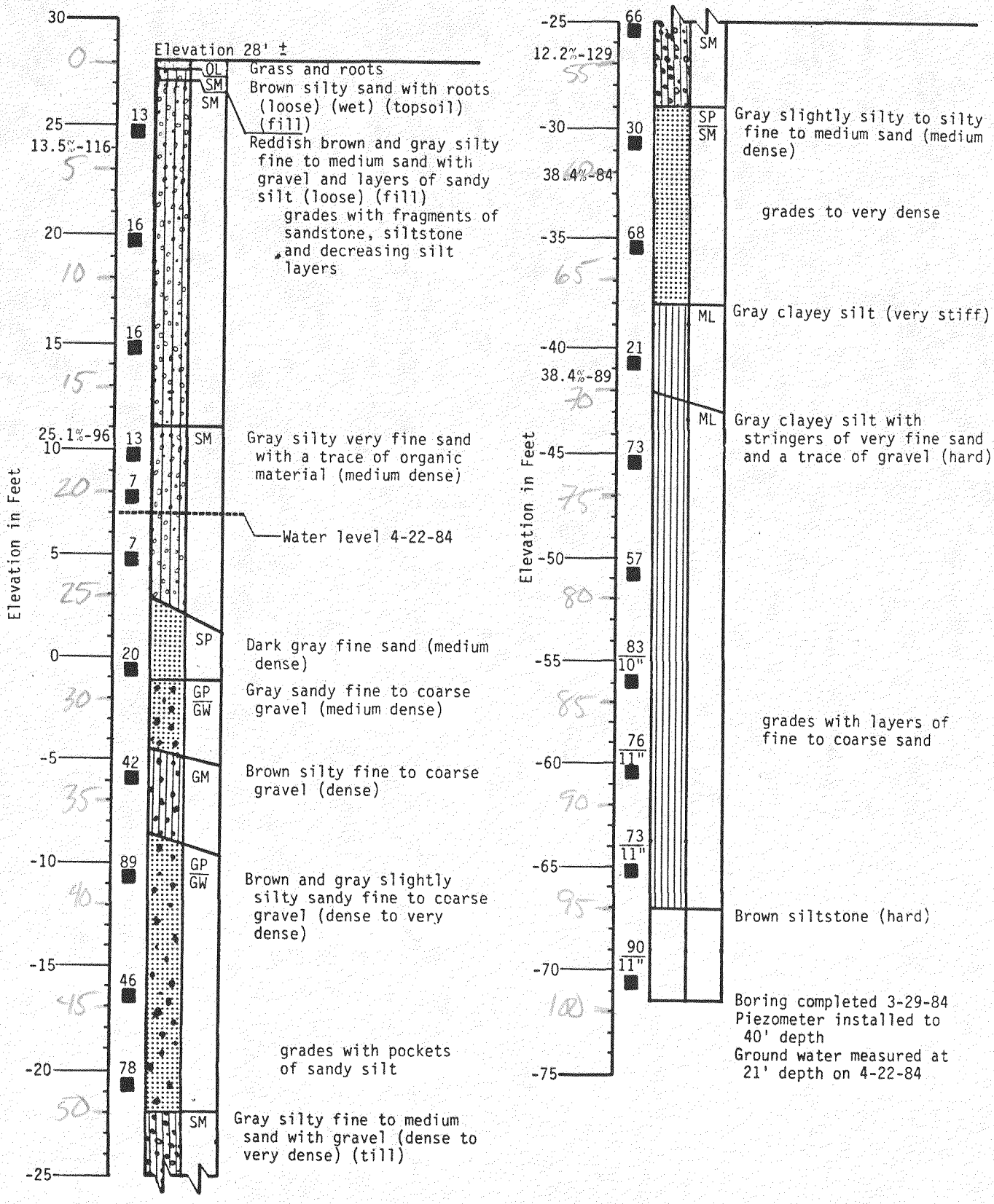
LOG OF BORINGS

Dames & Moore

Job No. 695-286

Plate A-2

Boring 84-3



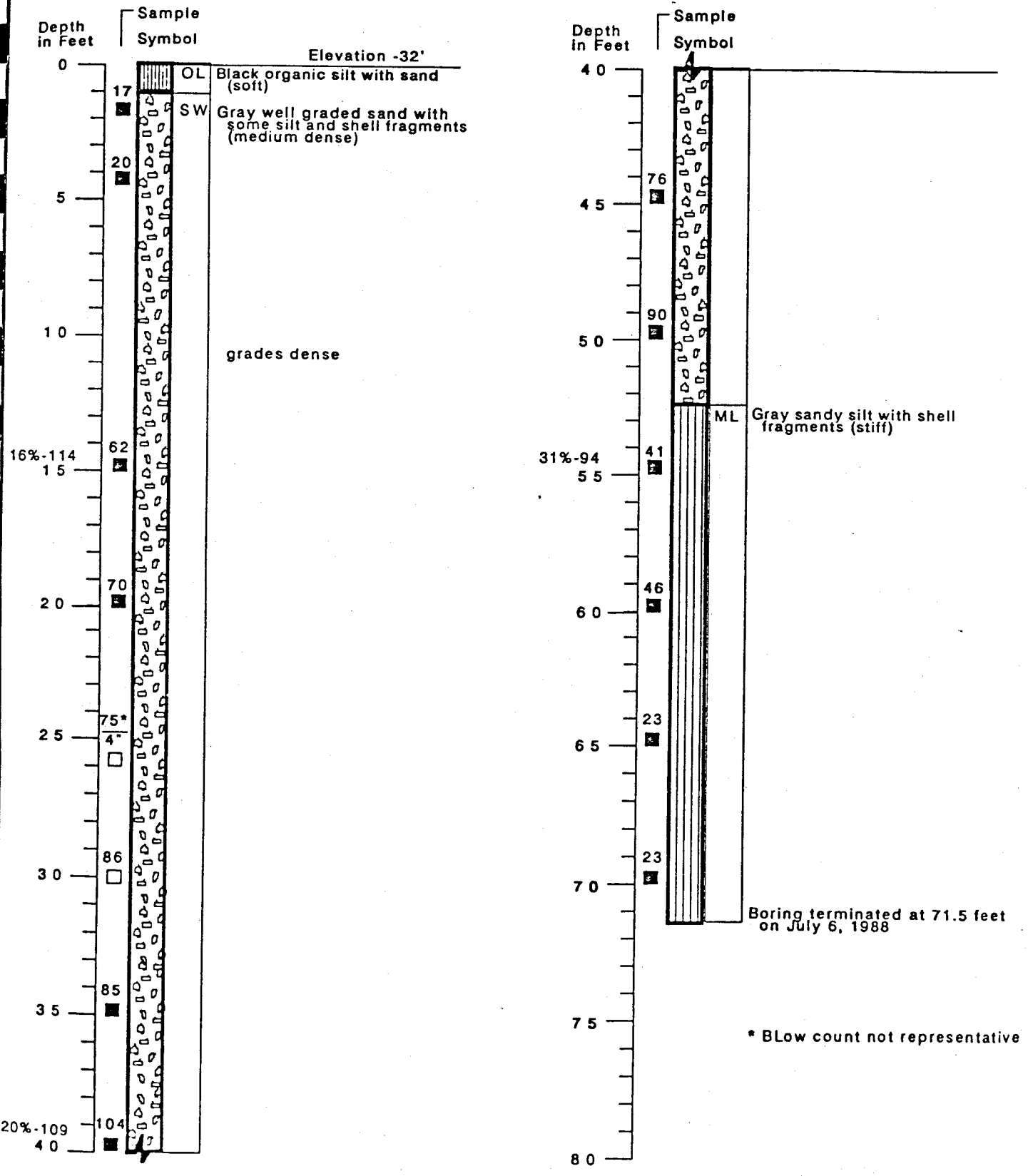
LOG OF BORINGS

Dames & Moore

Job No. 695-286

Plate A-3

Boring 88-3



Log of Borings

Dames & Moore

Job No. 17405-001-016

Plate A-3

REPLIC B
ALAGUA BARGELINE

CORE DESCRIPTION

Project Name: Duwamish River SI
Project No.: 04000-019-038-5100-00
Project Location: Seattle WA
Core Method Gravity Corer (4")

Field Log by: S. Fernández Lab Log by:

		Field	Lab
Tide Level (MLLW)	Date	9/23/98	
Depth to Mud	S. Time	1230	
Mud Line Elev.	E. Time	1233	

Core Number	DR 171 (replicate DR 171)
Drive Length, ft.	5' 3"
Recover Length, ft.	4', 7" 55"
Recovery Efficiency	87 %

DESCRIPTION OF CORE TUBES & TESTS (based on core tube lengths, feet)

Tube No. Ln, ft.	FIELD End Description	Spl No. & Test	LABORATORY Sample Description
_1	Silty CLAY, Bluish black, low plasticity, sat, no stain or odor, mottling in upper 6", wood fragments		
_2			
_3			
_4			
_5	TD 4', 7"		
_6			
_7			
_8			
_9			
_10			
_11			
_12			
_13			
_14			
_15			

(based on in-situ depths, feet)

Interpreted Summary Log (1)	Acquisition Data (2)	Blows/Ft. (3)
_1		
_2		
_3		
_4		
_5		
_6		
_7		
_8		
_9		
_10		
_11		
_12		
_13		
_14		
_15		

1. The summary log is an interpretation based on samples, blow counts, acquisition data, and interpolation. The recovery efficiency is a rough indication of the general confidence of the summary log. Variation between what is shown and actual conditions should be expected.
2. 11/9 (83%): Penetration Depth, ft./Corresponding Sample Recovery, ft. (Corresponding Total Recovery Efficiency, percent)
3. Blows/ft. are the number of hammer strikes required to drive the core tube 1 foot.

FIELD SAMPLING PLAN Expected Mudline Elev: Expected Thickness of Recent Sediment:

Tube Segment			Actual Recovery				Chain-of-Custody of Core Tube Sections Transfer Tube Sections from Field to Lab
No.	In Situ Depth	Ln.	Total % R	Core Tube Depth	Length	Segment % R	
A							Relinquished By:
B							Received By:
C							Date:
D							Time:
							Comments:

LAB: SAMPLES SELECTED FOR TESTING

SAMPLE		Sample Depth	
Number	Test	Tube	In-Situ
9839 4033	0-2		
9839 4034	2-4		

COMMENTS

95-1128.FRM

REACH C
ISAACSON CSC

CORE DESCRIPTION

Project Name: Duwamish River SI
Project No.: 04000-019-038-5100
Project Location: Seattle, WA
Core Method Gravity Corer (4")

Field Log by: S. Fernández Lab Log by:

		Field	Lab
Tide Level (MLLW)	Date	9/23/93	
Depth to Mud	S. Time	1140	
Mud Line Elev.	E. Time	1143	

Core Number	DR 220 (replaced DR187)
Drive Length, ft.	5', 3"
Recover Length, ft.	4', 6" 54"
Recovery Efficiency	86%

DESCRIPTION OF CORE TUBES & TESTS (based on core tube lengths, feet)

Tube No. Ln. ft.	FIELD End Description	Spl No. & Test	LABORATORY Sample Description
_1	Silty Clay, bluish black, sat, no stain or odor, low plasticity, nothing on top 6". wood frags.		
_2			
_3			
_4			
_5	TD - 4', 6"		
_6			
_7			
_8			
_9			
_10			
_11			
_12			
_13			
_14			
_15			

(based on in-situ depths, feet)

Interpreted Summary Log (1)	Acquisition Data (2)	Blows/FL (3)
_1		
_2		
_3		
_4		
_5		
_6		
_7		
_8		
_9		
_10		
_11		
_12		
_13		
_14		
_15		

1. The summary log is an interpretation based on samples, blow counts, acquisition data, and interpolation. The recovery efficiency is a rough indication of the general confidence of the summary log. Variation between what is shown and actual conditions should be expected.
2. 11/9 (83%): Penetration Depth, ft./Corresponding Sample Recovery, ft. (Corresponding Total Recovery Efficiency, percent)
3. Blows/ft. are the number of hammer strikes required to drive the core tube 1 foot.

FIELD SAMPLING PLAN Expected Mudline Elev: Expected Thickness of Recent Sediment:

Tube Segment No.	Tube Segment *In Situ* Depth	Tube Segment Ln.	Actual Recovery Total % R	Actual Recovery Core Tube Depth	Actual Recovery Length	Actual Recovery Segment % R	Chain-of-Custody of Core Tube Sections Transfer Tube Sections from Field to Lab
A							Relinquished By:
B							Received By:
C							Date:
D							Time:
							Comments:

LAB: SAMPLES SELECTED FOR TESTING

SAMPLE Number	SAMPLE Test	Sample Depth Tube	Sample Depth In-Situ
98394131	0-2		
98394032	2-4		

COMMENTS

95-1128.FRM

24/4E/33 F (10451)

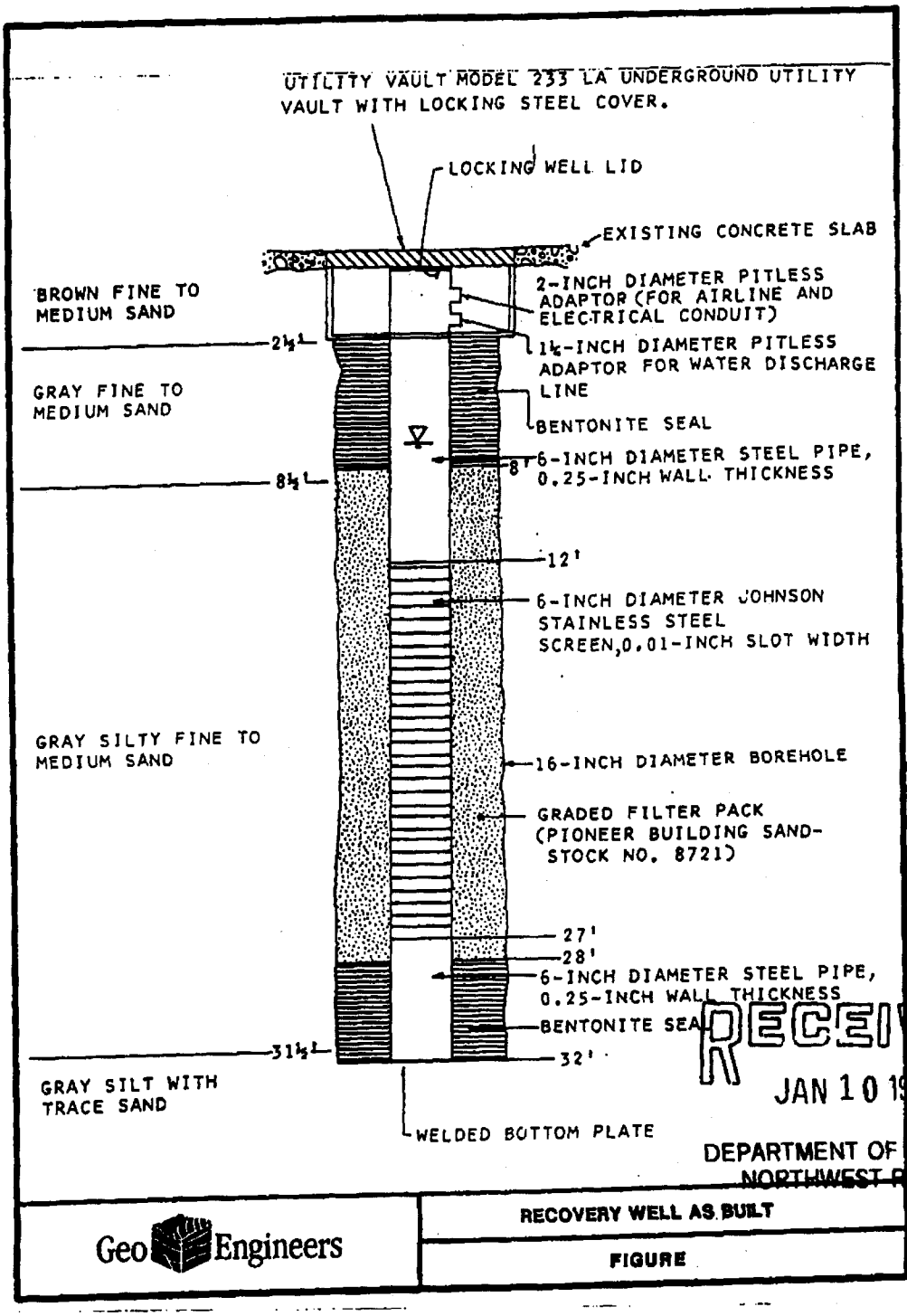
RESOURCE PROTECTION WELL REPORT

KING CO.

START CARD NO. 012329

PROJECT NAME: Kenworth TRUCK CO.
WELL INDENTIFICATION NO. RW-1
DRILLING METHOD: Cable Tool
DRILLER: Randy Holt
FIRM: Holt Drilling
SIGNATURE:
CONSULTING FIRM: GeoEngineers
REPRESENTATIVE: Scott Widness

LOCATION: T 24N, R 4E, SEC. 33 (SE NW) 9801 E. MARGINAL WAY SEATTLE, WA. 98108
DISTANCE: 2390 FT. East FROM N/S SECTION LINE
3280 FT. South FROM E/W SECTION LINE
DATUM: City of Seattle
WATER LEVEL ELEVATION: -3.5 ft
INSTALLED: 11/29 - 11/30/88
DEVELOPED: 12/1/88



RECEIVED
JAN 10 1989
DEPARTMENT OF ECOLOGY
NORTHWEST REGION

GeoEngineers

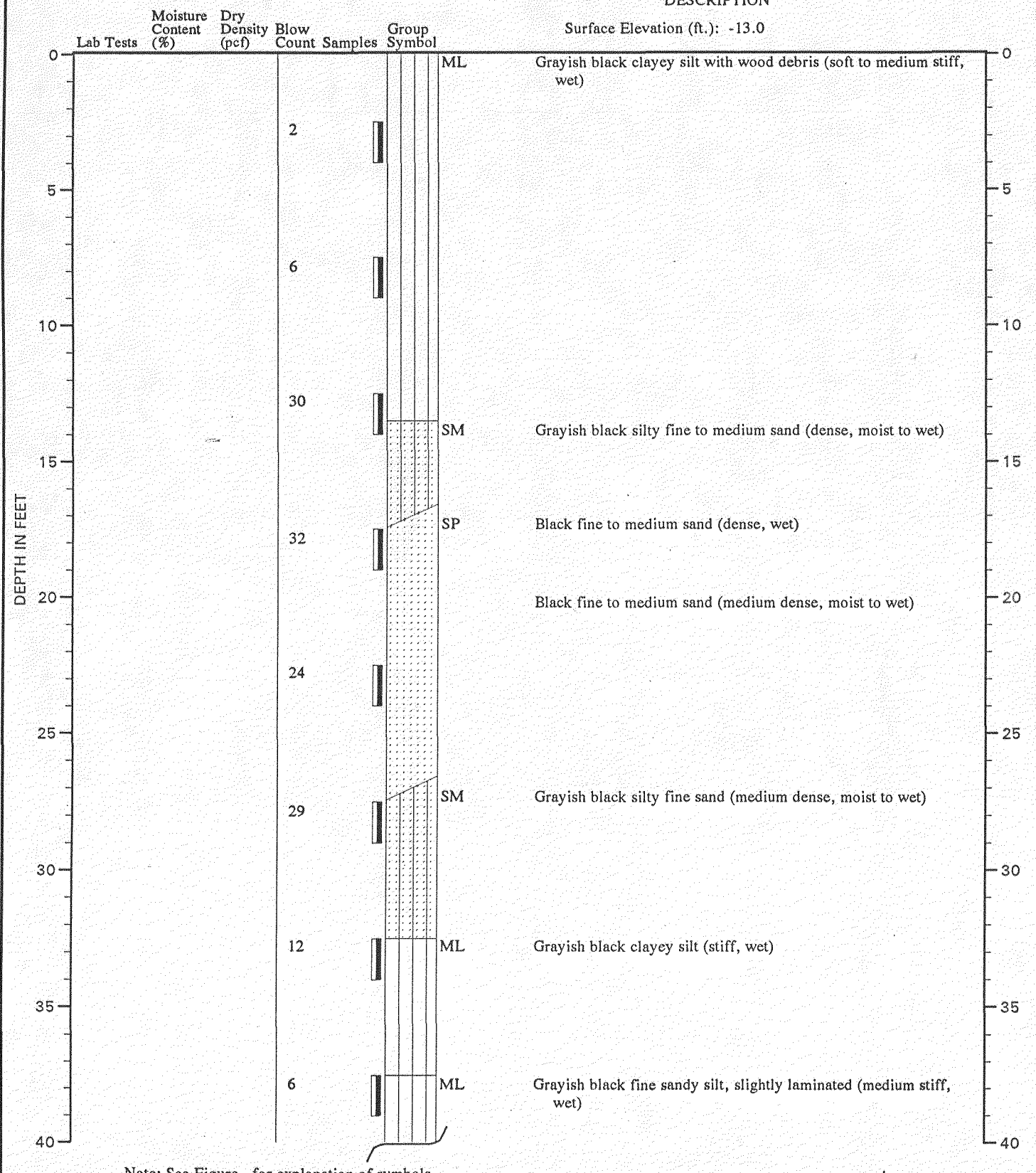
RECOVERY WELL AS BUILT

FIGURE

121-07-4 SEW:CJN 12-28-88 Rev. 1-6-89 KKT

TEST DATA

BORING B-2



Note: See Figure for explanation of symbols

JEB:GWH:vc: 6/1/95

1092-006-T03

NB40

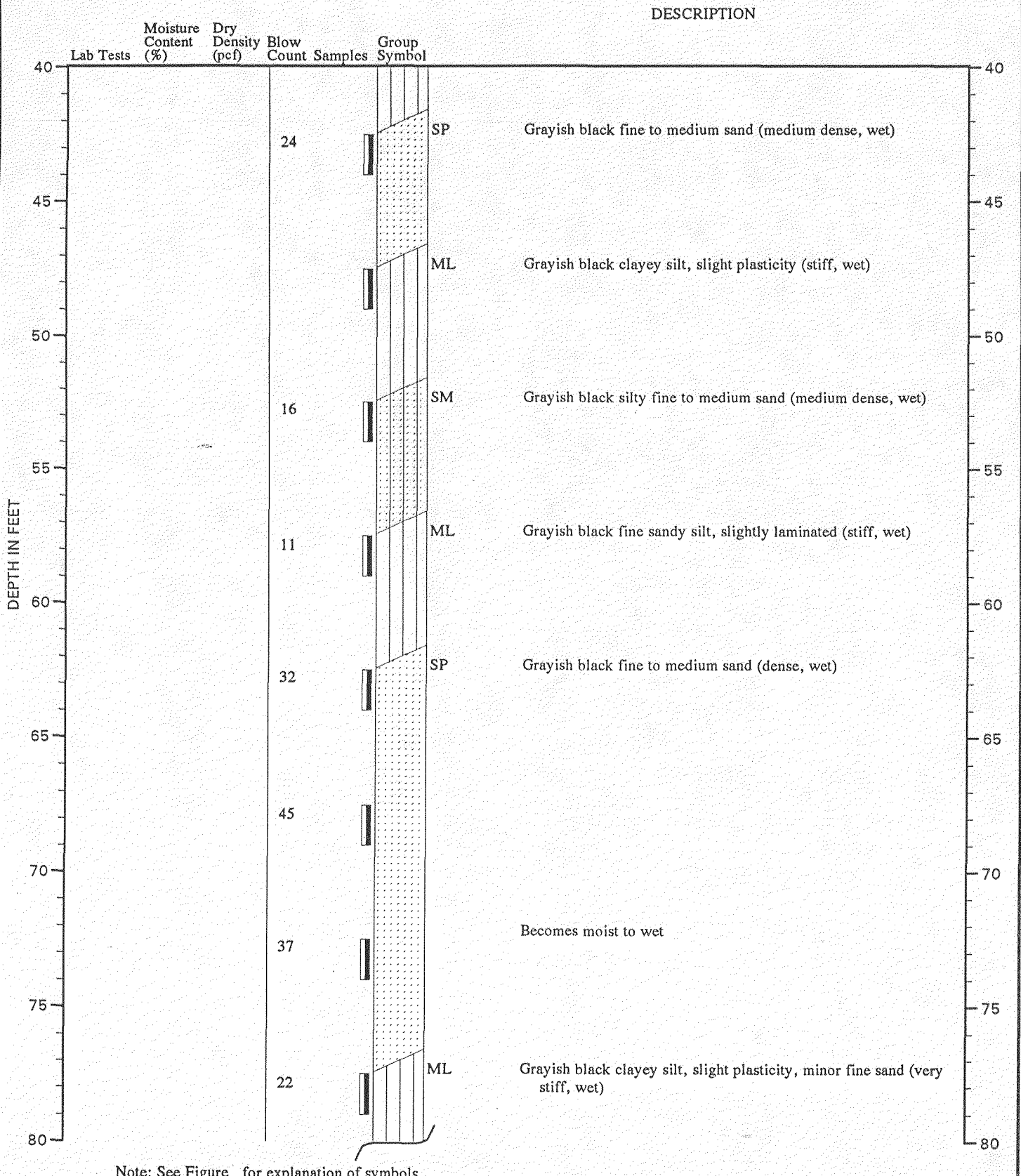
Geo Engineers

LOG OF BORING

FIGURE 4

TEST DATA

BORING B-2 (Continued)



Note: See Figure for explanation of symbols

JEB:GWH:vc: 6/1/95

1092-006-T03

NB40

GeoEngineers

LOG OF BORING

FIGURE 4

TEST DATA

BORING B-2
(Continued)

Lab Tests	Moisture Content (%)	Dry Density (pcf)	Blow Count	Samples	Group Symbol	DESCRIPTION
			38		SP	Grayish black fine to medium sand (dense, moist to wet)
						Boring completed at a depth of 84.0 feet on 05/03/95
						Ground water encountered at a depth of approximately 12.5 feet during drilling

DEPTH IN FEET

80 85 90 95 100 105 110 115 120

Note: See Figure for explanation of symbols

JEB:GWH:vc: 6/1/95

1092-006-T03

NB40

Geo Engineers

LOG OF BORING

FIGURE 4

SUMMARY: BORING NO. D-438

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED ARE A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

DATE DRILLED: 1/30/85

APPROX. ELEV. (MSL)	DEPTH (FT.)	SAMPLE TYPE	SAMPLE NO.	GRAPHIC SYMBOL	PIEZOMETER	BLOWS/6 IN	LAB TESTS	MOISTURE-DRY DENSITY	ATTERBERG LIMITS
40		SPT	12		GLACIAL LACUSTRINE DEPOSITS CLAYEY SILT		100		
	45				TOTAL DEPTH, 40.5 FEET.				
	30				PIEZOMETER: THREE QUARTER INCH DIAMETER PVC. SCREEN DEPTH: 5 TO 20 FEET. SEAL DEPTH: 1 TO 5 FEET.				

SAMPLE TYPES

B	GRAB SAMPLE - HAND COLLECTED FROM AUGER OR BIT
M	BAILER SAMPLE - MIXED AND HAND COLLECTED
C	CUTTING SAMPLE - HAND COLLECTED FROM DRILL FLUID RETURN
RD	3"O.D. SPLIT BARREL RING SAMPLER - DRIVEN WITH 300 LB. DOWN HOLE SLIP-JAR HAMMER
SPT	2"O.D. SPLIT SPOON SAMPLER - DRIVEN WITH 140 LB. SURFACE HAMMER WITH 30" DROP
SS	SPT, EXCEPT DRIVEN WITH 300 LB. DOWN HOLE SLIP-JAR HAMMER WITH 18" DROP
P	PITCHER SAMPLER - 3"O.D. THIN WALLED SHELBY TUBE PUSHED WITH ROTATING CUTTING BARREL
SH	3"O.D. THIN WALLED SHELBY TUBE - PUSHED WITH HYDRAULICS

MOISTURE CONTENT - PERCENT OF DRY WEIGHT
DRY DENSITY - POUNDS PER CUBIC FOOT

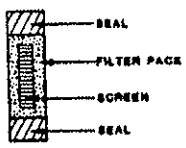
LABORATORY TESTS

G	GRAIN SIZE DISTRIBUTION
A	ATTERBERG LIMITS
V	MINI VANE SHEAR
C	CONSOLIDATION
UU	UNCONSOLIDATED-UNDRAINED TRIAXIAL
CU	CONSOLIDATED-UNDRAINED TRIAXIAL
PP	POCKET PENETROMETER
T	PETROGRAPHIC THIN SECTION

ATTERBERG LIMITS

LL	LIQUID LIMIT
PL	PLASTIC LIMIT
PI	PLASTICITY INDEX

PIEZOMETER DETAIL



SAMPLE DETAIL

RENTON EFFLUENT TRANSFER SYSTEM DUWAMISH ALIGNMENT
King County, Washington
for METRO

Project No. 275-05G

Drawing No. A-24

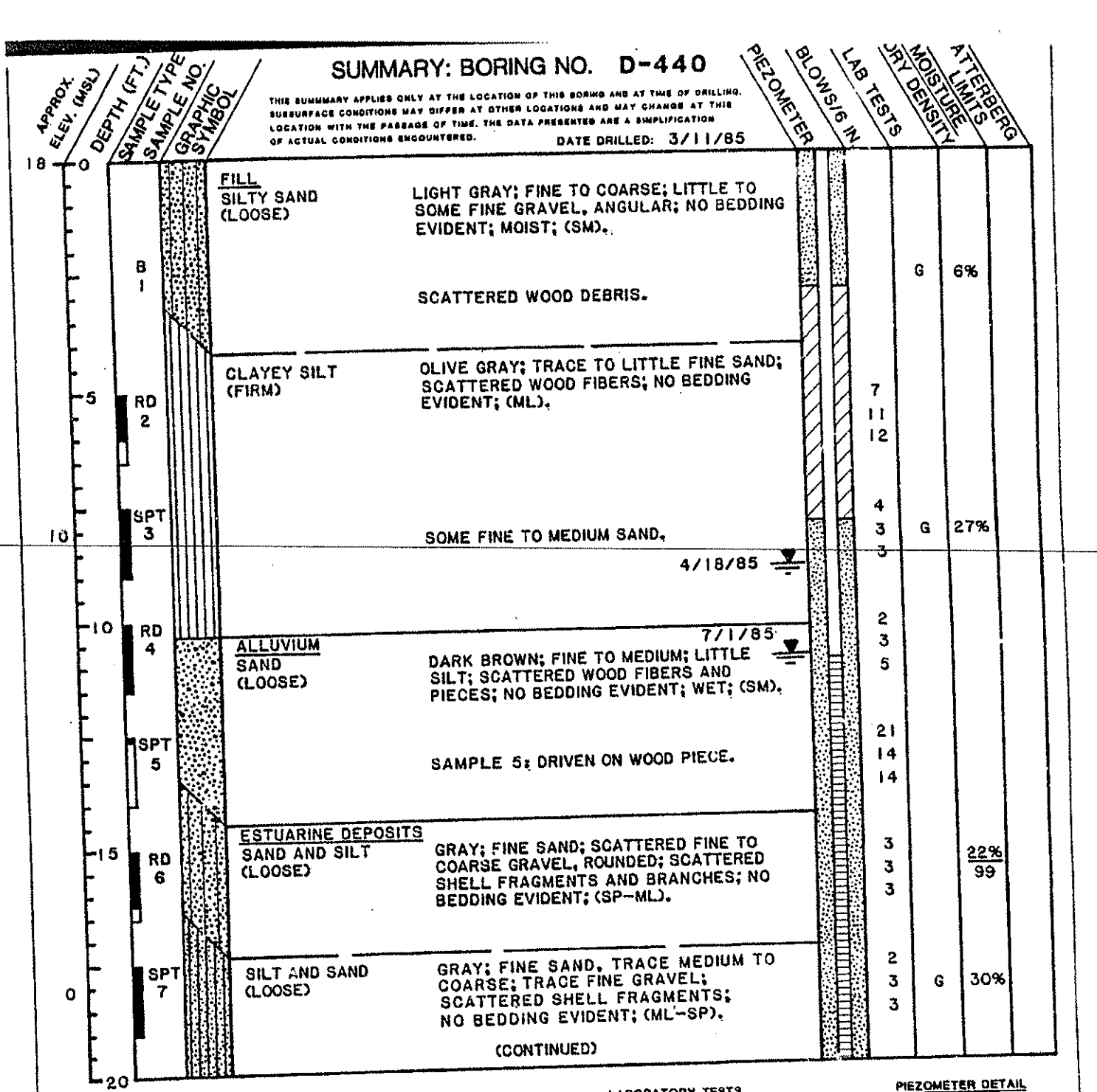
GEO/RESOURCE CONSULTANTS, INC.
Geologists/Geophysicists/Geotechnical Engineers

1116

SUMMARY: BORING NO. D-440

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED ARE A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

DATE DRILLED: 3/11/85



SAMPLE TYPES

- B GRAB SAMPLE – HAND COLLECTED FROM AUGER OR BIT
- M BARLER SAMPLE – MIXED AND HAND COLLECTED
- C CUTTING SAMPLE – HAND COLLECTED FROM DRILL FLUID RETURN
- RD 2"O.D. SPLIT BARREL RING SAMPLER – DRIVEN WITH 300 LB. DOWN HOLE SLIP-JAR HAMMER WITH 30" DROP
- SPT 2"O.D. SPLIT SPOON SAMPLER – DRIVEN WITH 140 LB. SURFACE HAMMER WITH 30" DROP
- 3S SPT, EXCEPT DRIVEN WITH 300 LB. DOWN HOLE SLIP-JAR HAMMER WITH 18" DROP
- P PITCHER SAMPLER – 3"O.D. THIN WALLED SHELBY TUBE PUSHED WITH ROTATING CUTTING BARREL
- SH 3"O.D. THIN WALLED SHELBY TUBE – PUSHED WITH HYDRAULICS

MOISTURE CONTENT – PERCENT OF DRY WEIGHT
DRY DENSITY – POUNDS PER CUBIC FOOT

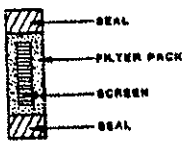
LABORATORY TESTS

- G GRAIN SIZE DISTRIBUTION
- A ATTERBERG LIMITS
- V MINI VANE SHEAR
- C CONSOLIDATION
- UU UNCONSOLIDATED-UNDRAINED TRIAXIAL
- CU CONSOLIDATED-UNDRAINED TRIAXIAL
- PP POCKET PENETROMETER
- T PETROGRAPHIC THIN SECTION

ATTERBERG LIMITS

- LL LIQUID LIMIT
- PL PLASTIC LIMIT
- PI PLASTICITY INDEX

PIEZOMETER DETAIL



SAMPLE DETAIL

RENTON EFFLUENT TRANSFER SYSTEM DUWAMISH ALIGNMENT
King County, Washington
for METRO

Project No. 275-05G

Drawing No. A-25

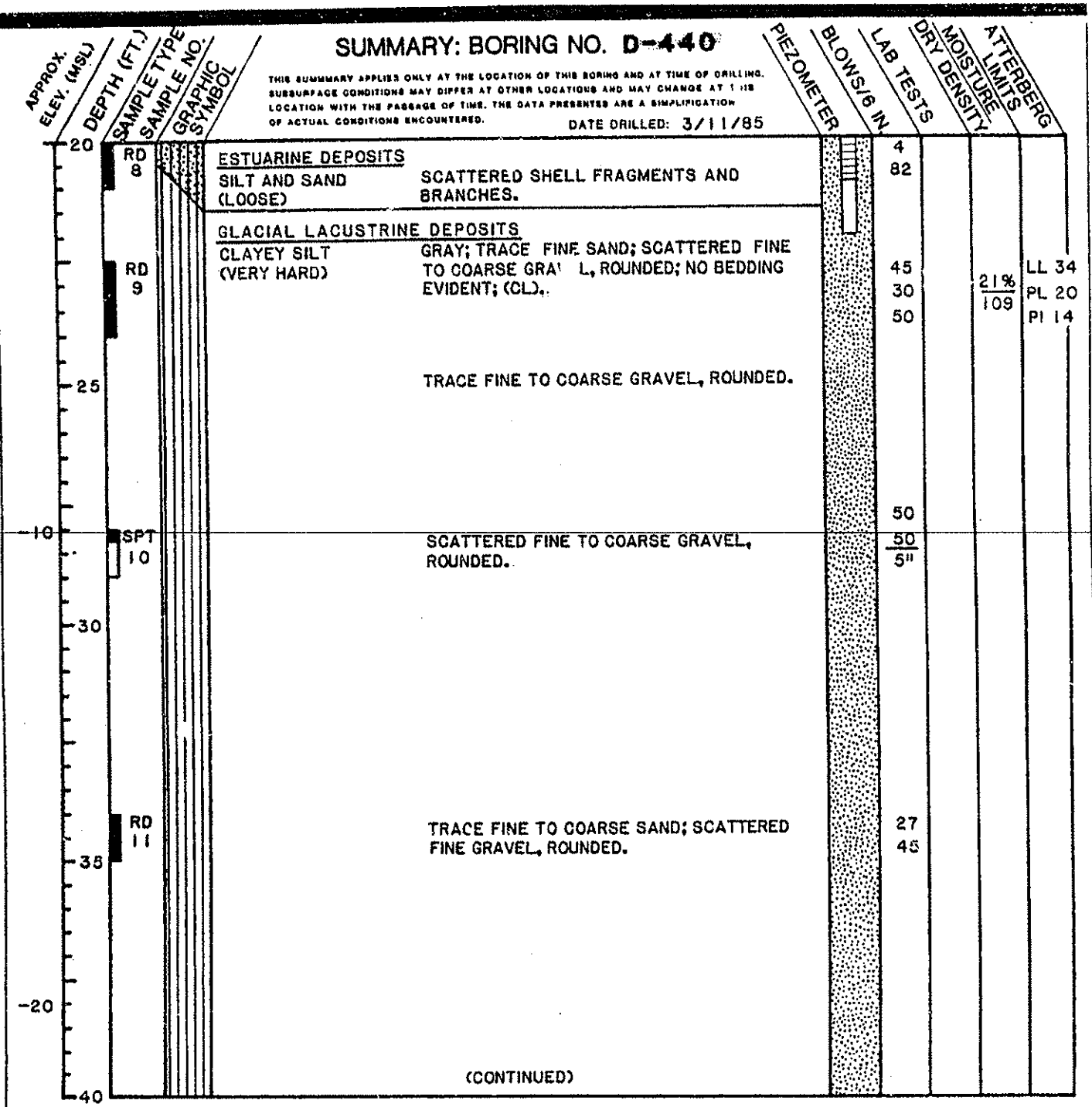
GEO/RESOURCE CONSULTANTS, INC.
Geologists/Geophysicists/Geotechnical Engineers

1116

SUMMARY: BORING NO. D-440

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED ARE A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

DATE DRILLED: 3/11/85



SAMPLE TYPES

G	GRAB SAMPLE - HAND COLLECTED FROM AUGER OR SIT
M	BAILER SAMPLE - MIXED AND HAND COLLECTED
C	CUTTING SAMPLE - HAND COLLECTED FROM DRILL FLUID RETURN
RD	3"O.D. SPLIT BARREL RING SAMPLER - DRIVEN WITH 300 LB. DOWN HOLE SLIP-JAR HAMMER
SPT	2"O.D. SPLIT SPOON SAMPLER - DRIVEN WITH 140 LB. SURFACE HAMMER WITH 30" DROP
SS	SPT, EXCEPT DRIVEN WITH 300 LB. DOWN HOLE SLIP-JAR HAMMER WITH 18" DROP
P	PITCHER SAMPLER - 3"O.D. THIN WALLED SHELBY TUBE PUSHED WITH ROTATING CUTTING BARREL
SH	3"O.D. THIN WALLED SHELBY TUBE - PUSHED WITH HYDRAULICS

MOISTURE CONTENT - PERCENT OF DRY WEIGHT
DRY DENSITY - POUNDS PER CUBIC FOOT

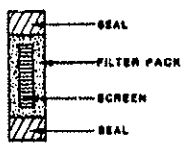
LABORATORY TESTS

G	GRAIN SIZE DISTRIBUTION
A	ATTERBERG LIMITS
V	MINI VANE SHEAR
C	CONSOLIDATION
UU	UNCONSOLIDATED-UNDRAINED TRIAXIAL
CU	CONSOLIDATED-UNDRAINED TRIAXIAL
PP	POCKET PENETROMETER
T	PETROGRAPHIC THIN SECTION

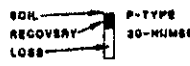
ATTERBERG LIMITS

LL	LIQUID LIMIT
PL	PLASTIC LIMIT
PI	PLASTICITY INDEX

PIEZOMETER DETAIL



SAMPLE DETAIL



RENTON EFFLUENT TRANSFER SYSTEM DUWAMISH ALIGNMENT
King County, Washington
for METRO

Project No.
275-05G

Drawing No.
A-26

GEO/RESOURCE CONSULTANTS, INC.
Geologists/Geophysicists/Geotechnical Engineers

11117

SUMMARY: BORING NO. D-440

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED ARE A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

DATE DRILLED: 3/11/85

APPROX. ELEV. (MSL)	DEPTH (FT.)	SAMPLE TYPE	SAMPLE NO.	GRAPHIC SYMBOL	PIEZOMETER	BLOWS/6 IN	LAB TESTS	DRY DENSITY	MOISTURE	ATTERBERG LIMITS
40		SPT	12				22			
							49			
45		RD	13				25			
							50			
-30										
50		RD	14				45			
							55			
55										

GLACIAL LACUSTRINE DEPOSITS
CLAYEY SILT
(VERY HARD)

TOTAL DEPTH, 51.0 FEET.

PIEZOMETER:

THREE INCH DIAMETER PVC.
SCREEN DEPTH: 11 TO 21 FEET.
SEAL DEPTH: 3 TO 8 FEET.

SAMPLE TYPES

B	GRAB SAMPLE - HAND COLLECTED FROM AUGER OR BIT
M	BAILER SAMPLE - MIXED AND HAND COLLECTED
C	CUTTING SAMPLE - HAND COLLECTED FROM DRILL FLUID RETURN
RD	3"O.D. SPLIT BARREL RING SAMPLER - DRIVEN WITH 300 LB. DOWN HOLE SLIP-JAR HAMMER
SPT	2"O.D. SPLIT SPOON SAMPLER - DRIVEN WITH 140 LB. SURFACE HAMMER WITH 30" DROP
SS	SPT, EXCEPT DRIVEN WITH 300 LB. DOWN HOLE SLIP-JAR HAMMER WITH 18" DROP
P	PITCHER SAMPLER - 3"O.D. THIN WALLED SHELBY TUBE PUSHED WITH ROTATING CUTTING BARREL
SH	3"O.D. THIN WALLED SHELBY TUBE - PUSHED WITH HYDRAULICS

MOISTURE CONTENT = PERCENT OF DRY WEIGHT
DRY DENSITY = POUNDS PER CUBIC FOOT

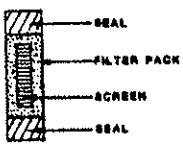
LABORATORY TESTS

G	GRAIN SIZE DISTRIBUTION
A	ATTERBERG LIMITS
V	MINI VANE SHEAR
C	CONSOLIDATION
UU	UNCONSOLIDATED-UNDRAINED TRIAXIAL
CU	CONSOLIDATED-UNDRAINED TRIAXIAL
PP	POCKET PENETROMETER
T	PETROGRAPHIC THIN SECTION

ATTERBERG LIMITS

LL	LIQUID LIMIT
PL	PLASTIC LIMIT
PI	PLASTICITY INDEX

PIEZOMETER DETAIL



SAMPLE DETAIL

RENTON EFFLUENT TRANSFER SYSTEM DUWAMISH ALIGNMENT
King County, Washington
for METRO

Project No. 275-05G

Drawing No. A-27

GEO/RESOURCE CONSULTANTS, INC.
Geologists/Geophysicists/Geotechnical Engineers

11117

PROJECT: ECLIPSE/DUWAMISH CROSSING/WA

RECORD OF BOREHOLE: DB-1

SHEET 1 OF 3

DATUM: MSL

PROJECT NUMBER: 973-1047.100

BORING LOCATION: North Side of the Duwamish

BORING DATE: 2 / 28 / 97

DEPTH FEET	BORING METHOD	SOIL PROFILE DESCRIPTION	USCS	GRAPHIC LOG	ELEV. / DEPTH	SAMPLES NUMBER	TYPE	BLOWS / 6 IN. 140 lb. hammer 30 inch drop	N	REC/ATT	PENETRATION RESISTANCE BLOWS/FT. ■ 0 10 20 30 40 50 / WATER CONTENT, PERCENT Wp W Wl	PIEZOMETER GRAPHIC / WATER LEVEL
					10.0							
0		Loose to very loose, dark brown to grayish brown, non-stratified, mottled, fine to coarse SAND trace to some silt, damp to moist (FILL)	SW		0.0							
					6.5							
			SW		3.5	1	SS	2-1-3	4	1/1.5	■	
5					5.0							
					5.0							
		Very loose, medium gray to brownish gray, stratified, silty, fine SAND and fine sandy SILT, slight FeOx staining, grades down to grayish brown, massive, SAND, trace silt (ALLUVIUM)	SM – ML		1.5							
					8.5		SS	1-1-2	3	0	■	▼ ATD
					0.0							
10					10.0	2	SS	1-2-1	3	1.5 / 1.5	■	
					-1.5							
					11.5							
					-3.5							
			SW		13.5	3	SS	1-1-1	2	1.5 / 1.5	■ G	
					-5.0							
15		Very loose, dark brown, fine to medium SAND and ORGANICS (woody detrius) little silt, moist (ALLUVIUM)	SP-SM		15.0							
					-8.5							
			SP		18.5	4	SS	6-15-42	57	1.5 / 1.5		
					-10.0							
20		Compact to dense, brownish gray to dark grayish brown, massive to faintly bedded, fine to medium SAND, trace to little silt in lenses, trace organics, wet, trace silt lens (ALLUVIUM)	SW		20.0							
					-13.5							
					23.5	5	SS	3-6-7	13	1.1 / 1.5	■	
					-15.0							
25					25.0							
					-18.5							
					28.5	6	SS	4-6-9	15	1.0 / 1.5	■ G	
					-20.0							
30					30.0							
		Log continued on next page										

DRILL RIG: Mobile B-59

DRILLING CONTRACTOR: Holt

DRILLER: F. Bennett

LOGGED: Mocker

CHECKED: JDC

DATE: 3/4/97

Golder Associates

PROJECT: ECLIPSE/DUWAMISH CROSSING/WA

RECORD OF BOREHOLE: DB-1

SHEET 2 OF 3

DATUM: MSL

PROJECT NUMBER: 973-1047.100

BORING LOCATION: North side of the Duwamish

BORING DATE: 2 / 28 / 97

DEPTH FEET	BORING METHOD	SOIL PROFILE DESCRIPTION	USCS	GRAPHIC LOG	ELEV. / DEPTH	SAMPLES NUMBER	TYPE	BLOWS / 6 IN. 140 lb. hammer 30 inch drop	N	REC/ATT	PENETRATION RESISTANCE BLOWS/FT ■ (0, 10, 20, 30, 40, 50) / WATER CONTENT, PERCENT (Wp, W, Wl)	PIEZOMETER GRAPHIC / WATER LEVEL
					-20.0							
30		Compact to dense, brownish gray to dark grayish brown, massive to faintly bedded, fine to medium SAND, trace to little silt in lenses, trace organics, wet, trace silt lens (ALLUVIUM)	SW		30.0							
					-23.5							
					33.5	7	SS	4-8-11	19	1.3 / 1.5	■	
35					-25.0							
					35.0							
					-28.5							
					38.5	8	SS	2-18-23	41	1.3 / 1.5	■	
					-30.0							
40					40.0							
					-33.5							
					43.5	9	SS	11-15-17	32	1.2 / 1.5	■	
					-35.0							
45					45.0							
					-38.5							
					48.5	10	SS	3-2-11	13	1.3 / 1.5	■	
					-40.0							
50					50.0							
					-43.5							
					53.5	11	SS	6-10-13	23	1.5 / 1.5	■	
					-45.0							
55					55.0							
					-48.5							
					58.5	12	SS	12-14-16	30	1.5 / 1.5	■	
					-50.0							
60					60.0							
		Log continued on next page										

DRILL RIG: Mobile B-59

DRILLING CONTRACTOR: Holt

DRILLER: F. Bennett

LOGGED: Mocker

CHECKED: JDC

DATE: 3/4/97

Golder Associates

PROJECT: ECLIPSE/DUWAMISH CROSSING/WA

RECORD OF BOREHOLE: DB-1

SHEET 3 OF 3

DATUM: MSL

PROJECT NUMBER: 973-1047.100

BORING LOCATION: North side of the Duwamish

BORING DATE: 2 / 28 / 97

DEPTH FEET	BORING METHOD	SOIL PROFILE DESCRIPTION	USCS	GRAPHIC LOG	ELEV. / DEPTH	SAMPLES NUMBER	TYPE	BLOWS / 6 IN. 140 lb. hammer 30 inch drop	N	REC/ATT	PENETRATION RESISTANCE BLOWS/FT. ■ (0, 10, 20, 30, 40, 50) / WATER CONTENT, PERCENT Wp, W, Wl	PIEZOMETER GRAPHIC / WATER LEVEL
					-50.0							
60		Compact to dense, brownish gray to dark grayish brown, massive to faintly bedded, fine to medium SAND, trace to little SILT, trace organics, wet, trace silt lens (ALLUVIUM)	SW		60.0							
					-53.5							
					63.5	13	SS	9-14-17	31	1.3 / 1.5		
65					-55.0							
					65.0							
					-58.5							
					68.5	14	SS	15-19-22	41	1.2 / 1.5		
					-60.0							
70					70.0							
					-63.5							
		blow count overstated			73.5	15	SS	15-28-26	54	1.2 / 1.5		
					-65.0							
75					75.0							
					-68.5							
					78.5	16	SS	11-8-20	28	1.2 / 1.5		
					-70.0							
80		Total Depth 80' below ground surface			80.0							
85												
90												

DRILL RIG: Mobile B-59

DRILLING CONTRACTOR: Holt

DRILLER: F. Bennett

LOGGED: Mocker

CHECKED: JDC

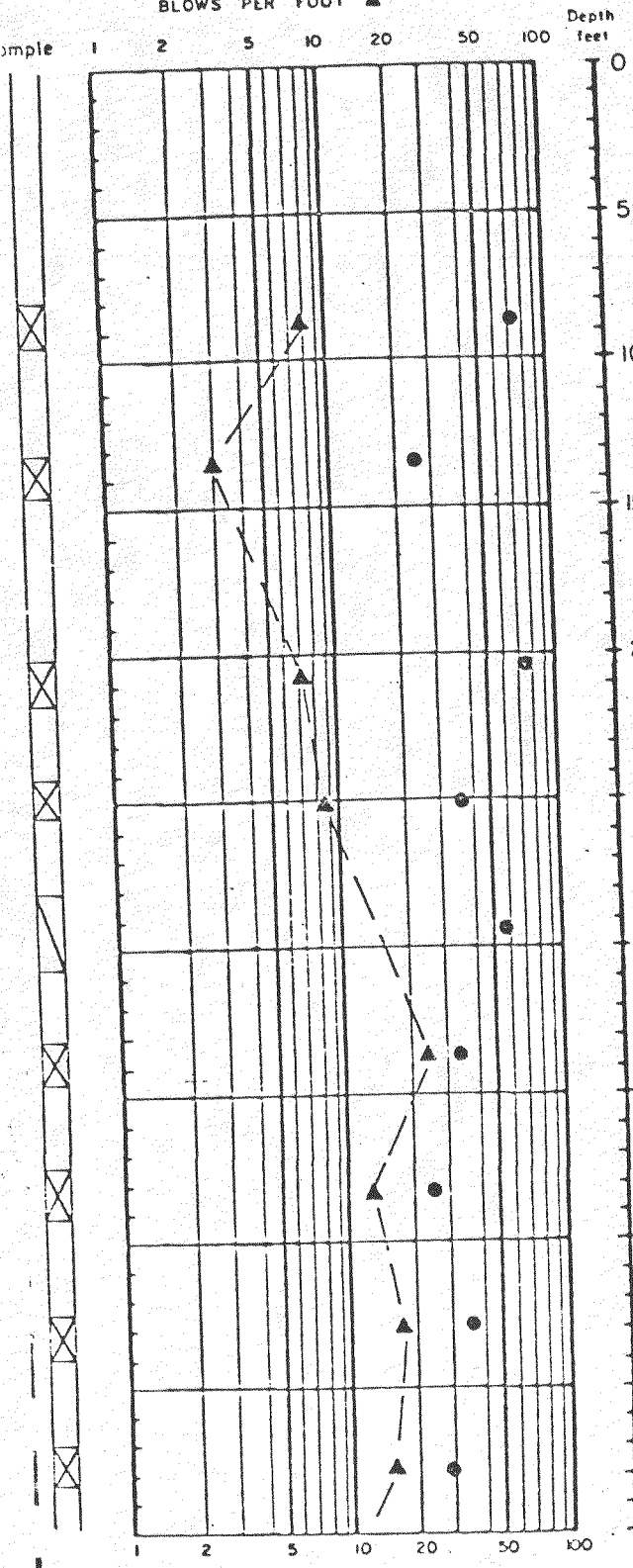
DATE: 3/4/97

Golder Associates

STANDARD PENETRATION RESISTANCE B-2

(140 pound weight, 30 inch drop)

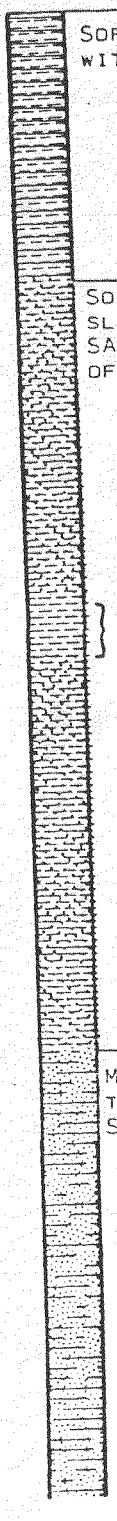
BLOWS PER FOOT ▲



WATER CONTENT

PERCENT ●

SOIL INTERPRETATION



MUDLINE 29.4 FEET BELOW WATER SURFACE

SOFT SATURATED BLACK CLAYEY SILT TO SILTY CLAY WITH TRACE OF ORGANICS.

SOFT TO MEDIUM STIFF, SATURATED GRAYISH-BLACK SLIGHTLY CLAYEY FINE SANDY SILT TO SILTY FINE SAND WITH OCCASIONAL THIN SILT LAYERS AND TRACES OF ORGANICS.

INTERBEDDED LAYERS OF BLACK ORGANIC SILT.

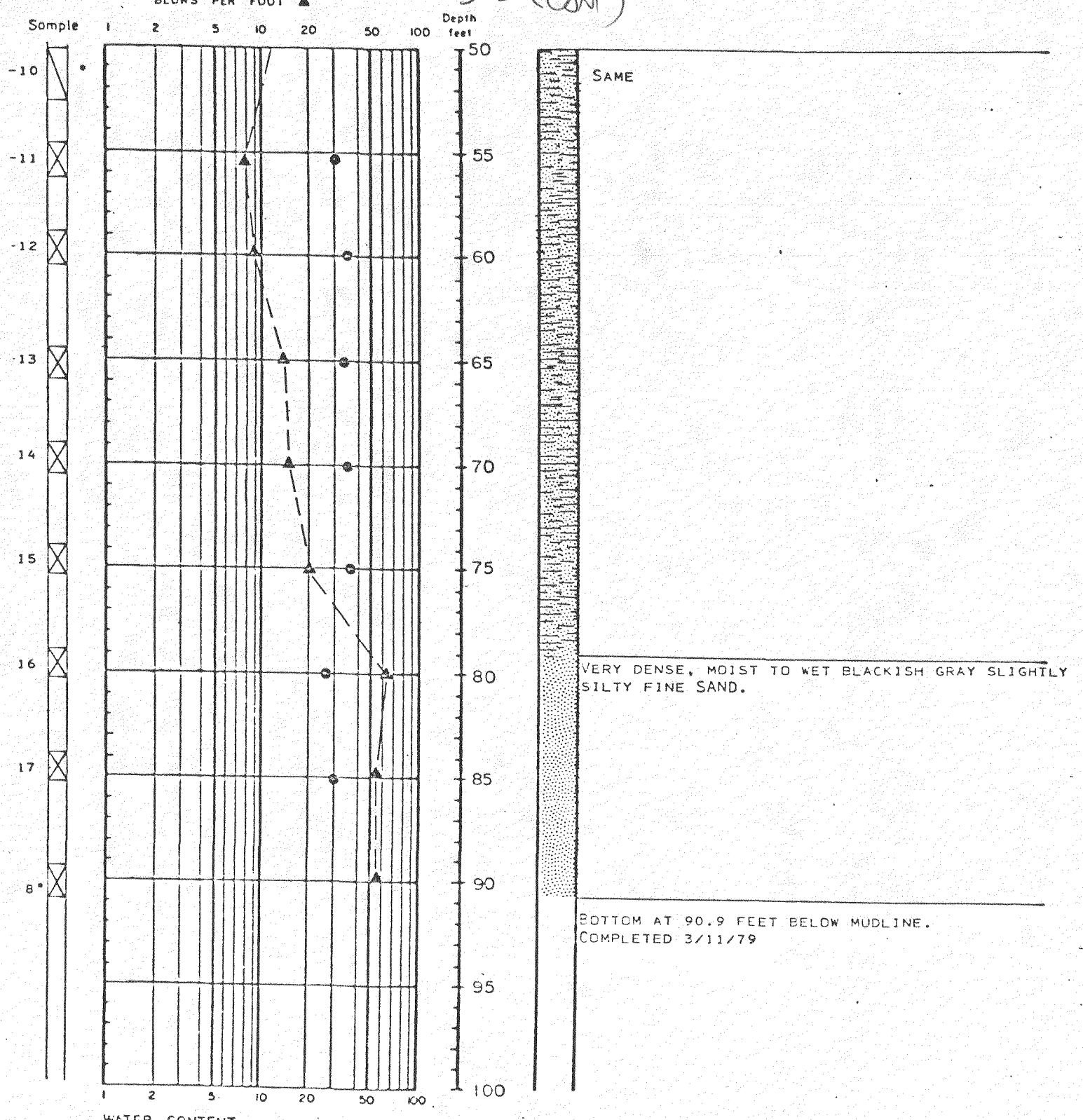
MEDIUM DENSE TO DENSE SATURATED GRAYISH-BLACK TO BLACKISH-GRAY SILTY FINE SAND TO FINE SANDY SILT WITH FEW THIN SILT AND FINE SAND LAYERS.

LEGEND

- ⊠ 2" O.D. Split Spoon Sample
- ▽ Water Level
- ▨ 3" O.D. Shelby Sample
- ▯ Observation Well
- ★ No Sample Recovery

NOTE: Soil descriptions are interpretive and actual changes may be gradual.

B-2 (cont)



LEGEND

- 2" OD Split Spoon Sample
- 3" OD Shelby Sample
- ★ No Sample Recovery
- Water Level
- Observation Well

NOTE: Soil descriptions are interpretive and actual changes may be gradual

J-788 April 1979

HART-CROWSER & associates inc.

Figure A-14

Boring

Sediment Core Log

LDW-SC-1 (R2)

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: **8.1**	Penetration Depth (ft): **6.6**
Client: **LDWG**	Water Depth (ft): **25.3**	Sample Quality: **Good**
Collection Date: **2/8/06**	Mudline Elevation (ft): **-15.7**	Recovery in ft (%): **6.0 (91)**
Contractor: **MCS Environmental, Inc.**	N./LAT: **211282** E./LONG: **1266316**	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. 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	LDW-SC1-0-2		PCB SVOC Metals TBT Hg	0	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.	@ 0.2' TV = 0.6 kg/cm2	recent
1					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).	Transitional Contact GT @ 1.6'	
2	LDW-SC1-2-4	97% (0-3)	PCB SVOC Metals TBT Hg	0	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	@1.9' TV = 0.5 kg/cm2	upper alluvium
3					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'.	Sharp Contact GT @ 3.1'	
4	LDW-SC1-4-6	100% (3-5)			@ 3.4' 1/2" round clay pocket @ 3.8' grades to trace silt	@ 3.6' TV = 0.7 kg/cm2	lower alluvium
5		89% (5-6.6)	PCB	0		Below 4.6' core is slightly winnowed (~5%) from edge of tube @ 5.1' TV = 0.5 kg/cm2	
6					End of core at 6.0' . Driven to refusal.		

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: slowed (6.2-3.4'), refusal (6.6').**
Two drive attempts made at station.

Calculated Recovery
Sample Length/Penetration Length:
6.0 / 6.6 = 91 %

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

Sediment Core Log

LDW-SC-2 (R1)

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: **7.4**	Penetration Depth (ft): **13.1**
Client: **LDWG**	Water Depth (ft): **31.4**	Sample Quality: **Good**
Collection Date: **2/9/06**	Mudline Elevation (ft): **-23.7**	Recovery in ft (%): **13.1 (100)**
Contractor: **MCS Environmental, Inc.**	N./LAT: **211196** E./LONG: **1267032**	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. Bacher, 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-SC2-0-2	47% (0-1)	PCB SVOC Metals Hg Pesticides	0	SM: (0.0-1.2) wet, loose, black (GLEY 1, 2.5/N) SAND, little silt.		0
1					@ 0.7-0.9' wood fragments and subrounded gravel up to 1" L	Transitional Contact PID bag @ 0.9' = 0.0	1
2	LDW-SC2-2-4	100% (1-2)			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.	Sheen Test @ 1.0: 50% rainbow w/ scattered 1/2" florets @ 1.5' TV = 0.3 kg/cm2 Transitional Contact	2
3			PCB SVOC Metals Hg Pesticides	0	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.	GT @ 2.9' @ 3.2' TV = 0.4 kg/cm2	3
4	LDW-SC2-4-6	100% (2-5)			OL: (4.1-4.3) wet, stiff, light gray (2.5Y, 7/1) CLAYEY ORGANIC SILT.	Sharp Contact	4
5			PCB SVOC Metals	0	ML: (4.3-10.5) wet to moist, 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 @ 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	5
6	LDW-	100% (5-8)			@ 6.0' 5" L wood fragment		6
				0			

recent

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 (2.2'), moderate (4.9'), hard (13.1'), penetration goal reached. One drive attempt made at station. Core catcher was intact.**

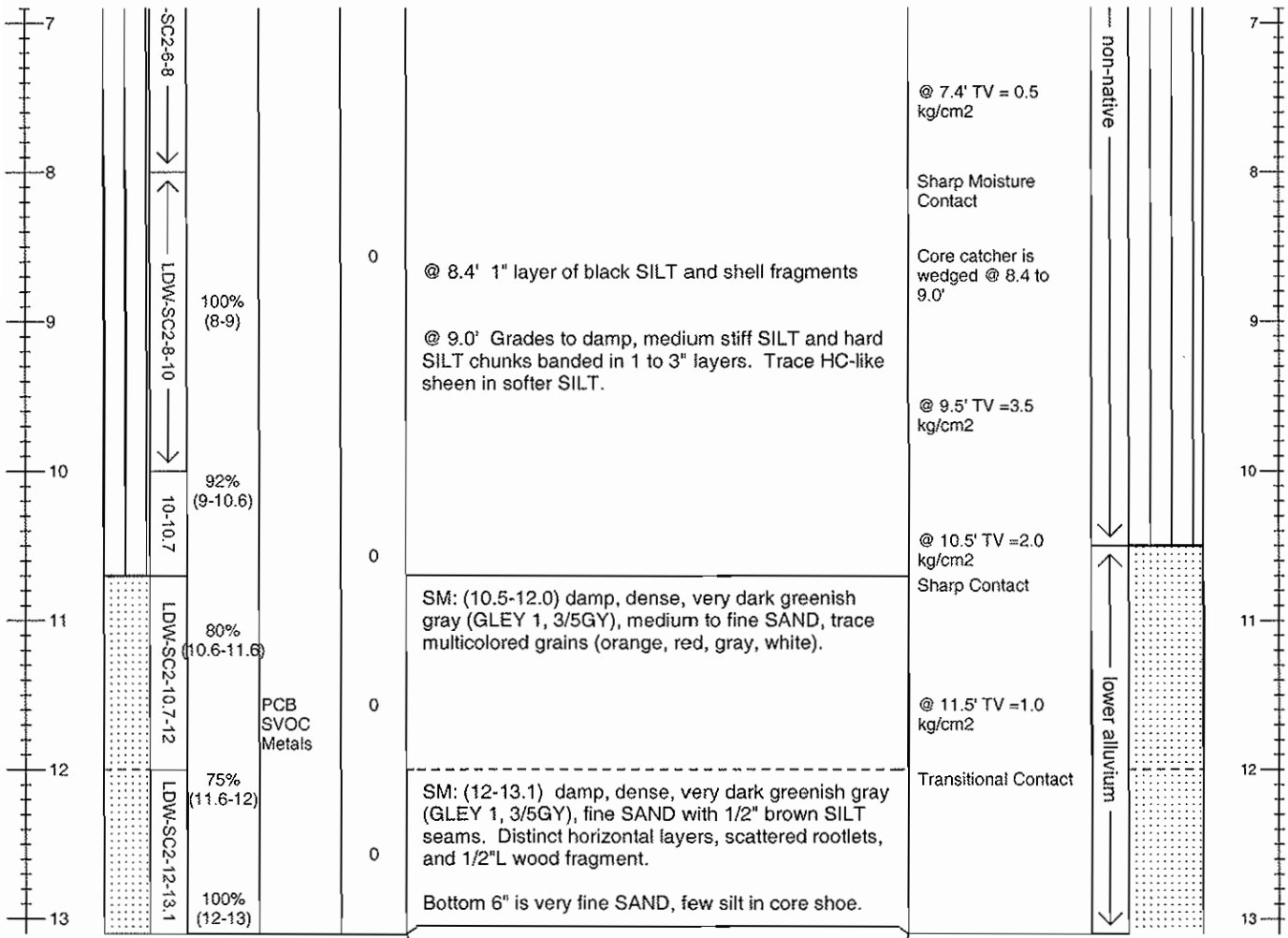
Calculated Recovery
Sample Length/Penetration Length:
13.1/ 13.1 = 100 %

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

Sediment Core Log

LDW-SC-2 (R1)

Project: **LDW RI/FS**	Water Body Type: **Lower Duwamish Waterway**	Tube Length (ft): **16.1**
Project #: **PORS5-18220-511**	Water Elevation (ft)/Tide: **7.4**	Penetration Depth (ft): **13.1**
Client: **LDWG**	Water Depth (ft): **31.4**	Sample Quality: **Good**
Collection Date: **2/9/06**	Mudline Elevation (ft): **-23.7**	Recovery in ft (%): **13.1 (100)**
Contractor: **MCS Environmental, Inc.**	N./LAT: **211196** E./LONG: **1267032**	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. Bacher, A. Fitzpatrick**



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 (2.2'), moderate (4.9'), hard (13.1'), penetration goal reached. One drive attempt made at station. Core catcher was intact.**

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

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

Sediment Core Log

LDW-SC-3 (R1)

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: **Good**
Collection Date: **2/9/06**	Mudline Elevation (ft): **-49.3**	Recovery in ft (%): **8.5 (83)**
Contractor: **MCS Environmental, 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. Bacher, 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-SC3-0-2	93% (0-1)	PCB SVOC Metals Hg TBT	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).	GT @ 0.7'	upper alluvium
1					@ 0.9' 1" thick SILT lens	@ 0.9' TV = 0.2 kg/cm2	
2	LDW-SC3-2-4	130% (1-2)			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'.	Sharp Contact GT @ 1.8'	
					@ 1.6' 1" thick SILT lens		
3		83% (2-5)	PCB SVOC Metals Hg TBT	0	@ 2.4' 1.5" thick SILT lens	@ 3.0' TV = 0.4 kg/cm2	
					@ 2.7' 3"L x 1"W thin wood fragment		
4	LDW-SC3-4-6				@ 3.1' 3" thick SILT lens		
					@ 4.0' Slight H2S-like odor to 4.6'		
5				0	@ 4.2' 1/2" thick SILT lens	Gradational Contact: less water	lower alluvium
					@ 4.6' Scattered twigs	@ 4.9' TV = 0.2 kg/cm2	
6	LDW	81% (5-7)			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').		
				0			

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 (5.0'), moderate (7.0'), hard (7.8'), refusal (8.7'). One drive attempt made at station.**

Calculated Recovery
Sample Length/Penetration Length:
8.5 / 10.2 = 83 %

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

Sediment Core Log

LDW-SC-3 (R1)

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: **Good**
Collection Date: **2/9/06**	Mudline Elevation (ft): **-49.3**	Recovery in ft (%): **8.5 (83)**
Contractor: **MCS Environmental, 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. Bacher, 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	SC3-8-8	70% (7-8)			@ 7.0' wood fragments, elongated @ 7.2' 1.5" thick SILT lens	@ 7.3' TV = 0.6 kg/cm2	7
8		80% (8-9)			@ 7.9' 1" thick SILT lens @ 8.1' small wood fragment	Not sampled below 8.0'.	8
9		83% (9-10.2)			End of core at 8.5'. Driven to refusal.		9
10							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: easy (5.0'), moderate (7.0'), hard (7.8'), refusal (8.7'). One drive attempt made at station.**

Calculated Recovery
Sample Length/Penetration Length:
8.5 / 10.2 = 83 %

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

Sediment Core Log

LDW-SC-4 (R2)

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): **9.0**
Client: **LDWG**	Water Depth (ft): **41.9**	Sample Quality: **Not indicated**
Collection Date: **2/9/06**	Mudline Elevation (ft): **-34.0**	Recovery in ft (%): **7.7 (85)**
Contractor: **MCS Environmental, Inc.**	N./LAT: **210597** E./LONG: **1266933**	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. 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	LDW-SC4-0-1	92% (0-2)	PCB SVOC Metals Hg TBT	0	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.	Sharp Contact GT @ 0.4'	recent
1	LDW-SC3-1-2				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.	@ 0.6' TV = 0.4 kg/cm2	
2	LDW-SC3-2-4	115% (2-4)	PCB SVOC Metals Hg TBT	0	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	upper alluvium
3					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.	Sharp Contact	
4			PCB SVOC Metals Hg TBT	0	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.	@ 2.1' TV = 0.4 kg/cm2	
5	LDW-SC3-4-6	92% (4-6)	PCB	0	SP-SC: (3.3-7.2) moist, medium dense, very dark 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	Sharp Contact	
6	LDW-SC	85% (6-7)			@ 5.0' 1/2" clay pocket	@ 4.5' TV = 0.5 kg/cm2	lower alluvium
					@ 5.4' 1/2" gray silt lens		
					@ 6.4' 1" clay pocket		

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: moderate (7.5'), hard (9.0'), refusal (9.0'). Two drive attempts made at station. Core catcher was intact.**

Calculated Recovery
Sample Length/Penetration Length:
7.7 / 9.0 = 85 %

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

Sediment Core Log

LDW-SC-4 (R2)

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): **9.0**
Client: **LDWG**	Water Depth (ft): **41.9**	Sample Quality: **Not indicated**
Collection Date: **2/9/06**	Mudline Elevation (ft): **-34.0**	Recovery in ft (%): **7.7 (85)**
Contractor: **MCS Environmental, Inc.**	N./LAT: **210597** E./LONG: **1266933**	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. 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
7	3-7.7'	60% (7-8)		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.	Transitional Contact @ 7.2' TV = 0.6 kg/cm2	7
8		60% (8-9)			End of core at 7.7'. Driven to refusal.		8
9							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: moderate (7.5'), hard (9.0'), refusal (9.0'). Two drive attempts made at station. Core catcher was intact.

Calculated Recovery
Sample Length/Penetration Length:
7.7 / 9.0 = 85 %

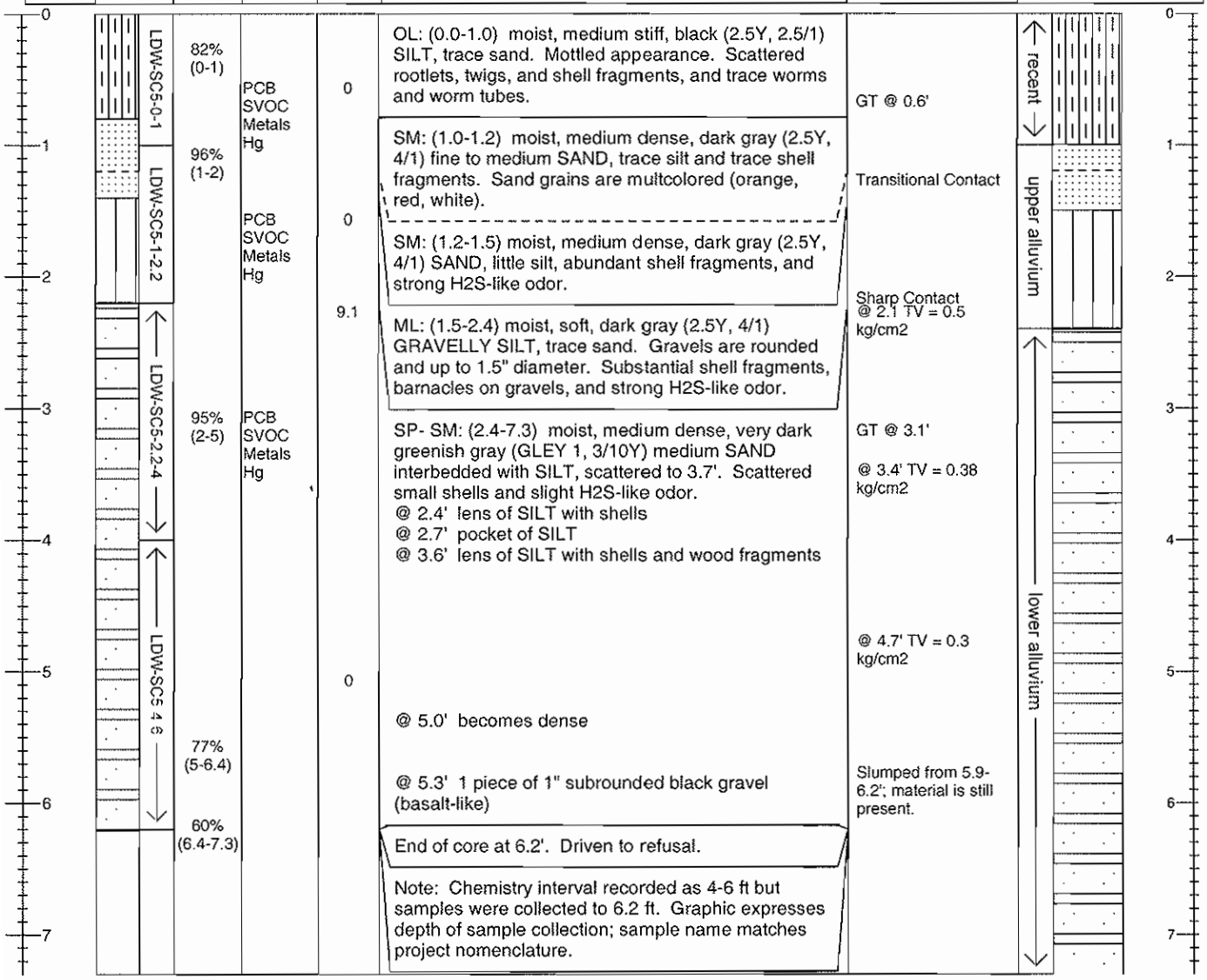
Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.

Sediment Core Log

LDW-SC-5 (R2)

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: **7.7**	Penetration Depth (ft): **7.3**
Client: **LDWG**	Water Depth (ft): **19.7**	Sample Quality: **Good**
Collection Date: **2/9/06**	Mudline Elevation (ft): **-10.4**	Recovery in ft (%): **6.2 (85)**
Contractor: **MCS Environmental, Inc.**	N./LAT: **210543** E./LONG: **1266048**	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: **N. Bacher, A. Fitzpatrick**



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 (5.0'), moderate (6.3'), hard (7.3'), refusal (7.3'). Two drive attempts made at station. Core catcher was intact. EPA oversight approved processing as Method A.**

Calculated Recovery
Sample Length/Penetration Length:
6.2 /7.3 = 85 %

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

Sediment Core Log

LDW-SC-6 (R1)

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: **NA**	Penetration Depth (ft): **11.0**
Client: **LDWG**	Water Depth (ft): **8.6**	Sample Quality: **Good**
Collection Date: **2/9/06**	Mudline Elevation (ft): **-33.0**	Recovery in ft (%): **8.6 (77)**
Contractor: **MCS Environmental, Inc.**	N./LAT: **209838** E./LONG: **1266285**	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: **N. Bacher, 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-SC6-0-2				OL: (0.0-0.4) wet, very soft, olive (5Y, 4/3) ORGANIC SILT. Scattered twigs and trace worm tubes.	Transitional Contact	0
1			PCB SVOC Metals Hg	0	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.	@ 0.7 TV = 0.5 kg/cm2 GT @ 1.1'	1
2		100% (0-2.6)				@ 1.7' TV = 0.8 kg/cm2	2
3	LDW-SC6-2-4.5	100% (2.6-4.7)	PCB SVOC Metals Hg	0		GT @ 3.2' @ 3.5' TV = 0.7 kg/cm2	3
4					@ 3.4' 2" pocket of soft, stiff, gray SILT 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).	Sharp Contact	4
5	LDW-SC6-4.5-6	71% (4.7-6.8)		0	@ 4.5' grades to fine sand	@ 4.9' TV = 1.2 kg/cm2	5
6	LDW				@ 5.4' grades to coarse to medium sand @ 6.0' grades to medium sand @ 6.4' grades to medium to fine sand	Bag @ 5.7' (debris) Bag @ 6.0' (sand clast with odor) @ 6.5' TV = 0.5 kg/cm2	6

recent

upper all

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 (2.6'), moderate (8.8'), hard (10.0'), refusal (11.0'). One drive attempt made at station.**

Core catcher was intact.

Calculated Recovery
Sample Length/Penetration Length:
8.6 / 11.0 = 78 %

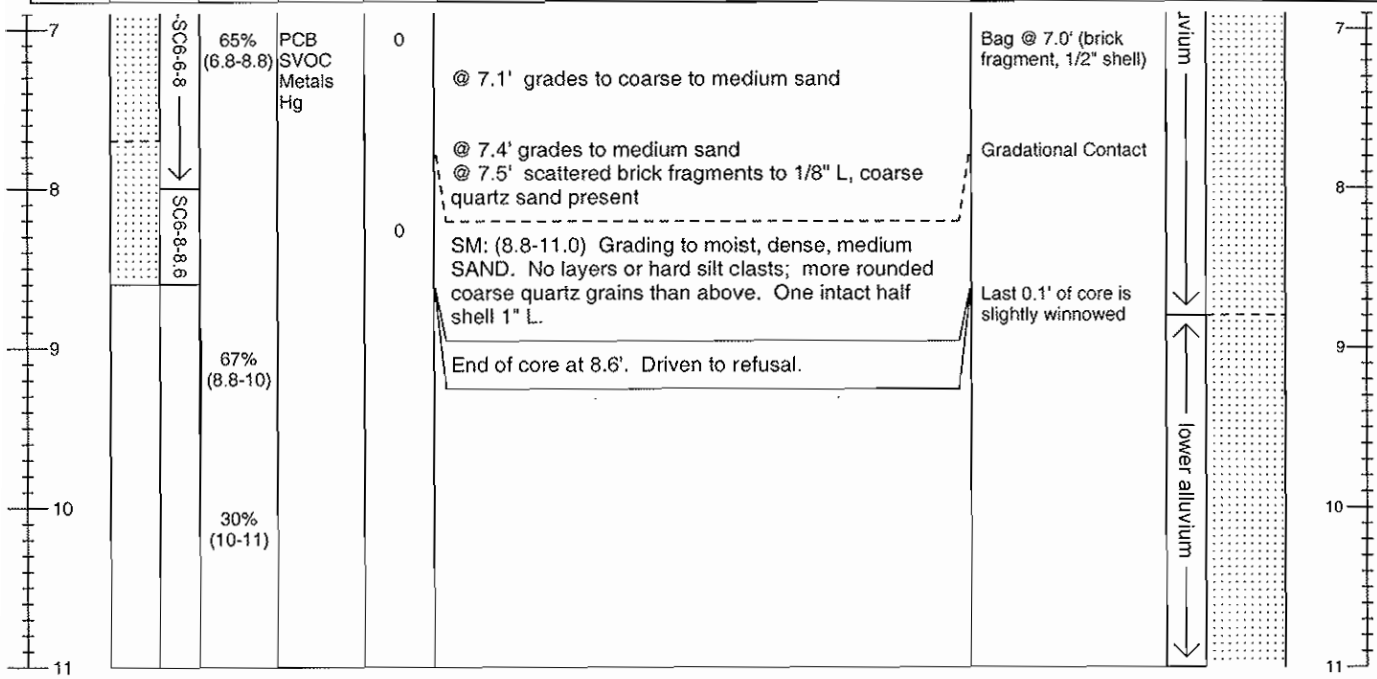
Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.

Sediment Core Log

LDW-SC-6 (R1)

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): **11.0**
Client: **LDWG**	Water Depth (ft): **8.6**	Sample Quality: **Good**
Collection Date: **2/9/06**	Mudline Elevation (ft): **-33.0**	Recovery in ft (%): **8.6 (77)**
Contractor: **MCS Environmental, Inc.**	N./LAT: **209838** E./LONG: **1266285**	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: **N. Bacher, 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	SC6-8-8	65% (6.8-8.8)	PCB SVOC Metals Hg	0	@ 7.1' grades to coarse to medium sand	Bag @ 7.0' (brick fragment, 1/2" shell)	7
					@ 7.4' grades to medium sand @ 7.5' scattered brick fragments to 1/8" L, coarse quartz sand present	Gradational Contact	
8	SC6-8-8.6			0	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.	Last 0.1' of core is slightly winnowed	8
9		67% (8.8-10)			End of core at 8.6'. Driven to refusal.		9
10		30% (10-11)					10
11							11



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 (2.6'), moderate (8.8'), hard (10.0'), refusal (11.0'). One drive attempt made at station.**

Core catcher was intact.

Calculated Recovery
Sample Length/Penetration Length:
8.6 / 11.0 = 78 %

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

Sediment Core Log

LDW-SC-7 (R1)

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): **11.0**
Client: **LDWG**	Water Depth (ft): **34.8**	Sample Quality: **Good**
Collection Date: **2/10/06**	Mudline Elevation (ft): **-27.1**	Recovery in ft (%): **8.7 (79)**
Contractor: **MCS Environmental, Inc.**	N./LAT: **209605** E./LONG: **1266850**	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 Depths	*In-situ* Depth (ft) & Graphic Log
0	LDW-SC7-0-1	100% (0-0.6)	PCB SVOC Metals Hg Pesticides TBT	0	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.		recent
1	SC7-1-1.7	92% (0.6-1)	PCB SVOC Metals Hg Pesticides TBT	0	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'	upper alluvium
2	LDW-SC7-1.7-4	56% (1-4)	PCB SVOC Metals Hg Pesticides TBT	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 GT @ 2.6'	
3					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.	@ 3.2' TV = 0.3 kg/cm2 @ 3.5' TV = 0.7 kg/cm2	
4	LDW-SC7-4-6.5	119% (4-6)			@ 4.0' 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
5				0		@ 5.3' TV = 0.4 kg/cm2	

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 (0.6'), moderate (9.4'), hard (10.7'), refusal (11'). One drive attempt made at station. Core shoe was 50% full of sand.**

Calculated Recovery
Sample Length/Penetration Length:
8.7 / 11.0 = 79 %

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

Sediment Core Log

LDW-SC-7 (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: **6.7**	Penetration Depth (ft): **11.0**
Client: **LDWG**	Water Depth (ft): **34.8**	Sample Quality: **Good**
Collection Date: **2/10/06**	Mudline Elevation (ft): **-27.1**	Recovery in ft (%): **8.7 (79)**
Contractor: **MCS Environmental, Inc.**	N./LAT: **209605** E./LONG: **1266850**	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 Depths	*In-situ* Depth (ft) & Graphic Log
6							6
7	LDW-SC7-6.5-8	89% (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).	Transitional Contact @ 7.1' TV = 0.5 kg/cm2	7
8	SC7-8-8.7			0	End of core at 8.7'. Driven to refusal.	@ 8.7 to 8.9' Core is winnowed and was not sampled. Shoe is 50% of same material as above.	8
9							9
10		38% (9-10) 33% (10-11)					10
11							11

fluvial

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 (0.6'), moderate (9.4'), hard (10.7'), refusal (11'). One drive attempt made at station. Core shoe was 50% full of sand.**

Calculated Recovery
Sample Length/Penetration Length:
8.7 / 11.0 = 79 %

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

Sediment Core Log

LDW-SC-8 (R1)

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: **7.3**	Penetration Depth (ft): **14.6**
Client: **LDWG**	Water Depth (ft): **46.5**	Sample Quality: **Good**
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 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 Depths	*In-situ* Depth (ft) & Graphic Log
0	LDW-SC8-0-1	73% (0-1)	PCB SVOC Metals Hg Pesticides	0	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.	Transitional Contact	
1	LDW-SC8-1-2		PCB SVOC Metals Hg Pesticides	0	OL: (1.1-4.8) wet, medium stiff, black (2.5Y, 2.5/1) 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.	GT @ 0.9'	
						Bag @ 1.2' (orange agglomerate) @ 1.5' TV = 0.6 kg/cm2	
2	LDW-SC8-2-4	100% (1-5)					
						@ 2.5' TV = 0.34 kg/cm2	
3			PCB SVOC Metals Hg Pesticides	0		GT @ 3'	
4	LDW-SC8-4-6				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.	Gradational Contact: less water	recent
					@ 4.8 to 5.0' 2" layer of wet, black (2.5Y, 4/2) SAND	Bag @ 4.8' (black chunk)	
5		100% (5-7)	PCB SVOC Metals Hg	0		@ 5' TV = 0.56 kg/cm2	
					@ 5.6' 2" layer of black SAND, moderate wood fragments, trace sheen florets, faint HC-like odor	@ 5.8' PID Bag = 0	
6							
						@ 6.6' TV = 0.84 kg/cm2	
7	LDW-SC8-6-8	81% (7-10)	PCB SVOC Metals Hg	0	@ 6.4' end of sand interbeds		
					@ 7 .0 to 8.0' possible HC-like odor		
8							

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 (0.8'), 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 %

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

Sediment Core Log

LDW-SC-8 (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: **7.3**	Penetration Depth (ft): **14.6**
Client: **LDWG**	Water Depth (ft): **46.5**	Sample Quality: **Good**
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 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 Depths	*In-situ* Depth (ft) & Graphic Log
8							8
9	LDW-SC8-8-10		PCB SVOC Metals Hg	0	CL: (11.4-11.8) wet, stiff, greenish gray (GLEY 1, 6/1) CLAY.	@ 8.4' TV = 0.4 kg/cm2	9
10					ML: (11.8-14.6) wet, stiff, black(2.5Y, 2.5/1) SILT. End of core at 10.0'.		10
11		73% (10-13)					11
12							12
13							13
14		62% (13-14.6)					14

upper 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 (0.8'), 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 %

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

Sediment Core Log

LDW-SC-9 (R1)

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: **Good**
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: **2/13/06**
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**

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-SC9-0-1	78% (0-2)	PCB SVOC Metals Hg Pesticides	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	recent
1	LDW-SC9-1-2.6		PCB SVOC Metals Hg Pesticides	0	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	
2		100% (2-4)			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	
3	LDW-SC9-2-6.4		PCB SVOC Metals Hg Pesticides	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.	GT @ 2.5'	upper alluvium
4		70% (4-6)				@ 3.8' TV = 0.4 kg/cm2	
5	LDW-SC9-4-6.4			0		@ 4.6' TV = 0.5 kg/cm2	
6		30% (6-8)					
7	LDW			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.	Sharp Contact @ 6.9' TV = 0.2 kg/cm2	

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 %

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

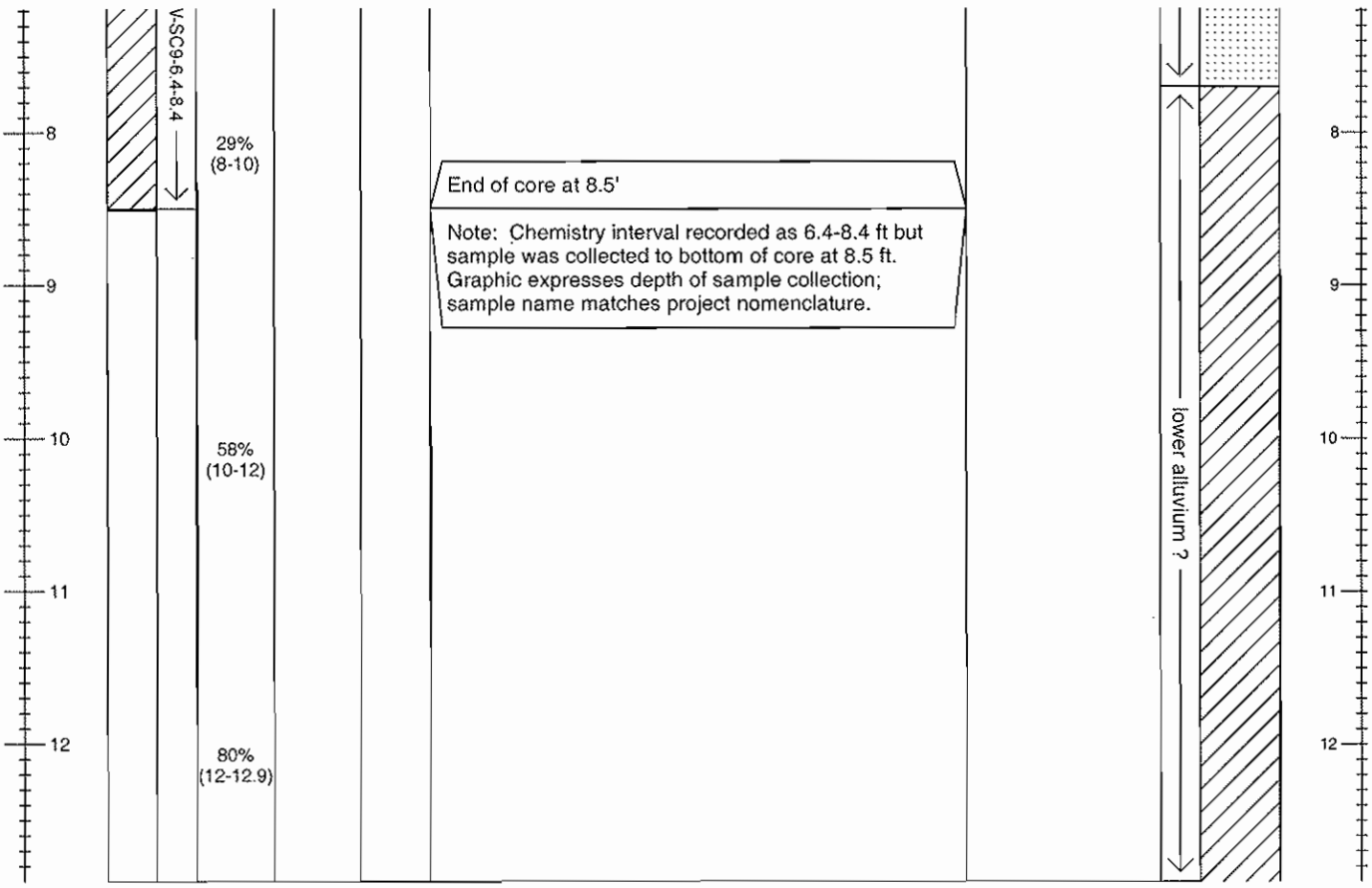
Sediment Core Log

LDW-SC-9 (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: **-1.6**	Penetration Depth (ft): **12.9**
Client: **LDWG**	Water Depth (ft): **30.0**	Sample Quality: **Good**
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: **2/13/06**
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**

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



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 %

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

Sediment Core Log

LDW-SC-10 (R1)

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 Depths	*In-situ* Depth (ft) & Graphic Log
0	LDW-SC10-0-1	82% (0-0.6)	PCB SVOC Metals Hg Pesticides	0	MH: (0.0-0.05) very wet, very soft, brown SILT.		0
					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'	
1	LDW-SC10-1-2		PCB SVOC Metals Hg Pesticides	0	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	1
2	LDW-SC10-2-4	100% (0.6-5.8)				@ 2.3' TV = 0.4 kg/cm2	2
3			PCB SVOC Metals Hg Pesticides	0	@ 3.4' one mussell shell fragment	GT @ 2.9'	3
4	LDW-SC10-4-5		PCB SVOC Hg	0	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	4
5	LDW-SC10-5-6			0	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.	Sharp Contact @ 5.4' TV = 0.5 kg/cm2	5
6	LDW-	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.	Sharp Contact @ 6.3' TV = 0.8 kg/cm2	6

recent

upper 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 (0.6'), 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 %

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

Sediment Core Log

LDW-SC-10 (R1)

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 Depths	*In-situ* Depth (ft) & Graphic Log
7	SC10-8-8	45% (7.8-9.8)	PCB	0		7.7' to 8.5' some slumping. Core is winnowed from 8.0' to 8.9' and was not sampled.	lower alluvium
8							
9					End of core @ 8.9'. Driven to refusal.		
10		50% (9.8-10.6)					

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 (0.6'), 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 %

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

Sediment Core Log

LDW-SC-11 (R1)

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: **5.3**	Penetration Depth (ft): **5.9**
Client: **LDWG**	Water Depth (ft): **8.6**	Sample Quality: **Good**
Collection Date: **2/13/06**	Mudline Elevation (ft): **-5.1**	Recovery in ft (%): **5.0 (85)**
Contractor: **MCS Environmental, Inc.**	N./LAT: **208291** E./LONG: **1265908**	Process Date: **2/13/06**
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**

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	SC11-0-0.8		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.	Core catcher found at 0.8' Bag @ 0.7' (red chips, debris)	recent
1	LDW-SC11-0.8-2	85% (0-3)	PCB SVOC Metals Hg	0	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.	GT @ 0.9' @ 1.2' TV = 0.8 kg/cm2	upper alluvium
2	LDW-SC11-2-3.4	79% (3-5)	PCB SVOC Metals Hg	0			
3	SC11-3.4-4.1		PCB SVOC Metals Hg		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.	Transitional Contact	
4	LDW-SC11-4.1-5				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.	Transitional Contact @ 4.5' TV = 12.0 kg/cm2	
5		100% (5-5.6) 67% (5.6-5.9)		0	End of core at 5.0'. Driven to refusal.		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: moderate (4.6), moderate to hard (5.6') hard (5.9'), refusal (5.9'). One drive attempt made at station. Core catcher was intact and 100% full. Difficult extraction.**

Calculated Recovery
Sample Length/Penetration Length:
5.0 / 5.9 = 85 %

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

Sediment Core Log

LDW-SC-12 (R1)

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: **2.8**	Penetration Depth (ft): **9.6**
Client: **LDWG**	Water Depth (ft): **13.7**	Sample Quality: **Good**
Collection Date: **2/16/06**	Mudline Elevation (ft): **-7.5**	Recovery in ft (%): **8.7 (91)**
Contractor: **MCS Environmental, Inc.**	N./LAT: **208217** E./LONG: **1266577**	Process Date: **2/16/06**
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	LDW-SC12-0-2				ML: (0.0-0.1) wet, very soft, olive brown (2.5Y, 4/3) SILT.	Transitional Contact	recent
1			PCB SVOC Metals Hg TBT	0	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	
2	LDW-SC12-2-4	100% (0-4)			@ 2.0' strong H2S-like odor		
3			PCB SVOC Metals Hg TBT	0	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	upper alluvium
4		89% (4-5)					
5	LDW-SC12-4-6.7		PCB Hg	0	@ 5.0' wood fragments up to 3" L	@ 5.4' TV = 0.6 kg/cm2	
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.	Transitional Contact	

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 (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 %

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

Sediment Core Log

LDW-SC-12 (R1)

Project: **LDW RI/FS**	Water Body Type: **Lower Duwamish Waterway**	Tube Length (ft): **16.1**
Project #: **PORS5-18220-511**	Water Elevation (ft)/Tide: **2.8**	Penetration Depth (ft): **9.6**
Client: **LDWG**	Water Depth (ft): **13.7**	Sample Quality: **Good**
Collection Date: **2/16/06**	Mudline Elevation (ft): **-7.5**	Recovery in ft (%): **8.7 (91)**
Contractor: **MCS Environmental, Inc.**	N./LAT: **208217** E./LONG: **1266577**	Process Date: **2/16/06**
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
7	LDW-SC12-6.7-8.7	83% (7-8)	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.	Sharp Contact @ 7.0' TV = 0.7 kg/cm2	lower alluvium
8		70% (8-9)				@ 8.2' TV = 0.8 kg/cm2	
9		80% (9-9.6)			End of core at 8.7'. Driven to refusal. 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.		

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 (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 %

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

Sediment Core Log

LDW-SC-13 (R1)

Project: **LDW RI/FS**	Water Body Type: **Lower Duwamish Waterway**	Tube Length (ft): **16.1**
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**
Collection Date: **2/13/06**	Mudline Elevation (ft): **-10.7**	Recovery in ft (%): **9.9 (79)**
Contractor: **MCS Environmental, Inc.**	N./LAT: **207096** E./LONG: **1267585**	Process Date: **2/13/06**
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**

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-SC13-0-2	115% (0-1)	PCB SVOC Metals Hg	0	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.	Sharp Contact	recent
1					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.	GT @ 0.9' @ 1.0' TV = 0.3 kg/cm2	
2	LDW-SC13-2-4	94% (1-3)			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		71% (3-5)	PCB SVOC Metals Hg	0	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	
4	LDW-SC13-4-6			0			
5						@ 4.9' TV = 0.4 kg/cm2	
6	LDW-	67% (5-7)		0	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	Transitional Contact @ 6.4' TV = 0.6 kg/cm2	

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 (5.2'), moderate (10.4'), hard (12.5'), penetration goal reached. One drive attempt made at station. Core catcher was intact.**

Calculated Recovery
Sample Length/Penetration Length:
9.9 / 12.5 = 79 %

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

Sediment Core Log

LDW-SC-13 (R1)

Project: **LDW RI/FS**	Water Body Type: **Lower Duwamish Waterway**	Tube Length (ft): **16.1**
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**
Collection Date: **2/13/06**	Mudline Elevation (ft): **-10.7**	Recovery in ft (%): **9.9 (79)**
Contractor: **MCS Environmental, Inc.**	N./LAT: **207096** E./LONG: **1267585**	Process Date: **2/13/06**
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**

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	SC13-6-8						7
8	LDW-SC13-8-9.5	75% (7-9)		0		@ 8.5' TV = 0.7 kg/cm2	8
9		82% (9-10)			End of core at 9.9'.	Core slightly winnowed from 9.5-9.9'	9
10		80% (10-11)					10
11		70% (11-12.5)					11
12							12

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: easy (5.2'), moderate (10.4'), hard (12.5'), penetration goal reached. One drive attempt made at station. Core catcher was intact.**

Calculated Recovery
Sample Length/Penetration Length:
9.9 / 12.5 = 79 %

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

Sediment Core Log

LDW-SC-14 (R1)

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): **12.6**
Client: **LDWG**	Water Depth (ft): **46.0**	Sample Quality: **Good**
Collection Date: **2/13/06**	Mudline Elevation (ft): **-36.8**	Recovery in ft (%): **11.6 (92)**
Contractor: **MCS Environmental, Inc.**	N./LAT: **207055** E./LONG: **1267397**	Process Date: **2/13/06**
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**

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-SC14-0-1.4	100% (0-2)	PCB SVOC Metals Hg Pesticides 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.		recent
1	1.4-2.0		PCB SVOC Metals Hg Pesticides TBT	0	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	@ 0.6' TV = 0.1 kg/cm2 GT @ 1.0'	
2	LDW-SC14-2-4.1	100% (2-2.4)					
3		100% (2.4-4)	PCB SVOC Metals Hg Pesticides TBT	0		GT @ 3.0' @ 3.4' TV = 0.3 kg/cm2	
4					ML: (3.7-4.1) moist, soft, dark gray (2.5Y, 4/1) SILT, little clay. Trace horizontal black mottling.	Transitional Contact	
5	LDW-SC14-4.1-6	100% (4-7)	PCB SVOC Hg	0	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'.	Transitional Contact	upper all
6							

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 (1.8'), easy (9.0'), moderate (12.7'), penetration goal reached. One drive attempt made at station. Core catcher was intact.**

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

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

Sediment Core Log

LDW-SC-14 (R1)

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): **12.6**
Client: **LDWG**	Water Depth (ft): **46.0**	Sample Quality: **Good**
Collection Date: **2/13/06**	Mudline Elevation (ft): **-36.8**	Recovery in ft (%): **11.6 (92)**
Contractor: **MCS Environmental, Inc.**	N./LAT: **207055** E./LONG: **1267397**	Process Date: **2/13/06**
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**

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-SC14-6-8.7	82% (7-9)	PCB Hg	0	@ 7.0' 1.5" thick layer of grayish brown SILT, few sand @ 7.7' 1" thick layer of brown fine SAND	@ 7.0' TV = 0.7 kg/cm2	Alluvium
8							
9	LDW-SC14-8.7-10	74% (9-11)			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). 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.	Transitional Contact Slight winnowing in sand below 10.3'	
10	LDW-SC14-10-11		PCB Hg				
11		67% (11-12.6)			End of core at 11.6'.	@ 11.0' TV = 0.4 kg/cm2	Lower alluvium
12					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 sample collection; sample name matches project nomenclature.		

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 (1.8'), easy (9.0'), moderate (12.7'), penetration goal reached. One drive attempt made at station. Core catcher was intact.**

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

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

Sediment Core Log

LDW-SC-15 (R1)

Project: **LDW RI/FS**	Water Body Type: **Lower Duwamish Waterway**	Tube Length (ft): **16.1**
Project #: **PORS5-18220-511**	Water Elevation (ft)/Tide: **6.6**	Penetration Depth (ft): **12.7**
Client: **LDWG**	Water Depth (ft): **37.8**	Sample Quality: **Good**
Collection Date: **2/16/06**	Mudline Elevation (ft): **-27.9**	Recovery in ft (%): **10.1 (80)**
Contractor: **MCS Environmental, Inc.**	N./LAT: **206821** E./LONG: **1267821**	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	LDW-SC15-0-1	80% (0-1)	PCB SVOC Metals Hg TBT	0	ML: (0.0-0.4) wet, very soft, olive brown (2.5Y, 4/3) SILT, few sand.	Transitional Contact	recent
1	LDW-SC15-1-2		PCB SVOC Metals Hg TBT	0	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'. @ 1.2' to 2.0' trace HC-like florets up to 1/2" L	GT @ 0.9' Sheen Test @ 1.0': no sheen @ 1.5' TV = 0.3 kg/cm2	
2	LDW-SC15-2-4	100% (1-3)	PCB SVOC Metals Hg TBT		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'	
3		86% (3-5)		0			
4	LDW-SC15-4-6		PCB TBT			Sheen Test @ 4.0': no sheen @ 4.7' TV = 0.1 kg/cm2	upper alluvium
5		57% (5-7)		0	@ 5.1' 6" L wood fragment		
6	LDW-						

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'), moderate (7.0'), hard (12.7'), refusal (12.7'). One drive attempt made at station.**

Core catcher was intact but slightly winnowed.

Calculated Recovery
Sample Length/Penetration Length:
10.1/ 12.7 = 80 %

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

Sediment Core Log

LDW-SC-15 (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: **6.6**	Penetration Depth (ft): **12.7**
Client: **LDWG**	Water Depth (ft): **37.8**	Sample Quality: **Good**
Collection Date: **2/16/06**	Mudline Elevation (ft): **-27.9**	Recovery in ft (%): **10.1 (80)**
Contractor: **MCS Environmental, Inc.**	N./LAT: **206821** E./LONG: **1267821**	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
7	SC15-8-8	87% (7-8)		0	SM: (8.2-8.7) Alternating 1" thick layers of very fine SAND and SILT, little clay (transitional unit).	Transitional Contact @ 7.0' TV = 0.8 kg/cm2	7
					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.	Sharp Contact	
8							8
	LDW-SC15-8-10	80% (8-9)	PCB			@ 8.8' TV = 0.8 kg/cm2	
9		70% (9-10)			@ 9.7' 1/2", subrounded, green-gray SILT pockets (xenoclasts)		9
10					End of core at 10.1'. Driven to refusal.		10
							lower alluvium
11		60% (10-12)					11
12		73% (12-12.7)					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 (1.0'), moderate (7.0'), hard (12.7'), refusal (12.7'). One drive attempt made at station. Core catcher was intact but slightly winnowed.**

Calculated Recovery
Sample Length/Penetration Length:
10.1/12.7 = 80 %

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

Sediment Core Log

LDW-SC-16 (R1)

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: **8.3**	Penetration Depth (ft): **13.5**
Client: **LDWG**	Water Depth (ft): **32.3**	Sample Quality: **Good**
Collection Date: **2/13/06**	Mudline Elevation (ft): **-24.6**	Recovery in ft (%): **10.8 (80)**
Contractor: **MCS Environmental, Inc.**	N./LAT: **206669** E./LONG: **1267959**	Process Date: **2/14/06**
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, 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	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.	Transitional Contact	0
1					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	GT @ 0.8'	1
2	LDW-SC16-2-4	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'	2
3			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.	Sharp Contact @ 3.0' TV = 1.5 kg/cm2	3
4	LDW-SC16-4-6	100% (4-6)			@ 4.0' to 7.4' trace HC-like odor and sheen		4
5			PCB SVOC Metals Hg	0		@ 5.0' TV = 0.8 kg/cm2	5
6	LDW-						6

recent

upper 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 (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 %

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

Sediment Core Log

LDW-SC-16 (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: **8.3**	Penetration Depth (ft): **13.5**
Client: **LDWG**	Water Depth (ft): **32.3**	Sample Quality: **Good**
Collection Date: **2/13/06**	Mudline Elevation (ft): **-24.6**	Recovery in ft (%): **10.8 (80)**
Contractor: **MCS Environmental, Inc.**	N./LAT: **206669** E./LONG: **1267959**	Process Date: **2/14/06**
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, 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	SC16-6-8	80% (6-8)		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.	Sharp Contact	7
8	LDW-SC16-8-10				@ 8.5' medium SAND with moderate wood fragments		8
9		85% (8-10)	PCB SVOC Metals Hg	0		@ 9.0' TV = 0.8 kg/cm2	9
10	SC16-10-10.8				@ 9.5' Unit grades to alternating 1/8" to 1/4" thick interbeds of very dark gray fine SAND and gray SILT.		10
				0	End of core at 10.8'.		
11		62% (10-12)					11
12		36% (12-13.5)					12
13							13

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 (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 %

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

Sediment Core Log

LDW-SC-17 (R5)

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: **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: **2/24/06**
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	LDW-SC17-0-1	66% (0-13)	PCB SVOC Metals Hg	0	ML: (0.0-0.9) wet, soft, olive brown (2.5Y, 4/3) SILT, little sand.	Winnowing @ 0.2' (70%)	0
1	LDW-SC17-1-2		PCB SVOC Metals Hg	0	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.	Transitional Contact @ 0.9' TV = 0.02 kg/cm2 GT @ 1.2'	1
2	LDW-SC17-2-4		PCB SVOC Metals Hg	0	@ 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.	@ 1.8' TV = 0.1 kg/cm2 GT @ 2.3'	2
3			PCB SVOC Metals Hg	0	@ 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.	Bag @ 2.6' (1/2" subrounded glass)	3
4	LDW-SC17-4-6				@ 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.	Bag @ 3.2' (2" foliated red chip)	4
5				0	@ 5.2' to 5.7' A 0.1' layer of wood, 2" pocket of peat, and 0.2' x 0.1' pieces of cloth with slight to moderate HC-like odor.	@ 4.6' TV = 0.02 kg/cm2	5
6							6

recent

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 (7.0'), moderate (10.0'), easy to moderate (14.0'), penetration goal reached. Five drive attempts made at station. Station re-occupied with vibracore. Rainbow sheen and strong HC-like odor on sidewalls from 2.0' to 6.0'. ua = upper alluvium**

Calculated Recovery
Sample Length/Penetration Length:
8.6 / 13.0 = 66 %

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

Sediment Core Log

LDW-SC-17 (R5)

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: **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: **2/24/06**
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
7	LDW-SC17-6.8-8.2		PCB SVOC Metals Hg	0	@ 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.		7
8						Transitional Contact	8
9					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).		9
10					End of core @ 8.6'.		10
11					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.		11
12							12
13							13

ua

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 (7.0'), moderate (10.0'), easy to moderate (14.0'), penetration goal reached. Five drive attempts made at station. Station re-occupied with vibracore. Rainbow sheen and strong HC-like odor on sidewalls from 2.0' to 6.0'. ua = upper alluvium**

Calculated Recovery
Sample Length/Penetration Length:
8.6 / 13.0 = 66 %

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

Sediment Core Log

LDW-SC-18 (R1)

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	LDW-SC18-0-1	65% (0-1)	PCB SVOC Metals Hg	0	ML: (0.0-0.1) wet, soft, olive brown (2.5Y, 4/3) SILT, few sand.	Sharp Contact	0
1	LDW-SC18-1-2	89% (1-3)	PCB SVOC Metals Hg	0	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	Bag @ 0.8' (glass shard) GT @ 1.2'	1
2	LDW-SC18-2-4				@ 1.5' subangular rock 0.3' L		2
3		100% (3-4)	PCB SVOC Metals Hg	0		GT @ 3.2'	3
4	LDW-SC18-4-6				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.	Transitional Contact	4
5		91% (4-7)		0	@ 5.5' scattered shell fragments		5
6	LDW-				SP- SM: (6.2-9.6) wet, medium dense, black (2.5Y, 2.5/1) very fine SAND alternating with layers of dark greenish gray (GLEY 1, 4/10Y) SILT, little clay.	Transitional Contact	6

upper 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 (0.8'), 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 %

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

Sediment Core Log

LDW-SC-18 (R1)

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
7	SC18-8-8	100% (6-9)		0			7
8	LDW-SC18-8-10.7				@ 8.6' 1" thick layer of wood fragments up to 3/4" L		8
9		91% (9-10)		0	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'.		9
10		90% (10-11)					10
					End of core at 10.7'. Driven to refusal.		
11		60% (11-11.8)				lower alluvium	11

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 (0.8'), 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 %

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

Sediment Core Log

LDW-SC-19 (R5)

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): **34.6**	Sample Quality: **Good**
Collection Date: **2/24/06**	Mudline Elevation (ft): **-25.3**	Recovery in ft (%): **11.9 (92)**
Contractor: **MSS**	N./LAT: **47 33.3172** E./LONG: **122 20.7486**	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 Alum**	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	LDW-SC19-0-1	93% (0-13)	PCB SVOC Metals Hg Dioxins/ Furans	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.	@ 0.9' TV = 0.1 kg/cm2	0
1	LDW-SC19-1-2		PCB SVOC Metals Hg Dioxins/ Furans	0	@ 1.9' rainbow sheen florets up to 1/4" and wood fragments up to 1" L	GT @ 2.2'	1
2	LDW-SC19-2-4					@ 2.6' TV = 0.2 kg/cm2	2
3			PCB SVOC Metals Hg Dioxins/ Furans	0		GT @ 3.1'	3
4	LDW-SC19-4-6					@ 3.7' TV = 0.2 kg/cm2	4
5			PCB	0			5
6	LDW-SC19-6-7		PCB	0			6

recent

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 (6.0'), moderate (6.5'), easy (13.0'), penetration goal reached. 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 %

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

Sediment Core Log

LDW-SC-19 (R5)

Sheet 2 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): **34.6**	Sample Quality: **Good**
Collection Date: **2/24/06**	Mudline Elevation (ft): **-25.3**	Recovery in ft (%): **11.9 (92)**
Contractor: **MSS**	N./LAT: **47 33.3172** E./LONG: **122 20.7486**	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 Alum**	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
7	LDW-SC19-7.9			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.	Transitional Contact	7
8					ML: (8.1-9.2) [moist to damp, medium stiff,] black (2.5Y, 2.5/1) SILT interbedded with gray-brown very fine SAND.	Transitional Contact	8 upper alluvium
9					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.		9
10	LDW-SC19-9.1-11.9		PCB	0	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.	Sharp Contact	10
11							11 lower alluvium
12					End of core at 11.9'.		12
13							13

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 (6.0'), moderate (6.5'), easy (13.0'), penetration goal reached. 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 %

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

Sediment Core Log

LDW-SC-20 (R1)

Project: **LDW RI/FS**	Water Body Type: **Lower Duwamish Waterway**	Tube Length (ft): **16.1**
Project #: **PORS5-18220-511**	Water Elevation (ft)/Tide: **7.4**	Penetration Depth (ft): **12.6**
Client: **LDWG**	Water Depth (ft): **43.5**	Sample Quality: **Good**
Collection Date: **2/15/06**	Mudline Elevation (ft): **-33.9**	Recovery in ft (%): **10.0 (79)**
Contractor: **MCS Environmental, Inc.**	N./LAT: **206177** E./LONG: **1267735**	Process Date: **2/15/06**
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	LDW-SC20-0-2	100% (0-4)	PCB SVOC Metals Hg Pesticides TBT Dioxins/ Furans	0	ML: (0.0-0.1) moist, soft, olive brown (2.5Y, 4/3) SILT, few sand.	Transitional Contact	recent
1					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.	GT @ 0.9' @ 1.1' TV = 0.2 kg/cm2	
2	LDW-SC20-2-4				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.	Transitional Contact	
3			PCB SVOC Metals Hg Pesticides TBT Dioxins/ Furans	0	@ 2.5' layer of moist, dense, black, fine SAND	GT @ 2.9'	
4	LDW-SC20-4-6				OL: (3.7-4.1) moist, medium stiff, very dark greenish gray (GLEY 1, 3/1), SILT, little clay. Slight H2S-like odor.	@ 3.9' TV = 0.2 kg/cm2	
5		95% (4-8)	PCB Dioxins/ Furans	0	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.		
6	LDW-						

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 (0.2'), moderate (12.6'), penetration goal reached. One drive attempt made at station.**

Core catcher was 50% full.

Calculated Recovery
Sample Length/Penetration Length:
10.0/ 12.6 = 79 %

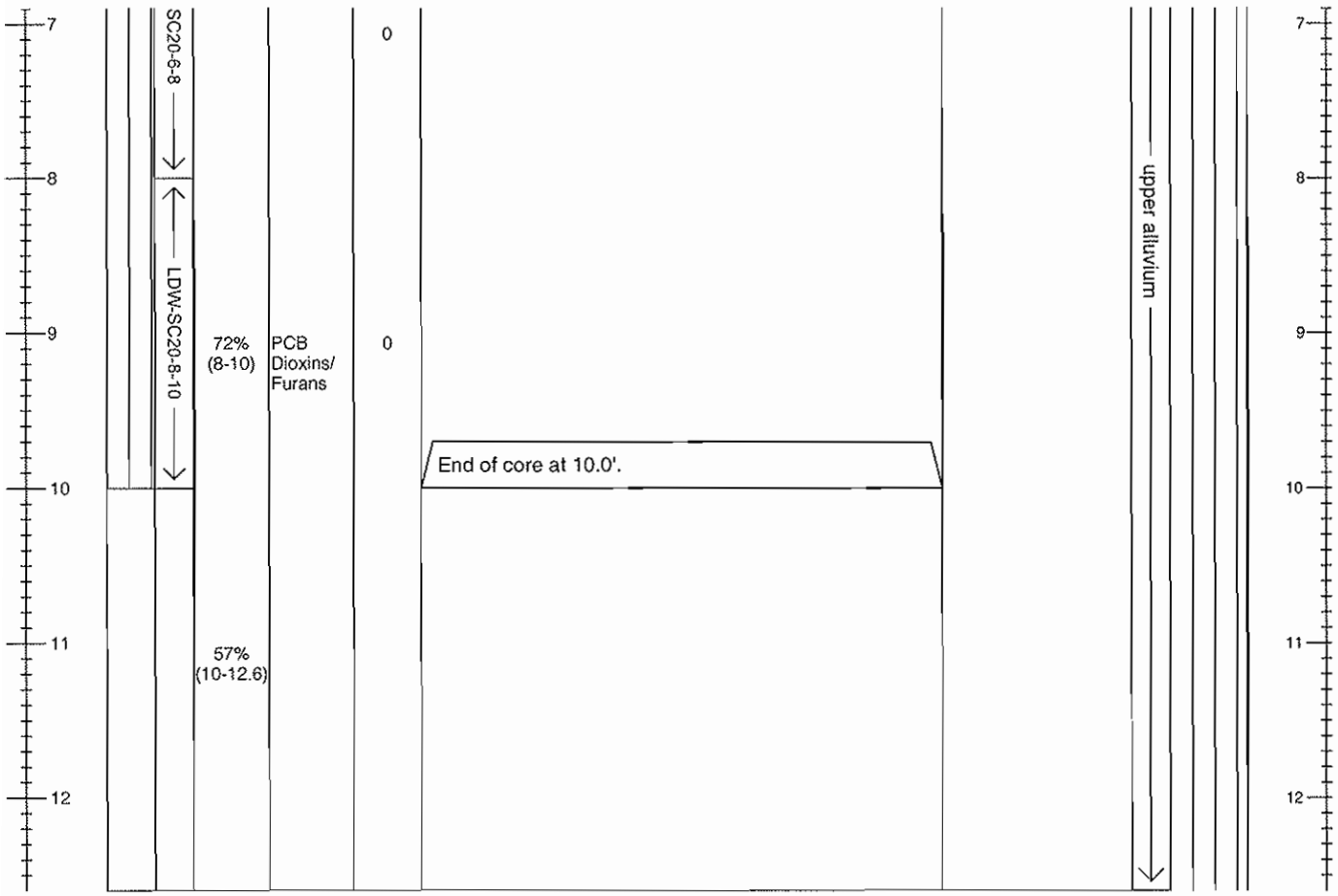
Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.

Sediment Core Log

LDW-SC-20 (R1)

RETEC

Project: **LDW RI/FS**	Water Body Type: **Lower Duwamish Waterway**	Tube Length (ft): **16.1**
Project #: **PORS5-18220-511**	Water Elevation (ft)/Tide: **7.4**	Penetration Depth (ft): **12.6**
Client: **LDWG**	Water Depth (ft): **43.5**	Sample Quality: **Good**
Collection Date: **2/15/06**	Mudline Elevation (ft): **-33.9**	Recovery in ft (%): **10.0 (79)**
Contractor: **MCS Environmental, Inc.**	N./LAT: **206177** E./LONG: **1267735**	Process Date: **2/15/06**
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**



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 (0.2'), moderate (12.6'), penetration goal reached. One drive attempt made at station. Core catcher was 50% full.**

Calculated Recovery
Sample Length/Penetration Length:
10.0/ 12.6 = 79 %

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

Sediment Core Log

LDW-SC-21 (R1)

Project: **LDW RI/FS**	Water Body Type: **Lower Duwamish Waterway**	Tube Length (ft): **16.1**
Project #: **PORS5-18220-511**	Water Elevation (ft)/Tide: **5.9**	Penetration Depth (ft): **12.7**
Client: **LDWG**	Water Depth (ft): **34.1**	Sample Quality: **Good**
Collection Date: **2/14/06**	Mudline Elevation (ft): **-28.5**	Recovery in ft (%): **11.3 (89)**
Contractor: **MCS Environmental, Inc.**	N./LAT: **206167** E./LONG: **1267486**	Process Date: **2/15/06**
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, 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	LDW-SC21-0-1	100% (0-0.5)	PCB SVOC Metals Hg	0	ML: (0.0-0.5) moist, medium stiff, olive brown (2.5Y, 4/3) fine SANDY SILT.		0
1	LDW-SC21-1-2	100% (0.5-3)			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'	1
2			PCB SVOC Metals Hg			GT @ 2.2'	2
3	LDW-SC21-2-4		PCB SVOC Metals Hg	0	@ 3.6' 2" layer of fine sand		3
4	LDW-SC21-4-6.2	100% (3-6)			@ 4.5' moderate H2S-like odor		4
5			PCB	0	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	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

recent

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 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 %

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

Sediment Core Log

LDW-SC-21 (R1)

Project: **LDW RI/FS**	Water Body Type: **Lower Duwamish Waterway**	Tube Length (ft): **16.1**
Project #: **PORS5-18220-511**	Water Elevation (ft)/Tide: **5.9**	Penetration Depth (ft): **12.7**
Client: **LDWG**	Water Depth (ft): **34.1**	Sample Quality: **Good**
Collection Date: **2/14/06**	Mudline Elevation (ft): **-28.5**	Recovery in ft (%): **11.3 (89)**
Contractor: **MCS Environmental, Inc.**	N./LAT: **206167** E./LONG: **1267486**	Process Date: **2/15/06**
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, 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	LDW-SC21-8.2-8	96% (6-8)		0	2" thick. Grades to coarse SAND and trace wood at basal contact.		upper alluvium
8							
9	LDW-SC21-8-10	81% (8-10)		0	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.	@ 9.5' TV = 0.9 kg/cm2 Transitional Contact	
10	LDW-SC21-10-11.3				@ 11.0' non-lumbered wood piece		lower alluvium
11		57% (10-12.7)	PCB		End of core at 11.3'.	Lost 0.2 feet of unit.	
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 (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 %

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

Sediment Core Log

LDW-SC-22 (R1)

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: **9.1**	Penetration Depth (ft): **9.3**
Client: **LDWG**	Water Depth (ft): **12**	Sample Quality: **Good**
Collection Date: **2/13/06**	Mudline Elevation (ft): **-3.4**	Recovery in ft (%): **7.7 (83)**
Contractor: **MCS Environmental, Inc.**	N./LAT: **205908** E./LONG: **1268174**	Process Date: **2/14/06**
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, 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	LDW-SC22-0-1.1	100% (0-3)	PCB SVOC Metals Hg	0	SM: (0.0-1.3) wet, loose, dark yellowish brown (10/YR, 4/4) medium SAND, few silt. Sand grains are multicolored (orange, red, white). Trace debris (brick fragments) and 1" diameter pocket of brown woody SILT (possibly peat).	GT @ 0.7'	recent
1	LDW-SC22-1.1-2		PCB SVOC Metals Hg	0	SM: (1.3-2.0) moist, medium dense, greenish black (GLEY 1, 2.5/10Y) medium SAND, few silt and moderate wood fragments up to 1.5" L. Sand grains are multicolored (orange, red, white). Moderate creosote-like sheen from 0.9' to 1.1' and moderate HC-like staining and odor to 1.1'.	Transitional Contact	
2	LDW-SC22-1.1-2					Transitional Contact GT @ 1.9'	
3	LDW-SC22-2-4		PCB SVOC Metals Hg	0	SP-SM: (2.0-9.3) moist, medium dense, black (GLEY 1, 2.5/N) fine SAND with pockets and lenses of gray SILT, few sand up to 1/2" L. Sand grains are multicolored (red, orange, white) and grade to medium below 6.5'. Trace scattered debris (brick fragment) and trace wood fragments up to 2" L. Trace pockets of brown peaty silt up to 1/2" diameter.	@ 3.0' TV = 0.6 kg/cm2	upper alluvium
4	LDW-SC22-4-6	95% (3-7)			@ 3.6' one 3" L red brick fragment		
5	LDW-SC22-4-6			0	@ 5.1' trace 1/4" diameter pocket of brown peaty material	@ 5.0' TV = 0.7 kg/cm2	
6	LDW-SC2					Winnowing from 5.7' to 6.9'.	

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: no freefall, easy (7.0'), moderate (8.0'), hard (9.0'), refusal (9.3'). One drive attempt made at station.**

Calculated Recovery
Sample Length/Penetration Length:
7.7 / 9.3 = 83 %

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

Sediment Core Log

LDW-SC-22 (R1)

Project: **LDW RI/FS**	Water Body Type: **Lower Duwamish Waterway**	Tube Length (ft): **16.1**
Project #: **PORS5-18220-511**	Water Elevation (ft)/Tide: **9.1**	Penetration Depth (ft): **9.3**
Client: **LDWG**	Water Depth (ft): **12**	Sample Quality: **Good**
Collection Date: **2/13/06**	Mudline Elevation (ft): **-3.4**	Recovery in ft (%): **7.7 (83)**
Contractor: **MCS Environmental, Inc.**	N./LAT: **205908** E./LONG: **1268174**	Process Date: **2/14/06**
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, 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	2.6-7.7	76% (7-8)		0	End of core at 7.7'. Driven to refusal.	@ 7.0' TV = 0.4 kg/cm2	7
8							8
9		18% (8-9.3)					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: no freefall, easy (7.0'), moderate (8.0'), hard (9.0'), refusal (9.3'). One drive attempt made at station.**

Calculated Recovery
Sample Length/Penetration Length:
7.7 / 9.3 = 83 %

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

Sediment Core Log

LDW-SC-23 (R1)

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: **2.1**	Penetration Depth (ft): **12.4**
Client: **LDWG**	Water Depth (ft): **23.2**	Sample Quality: **Good**
Collection Date: **2/16/06**	Mudline Elevation (ft): **-18.7**	Recovery in ft (%): **10.7 (86)**
Contractor: **MCS Environmental, Inc.**	N./LAT: **205418** E./LONG: **1268229**	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	LDW-SC23-0-2	94% (0-1)	PCB SVOC Metals Hg Pesticides TBT	0	ML: (0.0-0.5) wet, very soft, olive brown (2.5Y, 4/3) SILT and trace debris (piece of concrete).	@ 0.0 to 1.0' Sheen Test: no sheen	0
1					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.	Transitional Contact GT @ 0.9' @ 0.9' TV = 0.6 kg/cm2	1
2	LDW-SC23-2-4	100% (1-3)	PCB SVOC Metals Hg Pesticides TBT	0	@ 1.8' 4" thick layer of stiff, black SILT, little sand and few gravel up to 1/2" in diameter	@ 1.0 to 2.0' Sheen Test: no sheen	2
3						GT @ 2.9' @ 2.9' TV = 0.6 kg/cm2	3
4	LDW-SC23-4-6	100% (3-5)	PCB SVOC TBT	0		@ 4.4' TV = 0.3 kg/cm2	4
5					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.		5
6	LDW-	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.		6

recent

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 (1.6'), 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 %

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

Sediment Core Log

LDW-SC-23 (R1)

Project: **LDW RI/FS**	Water Body Type: **Lower Duwamish Waterway**	Tube Length (ft): **16.1**
Project #: **PORS5-18220-511**	Water Elevation (ft)/Tide: **2.1**	Penetration Depth (ft): **12.4**
Client: **LDWG**	Water Depth (ft): **23.2**	Sample Quality: **Good**
Collection Date: **2/16/06**	Mudline Elevation (ft): **-18.7**	Recovery in ft (%): **10.7 (86)**
Contractor: **MCS Environmental, Inc.**	N./LAT: **205418** E./LONG: **1268229**	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
7	SC23-6-8	85% (7-9)	PCB	0		@ 7.0' TV = 0.8 kg/cm2	upper alluvium
8							
9	LDW-SC23-6-10.2	85% (9-10)			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.	Transitional Contact	
10						Not sampled below 10.2'.	
11		65% (10-10.7)			End of core at 10.7'. Driven to refusal.		
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 (1.6'), 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 %

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

Sediment Core Log

LDW-SC-24 (R1)

Project: **LDW RI/FS**	Water Body Type: **Lower Duwamish Waterway**	Tube Length (ft): **16.1**
Project #: **PORS5-18220-511**	Water Elevation (ft)/Tide: **6.1**	Penetration Depth (ft): **12.2**
Client: **LDWG**	Water Depth (ft): **26.3**	Sample Quality: **Good**
Collection Date: **2/17/06**	Mudline Elevation (ft): **-20.4**	Recovery in ft (%): **11.8 (97)**
Contractor: **MCS Environmental, Inc.**	N./LAT: **205130** E./LONG: **1267860**	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	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.		recent
1	LDW-SC24-1-2		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).	GT @ 0.9' Gradational Contact @1.3' TV = 0.2 kg/cm2	upper alluvium
2	LDW-SC24-2-4	100% (1-2)					
3			PCB SVOC Metals Hg	0		GT @ 2.8'	
4	LDW-SC24-4-6	100% (2-5)			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	
5				0	@ 6.0' to 7.0' slight H2S-like odor	@ 5.4' TV = 0.6 kg/cm2	
6	LDW-	100% (5-7)					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 (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 %

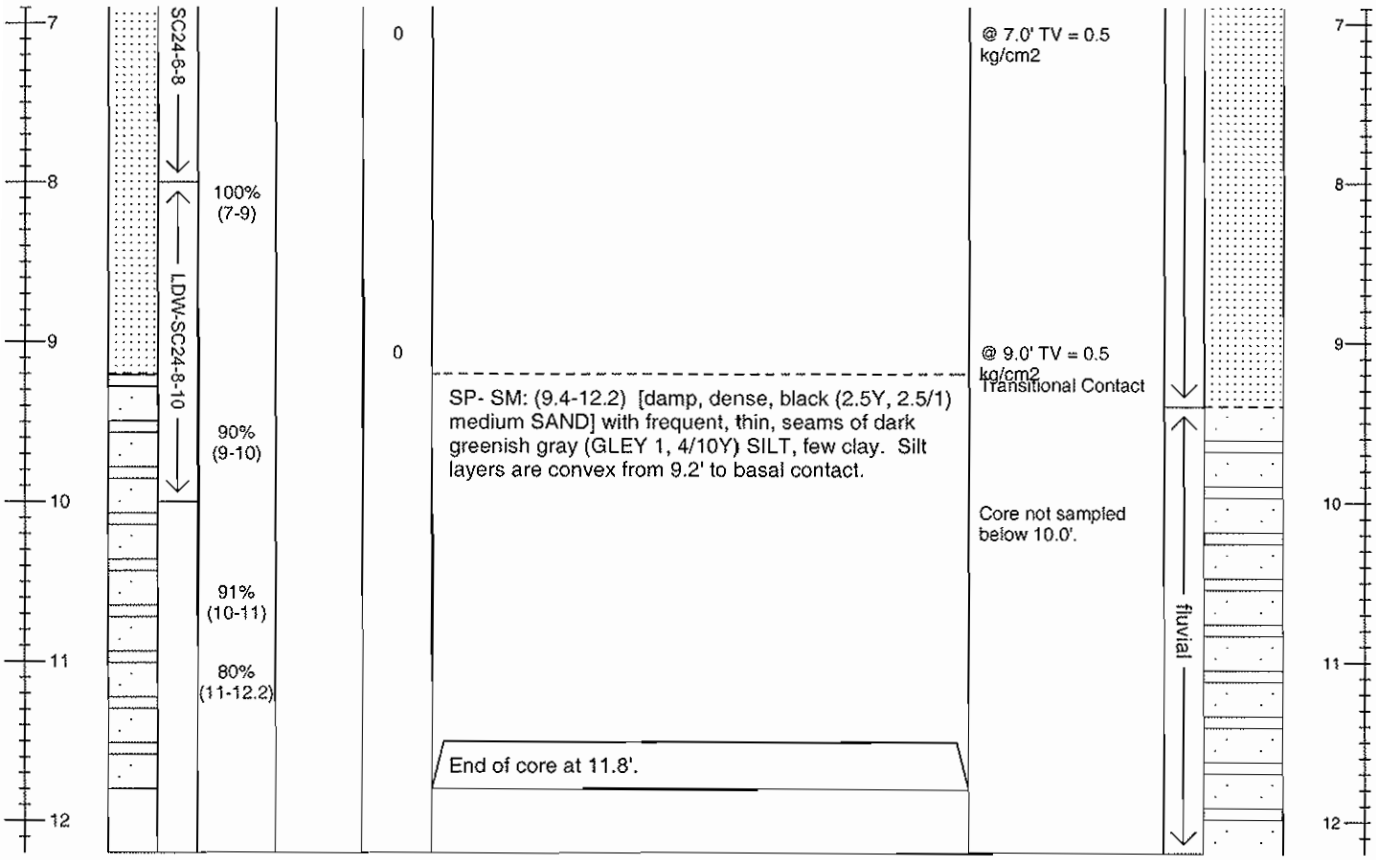
Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.

Sediment Core Log

LDW-SC-24 (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: **6.1**	Penetration Depth (ft): **12.2**
Client: **LDWG**	Water Depth (ft): **26.3**	Sample Quality: **Good**
Collection Date: **2/17/06**	Mudline Elevation (ft): **-20.4**	Recovery in ft (%): **11.8 (97)**
Contractor: **MCS Environmental, Inc.**	N./LAT: **205130** E./LONG: **1267860**	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**



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 %

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

Sediment Core Log

LDW-SC-25 (R2)

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): **10.3**
Client: **LDWG**	Water Depth (ft): **18.7**	Sample Quality: **Good**
Collection Date: **2/17/06**	Mudline Elevation (ft): **-15.2**	Recovery in ft (%): **9.1 (88)**
Contractor: **MCS Environmental, Inc.**	N./LAT: **204751** E./LONG: **1267980**	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: **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	LDW-SC25-0-1	67% (0-1)	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.		0
1	LDW-SC25-1-2		PCB SVOC Metals Hg TBT	0	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.	GT @ 1.4'	1
2	LDW-SC25-2-4	100% (1-3)			@ 1.8' clear glass shard and black clast 1" in diameter @ 2.0' slight H2S-like odor	@1.8' TV = 0.2 kg/cm2 Bag @ 1.8' (black clast)	2
3			PCB SVOC Metals Hg TBT	0		GT @ 3.2'	3
4		100% (3-5)				@ 3.6' TV = 0.4 kg/cm2	4
5	LDW-SC25-4-6		SVOC Metals TBT	0	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.		5
6	LDW-	90% (5-7)			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" diameter.	Transitional Contact @ 6.6' TV = 0.3 kg/cm2	6

recent

upper

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 (1.5'), 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 %

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

Sediment Core Log

LDW-SC-25 (R2)

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): **10.3**
Client: **LDWG**	Water Depth (ft): **18.7**	Sample Quality: **Good**
Collection Date: **2/17/06**	Mudline Elevation (ft): **-15.2**	Recovery in ft (%): **9.1 (88)**
Contractor: **MCS Environmental, Inc.**	N./LAT: **204751** E./LONG: **1267980**	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: **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	SC25-8-8			0			upper alluvium
8	LDW-SC25-8-9.1	69% (7-9)	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.	@ 7.9' TV = 0.2 kg/cm2	
9		80% (9-10)			End of core at 9.1'. Driven to refusal.		lower alluvium
10		88% (10-10.3)					

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 (1.5'), 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 %

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

Sediment Core Log

LDW-SC-26 (R1)

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, Inc.**	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	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-SC26-0-1	81% (0-1)	PCB SVOC Metals Hg TBT Dioxins/ Furans	0	OL: (0.0-0.6) wet, soft, olive brown (2.5Y, 4/3) ORGANIC SILT, few sand and trace worms.		
1	LDW-SC26-1-2		PCB SVOC Metals Hg TBT Dioxins/ Furans	0	OL: (0.6-5.3) wet, soft, black (2.5YR, 2.5/1) ORGANIC SILT, few sand and little olive-gray mottled SILT, little clay. Silt texture is slightly compressible and of low plasticity. Trace rootlets, shell fragments, and wood fragments up to 1.2" L.	Transitional Contact @ 0.9' TV = 0.8 kg/cm2 GT @ 1.5' @ 1.9' TV = 0.3 kg/cm2	recent
2	LDW-SC26-2-4	93% (1-3)					
3			PCB SVOC Metals Hg TBT Dioxins/ Furans	0		@ 3.0' TV = 0.4 kg/cm2	
4	LDW-SC26-4-6	100% (3-5)			@ 4.5' wood fragments with 1 mm rainbow sheen florets	GT @ 3.9'	
5				0	SM: (5.3-6.6) wet, medium dense, black (2.5Y, 2.5/1), medium SAND, few silt.	Sharp Contact @ 5.0' TV = 0.2 kg/cm2	

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 (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 %

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

Sediment Core Log

LDW-SC-26 (R1)

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, Inc.**	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	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	LDW-SC26-6-8	75% (5-7)			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.	Transitional Contact @ 6.5' TV = 0.0 kg/cm2	upper alluvium
7			PCB SVOC Metals Hg TBT Dioxins/ Furans	0	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	Bag @ 7.6' (1" chips)	
8	LDW-SC26-8-11.1	90% (7-9)			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.	Sharp Contact	non-native
9				0	@ 9.4' bronze/brass 3/8" nut	@ 9.0' TV = 0.7 kg/cm2	
10		75% (9-11)			@ 10.6' 6" x 1" plastic strips and metal clamp, slight HC-like odor, and 1/4" rainbow sheen florets	Bag @ 10.6' (1" plastic strips and metal clamp)	
11	LDW-	75% (10-13)	PCB Metals		SP-SM: (13.1-14.6) moist, medium dense, very dark greenish gray (GLEY1, 3/1) fine SAND with pockets	Transitional Contact	

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 (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 %

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

Sediment Core Log

LDW-SC-26 (R1)

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, Inc.**	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	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
12	SC26-11.1-12.1	75% (13-14.6)			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.	@ 11.6' TV = 0.2 kg/cm2	upper alluvium
13					End of core at 12.3'.	Bottom 0.3' winnowed.	
14					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.		

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 (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 %

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

Sediment Core Log

LDW-SC-27 (R1)

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): **11.2**
Client: **LDWG**	Water Depth (ft): **20.0**	Sample Quality: **Good**
Collection Date: **2/14/06**	Mudline Elevation (ft): **-10.5**	Recovery in ft (%): **9.5 (85)**
Contractor: **MCS Environmental, Inc.**	N./LAT: **204441** E./LONG: **1268518**	Process Date: **2/14/06**
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, 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	LDW-SC27-0-2	85% (0-0.5)			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.		
1		100% (0.5-2)	PCB SVOC Metals Hg	0		GT @ 0.9' @ 1.0' TV = 0.3 kg/cm2	
2	LDW-SC27-2-4.5						
3		96% (2-5)	PCB SVOC Metals Hg	0		GT @ 2.5' @ 3.0' TV = 0.6 kg/cm2	
4							
5	LDW-SC27-4.5-6			0	SP- SM: (4.6-9.1) moist, medium dense, very dark 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	recent
6	LDW-SC	67% (5-7)				@ 6.5' TV = 0.6 kg/cm2	upper al

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'), moderate (5.0'), hard (11.2'), refusal (11.2'). One drive attempt made at station.**

Calculated Recovery
Sample Length/Penetration Length:
9.5 / 11.2 = 85 %

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

Sediment Core Log

LDW-SC-27 (R1)

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): **11.2**
Client: **LDWG**	Water Depth (ft): **20.0**	Sample Quality: **Good**
Collection Date: **2/14/06**	Mudline Elevation (ft): **-10.5**	Recovery in ft (%): **9.5 (85)**
Contractor: **MCS Environmental, Inc.**	N./LAT: **204441** E./LONG: **1268518**	Process Date: **2/14/06**
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, 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
7	LDW-SC27-7.8-9.5 (27-6-7.8)			0	@ 7.5' 1" wood layer with substantial wood	Core catcher found @ 6.5'.	7
8		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					End of core at 9.5'. Driven to refusal.	@ 9.0' TV = 0.8 kg/cm2	9
10		100% (10-11.2)					10
11							11

Graphic Log: Iuvium; 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 (1.0'), moderate (5.0'), hard (11.2'), refusal (11.2'). One drive attempt made at station.**

Calculated Recovery
Sample Length/Penetration Length:
9.5 / 11.2 = 85 %

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

Sediment Core Log

LDW-SC-28 (R5)

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: **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: **2/25/06**
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	LDW-SC28-0-1		PCB SVOC Metals Hg TBT Dioxins/ Furans	0	OL: (0.0-0.6) wet, soft, brown (7.5YR, 4/3) ORGANIC SILT, few sand.		0
1	LDW-SC28-1-2		PCB SVOC Metals Hg TBT Dioxins/ Furans	0	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'	1
2							2
3	LDW-SC28-2-4		PCB SVOC Metals Hg TBT Dioxins/ Furans	0		@ 3.1' TV = 0.4 kg/cm2	3
4	LDW-SC28-4-5.5			0		GT @ 3.9'	4
5					@ 5.1' subrounded gravel 1.5' L	@ 5.0' TV = 1.2 kg/cm2	5
6	LDW-SC28-5.5-7		PCB 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)	6

recent

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 (5.0'), easy (6.0'), very easy (9.0'), hard (11.0'), easy (13.0'), penetration goal reached. Five drive attempts made at station. Core catcher was intact and 100% full.**

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

Calculated Recovery
Sample Length/Penetration Length:
11.9/ 13.0 = 92 %

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

Sediment Core Log

LDW-SC-28 (R5)

Sheet 2 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: **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: **2/25/06**
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
7	5				@ 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)	@ 6.9' TV = 0.4 kg/cm2 @ 6.5' Sheen Test: rainbow sheen florets and streaks up to 2" L.	7
8	LDW-SC28-7.5-9			0		@ 8.0' TV = 0.1 kg/cm2	8
9					@ 8.3' 1" foliated red chips (possibly paint)		9
10	LDW-SC28-9-12			0			10
11							11
12	12-12.6		PCB SVOC Metals Hg TBT	0	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).	Sharp Contact	12
13					End of core at 12.6'. Refusal reached with diver impact core at 7.0 feet. Station re-occupied with vibracore.		13

non-native

ua

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 (5.0'), easy (6.0'), very easy (9.0'), hard (11.0'), easy (13.0'), penetration goal reached. Five drive attempts made at station. Core catcher was intact and 100% full.**

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

Calculated Recovery
Sample Length/Penetration Length:
11.9/ 13.0 = 92 %

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

Sediment Core Log

LDW-SC-29 (R2)

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: **9.9**	Penetration Depth (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 (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 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	LDW-SC29-0-1	97% (0-3)	PCB SVOC Metals Hg Dioxins/ Furans	0	OL: (0.0-0.6) wet to moist, soft, black (2.5Y, 2.5/1) ORGANIC SILT, few sand.		recent
1	LDW-SC29-1-2		PCB SVOC Metals Hg Dioxins/ Furans	0	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).	Sharp Contact GT @ 0.7' GT @ 0.9'	upper alluvium
2	LDW-SC29-2-3.6	32% (3-5)	PCB SVOC Metals Hg Dioxins/ Furans	0	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	Transitional Contact Winnowing @ 1.2' to 2.0' (70%), 2.0' to 2.8' (30%), 2.8' to 3.3' (10%)	lower alluvium
3					End of core at 3.6'. Driven to refusal.		
4							
5		33% (5-6.1)					
6							

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 (3.0'), hard (6.1'), refusal (6.1').**
Two drive attempts made at station. Core catcher was 60% full.
No torvane measurements taken. Difficult intertidal access.

Calculated Recovery
Sample Length/Penetration Length:
3.6 / 6.1 = 59 %

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

Sediment Core Log

LDW-SC-30 (R2)

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: **3.5**	Penetration Depth (ft): **6.9**
Client: **LDWG**	Water Depth (ft): **18**	Sample Quality: **Good**
Collection Date: **2/14/06**	Mudline Elevation (ft): **-12.2**	Recovery in ft (%): **5.9 (86)**
Contractor: **MCS Environmental, Inc.**	N./LAT: **203576** E./LONG: **1268785**	Process Date: **2/14/06**
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, 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	LDW-SC30-0-2.5	86% (0-1)	PCB SVOC Metals Hg	0	SM: (0.0-0.2) wet, dense, very dark greenish gray (GLEY 1, 4/10Y) fine SAND, few silt.	Transitional Contact	recent
1					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.	GT @ 1.4' @ 1.5' TV = 0.4 kg/cm2	
2		97% (1-3)		0			
3	LDW-SC30-2.5-4		PCB SVOC Metals Hg		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).	Sharp Contact @ 3.0' TV = 1.1 kg/cm2	upper alluvium ?
4	LDW-SC30-4-5.9	100% (3-5)		0	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.	Transitional Contact GT @ 3.4'	
5		55% (5-6)		0	End of core at 5.9'. Driven to refusal.	Core catcher @ 4.7'. @ 5.0' TV = 0.9 kg/cm2	
6		100% (6-6.9)		0			

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 (0.7'), easy (5.0'), moderate-hard (6.0'), hard (6.9'), refusal (6.9'). Two drive attempts made at station.**

Calculated Recovery
Sample Length/Penetration Length:
5.9 / 6.9 = 86 %

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

Sediment Core Log

LDW-SC-31 (R1)

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: **NA**	Penetration Depth (ft): **7.5**
Client: **LDWG**	Water Depth (ft): **35.3**	Sample Quality: **Good**
Collection Date: **2/16/06**	Mudline Elevation (ft): **-31.7**	Recovery in ft (%): **5.9 (79)**
Contractor: **MCS Environmental, Inc.**	N./LAT: **203092** E./LONG: **1268934**	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	LDW-SC31-0-1	73% (0-2)	PCB SVOC Metals Hg Pesticides TBT	0	OL: (0.0-0.7) wet, soft, olive brown (2.5Y, 4/3) ORGANIC SILT, few sand. Trace worms.		recent
1	LDW-SC31-1-2.8		PCB SVOC Metals Hg Pesticides TBT	0	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'	
2		100% (2-4)			@ 2.3' trace subangular gravel up to 2" L		
3	LDW-SC31-2.8-4		PCB SVOC Metals Hg Pesticides TBT	0	SM: (2.8-3.0) moist, dense, black SAND pocketed and layered with soft, black ORGANIC SILT. (transitional unit)	GT @ 2.7' Sharp Contact	ua
4		90% (4-6)			SP: (3.0-5.3) moist, dense, black (2.5Y, 2.5/1) medium SAND. Sand grains are multicolored (orange, red, white).		lower alluvium
5	LDW-SC31-4-5.9			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.	Gradational Contact	
6		80% to 50% (6-7.5)			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.	Gradational Contact	fv
7					Bottom of core at 5.9'. Driven to refusal.		

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 (2.0'), easy (6.0'), moderate (7.0'), hard (7.5'), refusal (7.5'). One drive attempt made at station. Core catcher was empty. Difficult core extraction.**

ua = upper alluvium, fv = fluvial

Calculated Recovery
Sample Length/Penetration Length:
5.9 / 7.5 = 79 %

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

Sediment Core Log

LDW-SC-32 (R1)

Project: **LDW RI/FS**	Water Body Type: **Lower Duwamish Waterway**	Tube Length (ft): **16.1**
Project #: **PORS5-18220-511**	Water Elevation (ft)/Tide: **8.6**	Penetration Depth (ft): **12.7**
Client: **LDWG**	Water Depth (ft): **25.6**	Sample Quality: **Good**
Collection Date: **2/10/06**	Mudline Elevation (ft): **-17.2**	Recovery in ft (%): **11.2 (88)**
Contractor: **MCS Environmental, Inc.**	N./LAT: **202959** E./LONG: **1269344**	Process Date: **2/11/06**
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**

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-SC32-0-1		PCB SVOC Metals Hg	0	OL: (0.0-0.4) wet, very soft, dark olive brown (2.5Y, 3/3) ORGANIC SILT, little sand.	Transitional Contact @ 0.4' TV = 0.4 kg/cm2	recent
1	LDW-SC32-1-2	84% (0-3)	PCB SVOC Metals Hg	0	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) GRAVEL, little silt and sand. Slight HC-like odor.	Sharp Contact GT @ 1.1'	
2	LDW-SC32-2-4				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. @ 2.5' 1" diameter piece of gravel	@ 2.5' TV = 0.1 kg/cm2	
3			PCB SVOC Metals Hg	0	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.	Transitional Contact GT @ 3.3'	upper alluvium
4	LDW-SC32-4-5.2	100% (3-5)		0	@ 4.8' end of sheen	@ 4.5' TV = 0.4 kg/cm2	
5		100% (5-7)			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.	Transitional Contact	
6	LDW-SC32-5.2			0	@ 6.4' 2" diameter clast of hard, light gray clay	@ 5.7' TV = 1.1 kg/cm2	

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 (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 %

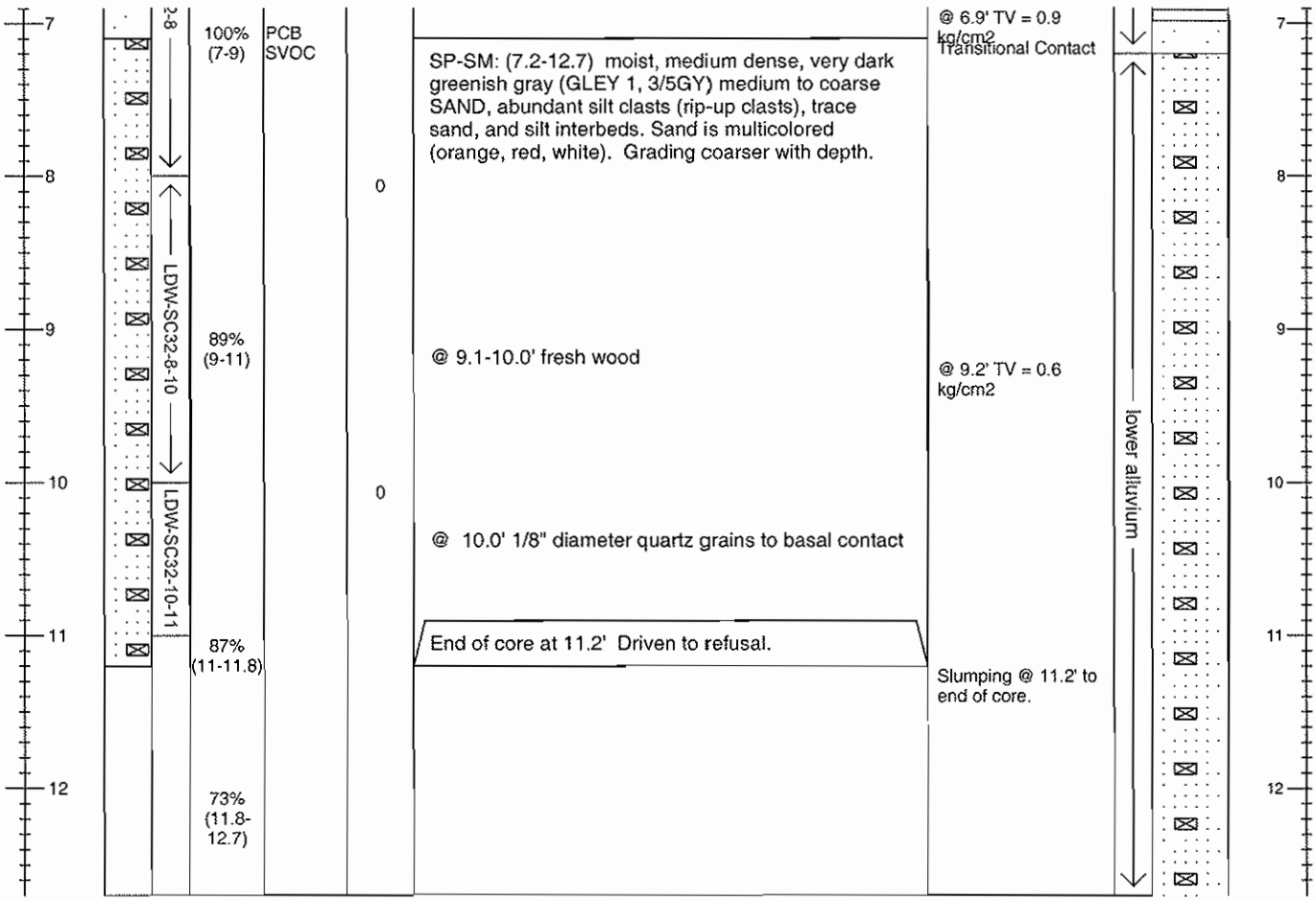
Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.

Sediment Core Log

LDW-SC-32 (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: **8.6**	Penetration Depth (ft): **12.7**
Client: **LDWG**	Water Depth (ft): **25.6**	Sample Quality: **Good**
Collection Date: **2/10/06**	Mudline Elevation (ft): **-17.2**	Recovery in ft (%): **11.2 (88)**
Contractor: **MCS Environmental, Inc.**	N./LAT: **202959** E./LONG: **1269344**	Process Date: **2/11/06**
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**



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 (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 %

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

Sediment Core Log

LDW-SC-33 (R2)

Project: **LDW RI/FS**	Water Body Type: **Lower Duwamish Waterway**	Tube Length (ft): **16.1**
Project #: **PORS5-18220-511**	Water Elevation (ft)/Tide: **8.4**	Penetration Depth (ft): **13.1**
Client: **LDWG**	Water Depth (ft): **24.1**	Sample Quality: **Good**
Collection Date: **2/10/06**	Mudline Elevation (ft): **-14.7**	Recovery in ft (%): **10.2 (78)**
Contractor: **MCS Environmental, 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 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	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-SC33-0-2	100% (0-0.6)	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.	Transitional Contact	recent
1		100% (0.6-3)			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.	@ 0.9' TV = 0.6 kg/cm2 GT @ 1.0'	
2	LDW-SC33-2-4		PCB SVOC Metals Hg	0	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	Transitional Contact Bag @ 1.9' (twine)	
3		87% (3-5)			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).	@ 2.5' TV = 0.5 kg/cm2 GT @ 3.0' Bag @ 3.2' (possible shell)	
4	LDW-SC33-4-6		PCB SVOC Metals	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'	@ 5.0' TV = 0.6 kg/cm2 Bag @ 5.5' (chunks) Bag @ 5.6' (silver chunk)	
5		76% (5-7)			@5.7': glass shard (top of soda bottle)	Bag @ 5.7' (glass shard)	
6	LDW-			0	@6.0': no debris observed below 6.0'.		

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 (0.6'), 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 %

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

Sediment Core Log

LDW-SC-33 (R2)

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: **8.4**	Penetration Depth (ft): **13.1**
Client: **LDWG**	Water Depth (ft): **24.1**	Sample Quality: **Good**
Collection Date: **2/10/06**	Mudline Elevation (ft): **-14.7**	Recovery in ft (%): **10.2 (78)**
Contractor: **MCS Environmental, 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 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	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	SC33-6-8	81% (7-9)	PCB SVOC	0		@ 7.0' TV = 0.1 kg/cm2	upper alluvium
8							
9	LDW-SC33-8-10	70% (9-11)			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	
10					End of core at 10.2'.	Sampled to 10.0'.	lower alluvium
11		45% (11-13.1)					
12							
13							

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 (0.6'), 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 %

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

Sediment Core Log

LDW-SC-34 (R2)

RETEC

Project: **LDW RI/FS**	Water Body Type: **Lower Duwamish Waterway**	Tube Length (ft): **16.1**
Project #: **PORS5-18220-511**	Water Elevation (ft)/Tide: **9.1**	Penetration Depth (ft): **12.2**
Client: **LDWG**	Water Depth (ft): **23.7**	Sample Quality: **Good**
Collection Date: **2/17/06**	Mudline Elevation (ft): **-14.5**	Recovery in ft (%): **9.3 (76)**
Contractor: **MCS Environmental, Inc.**	N./LAT: **202014** E./LONG: **1268831**	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, 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	LDW-SC34-0-1	72% (0-1)	PCB SVOC Metals Hg Pesticides	0	ML: (0.0-0.7) wet, medium stiff, dark olive brown (2.5Y, 3/3) SILT, little gravel, trace sand. Substantial wood fragments.		
						Transitional Contact	
1	LDW-SC34-1-2	91% (1-5)	PCB SVOC Metals Hg Pesticides	0	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, wood fragments). Silt texture is slightly compressible, uniform, with moderate to low plasticity, and grading to unit below. Trace debris.		
2	LDW-SC34-2-4		PCB SVOC Metals Hg Pesticides	0	@ 1.3' plastic zip-tie		recent
3							
					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)	Transitional Contact	
4				0	@ 3.4' glass shard	Bag @ 3.4' (glass shard)	
5	LDW-SC34-4-6	100% (5-7)					
6	LDW-			0			
						Sharp Contact	
					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		

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 (1.5'), easy (12.2'), penetration goal reached. Two drive attempts made at station. Core catcher was 100% full. No torvane or geotechnical samples taken due to frozen core. Field replicate of SC-203.**

Calculated Recovery
Sample Length/Penetration Length:
9.3 / 12.2 = 76 %

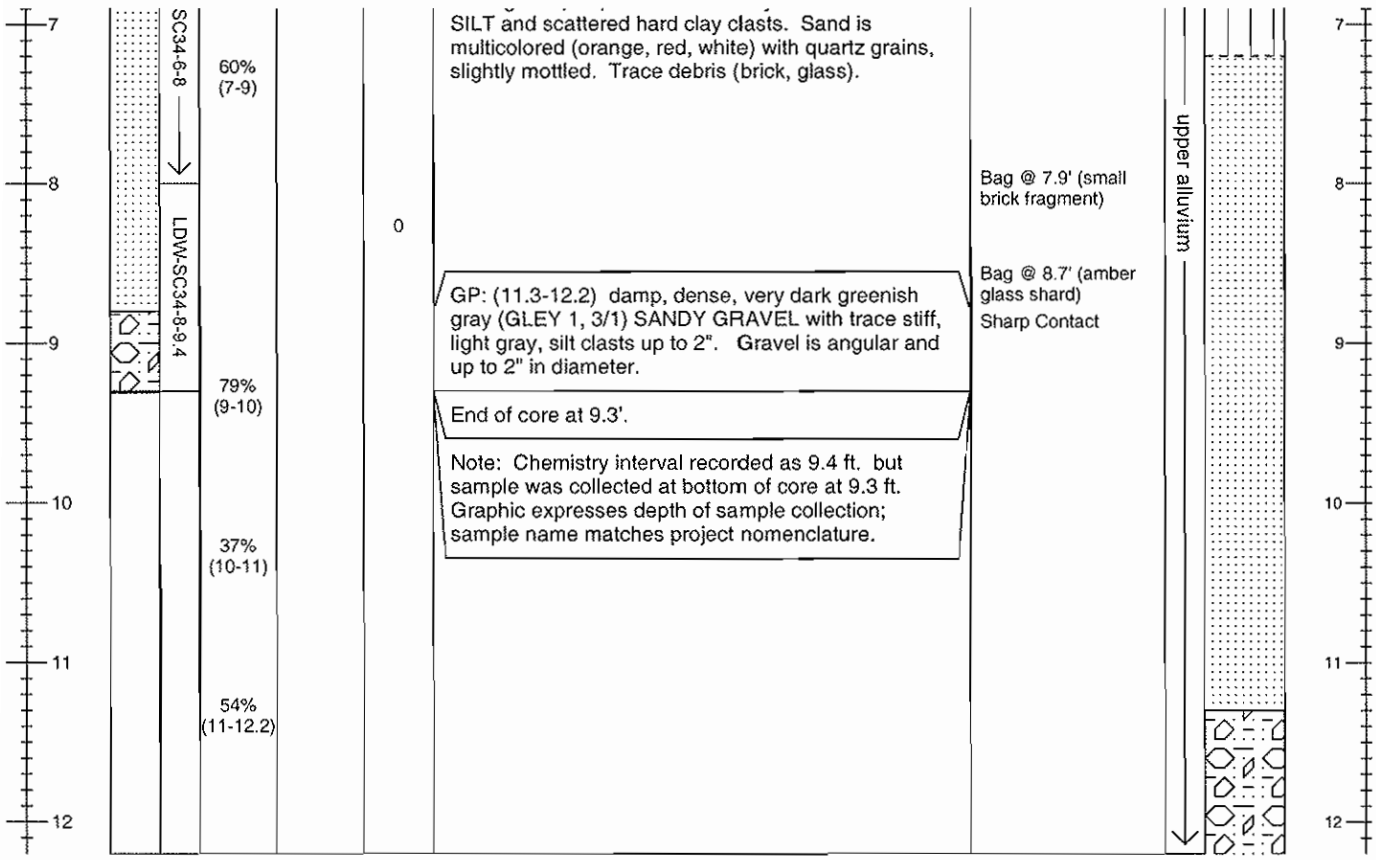
Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.

Sediment Core Log

LDW-SC-34 (R2)

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: **9.1**	Penetration Depth (ft): **12.2**
Client: **LDWG**	Water Depth (ft): **23.7**	Sample Quality: **Good**
Collection Date: **2/17/06**	Mudline Elevation (ft): **-14.5**	Recovery in ft (%): **9.3 (76)**
Contractor: **MCS Environmental, Inc.**	N./LAT: **202014** E./LONG: **1268831**	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, C.Brackett**



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 (1.5'), easy (12.2'), penetration goal reached. Two drive attempts made at station. Core catcher was 100% full. No torvane or geotechnical samples taken due to frozen core. Field replicate of SC-203.**

Calculated Recovery
Sample Length/Penetration Length:
9.3 / 12.2 = 76 %

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

Sediment Core Log

LDW-SC-35 (R2)

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**
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	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-SC35-0-2	100% (0-1)	PCB SVOC Metals Hg	0	OL: (0.0-0.7) wet, soft, olive brown (2.5Y, 4/3) ORGANIC SILT, few sand.		recent
1		100% (1-4)			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	
2	LDW-SC35-2-4		PCB SVOC Metals Hg	0			
3						GT @ 2.9' @ 2.9' TV = 0.4 kg/cm2	
4	LDW-SC35-4-4.9	76% (4-6)		0	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	upper alluvium
5	LDW-SC35-4.9-6			0	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)	
6	LDW-	73% (6-8)		0		@ 5.9 TV = 0.5 kg/cm2	

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 (0.8'), easy (3.7)', moderate (8.0'), hard (10.2'), refusal (10.2'). Two drive attempts made at this station. Core tip crushed, but full.**

Calculated Recovery
Sample Length/Penetration Length:
8.3 / 10.2 = 81 %

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

Sediment Core Log

LDW-SC-35 (R2)

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**
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	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	SCS5-6-8	50% (8-10)			End of core at 8.3'. Driven to refusal.	Sampled to 8.0'.	lower alluvium ?
8							
9							
10		100% (10-10.2)					

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 (0.8'), easy (3.7)', moderate (8.0'), hard (10.2'), refusal (10.2'). Two drive attempts made at this station. Core tip crushed, but full.**

Calculated Recovery
Sample Length/Penetration Length:
8.3 / 10.2 = 81 %

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

Sediment Core Log

LDW-SC-36 (R1)

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: **2.9**	Penetration Depth (ft): **12.3**
Client: **LDWG**	Water Depth (ft): **17.4**	Sample Quality: **Good**
Collection Date: **2/15/06**	Mudline Elevation (ft): **-12.3**	Recovery in ft (%): **10.2 (83)**
Contractor: **MCS Environmental, Inc.**	N./LAT: **201490** E./LONG: **1269988**	Process Date: **2/16/06**
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, 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-SC36-0-1	100% (0-1)	PCB SVOC Metals Hg TBT	0	OL: (0.0-0.4) wet, soft, olive brown (2.5Y, 4/3) ORGANIC SILT, few sand, trace worms.		0
					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	LDW-SC36-1-2	85% (1-2)	PCB SVOC Metals Hg TBT	0			1
2	LDW-SC36-2-4	84% (2-5)	PCB SVOC Metals Hg TBT	0	@ 2.0' 1/2" thick layer of medium sand	GT @2.1'	2
3							3
4	LDW-SC36-4-6				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)	Transitional Contact @ 3.9' TV = 1.1 kg/cm2	4
5		83% (5-8)		0	@ 4.9' whole clam shell 1" L		5
6	LDW-				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
							recent / upper alluv

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 (0.4'), 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 %

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

Sediment Core Log

LDW-SC-36 (R1)

Project: **LDW RI/FS**	Water Body Type: **Lower Duwamish Waterway**	Tube Length (ft): **16.1**
Project #: **PORS5-18220-511**	Water Elevation (ft)/Tide: **2.9**	Penetration Depth (ft): **12.3**
Client: **LDWG**	Water Depth (ft): **17.4**	Sample Quality: **Good**
Collection Date: **2/15/06**	Mudline Elevation (ft): **-12.3**	Recovery in ft (%): **10.2 (83)**
Contractor: **MCS Environmental, Inc.**	N./LAT: **201490** E./LONG: **1269988**	Process Date: **2/16/06**
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, 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	SC36-8-8			0	@ 7.4' 5" thick layer of black SILT, few clay	@ 7.8' TV = 0.9 kg/cm2	upper alluvium
8	LDW-SC36-8-10	85% (8-10)			SP- SM: (9.8-12.3) moist to damp, [dense], very dark greenish gray (GLEY 1, 3/1) fine SAND with 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".	Transitional Contact	
9						@ 9.0' TV = 0.9 kg/cm2	
10		69% (10-11)			End of core at 10.2'. Driven to refusal.	Slight winnowing from 10.0-10.2' Sampled to 10.0'.	lower alluvium
11		75% (11-12.3)					
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 (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 %

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

Sediment Core Log

LDW-SC-37 (R1)

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: **8.2**	Penetration Depth (ft): **8.6**
Client: **LDWG**	Water Depth (ft): **19.8**	Sample Quality: **Good**
Collection Date: **2/22/06**	Mudline Elevation (ft): **-11.4**	Recovery in ft (%): **6.9 (80)**
Contractor: **MCS Environmental, Inc.**	N./LAT: **201435** E./LONG: **1270690**	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	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-SC37-0-1	48% (0-1)	PCB SVOC Metals Hg	0	OL: (0.0-0.3) wet, soft, olive brown (2.5Y, 4/3) ORGANIC SILT, few sand.		0
					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 wood fragments.	Transitional Contact @ 0.4' TV = 0.2 kg/cm2 GT @ 0.9'	
1	LDW-SC37-1-2	100% (1-3)	PCB SVOC Metals Hg	0		Bag @ 1.5' (copper wire) @ 1.9' TV = 0.1 kg/cm2	1
2	LDW-SC37-2-4		PCB SVOC Metals Hg	0		GT @ 2.2'	2
					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, asphalt-like; 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%).	Transitional Contact	
3		100% (3-4)					3
4	LDW-SC37-4-5.3	80% (4-6)		0		@ 3.6' TV = 0.5 kg/cm2 Bag @ 3.9' (1/2-vesicular, 1/2-metallic, shiny, fused conglomerate)	4
5	L					@ 5.0' TV = 1.3 kg/cm2	5
					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).	Slumping in sand below 5.2'	

recent

upper 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 (1.4'), easy (3.0'), moderate (6.5'), hard (8.6'), refusal (8.6'). One drive attempt made at station. Core catcher was 100% full. Steep slope and pier pilings in area. Scattered rainbow sheen florets along sidewalls from 0.5' to 4.0' up to 1/2" diameter.**

Calculated Recovery
Sample Length/Penetration Length:
6.9 / 8.6 = 80 %

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

Sediment Core Log

LDW-SC-37 (R1)

Project: **LDW RI/FS**	Water Body Type: **Lower Duwamish Waterway**	Tube Length (ft): **16.1**
Project #: **PORS5-18220-511**	Water Elevation (ft)/Tide: **8.2**	Penetration Depth (ft): **8.6**
Client: **LDWG**	Water Depth (ft): **19.8**	Sample Quality: **Good**
Collection Date: **2/22/06**	Mudline Elevation (ft): **-11.4**	Recovery in ft (%): **6.9 (80)**
Contractor: **MCS Environmental, Inc.**	N./LAT: **201435** E./LONG: **1270690**	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	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	DW-SC37-5.3-6.9	75% (6-8)	PCB SVOC Metals	0			6
					End of core at 6.9'. Driven to refusal.		
7							7
8		78% (8-8.6)					8

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 (1.4'), easy (3.0'), moderate (6.5'), hard (8.6'), refusal (8.6'). One drive attempt made at station. Core catcher was 100% full. Steep slope and pier pilings in area. Scattered rainbow sheen florets along sidewalls from 0.5' to 4.0' up to 1/2" diameter.**

Calculated Recovery
Sample Length/Penetration Length:
6.9 / 8.6 = 80 %

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

Sediment Core Log

LDW-SC-38 (R1/R2)

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**	Sample Quality: **Good**
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: **2/21/06**
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, 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-SC38-0-1		PCB SVOC Metals Hg	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
1	LDW-SC38-1-2	81% (0-3)	PCB SVOC Metals Hg	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.	Transitional Contact @ 1.5' TV = 1.1 kg/cm2	upper alluvium
2	LDW-SC38-2-3		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	
3	3-3.3	75% (3-4)	PCB SVOC Metals Hg		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	
4		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'.	lower alluvium
5		75% R2 (5-5.6)					

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: no freefall, easy (3'), moderate (4'), hard (5.6'), refusal (5.6'). Two drive attempts made at station. Core tip crushed. Core is combined: 0-3' (R1) and 3-3.8' (R2). Header notes are from R2. R1 is from 1st Ave Bridge and R2 from 20' further downslope; tagged sand unit.**

Calculated Recovery
Sample Length/Penetration Length:
3.8 / 5.6 = 68 %

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

Sediment Core Log

LDW-SC-39 (R1)

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: **5.3**	Penetration Depth (ft): **12.4**
Client: **LDWG**	Water Depth (ft): **9.8**	Sample Quality: **Good**
Collection Date: **2/15/06**	Mudline Elevation (ft): **-5**	Recovery in ft (%): **9.2 (74)**
Contractor: **MCS Environmental, Inc.**	N./LAT: **200657** E./LONG: **1270056**	Process Date: **2/16/06**
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
	LDW-SC39-0-1	100% (0-1)	PCB SVOC Metals Hg Pesticides TBT Dioxins/ Furans	0	OL: (0.0-0.4) very wet, very soft, olive brown (2.5Y, 4/3) ORGANIC SILT, few sand.		
	LDW-SC39-1-2		PCB SVOC Metals Hg Pesticides TBT Dioxins/ Furans	0	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). @1.3' brick fragment 2" L	Transitional Contact; Bag @ 1.3' (brick fragment); GT @ 2.0'	
	LDW-SC39-2-4	82% (1-3)		0			
			PCB SVOC Metals Hg Pesticides 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).	Transitional Contact	
		93% (3-5)			OL: (3.9-7.5) moist, stiff, black (2.5Y, 2.5/1) ORGANIC SILT. Silt texture is uniform, slightly compressible, blocky, massive, and of low plasticity. Trace rootlets and wood fragments up to 5" L.	Transitional Contact	recent
	LDW-SC39-4-6		PCB	0			
		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		

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: no freefall, easy (1.0'), moderate (9.0'), hard (12.4'), penetration goal reached. One drive attempt made at station. Core catcher was 100% full. Difficult core extraction. No torvane measurements taken.**

Calculated Recovery
Sample Length/Penetration Length:
9.2 / 12.4 = 74 %

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

Sediment Core Log

LDW-SC-39 (R1)

Project: **LDW RI/FS**	Water Body Type: **Lower Duwamish Waterway**	Tube Length (ft): **16.1**
Project #: **PORS5-18220-511**	Water Elevation (ft)/Tide: **5.3**	Penetration Depth (ft): **12.4**
Client: **LDWG**	Water Depth (ft): **9.8**	Sample Quality: **Good**
Collection Date: **2/15/06**	Mudline Elevation (ft): **-5**	Recovery in ft (%): **9.2 (74)**
Contractor: **MCS Environmental, Inc.**	N./LAT: **200657** E./LONG: **1270056**	Process Date: **2/16/06**
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
7	JW-SC39-6.8-9.5			0	SAND. Trace wood fragments up to 7" L.		7
8							8
					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.	Transitional Contact	upper alluvium
9	8.5-9.2			0			9
		71% (9-10)			End of core at 9.2'.	Winnowing @ 9.2 to 9.3'	
10							10
		74% (10-12.4)					lower alluvium
11							11
12							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: no freefall, easy (1.0'), moderate (9.0'), hard (12.4'), penetration goal reached. One drive attempt made at station. Core catcher was 100% full. Difficult core extraction. No torvane measurements taken.**

Calculated Recovery
Sample Length/Penetration Length:
9.2 / 12.4 = 74 %

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

Sediment Core Log

LDW-SC-40 (R3)

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): **10.4**	Sample Quality: **Good**
Collection Date: **2/23/06**	Mudline Elevation (ft): **-1.0**	Recovery in ft (%): **10.0 (77)**
Contractor: **MSS**	N./LAT: **200339** E./LONG: **1270298**	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: **Vibracore/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
0–1	LDW-SC40-0-1.3	77% (0-13)	PCB, SVOC, Metals, Hg, Pesticides, Dioxins/Furans	0	SP: (0.0-0.5) damp, medium dense, brown (7.5YR, 4/2) medium SAND. Sand grains are multicolored (orange, red, white).	@ 0.2' TV = 0 kg/cm2 Tranistional Contact	upper alluvium
1–2	1.3-2		PCB, SVOC, Metals, Hg, Pesticides, Dioxins/Furans	0	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.	@ 0.7' TV = 0.3 kg/cm2 GT @ 1.2' Sharp Contact	
2–3	LDW-SC40-2-4				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 gravel up to 1" L. Scattered brick fragments up to 1" L.	@ 2.2' TV = 0 kg/cm2 GT @ 2.5'	
3–4			PCB, SVOC, Metals, Hg, Pesticides, Dioxins/Furans	0		@ 3.0' TV = 0.1 kg/cm2 Oxidation @ 0.0' to 4.0'.	
4–5	LDW-SC40-4-6			0	@ 4.4' color changes to very dark gray sand		
5–6	LDW-						

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: no freefall , easy (13.0'), penetration goal reached. Three drive attempts made at station. Station re-occupied with vibracore after MCS drives. Core catcher was empty (0.5' sediment loss).**

Calculated Recovery
Sample Length/Penetration Length:
10.0/13.0 = 77 %

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

Sediment Core Log

LDW-SC-40 (R3)

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): **10.4**	Sample Quality: **Good**
Collection Date: **2/23/06**	Mudline Elevation (ft): **-1.0**	Recovery in ft (%): **10.0 (77)**
Contractor: **MSS**	N./LAT: **200339** E./LONG: **1270298**	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: **Vibracore/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
7	SC40-9-8			0			lower alluvium
8	LDW-SC40-8-10			0			
9				0			
10				0	End of core at 10.0'.		
11							
12							
13							

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: no freefall , easy (13.0'), penetration goal reached. Three drive attempts made at station. Station re-occupied with vibracore after MCS drives. Core catcher was empty (0.5' sediment loss).**

Calculated Recovery
Sample Length/Penetration Length:
10.0/ 13.0 = 77 %

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

Sediment Core Log

LDW-SC-41 (R1)

Project: **LDW RI/FS**	Water Body Type: **Lower Duwamish Waterway**	Tube Length (ft): **16.1**
Project #: **PORS5-18220-511**	Water Elevation (ft)/Tide: **8.9**	Penetration Depth (ft): **11.6**
Client: **LDWG**	Water Depth (ft): **15.6**	Sample Quality: **Good**
Collection Date: **2/20/06**	Mudline Elevation (ft): **-6.5**	Recovery in ft (%): **7.9 (66)**
Contractor: **MCS Environmental, 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: **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	LDW-SC41-0-1	83% (0-1)	PCB SVOC Metals Hg Dioxins/ Furans	0	OL: (0.0-0.6) very wet, very soft, olive brown (2.5Y, 4/3) ORGANIC SILT, few sand.	@ 0.0' to 0.5' Sheen Test = no sheen	0
1	LDW-SC41-1-2		PCB SVOC Metals Hg Dioxins/ Furans	0	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.	Transitional Contact GT @ 1.2' @ 1.2' TV = 0.4 kg/cm2	1
2	LDW-SC41-2-4	100% (1-3)	PCB SVOC Metals Hg Dioxins/ Furans	0		GT @ 3.2' @ 3.5' TV = 0.2 kg/cm2	2
3							3
4	LDW-SC41-4-6	100% (3-5)				Slight winnowing @ 3.9' to 4.2'	4
5			PCB SVOC	0		@ 5.3' TV = 0.4 kg/cm2	5
6		68% (5-8)					6

recent

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 (2.0'), easy (11.6'), penetration goal reached. One drive attempt made at station. Scattered HC-like sheen florets along sidewalls from 4.0' to 5.4'.**

la = lower alluvium

Calculated Recovery
Sample Length/Penetration Length:
7.7 / 11.6 = 66 %

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

Sediment Core Log

LDW-SC-41 (R1)

Project: **LDW RI/FS**	Water Body Type: **Lower Duwamish Waterway**	Tube Length (ft): **16.1**
Project #: **PORS5-18220-511**	Water Elevation (ft)/Tide: **8.9**	Penetration Depth (ft): **11.6**
Client: **LDWG**	Water Depth (ft): **15.6**	Sample Quality: **Good**
Collection Date: **2/20/06**	Mudline Elevation (ft): **-6.5**	Recovery in ft (%): **7.9 (66)**
Contractor: **MCS Environmental, 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: **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
7	LDW-SC41-7.9'		PCB	0	ML: (7.9-8.3) moist, soft, very dark greenish gray (GLEY 1 3/1) SILT, little clay.	@ 6.6' TV = 0.5 kg/cm2	7
					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).	Transitional Contacts	
8					SP: (10.9-11.6) damp, medium dense, bluish gray (GLEY 2, 5/10B) fine SAND. Lost 0.2' of sand.	Sharp Contact	8
9		70% (8-10)			End of core at 7.9'.		9
10		60% (10-11.6)					10
11							11

upper alluvium

la

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 (2.0'), easy (11.6'), penetration goal reached. One drive attempt made at station. Scattered HC-like sheen florets along sidewalls from 4.0' to 5.4'.**

la = lower alluvium

Calculated Recovery
Sample Length/Penetration Length:
7.7 / 11.6 = 66 %

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

Sediment Core Log

LDW-SC-42 (R2)

Sheet 1 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: **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 Environmental, Inc.**	N./LAT: **199898** E./LONG: **1271361**	Process Date: **2/8/06**
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**

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-SC42-0-1	100% (0-5)	PCB SVOC Metals Hg	0	OL: (0.0-0.2) very wet, very soft, very dark greenish gray (GLEY 1, 3/10Y) ORGANIC SILT, few sand and trace twigs.	Transitional Contact	0
1	LDW-SC42-1-2		PCB SVOC Metals Hg	0	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.	@ 0.7' TV = 0.3 kg/cm2 GT @ 0.9' @ 1.3' TV = 0.5 kg/cm2	1
2	LDW-SC42-2-4		PCB SVOC Metals Hg	0	@3.4' a distinct 3" thick layer of moist, soft, dark greenish gray SILT with scattered rootlets, fibers, shells, and black sheen	GT @ 2.2'	2
3							3
4	LDW-SC42-4-6				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	4
5				0			5

recent

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 (0.0'), easy (2.4'), moderate (15.9'), penetration goal reached. Two drive attempts made at station. Core catcher was empty, but natural plug as described by boat crew. Fine sand in shoe.**

Calculated Recovery
Sample Length/Penetration Length:
12.8/ 15.9 = 81 %

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

Sediment Core Log

LDW-SC-42 (R2)

Project: **LDW RI/FS**	Water Body Type: **Lower Duwamish Waterway**	Tube Length (ft): **16.1**
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 Environmental, Inc.**	N./LAT: **199898** E./LONG: **1271361**	Process Date: **2/8/06**
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**

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	LDW-SC42-6-8	85% (5-8)		0	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
7					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
8	LDW-SC42-8-10	70% (8-13)		0			8
9						@ 9.5' TV = 0.9 kg/cm2	9
10	LDW-S				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. @ 11.0' piece of thin plastic (resting ontop of core; location qualified)		10 upper 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 (0.0'), easy (2.4'), moderate (15.9'), penetration goal reached. Two drive attempts made at station. Core catcher was empty, but natural plug as described by boat crew. Fine sand in shoe.**

Calculated Recovery
Sample Length/Penetration Length:
12.8/15.9 = 81 %

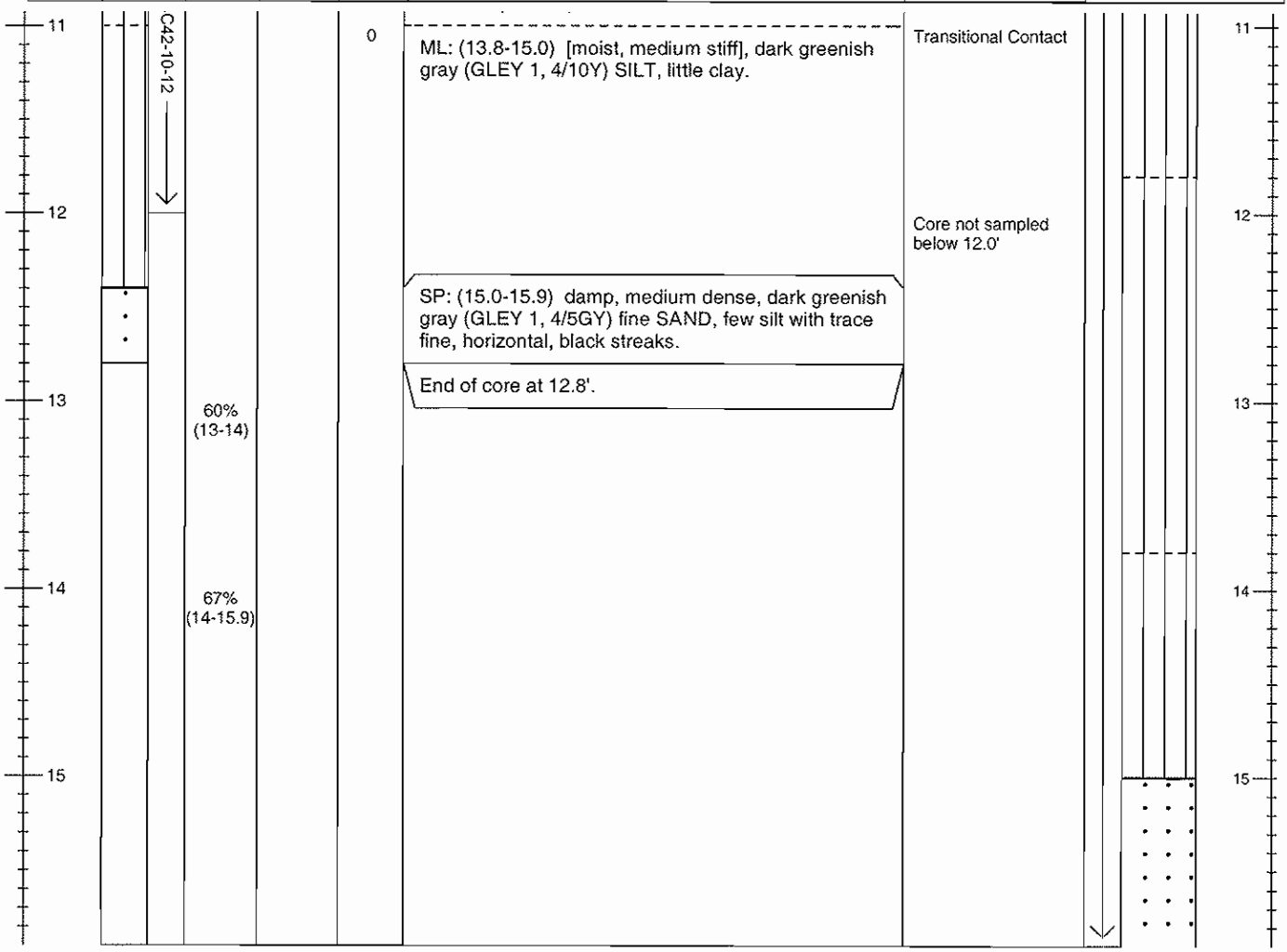
Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.

Sediment Core Log

LDW-SC-42 (R2)

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: **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 Environmental, Inc.**	N./LAT: **199898** E./LONG: **1271361**	Process Date: **2/8/06**
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**



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 (0.0'), easy (2.4'), moderate (15.9'), penetration goal reached. Two drive attempts made at station. Core catcher was empty, but natural plug as described by boat crew. Fine sand in shoe.**

Calculated Recovery
Sample Length/Penetration Length:
12.8/ 15.9 = 81 %

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

Sediment Core Log

LDW-SC-43 (R3)

Project: **LDW RI/FS**	Water Body Type: **Lower Duwamish Waterway**	Tube Length (ft): **16.1**
Project #: **PORS5-18220-511**	Water Elevation (ft)/Tide: **3.9**	Penetration Depth (ft): **15.9**
Client: **LDWG**	Water Depth (ft): **11.1**	Sample Quality: **Good**
Collection Date: **2/22/06**	Mudline Elevation (ft): **-6.8**	Recovery in ft (%): **9.8 (62)**
Contractor: **MCS Environmental, Inc.**	N./LAT: **199287** E./LONG: **1271846**	Process Date: **2/23/06**
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	LDW-SC43-0-2	100% (0-0.5)	PCB SVOC Metals Hg	0	OL: (0.0-0.1) very wet, very soft, yellowish red (5YR, 4/6) ORGANIC SILT, little sand.	Transitional Contact	recent
1		69% (0.5-3)			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.	Transitional Contact GT @ 0.9' @ 0.9' TV = 1.04 kg/cm2	
2	LDW-SC43-2-4		PCB SVOC Metals Hg	0	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.		
3		78% (3-7)			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.	GT @ 3.1'	
4							
5	LDW-SC43-4-6			0			

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 %

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

Sediment Core Log

LDW-SC-43 (R3)

Project: **LDW RI/FS**	Water Body Type: **Lower Duwamish Waterway**	Tube Length (ft): **16.1**
Project #: **PORS5-18220-511**	Water Elevation (ft)/Tide: **3.9**	Penetration Depth (ft): **15.9**
Client: **LDWG**	Water Depth (ft): **11.1**	Sample Quality: **Good**
Collection Date: **2/22/06**	Mudline Elevation (ft): **-6.8**	Recovery in ft (%): **9.8 (62)**
Contractor: **MCS Environmental, Inc.**	N./LAT: **199287** E./LONG: **1271846**	Process Date: **2/23/06**
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
6	LDW-SC43-6.9	80% (7-9)		0	@ 8' 1" thick layer of coarse SAND	Winnowing @ 8.5' to 8.9'.	upper alluvium
7							
8							
9	9.9.8	75% (9-11)		0	SW: (11.9-15.9) damp, stiff, black (2.5Y, 2.5/1), medium to coarse SAND, grading to coarse sand at basal contact.	Sharp Contact	
10					End of core at 9.8'.		
11		45% (11-13)					

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 %

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

Sediment Core Log

LDW-SC-43 (R3)

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: **3.9**	Penetration Depth (ft): **15.9**
Client: **LDWG**	Water Depth (ft): **11.1**	Sample Quality: **Good**
Collection Date: **2/22/06**	Mudline Elevation (ft): **-6.8**	Recovery in ft (%): **9.8 (62)**
Contractor: **MCS Environmental, Inc.**	N./LAT: **199287** E./LONG: **1271846**	Process Date: **2/23/06**
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
12							12
13		26% (13-15.9)					13
14							14
15							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 %

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

Sediment Core Log

LDW-SC-44 (R2)

Project: **LDW RI/FS**	Water Body Type: **Lower Duwamish Waterway**	Tube 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**	Sample Quality: **Good**
Collection Date: **2/21/06**	Mudline Elevation (ft): **-2.1**	Recovery in ft (%): **5.8 (50)**
Contractor: **MCS Environmental, Inc.**	N./LAT: **198925** E./LONG: **1272230**	Process Date: **2/21/06**
Vessel: **MCS barge**	Horiz. Datum: **NAD 83 N** Vert. Datum: **MLLW**	Process Method: **Cut tube**
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
0	LDW-SC44-0-2	70% (0-3)	PCB SVOC Metals Hg	0	OL: (0.0-0.4) wet to moist, soft, black (2.5Y, 2.5/1) ORGANIC SILT, few sand. Silt texture is uniform, massive, blocky, and slightly mottled.	Transitional Contact	recent
1		61% (3-5)			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.	GT @ 0.9' @ 1.2' TV = 0.9 kg/cm2	
2	LDW-SC44-2-3.2		PCB SVOC Metals Hg	0	@ 2.4' abundant 1" L glass shards	@ 2.6' TV = 0.6 kg/cm2	
3	3.2-4.0	41% (5-7)	PCB SVOC Metals Hg	0	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)	Sharp Contact @ 3.2' TV = 0.6 kg/cm2 Bag @ 3.3' (piece of conglomerate)	
4	LDW-SC44-4-5.8			0	SP: (6.2-11.7) damp, dense, brown (7.5YR, 4/2) medium to coarse SAND. Sand grains are multicolored (orange, red, white) and well sorted. Grades to gray (2.5Y, 5/1) coarse SAND, few subangular gravel at basal contact. Sand coarsens downward.	Transitional Contact GT @ 3.9'	
5					End of core at 5.8'. Driven to refusal.		
6							

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 (3.0'), moderate (7.0'), hard (11.7'), refusal (11.7'). Two drive attempts made at station.**

Core catcher was 66% full.

Calculated Recovery
Sample Length/Penetration Length:
5.8 / 11.7 = 50 %

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

Sediment Core Log

LDW-SC-44 (R2)

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: **10.0**	Penetration Depth (ft): **11.7**
Client: **LDWG**	Water Depth (ft): **12.0**	Sample Quality: **Good**
Collection Date: **2/21/06**	Mudline Elevation (ft): **-2.1**	Recovery in ft (%): **5.8 (50)**
Contractor: **MCS Environmental, Inc.**	N./LAT: **198925** E./LONG: **1272230**	Process Date: **2/21/06**
Vessel: **MCS barge**	Horiz. Datum: **NAD 83 N** Vert. Datum: **MLLW**	Process Method: **Cut tube**
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		56% (7-9)					upper alluvium
8							
9		23% (9-11)					
10							
11		40% (11-11.7)					

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: freefall (3.0'), moderate (7.0'), hard (11.7'), refusal (11.7'). Two drive attempts made at station.**

Core catcher was 66% full.

Calculated Recovery
Sample Length/Penetration Length:
5.8 / 11.7 = 50 %

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

Sediment Core Log

LDW-SC-45 (R3)

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): **7.7**
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**
Vessel: **MCS barge**	Horiz. Datum: **NAD 83 N** Vert. Datum: **MLLW**	Process Method: **Cut tube**
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
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.	Transitional Contact	0
					ML: (0.3-4.1) moist, medium stiff, black (2.5Y, 2.5/1) SILT, few sand, trace rootlets, wood and shell fragments.		
1	LDW-SC45-1-2	91% (1-5)	PCB SVOC Metals Hg	0		GT @ 1.1'	1
2	LDW-SC45-2-4		PCB SVOC Metals Hg	0	@ 2.2' scattered rainbow sheen florets to basal contact	@ 1.9' TV = 0.6 kg/cm2	2
3					@ 3' 1" thick layer of damp, black SAND with multicolored grains oriented transversely		3
						Transitional Contact	
4	LDW-SC45-4-5			0	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'	4
					MH: (4.5-5.2) moist, medium stiff, black (2.5Y, 2.5/1) SILT, few sand, trace rootlets. Trace debris.	Transitional Contact	
5	LDW-SC45-5-6				@ 4.8' 2" L piece of subrounded anthropogenic conglomerate (concrete)	Bag @ 4.8' (concrete conglomerate)	5
			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	
6		71% (5-7.7)				@ 5.6' TV = 0.7 kg/cm2	6

upper 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 (0.8'), 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 %

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

Sediment Core Log

LDW-SC-45 (R3)

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): **7.7**
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**
Vessel: **MCS barge**	Horiz. Datum: **NAD 83 N** Vert. Datum: **MLLW**	Process Method: **Cut tube**
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.	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: 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 %

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

Sediment Core Log

LDW-SC-46 (R1)

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**	Sample 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	LDW-SC46-0-1		PCB SVOC Metals Hg	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'	recent
1	LDW-SC46-1-2	86% (0-13)	PCB SVOC Metals Hg	0	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. @ 2.8' 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'	
2	LDW-SC46-2-4		PCB SVOC Metals Hg	0		@ 3.2' TV = 0.3 kg/cm2	
3							
4	LDW-SC46-4-6.8		PCB	0	@ 3.9' shell layer with shells up to 2" L and slight HC-like odor and rainbow sheen	@ 3.9' TV = 0.2 kg/cm2	upper alluvium
5							
6							

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 (3.5'), easy (13.0'), penetration goal reached. One drive attempt made at station. Core catcher was empty (0.5' sediment loss).**

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

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

Sediment Core Log

LDW-SC-46 (R1)

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**	Sample 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
7	LDW-SC46-6.8-8			0	@ 6.9' 2" L piece of plastic 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	lower alluvium
8							
9	LDW-SC46-8-10			0			
10				0			
11	LDW-SC46-10-11.2				End of core at 11.2'.		
12							
13							

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 (3.5'), easy (13.0'), penetration goal reached. One drive attempt made at station. Core catcher was empty (0.5' sediment loss).

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

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

Sediment Core Log

LDW-SC-47 (R3)

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): **10**	Sample Quality: **Good**
Collection Date: **2/23/06**	Mudline Elevation (ft): **-0.4**	Recovery in ft (%): **10.3 (79)**
Contractor: **MSS**	N./LAT: **197422** E./LONG: **1273340**	Process Date: **2/23/06**
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	LDW-SC47-0-1	79% (0-13)	PCB SVOC Metals Hg	0	ML: (0.0-0.1) very wet, very soft, olive brown (2.5Y, 4/3) SILT, few sand.		recent
1	LDW-SC47-1-2		PCB SVOC Metals Hg	0	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.		
2	LDW-SC47-2-3		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 (concrete)	GT @ 1.4' @ 1.8' TV = 0.2 kg/cm2	upper alluvium
3	LDW-SC47-3-4		PCB SVOC Metals Hg	0	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'	
4				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	
5	LDW-SC47-4-6			0		Oxidation @ 5.0' to 7.6' @ 5.5 TV = 0.1 kg/cm2	
6				0			

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

Calculated Recovery
Sample Length/Penetration Length:
10.3/ 13.0 = 79 %

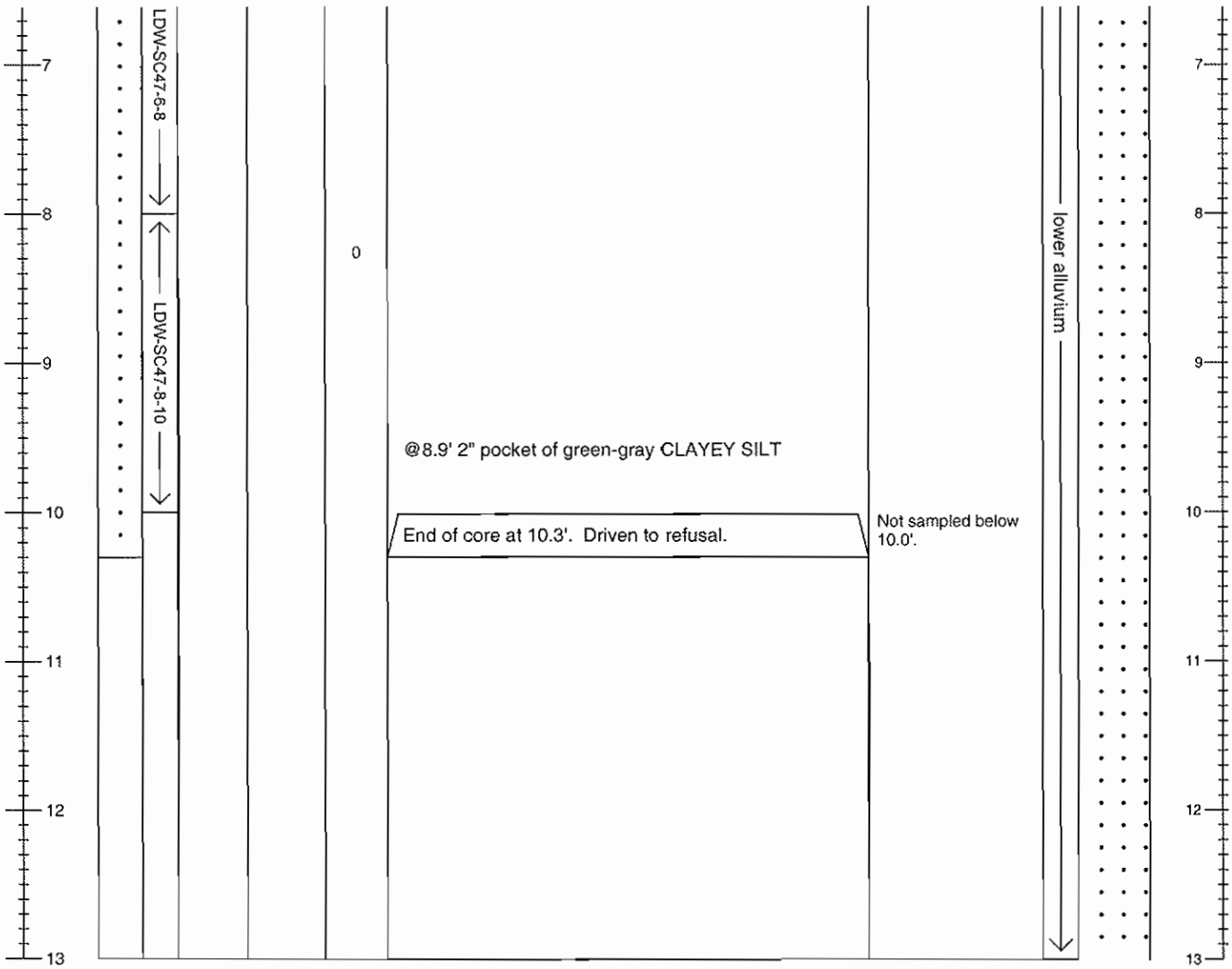
Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.

Sediment Core Log

LDW-SC-47 (R3)

Sheet 2 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): **10**	Sample Quality: **Good**
Collection Date: **2/23/06**	Mudline Elevation (ft): **-0.4**	Recovery in ft (%): **10.3 (79)**
Contractor: **MSS**	N./LAT: **197422** E./LONG: **1273340**	Process Date: **2/23/06**
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**



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

Calculated Recovery
Sample Length/Penetration Length:
10.3/ 13.0 = 79 %

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

Sediment Core Log

LDW-SC-48 (R2)

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: **9.4**	Penetration Depth (ft): **6.7**
Client: **LDWG**	Water Depth (ft): **37.4**	Sample Quality: **Good**
Collection Date: **2/8/06**	Mudline Elevation (ft): **-22.3**	Recovery in ft (%): **5.8 (86)**
Contractor: **MCS Environmental, Inc.**	N./LAT: **196658** E./LONG: **127453**	Process Date: **2/8/06**
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**

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-SC48-0-1	100% (0-4)	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.	Sharp Contact	r
1	LDW-SC48-1-2		PCB SVOC Metals Hg	0	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).	@ 0.6' TV = 0.1 kg/cm2 GT @ 0.9' (R1)	
2	LDW-SC48-2-4		PCB SVOC Metals Hg	0		@ 1.5' TV = 0.1 kg/cm2 GT @ 2.0' (R1)	
3						@ 3.0' TV = 0.1 kg/cm2	lower alluvium
4	LDW-SC48-4-5.6	85% (4-6)		0	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 1/8" thick 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	Transitional Contact @ 4.7' TV = 0.4 kg/cm2	
5					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).		
6		66% (6-6.3) 0% (6.3-6.6)			End of core at 5.8'. Driven to refusal.	50% winnowing below 5.8'.	

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 (0.2'), easy (6.0'), hard (6.6'), refusal (6.7'). Two drive attempts made at station. Core catcher was 50% full. r = recent**

Calculated Recovery
Sample Length/Penetration Length:
5.8 / 6.7 = 86 %

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

Sediment Core Log

LDW-SC-49 (R1)

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**

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-SC49-0-1	62% (0-1)	PCB SVOC Metals Hg	1.1	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. @ 0.7' 3" thick layer of wet, soft, black, silty, WOOD FRAGMENTS (60%), shredded, natural	@ 0.7' TV = 0.6 kg/cm2 GT @ 0.9'	0
1	LDW-SC49-1-2	93% (1-8)	PCB SVOC Metals Hg		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.	Transitional Contact @ 1.5' TV = 0.6 kg/cm2 GT @ 1.9'	1
2	LDW-SC49-2-4		PCB SVOC Metals Hg	2.9			2
3					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.	@ 3.0' TV = 0.4 kg/cm2 Sharp Contact	3
4	LDW-SC49-4-6		PCB	3.1	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.	Sharp Contact @ 5.0' TV = 0.4 kg/cm2	4
5							5
6	LDW-SC49-6-		PCB				6
7						@ 7.0' TV = 0.6 kg/cm2	7

recent

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: none taken. One drive attempt made at station. Core shoe was 100% full.**

Calculated Recovery
Sample Length/Penetration Length:
11.4/14.0 = 81 %

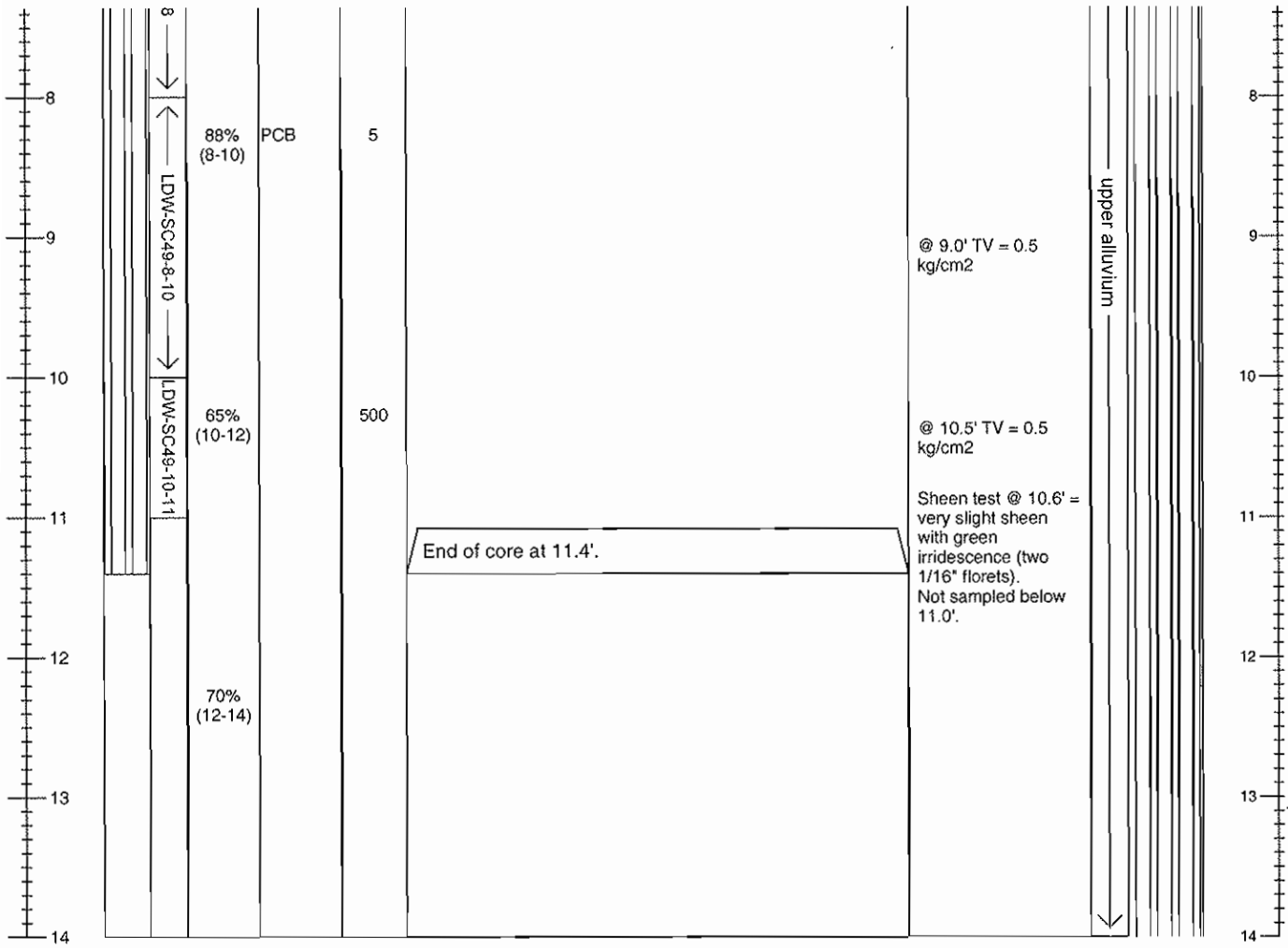
Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.

Sediment Core Log

LDW-SC-49 (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: **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**



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: none taken. One drive attempt made at station. Core shoe was 100% full.**

Calculated Recovery
Sample Length/Penetration Length:
11.4/14.0 = 81 %

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

Sediment Core Log

LDW-SC-50 (R3)

RETEC

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): **11.6**	Sample Quality: **Good**
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 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	LDW-SC50-0-1	75% (0-13)	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	0
1	LDW-SC50-1-2		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	1
2	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	2
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.	Sharp Contact @ 3.2' TV = 0.0 kg/cm2 Salinity collected at 2.0' intervals from 2.8' to 9.8'.	3
4	LDW-SC50-4-6			0			4
5							5
6				0			6

upper 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 (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 Log

LDW-SC-50 (R3)

Sheet 2 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): **11.6**	Sample Quality: **Good**
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 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
7	LDW-SC50-6.8			0			lower alluvium
8							
9	LDW-SC50-8.9.8				End of core at 9.8'.		
10							
11							
12							
13							

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 (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 Log

LDW-SC-51 (R1)

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	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-SC51-0-2	78% (0-1)	PCB SVOC Metals Hg	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.		recent
1					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.	Sheen Test = trace HC-like sheen GT @ 1.0' @ 1.1' TV = 0.8 kg/cm2	
2	LDW-SC51-2-3.8	69% (1-3)			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. Slight HC-like sheen associated with gravel and debris. Moderate HC-like odor.	Transitional Contact Sheen Test = moderate HC-like sheen Bag @ 2.0' (marble)	upper alluvium
3		85% (3-4)	PCB SVOC Metals Hg	0	@ 1.8' brick fragment @ 2.0' rock fragment (marble) 0.2' L @ 2.6' 2" thick layer of coarse SAND, few gravel @ 3.5' 1" thick layer of GRAVEL and moderate amounts of blue-metallic, flat, angular, sharp anthropogenic material.	@ 2.4' TV = 0.2 kg/cm2 GT @ 2.5' Sheen Test = trace HC-like sheen Bag @ 3.5' (anthropogenic)	
4	LDW-SC51-3.8-5.8		PCB	0	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.	Sharp Contact @ 4.5' TV = 0.2 kg/cm2	
5		34% (5-9)					

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 (1.4'), 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 %

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

Sediment Core Log

LDW-SC-51 (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: **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	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
					End of core at 6.1'. Driven to refusal.	Not sampled below 5.8' due to winnowing	lower alluvium
		44% (9-10.6)					

6 7 8 9 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 %**

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

Sediment Core Log

LDW-SC-52 (R3)

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: **4**	Penetration Depth (ft): **10.3**
Client: **LDWG**	Water Depth (ft): **5.8**	Sample Quality: **fair**
Collection Date: **2/7/06**	Mudline Elevation (ft): **1.3**	Recovery in ft (%): **5.9 (57)**
Contractor: **MCS Environmental, Inc.**	N./LAT: **194160** E./LONG: **1276279**	Process Date: **2/8/06**
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**

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-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.	Transitional Contact	0
1	LDW-SC52-1-2		PCB SVOC Metals Hg	0	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 @ 0.8' TV = 2.3 kg/cm2	1
2	LDW-SC52-2-4	71% (3-4)	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	2
3					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 @ 3.4' TV = 0.5 kg/cm2 GT @ 3.7'	3
4	LDW-SC52-4-4.9	57% (4-6)		0			4
5						End of sediment at 4.9'. One foot void (48% recovery)	5
6					End of core at 5.9'. Driven to refusal.		6

recent

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: 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 %

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

Sediment Core Log

LDW-SC-52 (R3)

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: **4**	Penetration Depth (ft): **10.3**
Client: **LDWG**	Water Depth (ft): **5.8**	Sample Quality: **fair**
Collection Date: **2/7/06**	Mudline Elevation (ft): **1.3**	Recovery in ft (%): **5.9 (57)**
Contractor: **MCS Environmental, Inc.**	N./LAT: **194160** E./LONG: **1276279**	Process Date: **2/8/06**
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**

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		64% (6-7)					6
7		46% (7-9)					lower alluvium; 7
8							8
9		31% (9-10.3)					9
10							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: 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 %

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

Sediment Core Log

LDW-SC-53 (R1)

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**

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-SC53-0-2	64% (0-2)	PCB SVOC Metals Hg Pesticides	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.	Transitional Contact	0
1					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.	GT @ 1.0' @ 1.0' TV = 1.0 kg/cm2	1
2	LDW-SC53-2-4	95% (2-4)	PCB SVOC Metals Hg Pesticides	0		Sheen Test @ 2.0' = no sheen	2
3						@ 1.0' TV = 1.2 kg/cm2 GT @ 3.0'	3
4	LDW-SC53-4-6	79% (4-6)		0		@ 4.2' TV = 1.5 kg/cm2	4
5					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	Transitional Contact @ 5.2' TV = 1.0 kg/cm2	5
6	LDW-	85% (6-8)		0	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.	Transitional Contact	6
					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.	Top of unit has angled contact from 6.3' to 7.0'	

recent

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: none taken. One drive attempt made at station. Core catcher was 100% full.**

Calculated Recovery
Sample Length/Penetration Length:
11.1/13.6 = 82 %

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

Sediment Core Log

LDW-SC-53 (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: **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**

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
	SC53-8-8					@ 7.0' TV = 1.4 kg/cm2	upper alluvium
8		82% (8-9)		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.	@ 8.2' TV = 0.5 kg/cm2	
9	LDW-SC53-8-10	80% (9-10)			ML: (10.6-11.1) moist, medium stiff, dark brown (7.5YR, 3/2) SILT, few sand.	Transitional Contact	
10		100% (10-11)			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.	@ 9.5' TV = 0.8 kg/cm2	
11		83% (11-13.6)			End of core at 11.1'.	@ 10.4' TV = 0.5 kg/cm2	lower alluvium
12							
13							

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: none taken. One drive attempt made at station. Core catcher was 100% full.**

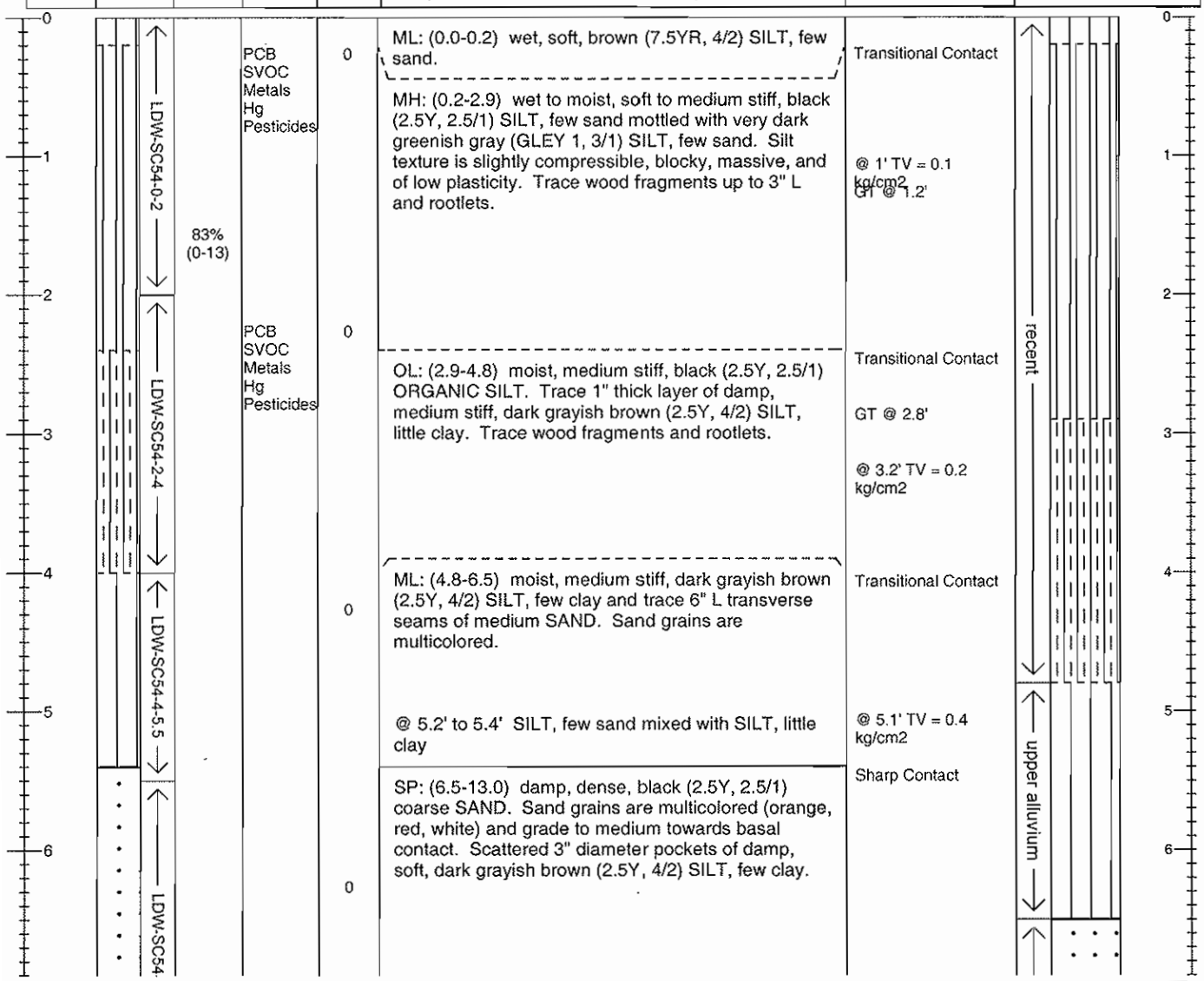
Calculated Recovery
Sample Length/Penetration Length:
11.1/ 13.6 = 82 %

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

Sediment Core Log

LDW-SC-54 (R3)

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): **9.4**	Sample Quality: **Good**
Collection Date: **2/23/06**	Mudline Elevation (ft): **-0.2**	Recovery in ft (%): **10.2 (78)**
Contractor: **MSS**	N./LAT: **192179** E./LONG: **1276342**	Process Date: **2/23/06**
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, N.Bacher**



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 %

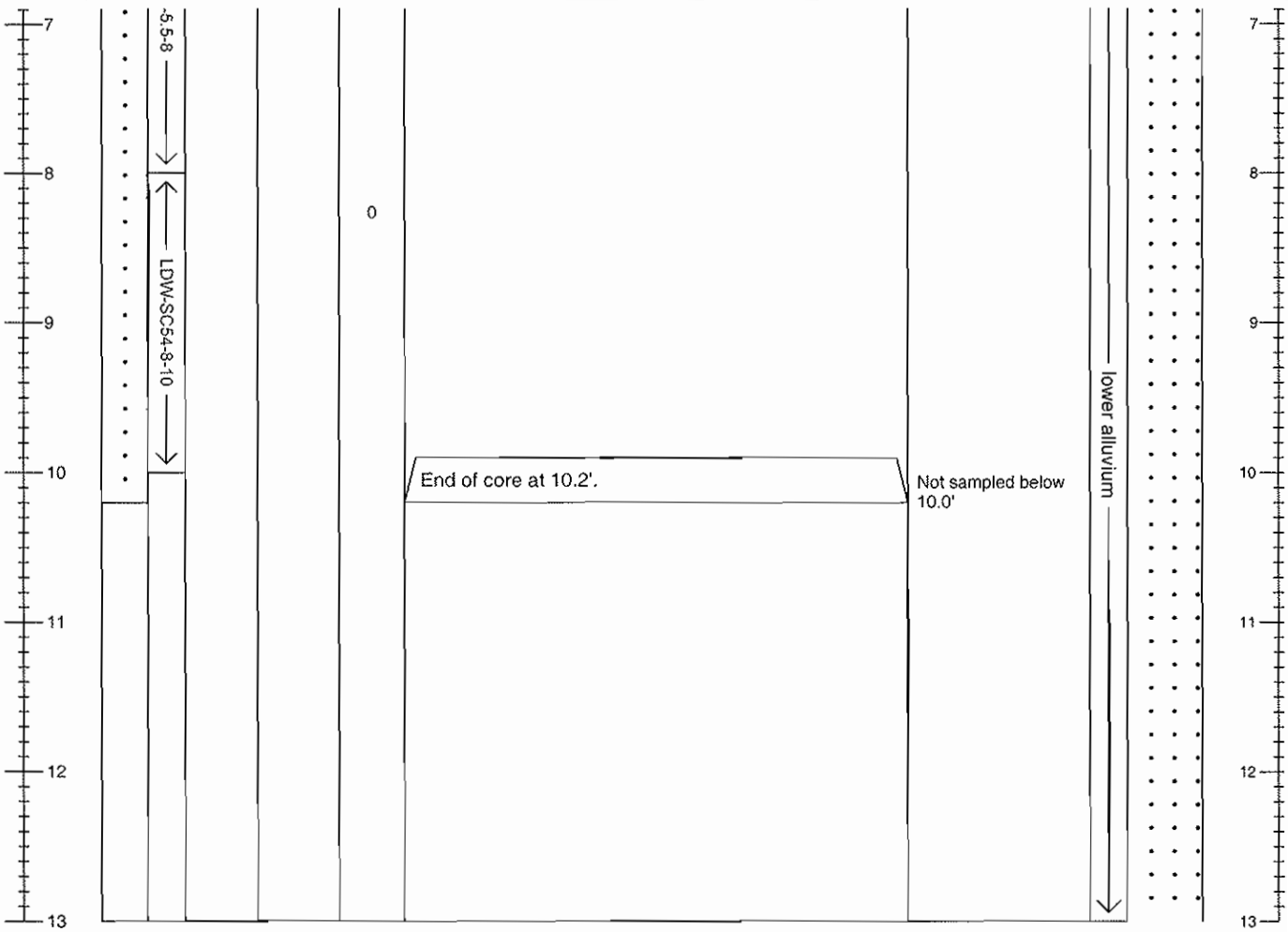
Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.

Sediment Core Log

LDW-SC-54 (R3)

Sheet 2 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): **9.4**	Sample Quality: **Good**
Collection Date: **2/23/06**	Mudline Elevation (ft): **-0.2**	Recovery in ft (%): **10.2 (78)**
Contractor: **MSS**	N./LAT: **192179** E./LONG: **1276342**	Process Date: **2/23/06**
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, N.Bacher**



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 %

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

Sediment Core Log

LDW-SC-55 (R1)

Project: **LDW RI/FS**	Water Body Type: **Lower Duwamish Waterway**	Tube Length (ft): **16.1**
Project #: **PORS5-18220-511**	Water Elevation (ft)/Tide: **10.4**	Penetration Depth (ft): **11.3**
Client: **LDWG**	Water Depth (ft): **8.5**	Sample Quality: **NA**
Collection Date: **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 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	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					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	
	LDW-SC55-1-2	72% (1-3)	PCB SVOC Metals Hg	0	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					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 alluvium
	LDW-SC55-2-3		PCB SVOC Metals Hg	0	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	
3	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, 10BG) SILT. Trace wood fragments and rootlets.	Sharp Contact @ 3.3' TV = 1.2 kg/cm2	
4				0	@ 4.6' grades to medium sand	@ 4.3' TV = 1.0 kg/cm2	
	LDW-SC55-4-6				@ 4.9' abundant wood fragments to 5.6' (75%)	GT @ 4.8'	
5					@ 5.6' grades to fine sand		
6		45% (6-8)			End of core at 6.2'. Driven to refusal.	@ 5.7' TV = 0.8 kg/cm2 Slightly winnowed below 6.0'	

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 (11.3). Three drive attempts made at station. Abundant logs/wood observed in vicinity. Wood found in core catcher.**

Calculated Recovery
Sample Length/Penetration Length:
6.2 / 11.3 = 55 %

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

Sediment Core Log

LDW-SC-55 (R1)

Project: **LDW RI/FS**	Water Body Type: **Lower Duwamish Waterway**	Tube Length (ft): **16.1**
Project #: **PORS5-18220-511**	Water Elevation (ft)/Tide: **10.4**	Penetration Depth (ft): **11.3**
Client: **LDWG**	Water Depth (ft): **8.5**	Sample Quality: **NA**
Collection Date: **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 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	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							lower alluvium
8		50% (8-10)					
9							
10		50% (10-11.3)					
11							

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 (11.3). Three drive attempts made at station. Abundant logs/wood observed in vicinity. Wood found in core catcher.**

Calculated Recovery
Sample Length/Penetration Length:
6.2 / 11.3 = 55 %

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

STATION: 4

REPLICATE: 1

Field Log by: Sandy Browning	Processing by:	Coring by: USACE
Tide Level from MLLW: Depth to Mudline: Mudline Elev.:	Date: 9/6/96 Time: 1055	Total Drive Length: Recovered Length: ≈8 FT Recovery Efficiency:

Note: All elevations, depths, and distances in feet.

Core Description - Core Tube Lengths

Tube Length	Sample No.	Visual Description
1		sand
2	chip	sand
3		black, cohesive clayey silt
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

In-Situ Summary Log

Interpreted Summary	Sample No.	Acquisition Notes
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Core Tube Field Cut Information

Sample No.	Tube Length Interval	Segment Length
31		0-4

Sample Test Information

Sample No./Tests	In-Situ Depth Int.
PSDDA/VOAs	

Notes:

000007

Striplin Environmental Associates, Inc.

Core Description and Sample Information

STATION: 4
REPLICATE: 2

Field Log by: Sandy Browning	Processing by:	Coring by: USACE
Tide Level from MLLW:	Date: 9/6/96	Total Drive Length:
Depth to Mudline:	Time: 1105	Recovered Length: 9 FT
Mudline Elev.:		Recovery Efficiency:

Note: All elevations, depths, and distances in feet.

Core Description - Core Tube Lengths

Tube Length	Sample No.	Visual Description
1		Oxidized surface
2		Black cohesive
3		clayey silt
4		with thin alternating
5		bands of fine to
6		med. sand
7		
8		
9		
10		
11		
12		
13		
14		
15		

In-Situ Summary Log

Interpreted Summary	Sample No.	Acquisition Notes
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Core Tube Field Cut Information

Sample No.	Tube Length Interval	Segment Length
51		0-4

Sample Test Information

Sample No./Tests	In-Situ Depth Int.
PSDDA	

Notes:

000008

STATION: 4
REPLICATE: 3

Field Log by: Sandy Browning	Processing by:	Coring by: USACE
Tide Level from MLLW: Depth to Mudline: Mudline Elev.:	Date: 9/6/96 Time: 1130	Total Drive Length: Recovered Length: 9 FT Recovery Efficiency:

Note: All elevations, depths, and distances in feet.

Core Description - Core Tube Lengths

Tube Length	Sample No.	Visual Description
1		Black, moist silt
2		
3		fine - med. sand
4		Black silt w/ clay (very cohesive) alternating w/ thin sand layers
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

In-Situ Summary Log

Interpreted Summary	Sample No.	Acquisition Notes
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Core Tube Field Cut Information

Sample No.	Tube Length Interval	Segment Length
S1		0-4

Sample Test Information

Sample No./Tests	In-Situ Depth Int.
PSDDA/sulfides	

Notes:

000003

Striplin Environmental Associates, Inc.

Core Description and Sample Information

STATION: 2
REPLICATE:

Field Log by: SB	Processing by: SD, DT	Coring by: Puget
Tide Level from MLLW:	Date: 5 oct 98	Total Drive Length:
Depth to Mudline:	Time: 1000 - 1205	Recovered Length:
Mudline Elev.:		Recovery Efficiency:

Note: All elevations, depths, and distances in feet.

Core Description - Core Tube Lengths

Tube Length	Sample No.	1	2 Visual Description	3
1		uniform DK gray to black Silt w/ Clay — mod. sulfides odor	*DK gray to black clayey silt	DK gray to black clayey silt
2				
3				
4			thin layers >1C riverine org.	
5			Dense, Cohesive Clay+Silt	Dense, cohesive Clay+silt
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				

#1 → 6
#2 → 8
#3 → 9

In-Situ Summary Log

	Interpreted Summary	Sample No.	Acquisition Notes
1	* soft shell clam		
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			

Bioassay — 4.5 l
TBT — 3 l
No composite archive

Core Tube Field Cut Information

Sample No.	Tube Length Interval	Segment Length

Sample Test Information

Sample No./Tests	In-Situ Depth Int.

Notes:

Core #2 Sulfides
& #3 VOAs

Vibracore driven 15' to retain 6-8' of sediment.
4 bad cores

Striplin Environmental Associates, Inc.

Core Description and Sample Information

STATION: 3

REPLICATE:

Field Log by: SB	Processing by: SB/TS	Coring by: Purser [?]
Tide Level from MLLW:	Date: 10.5.98	Total Drive Length:
Depth to Mudline:	Time: 1230 – 13	Recovered Length:
Mudline Elev.:		Recovery Efficiency:

Note: All elevations, depths, and distances in feet.

Core Description - Core Tube Lengths

Tube Length	Sample No.	1	2 (Visual Description)	3
1		DK gray silt w/ clay	DK gray to Black silt w/ clay	DK gray to black silt w/ clay
2				
3				
4			~~SAND w/ Sheen~~ ☆	
5		F. grained sand w/ silt ☆	Black clayey silt	F. grained sand
6		Dense clayey silt		Black clayey silt
7				
8				
9		F. grained sand	SAND	F. grained sand
10				
11				
12				
13				
14				
15				
16				
17				
18				

In-Situ Summary Log

	Interpreted Summary	Sample No.	Acquisition Notes
1			
2			
3			
4			
5	(☆) mod. sulfides odor in sand		
6	(☆) oily sheen 3'5"–3'9"		
7			
8			
9			
10	TBT – 3 liters		
11	Bioassay – 5 liters		
12			
13			
14			
15			
16			
17			
18			

Core Tube Field Cut Information

Sample No.	Tube Length Interval	Segment Length

Sample Test Information

Sample No./Tests	In-Situ Depth Int.

Notes:

Core #1 Sulfides

" #2 VOAs

Striplin Environmental Associates, Inc.

Core Description and Sample Information

STATION: CO

REPLICATE:

Field Log by: TS	Processing by: TS/FP	Coring by: Puget
Tide Level from MLLW: Depth to Mudline: Mudline Elev.:	Date: 6 Oct 98 Time:	Total Drive Length: Recovered Length: Recovery Efficiency:

Note: All elevations, depths, and distances in feet.

Core Description - Core Tube Lengths

Tube Length	Sample No.	1	Visual Description 2	3
1		dark gray silty clay	sand	sand
2				
3		sandy		
4				
5				
#1 → 6			sandy ↓	sandy
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				

In-Situ Summary Log

	Interpreted Summary	Sample No.	Acquisition Notes
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			

Core Tube Field Cut Information

Sample No.	Tube Length Interval	Segment Length

Sample Test Information

Sample No./Tests	In-Situ Depth Int.

Notes:

Striplin Environmental Associates, Inc.

Core Description and Sample Information

STATION: 7

REPLICATE:

Field Log by: TS	Processing by: TS/TP	Coring by: Puget
Tide Level from MLLW:	Date: 0850	Total Drive Length: 0
Depth to Mudline:	Time: 6 Oct 98	Recovered Length:
Mudline Elev.:		Recovery Efficiency:

Note: All elevations, depths, and distances in feet.

Core Description - Core Tube Lengths

Tube Length	Sample No.	1	2	3
		Visual Description		
1		dark gray Sandy silt	Sample	
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				

In-Situ Summary Log

	Interpreted Summary	Sample No.	Acquisition Notes
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			

Core Tube Field Cut Information

Sample No.	Tube Length Interval	Segment Length

Sample Test Information

Sample No./Tests	In-Situ Depth Int.

Notes:

voa / sulfide from #1

Striplin Environmental Associates, Inc. **Core Description and Sample Information**

PROJECT: DR FY2006

STATION: 7 REPLICATE: 1

Field Log by: TS	Processing by: TS / PS	Coring by: Puget
Tide Level from MLLW:	Date: 23 Aug 99	Total Drive Length:
Depth to Mudline:	Time: 850	Recovered Length:
Mudline Elev.:		Recovery Efficiency:

Core Description - Core Tube Lengths (ft)

Tube Length	Sample No.	Visual Description
		black, stiff silt/clay
1		
2		dark gray clay
3		black, organic clay/silt
4		
5		
6		
7		
8		
9		

In-Situ Summary Log

Interpreted Summary	Sample No.	Acquisition Notes
1		
2		
3		
4		
5		
6		
7		
8		
9		

Core Tube Field Cut Information

Sample No.	Tube Length Interval	Segment Length

Sample Test Information

Sample No./Tests	In-Situ Depth Int.

Notes:

took sulfides + VOAs

Striplin Environmental Associates, Inc. **Core Description and Sample Information**

PROJECT: DR FY2000

STATION: 5 REPLICATE: 1

Field Log by: FS	Processing by: TS/PS	Coring by: Purgatory
Tide Level from MLLW:	Date: 23 Aug 99	Total Drive Length:
Depth to Mudline:	Time: 1040	Recovered Length:
Mudline Elev.:		Recovery Efficiency:

Core Description - Core Tube Lengths (ft)

Tube Length	Sample No.	Visual Description
		black clay/silt
1		
2		dark gray v. fine sandy/clay
		black clay/silt
3		organic black clay/silt
4		
5		
6		
7		
8		
9		

In-Situ Summary Log

Interpreted Summary	Sample No.	Acquisition Notes
1		
2		
3		
4		
5		
6		
7		
8		
9		

Core Tube Field Cut Information

Sample No.	Tube Length Interval	Segment Length

Sample Test Information

Sample No./Tests	In-Situ Depth Int.

Notes:

Striplin Environmental Associates, Inc. **Core Description and Sample Information**

PROJECT: DRFV 2000

STATION: C0 REPLICATE: 1

Field Log by: TS	Processing by: TS/BS	Coring by: Pinnacle
Tide Level from MLLW:	Date: 23 Aug 99	Total Drive Length:
Depth to Mudline:	Time: 1100	Recovered Length:
Mudline Elev.:		Recovery Efficiency:

Core Description - Core Tube Lengths (ft)

Tube Length	Sample No.	Visual Description
		dark gray clay/silt
1		
		black organic clay/silt
2		
		black silt/clay
3		
		organic, soft black clay/silt
4		
5		
6		
7		
8		
9		

In-Situ Summary Log

Interpreted Summary	Sample No.	Acquisition Notes
1		
2		
3		
4		
5		
6		
7		
8		
9		

Core Tube Field Cut Information

Sample No.	Tube Length Interval	Segment Length

Sample Test Information

Sample No./Tests	In-Situ Depth Int.

Notes:

took sulfides + VOAs

Striplin Environmental Associates, Inc. **Core Description and Sample Information**

PROJECT: DR FY2000

STATION: 12 REPLICATE: 1

Field Log by: TS	Processing by: TS/BS	Coring by: Purgatory
Tide Level from MLLW:	Date: 23 Aug 99	Total Drive Length:
Depth to Mudline:	Time: 1500	Recovered Length:
Mudline Elev.:		Recovery Efficiency:

Core Description - Core Tube Lengths (ft)

Tube Length	Sample No.	Visual Description
		dark gray/olive
		v fine sand/silt
1		
2		
		black organic
		clay/silt
3		
4		
5		
6		
7		
8		
9		

In-Situ Summary Log

Interpreted Summary	Sample No.	Acquisition Notes
1		
2		
3		
4		
5		
6		
7		
8		
9		

Core Tube Field Cut Information

Sample No.	Tube Length Interval	Segment Length

Sample Test Information

Sample No./Tests	In-Situ Depth Int.

Notes:

took sulfides + VOAs

Striplin Environmental Associates, Inc. **Core Description and Sample Information**

PROJECT: DR FY2000

STATION: 13 REPLICATE: 1

Field Log by: TS	Processing by: TS / LR	Coring by: Puget
Tide Level from MLLW:	Date: 25 Aug 99	Total Drive Length:
Depth to Mudline:	Time: 0800	Recovered Length:
Mudline Elev.:		Recovery Efficiency:

Core Description - Core Tube Lengths (ft)

Tube Length	Sample No.	Visual Description
		dark gray fine sand/silt
		organic debris
1		
2		dark gray clay/silt
3		
4		
5		
6		
7		
8		
9		

In-Situ Summary Log

Interpreted Summary	Sample No.	Acquisition Notes
1		
2		
3		
4		
5		
6		
7		
8		
9		

Core Tube Field Cut Information

Sample No.	Tube Length Interval	Segment Length

Sample Test Information

Sample No./Tests	In-Situ Depth Int.

Notes:

Striplin Environmental Associates, Inc. **Core Description and Sample Information**

PROJECT: OR FY2000

STATION: 14 REPLICATE: 1

Field Log by: TC	Processing by: TS/GR	Coring by: Puget
Tide Level from MLLW:	Date: 25 Aug 99	Total Drive Length:
Depth to Mudline:	Time: 0810	Recovered Length:
Mudline Elev.:		Recovery Efficiency:

Core Description - Core Tube Lengths (ft)

Tube Length	Sample No.	Visual Description
		dark gray-black clay/silt
1		
2		
3		
4		black med sand
5		black organic clay/silt
6		gray silt/clay
		black silt/clay
7		
8		
9		

In-Situ Summary Log

Interpreted Summary	Sample No.	Acquisition Notes
1		
2		
3		
4		
5		
6		
7		
8		
9		

Core Tube Field Cut Information

Sample No.	Tube Length Interval	Segment Length

Sample Test Information

Sample No./Tests	In-Situ Depth Int.

Notes:

Striplin Environmental Associates, Inc. **Core Description and Sample Information**

PROJECT: DR FY 2000

STATION: 16 REPLICATE: 1

Field Log by: TS	Processing by: TS/GR	Coring by: Puget
Tide Level from MLLW:	Date: 25 Aug 99	Total Drive Length:
Depth to Mudline:	Time: 835	Recovered Length:
Mudline Elev.:		Recovery Efficiency:

Core Description - Core Tube Lengths (ft)

Tube Length	Sample No.	Visual Description
		dark gray-olive fine sand/silt
1		
		black clay/silt
2		
3		black organic clay/silt
4		
5		
6		
7		
8		
9		

In-Situ Summary Log

Interpreted Summary	Sample No.	Acquisition Notes
1		
2		
3		
4		
5		
6		
7		
8		
9		

Core Tube Field Cut Information

Sample No.	Tube Length Interval	Segment Length

Sample Test Information

Sample No./Tests	In-Situ Depth Int.

Notes:

Striplin Environmental Associates, Inc. **Core Description and Sample Information**

PROJECT: DR FY2000

STATION: 17 REPLICATE: 1

Field Log by: TS	Processing by: TS/GR	Coring by: Puget
Tide Level from MLLW:	Date: 25 Aug 99	Total Drive Length:
Depth to Mudline:	Time: 933	Recovered Length:
Mudline Elev.:		Recovery Efficiency:

Core Description - Core Tube Lengths (ft)

Tube Length	Sample No.	Visual Description
		dark gray silt/clay
1		
		black organic clay/silt
2		
3		
4		
5		
6		
7		
8		
9		

In-Situ Summary Log

Interpreted Summary	Sample No.	Acquisition Notes
1		
2		
3		
4		
5		
6		
7		
8		
9		

Core Tube Field Cut Information

Sample No.	Tube Length Interval	Segment Length

Sample Test Information

Sample No./Tests	In-Situ Depth Int.

Notes:

Striplin Environmental Associates, Inc. **Core Description and Sample Information**

PROJECT: DR FY2000

STATION: 18 REPLICATE: 1

Field Log by: TS	Processing by: TS/GR	Coring by: Puget
Tide Level from MLLW:	Date: 25 Aug 99	Total Drive Length:
Depth to Mudline:	Time: 940	Recovered Length:
Mudline Elev.:		Recovery Efficiency:

Core Description - Core Tube Lengths (ft)

Tube Length	Sample No.	Visual Description
		dark gray - black silt/clay
1		
2		black organic clay/silt
3		
4		dark gray - black stiff silt/clay
5		
6		black fine-med sand
7		
8		
9		

In-Situ Summary Log

Interpreted Summary	Sample No.	Acquisition Notes
1		
2		
3		
4		
5		
6		
7		
8		
9		

Core Tube Field Cut Information

Sample No.	Tube Length Interval	Segment Length

Sample Test Information

Sample No./Tests	In-Situ Depth Int.

Notes:

took sulfides & VOAs for both SC & BP

PROJECT NAME : SEATTLE CITY LIGHT-DUWAMISH
PROJECT NO. : 86-140-04
PROBE : CPT-D77-01
INSTRUMENT NO. : F15CKE084
DATE : 09/25/85

DEPTH FT	CONE TSF	FRICTION TSF	FRIC RATIO	SOIL BEHAVIOR TYPES	EQUIV RELATIVE DENSITY	EQUIV FRIC ANGLE	EQUIV N1	EQUIV N1'
1.0	0.0	0.00	0.03	SILTY CLAY TO CLAY	UNDEF	UNDEF	1-2	1-5
2.0	75.5	0.27	0.37	SAND TO SILTY SAND	40-50	40-42	25-30	20-25
3.0	76.3	0.30	0.41	SAND TO SILTY SAND	40-50	40-42	30-35	20-25
4.0	46.1	0.21	0.46	SAND TO SILTY SAND	30-40	35-40	15-20	15-20
5.0	27.9	0.21	0.77	SAND TO SILTY SAND	30-40	35-40	7-10	10-15
6.0	12.0	0.15	1.78	CLAYEY SILT-SILTY CLAY	30-40	27-31	3-5	10-15
7.0	19.8	0.10	0.76	SILTY SAND-SANDY SILT	20-30	31-35	5-7	5-10
8.0	54.0	0.21	0.38	SAND TO SILTY SAND	30-40	35-40	12-15	10-15
9.0	62.2	0.29	0.46	SAND TO SILTY SAND	30-40	40-42	15-20	15-20
10.0	51.9	0.26	0.49	SAND TO SILTY SAND	30-40	35-40	12-15	10-15
11.0	35.5	0.17	0.48	SAND TO SILTY SAND	20-30	35-40	7-10	10-15
12.0	26.7	0.13	0.50	SAND TO SILTY SAND	20-30	31-35	5-7	5-10
13.0	22.6	0.13	0.57	SILTY SAND-SANDY SILT	20-30	31-35	3-5	5-10
14.0	22.6	0.13	0.59	SILTY SAND-SANDY SILT	20-30	31-35	3-5	5-10
15.0	28.9	0.15	0.54	SAND TO SILTY SAND	20-30	35-40	5-7	5-10
16.0	23.5	0.20	0.81	SILTY SAND-SANDY SILT	20-30	31-35	5-7	10-15
17.0	22.2	0.20	0.89	SILTY SAND-SANDY SILT	20-30	31-35	3-5	5-10
18.0	46.7	0.33	0.73	SAND TO SILTY SAND	30-40	35-40	10-12	15-20
19.0	53.6	0.45	0.81	SAND TO SILTY SAND	30-40	35-40	15-20	15-20
20.0	98.4	0.45	0.45	SAND TO SILTY SAND	40-50	40-42	25-30	15-20
21.0	102.2	0.45	0.44	SAND TO SILTY SAND	40-50	40-42	25-30	15-20
22.0	70.8	0.28	0.38	SAND TO SILTY SAND	30-40	35-40	12-15	10-15
23.0	43.0	0.25	0.56	SAND TO SILTY SAND	20-30	35-40	7-10	10-15
24.0	48.0	0.16	0.38	SAND TO SILTY SAND	20-30	35-40	7-10	5-10
25.0	68.0	0.21	0.33	SAND TO SILTY SAND	30-40	35-40	12-15	10-15
26.0	42.5	0.21	0.54	SAND TO SILTY SAND	20-30	35-40	7-10	10-15
27.0	60.2	0.18	0.29	SAND TO SILTY SAND	30-40	35-40	10-12	5-10
28.0	83.4	0.27	0.32	SAND TO SILTY SAND	30-40	40-42	15-20	10-15
29.0	43.6	0.29	0.67	SAND TO SILTY SAND	20-30	35-40	7-10	10-15
30.0	155.4	0.34	0.23	GRAVELLY SAND TO SAND	40-50	40-42	35-40	20-25

FIGURE 2B

Boring No. B-1

Logged by: KPR

Date: 3/22/99

Approximate Elev.

Soil Description	Consistency/ Relative Density.	Depth (ft.)	Sample	(N) Blows/ ft.	Moisture Content (%)	Notes
FILL; Brown silty, fine to medium sand, moist. (Cuttings: SM)						
FILL; Brown fine to medium sand, moist. (SP)	Loose to Medium Dense			10	6.1	Boulder at 4.5 feet.
FILL; Dark brown mottled, silty, fine to medium sand, moist. (SM)	Loose	5		6	14.4	
Dark gray medium SAND with silt, water-bearing. (SP-SM)	Loose	10		8	22.9	
Dark gray medium SAND, water-bearing. (SP)	Medium Dense	15		13	26.9	Augers sinking into ground under own weight.
No recovery.	Medium Dense	20		12		Drilled to 20 feet. 4.5 feet of sand heave into auguer. Heave flushed out of hole. Drilling with column of water.
Dark gray to black, fine to medium SAND, water-bearing. (SP)	Dense	25		30	24.2	
Black fine to medium SAND with silt, 3-inch layer of sandy silt at 31 feet, water-bearing. (SP-SM)	Medium Dense	30		17	31.4	
Black fine to medium SAND with silt, water-bearing. (SP-SM)	Loose to Medium Dense	35		10	27.4	
	Medium Dense	40		26	28.4	

Boring terminated at 41.5 feet.
Groundwater encountered at 8.5 feet.

TERRA ASSOCIATES
Geotechnical Consultants

BORING LOG
OFFICE/WAREHOUSE FACILITY
SEATTLE, WASHINGTON

Proj. No. T-4343 | Date APR 1999 | Figure A-2

Boring No. B-2

Logged by: KPR

Date: 3/23/99

Approximate Elev.

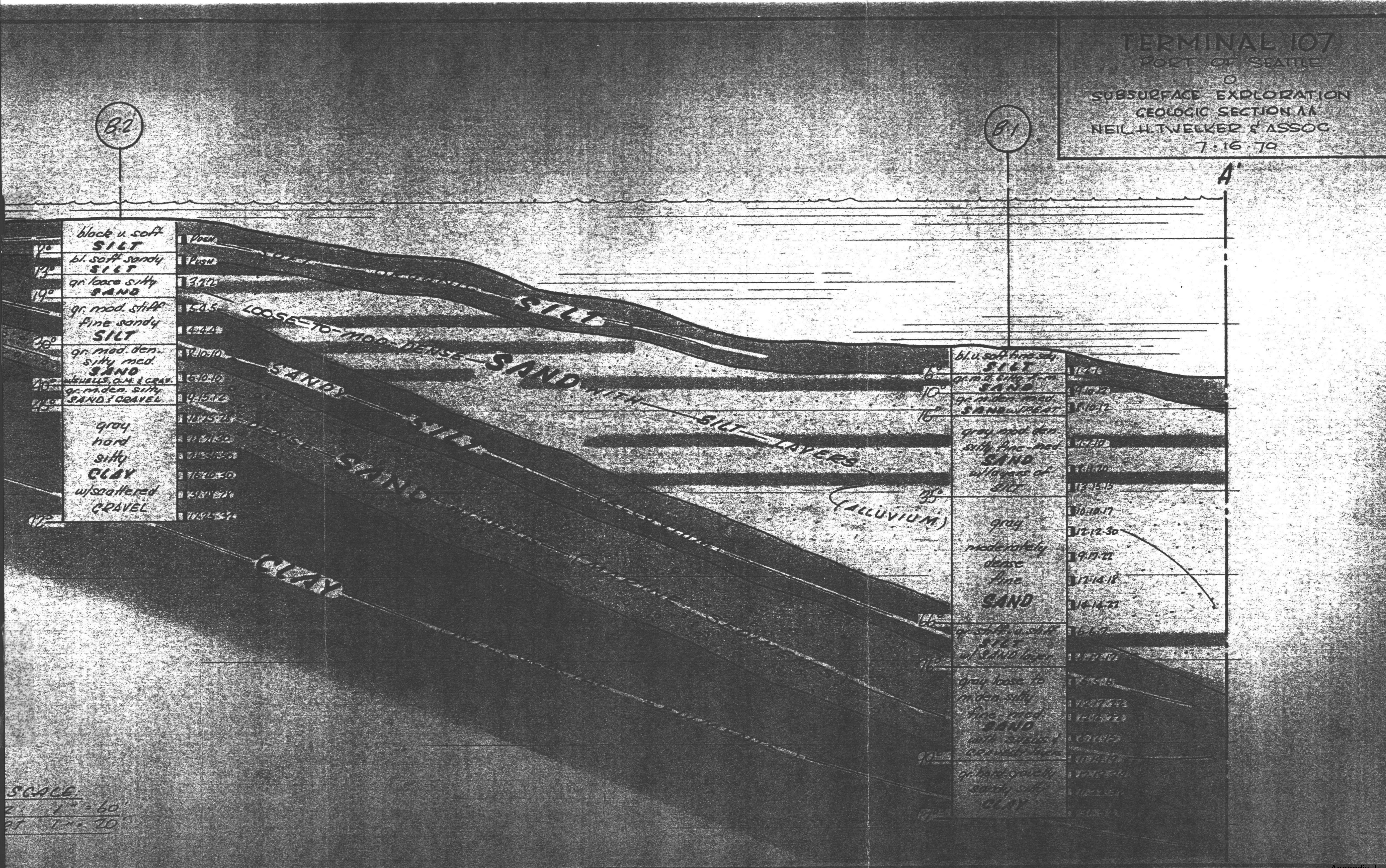
Soil Description	Consistency/ Relative Density	Depth (ft.)	Sample	(N) Blows/ ft.	Moisture Content (%)	Notes
FILL; Brown sandy silt with some gravel, moist. (Cuttings: ML)						
FILL; Dark brown-gray, fine to medium SAND with silt, moist. (SP-SM)	Medium Dense			11	15.0	
No recovery. Rock in sampler shoe.	Loose	5		7		
Dark gray-brown, medium SAND, water-bearing. (SP)	Loose	10 ▼		9	26.2	Two feet of water shown on sampler and rods. Water added to hole to control heave.
Black medium SAND, water-bearing. (SP)	Medium Dense	15		18	26.4	
Black, fine to medium SAND, water-bearing. (SP)		20		16	29.1	
As above. (SP)	Medium Dense	25		18	28.0	
Black, sandy SILT, very fine to fine sand, saturated, non-plastic. (ML)	Loose	30		7	36.7	
Black, fine to medium SAND with silt, water-bearing. (SP-SM)	Medium Dense	35		21	29.5	
Black, fine to medium SAND, water-bearing. (SP)	Medium Dense	40		26	29.5	

Boring terminated at 41.5 feet.
Groundwater encountered at 9.5 feet.

TERRA ASSOCIATES
Geotechnical Consultants

BORING LOG
OFFICE/WAREHOUSE FACILITY
SEATTLE, WASHINGTON

Proj. No. T-4343 | Date APR 1999 | Figure A-3


TERMINAL 107
PORT OF SEATTLE
SUBSURFACE EXPLORATION
GEOLOGIC SECTION AA'
NEIL H. TWELKER & ASSOC.
7·16·70
B-2
B-1
A'
black v. soft SILT
bl. soft sandy SILT
gr. loose silty SAND
gr. mod. stiff fine sandy SILT
gr. mod. den. silty med. SAND
gr. m. den. silty SAND & GRAVEL
gray hard silty CLAY w/scattered GRAVEL
SILT
LOOSE-TO-MOD-DENSE SAND WITH SILT LAYERS
SAND
(ALLUVIUM)
CLAY
bl. v. soft SILT
gray mod. den. silty fine-med SAND w/layers of SILT
gray moderately dense fine SAND
gray loose to m. den. silty fine-med SAND
SCALE

LOG OF BORING NO. 1

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED ARE A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

STANDARD PENETRATION
▲ BLOWS PER FOOT**

ELEVATION	DEPTH IN FEET	SAMPLE*	SYMBOL		DRY DENSITY LB./CU.FT.	BLOW COUNTS/ 140LB. HAMME 30" DROP
16±				BROWN SAND AND GRAVEL WITH DEBRIS - FILL.		
11	5	1-A		BROWN SILTY FINE SAND TO SANDY FINE SILT, WITH SOME ORGANICS, TRACE COARSE SAND, AND FINE GRAVEL - LOOSE, WET.		3 3 4
6	10	2-A		BROWNISH-GRAY FINE TO MEDIUM SAND WITH LITTLE SILT - LOOSE TO MEDIUM COMPACT, WET.		3 5 9
1	15	3-A		SLIGHTLY SILTIER.		5 4 7
-4	20	4-A		GRADES DARK GRAY WITH TRACE SILT-MEDIUM COMPACT. TRACE OF FINE GRAVEL.		7 13 12
-9	25	5-A				8 12 12
-14	30	6-A		DECAYED WOOD CHIPS AND TRACE ORGANIC MATERIAL.		7 11 12
				FINE TO MEDIUM ROUNDED GRAVEL IN MATRIX OF GREEN SILT.		
-19	35	7-A		DARK GRAY FINE TO MEDIUM SAND, TRACE OF SILT-COMPACT.		9 15 17
-24	40	8-A		CONTAINS OCCASIONAL THIN SILTY VERY FINE SAND LAYERS-VERY COMPACT.		25 35 49
-29	45	9-A		DARK GRAY FINE TO MEDIUM SAND WITH THIN 1/4" LAYERS OF BROWN SILT-COMPACT.		10 14 18
-34	50	10-A				19 20 24
-39	55	11-A		DARK GRAY FINE SAND WITH SOME SILT, TRACE FINE GRAVEL AND ORGANICS-COMPACT.		13 16 15
-44	60	12-A		WITH WOOD CHIPS.		13 23 25
-49	65	13-A		GRADES FINER TO VERY FINE TO FINE.		12 14 16
-54	70	14-A		OCCASIONAL BROWN SILT LAYERS TO 3/4" THICK.		11 16 18
-59	75	15-A		DARK GRAY VERY FINE TO FINE SILTY SAND WITH BROWN SILT LAYERS TO 2" THICK-LOOSE, WET.		8 8 9
-64	80	20-A		DARK GRAY FINE SAND WITH TRACE OF SILT AND FINE GRAVEL - OCCASIONAL THIN (1/2") BROWN SILT LAYERS - COMPACT.		13 15 16
				BOTTOM OF BORING AT 81.5'.		

0 50 100

0 25 50

WATER CONTENT - % dry weight

plastic limit — liquid limit

natural water content

PROPOSED WAREHOUSE FACILITIES
Seattle, Washington
for C.D. Stimson Company

ConverseWardDavisDixon Geotechnical Consultants

Project No.
79-5154

Drawing No.
A-1

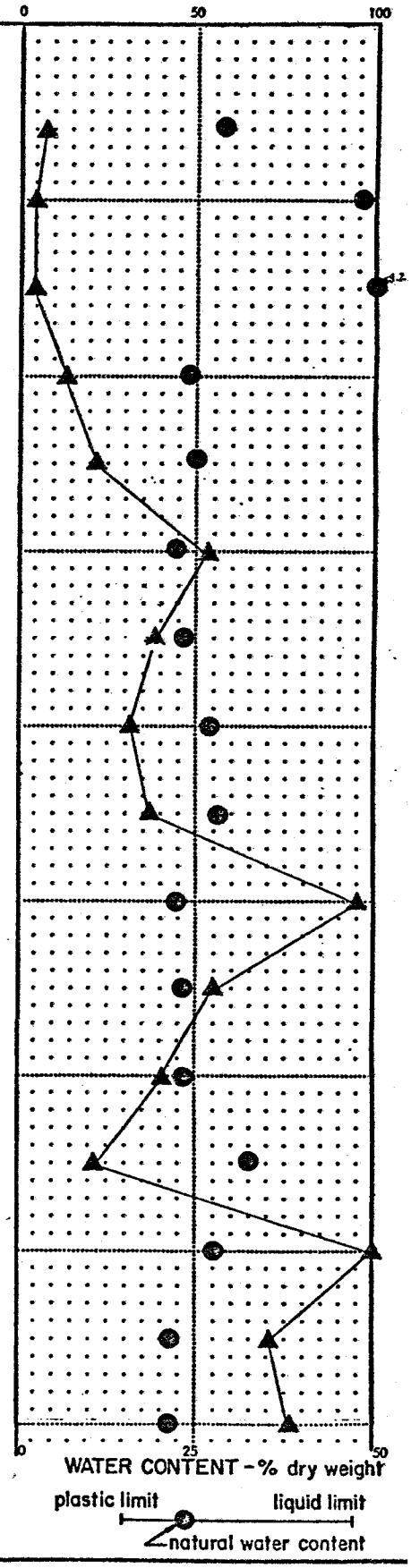
DATE DRILLED: 11/10/79

LOG OF BORING NO. 3

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED ARE A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

STANDARD PENETRATION ▲ BLOWS PER FOOT**

ELEVATION	DEPTH IN FEET	SAMPLE*	SYMBOL		DRY DENSITY LB./CU.FT.	BLOW COUNTS/6 140LB. HAMMER 30" DROP
15±				CONCRETE FRAGMENTS, WOOD DEBRIS, SOME GRAVEL - UNSORTED FILL.		
10	5	1-A		BROWNISH-GRAY VERY FINE TO FINE SANDY SILT AND SILT WITH TRACE FINE GRAVEL AND COARSE SAND, TRACE ORGANICS - MOIST, SOFT.		1 3 5
5	10	2-A		WOOD CHIPS. FEW THIN LAYERS OF SILTY CLAY.		1 2 3
0	15	3-A		NUMEROUS WOOD FRAGMENTS.		3 2 3
-5	20	4-A		DARK GRAY VERY FINE TO FINE SILTY SAND, WITH TRACE ORGANICS - LOOSE, WET.		6 6 7
-10	25	5-A		BLACK FINE TO MEDIUM SAND WITH TRACE SILT AND FINE GRAVEL - LOOSE. MEDIUM COMPACT.		7 10 12
-15	30	6-A		COMPACT TO VERY COMPACT.		11 17 36
-20	35	7-A		DARK GRAY FINE SAND WITH TRACE OF SILT - COMPACT, WET.		13 20 19
-25	40	8-A		TRACE MEDIUM TO COARSE SAND, ORGANICS AND WOOD FRAGMENTS - OCCASIONAL SOFT GRAY-BROWN VERY FINE SANDY SILT LAYERS (TO 1/4").		10 16 16
-30	45	9-A		WITH INCREASED VERY FINE SANDY SILT LAYERS (UP TO 25%).		12 17 20
-35	50	10-A		DARK GRAY FINE TO MEDIUM SAND WITH TRACE TO LITTLE SILT - VERY COMPACT.		24 43 52
-40	55	11-A		GRADES FINER - COMPACT.		16 24 31
-45	60	12-A				10 17 24
-50	65	13-A		DARK GRAY SILT WITH TRACE VERY FINE SAND - MEDIUM STIFF, WET. WITH INTERBEDS OF VERY FINE TO FINE SILTY SAND (TO 1/2" THICK).		3 10 12
-55	70	14-A		DARK GRAY SILTY VERY FINE TO FINE SAND WITH 1/4" LAYERS OF SILT TO VERY FINE SANDY SILT - VERY COMPACT.		40 54/6"
-60	75	15-A		DARK GRAY VERY FINE TO FINE SILTY SAND WITH TRACE MEDIUM SAND - COMPACT.		24 33 38
-65	80	16-A		SLIGHTLY LESS SILTY WITH OCCASIONAL LAYERS OF GRAY-BROWN VERY FINE SANDY SILT.		22 34 43
				BOTTOM OF BORING AT 81.5'.		



PROPOSED WAREHOUSE FACILITIES
Seattle, Washington
for C.D. Stimson Company

ConverseWardDavisDixon Geotechnical Consultants

Project No.
79-5154

Drawing No.
A-3