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NCBC GULFPORT
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LETTER REGARDING SEDIMENT RECOVERY TRAP (SRT) EVALUATION REPORT NCBC
GULFPORT MS
10/17/1997
ABB ENVIRONMENTAL



October 17, 1997

18.2.0.3

Southern Division
Naval Facilities Engineering Command
ATTN: Mr. Art Conrad
P.O. Box 190010
2155 Eagle Drive
North Charleston, SC 29418

SUBJECT: Sediment Recovery Trap (SRT) Evaluation Report, Naval Construction Battalion Center (NCBC), Gulfport, Mississippi; Comprehensive Long-Term Environmental Action, Navy District I, Contract No. N62467-89-D-0317/128

Dear Mr. Conrad:

This report summarizes field sampling activities that occurred at the NCBC in Gulfport, Mississippi, during the week of April 21, 1997. These activities consisted of collecting sediment samples upgradient and downgradient of existing SRT locations and analyzing for dioxin, total organic carbon (TOC), and grain size. This report describes the field sampling activities, provides the analytical results, and presents conclusions.

SAMPLING ACTIVITIES

There are currently 11 existing SRTs located within drainage ditches at the NCBC identified as SRT-2 through -7, -9, -10, -13, -N1, and -N2. SRT-1, -8, -11, and -12 have been either demolished by drainage flow or removed. Sediment samples were collected immediately upgradient and downgradient of each existing SRT to establish a baseline for monitoring and evaluating their performance. A stainless-steel hand auger, decontaminated between sample locations, was used to collect each sample. Samples were transferred to laboratory-prepared sample jars. Two samples were collected from each sampling point. One group of samples were shipped overnight to Quanterra, Inc., for grain size and TOC analysis and the other to Triangle Laboratories, Inc., for dioxin analysis. Table 1 (Attachment B) provides the sampling scheme.

Samples were collected from each existing SRT location and analyzed for both TOC and grain size. Because of the relationship that has been discovered between TOC and dioxin levels from previous sampling events, only six locations were targeted for dioxin analysis. This approach allows cost savings to be passed on to the client. The six locations analyzed for dioxin were chosen to evaluate the movement of dioxin from the source area towards the base outfall.

ABB Environmental Services Inc.

SRT EVALUATION AND SAMPLE RESULTS

Each of the 11 SRT locations is discussed individually, and the sample results are summarized and discussed. The condition of the SRTs are described as poor, moderate, and good. A poor condition indicates that the integrity of the SRT structure has been compromised. A moderate condition indicates that the structure has suffered some minor damage, and a good condition indicates that the SRT structure is intact. All existing SRT locations are shown on Figure 1 (Attachment A).

SRT-1. This location is approximately 200 feet east of Outfall No. 1 within the drainage ditch that parallels 28th Street. A majority of the structure has been washed away, leaving only a minimal amount of gravel in the bottom of the ditch. Drainage across the SRT has caused some erosion of the SRT material making an indentation. The condition of the SRT is considered poor.

Samples collected upgradient and downgradient were analyzed for TOC and grain size, but not for dioxin. Results indicate that a reduction in TOC concentrations or silt and clay particles is not occurring. This can be attributed to a reduction in the SRT cross-section area and high flow conditions experienced within this section of drainageway during rain events.

SRT-2. The SRT in this location no longer exists. This structure was demolished by drainage flow, and samples were not collected. This SRT was located approximately 300 feet east of SRT-1.

SRT-3. This location is approximately 400 feet upstream and east of SRT-1. The majority of the structure has remained intact. However, there has been some loss of SRT material from the top due to drainage. The condition of the SRT is considered moderate.

Samples collected were analyzed for TOC and grain size only. The results indicate that a reduction in TOC concentrations or silt and clay particles is not occurring. This can be attributed to the reduction in SRT cross-sectional area, as well as high flow conditions that occur in this section of drainageway during rain events.

SRT-4. This location is approximately 400 feet upstream of SRT-3 and 300 feet upstream of SRT-13, which will be discussed later. This SRT is also located within a separate drainageway that feeds into the 28th Street ditch approximately 200 feet upstream of SRT-3. Much of the SRT material still remains in place, but a notch has been cut across the top of the SRT that allows continuous flow across the structure. The SRT is in poor condition.

Samples collected from this location were analyzed for TOC, grain size, and dioxins. Results indicate a reduction in dioxin concentrations from upstream to downstream, but no reduction in TOC concentrations. Grain size results also indicate a reduction of silt and clay size particles across the SRT.

SRT-5. This location is approximately 3,500 feet upstream of SRT-4 within the same drainageway. SRT-5 is in close proximity of the source area (Site 8). The majority of the SRT structure is intact, and the condition of the SRT is good.

Samples collected from this location were analyzed for TOC, grain size, and dioxins. Results indicate a similar reduction in both TOC and dioxin concentrations across the SRT. Grain size results also indicate a reduction of silt and clay size particles from upstream to downstream of the structure.

SRT-6. This location is approximately 500 feet upstream of SRT-5 within the same drainageway. This structure is fully intact and in good condition.

Samples collected were analyzed for TOC and grain size only. The results indicate a reduction in TOC concentrations across the SRT and also show a reduction in silt and clay particles.

SRT-7. This structure is located approximately 200 feet upstream of SRT-13 within the 28th Street drainageway. The majority of the SRT material is still within the drainageway, but much has dispersed downstream from the original SRT location. A large notch has been cut across the top of the structure. This notch was cut to alleviate upstream volume of water during construction of SRT-13. The SRT is in poor condition.

Samples collected from this location were analyzed for TOC, grain size, and dioxins. The results indicate a similar reduction in both TOC and dioxin concentrations across the SRT, as well as a reduction in silt and clay particles.

SRT-8. This structure has been demolished by drainage flow. This SRT was located in the drainage ditch along 28th Street upgradient of SRT-7.

SRT-9. This SRT is located on the southeast side of Site 8. The structure is intact and in good condition. There were no indications that drainage flow has ever crested the top of the SRT.

The samples collected from this location were analyzed for TOC concentrations and grain size. Results indicate a reduction in TOC concentrations across the structure and also a reduction in silt and clay particles.

SRT-10. This structure is located to the northeast of SRT-9 in a small drainageway that feeds into the SRT-9 drainageway. The structure is intact and in good condition; however, it appears that little flow is carried in this drainageway through this structure.

Samples collected at this location were analyzed for TOC and grain size. Results indicate that a reduction in TOC concentrations and grain size is not occurring at this location. This can be attributed to the low flow conditions of this drainageway, which probably did not mobilize bedload sediments.

SRT-11 and SRT-12. These two locations were not evaluated and are not included in the report, because of historically low dioxin levels in the area. Both SRTs are located along the southern base boundary.

SRT-13. This structure is located approximately 100 feet upstream of SRT-3 within the 28th Street drainageway. This structure is intact and in good condition. There was no damage observed to the structure due to drainage flow; however, a buildup of debris was observed on the upgradient side of the structure.

Samples collected were analyzed for TOC, grain size, and dioxins. Results indicated a reduction in both TOC and dioxin concentrations from upgradient to downgradient of the structure. Grain size analysis also showed a reduction in silt and clay particles across the SRT.

SRT-N1. This location is on the source area (Site 8). The structure is intact and in good condition. No damage was observed to the structure from the drainage flow.

Samples collected were analyzed for TOC, grain size, and dioxins. Results indicate a reduction in both TOC and dioxin concentrations across the structure, as well as a reduction in silt and clay particles.

SRT-N2. This location is also on the source area (Site 8). The majority of the structure is intact, but some of the SRT material has been dispersed downstream of the original location. A ditch has been created across the top of the SRT from the drainage flow. The structure is in poor condition.

Samples collected were analyzed for TOC, grain size, and dioxins. Results indicate a reduction in both TOC and dioxin concentrations across the structure, as well as a reduction in silt and clay particles.

ANALYTICAL RESULT SUMMARY

A summary of sample results is provided in Tables 2 through 4 in Attachment B, and the laboratory sample result sheets are provided as Attachment C. Sample identification numbers found on the laboratory sample result sheets are defined as follows:

EE02UD1P1

Where

EE = engineering evaluation
02 = SRT number
U = upgradient
D = sediment sample
1 = sample event number
P1 = primary results

GENERAL EVALUATIONS

The analytical results for dioxin samples collected from six SRT locations (SRT-4, -5, -7, -13, -N1, and -N2) indicate that the levels of dioxin have been reduced from upgradient to downgradient locations at each SRT. It is also noted that dioxin concentrations decrease as drainage moves away from the source area (i.e., in the ditch line that contains SRT-N2, -5, -4, and -13); the concentrations decrease as follows: 1,006 ppt, 204 ppt, 61 ppt, and 9 ppt.

The additional SRT locations (SRT-1, -3, -6, -9, and -10) were sampled and analyzed for TOC and grain size only. Comparing dioxin results to TOC provides a consistent correlation — as TOC levels decrease, so do dioxin levels. This supports the observation that dioxin and TOC exhibit a direct relationship with one another. As levels of TOC increase, so do levels of dioxin. Because of the relationship between TOC and dioxin, reduction in dioxin levels is expected where there is a reduction in TOC levels. Of these five SRT locations, SRT-6 and -9 have shown a reduction in both TOC levels and particle size across the structure. At location SRT-10, TOC and grain size levels may not be good indicators because of the low flow levels of that location. At locations SRT-1 and SRT-3, the TOC and grain size results do not indicate decreasing trends, although this may be more a function of preexisting conditions in the ditch than of the operating capabilities of these SRTs.

It has also been observed that SRT locations that have reduced levels of dioxin and TOC have also been successful in reducing the silt and clay size particles across the structures. Dioxin typically adheres to the silt and clay particles that would settle in low energy areas created behind the SRTs. It appears that the condition of the SRT does not effect its ability to reduce dioxin levels.

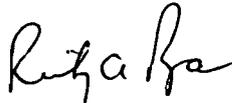
The conclusions discussed in this report are based on one sampling event. It is recommended that continued sampling occur at the SRTs to monitor performance. Initially, these sampling events should occur several weeks after either rain events or any excavating activity to allow time for sediment to settle out and accumulate at each SRT location.

The analytical data received from these sampling events to compare and monitor performance should not be viewed quantitatively. There are many factors that could skew results and provide inadequate comparisons: for example, (1) the exact sample collection locations cannot be duplicated, (2) sample collection schedules can be disrupted by weather conditions, and (3) storm events can create erosion and runoff problems that may alter sediment concentrations at the SRTs.

If you should have any questions concerning the above information, please do not hesitate to call Rick Ryan or Louis Barrentine at (423) 531-1922.

Sincerely,

ABB ENVIRONMENTAL SERVICES, INC.



Rick Ryan, P.E.
Project Engineer



Penny Baxter, P.G.
Project Manager

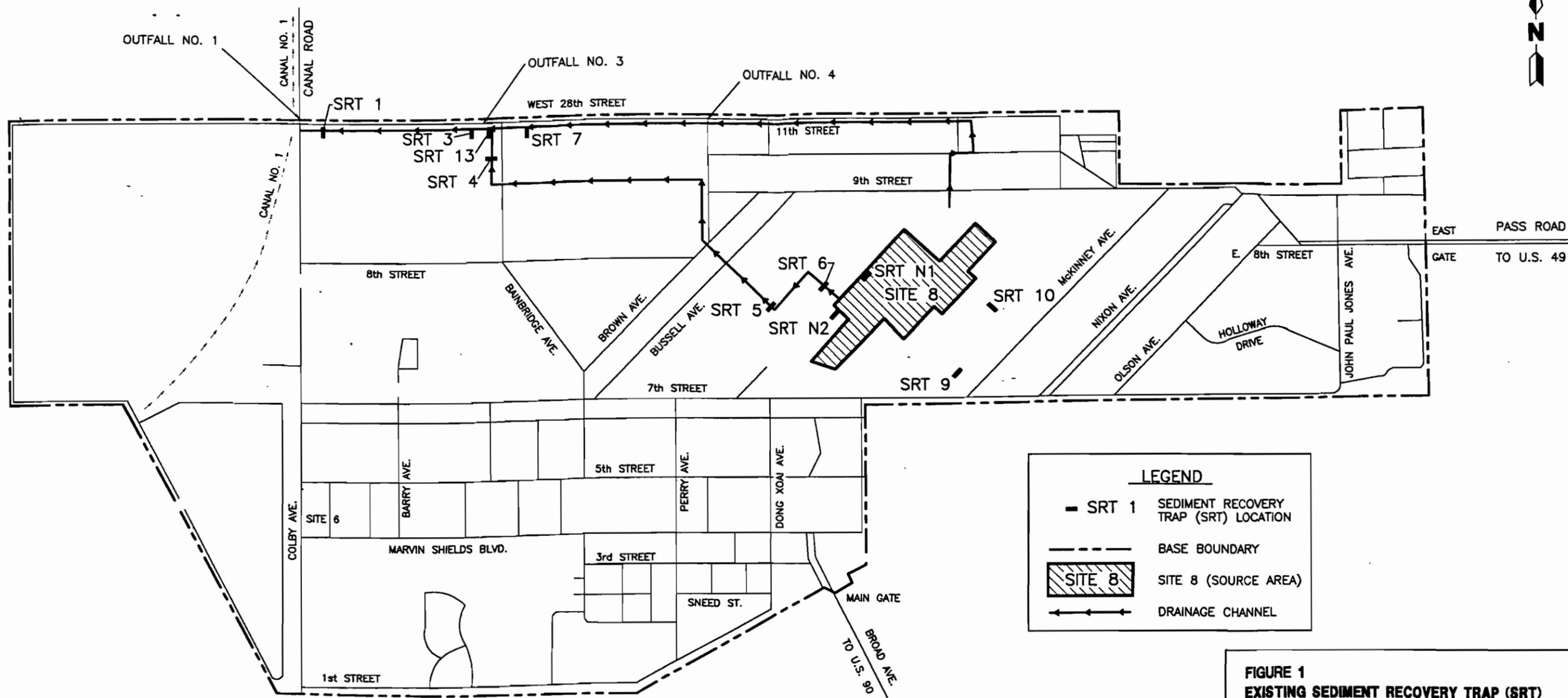
pc: Gordon Crane, NCBC Gulfport
Louis Barrentine, ABB-ES
Marland Dulaney, ABB-ES
Bob Fisher, ABB-ES
Nancy Rouse, ABB-ES

Attachments:

Attachment A: Figure
Attachment B: Tables
Attachment C: Laboratory Sample Sheets
Attachment D: Glossary

ATTACHMENT A

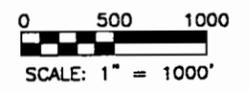
FIGURE



LEGEND

- SRT 1 SEDIMENT RECOVERY TRAP (SRT) LOCATION
- BASE BOUNDARY
- SITE 8 (SOURCE AREA)
- DRAINAGE CHANNEL

**FIGURE 1
EXISTING SEDIMENT RECOVERY TRAP (SRT)
LOCATIONS**



SRT EVALUATION REPORT

**NAVAL CONSTRUCTION
BATTALION CENTER
GULFPORT, MISSISSIPPI**



ATTACHMENT B

TABLES

**Table 1
Sampling Scheme**

Sediment Recovery Trap Evaluation Report
Naval Construction Battalion Center
Gulfport, Mississippi

SRT No.	TOC	Grain Size	Dioxin
1	X	X	---
3	X	X	---
4	X	X	X
5	X	X	X
6	X	X	---
7	X	X	X
9	X	X	---
10	X	X	---
13	X	X	X
N1	X	X	X
N2	X	X	X

Notes: SRT = sediment recovery trap.
TOC = total organic carbon.
X = sampled.
--- = not sampled.

**Table 2
Dioxin Analytical Results for
Tetrachlorodibenzo-p-dioxin Toxicity Equivalent**

Sediment Recovery Trap Evaluation Report
Naval Construction Battalion Center
Gulfport, Mississippi

SRT No.	Upgradient Results (ppt)	Downgradient Results (ppt)	Upgradient/Downgradient Ratio
4	61.89	10.92	5.7
5	204.92	52.11	3.9
7	38.86	7.057	5.5
13	9.865	6.885	1.4
N1	468.583	263.11	1.8
N2	1,006.52	623.38	1.6

Notes: SRT = sediment recovery trap.
ppt = parts per trillion.

Table 3
Total Organic Carbon Analytical Results

Sediment Recovery Trap Evaluation Report
Naval Construction Battalion Center
Gulfport, Mississippi

SRT No.	Upgradient Results (ppm)	Downgradient Results (ppm)	Upgradient/Downgradient Ratio
1	13,000	20,000	0.7
3	5,400	33,000	0.2
4	11,000	11,000	1.0
5	29,000	7,100	4.1
6	43,000	23,000	1.9
7	13,000	3,000	4.3
9	43,000	19,000	2.3
10	11,000	30,000	0.4
13	7,700	2,100	3.7
N1	12,000	8,800	1.4
N2	35,000	32,000	1.1

Notes: Values less than 1.0 shown at SRT locations 1, 3, and 10 indicate an increase in levels. Values greater than 1.0 indicate a decrease in levels.

SRT = sediment recovery trap.
ppm = parts per million.

Table 4
Grain Size Analysis

Sediment Recovery Trap Evaluation Report
Naval Construction Battalion Center
Gulfport, Mississippi

SRT No.	Upgradient Percent	Downgradient Percent	Percent Difference
Gravel			
1	0.1	5.2	-5.1
3	1.3	0.3	1
4	3.8	3.2	0.6
5	3.7	11.3	-7.6
6	0.1	4.8	-4.7
7	2.1	14.4	-12.3
9	6.5	0.4	6.1
10	11.4	6.6	4.8
13	2.3	15.5	-13.2
N1	5.9	11.7	-5.8
N2	4.2	1.3	2.9

See notes at end of table.

**Table 4 (Continued)
Grain Size Analysis**

Sediment Recovery Trap Evaluation Report
Naval Construction Battalion Center
Gulfport, Mississippi

SRT No.	Upgradient Percent	Downgradient Percent	Percent Difference
<u>Sand</u>			
1	50.4	16.2	34.2
3	69.7	14.7	55
4	15.7	38.5	-22.8
5	50.6	71.8	-21.2
6	33.2	62	-28.8
7	55.4	70.4	-15
9	45.1	76.2	-31.1
10	50.9	33	17.9
13	46.9	68.3	-21.4
N1	59.1	79.8	-20.7
N2	37.7	68.7	-31
<u>Silt</u>			
1	33.2	53.3	-20.1
3	29	57.7	-28.7
4	55.9	43.1	12.8
5	38.6	16.9	21.7
6	53.4	27.9	25.5
7	32.6	15.2	17.4
9	33.6	23.4	10.2
10	27.6	44.8	-17.2
13	43.8	16.2	27.6
N1	28.1	8.5	19.6
N2	48.8	24.5	24.3
<u>Clay</u>			
1	16.3	25.3	-9
3		27.3	-27.3
4	24.6	15.2	9.4
5	7.1		7.1
6	13.3	5.3	8
7	9.9		9.9
9	14.8		14.8
10	10.1	15.6	-5.5
13	7		7
N1	6.9		6.9
N2	9.3	5.5	3.8

Notes: Positive values indicate a higher percent of soil material upgradient of the SRT compared to downgradient. This implies that the SRT is successful in stopping the migration of sediments through the drainageways. A negative value indicates a higher percent of soil material downgradient of the SRT as compared to upgradient..

SRT = sediment recovery trap.

ATTACHMENT C
LABORATORY SAMPLE SHEETS

ABB Environmental Services

TLI Project: 41516B
 Client Sample: EE04UD1P1

Toxicity Equivalents Report
 Analysis File: W971496

Client Project:	NCBC Gulfport, Phase I				
Sample Matrix:	Sediment	Date Received:	04/23/97	Spike File:	SPX2372S
TLI ID:	165-69-13	Date Extracted:	04/24/97	ICal:	WF54307
		Date Analyzed:	05/07/97	ConCal:	W971493
Sample Size:	19.520 g	Dilution Factor:	n/a	% Moisture:	49.0
Dry Weight:	9.955 g	Blank File:	W971488	% Lipid:	n/a
GC Column:	DB-5	Analyst:	JM	% Solids:	51.0

Analytes	Conc. (ppt)		TEF		Equivalent
2,3,7,8-TCDD	39.8	x	1	=	39.8
1,2,3,7,8-PeCDD	3.8	x	0.5	=	1.9
1,2,3,4,7,8-HxCDD	10.8	x	0.1	=	1.08
1,2,3,6,7,8-HxCDD	26.0	x	0.1	=	2.6
1,2,3,7,8,9-HxCDD	24.5	x	0.1	=	2.45
1,2,3,4,6,7,8-HpCDD	725	x	0.01	=	7.25
1,2,3,4,6,7,8,9-OCDD	6810	x	0.001	=	6.81
2,3,7,8-TCDF	11.8	x	0.1	=	1.18
2,3,4,7,8-PeCDF	1.7	x	0.5	=	0.85
1,2,3,8-PeCDF	[1.5]	x	0.05	=	0.075
1,2,3,7,8-HxCDF	[13.0]	x	0.1	=	1.3
1,2,3,6,7,8-HxCDF	8.1	x	0.1	=	0.81
2,3,4,6,7,8-HxCDF	5.6	x	0.1	=	0.56
1,2,3,7,8,9-HxCDF	(1.5)	x	0.1	=	0.15
1,2,3,4,6,7,8-HpCDF	172	x	0.01	=	1.72
1,2,3,4,7,8,9-HpCDF	10.9	x	0.01	=	0.109
1,2,3,4,6,7,8,9-OCDF	530	x	0.001	=	0.53

Total International Toxicity Equivalency Factors: 69.2 ppt

[...] indicates that the value is that of an EMPC.
 (...) indicates that the value is that of a Detection Limit.

DRAFT

LI Project: 42263A
 Client Sample: EE04DD1P3

Toxicity Equivalents Report
 Analysis File: T974795

Client Project:	NCBC Gulfport	Date Received:	06/27/97	Spike File:	SPX2372S
Sample Matrix:	SOIL	Date Extracted:	07/01/97	ICal:	TF53286
TLI ID:	173-25-15	Date Analyzed:	07/12/97	ConCal:	T974782

Sample Size:	14.530 g	Dilution Factor:	n/a	% Moisture:	29.9
Dry Weight:	10.186 g	Blank File:	T974770	% Lipid:	n/a
GC Column:	DB-5	Analyst:	MS	% Solids:	70.1

Analytes	Conc. (ppt)		TEF		Equivalent
.3,7,8-TCDD	7.8	x	1	=	7.8
.2,3,7,8-PeCDD	ND	x	0.5	=	0
.2,3,4,7,8-HxCDD	1.3	x	0.1	=	0.13
.2,3,6,7,8-HxCDD	3.8	x	0.1	=	0.38
.2,3,7,8,9-HxCDD	3.6	x	0.1	=	0.36
.2,3,4,6,7,8-HpCDD	114	x	0.01	=	1.14
.2,3,4,6,7,8,9-OCDD	1110	x	0.001	=	1.11
.3,7,8-TCDF	[2.9]	x	0.1	=	0.29
.2,3,7,8-PeCDF	ND	x	0.05	=	0
.3,4,7,8-PeCDF	ND	x	0.5	=	0
.2,3,4,7,8-HxCDF	2.5	x	0.1	=	0.25
.2,3,6,7,8-HxCDF	1.4	x	0.1	=	0.14
.3,4,6,7,8-HxCDF	2.1	x	0.1	=	0.21
.2,3,7,8,9-HxCDF	ND	x	0.1	=	0
.2,3,4,6,7,8-HpCDF	25.8	x	0.01	=	0.258
.2,3,4,7,8,9-HpCDF	2.3	x	0.01	=	0.023
.2,3,4,6,7,8,9-OCDF	112	x	0.001	=	0.112

Total EPA TEFs, 1989 (Detects Only): 12.2 ppt

1) Detection Limits not used in calculations.
 Note: Only 0% of EMPCs are used in the calculations.

[...] indicates that the value is that of an EMPC.

ABB Environmental Services

TLI Project: 41530B
 Sample: EE05UD1P1

Toxicity Equivalents Report
 Analysis File: W971610

Client Project: NCBC Gulfport, Phase I	Date Received: 04/24/97	Spike File: SPX2372S
Sample Matrix: SEDIMENT	Date Extracted: 04/29/97	ICal: WF54307
TLI ID: 165-83-14	Date Analyzed: 05/13/97	ConCal: W971607

Sample Size: 21.440 g	Dilution Factor: n/a	% Moisture: 52.5
Dry Weight: 10.184 g	Blank File: W971601	% Lipid: n/a
GC Column: DB-5	Analyst: BJG	% Solids: 47.5

Analytes	Conc. (ppt)		TEF		Equivalent
2,3,7,8-TCDD	182	x	1	=	182
1,2,3,7,8-PeCDD	6.8	x	0.5	=	3.4
1,2,3,4,7,8-HxCDD	11.7	x	0.1	=	1.17
1,2,3,6,7,8-HxCDD	29.6	x	0.1	=	2.96
1,2,3,7,8,9-HxCDD	29.8	x	0.1	=	2.98
1,2,3,4,6,7,8-HpCDD	721	x	0.01	=	7.21
1,2,3,4,6,7,8,9-OCDD	5200	x	0.001	=	5.2
2,3,7,8-TCDF	33.7	x	0.1	=	3.37
2,3,4,7,8-PeCDF	2.8	x	0.5	=	1.4
1,2,3,8-PeCDF	(0.70)	x	0.05	=	0.035
1,2,3,7,8-HxCDF	[20.3]	x	0.1	=	2.03
1,2,3,6,7,8-HxCDF	9.3	x	0.1	=	0.93
2,3,4,6,7,8-HxCDF	8.4	x	0.1	=	0.84
1,2,3,7,8,9-HxCDF	(1.1)	x	0.1	=	0.11
1,2,3,4,6,7,8-HpCDF	160	x	0.01	=	1.6
1,2,3,4,7,8,9-HpCDF	9.9	x	0.01	=	0.099
1,2,3,4,6,7,8,9-OCDF	279	x	0.001	=	0.279

Total International Toxicity Equivalency Factors: 216 ppt

[...] indicates that the value is that of an EMPC.
 (...) indicates that the value is that of a Detection Limit.

D R A F T

ABB Environmental Services

LI Project: 41530B
 Client Sample: EE05DD1P1

Toxicity Equivalents Report
 Analysis File: W971602

Client Project:	NCBC Gulfport, Phase I				
Sample Matrix:	SEDIMENT	Date Received:	04/24/97	Spike File:	SPX2372S
CLI ID:	165-83-13	Date Extracted:	04/29/97	ICal:	WF54307
		Date Analyzed:	05/12/97	ConCal:	W971587

Sample Size:	14.750 g	Dilution Factor:	n/a	% Moisture:	31.8
Dry Weight:	10.060 g	Blank File:	W971601	% Lipid:	n/a
GC Column:	DB-5	Analyst:	BB	% Solids:	68.2

Analytes	Conc. (ppt)		TEF		Equivalent
3,7,8-TCDD	44.4	x	1	=	44.4
2,3,7,8-PeCDD	[1.8]	x	0.5	=	0.9
2,3,4,7,8-HxCDD	4.6	x	0.1	=	0.46
2,3,6,7,8-HxCDD	9.5	x	0.1	=	0.95
2,3,7,8,9-HxCDD	11.3	x	0.1	=	1.13
2,3,4,6,7,8-HpCDD	241	x	0.01	=	2.41
2,3,4,6,7,8,9-OCDD	1860	x	0.001	=	1.86
3,7,8-TCDF	8.1	x	0.1	=	0.81
3,4,7,8-PeCDF	0.82	x	0.5	=	0.41
2,3,7,8-PeCDF	[0.79]	x	0.05	=	0.0395
2,3,4,7,8-HxCDF	[7.5]	x	0.1	=	0.75
2,3,6,7,8-HxCDF	3.2	x	0.1	=	0.32
3,4,6,7,8-HxCDF	4.2	x	0.1	=	0.42
2,3,7,8,9-HxCDF	(0.96)	x	0.1	=	0.096
2,3,4,6,7,8-HpCDF	54.8	x	0.01	=	0.548
2,3,4,7,8,9-HpCDF	4.3	x	0.01	=	0.043
2,3,4,6,7,8,9-OCDF	94.7	x	0.001	=	0.0947

Total International Toxicity Equivalency Factors: 55.6 ppt

[.] indicates that the value is that of an EMPC.
 [.) indicates that the value is that of a Detection Limit.

DRAFT

ABB Environmental Services

TLI Project: 41516B
 Client Sample: EE07UD1P1

Toxicity Equivalents Report
 Analysis File: W971491

Client Project:	NCBC Gulfport, Phase I				
Sample Matrix:	Sediment	Date Received:	04/23/97	Spike File:	SPX2372S
TLI ID:	165-69-11	Date Extracted:	04/24/97	ICal:	WF54307
		Date Analyzed:	05/06/97	ConCal:	W971477
Sample Size:	17.150 g	Dilution Factor:	n/a	% Moisture:	41.7
Dry Weight:	9.998 g	Blank File:	W971488	% Lipid:	n/a
GC Column:	DB-5	Analyst:	BB	% Solids:	58.3

Analytes	Conc. (ppt)		TEF		Equivalent
2,3,7,8-TCDD	18.9	x	1	=	18.9
1,2,3,7,8-PeCDD	4.1	x	0.5	=	2.05
1,2,3,4,7,8-HxCDD	10.1	x	0.1	=	1.01
1,2,3,6,7,8-HxCDD	21.1	x	0.1	=	2.11
1,2,3,7,8,9-HxCDD	20.4	x	0.1	=	2.04
1,2,3,4,6,7,8-HpCDD	619	x	0.01	=	6.19
1,2,3,4,6,7,8,9-OCDD	6560	x	0.001	=	6.56
2,3,7,8-TCDF	12.4	x	0.1	=	1.24
2,3,4,7,8-PeCDF	[1.8]	x	0.5	=	0.9
1,2,3,7,8-PeCDF	1.8	x	0.05	=	0.09
1,2,3,7,8-HxCDF	11.9	x	0.1	=	1.19
1,2,3,4,7,8-HxCDF	11.3	x	0.1	=	1.13
2,3,4,6,7,8-HxCDF	5.7	x	0.1	=	0.57
1,2,3,7,8,9-HxCDF	(1.1)	x	0.1	=	0.11
1,2,3,4,6,7,8-HpCDF	134	x	0.01	=	1.34
1,2,3,4,7,8,9-HpCDF	9.6	x	0.01	=	0.096
1,2,3,4,6,7,8,9-OCDF	283	x	0.001	=	0.283

Total International Toxicity Equivalency Factors: 45.8 ppt

[...] indicates that the value is that of an EMPC.
 (...) indicates that the value is that of a Detection Limit.

D R A F T

ABB Environmental Services

TLI Project: **41516B**
 Client Sample: **EE07DD1P1**

Toxicity Equivalents Report
 Analysis File: **W971490**

Client Project:	NCBC Gulfport, Phase I		
Sample Matrix:	Sediment	Date Received:	04/23/97
TLI ID:	165-69-10	Date Extracted:	04/24/97
		Date Analyzed:	05/06/97
		Spike File:	SPX2372S
		ICal:	WF54307
		ConCal:	W971477
Sample Size:	15.080 g	Dilution Factor:	n/a
Dry Weight:	9.968 g	Blank File:	W971488
GC Column:	DB-5	Analyst:	BB
		% Moisture:	33.9
		% Lipid:	n/a
		% Solids:	66.1

Analytes	Conc. (ppt)		TEF		Equivalent
2,3,7,8-TCDD	(0.70)	x	1	=	0.7
1,2,3,7,8-PeCDD	[2.9]	x	0.5	=	1.45
1,2,3,4,7,8-HxCDD	5.6	x	0.1	=	0.56
1,2,3,6,7,8-HxCDD	9.0	x	0.1	=	0.9
1,2,3,7,8,9-HxCDD	11.5	x	0.1	=	1.15
1,2,3,4,6,7,8-HpCDD	131	x	0.01	=	1.31
1,2,3,4,6,7,8,9-OCDD	987	x	0.001	=	0.987
2,3,7,8-TCDF	(0.47)	x	0.1	=	0.047
2,3,4,7,8-PeCDF	(0.71)	x	0.5	=	0.355
1,2,3,7,8-PeCDF	[0.54]	x	0.05	=	0.027
1,2,3,4,7,8-HxCDF	2.8	x	0.1	=	0.28
1,2,3,6,7,8-HxCDF	1.6	x	0.1	=	0.16
2,3,4,6,7,8-HxCDF	[1.6]	x	0.1	=	0.16
1,2,3,7,8,9-HxCDF	(1.1)	x	0.1	=	0.11
1,2,3,4,6,7,8-HpCDF	35.2	x	0.01	=	0.352
1,2,3,4,7,8,9-HpCDF	1.9	x	0.01	=	0.019
1,2,3,4,6,7,8,9-OCDF	57.2	x	0.001	=	0.0572

Total International Toxicity Equivalency Factors: 8.62 ppt

[...] indicates that the value is that of an EMPC.
 (...) indicates that the value is that of a Detection Limit.

D R A F T

TLI Project: 41516B
 Client Sample: ~~EE13UD1P1~~ ~~EEC3271P1~~ OK.

Toxicity Equivalents Report
 Analysis File: W971489

Client Project:	NCBC Gulfport, Phase I		
Sample Matrix:	Sediment	Date Received:	04/23/97
Sample ID:	165-69-9	Date Extracted:	04/24/97
		Date Analyzed:	05/06/97
		Spike File:	SPX2372S
		ICal:	WF54307
		ConCal:	W971477
Sample Size:	14.250 g	Dilution Factor:	n/a
Dry Weight:	9.776 g	Blank File:	W971488
GC Column:	DB-5	Analyst:	BB
		% Moisture:	31.4
		% Lipid:	n/a
		% Solids:	68.6

Analytes	Conc. (ppt)		TEF		Equivalent
2,3,7,8-TCDD	6.3	x	1	=	6.3
1,2,3,7,8-PeCDD	[0.69]	x	0.5	=	0.345
1,2,3,4,7,8-HxCDD	1.8	x	0.1	=	0.18
1,2,3,6,7,8-HxCDD	4.4	x	0.1	=	0.44
1,2,3,7,8,9-HxCDD	4.6	x	0.1	=	0.46
1,2,3,4,6,7,8-HpCDD	111	x	0.01	=	1.11
1,2,3,4,6,7,8,9-OCDD	1030	x	0.001	=	1.03
2,3,7,8-TCDF	1.6	x	0.1	=	0.16
1,3,4,7,8-PeCDF	(0.35)	x	0.5	=	0.175
1,2,3,7,8-PeCDF	(0.35)	x	0.05	=	0.0175
1,2,3,4,7,8-HxCDF	1.9	x	0.1	=	0.19
1,2,3,6,7,8-HxCDF	1.3	x	0.1	=	0.13
1,3,4,7,8-HxCDF	1.2	x	0.1	=	0.12
1,2,3,7,8,9-HxCDF	(0.49)	x	0.1	=	0.049
1,2,3,4,6,7,8-HpCDF	26.8	x	0.01	=	0.268
1,2,3,4,7,8,9-HpCDF	2.1	x	0.01	=	0.021
1,2,3,4,6,7,8,9-OCDF	78.7	x	0.001	=	0.0787

Total International Toxicity Equivalency Factors: 11.1 ppt

] indicates that the value is that of an EMPC.
) indicates that the value is that of a Detection Limit.

DRAFT

ABB Environmental Services

TLI Project: **41516A**
 Client Sample: **EE13DD1P1** ← ok.
~~EE13DD1P1~~

Toxicity Equivalents Report
 Analysis File: **W971486**

Client Project:	NCBC Gulfport, Phase I				
Sample Matrix:	SEDIMENT	Date Received:	04/23/97	Spike File:	SPX2372S
TLI ID:	165-69-8	Date Extracted:	04/24/97	ICal:	WF54307
		Date Analyzed:	05/06/97	ConCal:	W971477
Sample Size:	11.790 g	Dilution Factor:	n/a	% Moisture:	14.6
Dry Weight:	10.069 g	Blank File:	W971479	% Lipid:	n/a
GC Column:	DB-5	Analyst:	BB	% Solids:	85.4

Analytes	Conc. (ppt)		TEF		Equivalent
2,3,7,8-TCDD	5.0	x	1	=	5
1,2,3,7,8-PeCDD	(1.4)	x	0.5	=	0.7
1,2,3,4,7,8-HxCDD	(1.6)	x	0.1	=	0.16
1,2,3,6,7,8-HxCDD	1.5	x	0.1	=	0.15
1,2,3,7,8,9-HxCDD	(1.5)	x	0.1	=	0.15
1,2,3,4,6,7,8-HpCDD	36.8	x	0.01	=	0.368
1,2,3,4,6,7,8,9-OCDD	357	x	0.001	=	0.357
2,3,7,8-TCDF	[0.84]	x	0.1	=	0.084
2,3,4,7,8-PeCDF	(0.96)	x	0.5	=	0.48
1,2,3,7,8-PeCDF	(0.95)	x	0.05	=	0.0475
1,2,3,4,7,8-HxCDF	(1.1)	x	0.1	=	0.11
1,2,3,6,7,8-HxCDF	(0.81)	x	0.1	=	0.081
2,3,4,6,7,8-HxCDF	(1.2)	x	0.1	=	0.12
1,2,3,7,8,9-HxCDF	(1.3)	x	0.1	=	0.13
1,2,3,4,6,7,8-HpCDF	9.4	x	0.01	=	0.094
1,2,3,4,7,8,9-HpCDF	(1.8)	x	0.01	=	0.018
1,2,3,4,6,7,8,9-OCDF	60.3	x	0.001	=	0.0603

Total International Toxicity Equivalency Factors: 8.11 ppt

[...] indicates that the value is that of an EMPC.
 (...) indicates that the value is that of a Detection Limit.

DRAFT

ABB Environmental Services

TLI Project: 41530B
 Sample: EEN1UD1P1

Toxicity Equivalents Report
 Analysis File: W971616

Client Project: NCBC Gulfport, Phase I	Date Received: 04/24/97	Spike File: SPX2372S
Sample Matrix: SEDIMENT	Date Extracted: 04/29/97	ICal: WF54307
TLI ID: 165-83-18	Date Analyzed: 05/13/97	ConCal: W971607

Sample Size: 17.950 g	Dilution Factor: n/a	% Moisture: 43.9
Dry Weight: 10.070 g	Blank File: W971601	% Lipid: n/a
GC Column: DB-5	Analyst: MM	% Solids: 56.1

Analytes	Conc. (ppt)		TEF		Equivalent
2,3,7,8-TCDD	453	x	1	=	453
1,2,3,7,8-PeCDD	23.0	x	0.5	=	11.5
1,2,3,4,7,8-HxCDD	2.9	x	0.1	=	0.29
1,2,3,6,7,8-HxCDD	9.5	x	0.1	=	0.95
1,2,3,7,8,9-HxCDD	7.9	x	0.1	=	0.79
1,2,3,4,6,7,8-HpCDD	122	x	0.01	=	1.22
1,2,3,4,6,7,8,9-OCDD	833	x	0.001	=	0.833
2,3,7,8-TCDF	51.7	x	0.1	=	5.17
2,3,7,8-PeCDF	3.4	x	0.5	=	1.7
1,2,3,7,8-PeCDF	1.5	x	0.05	=	0.075
1,2,3,4,7,8-HxCDF	[7.4]	x	0.1	=	0.74
1,2,3,6,7,8-HxCDF	[1.4]	x	0.1	=	0.14
2,3,4,6,7,8-HxCDF	4.9	x	0.1	=	0.49
1,2,3,7,8,9-HxCDF	(0.97)	x	0.1	=	0.097
1,2,3,4,6,7,8-HpCDF	31.2	x	0.01	=	0.312
1,2,3,4,7,8,9-HpCDF	[4.3]	x	0.01	=	0.043
1,2,3,4,6,7,8,9-OCDF	72.1	x	0.001	=	0.0721

Total International Toxicity Equivalency Factors: 477 ppt

[...] indicates that the value is that of an EMPC.
 (...) indicates that the value is that of a Detection Limit.

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ABB Environmental Services

TLI Project: 41530B
 Client Sample: EEN1DD1P1

Toxicity Equivalents Report
 Analysis File: W971615

Client Project:	NCBC_Gulfport, Phase I		
Sample Matrix:	SEDIMENT	Date Received:	04/24/97
TLI ID:	165-83-17	Date Extracted:	04/29/97
		Date Analyzed:	05/13/97
		Spike File:	SPX2372S
		ICal:	WF54307
		ConCal:	W971607
Sample Size:	14.510 g	Dilution Factor:	n/a
Dry Weight:	10.128 g	Blank File:	W971601
GC Column:	DB-5	Analyst:	MM
		% Moisture:	30.2
		% Lipid:	n/a
		% Solids:	69.8

Analytes	Conc. (ppt)		TEF		Equivalent
2,3,7,8-TCDD	259	x	1	=	259
1,2,3,7,8-PeCDD	[4.2]	x	0.5	=	2.1
1,2,3,4,7,8-HxCDD	(2.5)	x	0.1	=	0.25
1,2,3,6,7,8-HxCDD	4.0	x	0.1	=	0.4
1,2,3,7,8,9-HxCDD	2.4	x	0.1	=	0.24
1,2,3,4,6,7,8-HpCDD	60.4	x	0.01	=	0.604
1,2,3,4,6,7,8,9-OCDD	516	x	0.001	=	0.516
2,3,7,8-TCDF	39.7	x	0.1	=	3.97
2,3,4,7,8-PeCDF	(1.4)	x	0.5	=	0.7
1,2,3,7,8-PeCDF	(1.4)	x	0.05	=	0.07
1,2,3,4,7,8-HxCDF	4.4	x	0.1	=	0.44
1,2,3,6,7,8-HxCDF	[2.1]	x	0.1	=	0.21
2,3,4,6,7,8-HxCDF	4.0	x	0.1	=	0.4
1,2,3,7,8,9-HxCDF	(2.1)	x	0.1	=	0.21
1,2,3,4,6,7,8-HpCDF	23.3	x	0.01	=	0.233
1,2,3,4,7,8,9-HpCDF	(2.5)	x	0.01	=	0.025
1,2,3,4,6,7,8,9-OCDF	62.0	x	0.001	=	0.062

Total International Toxicity Equivalency Factors: 269 ppt

[...] indicates that the value is that of an EMPC.
 (...) indicates that the value is that of a Detection Limit.

DRAFT

ABB Environmental Services

TLI Project: **41530B**
 Client Sample: **EEN2UD1P1**

Toxicity Equivalents Report
 Analysis File: **W971614**

Client Project:	NCBC Gulfport, Phase I				
Sample Matrix:	SEDIMENT	Date Received:	04/24/97	Spike File:	SPX2372S
TLI ID:	165-83-16	Date Extracted:	04/29/97	ICal:	WF54307
		Date Analyzed:	05/13/97	ConCal:	W971607
Sample Size:	28.190 g	Dilution Factor:	n/a	% Moisture:	64.0
Dry Weight:	10.148 g	Blank File:	W971601	% Lipid:	n/a
GC Column:	DB-5	Analyst:	MM	% Solids:	36.0

Analytes	Conc. (ppt)		TEF		Equivalent
2,3,7,8-TCDD	980	x	1	=	980
1,2,3,7,8-PeCDD	13.8	x	0.5	=	6.9
1,2,3,4,7,8-HxCDD	14.9	x	0.1	=	1.49
1,2,3,6,7,8-HxCDD	26.0	x	0.1	=	2.6
1,2,3,7,8,9-HxCDD	31.8	x	0.1	=	3.18
1,2,3,4,6,7,8-HpCDD	694	x	0.01	=	6.94
1,2,3,4,6,7,8,9-OCDD	5410	x	0.001	=	5.41
2,3,7,8-TCDF	49.0	x	0.1	=	4.9
2,3,4,7,8-PeCDF	3.3	x	0.5	=	1.65
1,2,3,8-PeCDF	3.4	x	0.05	=	0.17
1,2,3,6,8-HxCDF	[24.8]	x	0.1	=	2.48
1,2,3,6,7,8-HxCDF	5.6	x	0.1	=	0.56
2,3,4,6,7,8-HxCDF	7.4	x	0.1	=	0.74
1,2,3,7,8,9-HxCDF	(1.3)	x	0.1	=	0.13
1,2,3,4,6,7,8-HpCDF	116	x	0.01	=	1.16
1,2,3,4,7,8,9-HpCDF	9.0	x	0.01	=	0.09
1,2,3,4,6,7,8,9-OCDF	204	x	0.001	=	0.204

Total International Toxicity Equivalency Factors: 1020 ppt

[...] indicates that the value is that of an EMPC.
 (...) indicates that the value is that of a Detection Limit.

D R A F T

ABB Environmental Services

LI Project: **41530B**
 Client Sample: **EEN2DD1P1**

Toxicity Equivalents Report
 Analysis File: **W971612**

Client Project: NCBC Gulfport, Phase I	Date Received: 04/24/97	Spike File: SPX2372S
Sample Matrix: SEDIMENT	Date Extracted: 04/29/97	ICal: WF54307
TLI ID: 165-83-15	Date Analyzed: 05/13/97	ConCal: W971607
Sample Size: 28.690 g	Dilution Factor: n/a	% Moisture: 65.1
Dry Weight: 10.013 g	Blank File: W971601	% Lipid: n/a
GC Column: DB-5	Analyst: BJG	% Solids: 34.9

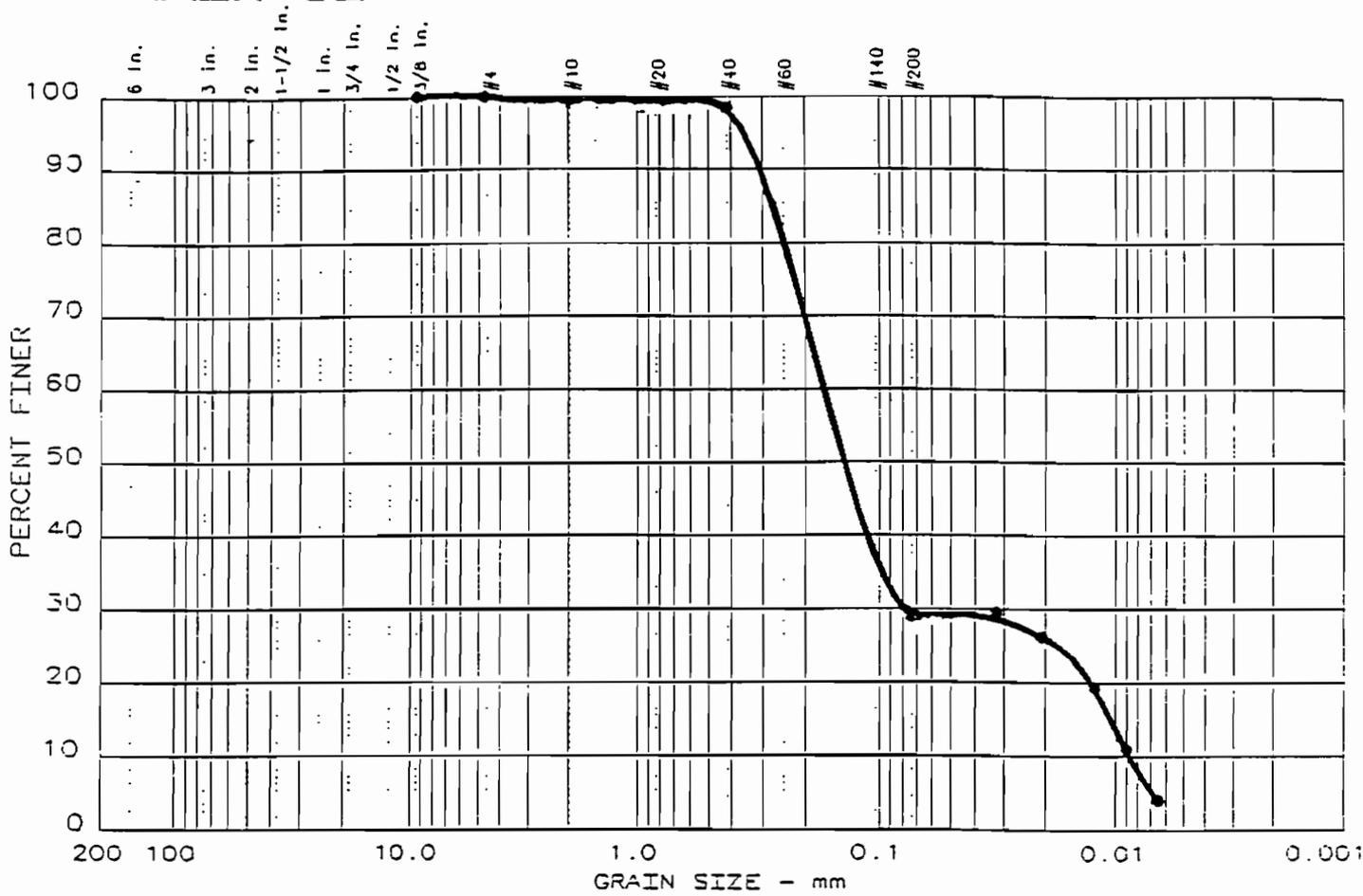
Analytes	Conc. (ppt)		TEF		Equivalent
2,3,7,8-TCDD	575	x	1	=	575
1,2,3,7,8-PeCDD	8.2	x	0.5	=	4.1
1,2,3,4,7,8-HxCDD	15.2	x	0.1	=	1.52
1,2,3,6,7,8-HxCDD	43.3	x	0.1	=	4.33
1,2,3,7,8,9-HxCDD	37.3	x	0.1	=	3.73
1,2,3,4,6,7,8-HpCDD	2040	x	0.01	=	20.4
1,2,3,4,6,7,8,9-OCDD	14260	x	0.001	=	14.3
2,3,7,8-TCDF	31.8	x	0.1	=	3.18
2,3,4,7,8-PeCDF	3.4	x	0.5	=	1.7
1,2,3,7,8-PeCDF	2.8	x	0.05	=	0.14
1,2,3,4,7,8-HxCDF	[43.1]	x	0.1	=	4.31
1,2,3,6,7,8-HxCDF	5.6	x	0.1	=	0.56
2,3,4,6,7,8-HxCDF	5.0	x	0.1	=	0.5
1,2,3,7,8,9-HxCDF	(3.7)	x	0.1	=	0.37
1,2,3,4,6,7,8-HpCDF	150	x	0.01	=	1.5
1,2,3,4,7,8,9-HpCDF	13.1	x	0.01	=	0.131
1,2,3,4,6,7,8,9-OCDF	461	x	0.001	=	0.461

Total International Toxicity Equivalency Factors: 636 ppt

[...] indicates that the value is that of an EMPC.
 (...) indicates that the value is that of a Detection Limit.

D R A F T

GRAIN SIZE DISTRIBUTION TEST REPORT



% +3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	1.3	69.7	29.0	

LL	PI	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
		0.27	0.17	0.14	0.079	0.0105	0.0087	4.34	19.2

MATERIAL DESCRIPTION	USCS	AASHTO
● BROWN SILTY FINE SAND	SM	A-2-4

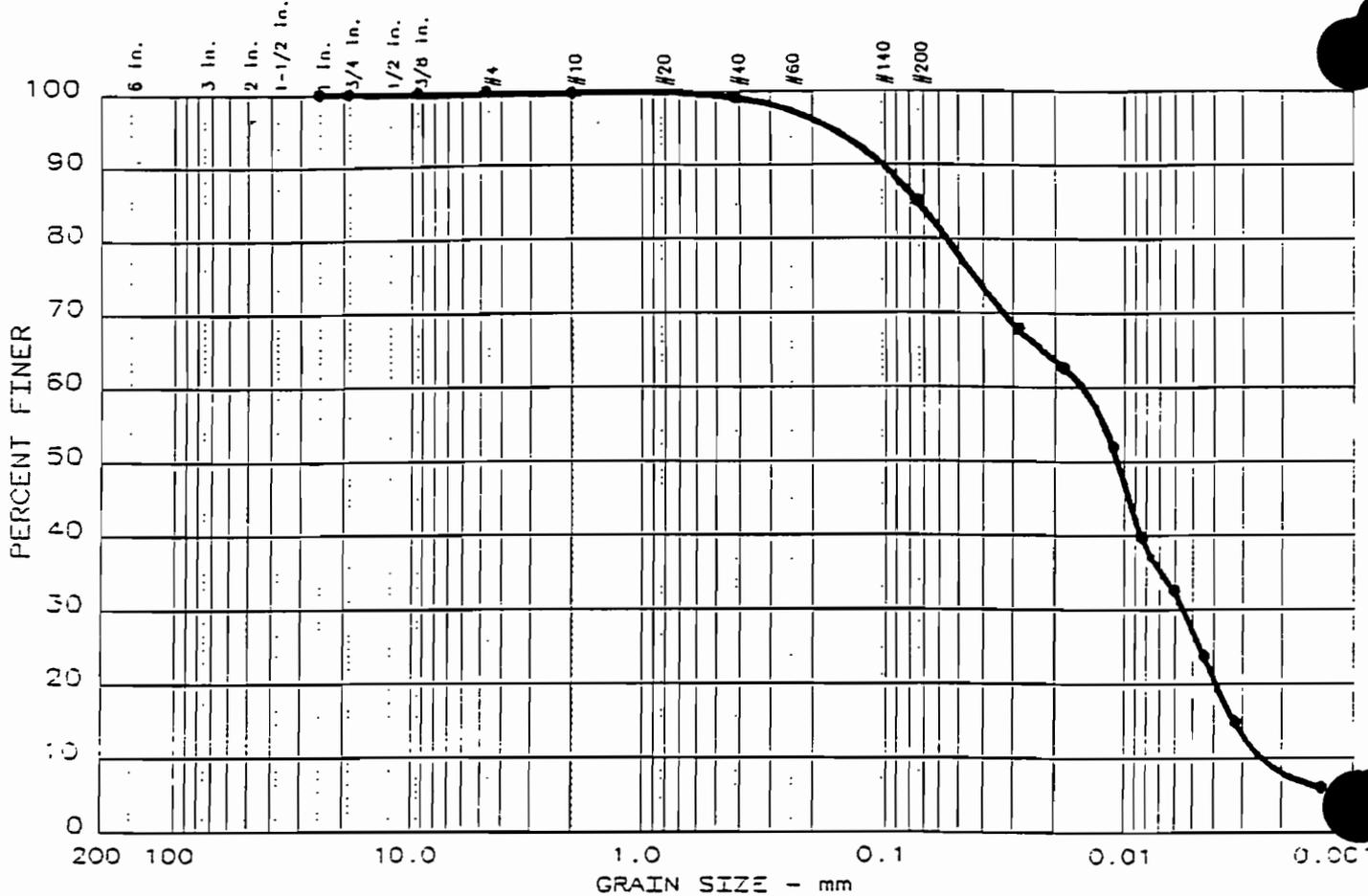
Project No.: 9701.14
 Project: P.O. SRO08244 CLIENT CODE: 48696
 ● Location: A7D230148-004 C97HE-1-03

EEØ3UD1P1

Date: 4/28/97

Remarks:
 CLIENT: QUANTERRA INC.
 Jar Samples Received On
 4-24-97.

GRAIN SIZE DISTRIBUTION TEST REPORT



% +3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.3	14.7	57.7	27.3

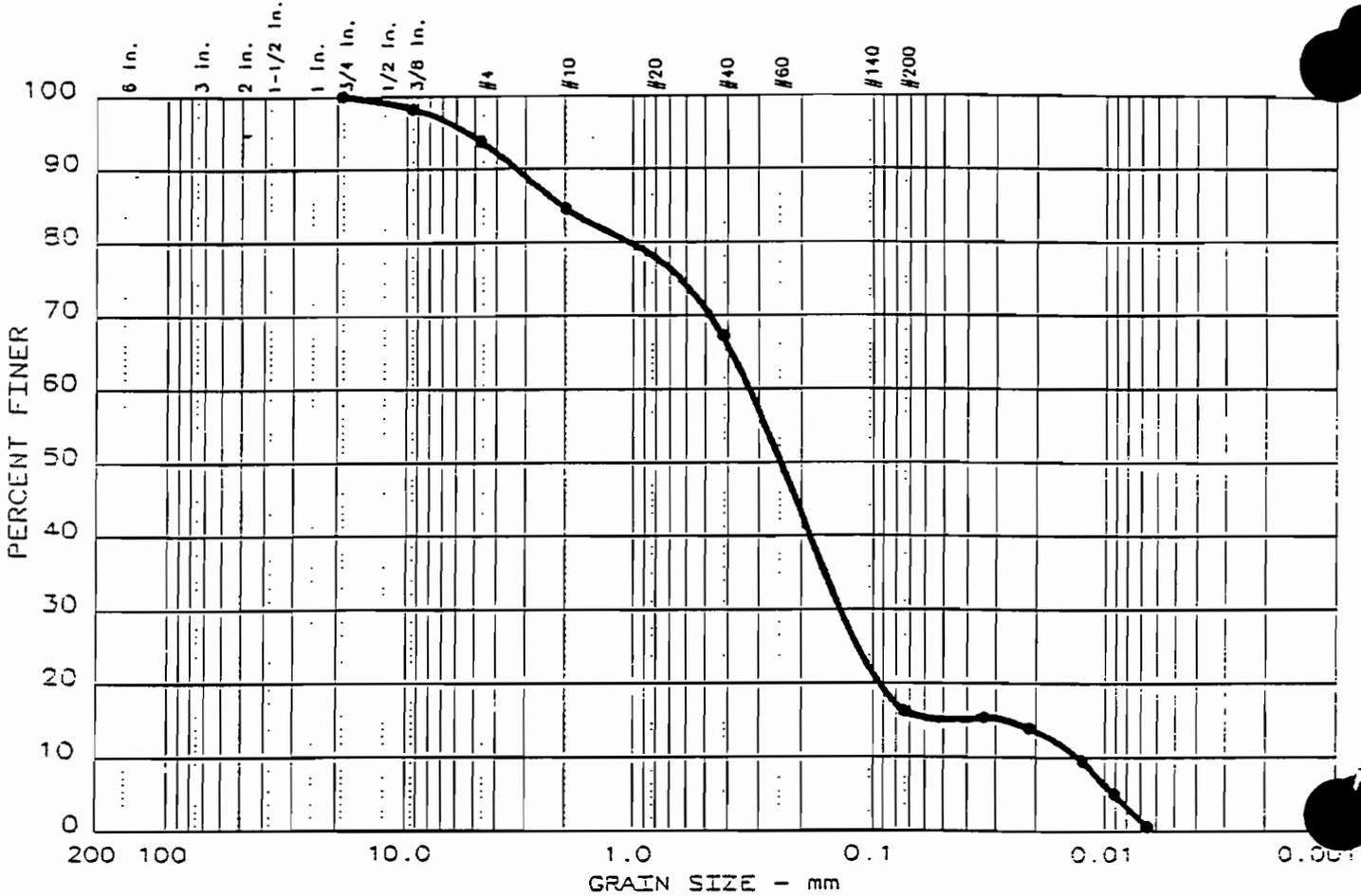
LL	PI	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
				0.01	0.005	0.0032	0.0024	0.81	6.3

MATERIAL DESCRIPTION	USCS	AASHTO
● BROWN SILTY CLAY WITH SAND	ML-CL	A-4

Project No.: 9701.14
 Project: P.O. SR008244 Client Code: 48696
 ● Location: A7D230148-003 C97HD-1-03
EEØ3DD1P1
 Date: 4-28-97

Remarks:
 Client: Quanterra Inc.
 Jar Samples Received On
 4-24-97

GRAIN SIZE DISTRIBUTION TEST REPORT



% +3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	15.5	68.3	16.2	

LL	PI	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
		2.11	0.33	0.24	0.136	0.0636	0.0133	4.27	24.5

MATERIAL DESCRIPTION	USCS	AASHTO
• Brown Silty Sand With Gravel	SM	

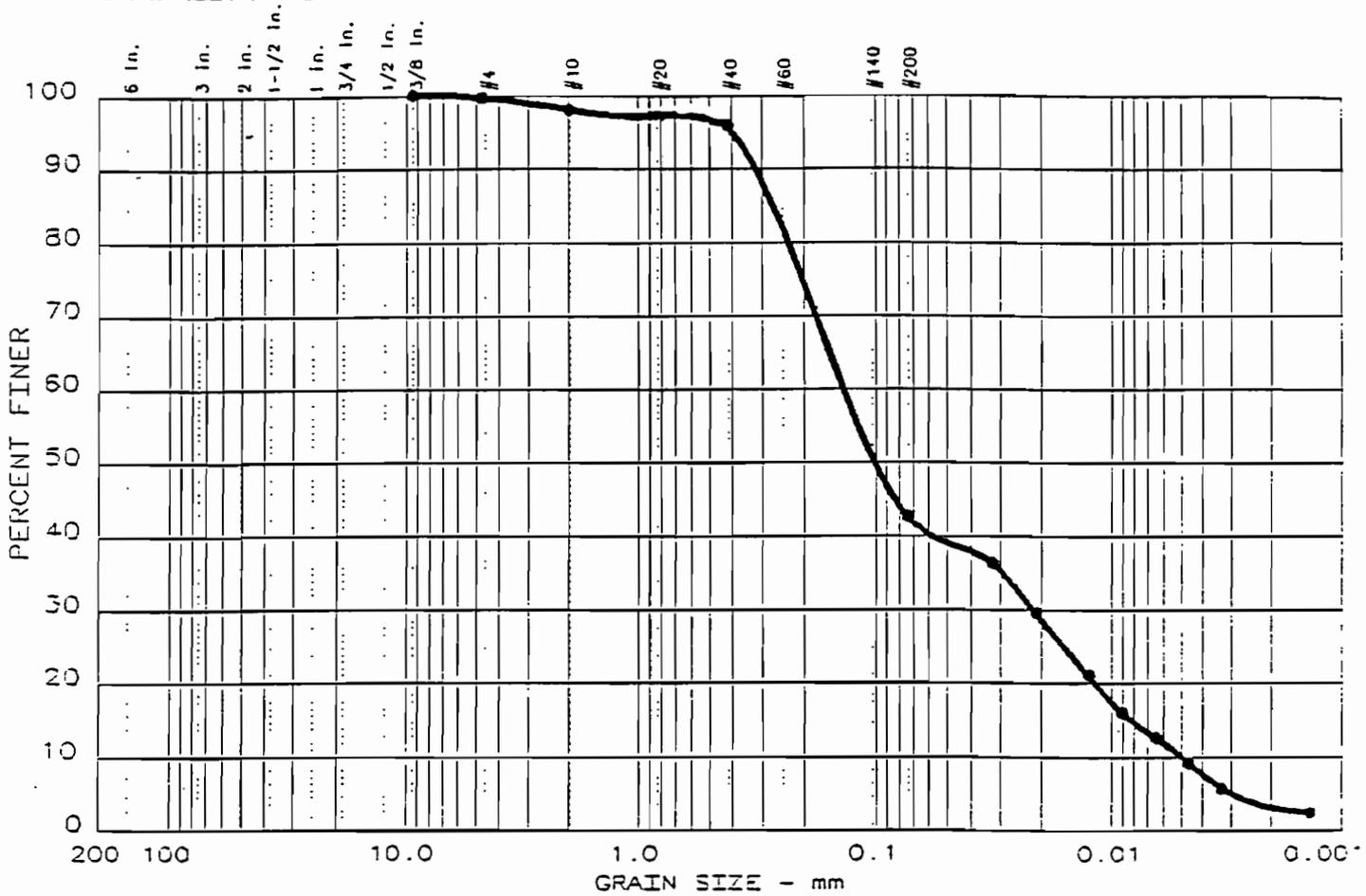
Project No.: 9701.14
 Project: P.O. SR008244 Client Code: 48696
 • Location: A7D230148-005 C97HG-1-03

EE13DD1P1

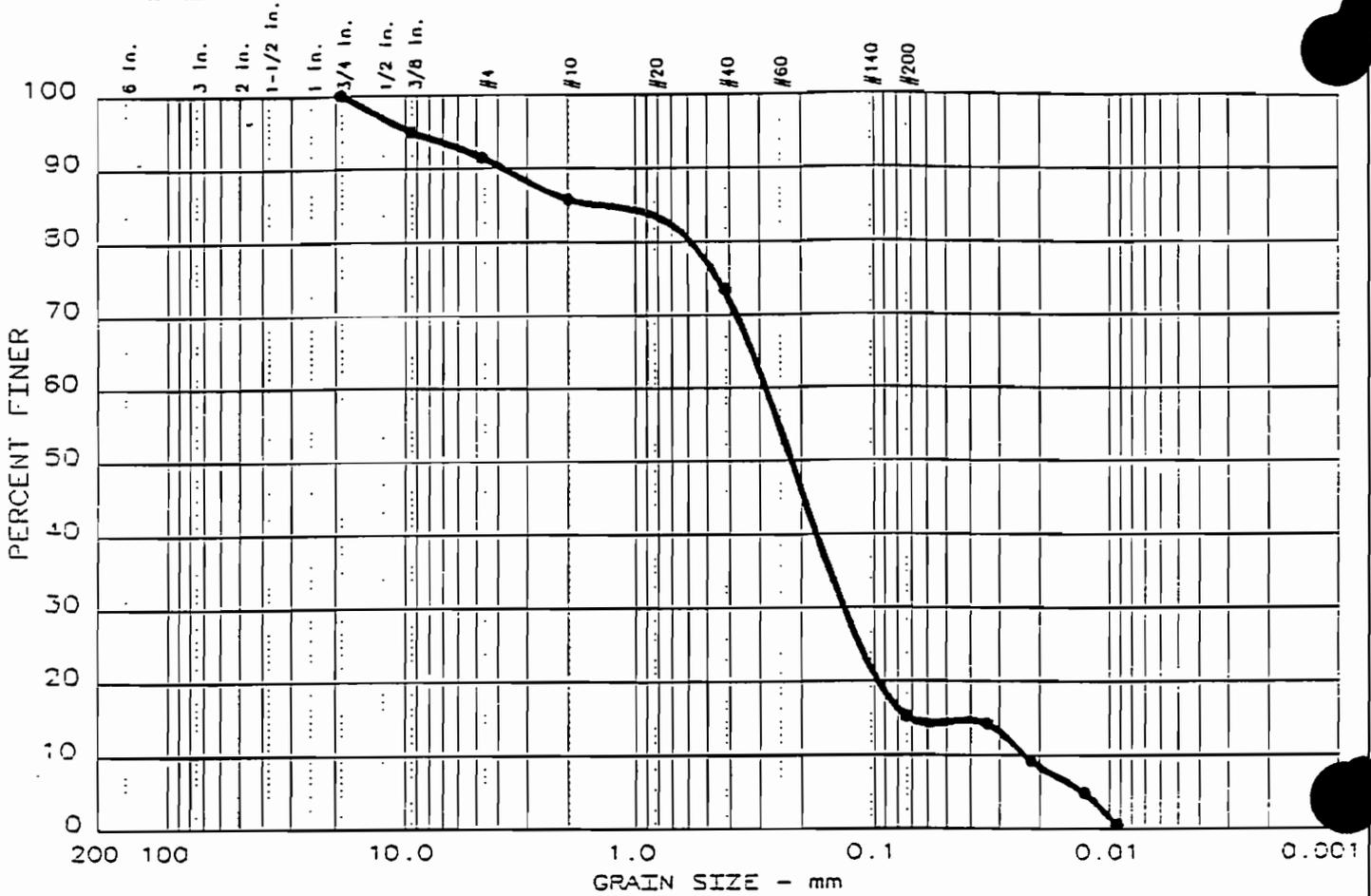
Date: 4-28-97

Remarks:
 Client: Quanterra Inc.
 Jar Samples Received On
 4-24-97

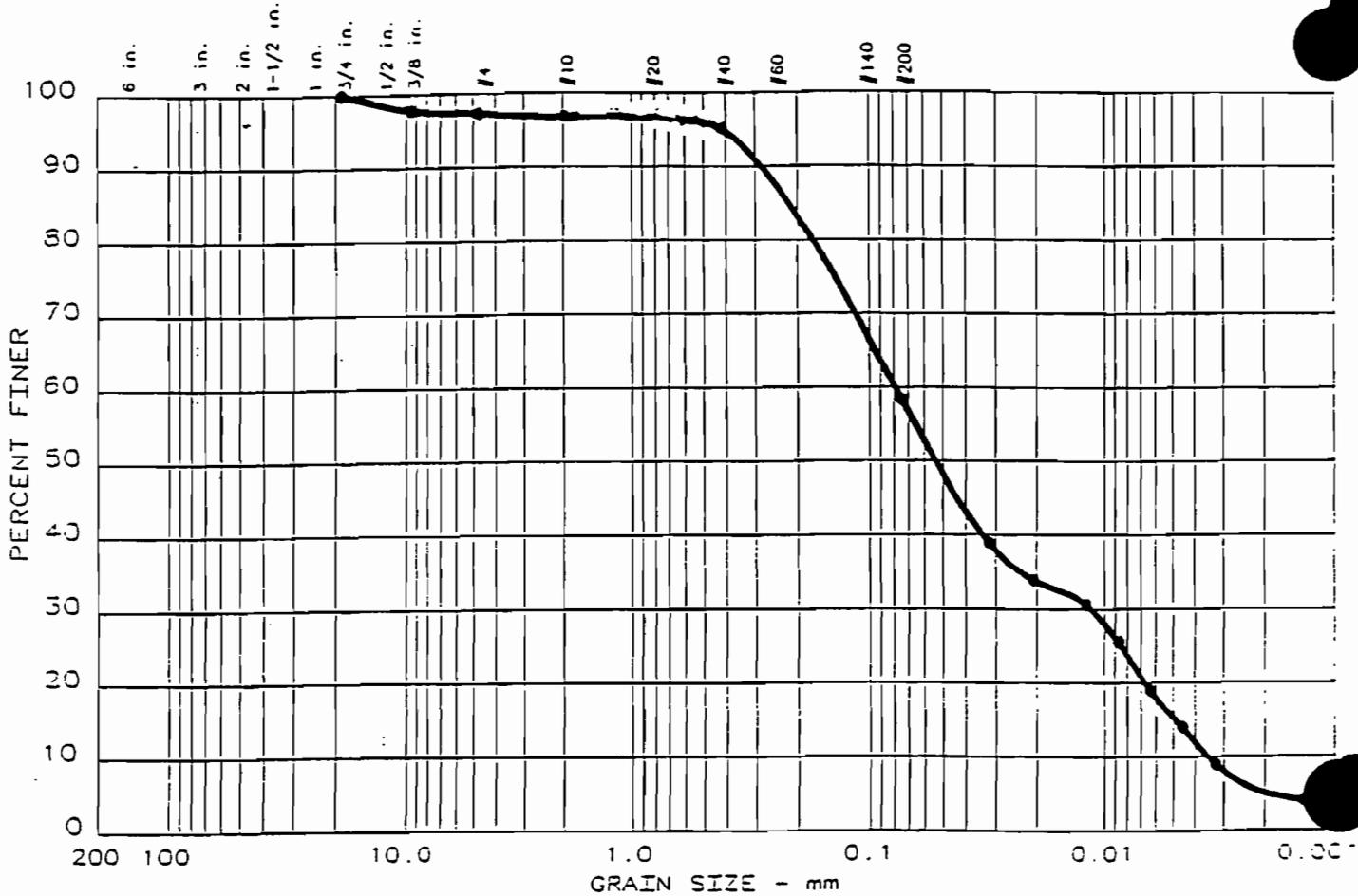
GRAIN SIZE DISTRIBUTION TEST REPORT



GRAIN SIZE DISTRIBUTION TEST REPORT



GRAIN SIZE DISTRIBUTION TEST REPORT



% +3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	3.2	38.5	43.1	15.2

LL	PI	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
		0.22	0.08	0.05	0.011	0.0049	0.0035	0.48	22.4

MATERIAL DESCRIPTION	USCS	AASHTO
• Brown Sandy Silty Clay	CL-ML	

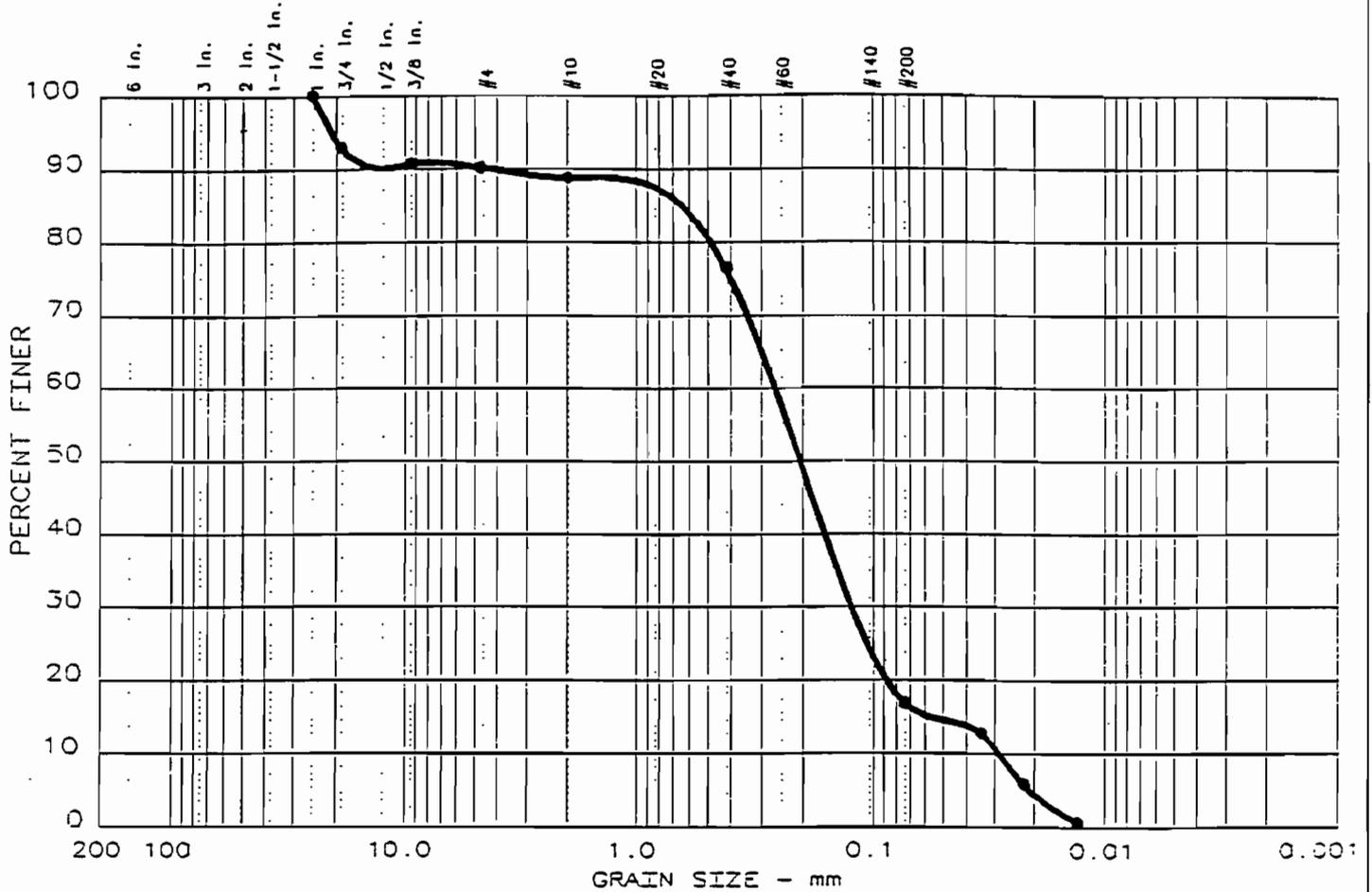
Project No.: 9701.14
 Project: P.O. SR008244 Client Code: 48696
 • Location: A7D230148-009 C97HL-1-03

EEØ4DD1P1

Date: 4-28-97

Remarks:
 Client: Quanterra Inc.
 Jar Samples Received On
 4-24-97

GRAIN SIZE DISTRIBUTION TEST REPORT



% +3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	11.3	71.8	16.9	

LL	PI	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
		0.65	0.26	0.21	0.124	0.0585	0.0286	2.04	9.1

MATERIAL DESCRIPTION	USCS	AASHTO
• Brown Silty Sand Little Gravel	SM	

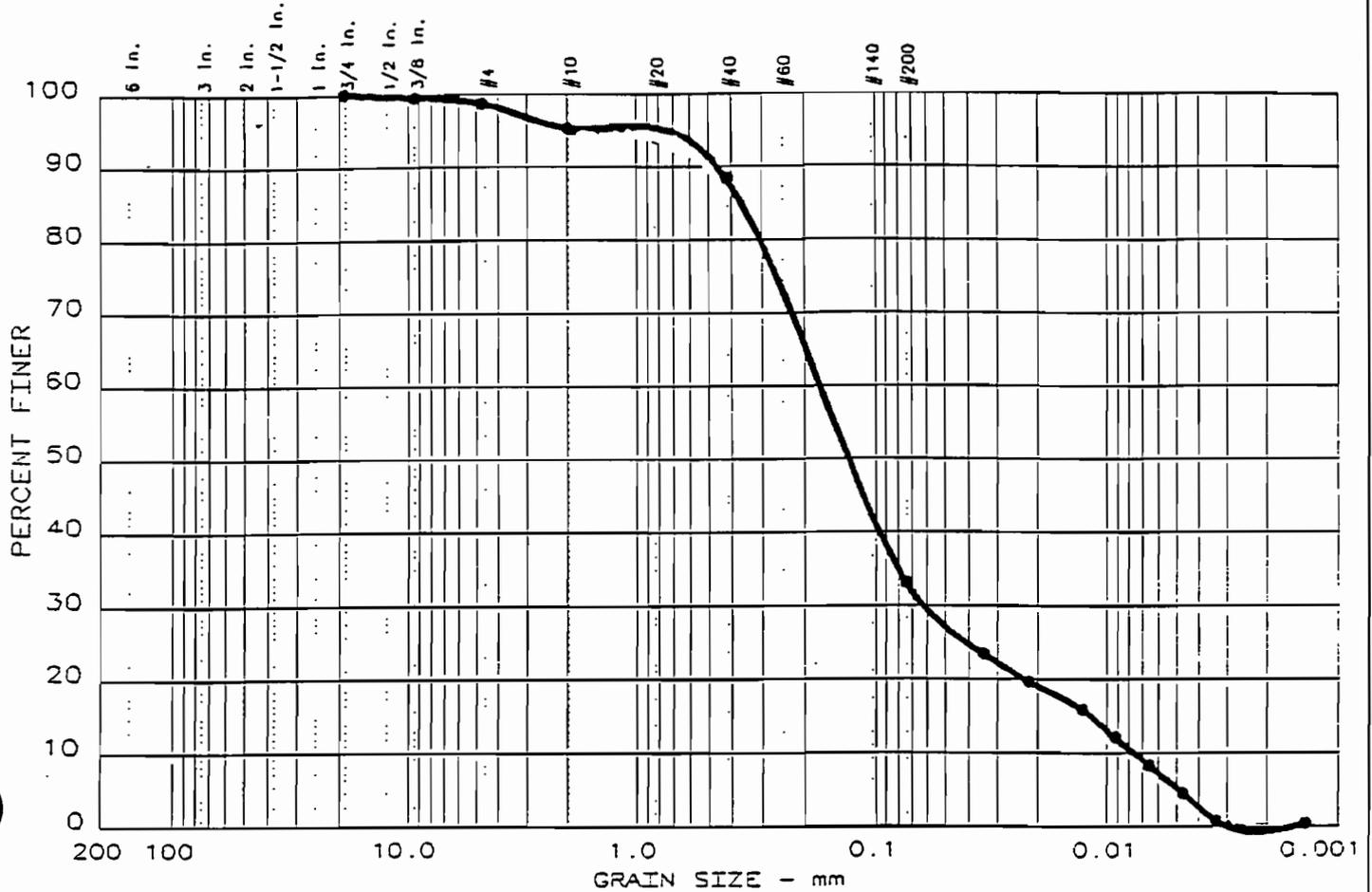
Project No.: 9701.14
 Project: P.O. SR008251 Client Code: 48696
 • Location: A7D240108-001 C97XR-1-03

EEφ5DD1P1

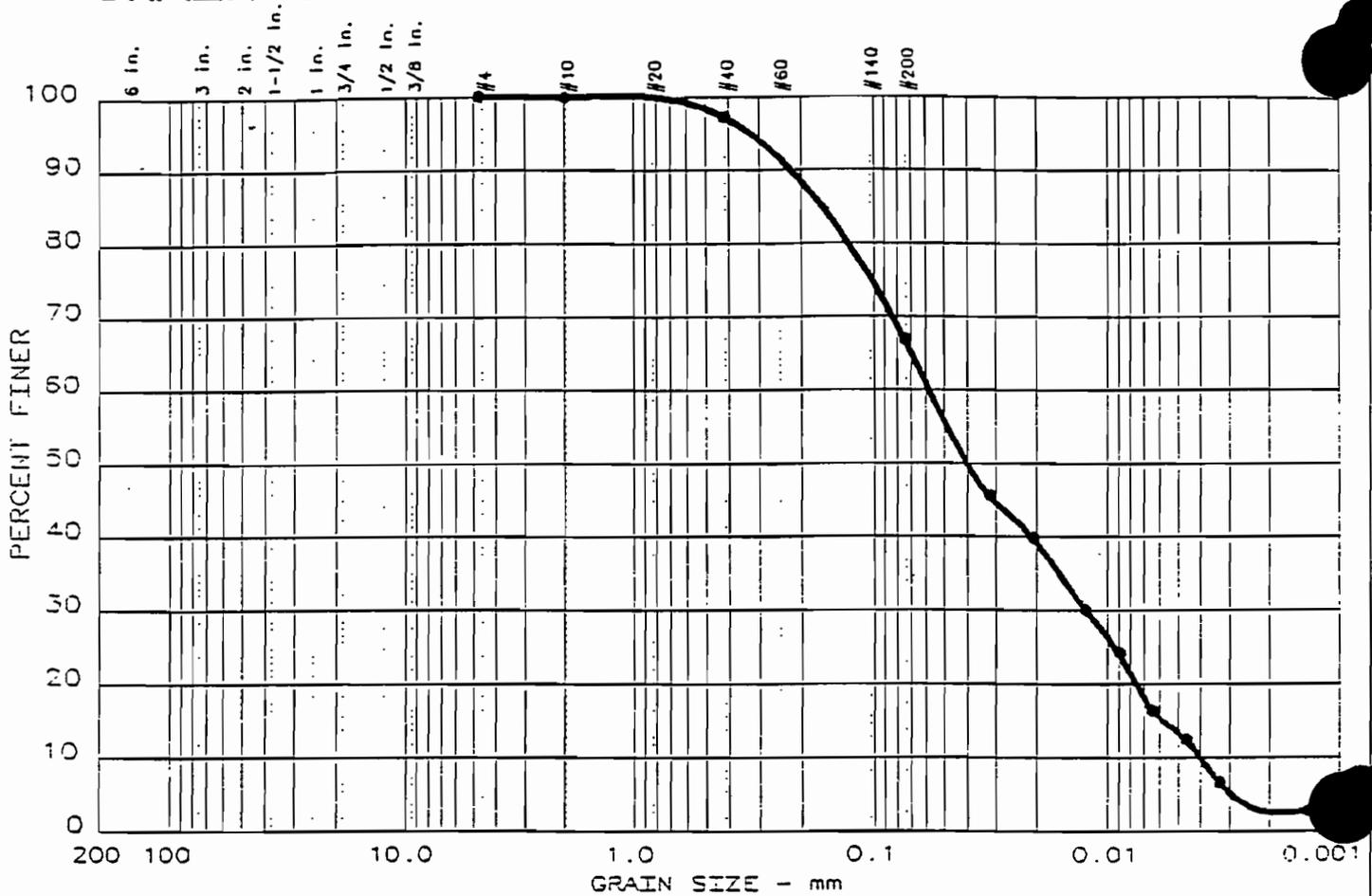
Date: 4-28-97

Remarks:
 Client: Quanterra Inc.
 Jar Samples Received On
 4-24-97.

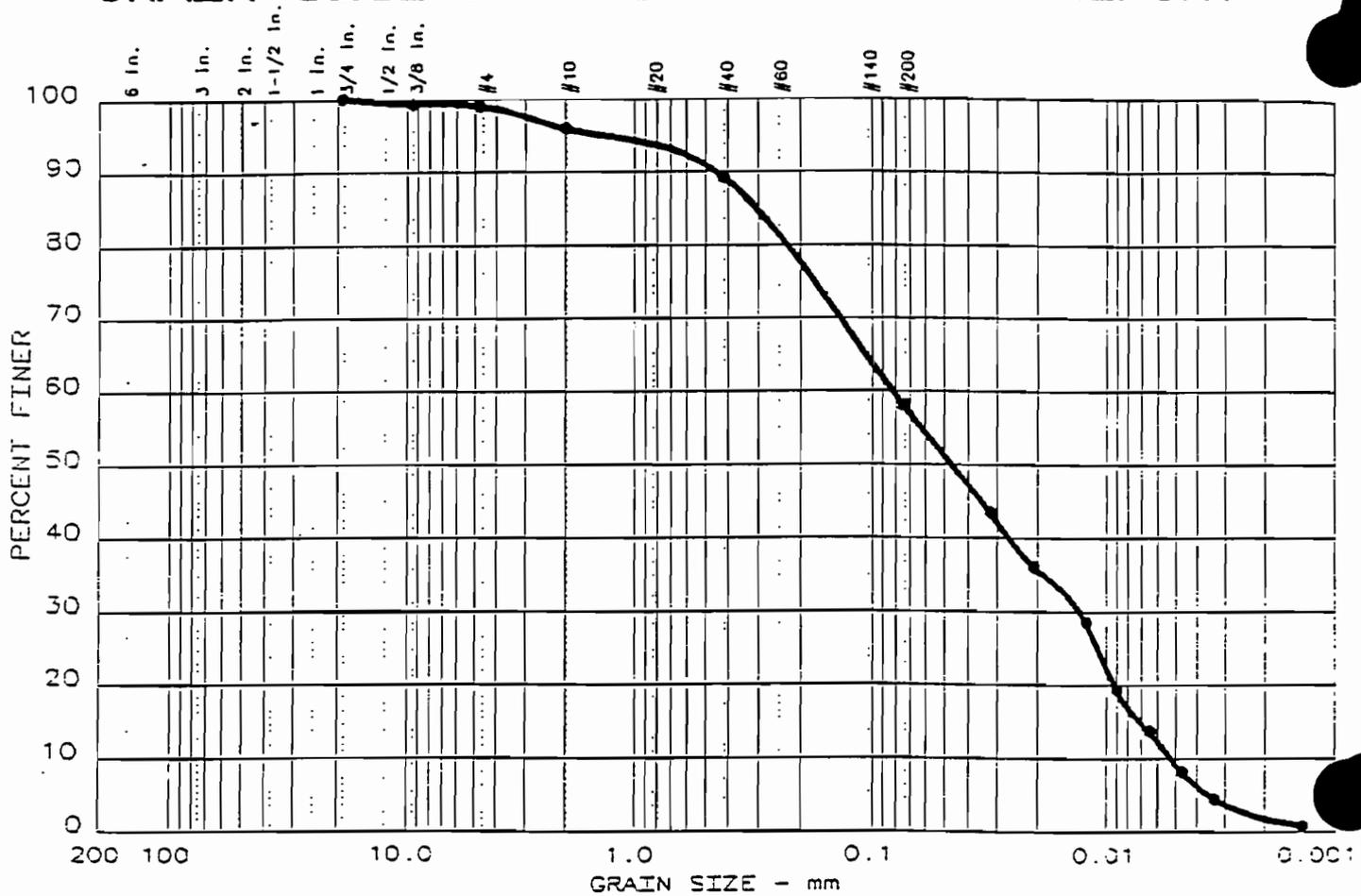
GRAIN SIZE DISTRIBUTION TEST REPORT



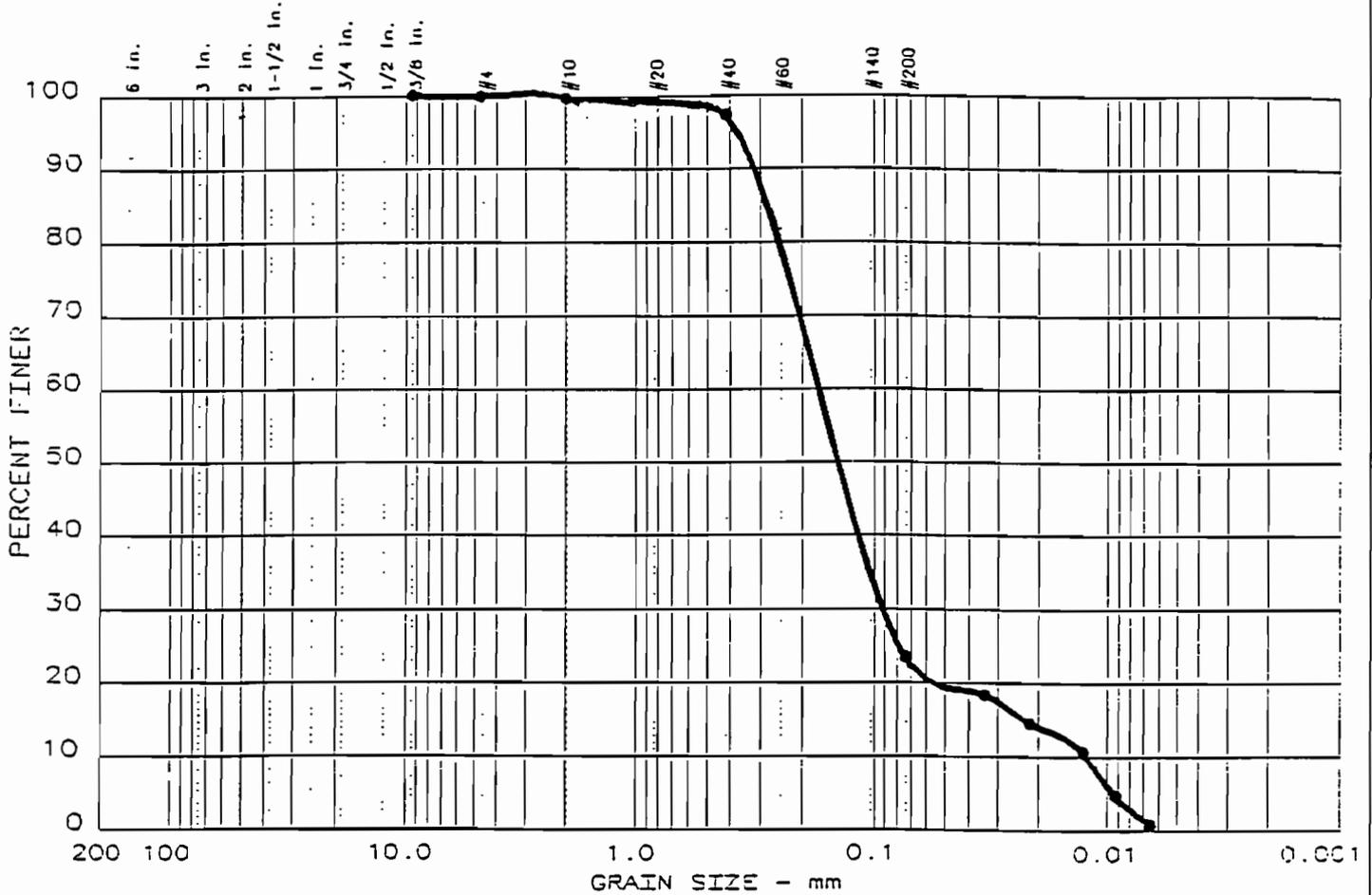
GRAIN SIZE DISTRIBUTION TEST REPORT



GRAIN SIZE DISTRIBUTION TEST REPORT



GRAIN SIZE DISTRIBUTION TEST REPORT



% +3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.4	76.2	23.4	

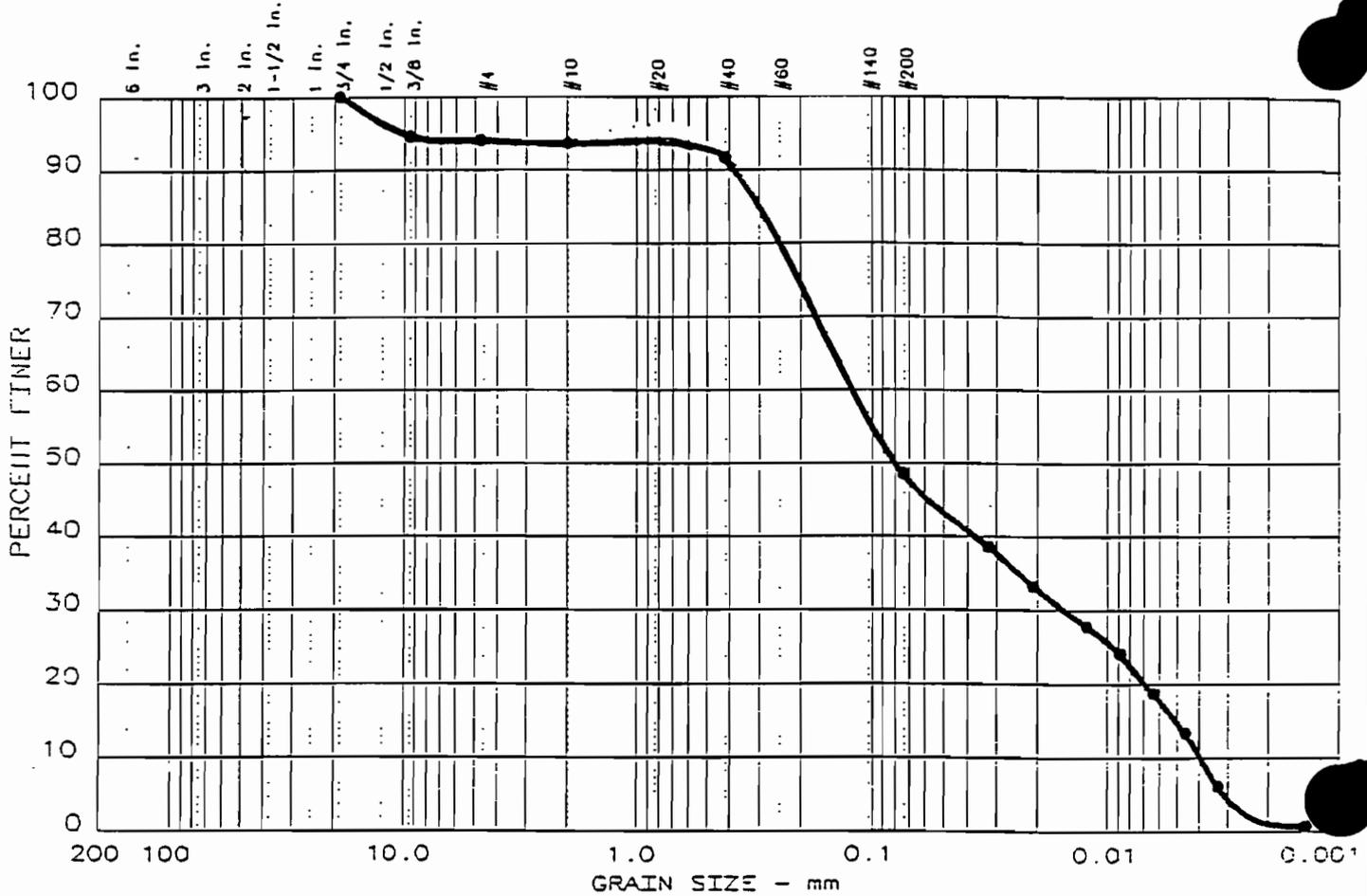
LL	PI	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
		0.28	0.17	0.14	0.092	0.0234	0.0123	4.06	13.8

MATERIAL DESCRIPTION	USCS	AASHTO
● BROWN SILTY FINE SAND.	SM	

Project No.: 9701.14
 Project: P.O. SR008251 Client Code: 48696
 ● Location: A7D240108-009 C9815-1-03
EE Ø9 DD1P1
 Date: 4-28-97

Remarks:
 Client: Quanterra Inc.
 Jar Samples Received On
 4-24-97.

GRAIN SIZE DISTRIBUTION TEST REPORT



% +3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	6.5	45.1	33.6	14.3

LL	PI	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
		0.30	0.12	0.08	0.016	0.0050	0.0040	0.51	30.6

MATERIAL DESCRIPTION	USCS	AASHTO
● Clayey Silty Brown Sand Trace Gravel.	SC-SM	A-4

Project No.: 9701.14
 Project: P.O. SR008251 Client Code: 48696
 ● Location: A7D240108-010 C9816-1-03

EEφ9UD1P1

Date: 4-28-97

Remarks:
 Client: Quanterra Inc.
 Jar Samples Received On
 4-24-97.

ABB ENVIRONMENTAL SERVICES, INC

Client Sample ID: EE01DD1P1

General Chemistry

Lot-Sample #....: A7D230148-001 Work Order #....: C97HA Matrix.....: SOLID
Date Sampled....: 04/22/97 13:15 Date Received...: 04/23/97
% Moisture.....: 53

<u>PARAMETER</u>	<u>RESULT</u>	<u>RL</u>	<u>UNITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>PREP BATCH #</u>
Percent Solids	46.6	0.10	%	MCAWW 160.3 MOD	05/12-05/13/97	7129182
	Dilution Factor: 1					
Total Organic Carbon 20000		210	mg/kg	SMCA WALKLEY-BLAC	05/13/97	7133216
	Dilution Factor: 1					

NOTE(S) :

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

ABB ENVIRONMENTAL SERVICES, INC

Client Sample ID: EE01UD1P1

General Chemistry

Lot-Sample #...: A7D230148-002 Work Order #...: C97HC Matrix.....: SOLID
Date Sampled...: 04/22/97 13:30 Date Received...: 04/23/97
% Moisture.....: 40

<u>PARAMETER</u>	<u>RESULT</u>	<u>RL</u>	<u>UNITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>PREP BATCH #</u>
Percent Solids	60.0	0.10	%	MCAWW 160.3 MOD	05/12-05/13/97	7129182
	Dilution Factor: 1					
Total Organic Carbon	13000	170	mg/kg	SMCA WALKLEY-BLAC	05/13/97	7133216
	Dilution Factor: 1					

NOTE(S) :

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

ABB ENVIRONMENTAL SERVICES, INC

Client Sample ID: KE03DD1P1

General Chemistry

Lot-Sample #....: A7D230148-003 Work Order #....: C97HD Matrix.....: SOLID
Date Sampled....: 04/22/97 14:50 Date Received...: 04/23/97
% Moisture.....: 63

<u>PARAMETER</u>	<u>RESULT</u>	<u>RL</u>	<u>UNITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>PREP BATCH #</u>
Percent Solids	37.4	0.10	%	MCAWW 160.3 MOD	05/12-05/13/97	7129182
	Dilution Factor: 1					
Total Organic Carbon	33000	270	mg/kg	SMCA WALKLEY-BLAC	05/13/97	7133216
	Dilution Factor: 1					

NOTE(S) :

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

ABB ENVIRONMENTAL SERVICES, INC

Client Sample ID: EE03UD1P1

General Chemistry

Lot-Sample #....: A7D230148-004 Work Order #....: C97HE Matrix.....: SOLID
Date Sampled....: 04/22/97 15:00 Date Received...: 04/23/97
% Moisture.....: 29

<u>PARAMETER</u>	<u>RESULT</u>	<u>RL</u>	<u>UNITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>PREP BATCH #</u>
Percent Solids	71.3	0.10	%	MCAWW 160.3 MOD	05/12-05/13/97	7129182
	Dilution Factor: 1					
Total Organic Carbon	5400	140	mg/kg	SMCA WALKLEY-BLAC	05/13/97	7133216
	Dilution Factor: 1					

NOTE(S) :

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

ABB ENVIRONMENTAL SERVICES, INC

Client Sample ID: EE13DD1P1

General Chemistry

Lot-Sample #....: A7D230148-005 Work Order #....: C97HG Matrix.....: SOLID
Date Sampled....: 04/22/97 15:25 Date Received...: 04/23/97
% Moisture.....: 26

<u>PARAMETER</u>	<u>RESULT</u>	<u>RL</u>	<u>UNITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>PREP BATCH #</u>
Percent Solids	74.0	0.10	%	MCAWW 160.3 MOD	05/12-05/13/97	7129182
	Dilution Factor: 1					
Total Organic Carbon	2100	140	mg/kg	SMCA WALKLEY-BLAC	05/13/97	7133216
	Dilution Factor: 1					

NOTE(S) :

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

ABB ENVIRONMENTAL SERVICES, INC

Client Sample ID: EE13UD1P1

General Chemistry

Lot-Sample #...: A7D230148-006 Work Order #...: C97HH Matrix.....: SOLID
Date Sampled...: 04/22/97 15:35 Date Received...: 04/23/97
% Moisture.....: 34

<u>PARAMETER</u>	<u>RESULT</u>	<u>RL</u>	<u>UNITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>PREP BATCH #</u>
Percent Solids	65.7 Dilution Factor: 1	0.10	%	MCAWW 160.3 MOD	05/12-05/13/97	7129182
Total Organic Carbon	7700 Dilution Factor: 1	150	mg/kg	SMCA WALKLEY-BLAC	05/13/97	7133216

NOTE(S) :

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

ABB ENVIRONMENTAL SERVICES, INC

Client Sample ID: KK07DD1P1

General Chemistry

Lot-Sample #....: A7D230148-007 Work Order #....: C97HJ Matrix.....: SOLID
Date Sampled...: 04/22/97 15:55 Date Received...: 04/23/97
% Moisture.....: 24

<u>PARAMETER</u>	<u>RESULT</u>	<u>RL</u>	<u>UNITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>PREP BATCH #</u>
Percent Solids	75.8	0.10	%	MCAWW 160.3 MOD	05/12-05/13/97	7129182
	Dilution Factor: 1					
Total Organic Carbon 3000		130	mg/kg	SMCA WALKLEY-BLAC	05/13/97	7133216
	Dilution Factor: 1					

NOTE (S) :

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

ABB ENVIRONMENTAL SERVICES, INC

Client Sample ID: EE07UD1P1

General Chemistry

Lot-Sample #....: A7D230148-008 Work Order #....: C97HK Matrix.....: SOLID
Date Sampled....: 04/22/97 16:00 Date Received...: 04/23/97
% Moisture.....: 44

<u>PARAMETER</u>	<u>RESULT</u>	<u>RL</u>	<u>UNITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>PREP BATCH #</u>
Percent Solids	55.7	0.10	%	MCAWW 160.3 MOD	05/12-05/13/97	7129182
	Dilution Factor: 1					
Total Organic Carbon	13000	180	mg/kg	SMCA WALKLEY-BLAC	05/13/97	7133216
	Dilution Factor: 1					

NOTE (S) :

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

ABB ENVIRONMENTAL SERVICES, INC

Client Sample ID: EE04DD1P1

General Chemistry

Lot-Sample #....: A7D230148-009 Work Order #....: C97HL Matrix.....: SOLID
Date Sampled....: 04/22/97 16:25 Date Received...: 04/23/97
% Moisture.....: 42

<u>PARAMETER</u>	<u>RESULT</u>	<u>RL</u>	<u>UNITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>PREP BATCH #</u>
Percent Solids	58.1	0.10	%	MCAWW 160.3 MOD	05/12-05/13/97	7132162
	Dilution Factor: 1					
Total Organic Carbon	11000	170	mg/kg	SMCA WALKLEY-BLAC	05/13/97	7133216
	Dilution Factor: 1					

NOTE (S) :

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

0542

ABB ENVIRONMENTAL SERVICES, INC

Client Sample ID: EE04UD1P1

General Chemistry

Lot-Sample #...: A7D230148-010 Work Order #...: C97HM Matrix.....: SOLID
Date Sampled...: 04/22/97 16:30 Date Received...: 04/23/97
% Moisture.....: 49

<u>PARAMETER</u>	<u>RESULT</u>	<u>RL</u>	<u>UNITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>PREP BATCH #</u>
Percent Solids	51.0	0.10	%	MCAWW 160.3 MOD	05/12-05/13/97	7132162
	Dilution Factor: 1					
Total Organic Carbon	11000	200	mg/kg	SMCA WALKLEY-BLAC	05/13/97	7133216
	Dilution Factor: 1					

NOTE (S) :

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

ABB ENVIRONMENTAL SERVICES, INC

Client Sample ID: EE05DD1P1

General Chemistry

Lot-Sample #....: A7D240108-001 Work Order #....: C97XR Matrix.....: SOLID
Date Sampled....: 04/23/97 10:55 Date Received...: 04/24/97
% Moisture.....: 29

<u>PARAMETER</u>	<u>RESULT</u>	<u>RL</u>	<u>UNITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>PREP BATCH #</u>
Percent Solids	71.3	0.10	%	MCAWW 160.3 MOD	05/12-05/13/97	7132198
	Dilution Factor: 1					
Total Organic Carbon	7100	280	mg/kg	SMCA WALKLEY-BLAC	05/16/97	7136214
	Dilution Factor: 2					

NOTE (S) :

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

ABB ENVIRONMENTAL SERVICES, INC

Client Sample ID: EE05UD1P1

General Chemistry

Lot-Sample #....: A7D240108-002 Work Order #....: C980L Matrix.....: SOLID
Date Sampled....: 04/23/97 11:15 Date Received...: 04/24/97
% Moisture.....: 52

<u>PARAMETER</u>	<u>RESULT</u>	<u>RL</u>	<u>UNITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>PREP BATCH #</u>
Percent Solids	47.5	0.10	%	MCAWW 160.3 MOD	05/12-05/13/97	7132198
	Dilution Factor: 1					
Total Organic Carbon	29000	420	mg/kg	SMCA WALKLEY-BLAC	05/16/97	7136214
	Dilution Factor: 2					

NOTE (S) :

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

ABB ENVIRONMENTAL SERVICES, INC

Client Sample ID: EE06DD1P1

General Chemistry

Lot-Sample #....: A7D240108-003 Work Order #....: C980M Matrix.....: SOLID
Date Sampled....: 04/23/97 12:05 Date Received...: 04/24/97
% Moisture.....: 62

<u>PARAMETER</u>	<u>RESULT</u>	<u>RL</u>	<u>UNITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>PREP BATCH #</u>
Percent Solids	38.3	0.10	%	MCAWW 160.3 MOD	05/12-05/13/97	7132198
	Dilution Factor: 1					
Total Organic Carbon	23000	520	mg/kg	SMCA WALKLEY-BLAC	05/16/97	7136214
	Dilution Factor: 2					

NOTE(S) :

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

ABB ENVIRONMENTAL SERVICES, INC

Client Sample ID: EE06UD1P1

General Chemistry

Lot-Sample #....: A7D240108-004 Work Order #....: C980X Matrix.....: SOLID
Date Sampled....: 04/23/97 12:30 Date Received...: 04/24/97
% Moisture.....: 70

<u>PARAMETER</u>	<u>RESULT</u>	<u>RL</u>	<u>UNITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>PREP BATCH #</u>
Percent Solids	30.4	0.10	%	MCAWW 160.3 MOD	05/12-05/13/97	7132198
	Dilution Factor: 1					
Total Organic Carbon	43000	660	mg/kg	SMCA WALKLEY-BLAC	05/16/97	7136214
	Dilution Factor: 2					

NOTE (S) :

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

ABB ENVIRONMENTAL SERVICES, INC

Client Sample ID: KKN2DD1P1

General Chemistry

Lot-Sample #....: A7D240108-005 Work Order #....: C9811 Matrix.....: SOLID
Date Sampled....: 04/23/97 14:25 Date Received...: 04/24/97
% Moisture.....: 60

<u>PARAMETER</u>	<u>RESULT</u>	<u>RL</u>	<u>UNITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>PREP BATCH #</u>
Percent Solids	40.3	0.10	%	MCAWW 160.3 MOD	05/12-05/13/97	7132198
	Dilution Factor: 1					
Total Organic Carbon	32000	500	mg/kg	SMCA WALKLEY-BLAC	05/16/97	7136214
	Dilution Factor: 2					

NOTE (S) :

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

ABB ENVIRONMENTAL SERVICES, INC

Client Sample ID: EKNZUD1P1

General Chemistry

Lot-Sample #....: A7D240108-006 Work Order #....: C9812 Matrix.....: SOLID
Date Sampled....: 04/23/97 14:45 Date Received...: 04/24/97
% Moisture.....: 61

<u>PARAMETER</u>	<u>RESULT</u>	<u>RL</u>	<u>UNITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>PREP BATCH #</u>
Percent Solids	38.6	0.10	%	MCAWW 160.3 MOD	05/12-05/13/97	7132198
	Dilution Factor: 1					
Total Organic Carbon	35000	520	mg/kg	SMCA WALKLEY-BLAC	05/16/97	7136214
	Dilution Factor: 2					

NOTE (S) :

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

ABB ENVIRONMENTAL SERVICES, INC

Client Sample ID: KENLDD1P1

General Chemistry

Lot-Sample #....: A7D240108-007 Work Order #....: C9813 Matrix.....: SOLID
Date Sampled....: 04/23/97 15:15 Date Received...: 04/24/97
% Moisture.....: 40

<u>PARAMETER</u>	<u>RESULT</u>	<u>RL</u>	<u>UNITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>PREP BATCH #</u>
Percent Solids	59.6	0.10	%	MCAWW 160.3 MOD	05/12-05/13/97	7132198
	Dilution Factor: 1					
Total Organic Carbon	8800	340	mg/kg	SMCA WALKLEY-BLAC	05/16/97	7136214
	Dilution Factor: 2					

NOTE(S) :

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

ABB ENVIRONMENTAL SERVICES, INC

Client Sample ID: KEN1UD1P1

General Chemistry

Lot-Sample #....: A7D240108-008 Work Order #....: C9814 Matrix.....: SOLID
Date Sampled....: 04/23/97 15:22 Date Received...: 04/24/97
% Moisture.....: 45

<u>PARAMETER</u>	<u>RESULT</u>	<u>RL</u>	<u>UNITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>PREP BATCH #</u>
Percent Solids	54.8	0.10	%	MCAWW 160.3 MOD	05/12-05/13/97	7132198
	Dilution Factor: 1					
Total Organic Carbon 12000		370	mg/kg	SMCA WALKLEY-BLAC	05/16/97	7136214
	Dilution Factor: 2					

NOTE(S) :

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

ABB ENVIRONMENTAL SERVICES, INC

Client Sample ID: KE09DD1P1

General Chemistry

Lot-Sample #....: A7D240108-009 Work Order #....: C9815 Matrix.....: SOLID
Date Sampled...: 04/23/97 15:45 Date Received...: 04/24/97
% Moisture.....: 44

<u>PARAMETER</u>	<u>RESULT</u>	<u>RL</u>	<u>UNITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>PREP BATCH #</u>
Percent Solids	56.3	0.10	%	MCAWW 160.3 MOD	05/12-05/13/97	7132198
	Dilution Factor: 1					
Total Organic Carbon	19000	360	mg/kg	SMCA WALKLEY-BLAC	05/16/97	7136214
	Dilution Factor: 2					

NOTE (S) :

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

ABB ENVIRONMENTAL SERVICES, INC

Client Sample ID: KE09UD1P1

General Chemistry

Lot-Sample #....: A7D240108-010 Work Order #....: C9816 Matrix.....: SOLID
Date Sampled....: 04/23/97 16:00 Date Received...: 04/24/97
% Moisture.....: 66

<u>PARAMETER</u>	<u>RESULT</u>	<u>RL</u>	<u>UNITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>PREP BATCH #</u>
Percent Solids	33.9	0.10	%	MCAWW 160.3 MOD	05/12-05/13/97	7132198
	Dilution Factor: 1					
Total Organic Carbon	43000	590	mg/kg	SMCA WALKLEY-BLAC	05/16/97	7136214
	Dilution Factor: 2					

NOTE (S) :

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

ABB ENVIRONMENTAL SERVICES, INC

Client Sample ID: EE10DD1P1

General Chemistry

Lot-Sample #....: A7D240108-011 Work Order #....: C9817 Matrix.....: SOLID
Date Sampled....: 04/23/97 16:13 Date Received...: 04/24/97
% Moisture.....: 41

<u>PARAMETER</u>	<u>RESULT</u>	<u>RL</u>	<u>UNITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>PREP BATCH #</u>
Percent Solids	59.2	0.10	%	MCAWW 160.3 MOD	05/12-05/13/97	7132198
	Dilution Factor: 1					
Total Organic Carbon	30000	340	mg/kg	SMCA WALKLEY-BLAC	05/16/97	7136214
	Dilution Factor: 2					

NOTE (S) :

RL Reporting Limit
Results and reporting limits have been adjusted for dry weight.

ABB ENVIRONMENTAL SERVICES, INC

Client Sample ID: EE10UD1P1

General Chemistry

Lot-Sample #....: A7D240108-012 Work Order #....: C9818 Matrix.....: SOLID
Date Sampled....: 04/23/97 16:20 Date Received...: 04/24/97
% Moisture.....: 32

<u>PARAMETER</u>	<u>RESULT</u>	<u>RL</u>	<u>UNITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>PREP BATCH #</u>
Percent Solids	67.7 Dilution Factor: 1	0.10	%	MCAWW 160.3 MOD	05/12-05/13/97	7132198
Total Organic Carbon	11000 Dilution Factor: 2	300	mg/kg	SMCA WALKLEY-BLAC	05/16/97	7136214

NOTE(S) :

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

ATTACHMENT D

GLOSSARY

GLOSSARY

ABB-ES	ABB Environmental Services, Inc.
NCBC	Naval Construction Battalion Center
SRT	sediment recovery trap
TOC	total organic carbon