APPENDIX B
BORING LOGS

LOG OF BORING L18-A

PROJECT NUMBER: 89-977	PROJECT NAME: B-18 LANDFILL, KHF		
BORING NUMBER: L18-A	ELEVATION: 856'	DATE	
COORDINATES: N. 228,940 E. 1,700,840	BORING DIA.: 5"	STARTED	COMPLETED
DRILLING METHODS: MUD ROTARY	WATER DEPTH: NONE	3/12/90	3/12/90
ENG/GEO: R. HARLAN (WAHLER ASSOCIATES)	CHECKED BY: J. BADEL	PAGE: 1 OF 3	

LEGEND

SANDS
SILTS
CLAYS
SANDSTONE (ss)
SILTSTONE (slt)
CLAYSTONE (cs)

PB - Pitcher Barrel
DR - Drive Ring Sample
CHEM - Chemical Test
PI - Atterberg Limits Test
COMP - Compaction Test
DIR - Direct Shear Test
TX - Triaxial Test

PER - Permeability Test
SW - Swelling Test
SI - Sieve Analysis Test
%200 - Percentage Passing
HYD - Hydrometer Test
SG - Specific Gravity Test

DEPTH IN FEET	SAMPLE TYPE	SAMPLE NO.	RESISTANCE (BLOWS PER FOOT)	RECOVERY	USCS/ROCK TYPE	PROFILE	DESCRIPTION	MOISTURE CONTENT %	DRY DENSITY (pcf)	OTHER TESTS
							SAN JOAQUIN FORMATION			
1, 2, 3, 4					cs		CLAYSTONE/SANDSTONE, gray, light brown, gray brown, orange claystone; interbedded claystone/sandstone, laminated, soft, weak			
5	PB	S-1	300 - 400	1.0/1.1	ss		- predominantly claystone from 0' - 0.5' - sandstone at 4.5'	18	98	
6, 7, 8, 9					cs/ss		- gray claystone, orange-tan silty sandstone (interbedded)			
10, 11	PB	S-2	250	2.1/2.5			- orange claystone laminae, sandstone			
12							- tan, light brown sandstone, very fine, clean			
13, 14, 15							- light brown, gray brown, orange claystone, lesser gray claystone, sandstone from 12.5' to 17'			

REV. 8/10/90

LOG OF BORING L18-A

PROJECT NUMBER: 89-977	PROJECT NAME: B-18 LANDFILL, KHF		
BORING NUMBER: L18-A	ELEVATION: 856'	DATE	
COORDINATES: N. 228,940 E. 1,700,840	BORING DIA.: 5"	STARTED	COMPLETED
DRILLING METHODS: MUD ROTARY	WATER DEPTH: NONE	3/12/90	3/12/90
ENG/GEO: R. HARLAN (WAHLER ASSOCIATES)	CHECKED BY: J. BADEL	PAGE: 2 OF 3	

DEPTH IN FEET	SAMPLE TYPE	SAMPLE NO.	RESISTANCE (BLOWS PER FOOT)	RECOVERY	USCS/ROCK TYPE	PROFILE	DESCRIPTION	MOISTURE CONTENT %	DRY DENSITY (pcf)	OTHER TESTS
16					cs/ ss					
17					ss		- clean, very fine sandstone			
18	PB	S-3	250	2.4/2.5	slt/cs		- interbedded siltstone/claystone, laminated	16	102	%200
19			300				- interbedded sandstone/claystone, laminated to very thin bedded			
20							- fine, clean, sandstone, tan with gray claystone lamination			
21					ss/ cs					
22							- red, hard cemented sandstone			
23										
24										
25							- very fine, silty sandstone, light brown			
26	PB	S-4	350	2.5/2.5			- silty sandstone, sandy siltstone	20		%200
27					ss/ slt		- very fine, silty sandstone, light brown with minor claystone pocket/lamination			
28										
29										
30										
31										
32					ss/ cs					
33										
34	PB	S-5	350	2.2/2.5						CHEM
35							- claystone with sandstone			

LOG OF BORING L18-A

PROJECT NUMBER: 89-977	PROJECT NAME: B-18 LANDFILL, KHF		
BORING NUMBER: L18-A	ELEVATION: 856'	DATE	
COORDINATES: N. 228,940 E. 1,700,840	BORING DIA.: 5"	STARTED	COMPLETED
DRILLING METHODS: MUD ROTARY	WATER DEPTH: NONE	3/12/90	3/12/90
ENG/GEO: R. HARLAN (WAHLER ASSOCIATES)	CHECKED BY: J. BADEL	PAGE: 3 OF 3	

DEPTH IN FEET	SAMPLE TYPE	SAMPLE NO.	RESISTANCE (BLOWS PER FOOT)	RECOVERY	USCS/ROCK TYPE	PROFILE	DESCRIPTION	MOISTURE CONTENT %	DRY DENSITY (pcf)	OTHER TESTS
36					ss/ cs		- very fine silty sandstone with claystone laminations			
37					cs		- claystone with interbedded sandstone laminae			
38	PB	S-6		1.5/1.7	ss		- silty sandstone with claystone laminae	15	102	%200

- TOTAL DEPTH = 38.7'
- NO GROUND WATER ENCOUNTERED
- BACKFILLED WITH CEMENT GROUT VIA TREMIE

LOG OF BORING L18-B

PROJECT NUMBER: 89-977	PROJECT NAME: B-18 LANDFILL, KHF		
BORING NUMBER: L18-B	ELEVATION: 861'	DATE	
COORDINATES: N. 228,750 E. 1,700,860	BORING DIA.: 5"	STARTED	COMPLETED
DRILLING METHODS: MUD ROTARY	WATER DEPTH: NONE	3/13/90	3/13/90
ENG/GEO: R. HARLAN (WAHLER ASSOCIATES)	CHECKED BY: J. BADEL	PAGE: 1 OF 3	

LEGEND

SANDS
SILTS
CLAYS
SANDSTONE (ss)
SILTSTONE (slt)
CLAYSTONE (cs)

PB - Pitcher Barrel
DR - Drive Ring Sample
CHEM - Chemical Test
PI - Atterberg Limits Test
COMP - Compaction Test
DIR - Direct Shear Test
TX - Triaxial Test

PER - Permeability Test
SW - Swelling Test
SI - Sieve Analysis Test
%200 - Percentage Passing
HYD - Hydrometer Test
SG - Specific Gravity Test

DEPTH IN FEET	SAMPLE TYPE	SAMPLE NO.	RESISTANCE (BLOWS PER FOOT)	RECOVERY	USCS/ROCK TYPE	PROFILE	DESCRIPTION	MOISTURE CONTENT %	DRY DENSITY (pcf)	OTHER TESTS
1					CS		SAN JOAQUIN FORMATION CLAYSTONE, gray, highly plastic, minor very fine sand, occasional sandstone pockets (bioturbation), laminae			
2										
3										
4										
5										
6										
7	PB	S-1		2.3/2.5			- silty claystone, high plasticity, some sandstone modules and bedding	22	96	PI-HYD
8							- gray claystone, minor very fine sand at 8.3'			
9										
10										
11					SS		SILTY SANDSTONE, tan, light brown, mottled orange, very fine grained			
12	PB	S-2		2.4/2.5						
13										
14										
15										

REV. 8/10/90

LOG OF BORING L18-B

PROJECT NUMBER: 89-977	PROJECT NAME: B-18 LANDFILL, KHF		
BORING NUMBER: L18-B	ELEVATION: 861'	DATE	
COORDINATES: N. 228,750 E. 1,700,860	BORING DIA.: 5"	STARTED	COMPLETED
DRILLING METHODS: MUD ROTARY	WATER DEPTH: NONE	3/13/90	3/13/90
ENG/GEO: R. HARLAN (WAHLER ASSOCIATES)	CHECKED BY: J. BADEL	PAGE: 2 OF 3	

DEPTH IN FEET	SAMPLE TYPE	SAMPLE NO.	RESISTANCE (BLOWS PER FOOT)	RECOVERY	USCS/ROCK TYPE	PROFILE	DESCRIPTION	MOISTURE CONTENT %	DRY DENSITY (pcf)	OTHER TESTS
16, 17, 18					ss (silty)					
19, 20, 21, 22, 23, 24, 25, 26	PB	S-3		1.6/2.5	ss		SANDSTONE, tan, mottled orange, very fine to medium grained, clean (<10% fines), occasional cemented claystone laminae, orange	16	107	TX DIR
27, 28, 29, 30, 31, 32, 33, 34, 35	PB	S-4		2.2/2.5	ss, w/ cs/slt		SANDSTONE with interbedded CLAYSTONE/ SILTSTONE, predominantly tan, light brown sandstone (very fine grained), lesser gray claystone, clayey siltstone interbeds - very fine sandstone at 30.2'			

LOG OF BORING L18-B

PROJECT NUMBER: 89-977	PROJECT NAME: B-18 LANDFILL, KHF		
BORING NUMBER: L18-B	ELEVATION: 861'	DATE	
COORDINATES: N. 228,750 E. 1,700,860	BORING DIA.: 5"	STARTED	COMPLETED
DRILLING METHODS: MUD ROTARY	WATER DEPTH: NONE	3/13/90	3/13/90
ENG/GEO: R. HARLAN (WAHLER ASSOCIATES)	CHECKED BY: J. BADEL	PAGE: 3 OF 3	

DEPTH IN FEET	SAMPLE TYPE	SAMPLE NO.	RESISTANCE (BLOWS PER FOOT)	RECOVERY	USCS/ROCK TYPE	PROFILE	DESCRIPTION	MOISTURE CONTENT %	DRY DENSITY (pcf)	OTHER TESTS
36										
37					SS		SANDSTONE, tan, fine to medium grained, clean			
38	PB	S-5		2.0/2.5				14	106	%200
39										

- TOTAL DEPTH = 39.5'
- NO GROUND WATER ENCOUNTERED
- BACKFILLED WITH CEMENT GROUT VIA TREMIE

LOG OF BORING L18-C

PROJECT NUMBER: 89-977	PROJECT NAME: B-18 LANDFILL, KHF		
BORING NUMBER: L18-C	ELEVATION: 754'	DATE	
COORDINATES: N. 228,620 E. 1,702,120	BORING DIA.: 5"	STARTED	COMPLETED
DRILLING METHODS: MUD ROTARY	WATER DEPTH: NONE	3/13/90	3/14/90
ENG/GEO: R. HARLAN (WAHLER ASSOCIATES)	CHECKED BY: J. BADEL	PAGE: 1 OF 5	

LEGEND

SANDS
SILTS
CLAYS
SANDSTONE (ss)
SILTSTONE (slt)
CLAYSTONE (cs)

PB - Pitcher Barrel
DR - Drive Ring Sample
CHEM - Chemical Test
PI - Atterberg Limits Test
COMP - Compaction Test
DIR - Direct Shear Test
TX - Triaxial Test

PER - Permeability Test
SW - Swelling Test
SI - Sieve Analysis Test
%200 - Percentage Passing
HYD - Hydrometer Test
SG - Specific Gravity Test

DEPTH IN FEET	SAMPLE TYPE	SAMPLE NO.	RESISTANCE (BLOWS PER FOOT)	RECOVERY	USCS/ROCK TYPE	PROFILE	DESCRIPTION	MOISTURE CONTENT %	DRY DENSITY (pcf)	OTHER TESTS
							COLLUVIUM			
1							SANDY CLAY, light brown, damp (to 7.5'), low to moderate plasticity, 20 to 40% very fine grained sand.			
2										
3										
4										
5					cl					
6										
7	DR	B-1	15	1.3/1.5			- very stiff from 6' to 7.5'			PI
8										
9										
10										
11										
12										
13	DR	B-2	17	.8/15	sp		- 1"/2 thick, clean, very fine grained sand lens.			
14					cl		- very stiff from 12' to 13.5'			
15										

REV. 8/10/90

LOG OF BORING L18-C

PROJECT NUMBER: 89-977	PROJECT NAME: B-18 LANDFILL, KHF		
BORING NUMBER: L18-C	ELEVATION: 754'	DATE	
COORDINATES: N. 228,620 E. 1,702,120	BORING DIA.: 5"	STARTED	COMPLETED
DRILLING METHODS: MUD ROTARY	WATER DEPTH: NONE	3/13/90	3/14/90
ENG/GEO: R. HARLAN (WAHLER ASSOCIATES)	CHECKED BY: J. BADEL	PAGE: 2 OF 5	

DEPTH IN FEET	SAMPLE TYPE	SAMPLE NO.	RESISTANCE (BLOWS PER FOOT)	RECOVERY	USCS/ROCK TYPE	PROFILE	DESCRIPTION	MOISTURE CONTENT %	DRY DENSITY (pcf)	OTHER TESTS
16	PB	S-1		2.1/2.3	cl			23	100	PI HYD.
17					slt		SAN JOAQUIN FORMATION			
18										
19							SILTSTONE, gray - brown, mottled orange, non - plastic, occasional gray claystone laminae, (Iron oxide stained.)			
20										
21	PB	S-2		2.3/2.5			- bedding @ ~ 20° @ 16'			CHM
22							- siltstone, non-plastic, trace of very fine grained sand.			
23										
24										
25										
26	PB	S-3		2.2/2.5	slt cs		- silty claystone - clayey siltstone, moderate plasticity at 26'	14	102	PI
27					slt		- siltstone at 27.2'			
28										
29					cs/slt		CLAYSTONE/SILTSTONE, gray claystone, light gray-brown, clayey siltstone, inter bedded, laminated.			
30										
31										
32										
33										
34	PB	S-4		1.9/2.0						
35										

LOG OF BORING L18-C

PROJECT NUMBER: 89-977	PROJECT NAME: B-18 LANDFILL, KHF		
BORING NUMBER: L18-C	ELEVATION: 754'	DATE	
COORDINATES: N. 228,620 E. 1,702,120	BORING DIA.: 5"	STARTED	COMPLETED
DRILLING METHODS: MUD ROTARY	WATER DEPTH: NONE	3/13/90	3/14/90
ENG/GEO: R. HARLAN (WAHLER ASSOCIATES)	CHECKED BY: J. BADEL	PAGE: 3 OF 5	

DEPTH IN FEET	SAMPLE TYPE	SAMPLE NO.	RESISTANCE (BLOWS PER FOOT)	RECOVERY	USCS/ROCK TYPE	PROFILE	DESCRIPTION	MOISTURE CONTENT %	DRY DENSITY (pcf)	OTHER TESTS
36										
37					ss		SANDSTONE, SILTY SANDSTONE, light brown, very fine to fine grained			
38										
39										
40										
41										
42	PB	S-5		2.0/2.1			- silty sandstone, light brown, very fine grained.	12	102	
43										
44										
45										
46										
47										
48										
49	PB	S-6		1.9/2.1	slt, cs		SANDSTONE, CLAYSTONE, gray brown, gray, interbedded (laminated-thin bedded), occasional sandstone interbeds.			
50										
51							- gray siltstone, non-plastic at 49.9'			
52										
53										
54										
55										

LOG OF BORING L18-C

PROJECT NUMBER: 89-977	PROJECT NAME: B-18 LANDFILL, KHF		
BORING NUMBER: L18-C	ELEVATION: 754'	DATE	
COORDINATES: N. 228,620 E. 1,702,120	BORING DIA.: 5"	STARTED	COMPLETED
DRILLING METHODS: MUD ROTARY	WATER DEPTH: NONE	3/13/90	3/14/90
ENG/GEO: R. HARLAN (WAHLER ASSOCIATES)	CHECKED BY: J. BADEL	PAGE: 4 OF 5	

DEPTH IN FEET	SAMPLE TYPE	SAMPLE NO.	RESISTANCE (BLOWS PER FOOT)	RECOVERY	USCS/ROCK TYPE	PROFILE	DESCRIPTION	MOISTURE CONTENT %	DRY DENSITY (pcf)	OTHER TESTS
56										
57	PB	S-7		1.8/2.0	cs ss					PI HYD TX DIR
58					cs					
59					slt					
60					slt, cs					
61										
62										
63										
64										
65	PB	S-8		1.8/2.3			- gray brown, clayey siltstone with very thin gray claystone laminae, orange (iron oxide stained)			TX
66										
67										
68										
69										
70										
71										
72					ss		SANDSTONE, SILTY SANDSTONE, light brown, very fine grained, 10 to 20% fines.	8	10.5	
73	PB	S-9		2.3/2.3						
74										
75										

LOG OF BORING L18-C

PROJECT NUMBER: 89-977	PROJECT NAME: B-18 LANDFILL, KHF		
BORING NUMBER: L18-C	ELEVATION: 754'	DATE	
COORDINATES: N. 228,620 E. 1,702,120	BORING DIA.: 5"	STARTED	COMPLETED
DRILLING METHODS: MUD ROTARY	WATER DEPTH: NONE	3/13/90	3/14/90
ENG/GEO: R. HARLAN (WAHLER ASSOCIATES)	CHECKED BY: J. BADEL	PAGE: 5 OF 5	

DEPTH IN FEET	SAMPLE TYPE	SAMPLE NO.	RESISTANCE (BLOWS PER FOOT)	RECOVERY	USCS/ROCK TYPE	PROFILE	DESCRIPTION	MOISTURE CONTENT %	DRY DENSITY (pcf)	OTHER TESTS
76										
77										
78					slt		SILTSTONE, light brown, minor sand, occasional claystone interbeds, claystone with moderate plasticity	14	106	%200
79										
80										
81	PB	S-10		1.9/2.0						
82					slt/cs		- siltstone/claystone (interbedded.)			
83										
84										
85										
86										
87										
88	PB	S-11		1.7/2.0	cs		- sandy, silty claystone with moderate plasticity.	12	106	PI
					slt		- sandy siltstone.			

TOTAL DEPTH 89'
NO GROUNDWATER ENCOUNTERED
BACKFILLED WITH CEMENT GROUT VIA TREMIE

LOG OF BORING L18-D

PROJECT NUMBER: 89-977	PROJECT NAME: B-18 LANDFILL, KHF		
BORING NUMBER: L18-D	ELEVATION: 740'	DATE	
COORDINATES: N. 228,780 E. 1,702,480	BORING DIA.: 5"	STARTED	COMPLETED
DRILLING METHODS: MUD ROTARY	WATER DEPTH: NONE	3/14/90	3/15/90
ENG/GEO: R. HARLAN (WAHLER ASSOCIATES)	CHECKED BY: J. BADEL	PAGE: 1 OF 5	

LEGEND

SANDS
SILTS
CLAYS
SANDSTONE (ss)
SILTSTONE (slt)
CLAYSTONE (cs)

PB - Pitcher Barrel
DR - Drive Ring Sample
CHEM - Chemical Test
PI - Atterberg Limits Test
COMP - Compaction Test
DIR - Direct Shear Test
TX - Triaxial Test

PER - Permeability Test
SW - Swelling Test
SI - Sieve Analysis Test
%200 - Percentage Passing
HYD - Hydrometer Test
SG - Specific Gravity Test

DEPTH IN FEET	SAMPLE TYPE	SAMPLE NO.	RESISTANCE (BLOWS PER FOOT)	RECOVERY	USCS/ROCK TYPE	PROFILE	DESCRIPTION	MOISTURE CONTENT %	DRY DENSITY (pcf)	OTHER TESTS
					gc		FILL - sandy, clayey gravel			
1, 2, 3, 4					cl		COLLUVIUM Sandy clay, light brown; dry (to 5' deep), low plasticity, stiff 30 to 40% very fine sand.			
5, 6	DR	B-1	11	1.3/1.5						
7, 8, 9										
10, 11	DR	B-2	11	1.5/1.5				19		PI HYD
12, 13										
14, 15	B	B-3	(BAG)		slt/ss		SAN JOAQUIN FORMATION CEMENTED SILTSTONE-SANDSTONE WITH FOSSILS (MYA BED), orange, brown, hard, strong			

REV. 8/10/90

LOG OF BORING L18-D

PROJECT NUMBER: 89-977	PROJECT NAME: B-18 LANDFILL, KHF		
BORING NUMBER: L18-D	ELEVATION: 740'	DATE	
COORDINATES: N. 228,780 E. 1,702,480	BORING DIA.: 5"	STARTED	COMPLETED
DRILLING METHODS: MUD ROTARY	WATER DEPTH: NONE	3/14/90	3/15/90
ENG/GEO: R. HARLAN (WAHLER ASSOCIATES)	CHECKED BY: J. BADEL	PAGE: 2 OF 5	

DEPTH IN FEET	SAMPLE TYPE	SAMPLE NO.	RESISTANCE (BLOWS PER FOOT)	RECOVERY	USCS/ROCK TYPE	PROFILE	DESCRIPTION	MOISTURE CONTENT %	DRY DENSITY (pcf)	OTHER TESTS
16	PB	S-1		1.8/2.3	slt		SANDY SILTSTONE, SILTSTONE, tan, light brown, mottled orange, low plasticity			
17										
18										
19										
20										
21										
22										
23	PB	S-2		2.2/2.3				19	95	PI HYD TX DIR
24							- siltstone, trace very fine sand, tan, mottled orange at 24'			
25					cs/ slt		CLAYSTONE/SILTSTONE, gray, brown, orange interbedded, laminated, high plasticity claystone, low plasticity siltstone			
26										
27										
28										
29										
30	PB	S-3		2.0/2.5				19	100	
31										
32										
33										
34										
35										

LOG OF BORING L18-D

PROJECT NUMBER: 89-977	PROJECT NAME: B-18 LANDFILL, KHF		
BORING NUMBER: L18-D	ELEVATION: 740'	DATE	
COORDINATES: N. 228,780 E. 1,702,480	BORING DIA.: 5"	STARTED	COMPLETED
DRILLING METHODS: MUD ROTARY	WATER DEPTH: NONE	3/14/90	3/15/90
ENG/GEO: R. HARLAN (WAHLER ASSOCIATES)	CHECKED BY: J. BADEL	PAGE: 3 OF 5	

DEPTH IN FEET	SAMPLE TYPE	SAMPLE NO.	RESISTANCE (BLOWS PER FOOT)	RECOVERY	USCS/ROCK TYPE	PROFILE	DESCRIPTION	MOISTURE CONTENT %	DRY DENSITY (pcf)	OTHER TESTS
36										
37	PB	S-4		2.3/2.5			- yellow brown silty claystone moderate plasticity	20	100	
38										
39										
40										
41										
42										
43										
44										
45	PB	S-5		1.5/2.5			- gray brown claystone, orange			
46										
47										
48										
49										
50										
51										
52										
53	PB	S-6		1.5/2.3			- dark olive, gray claystone, moderate to high plasticity striated slick surfaces, very thin sand lamination	25	101	PI
54										
55										

LOG OF BORING L18-D

PROJECT NUMBER: 89-977	PROJECT NAME: B-18 LANDFILL, KHF		
BORING NUMBER: L18-D	ELEVATION: 740'	DATE	
COORDINATES: N. 228,780 E. 1,702,480	BORING DIA.: 5"	STARTED	COMPLETED
DRILLING METHODS: MUD ROTARY	WATER DEPTH: NONE	3/14/90	3/15/90
ENG/GEO: R. HARLAN (WAHLER ASSOCIATES)	CHECKED BY: J. BADEL	PAGE: 4 OF 5	

DEPTH IN FEET	SAMPLE TYPE	SAMPLE NO.	RESISTANCE (BLOWS PER FOOT)	RECOVERY	USCS/ROCK TYPE	PROFILE	DESCRIPTION	MOISTURE CONTENT %	DRY DENSITY (pcf)	OTHER TESTS
56										
57										
58										
59										
60										
61	PB	S-7		1.2/2.5			- interbedded claystone/siltstone and very fine grained sandstone			
62										
63										
64										
65										
66										
67										
68										
69	PB	S-8		1.4/2.5			- gray claystone			
70										
71										
72										
73										
74					slt/ss		SILTSTONE, SILTY SANDSTONE, tan, light brown, orange mottling/layering			
75										

LOG OF BORING L18-D

PROJECT NUMBER: 89-977	PROJECT NAME: B-18 LANDFILL, KHF		
BORING NUMBER: L18-D	ELEVATION: 740'	DATE	
COORDINATES: N. 228,780 E. 1,702,480	BORING DIA.: 5"	STARTED	COMPLETED
DRILLING METHODS: MUD ROTARY	WATER DEPTH: NONE	3/14/90	3/15/90
ENG/GEO: R. HARLAN (WAHLER ASSOCIATES)	CHECKED BY: J. BADEL	PAGE: 5 OF 5	

DEPTH IN FEET	SAMPLE TYPE	SAMPLE NO.	RESISTANCE (BLOWS PER FOOT)	RECOVERY	USCS/ROCK TYPE	PROFILE	DESCRIPTION	MOISTURE CONTENT %	DRY DENSITY (pcf)	OTHER TESTS
76							- nonplastic siltstone, silty sandstone, interbedded/laminated, occasional claystone laminae			
77	PB	S-9		0.8/2.5			- tan, silty sandstone, fine/orange, cemented siltstone at 77'			
78										
79										
80					slt					
81										
82	PB	S-10		0.9/2.5			- tan, silty sandstone, orange siltstone with fossils (clam shell) at 81.9'	16	109	%200
83										
84										
85	PB	S-11		1.7/2.5			- very fine silty sandstone, tan, brown, mottled orange (bioturbation)			

- TOTAL DEPTH = 86'
- NO GROUND WATER ENCOUNTERED
- BACKFILLED WITH CEMENT GROUT VIA TREMIE

LOG OF BORING L18-E

PROJECT NUMBER: 89-977	PROJECT NAME: B-18 LANDFILL, KHF		
BORING NUMBER: L18-E	ELEVATION: 727'	DATE	
COORDINATES: N. 228,890 E. 1,702,670	BORING DIA.: 5"	STARTED	COMPLETED
DRILLING METHODS: MUD ROTARY	WATER DEPTH: NONE	3/19/90	3/20/90
ENG/GEO: R. HARLAN (WAHLER ASSOCIATES)	CHECKED BY: J. BADEL	PAGE: 1 OF 4	

LEGEND

SANDS
SILTS
CLAYS
SANDSTONE (ss)
SILTSTONE (slt)
CLAYSTONE (cs)

PB - Pitcher Barrel
DR - Drive Ring Sample
CHEM - Chemical Test
PI - Atterberg Limits Test
COMP - Compaction Test
DIR - Direct Shear Test
TX - Triaxial Test

PER - Permeability Test
SW - Swelling Test
SI - Sieve Analysis Test
%200 - Percentage Passing
HYD - Hydrometer Test
SG - Specific Gravity Test

DEPTH IN FEET	SAMPLE TYPE	SAMPLE NO.	RESISTANCE (BLOWS PER FOOT)	RECOVERY	USCS/ROCK TYPE	PROFILE	DESCRIPTION	MOISTURE CONTENT %	DRY DENSITY (pcf)	OTHER TESTS
1							COLLUVIUM SANDY CLAY, light brown, dry, low to moderate plasticity, 10 to 40% very fine grained sand. Numerous thin interbeds/laminae of sand (sp), probably intermittent alluvial deposits			
2										
3										
4										
5										
6	DR	B-1	19	1.3/1.5	cl		- very stiff			
7										
8							- numerous cemented sandstone fragments (hard, orange brown, to 1/2" Ø), occasional gray claystone fragments from 8' to 13'			
9										
10							- cemented sandstone fragments			
11	PB	S-1		1.7/2.5			- very stiff to hard, light brown sandy clay with claystone fragments, moderate plasticity	16	106	
12										
13					ss		SAN JOAQUIN FORMATION SANDSTONE, tan, very fine to fine, occasional siltstone, claystone laminae, occasional orange			
14										
15										

REV. 8/10/90

LOG OF BORING L18-E

PROJECT NUMBER: 89-977	PROJECT NAME: B-18 LANDFILL, KHF		
BORING NUMBER: L18-E	ELEVATION: 727'	DATE	
COORDINATES: N. 228,890 E. 1,702,670	BORING DIA.: 5"	STARTED	COMPLETED
DRILLING METHODS: MUD ROTARY	WATER DEPTH: NONE	3/19/90	3/20/90
ENG/GEO: R. HARLAN (WAHLER ASSOCIATES)	CHECKED BY: J. BADEL	PAGE: 2 OF 4	

DEPTH IN FEET	SAMPLE TYPE	SAMPLE NO.	RESISTANCE (BLOWS PER FOOT)	RECOVERY	USCS/ROCK TYPE	PROFILE	DESCRIPTION	MOISTURE CONTENT %	DRY DENSITY (pcf)	OTHER TESTS
16	PB	S-2		2.1/2.5	ss		- cemented laminae	12		%200
17							- tan, fine sandstone, clean, with minor claystone laminae at 19'			
18										
19										
20										
21	PB	S-3		1.4/2.5			- very fine silty sandstone at 21'			
22										
23										
24										
25										
26										
27										
28										
29	PB	S-4		1.9/2.2						
30							- very fine to fine sandstone (sp-sm) at 30'			
31					cs/slt		CLAYSTONE/SILTSTONE, gray brown, with orange laminae			
32										
33										
34					slt/cs		SILTSTONE, SANDY SILTSTONE, CLAYSTONE predominantly siltstone, sandy siltstone			
35										

LOG OF BORING L18-E

PROJECT NUMBER: 89-977	PROJECT NAME: B-18 LANDFILL, KHF		
BORING NUMBER: L18-E	ELEVATION: 727'	DATE	
COORDINATES: N. 228,890 E. 1,702,670	BORING DIA.: 5"	STARTED	COMPLETED
DRILLING METHODS: MUD ROTARY	WATER DEPTH: NONE	3/19/90	3/20/90
ENG/GEO: R. HARLAN (WAHLER ASSOCIATES)	CHECKED BY: J. BADEL	PAGE: 3 OF 4	

DEPTH IN FEET	SAMPLE TYPE	SAMPLE NO.	RESISTANCE (BLOWS PER FOOT)	RECOVERY	USCS/ROCK TYPE	PROFILE	DESCRIPTION	MOISTURE CONTENT %	DRY DENSITY (pcf)	OTHER TESTS
36	PB	S-5		2.2/2.5			with claystone interbeds, laminae			
37							- tan, sandy siltstone, interbedded with brown claystone, laminated at 37'			
38										
39										
40										
41										
42										
43										
44	PB	S-6		1.6/2.0			- yellow brown sandy siltstone, nonplastic at 44'	14	102	PI
45										
46										
47										
48							CLAYSTONE, gray, gray brown, highly plastic, occasional sandstone pockets (bioturbation), laminae			
49										
50										
51					CS					
52	PB	S-7		1.9/2.0			- gray brown claystone, highly plastic, with orange laminae at 52'			
53										
54										
55										

LOG OF BORING L18-E

PROJECT NUMBER: 89-977	PROJECT NAME: B-18 LANDFILL, KHF		
BORING NUMBER: L18-E	ELEVATION: 727'	DATE	
COORDINATES: N. 228,890 E. 1,702,670	BORING DIA.: 5"	STARTED	COMPLETED
DRILLING METHODS: MUD ROTARY	WATER DEPTH: NONE	3/19/90	3/120/90
ENG/GEO: R. HARLAN (WAHLER ASSOCIATES)	CHECKED BY: J. BADEL	PAGE: 4 OF 4	

DEPTH IN FEET	SAMPLE TYPE	SAMPLE NO.	RESISTANCE (BLOWS PER FOOT)	RECOVERY	USCS/ROCK TYPE	PROFILE	DESCRIPTION	MOISTURE CONTENT %	DRY DENSITY (pcf)	OTHER TESTS
56										
57										
58										
59										
60										
61	PB	S-8		2.4/2.5			- gray sandy claystone, mottled orange (sand in pockets - bioturbation) at 62'	28	95	PI
62										

- TOTAL DEPTH = 62.5'
- NO GROUND WATER ENCOUNTERED
- BACKFILLED WITH CEMENT GROUT VIA TREMIE

LOG OF BORING L18-F

PROJECT NUMBER: 89-977	PROJECT NAME: B-18 LANDFILL, KHF		
BORING NUMBER: L18-F	ELEVATION: 821'	DATE	
COORDINATES: N. 228,930 E. 1,701,540	BORING DIA.: 5"	STARTED	COMPLETED
DRILLING METHODS: MUD ROTARY	WATER DEPTH: NONE	3/20/90	3/21/90
ENG/GEO: R. HARLAN (WAHLER ASSOCIATES)	CHECKED BY: J. BADEL	PAGE: 1 OF 4	

LEGEND

SANDS
SILTS
CLAYS
SANDSTONE (ss)
SILTSTONE (slt)
CLAYSTONE (cs)

PB - Pitcher Barrel
DR - Drive Ring Sample
CHEM - Chemical Test
PI - Atterberg Limits Test
COMP - Compaction Test
DIR - Direct Shear Test
TX - Triaxial Test

PER - Permeability Test
SW - Swelling Test
SI - Sieve Analysis Test
%200 - Percentage Passing
HYD - Hydrometer Test
SG - Specific Gravity Test

DEPTH IN FEET	SAMPLE TYPE	SAMPLE NO.	RESISTANCE (BLOWS PER FOOT)	RECOVERY	USCS/ROCK TYPE	PROFILE	DESCRIPTION	MOISTURE CONTENT %	DRY DENSITY (pcf)	OTHER TESTS
1							SAN JOAQUIN FORMATION CLAYSTONE, gray, brown with orange laminae, slightly weathered, soft, weak, laminated to thin bedded, occasional very fine sand laminae, occasional siltstone interbeds/laminae; highly plastic			
2										
3										
4										
5										
6										
7	PB	S-1		2.5/2.5	cs		- olive brown, silty claystone, moderate to high plasticity	20	103	PI HYD
8										
9										
10										
11										
12										
13										
14										
15										

REV. 8/10/90

LOG OF BORING L18-F

PROJECT NUMBER: 89-977	PROJECT NAME: B-18 LANDFILL, KHF		
BORING NUMBER: L18-F	ELEVATION: 821'	DATE	
COORDINATES: N. 228,930 E. 1,701,540	BORING DIA.: 5"	STARTED	COMPLETED
DRILLING METHODS: MUD ROTARY	WATER DEPTH: NONE	3/20/90	3/21/90
ENG/GEO: R. HARLAN (WAHLER ASSOCIATES)	CHECKED BY: J. BADEL	PAGE: 2 OF 4	

DEPTH IN FEET	SAMPLE TYPE	SAMPLE NO.	RESISTANCE (BLOWS PER FOOT)	RECOVERY	USCS/ROCK TYPE	PROFILE	DESCRIPTION	MOISTURE CONTENT %	DRY DENSITY (pcf)	OTHER TESTS
16										
17	PB	S-2		2.2/2.5			- gray claystone with orange (iron oxide stained) bedding surfaces, laminated at 18'			
18										
19										
20										
21										
22										
23										
24										
25										
26										
27	PB	S-3		2.4/2.6			- laminated at 28' silty claystone	29	93	PI HYD
28										
29										
30										
31										
32										
33										
34										
35										

LOG OF BORING L18-F

PROJECT NUMBER: 89-977	PROJECT NAME: B-18 LANDFILL, KHF		
BORING NUMBER: L18-F	ELEVATION: 821'	DATE	
COORDINATES: N. 228,930 E. 1,701,540	BORING DIA.: 5"	STARTED	COMPLETED
DRILLING METHODS: MUD ROTARY	WATER DEPTH: NONE	3/20/90	3/21/90
ENG/GEO: R. HARLAN (WAHLER ASSOCIATES)	CHECKED BY: J. BADEL	PAGE: 3 OF 4	

DEPTH IN FEET	SAMPLE TYPE	SAMPLE NO.	RESISTANCE (BLOWS PER FOOT)	RECOVERY	USCS/ROCK TYPE	PROFILE	DESCRIPTION	MOISTURE CONTENT %	DRY DENSITY (pcf)	OTHER TESTS
36										
37	PB	S-4		1.9/2.5			- laminated claystone at 38'			
38										
39										
40										
41										
42										
43										
44										
45										
46										
47	PB	S-5		2.1/2.1			- laminated, brown/gray claystone with 1/4" thick tan, very fine sandstone lamination at 48'	26	95	
48										
49										
50										
51										
52										
53										
54										
55										

LOG OF BORING L18-F

PROJECT NUMBER: 89-977	PROJECT NAME: B-18 LANDFILL, KHF		
BORING NUMBER: L18-F	ELEVATION: 821'	DATE	
COORDINATES: N. 228,930 E. 1,701,540	BORING DIA.: 5"	STARTED	COMPLETED
DRILLING METHODS: MUD ROTARY	WATER DEPTH: NONE	3/20/90	3/21/90
ENG/GEO: R. HARLAN (WAHLER ASSOCIATES)	CHECKED BY: J. BADEL	PAGE: 4 OF 4	

DEPTH IN FEET	SAMPLE TYPE	SAMPLE NO.	RESISTANCE (BLOWS PER FOOT)	RECOVERY	USCS/ROCK TYPE	PROFILE	DESCRIPTION	MOISTURE CONTENT %	DRY DENSITY (pcf)	OTHER TESTS
56 57 58	PB	S-6		2.1/2.5			- gray claystone, highly plastic with 1/2" thick orange (iron oxide cemented) sandstone lamination and several sandy bioturbation pockets	26	95	PI HYD TX DIR

- TOTAL DEPTH = 58.5'
- NO GROUND WATER ENCOUNTERED
- BACKFILLED WITH CEMENT GROUT VIA TREMIE

LOG OF BORING L18-G

PROJECT NUMBER: 89-977	PROJECT NAME: B-18 LANDFILL, KHF		
BORING NUMBER: L18-G	ELEVATION: 853'	DATE	
COORDINATES: N. 227,500 E. 1,701,910	BORING DIA.: 5"	STARTED	COMPLETED
DRILLING METHODS: MUD ROTARY	WATER DEPTH: NONE	3/21/90	3/22/90
ENG/GEO: R. HARLAN (WAHLER ASSOCIATES)	CHECKED BY: J. BADEL	PAGE: 1 OF 5	

LEGEND

SANDS
SILTS
CLAYS
SANDSTONE (ss)
SILTSTONE (slt)
CLAYSTONE (cs)

PB - Pitcher Barrel
DR - Drive Ring Sample
CHEM - Chemical Test
PI - Atterberg Limits Test
COMP - Compaction Test
DIR - Direct Shear Test
TX - Triaxial Test

PER - Permeability Test
SW - Swelling Test
SI - Sieve Analysis Test
%200 - Percentage Passing
HYD - Hydrometer Test
SG - Specific Gravity Test

DEPTH IN FEET	SAMPLE TYPE	SAMPLE NO.	RESISTANCE (BLOWS PER FOOT)	RECOVERY	USCS/ROCK TYPE	PROFILE	DESCRIPTION	MOISTURE CONTENT %	DRY DENSITY (pcf)	OTHER TESTS
1, 2, 3, 4					ss (silty)		SAN JOAQUIN FORMATION SILTY SANDSTONE, tan-gray, mottled orange, very fine, weakly cemented, occasional claystone laminae, bioturbation, occasional fossils (description based on access road cut exposure adjacent to the boring)			
5, 6, 7, 8	PB	S-1		1.4 / 2.5	ss		SANDSTONE, tan very fine to fine, clean, occasional iron oxide cemented sandstone laminae, interbeds (orange reddish brown), occasional silty sandstone interbeds, occasional iron oxide cemented siltstone laminae	9	107	%200
9, 10, 11, 12, 13, 14, 15	PB	S-2		1.4 / 2.5			- very fine, light brown, clean sandstone			

REV. 8/10/90

LOG OF BORING L18-G

PROJECT NUMBER: 89-977	PROJECT NAME: B-18 LANDFILL, KHF		
BORING NUMBER: L18-G	ELEVATION: 853'	DATE	
COORDINATES: N. 227,500 E. 1,701,910	BORING DIA.: 5"	STARTED	COMPLETED
DRILLING METHODS: MUD ROTARY	WATER DEPTH: NONE	3/21/90	3/22/90
ENG/GEO: R. HARLAN (WAHLER ASSOCIATES)	CHECKED BY: J. BADEL	PAGE: 2 OF 5	

DEPTH IN FEET	SAMPLE TYPE	SAMPLE NO.	RESISTANCE (BLOWS PER FOOT)	RECOVERY	USCS/ROCK TYPE	PROFILE	DESCRIPTION	MOISTURE CONTENT %	DRY DENSITY (pcf)	OTHER TESTS
16	PB	S-2		1.4/2.5						
17										
18										
19										
20										
21										
22										
23	PB	S-3		1.5/1.7			- very fine, clean sandstone			
24										
25										
26										
27										
28										
29										
30										
31	PB	S-4		1.2/2.0			- very fine, clean sandstone, 1/4" thick iron oxide cemented clay lamination (orange)			
32										
33										
34										
35										

LOG OF BORING L18-G

PROJECT NUMBER: 89-977	PROJECT NAME: B-18 LANDFILL, KHF		
BORING NUMBER: L18-G	ELEVATION: 853'	DATE	
COORDINATES: N. 227,500 E. 1,701,910	BORING DIA.: 5"	STARTED	COMPLETED
DRILLING METHODS: MUD ROTARY	WATER DEPTH: NONE	3/21/90	3/22/90
ENG/GEO: R. HARLAN (WAHLER ASSOCIATES)	CHECKED BY: J. BADEL	PAGE: 3 OF 5	

DEPTH IN FEET	SAMPLE TYPE	SAMPLE NO.	RESISTANCE (BLOWS PER FOOT)	RECOVERY	USCS/ROCK TYPE	PROFILE	DESCRIPTION	MOISTURE CONTENT %	DRY DENSITY (pcf)	OTHER TESTS
36										
37										
38										
39										
40										%200
41	PB	S-5		1.2/1.3			- very fine to fine clean sandstone			TX
42										
43							CLAYSTONE, dark gray, highly plastic			
44										
45										
46	PB	S-6		1.5/2.5			- gray claystone, highly plastic	30	91	
47										
48					CS					
49										
50										PI
51	PB	S-7		1.3/1.8			- dark gray claystone, highly plastic, gypsum clots, striated slick surfaces	29	92	TX HYD
52										
53										
54										
55										

LOG OF BORING L18-G

PROJECT NUMBER: 89-977	PROJECT NAME: B-18 LANDFILL, KHF		
BORING NUMBER: L18-G	ELEVATION: 853'	DATE	
COORDINATES: N. 227,500 E. 1,701,910	BORING DIA.: 5"	STARTED	COMPLETED
DRILLING METHODS: MUD ROTARY	WATER DEPTH: NONE	3/21/90	3/22/90
ENG/GEO: R. HARLAN (WAHLER ASSOCIATES)	CHECKED BY: J. BADEL	PAGE: 4 OF 5	

DEPTH IN FEET	SAMPLE TYPE	SAMPLE NO.	RESISTANCE (BLOWS PER FOOT)	RECOVERY	USCS/ROCK TYPE	PROFILE	DESCRIPTION	MOISTURE CONTENT %	DRY DENSITY (pcf)	OTHER TESTS
56										
57										
58										
59										
60										
61	PB	S-8		1.0/2.5			- gray claystone with sandy pockets (bioturbation)			
62										
63										
64										
65										
66	PB	S-9		1.4/2.0			- gray claystone, high plasticity with silt-sand filled pockets (bioturbation)	27	95	PI HYD
67										
68										
69										
70					SS		SANDSTONE, SILTY SANDSTONE, tan very fine, occasional silty sandstone pockets, occasional claystone laminae			
71										
72										
73										
74										
75										

LOG OF BORING L18-G

PROJECT NUMBER: 89-977	PROJECT NAME: B-18 LANDFILL, KHF		
BORING NUMBER: L18-G	ELEVATION: 853'	DATE	
COORDINATES: N. 227,500 E. 1,701,910	BORING DIA.: 5"	STARTED	COMPLETED
DRILLING METHODS: MUD ROTARY	WATER DEPTH: NONE	3/21/90	3/22/90
ENG/GEO: R. HARLAN (WAHLER ASSOCIATES)	CHECKED BY: J. BADEL	PAGE: 5 OF 5	

DEPTH IN FEET	SAMPLE TYPE	SAMPLE NO.	RESISTANCE (BLOWS PER FOOT)	RECOVERY	USCS/ROCK TYPE	PROFILE	DESCRIPTION	MOISTURE CONTENT %	DRY DENSITY (pcf)	OTHER TESTS
76 – 77	PB	S-10		0.8 / 2.5			- clean sandstone with silty sandstone pockets and brown claystone lamination			

- TOTAL DEPTH = 77.5'
- NO GROUND WATER ENCOUNTERED
- BACKFILLED WITH CEMENT GROUT VIA TREMIE

LOG OF BORING L18-H

PROJECT NUMBER: 89-977	PROJECT NAME: B-18 LANDFILL, KHF		
BORING NUMBER: L18-H	ELEVATION: 865'	DATE	
COORDINATES: N. 228,060 E. 1,702,050	BORING DIA.: 5"	STARTED	COMPLETED
DRILLING METHODS: MUD ROTARY	WATER DEPTH: NONE	3/22/90	3/22/90
ENG/GEO: R. HARLAN (WAHLER ASSOCIATES)	CHECKED BY: J. BADEL	PAGE: 1 OF 4	

LEGEND

SANDS
SILTS
CLAYS
SANDSTONE (ss)
SILTSTONE (slt)
CLAYSTONE (cs)

PB - Pitcher Barrel
DR - Drive Ring Sample
CHEM - Chemical Test
PI - Atterberg Limits Test
COMP - Compaction Test
DIR - Direct Shear Test
TX - Triaxial Test

PER - Permeability Test
SW - Swelling Test
SI - Sieve Analysis Test
%200 - Percentage Passing
HYD - Hydrometer Test
SG - Specific Gravity Test

DEPTH IN FEET	SAMPLE TYPE	SAMPLE NO.	RESISTANCE (BLOWS PER FOOT)	RECOVERY	USCS/ROCK TYPE	PROFILE	DESCRIPTION	MOISTURE CONTENT %	DRY DENSITY (pcf)	OTHER TESTS
					cl		FILL, sandy clay (drilling pad)			
1, 2, 3, 4					cl		COLLUVIUM SANDY CLAY, light brown, dry, low plasticity			
5, 6, 7, 8	PB	S-1		1.8 / 2.5	cs		SAN JOAQUIN FORMATION CLAYSTONE, gray, highly plastic, occasional thin sandstone interbeds laminae - gray highly plastic silty claystone	29	89	PI
9, 10, 11, 12, 13, 14, 15					ss		SANDSTONE - SILTY SANDSTONE			

REV. 8/10/90

LOG OF BORING L18-H

PROJECT NUMBER: 89-977	PROJECT NAME: B-18 LANDFILL, KHF		
BORING NUMBER: L18-H	ELEVATION: 865'	DATE	
COORDINATES: N. 228,060 E. 1,702,050	BORING DIA.: 5"	STARTED	COMPLETED
DRILLING METHODS: MUD ROTARY	WATER DEPTH: NONE	3/22/90	3/22/90
ENG/GEO: R. HARLAN (WAHLER ASSOCIATES)	CHECKED BY: J. BADEL	PAGE: 2 OF 4	

DEPTH IN FEET	SAMPLE TYPE	SAMPLE NO.	RESISTANCE (BLOWS PER FOOT)	RECOVERY	USCS/ROCK TYPE	PROFILE	DESCRIPTION	MOISTURE CONTENT %	DRY DENSITY (pcf)	OTHER TESTS
16	PB	S-2		1.9/2.5			- yellowish brown silty sandstone, non to weakly cemented with gray claystone layer	15	108	%200
17										
18							CLAYSTONE, gray, highly plastic, occasional siltstone, sandstone interbeds/laminae			
19										
20										
21										
22										
23					CS					
24										
25										
26	PB	S-3		1.7/2.5			- gray claystone with sand filled pocket			
27										
28										
29										
30					slt		- siltstone, nonplastic, minor very fine sand			
31										
32										
33					CS					
34										
35										

LOG OF BORING L18-H

PROJECT NUMBER: 89-977	PROJECT NAME: B-18 LANDFILL, KHF		
BORING NUMBER: L18-H	ELEVATION: 865'	DATE	
COORDINATES: N. 228,060 E. 1,702,050	BORING DIA.: 5"	STARTED	COMPLETED
DRILLING METHODS: MUD ROTARY	WATER DEPTH: NONE	3/22/90	3/22/90
ENG/GEO: R. HARLAN (WAHLER ASSOCIATES)	CHECKED BY: J. BADEL	PAGE: 3 OF 4	

DEPTH IN FEET	SAMPLE TYPE	SAMPLE NO.	RESISTANCE (BLOWS PER FOOT)	RECOVERY	USCS/ROCK TYPE	PROFILE	DESCRIPTION	MOISTURE CONTENT %	DRY DENSITY (pcf)	OTHER TESTS
36–37	PB	S-4		2.3/2.5			- gray claystone, highly plastic, laminated with thin interbedded sandstone	26	95	PI
38–40										
41–44					SS		SILTY SANDSTONE, tan-brown, very fine, occasional claystone pockets, laminae, 30 to 40% fine			
45–47	PB	S-5		2.4/2.5			- abundant claystone bioturbation (clay filled pockets) from 45' to 46'			
48–55					CS		CLAYSTONE, gray, highly plastic, occasional thin sandstone interbeds, laminae			

LOG OF BORING L18-H

PROJECT NUMBER: 89-977	PROJECT NAME: B-18 LANDFILL, KHF		
BORING NUMBER: L18-H	ELEVATION: 865'	DATE	
COORDINATES: N. 228,060 E. 1,702,050	BORING DIA.: 5"	STARTED	COMPLETED
DRILLING METHODS: MUD ROTARY	WATER DEPTH: NONE	3/22/90	3/22/90
ENG/GEO: R. HARLAN (WAHLER ASSOCIATES)	CHECKED BY: J. BADEL	PAGE: 4 OF 4	

DEPTH IN FEET	SAMPLE TYPE	SAMPLE NO.	RESISTANCE (BLOWS PER FOOT)	RECOVERY	USCS/ROCK TYPE	PROFILE	DESCRIPTION	MOISTURE CONTENT %	DRY DENSITY (pcf)	OTHER TESTS
56 – 57	PB	S-6		1.2/2.5			- gray claystone with sand filled pockets (bioturbation)	25	96	PI

- TOTAL DEPTH = 57.5'
- NO GROUND WATER ENCOUNTERED
- BACKFILLED WITH CEMENT GROUT VIA TREMIE

LOG OF BORING L18-I

PROJECT NUMBER: 89-977	PROJECT NAME: B-18 LANDFILL, KHF		
BORING NUMBER: L18-I	ELEVATION: 766'	DATE	
COORDINATES: N. 228,020 E. 1,702,410	BORING DIA.: 5"	STARTED	COMPLETED
DRILLING METHODS: MUD ROTARY	WATER DEPTH: NONE	3/23/90	3/23/90
ENG/GEO: R. HARLAN (WAHLER ASSOCIATES)	CHECKED BY: J. BADEL	PAGE: 1 OF 2	

LEGEND

SANDS
SILTS
CLAYS
SANDSTONE (ss)
SILTSTONE (slt)
CLAYSTONE (cs)

PB - Pitcher Barrel
DR - Drive Ring Sample
CHEM - Chemical Test
PI - Atterberg Limits Test
COMP - Compaction Test
DIR - Direct Shear Test
TX - Triaxial Test

PER - Permeability Test
SW - Swelling Test
SI - Sieve Analysis Test
%200 - Percentage Passing
HYD - Hydrometer Test
SG - Specific Gravity Test

DEPTH IN FEET	SAMPLE TYPE	SAMPLE NO.	RESISTANCE (BLOWS PER FOOT)	RECOVERY	USCS/ROCK TYPE	PROFILE	DESCRIPTION	MOISTURE CONTENT %	DRY DENSITY (pcf)	OTHER TESTS
							COLLUVIUM			
1							SILTY CLAY, light brown, dry (to 13') low to moderate plasticity, minor very fine sand, occasional root voids (pin-holes), minor caliche			
2										
3										
4										
5										
6										
7	DR	B-1	35	1.3/1.5			- hard			
					cl		- occasional hard, gray claystone fragments (detrital) to 1/2" Ø, from 7' to 10'			
8										
9										
10										
11										
12										
13	PB	S-1		1.4/1.8			- sandy clay, light brown, dry, low to moderate plasticity, 20 to 40% very fine sand, occasional claystone fragments			
14										
15										

REV. 8/10/90

LOG OF BORING L18-I

PROJECT NUMBER: 89-977	PROJECT NAME: B-18 LANDFILL, KHF		
BORING NUMBER: L18-I	ELEVATION: 766'	DATE	
COORDINATES: N. 228,020 E. 1,702,410	BORING DIA.: 5"	STARTED	COMPLETED
DRILLING METHODS: MUD ROTARY	WATER DEPTH: NONE	3/23/90	3/23/90
ENG/GEO: R. HARLAN (WAHLER ASSOCIATES)	CHECKED BY: J. BADEL	PAGE: 2 OF 2	

DEPTH IN FEET	SAMPLE TYPE	SAMPLE NO.	RESISTANCE (BLOWS PER FOOT)	RECOVERY	USCS/ROCK TYPE	PROFILE	DESCRIPTION	MOISTURE CONTENT %	DRY DENSITY (pcf)	OTHER TESTS
16 17 18	PB	S-2		2.3/2.5	CS		SAN JOAQUIN FORMATION CLAYSTONE, gray, highly plastic, includes brown laminae, occasional siltstone, very fine sand laminae - laminated claystone/siltstone with very fine sand laminae	19	92	PI HYD

- TOTAL DEPTH = 18.5'
- NO GROUND WATER ENCOUNTERED
- BACKFILLED WITH CEMENT GROUT VIA TREMIE

LOG OF BORING L18-J

PROJECT NUMBER: 89-977	PROJECT NAME: B-18 LANDFILL, KHF		
BORING NUMBER: L18-J	ELEVATION: 820'	DATE	
COORDINATES: N. 228,390 E. 1,701,985	BORING DIA.: 5"	STARTED	COMPLETED
DRILLING METHODS: MUD ROTARY	WATER DEPTH: NONE	5/8/90	5/9/90
ENG/GEO: R. HARLAN (WAHLER ASSOCIATES)	CHECKED BY: J. BADEL	PAGE: 1 OF 9	

LEGEND

SANDS
SILTS
CLAYS
SANDSTONE (ss)
SILTSTONE (slt)
CLAYSTONE (cs)

PB - Pitcher Barrel
DR - Drive Ring Sample
CHEM - Chemical Test
PI - Atterberg Limits Test
COMP - Compaction Test
DIR - Direct Shear Test
TX - Triaxial Test

PER - Permeability Test
SW - Swelling Test
SI - Sieve Analysis Test
%200 - Percentage Passing
HYD - Hydrometer Test
SG - Specific Gravity Test

DEPTH IN FEET	SAMPLE TYPE	SAMPLE NO.	RESISTANCE (BLOWS PER FOOT)	RECOVERY	USCS/ROCK TYPE	PROFILE	DESCRIPTION	MOISTURE CONTENT %	DRY DENSITY (pcf)	OTHER TESTS
					cl		FILL, sandy clay to clayey sand			
1, 2, 3, 4							SAN JOAQUIN FORMATION CLAYSTONE, gray, brown, highly plastic, occasional thin sandstone/siltstone interbeds and laminae			
5, 6, 7	PB	S-1		1.7/2.5	cs		- gray, dark brown silty claystone interbedded sandstone, minor silt pockets, faint orange mottling	24	92	PI HYD SW
8, 9, 10, 11, 12	PB	S-2		2.2/2.5			- dark brown claystone, 1/8" thick gypsum layer (along bedding?)			
13, 14, 15										

REV. 8/10/90

LOG OF BORING L18-J

PROJECT NUMBER: 89-977	PROJECT NAME: B-18 LANDFILL, KHF		
BORING NUMBER: L18-J	ELEVATION: 820	DATE	
COORDINATES: N. 228,390 E. 1,701,985	BORING DIA.: 5"	STARTED	COMPLETED
DRILLING METHODS: MUD ROTARY	WATER DEPTH: NONE	5/8/90	5/9/90
ENG/GEO: R. HARLAN (WAHLER ASSOCIATES)	CHECKED BY: J. BADEL	PAGE: 2 OF 9	

DEPTH IN FEET	SAMPLE TYPE	SAMPLE NO.	RESISTANCE (BLOWS PER FOOT)	RECOVERY	USCS/ROCK TYPE	PROFILE	DESCRIPTION	MOISTURE CONTENT %	DRY DENSITY (pcf)	OTHER TESTS
16	PB	S-3		2.2/2.5			- 70° joint filled with 1/4" thick gypsum vein	24	92	PI
17							- gray, brown silty claystone interbedded sandstone, minor orange mottling			
18										
19										
20										
21	PB	S-4		1.5/2.0	ss		- orange, cemented sandstone, fine grained			
22										
23										
24										
25										
26	PB	S-5		1.9/2.5			- bedding at 25°	24	99	PI
27							- gray dark brown claystone interbedded sandstone			
28										
29					cs					
30										
31	PB	S-6		2.4/2.5						
32							- gray, brown claystone, laminated very thin orange (iron oxide) stain along bedding (at 30°), 1/4" thick gypsum vein along joint (across bedding)			
33										
34										
35										

LOG OF BORING L18-J

PROJECT NUMBER: 89-977	PROJECT NAME: B-18 LANDFILL, KHF		
BORING NUMBER: L18-J	ELEVATION: 820'	DATE	
COORDINATES: N. 228,390 E. 1,701,985	BORING DIA.: 5"	STARTED	COMPLETED
DRILLING METHODS: MUD ROTARY	WATER DEPTH: NONE	5/8/90	5/9/90
ENG/GEO: R. HARLAN (WAHLER ASSOCIATES)	CHECKED BY: J. BADEL	PAGE: 3 OF 9	

DEPTH IN FEET	SAMPLE TYPE	SAMPLE NO.	RESISTANCE (BLOWS PER FOOT)	RECOVERY	USCS/ROCK TYPE	PROFILE	DESCRIPTION	MOISTURE CONTENT %	DRY DENSITY (pcf)	OTHER TESTS
36–37	PB	S-7		2.5/2.5			- 1/2" thick gypsum vein, at 10° dip	25	98	PI HYD COMP SG PER SW
38–39							- laminated claystone, gray, brown, thin interbedded sandstone - bedding at 30° dip			
40–41	PB	S-8		1.8/2.5			- gray brown claystone, minor orange mottling, silt and sand pockets (bioturbation?)			
42–43										
44–45										
46–47	PB	S-9		2.3/2.5			- gray claystone, laminated, thin iron oxide stain bedding, near vertical joint with 1/8" thick gypsum vein, sandstone lenses	25	97	PI
48–49										
50–51	PB	S-10		2.3/2.5			- brown-gray claystone			
52–53										
54–55										

LOG OF BORING L18-J

PROJECT NUMBER: 89-977	PROJECT NAME: B-18 LANDFILL, KHF		
BORING NUMBER: L18-J	ELEVATION: 820'	DATE	
COORDINATES: N. 228,390 E. 1,701,985	BORING DIA.: 5"	STARTED	COMPLETED
DRILLING METHODS: MUD ROTARY	WATER DEPTH: NONE	5/8/90	5/9/90
ENG/GEO: R. HARLAN (WAHLER ASSOCIATES)	CHECKED BY: J. BADEL	PAGE: 4 OF 9	

DEPTH IN FEET	SAMPLE TYPE	SAMPLE NO.	RESISTANCE (BLOWS PER FOOT)	RECOVERY	USCS/ROCK TYPE	PROFILE	DESCRIPTION	MOISTURE CONTENT %	DRY DENSITY (pcf)	OTHER TESTS
56–57	PB	S-11		2.3/2.5			- gray, orange claystone, laminated, thin interbedded sandstone lens	26	99	PI
58–59										
60–62	PB	S-12		2.4/2.5			- gray claystone, laminated			
63–64										
65–67	PB	S-13		2.1/2.5			- bedding attitude rotates ~ 90° (NE to NW) at 66'	25	100	PI
							- dark gray claystone, thin interbedded sandstone			
68–69										
70–72	PB	S-14		2.2/2.5			- dark brown-gray claystone			
73–74										
75										

LOG OF BORING L18-J

PROJECT NUMBER: 89-977	PROJECT NAME: B-18 LANDFILL, KHF		
BORING NUMBER: L18-J	ELEVATION: 820'	DATE	
COORDINATES: N. 228,390 E. 1,701,985	BORING DIA.: 5"	STARTED	COMPLETED
DRILLING METHODS: MUD ROTARY	WATER DEPTH: NONE	5/8/90	5/9/90
ENG/GEO: R. HARLAN (WAHLER ASSOCIATES)	CHECKED BY: J. BADEL	PAGE: 5 OF 9	

DEPTH IN FEET	SAMPLE TYPE	SAMPLE NO.	RESISTANCE (BLOWS PER FOOT)	RECOVERY	USCS/ROCK TYPE	PROFILE	DESCRIPTION	MOISTURE CONTENT %	DRY DENSITY (pcf)	OTHER TESTS
76–77	PB	S-15		2.5/2.5			- gray, brown, minor orange claystone, thin interbedded sandstone	25	94	PI HYD COMP PER
78–79										
80–81	PB	S-16		2.4/2.5			- blue gray claystone with occasional sand pockets (bioturbation?)			
82–83										
84–85	PB	S-17		2.2/2.5						
86–87							- gray brown claystone with sand pockets or thin sand interbed	25	99	PI
88–89										
90–91	PB	S-18		2.1/2.5			- gray, orange claystone with large sand pockets or sandstone interbeds			
92–93										
94										CHEM
95							- claystone with sandstone			

LOG OF BORING L18-J

PROJECT NUMBER: 89-977	PROJECT NAME: B-18 LANDFILL, KHF		
BORING NUMBER: L18-J	ELEVATION: 820'	DATE	
COORDINATES: N. 228,390 E. 1,701,985	BORING DIA.: 5"	STARTED	COMPLETED
DRILLING METHODS: MUD ROTARY	WATER DEPTH: NONE	5/8/90	5/9/90
ENG/GEO: R. HARLAN (WAHLER ASSOCIATES)	CHECKED BY: J. BADEL	PAGE: 6 OF 9	

DEPTH IN FEET	SAMPLE TYPE	SAMPLE NO.	RESISTANCE (BLOWS PER FOOT)	RECOVERY	USCS/ROCK TYPE	PROFILE	DESCRIPTION	MOISTURE CONTENT %	DRY DENSITY (pcf)	OTHER TESTS
96	PB	S-19		0.8/2.5	ss		- intermittent sandstone from a 95.5' to 105' - cemented sandstone			
97										
98										
99										
100	PB	S-20		0.9/1.5	ss/cs		- very fine silty sandstone, noncemented, mottled, tan/orange	13	121	
101										
102										
103										
104										
105	PB	S-21		2.5/2.5			- dark gray claystone			
106										
107										
108										
109										
110	PB	S-22		2.5/2.5	cs		- dark gray claystone, thin interbedded sandstone, 1/4" sandstone lens	23	103	PI
111										
112										
113										
114										
115										

LOG OF BORING L18-J

PROJECT NUMBER: 89-977	PROJECT NAME: B-18 LANDFILL, KHF		
BORING NUMBER: L18-J	ELEVATION: 820'	DATE	
COORDINATES: N. 228,390 E. 1,701,985	BORING DIA.: 5"	STARTED	COMPLETED
DRILLING METHODS: MUD ROTARY	WATER DEPTH: NONE	5/8/90	5/9/90
ENG/GEO: R. HARLAN (WAHLER ASSOCIATES)	CHECKED BY: J. BADEL	PAGE: 7 OF 9	

DEPTH IN FEET	SAMPLE TYPE	SAMPLE NO.	RESISTANCE (BLOWS PER FOOT)	RECOVERY	USCS/ROCK TYPE	PROFILE	DESCRIPTION	MOISTURE CONTENT %	DRY DENSITY (pcf)	OTHER TESTS
116–117	PB	S-23		2.4/2.5			- dark gray claystone			
118–119										
120–122	PB	S-24		2.5/2.5			- dark gray claystone, thin interbedded sandstone	29	96	PI HYD SW
123–124										
125–127	PB	S-25		2.4/2.5			- dark gray claystone			
128–129										
130–132	PB	S-26		2.8/2.8			- dark gray claystone, thin interbedded sandstone	26	97	PI COMP PER
133–134										
135										

LOG OF BORING L18-J

PROJECT NUMBER: 89-977	PROJECT NAME: B-18 LANDFILL, KHF		
BORING NUMBER: L18-J	ELEVATION: 820'	DATE	
COORDINATES: N. 228,390 E. 1,701,985	BORING DIA.: 5"	STARTED	COMPLETED
DRILLING METHODS: MUD ROTARY	WATER DEPTH: NONE	5/8/90	5/9/90
ENG/GEO: R. HARLAN (WAHLER ASSOCIATES)	CHECKED BY: J. BADEL	PAGE: 8 OF 9	

DEPTH IN FEET	SAMPLE TYPE	SAMPLE NO.	RESISTANCE (BLOWS PER FOOT)	RECOVERY	USCS/ROCK TYPE	PROFILE	DESCRIPTION	MOISTURE CONTENT %	DRY DENSITY (pcf)	OTHER TESTS
136–137	PB	S-27		2.5/2.5			- dark gray claystone			
138–139										
140–141	PB	S-28		2.5/2.5			- dark gray claystone, thin interbedded sandstone	28	93	PI
143–144										
145–146	PB	S-29		2.5/2.5			- dark gray claystone			
148–149										
150–151	PB	S-30		2.5/2.5			- dark gray claystone, thin interbedded sandstone	28	96	PI
153–154										
155										

LOG OF BORING L18-J

PROJECT NUMBER: 89-977	PROJECT NAME: B-18 LANDFILL, KHF		
BORING NUMBER: L18-J	ELEVATION: 820'	DATE	
COORDINATES: N. 228,390 E. 1,701,985	BORING DIA.: 5"	STARTED	COMPLETED
DRILLING METHODS: MUD ROTARY	WATER DEPTH: NONE	5/8/90	5/9/90
ENG/GEO: R. HARLAN (WAHLER ASSOCIATES)	CHECKED BY: J. BADEL	PAGE: 9 OF 9	

DEPTH IN FEET	SAMPLE TYPE	SAMPLE NO.	RESISTANCE (BLOWS PER FOOT)	RECOVERY	USCS/ROCK TYPE	PROFILE	DESCRIPTION	MOISTURE CONTENT %	DRY DENSITY (pcf)	OTHER TESTS
156–157	PB	S-31		2.5/2.5			- dark gray claystone - harder (slower drilling)			
158–159										
160–161	PB	S-32		2.5/2.5			- silty	20	104	PI HYD SW
162–163					ss		SILTY SANDSTONE, tan, very fine, noncemented			
164										
165–166	PB	S-33		2.3/2.5	slt		SILTSTONE, light brown, gray, mottled orange, nonplastic			
167–168										
169					ss		SANDSTONE, SILTY SANDSTONE, orange brown, very fine grained, noncemented			
170–171	PB	S-34		2.2/2.5						
172					cs		CLAYSTONE, dark brown, black, highly plastic			

- TOTAL DEPTH = 172.5'
- NO GROUND WATER ENCOUNTERED
- BACKFILLED WITH CEMENT GROUT VIA TREMIE

LOG OF BORING L18-K

PROJECT NUMBER: 89-977	PROJECT NAME: B-18 LANDFILL, KHF		
BORING NUMBER: L18-K	ELEVATION: 804'	DATE	
COORDINATES: N. 228,390 E. 1,701,722	BORING DIA.: 5"	STARTED	COMPLETED
DRILLING METHODS: MUD ROTARY	WATER DEPTH: NONE	5/9/90	5/10/90
ENG/GEO: R. HARLAN (WAHLER ASSOCIATES)	CHECKED BY: J. BADEL	PAGE: 1 OF 6	

LEGEND

SANDS
SILTS
CLAYS
SANDSTONE (ss)
SILTSTONE (slt)
CLAYSTONE (cs)

PB - Pitcher Barrel
DR - Drive Ring Sample
CHEM - Chemical Test
PI - Atterberg Limits Test
COMP - Compaction Test
DIR - Direct Shear Test
TX - Triaxial Test

PER - Permeability Test
SW - Swelling Test
SI - Sieve Analysis Test
%200 - Percentage Passing
HYD - Hydrometer Test
SG - Specific Gravity Test

DEPTH IN FEET	SAMPLE TYPE	SAMPLE NO.	RESISTANCE (BLOWS PER FOOT)	RECOVERY	USCS/ROCK TYPE	PROFILE	DESCRIPTION	MOISTURE CONTENT %	DRY DENSITY (pcf)	OTHER TESTS
					cl		FILL, sandy, clay			
1							SAN JOAQUIN FORMATION SANDSTONE, SILTY SANDSTONE, occasional sandy siltstone, tan, light brown, orange brown, typically very fine, non to weakly cemented			
2										
3										
4										
5										
6	PB	S-1		2.2/2.5						%200
7							- very fine sandstone, tan, mottled orange			
8					ss					
9										
10										
11	PB	S-2		2.3/2.5						
12							- tan, silty sandstone, very fine, minor claystone fragments, weakly cemented			
13										
14										
15										

REV. 8/10/90

LOG OF BORING L18-K

PROJECT NUMBER: 89-977	PROJECT NAME: B-18 LANDFILL, KHF		
BORING NUMBER: L18-K	ELEVATION: 840'	DATE	
COORDINATES: N. 228,390 E. 1,701,722	BORING DIA.: 5"	STARTED	COMPLETED
DRILLING METHODS: MUD ROTARY	WATER DEPTH: NONE	5/9/90	5/10/90
ENG/GEO: R. HARLAN (WAHLER ASSOCIATES)	CHECKED BY: J. BADEL	PAGE: 2 OF 6	

DEPTH IN FEET	SAMPLE TYPE	SAMPLE NO.	RESISTANCE (BLOWS PERFOOT)	RECOVERY	USCS/ROCK TYPE	PROFILE	DESCRIPTION	MOISTURE CONTENT %	DRY DENSITY (pcf)	OTHER TESTS
16–17	PB	S-3		2.5/2.5			- tan, silty sandstone, very fine			
18–19										
20–21	PB	S-4		1.5/2.5			- tan, silty sandstone with orange brown siltstone interbed/pockets			%200
23–24										
25–26	PB	S-5		2.4/2.5			- clean sandstone with silty sandstone, sandy siltstone interbeds (or pockets)			SG COMP PER SW
28–29										
30–31	PB	S-6		2.5/2.5			- tan, sandy siltstone, mottled orange with minor gray claystone pocket (bioturbation)			
33–34										
35										

LOG OF BORING L18-K

PROJECT NUMBER: 89-977	PROJECT NAME: B-18 LANDFILL, KHF		
BORING NUMBER: L18-K	ELEVATION: 804'	DATE	
COORDINATES: N. 228,390 E. 1,701,722	BORING DIA.: 5"	STARTED	COMPLETED
DRILLING METHODS: MUD ROTARY	WATER DEPTH: NONE	5/9/90	5/10/90
ENG/GEO: R. HARLAN (WAHLER ASSOCIATES)	CHECKED BY: J. BADEL	PAGE: 3 OF 6	

DEPTH IN FEET	SAMPLE TYPE	SAMPLE NO.	RESISTANCE (BLOWS PER FOOT)	RECOVERY	USCS/ROCK TYPE	PROFILE	DESCRIPTION	MOISTURE CONTENT %	DRY DENSITY (pcf)	OTHER TESTS
36	PB	S-7		1.9/2.2						
37							- light brown, silty sandstone, very fine			
38										
39										
40										
41	PB	S-8		2.3/2.5						%200
42							- light brown, orange brown silty sandstone, very fine			
43										
44										
45										
46	PB	S-9		1.9/2.0						
47							- light brown siltstone - sandy siltstone			
48										
49										
50										
51	PB	S-10		2.2/2.5	slt					COMP PER SW
52							- sandy siltstone with claystone pockets (or interbeds)			
53										
54										
55										

LOG OF BORING L18-K

PROJECT NUMBER: 89-977	PROJECT NAME: B-18 LANDFILL, KHF		
BORING NUMBER: L18-K	ELEVATION: 804'	DATE	
COORDINATES: N. 228,390 E. 1,701,722	BORING DIA.: 5"	STARTED	COMPLETED
DRILLING METHODS: MUD ROTARY	WATER DEPTH: NONE	5/9/90	5/10/90
ENG/GEO: R. HARLAN (WAHLER ASSOCIATES)	CHECKED BY: J. BADEL	PAGE: 4 OF 6	

DEPTH IN FEET	SAMPLE TYPE	SAMPLE NO.	RESISTANCE (BLOWS PER FOOT)	RECOVERY	USCS/ROCK TYPE	PROFILE	DESCRIPTION	MOISTURE CONTENT %	DRY DENSITY (pcf)	OTHER TESTS
56–57	PB	S-11		1.7/2.5			- tan to light brown silty sandstone, sandy siltstone, very fine grained			
58–59										
60–62	PB	S-12		1.4/2.5			- light brown siltstone - sandy siltstone, minor white gypsum			
63–64										
65–67	PB	S-13		1.9/2.2	SS		- cemented sandstone - light brown sandstone, silty sandstone, very fine grained, moderate to well cemented, mottled dark brown (carbonacesus?), few shells at 67'			%200
68–69										
70–72	PB	S-14		2.5/2.5			- orange brown silty sandstone, very fine, noncemented			
73–74										
75										

LOG OF BORING L18-K

PROJECT NUMBER: 89-977	PROJECT NAME: B-18 LANDFILL, KHF		
BORING NUMBER: L18-K	ELEVATION: 804'	DATE	
COORDINATES: N. 228,390 E. 1,701,722	BORING DIA.: 5"	STARTED	COMPLETED
DRILLING METHODS: MUD ROTARY	WATER DEPTH: NONE	5/9/90	5/10/90
ENG/GEO: R. HARLAN (WAHLER ASSOCIATES)	CHECKED BY: J. BADEL	PAGE: 5 OF 6	

DEPTH IN FEET	SAMPLE TYPE	SAMPLE NO.	RESISTANCE (BLOWS PER FOOT)	RECOVERY	USCS/ROCK TYPE	PROFILE	DESCRIPTION	MOISTURE CONTENT %	DRY DENSITY (pcf)	OTHER TESTS
76	PB	S-15		1.7/1.8			- orange brown silty sandstone, very fine			COMP PER SW
77										
78										
79										
80							- cemented from 80' to 82'			
81	PB	S-16		1.2/2.3						%200 PI
82										
83							CLAYSTONE, gray, brown, highly plastic, faint orange mottling			
84										
85										
86	PB	S-17		2.2/2.5			- dark gray claystone			
87										
88					CS					
89										
90										
91	PB	S-18		2.5/2.5			- dark gray claystone			
92										
93										
94										
95										

LOG OF BORING L18-K

PROJECT NUMBER: 89-977	PROJECT NAME: B-18 LANDFILL, KHF		
BORING NUMBER: L18-K	ELEVATION: 740'	DATE	
COORDINATES: N. 228,780 E. 1,702,480	BORING DIA.: 5"	STARTED	COMPLETED
DRILLING METHODS: MUD ROTARY	WATER DEPTH: NONE	3/14/90	3/15/90
ENG/GEO: R. HARLAN (WAHLER ASSOCIATES)	CHECKED BY: J. BADEL	PAGE: 6 OF 6	

DEPTH IN FEET	SAMPLE TYPE	SAMPLE NO.	RESISTANCE (BLOWS PER FOOT)	RECOVERY	USCS/ROCK TYPE	PROFILE	DESCRIPTION	MOISTURE CONTENT %	DRY DENSITY (pcf)	OTHER TESTS
96 – 97	PB	S-19		2.5/2.5			- dark gray claystone			

- TOTAL DEPTH = 97.5'
- NO GROUND WATER ENCOUNTERED
- BACKFILLED WITH CEMENT GROUT VIA TREMIE

APPENDIX C
TRENCH AND TEST PIT LOGS

CLIENT CHEMICAL WASTE MANAGEMENT, INC.
PROJECT NO. 89-977
LOCATION KETTLEMAN, CALIFORNIA

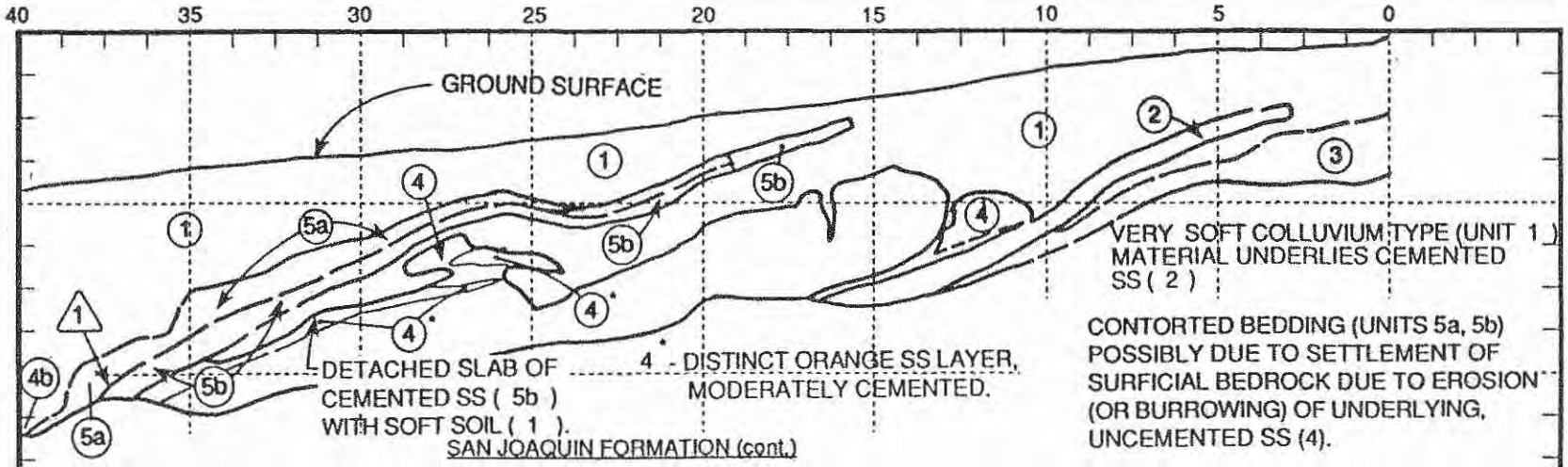
TRENCH NO. T-1

SHEET 1 OF 2
DATE 7/21/90

EQUIPMENT: DOZER	LOCATION: SEE FIGURE 2.3 - SITE GEOLOGIC MAP
BEARING: N50°E	NOTES: LOG OF PORTION OF NORTH WALL OF DOZER CUT DT-B

FIELD ENGINEER: R. H. (WAHLER)

UNITS			SAMPLE	LAB	STRUCTURE			
DEPTH	NO.	DESCRIPTION	NO.	TESTS	NO.	STRIKE	DIP	TYPE
		COLLUVIUM						
	1	SANDY CLAY (cl, occasional sc): Light brown, dry-damp; low plasticity; 10-40% very fine sand; typically contains root voids. Unit 1 type-material which occursbeneath disturbed unit 3, and units 2 & 4 are very soft, easily gouged with fingers. Occasional clayey sand, very fine, loose (sc); occasional charcoal.			1	N42°W	33°SW	bedding on unit 5b
		SAN JOAQUIN FORMATION						
	2	SANDSTONE (SS): Tan-light brown; well-cemented (hard); moderately strong; underlain by.						
	3	SANDSTONE (SS): White-tan, minor orange mottling: Very thick bedded (little discernable bedding). Very fine; non-weakly cemented; soft; friable (easily crumbled to loose soil with fingers.						



SAN JOAQUIN FORMATION (cont.)

4 SANDSTONE (SS): Very similar to 3; white-tan with orange mottling, banding along bedding; soft; friable; thick-very thick bedded. Excavates as loose, fine sand (sp-sm). Contains numerous in-filled voids, cracks (filled with 1), possibly partially due to burrowing, at and near contact with overlying units.

4b Same as 4, but stratigraphically up-section (above 5a & 5b).

5a SANDSTONE (SS): Tan-yellowish brown; moderately cemented; soft; weak.

5b SANDSTONE (SS): Orange-brown, well-cemented; hard; moderately strong.

NOTE: Contorted bedding (units 5a, 5b) possibly due to settlement of surficial bedrock due to erosion (or burrowing) of underlying, uncemented ss (4).

REV. 8/14/90

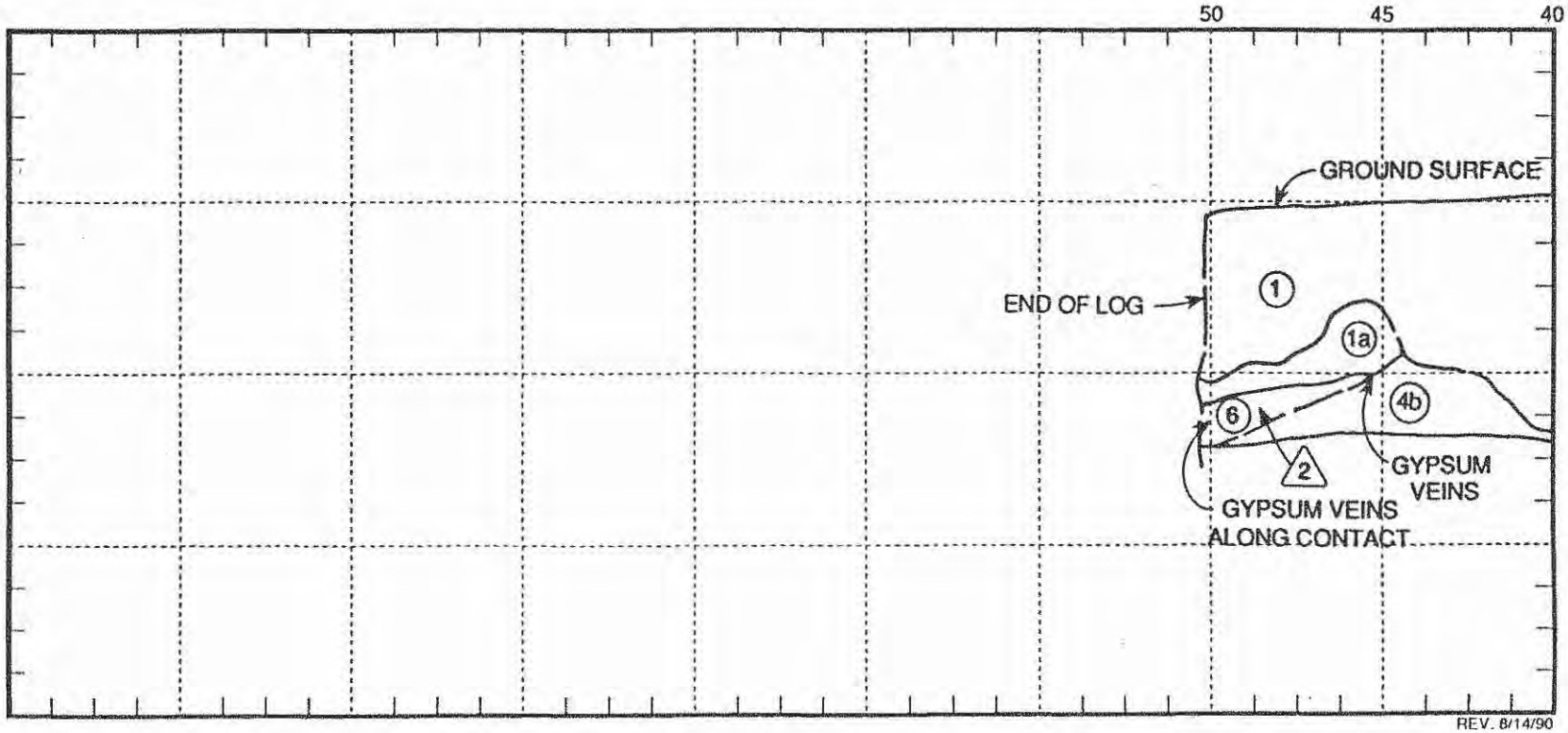
CLIENT CHEMICAL WASTE MANAGEMENT, INC.
PROJECT NO. 89-977
LOCATION KETTLEMAN, CALIFORNIA

TRENCH NO. T-1 (cont.)

SHEET 2 OF 2
DATE 2/21/90

EQUIPMENT: DOZER
BEARING: N50°E
LOCATION: SEE FIGURE 2.3 - SITE GEOLOGIC MAP
NOTES: LOG OF PORTION OF NORTH WALL OF DOZER CUT DT-B
FIELD ENGINEER: R. H. (WAHLER)

UNITS			SAMPLE	LAB	STRUCTURE			
DEPTH	NO.	DESCRIPTION	NO.	TESTS	NO.	STRIKE	DIP	TYPE
		SAN JOAQUIN FORMATION (cont.)						
	6	SILTY SANDSTONE: Tan-gray; very fine; soft; friable to weak; laminated-thin bedded; 30-40% fines (sm); some siltstone-sandy siltstone interbeds.			2	N43°W	31°SW	bedding
		COLLUVIUM (?)*						
	1a	SANDY CLAY: Gray-light brown; abundant white mottling (precipitate/gypsum?); appears very stiff; moderate plasticity; possibly severely weathered San Joaquin Formation?						



REV. 8/14/90

CLIENT CHEMICAL WASTE MANAGEMENT, INC.

PROJECT NO. 89-977

LOCATION KETTLEMAN, CALIFORNIA

TRENCH NO. T-2

SHEET 1 OF 1

DATE 2/27/90

EQUIPMENT: DOZER

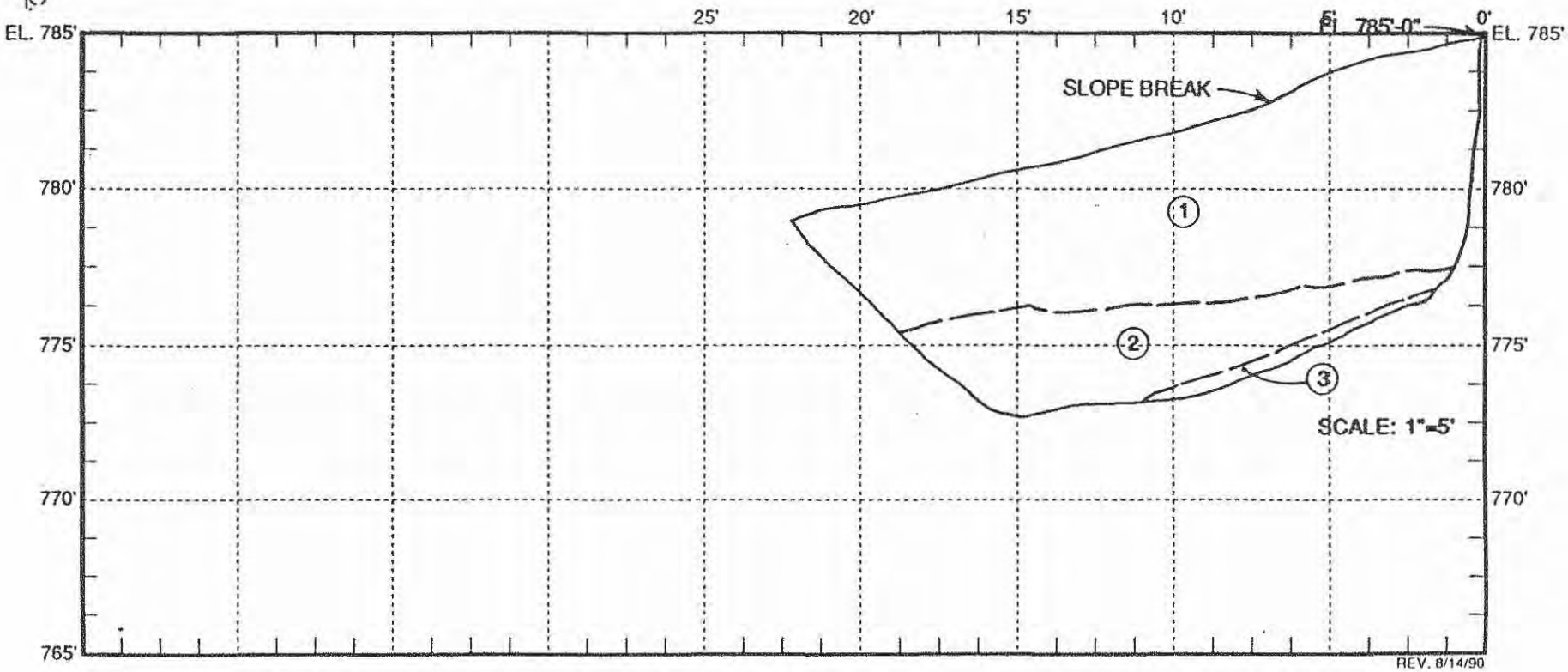
LOCATION: SEE FIGURE 2.3 - SITE GEOLOGIC MAP

BEARING: N4°E

NOTES:

FIELD ENGINEER: R. H. (WAHLER)

UNITS			SAMPLE	LAB	STRUCTURE			
DEPTH	NO.	DESCRIPTION	NO.	TESTS	NO.	STRIKE	DIP	TYPE
		COLLUVIUM						
	1	SANDY CLAY (CL): Light brown; dry-slighty damp; low-moderate plasticity; 10-40% very fine sand; excavates easily.						
		SAN JOAQUIN FORMATION						
	2	SANDSTONE (SS): White-tan; very fine; non-weakly cemented; excavates with moderate difficulty; very dense.						
	3	CEMENTED SANDSTONE/SILTSTONE (SS/SLT): Orange-brown; moderately hard; moderately strong; excavates with difficulty; appears planar.						



REV. 8/14/90

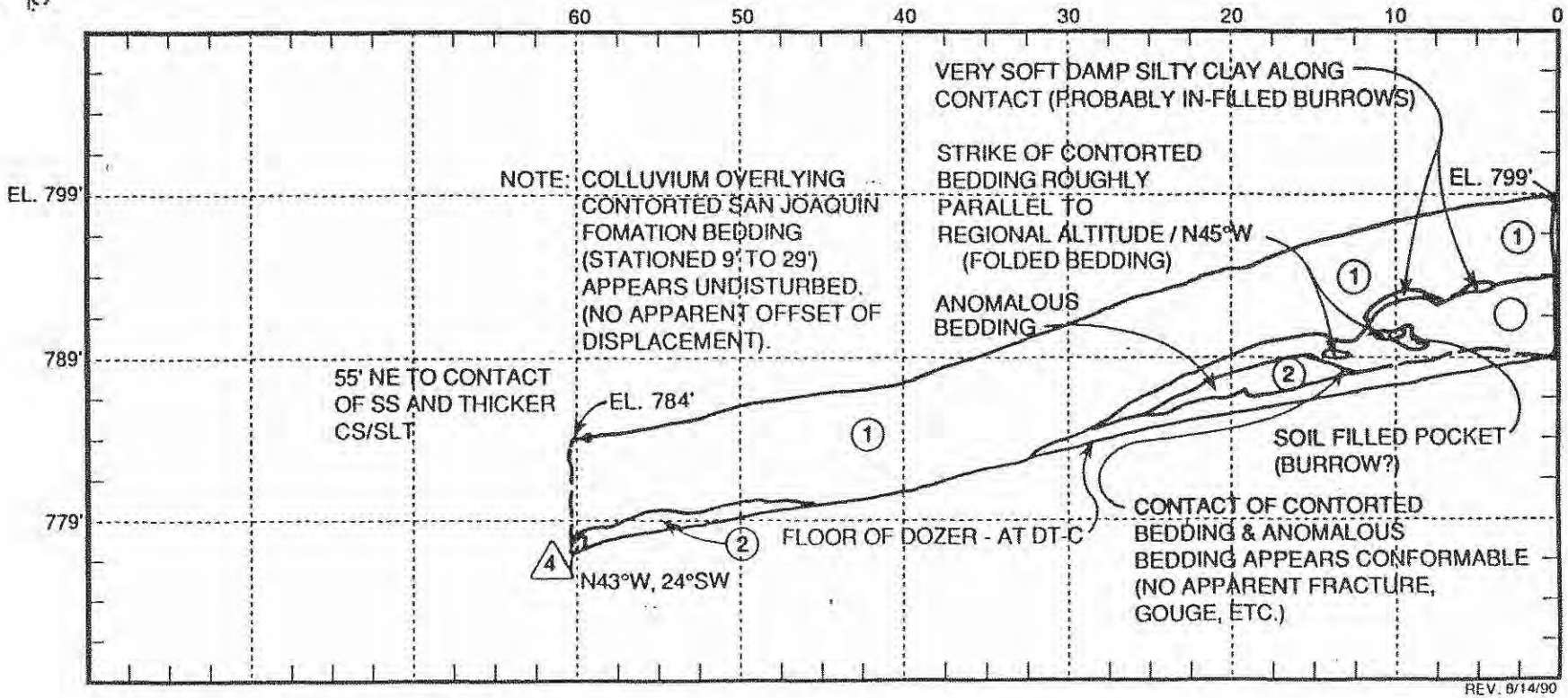
CLIENT CHEMICAL WASTE MANAGEMENT, INC.
PROJECT NO. 89-977
LOCATION KETTLEMAN, CALIFORNIA

TRENCH NO. T-3

SHEET 1 OF 1
DATE 3/23/90

EQUIPMENT: DOZER
BEARING: S72°W
LOCATION: SEE FIGURE 2.3 - SITE GEOLOGIC MAP
NOTES:
FIELD ENGINEER: R. H. (WAHLER)

UNITS			SAMPLE	LAB	STRUCTURE			
DEPTH	NO.	DESCRIPTION	NO.	TESTS	NO.	STRIKE	DIP	TYPE
		COLLUVIUM						
	1	SANDY CLAY (SC): Light brown; dry; low-moderate plasticity; 20-40% very fine sand; numerous root voids (pin-hole); caliche along root voids & soil fractures (dessication cracks); very stiff to hard.			1	N46°W	26°SW	bedding
		SAN JOAQUIN FORMATION			2	N55°W	73°SW	bedding
	2	CLAYSTONE (C/ST): Gray/brown; severly weathered to about 1' below contact with 1 slightly weathered at depth. soft; weak; laminated to thin bedded; occasional siltstone; very fine sandstone laminae.			3	N68°W	40°SW	bedding
					4	N43°W	24°SW	bedding

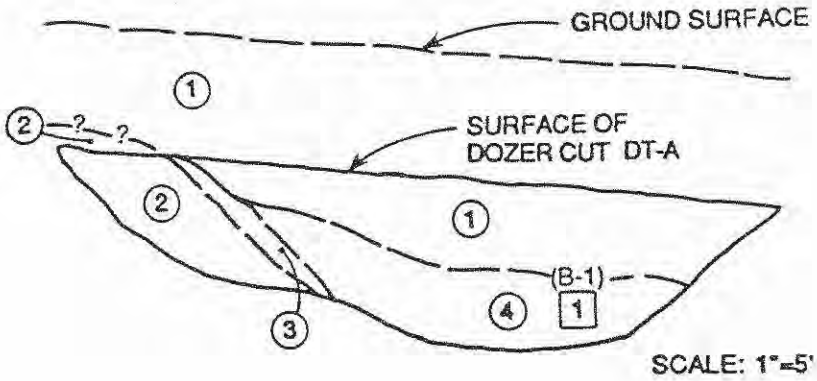


REV. 8/14/90

TEST PIT NO. TP-1

SHEET 1 OF 1	LOCATION: SEE FIGURE 2.3 - SITE GEOLOGIC MAP		BEARING: S53°W
RIG: CAT 426 BACKHOE	PIT WIDTH: 24"	DATE 2/20/90	LOGGED BY: R. H. (WAHLER)

TEST PIT NO.	DEPTH INTERVAL	SOIL TYPE	WATER DEPTH	MATERIAL DESCRIPTION EXCAVATION CHARACTERISTICS	SAMPLE NUMBER	SAMPLE DEPTH
TP-1	0-~6'		NONE	COLLUVIUM (1) SANDY CLAY (cl): Light brown; dry -damp; low-moderate plasticity; 20-40% very fine sand; numerous root voids; occasional white precipitate (gypsum?); stiff; excavates easily. SAN JOAQUIN FORMATION (2) CLAYEY SILTSTONE/CLAYSTONE (SLT/CS): Light brown mottled orange (siltstone); moderate-dark gray (claystone), interbeded; laminated to thin bedded; slightly weathered; soft; weak; excavates with moderate difficulty; 1/4" to 1" thick slabs of hard clay (up to 6"dia.). (3) CEMENTED SANDSTONE (SS): White/tan, some orange, brown mottling; fine to coarse sand; moderately hard; moderately strong; slightly weathered. (4) SANDSTONE (SS): Tan/white, mottled orange; slightly weathered; very fine; 5-30% fines (sp-sm); very thick bedded; soft; friable; excavates with slight difficulty.	1 B-1	~7'



REV. 8/14/90

CLIENT CHEMICAL WASTE MANAGEMENT, INC.

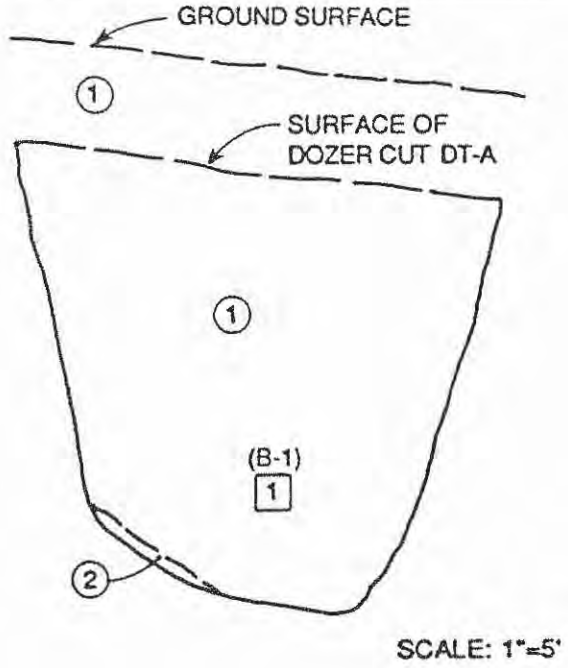
PROJECT NO. 89-977

LOCATION KETTLEMAN, CALIFORNIA

TEST PIT NO. TP-2

SHEET 1 OF 1	LOCATION: SEE FIGURE 2.3 - SITE GEOLOGIC MAP		BEARING: S50°W
RIG: CAT 426 BACKHOE	PIT WIDTH: 24"	DATE: 2/20/90	LOGGED BY: R. H. (WAHLER)

TEST PIT NO.	DEPTH INTERVAL	SOIL TYPE	WATER DEPTH	MATERIAL DESCRIPTION EXCAVATION CHARACTERISTICS	SAMPLE NUMBER	SAMPLE DEPTH
TP-2	0'-~15'		NONE	COLLUVIUM (1) SANDY CLAY (cl): Light brown; dry-damp; low-moderate plasticity; 20-40% very fine sand; numerouw root voids; occasional white precipitate (gypsum?); stiff; excavates easily. SAN JOAQUIN FORMATION (2) SANDSTONE (SS): Tan/white; faint orange mottling; slightly weathered; soft friable; excavates with slight difficulty; very fine grained.		



REV. 8/14/90

CLIENT CHEMICAL WASTE MANAGEMENT, INC.

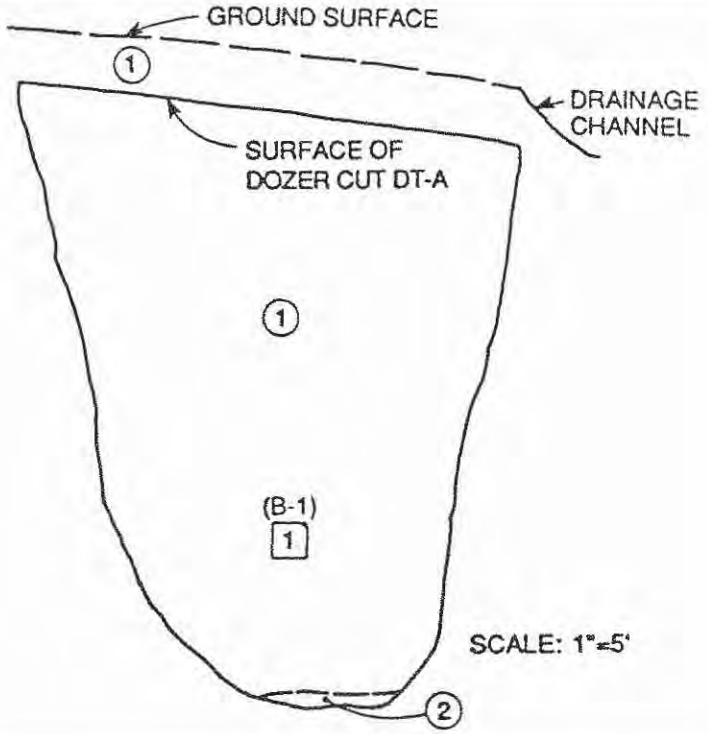
PROJECT NO. 89-977

LOCATION KETTLEMAN, CALIFORNIA

TEST PIT NO. TP-3

SHEET 1 OF 1	LOCATION: SEE FIGURE 2.3 - SITE GEOLOGIC MAP		BEARING: S55°W
RIG: CAT 426 BACKHOE	PIT WIDTH: 24"	DATE: 2/20/90	LOGGED BY: R.H. (WAHLER)

TEST PIT NO.	DEPTH INTERVAL	SOIL TYPE	WATER DEPTH	MATERIAL DESCRIPTION EXCAVATION CHARACTERISTICS	SAMPLE NUMBER	SAMPLE DEPTH
TP-3	0'-~18'		NONE	COLLUVIUM (1) SANDY CLAY (cl): Light brown; damp; low-moderate plasticity; 10-20% very fine sand, occasional lenses of fine, clayey sand; 10-40% fines; stiff; excavates easily. SAN JOAQUIN FORMATION (2) SANDSTONE (SS): Tan, stained white (precipitation/gypsum?); some orange mottling; soft; friable; very fine.	[1] B-1	~15'



REV. 8/14/90

CLIENT CHEMICAL WASTE MANAGEMENT, INC.

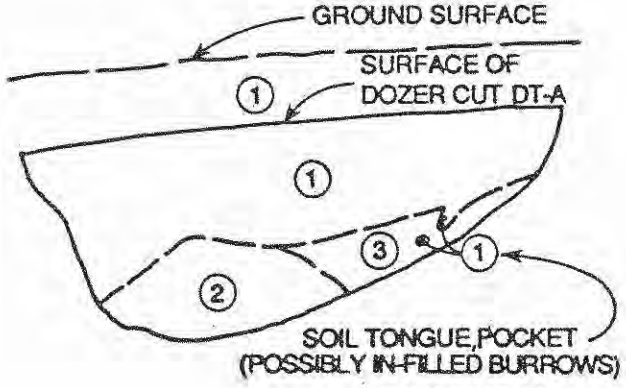
PROJECT NO. 89-977

LOCATION KETTLEMAN, CALIFORNIA

TEST PIT NO. TP-4

SHEET 1 OF 1	LOCATION: SEE FIGURE 2.3 - SITE GEOLOGIC MAP		BEARING: S53°W
RIG: CAT 426 BACKHOE	PIT WIDTH: 24"	DATE: 2/20/90	LOGGED BY: R. H. (WAHLER)

TEST PIT NO.	DEPTH INTERVAL	SOIL TYPE	WATER DEPTH	MATERIAL DESCRIPTION EXCAVATION CHARACTERISTICS	SAMPLE NUMBER	SAMPLE DEPTH
TP-4	0'-~6.5'@ NE end 0-~3.5'@ SW end (Thickens to NE towards channel)		NONE	COLLUVIUM (1) SANDY CLAY (cl): Light brown; dry-damp; low-moderate plasticity; 10-40% very fine sand; appears firm-stiff; excavates easily. SAN JOAQUIN FORMATION (2) SANDSTONE (SS): Tan/white, minor orange mottling; very fine; 5-30% fines; soft; friable; slightly weatered; very thick bedded. Excavates with slight difficulty. (3) CLAYSTONE (CS): Gray, mottled white (gypsum?); slightly weathered; laminated to very thin bedded; soft; weak; occastional fossils; sand content varies along laminae and in-filled pockets (bioturbation). Excavates with slight difficulty as hard, angular chunks of clay up to ~2" dia.		



SCALE: 1"=5'

REV. 8/14/90

CLIENT CHEMICAL WASTE MANAGEMENT, INC.

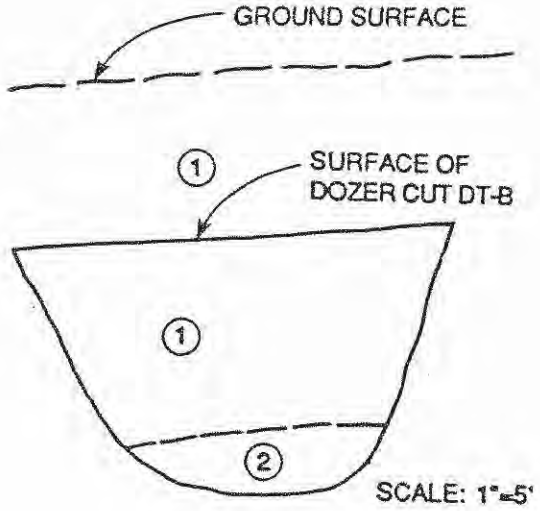
PROJECT NO. 89-977

LOCATION KETTLEMAN, CALIFORNIA

TEST PIT NO. TP-5

SHEET 1 OF 1	LOCATION: SEE FIGURE 2.3 - SITE GEOLOGIC MAP		BEARING: N50°E
RIG: CAT 426 BACKHOE	PIT WIDTH: 24"	DATE: 2/21/90	LOGGED BY: R. H. (WAHLER)

TEST PIT NO.	DEPTH INTERVAL	SOIL TYPE	WATER DEPTH	MATERIAL DESCRIPTION EXCAVATION CHARACTERISTICS	SAMPLE NUMBER	SAMPLE DEPTH
TP-5	0'-10'		NONE	COLLUVIUM (1) SANDY CLAY (cl): Light brown; dry-slightly damp; 30-40% very fine sand; low plasticity appears firm; excavates easily.		
	10'-11.5'			SAN JOAQUIN FORMATION (2) SANDSTONE (SS): Light gray; very fine; 20-40% non-plastic fines; soft; friable; excavates with slight difficulty as loose soil to ~3"dia. chunks (easily broken by hand).		



REV. 8/14/90

CLIENT CHEMICAL WASTE MANAGEMENT, INC.

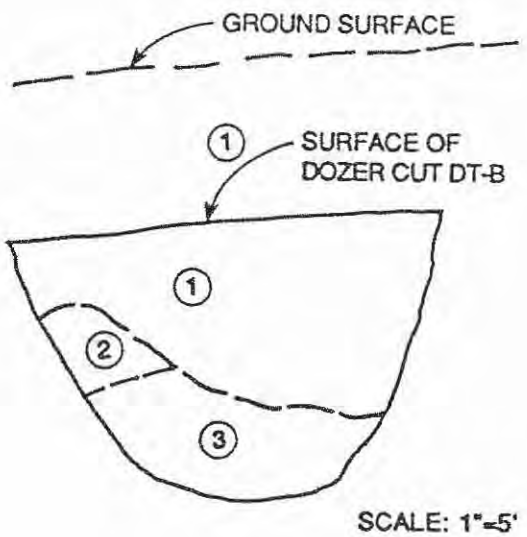
PROJECT NO. 89-977

LOCATION KETTLEMAN, CALIFORNIA

TEST PIT NO. TP-6

SHEET 1 OF 1	LOCATION: SEE FIGURE 2.3 - SITE GEOLOGIC MAP		BEARING: N38°E
RIG: CAT 426 BACKHOE	PIT WIDTH: 24"	DATE: 2/21/90	LOGGED BY: R. H. (WAHLER)

TEST PIT NO.	DEPTH INTERVAL	SOIL TYPE	WATER DEPTH	MATERIAL DESCRIPTION EXCAVATION CHARACTERISTICS	SAMPLE NUMBER	SAMPLE DEPTH
TP-6	varies (see sketch)		NONE	COLLUVIUM (1) SANDY CLAY (cl): Light brown; damp; 10-40% very fine sand; low-moderate plasticity; excavates easily; numerous root voids; occasional concentrations of precipitate along root voids (white stringers). SAN JOAQUIN FORMATION (2) CLAYSTONE (CS): Dark gray; some orange laminae; damp (moderate-severely weathered); soft, friable. (3) SILTSTONE/SANDY SILTSTONE (SLT): Tan with orange laminae; slightly weathered; laminated-very thin bedded; soft; excavates with slight difficulty as chunks up to ~2"dia. (can be broken by hand with some difficulty).		



REV. 8/14/90

CLIENT CHEMICAL WASTE MANAGEMENT, INC.

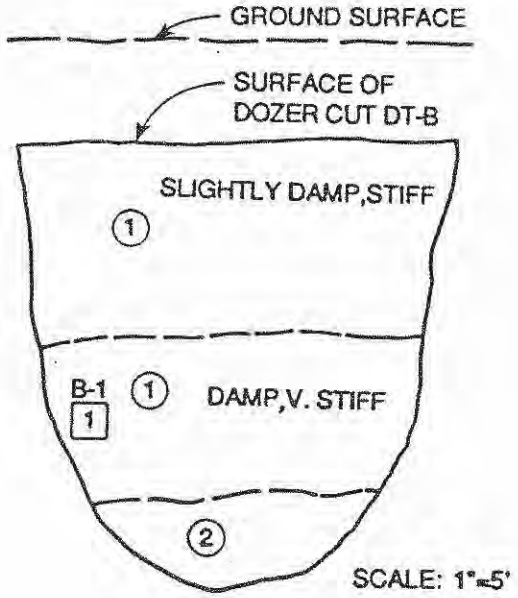
PROJECT NO. 89-977

LOCATION KETTLEMAN, CALIFORNIA

TEST PIT NO. TP-7

SHEET 1 OF 1	LOCATION: SEE FIGURE 2.3 - SITE GEOLOGIC MAP		BEARING: N36°E
RIG: CAT 426 BACKHOE	PIT WIDTH: 24"	DATE: 2/22/90	LOGGED BY: R. H. (WAHLER)

TEST PIT NO.	DEPTH INTERVAL	SOIL TYPE	WATER DEPTH	MATERIAL DESCRIPTION EXCAVATION CHARACTERISTICS	SAMPLE NUMBER	SAMPLE DEPTH
TP-7	0'-12.5'		NONE	COLLUVIUM (1) SANDY CLAY (cl): Light brown; dry-slightly damp; low-moderate plasticity; 10-40% very fine sand; numerous root voids; occasional precipitation(gypsum?) stringers; excavates easily; stiff. 8-12.5' - medium brown; excavates with moderate difficulty, very stiff, damp; moderate plasticity; generally less sand content (10-20%); occasional gray claystone fragments to 1/2"dia.	[1] B-1	~110'
	12.5'-15'			SAN JOAQUIN FORMATION (2) CLAYSTONE (CS): Dark gray with occasional orange banding (Fe-stain along bedding); slightly weathered; laminated to thin bedded; soft; weak; occasional very fine sand laminae; highly plastic; excavates with slight difficulty as ~1/2" to 3"dia. slabs (up to~1" thick) of hard clay.		



REV. 8/14/90

CLIENT CHEMICAL WASTE MANAGEMENT, INC.

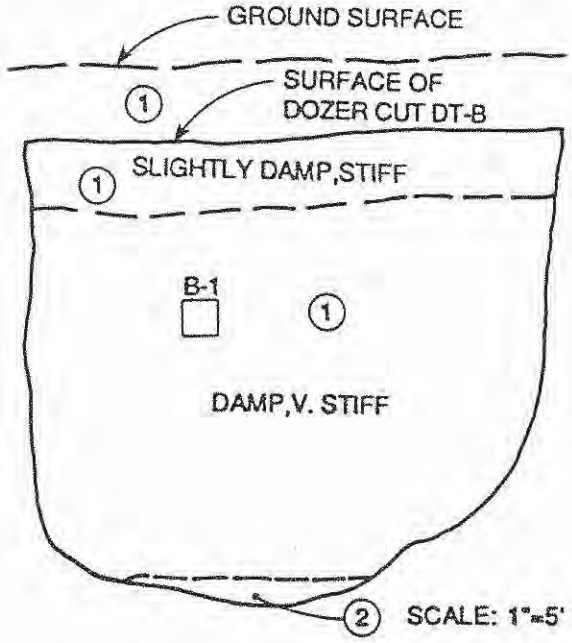
PROJECT NO. 89-977

LOCATION KETTLEMAN, CALIFORNIA

TEST PIT NO. TP-8

SHEET 1 OF 1	LOCATION: SEE FIGURE 2.3 - SITE GEOLOGIC MAP		BEARING: N41°E
RIG: CAT 426 BACKHOE	PIT WIDTH: 24"	DATE: 2/22/90	LOGGED BY: R. H. (WAHLER)

TEST PIT NO.	DEPTH INTERVAL	SOIL TYPE	WATER DEPTH	MATERIAL DESCRIPTION EXCAVATION CHARACTERISTICS	SAMPLE NUMBER	SAMPLE DEPTH
				COLLUVIUM		
TP-8	0'-14.5'		none	(1) SANDY CLAY (cl): Light brown; dry-slightly damp; low-moderate plasticity; 10-40% very fine sand; excavates slightly difficultly; stiff; root voids.		
				brown; damp; moderately plastic; excavates with moderate difficulty; occasional white precipitate (gypsum?); rare slickensides (striated slick surfaces noted @ ~9',11'); minor black organic material from ~4' to 14.5'.	[1] B-1	7'
				Occasional gray claystone fragments from ~10' to 14.5' (increased fragments from ~14' to 14.5').		
				SAN JOAQUIN FORMATION		
	14.5'-15'			(2) CLAYSTONE (CS): Dark gray; some orange banding;soft; weak; highly plastic; laminated - very thin bedded.		



REV. 8/14/90

CLIENT CHEMICAL WASTE MANAGEMENT, INC.

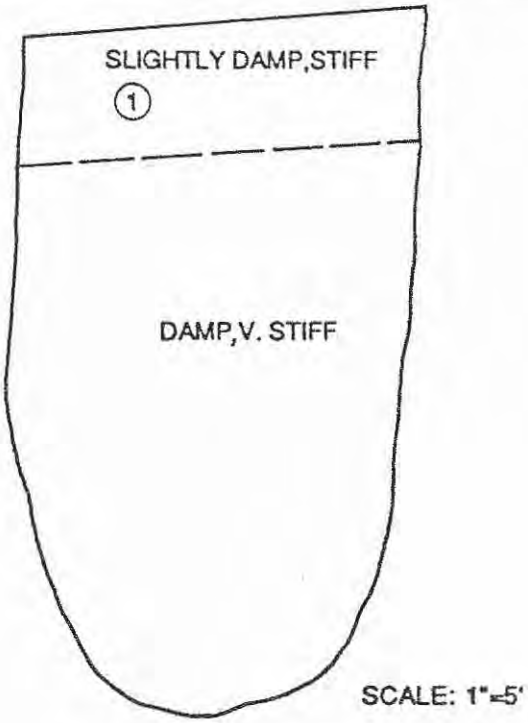
PROJECT NO. 89-977

LOCATION KETTLEMAN, CALIFORNIA

TEST PIT NO. TP-9

SHEET 1 OF 1	LOCATION: SEE FIGURE 2.3 - SITE GEOLOGIC MAP		BEARING: N41°E
RIG: CAT 426 BACKHOE	PIT WIDTH: 24"	DATE: 2/22/90	LOGGED BY: R. H. (WAHLER)

TEST PIT NO.	DEPTH INTERVAL	SOIL TYPE	WATER DEPTH	MATERIAL DESCRIPTION EXCAVATION CHARACTERISTICS	SAMPLE NUMBER	SAMPLE DEPTH
TP-9	0'-18'		NONE	COLLUVIUM (1) SANDY CLAY (cl): Light brown; slightylyt damp; low-moderate plasticity; root voids. moderate brown; damp; moderately plastic; numerous fine, clayey sand and clean sand laminae (intermittent alluvial deposits); excavates with moderate difficulty (very stiff). NOTE: Unable to reach bedrock (colluvium > 18' deep). Test pit located at floor of DT-B		



REV. 8/14/90

CLIENT CHEMICAL WASTE MANAGEMENT, INC.

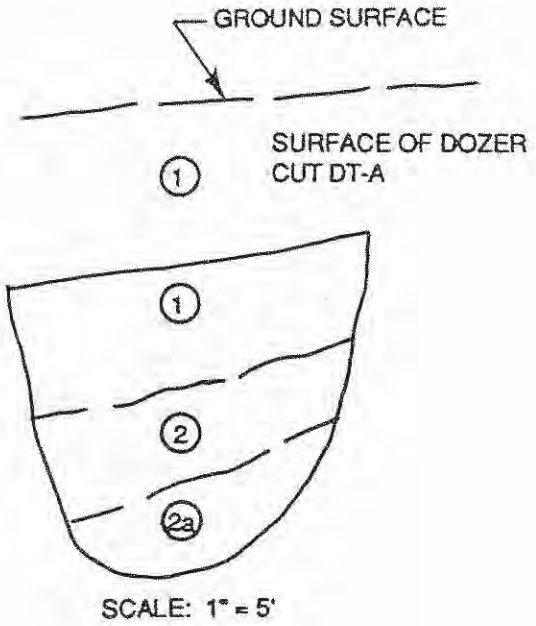
PROJECT NO. 89-977

LOCATION KETTLEMAN, CALIFORNIA

TEST PIT NO. TP-10

SHEET 1 OF 1	LOCATION: SEE FIGURE 2.3 - SITE GEOLOGIC MAP		BEARING: S56°W
RIG: CAT 426 BACKHOE	PIT WIDTH: 24"	DATE: 2/22/90	LOGGED BY: R. H. (WAHLER)

TEST PIT NO.	DEPTH INTERVAL	SOIL TYPE	WATER DEPTH	MATERIAL DESCRIPTION EXCAVATION CHARACTERISTICS	SAMPLE NUMBER	SAMPLE DEPTH
				COLLUVIUM		
TP-10	0 - 7'		NONE	(1) CLAYEY SAND, SANDY CLAY (cl,sc): Light brown: dry to damp (moisture content increases with depth); varies from (sc) to (cl), 30-70% fines; medium dense/stiff (very stiff, damp @ depth). Excavates with slight difficulty. Mottled white (gypsum?).		
				SAN JOAQUIN FORMATION		
	7' - 9'			(2) CLAYSTONE (CS): Gray; severely weathered; soft; plastic.		
	9' - 12.5'			(2a) CLAYSTONE (CS): Dark gray; severely weathered; soft; weak; excavates with moderate difficulty; thick-very thick bedded (bedding not apparent); excavates as ~1/2" to 3" chunks of hard CH.		



REV. 8/14/90

CLIENT CHEMICAL WASTE MANAGEMENT, INC.

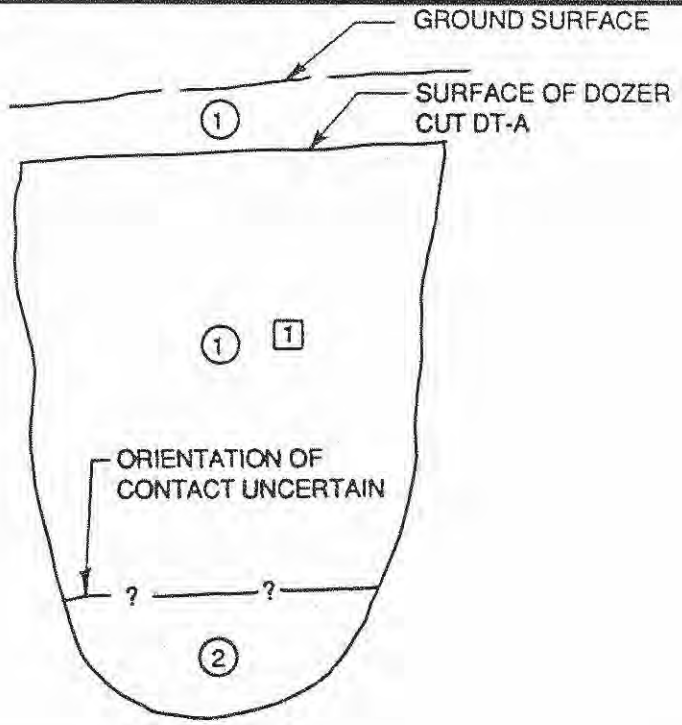
PROJECT NO. 89-977

LOCATION KETTLEMAN, CALIFORNIA

TEST PIT NO. TP-11

SHEET 1 OF 1	LOCATION: SEE FIGURE 2.3 - SITE GEOLOGIC MAP		BEARING: S51°W
RIG: CAT 426 BACKHOE	PIT WIDTH: 24"	DATE: 2/21/90	LOGGED BY: R. H. (WAHLER)

TEST PIT NO.	DEPTH INTERVAL	SOIL TYPE	WATER DEPTH	MATERIAL DESCRIPTION EXCAVATION CHARACTERISTICS	SAMPLE NUMBER	SAMPLE DEPTH
TP-11	0 - 14'		NONE	COLLUVIUM (1) CLAYEY SAND (sc): Light brown; dry-damp; very fine; 20-40% fines; excavates easily; appears loose near surface to medium dense, dense with depth; grades into cleaner sand (10-20% fines) and sandy clay (30-40% very fine sand); moderate white precipitate. 9' - 14': Excavates with moderate difficulty (dense); abundant white precipitate (gypsum). 13' - 14': Includes white, tubular chunks of hard, cemented sandstone, at random orientations.	[1] B-1	~7'
	14' - 17.5'			SAN JOAQUIN FORMATION (2) INTERBEDDED CLAYSTONE/SANDSTONE (CS/SS): Dark gray claystone, highly plastic, soft, weak; tan-gray, very fine sandstone with minor orange mottling; soft, friable; both materials SS non-weakly cemented, laminated - thin bedded (planer chunks up to ~3" thick): Severly weathered claystone, plastic, @ contact (14'-~14.5')		



SCALE: 1" = 5'

REV. 8/14/90

CLIENT CHEMICAL WASTE MANAGEMENT, INC.

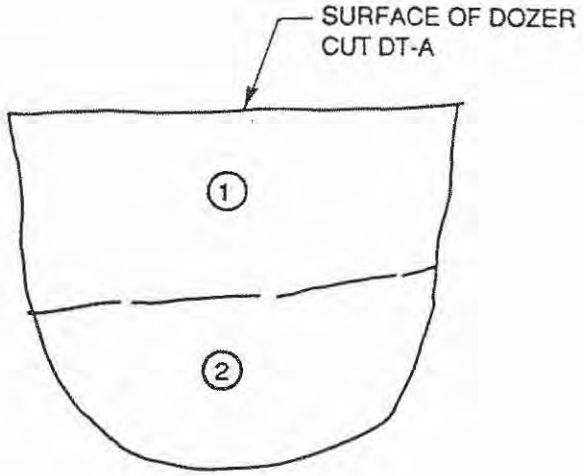
PROJECT NO. 89-977

LOCATION KETTLEMAN, CALIFORNIA

TEST PIT NO. TP-12

SHEET 1 OF 1	LOCATION: SEE FIGURE 2.3 - SITE GEOLOGIC MAP		BEARING: N87°W
RIG: CAT 426 BACKHOE	PIT WIDTH: 24"	DATE: 2/22/90	LOGGED BY: R. H. (WAHLER)

TEST PIT NO.	DEPTH INTERVAL	SOIL TYPE	WATER DEPTH	MATERIAL DESCRIPTION EXCAVATION CHARACTERISTICS	SAMPLE NUMBER	SAMPLE DEPTH
				COLLUVIUM		
TP-12	0 - 10.5'			(1) SANDY CLAY (cl occasional SC): Dry-slightly damp to ~5'; damp below ~5'; low plasticity; 30-40% very fine sand; occasional grades to clayey sand; appears loose to ~5' (excavates with moderate difficulty below 5'); variable white precipitate.		
				SAN JOAQUIN FORMATION		
	10.5' - 15.5'			(2) INTERBEDDED CLAYEY SILTSTONE, CLAYSTONE, SANDSTONE: (SLT/CS/SS): Clayey siltstone-brown; claystone-gray; sandstone-tan; entire unit laminated-thin bedded; non-weakly cemented very fine SS; predominately clayey siltstone/claystone (SS ~25% of unit).		



SCALE: 1" = 5'

REV. 8/14/90

CLIENT CHEMICAL WASTE MANAGEMENT, INC.

PROJECT NO. 89-977

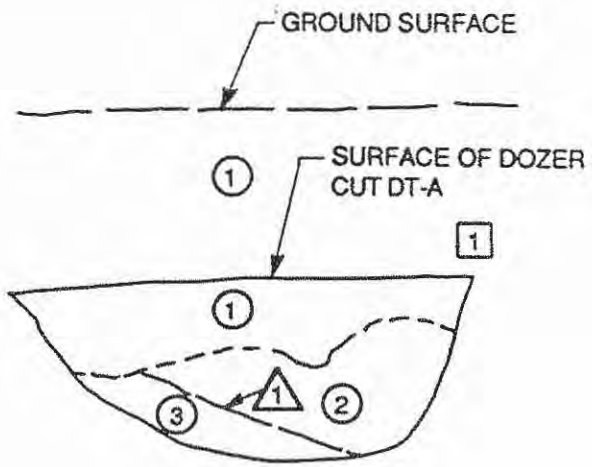
LOCATION KETTLEMAN, CALIFORNIA

TEST PIT NO. TP-13

BEDDING △1: N47°, 32°SW

SHEET 1 OF 1	LOCATION: SEE FIGURE 2.3 - SITE GEOLOGIC MAP		BEARING: S83°W
RIG: CAT 426 BACKHOE	PIT WIDTH: 24"	DATE: 2/22/90	LOGGED BY: R. H. (WAHLER)

TEST PIT NO.	DEPTH INTERVAL	SOIL TYPE	WATER DEPTH	MATERIAL DESCRIPTION EXCAVATION CHARACTERISTICS	SAMPLE NUMBER	SAMPLE DEPTH
TP-13	0 - 6.5'			COLLUVIUM (1) SANDY CLAY (cl): Light brown; dry to ~5'; damp below ~5'; low-moderate plasticity; variable white precipitate; root voids; stiff to ~5'; very stiff below 5'; 30-40% very fine sand.		
	6.5' - 11.5'			SAN JOAQUIN FORMATION (2) CLAYSTONE (CS): Dark, gray; laminated; lesser brown, clayey siltstone laminae; some orange stain along bedding; abundant gypsum @ contact with (1); soft; weak. (3) SILTY SANDSTONE (SLT/SS): Tan-light brown; very fine; thick-very thick bedded (bedding not discernible); non-weakly cemented; soft; friable.	[1] B-1	~4'



REV. 8/14/90

CLIENT CHEMICAL WASTE MANAGEMENT, INC.

PROJECT NO. 89-977

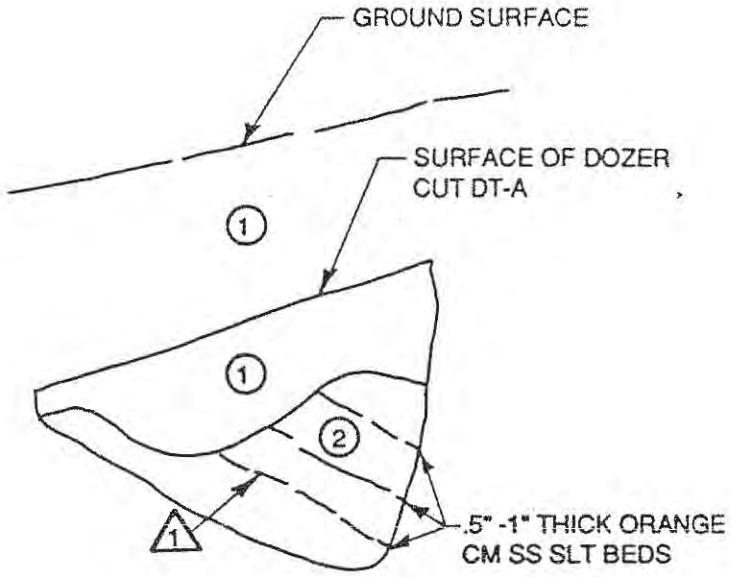
LOCATION KETTLEMAN, CALIFORNIA

TEST PIT NO. TP-14

BEDDING 1: N48°, 33°SW

SHEET 1 OF 1	LOCATION: SEE FIGURE 2.3 - SITE GEOLOGIC MAP		BEARING: S51°W
RIG: CAT 426 BACKHOE	PIT WIDTH: 24"	DATE: 2/22/90	LOGGED BY: R. H. (WAHLER)

TEST PIT NO.	DEPTH INTERVAL	SOIL TYPE	WATER DEPTH	MATERIAL DESCRIPTION EXCAVATION CHARACTERISTICS	SAMPLE NUMBER	SAMPLE DEPTH
				COLLUVIUM		
TP-14	0 - ~7'			(1) CLAYEY SAND (sc): Light brown; dry; very loose-loose; very fine; 20-40% fines; excavates easily.		
				SAN JOAQUIN FORMATION		
	7' - ~12'			(2) SANDSTONE (SS): Tan-white; thin-medium bedding;(dense) friable: non-cemented (easily crumbled with fingers); excavates with slight difficulty.		



SCALE: 1" = 5'

REV. 8/14/90

CLIENT CHEMICAL WASTE MANAGEMENT, INC.

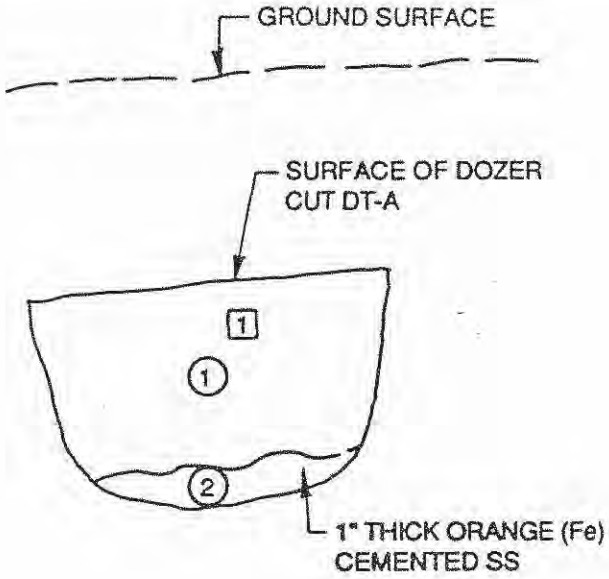
PROJECT NO. 89-977

LOCATION KETTLEMAN, CALIFORNIA

TEST PIT NO. TP-15

SHEET 1 OF 1	LOCATION: SEE FIGURE 2.3 - SITE GEOLOGIC MAP		BEARING: S54°W
RIG: CAT 426 BACKHOE	PIT WIDTH: 36"	DATE: 2/27/90	LOGGED BY: R. H. (WAHLER)

TEST PIT NO.	DEPTH INTERVAL	SOIL TYPE	WATER DEPTH	MATERIAL DESCRIPTION EXCAVATION CHARACTERISTICS	SAMPLE NUMBER	SAMPLE DEPTH
TP-15	0 - 11'			COLLUVIUM (1) CLAYEY SAND (sc occasional cl): Light brown; slightly damp; very fine; 20-40% fines; occasional grades to sandy clay; 30-40% very fine sand; excavates easily; appears medium dense; occasional white mottling (precipitate/gypsum?); numerous root voids.	[1] B-1	~7'
	11' - 12'			SAN JOAQUIN FORMATION (2) SANDSTONE (SS): Tan-white; soft; friable; very fine; very thick bedded; excavates with slight difficulty; occasionally thin (up to ~1" thick) cemented layers. Excavates as loose, fine sand (sp).		



REV. 8/14/90

CLIENT CHEMICAL WASTE MANAGEMENT, INC.

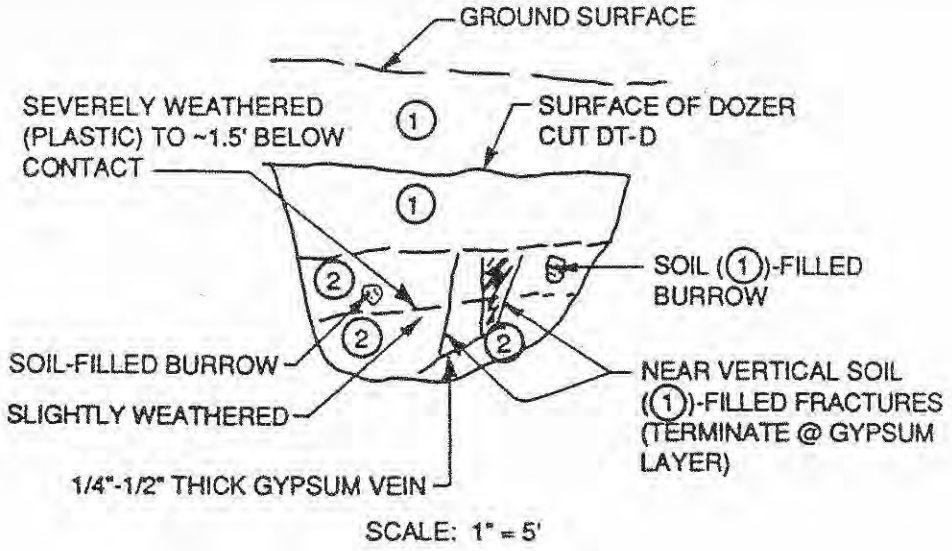
PROJECT NO. 89-977

LOCATION KETTLEMAN, CALIFORNIA

TEST PIT NO. TP-16

SHEET 1 OF 1	LOCATION: SEE FIGURE 2.3 - SITE GEOLOGIC MAP		BEARING: N54°E
RIG: CAT 426 BACKHOE	PIT WIDTH: 36"	DATE: 2/27/90	LOGGED BY: R. H. (WAHLER)

TEST PIT NO.	DEPTH INTERVAL	SOIL TYPE	WATER DEPTH	MATERIAL DESCRIPTION EXCAVATION CHARACTERISTICS	SAMPLE NUMBER	SAMPLE DEPTH
				COLLUVIUM		
TP-16	0 - 5.5'			(1) SANDY CLAY (cl): Light brown; damp; low plasticity; 30-40% very fine sand; appears very stiff ; excavates easily; root vords; variable white mottling (gypsum(?) stringers along root vords and soil fractures).		
				SAN JOAQUIN FORMATION		
	5.5' - 8.5'			(2) CLAYSTONE (CS): Moderate-dark gray; severely weathered to ~1.5' below contact (slightly weathered at greater depth); soft; weak (plastic where severely weathered); excavates with slight difficulty; laminated to very thin bedded.		



REV. 8/14/90

CLIENT CHEMICAL WASTE MANAGEMENT, INC.

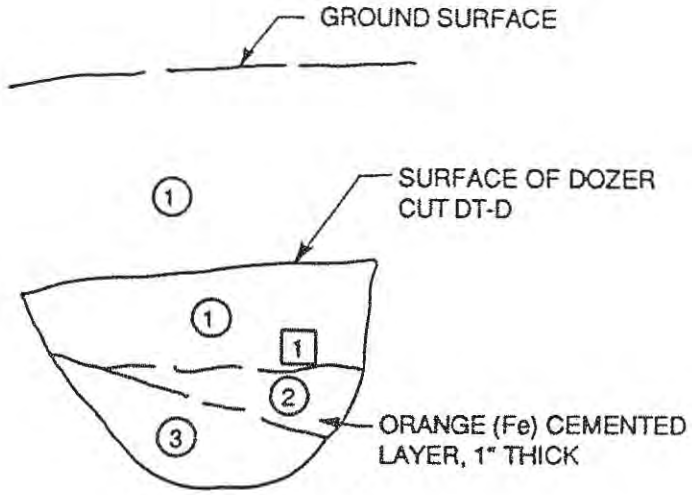
PROJECT NO. 89-977

LOCATION KETTLEMAN, CALIFORNIA

TEST PIT NO. TP-17

SHEET 1 OF 1	LOCATION: SEE FIGURE 2.3 - SITE GEOLOGIC MAP		BEARING: S44°E
RIG: CAT 426 BACKHOE	PIT WIDTH: 36"	DATE: 2/27/90	LOGGED BY: R. H. (WAHLER)

TEST PIT NO.	DEPTH INTERVAL	SOIL TYPE	WATER DEPTH	MATERIAL DESCRIPTION EXCAVATION CHARACTERISTICS	SAMPLE NUMBER	SAMPLE DEPTH
				COLLUVIUM		
TP-17	0 - 8'			(1) SANDY CLAY (cl): Light moderate brown; slightly damp-damp; low plasticity; 30-40% very fine sand; numerous root voids; white precipitate; excavates with ease - slight difficulty; appears very stiff.	1 B-1	~8'
				SAN JOAQUIN FORMATION		
	8' - 10'			(2) SAND-CLAYEY SAND (SP-SC): Tan-light brown; very fine; 5-15% fines; resembles (probably derived from) San Joaquin Formation sandstone immediately upslope (SW); includes gray claystone fragments to 1/2" dia.		
	10' - 11.5'			(3) CLAYSTONE (CS): Dark gray; laminated to thin bedded, soft; weak; highly plastic.		



REV. 8/14/90

CLIENT CHEMICAL WASTE MANAGEMENT, INC.

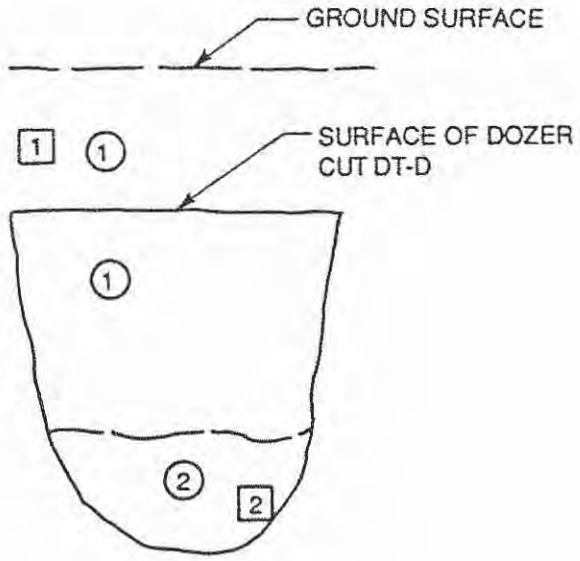
PROJECT NO. 89-977

LOCATION KETTLEMAN, CALIFORNIA

TEST PIT NO. TP-18

SHEET 1 OF 1	LOCATION: SEE FIGURE 2.3 - SITE GEOLOGIC MAP		BEARING: S44°E
RIG: CAT 426 BACKHOE	PIT WIDTH: 36"	DATE: 2/27/90	LOGGED BY: R. H. (WAHLER)

TEST PIT NO.	DEPTH INTERVAL	SOIL TYPE	WATER DEPTH	MATERIAL DESCRIPTION EXCAVATION CHARACTERISTICS	SAMPLE NUMBER	SAMPLE DEPTH
				COLLUVIUM		
TP-18	0 - 10'			(1) SANDY CLAY (cl): Light moderate brown; slightly damp; low-moderate plasticity; 10-40% very fine, sand; stiff-very stiff; excavates with slight difficulty; variable white precipitate.	[1] B-1	~2' (sample from n-opposite wall of dozer cut)
				SAN JOAQUIN FORMATION		
	10' - 13.5'			(2) CLAYSTONE (CS): Dark gray; soft; weak; laminated-thin bedded; highly plastic; slickensides; numerous very fine sandstone, siltstone laminae (up to ~1/2" thick).	[2] B-2	~12'



REV. 8/14/90

CLIENT CHEMICAL WASTE MANAGEMENT, INC.

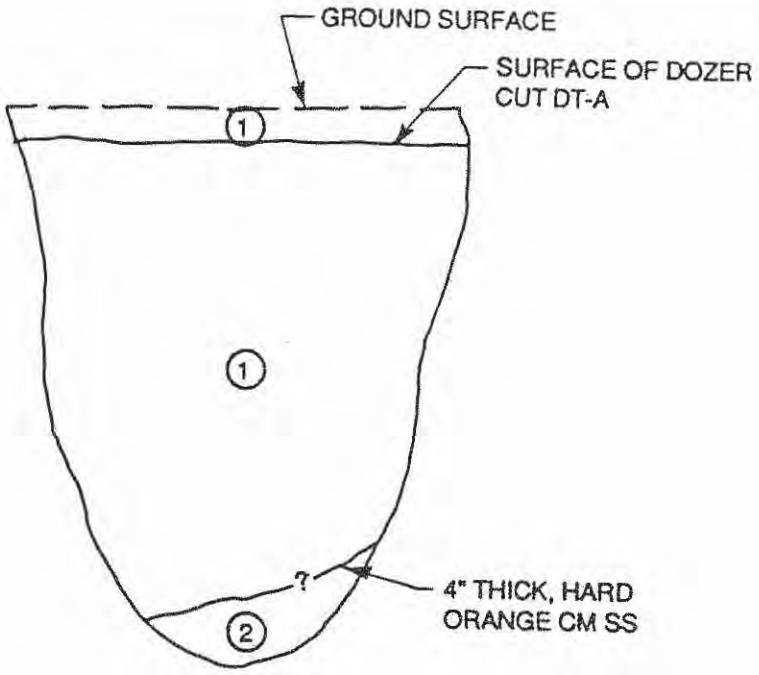
PROJECT NO. 89-977

LOCATION KETTLEMAN, CALIFORNIA

TEST PIT NO. TP-19

SHEET 1 OF 1	LOCATION: SEE FIGURE 2.3 - SITE GEOLOGIC MAP		BEARING: S55°W
RIG: CAT 426 BACKHOE	PIT WIDTH: 36"	DATE: 2/27/90	LOGGED BY: R. H. (WAHLER)

TEST PIT NO.	DEPTH INTERVAL	SOIL TYPE	WATER DEPTH	MATERIAL DESCRIPTION EXCAVATION CHARACTERISTICS	SAMPLE NUMBER	SAMPLE DEPTH
TP-19	0 - ~13' (see sketch)			COLLUVIUM (1) SANDY CLAY, CLAYEY SAND (cl,SC): Light brown; slightly damp; variable cl,SC; cl: low plasticity, 10-40% very fine sand; SC: very fine, 10-40% fines: excavates easily to ~8'; slightly difficult excavation below ~8'. Occasional laminated sand/silt, SP/ML-cl (old alluvium deposits).		
	13' - 15'			SAN JOAQUIN FORMATION (2) INTERBEDDED SANDSTONE/CLAYSTONE (CS/SS): Sandstone: Tan, mottled orange; very fine; bioturbation; soft, friable; claystone: Dark gray; highly plastic; excacates with slight difficulty.		



SCALE: 1" = 5'

REV. 6/14/90

CLIENT CHEMICAL WASTE MANAGEMENT, INC.

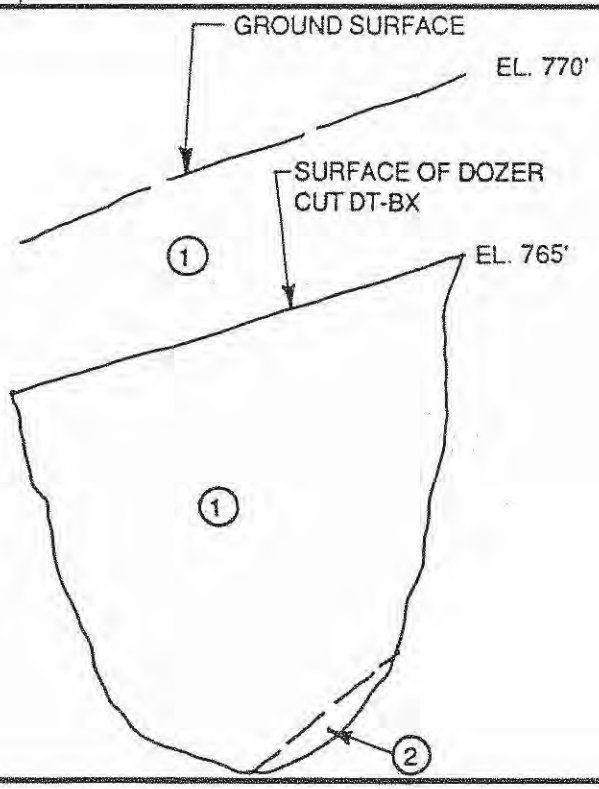
PROJECT NO. 89-977

LOCATION KETTLEMAN, CALIFORNIA

TEST PIT NO. TP-20

SHEET 1 OF 1	LOCATION: SEE FIGURE 2.3 - SITE GEOLOGIC MAP		BEARING: S53°W
RIG: CAT 426 BACKHOE	PIT WIDTH: 36"	DATE: 2/27/90	LOGGED BY: R. H. (WAHLER)

TEST PIT NO.	DEPTH INTERVAL	SOIL TYPE	WATER DEPTH	MATERIAL DESCRIPTION EXCAVATION CHARACTERISTICS	SAMPLE NUMBER	SAMPLE DEPTH
				COLLUVIUM		
TP-20	0 - 15.5'			(1) SANDY CLAY(cl): Light brown; dry-damp low-moderate plasticity; 10-40% very fine sand; excavates easily.		
				SAN JOAQUIN FORMATION		
	15.5' - 16'			(2) CLAYEY SILTSTONE (SLT): Light gray-brown; slighty plastic; soft; friable.		



REV. 8/14/90

CLIENT CHEMICAL WASTE MANAGEMENT, INC.

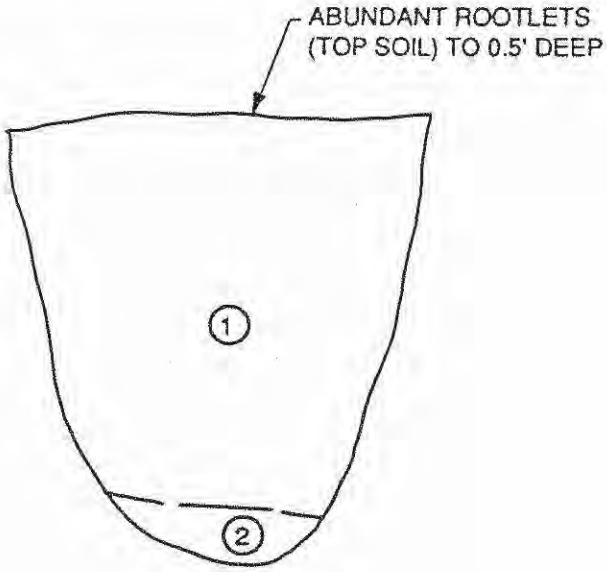
PROJECT NO. 89-977

LOCATION KETTLEMAN, CALIFORNIA

TEST PIT NO. TP-21

SHEET 1 OF 1	LOCATION: SEE FIGURE 2.3 - SITE GEOLOGIC MAP		BEARING: N72°W
RIG: CAT 426 BACKHOE	PIT WIDTH: 36"	DATE: 2/27/90	LOGGED BY: R. H. (WAHLER)

TEST PIT NO.	DEPTH INTERVAL	SOIL TYPE	WATER DEPTH	MATERIAL DESCRIPTION EXCAVATION CHARACTERISTICS	SAMPLE NUMBER	SAMPLE DEPTH
				COLLUVIUM		
TP-21	0 - 11'			(1) SANDY CLAY (cl): Light brown; slightly damp-damp; low-moderate plasticity; 10-30% very fine sand; stiff (excavates with slight difficulty).		
				SAN JOAQUIN FORMATION		
	11' - 12.5'			(2) CLAYEY SILTSTONE (SLT): Light gray; soft; friable to weak; low-moderate plasticity; laminated; fragments can be crumbled by fingers with moderate effort.		



SCALE: 1" = 5'

REV. 8/14/90

CLIENT CHEMICAL WASTE MANAGEMENT, INC.

PROJECT NO. 89-977

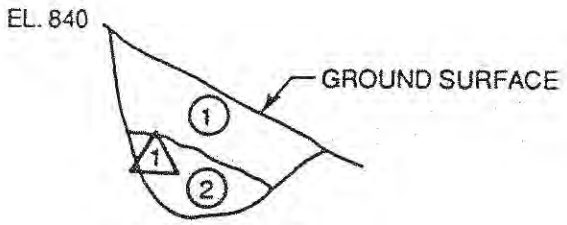
LOCATION KETTLEMAN, CALIFORNIA

TEST PIT NO. TP-22

BEDDING 1: N50°W, 28°SW

SHEET 1 OF 1	LOCATION: SEE FIGURE 2.3 - SITE GEOLOGIC MAP		BEARING:
RIG: CAT 426 BACKHOE	PIT WIDTH: 30"	DATE: 3/19/90	LOGGED BY: A. S. B. (WAHLER)

TEST PIT NO.	DEPTH INTERVAL	SOIL TYPE	WATER DEPTH	MATERIAL DESCRIPTION EXCAVATION CHARACTERISTICS	SAMPLE NUMBER	SAMPLE DEPTH
				COLLUVIUM		
TP-22	0 - 4.5'			(1) SANDY CLAY to CLAYEY SAND (cl-sc): Moderate brown; fine sand; about 25% slightly plastic to low plastic fines; loose; dry.		
				SAN JOAQUIN FORMATION		
	4.5' - 8'			(2) SANDSTONE (SS): Brownish gray; fine to medium sand; ~5-10% silt; streaks of gypsum; loose to medium dense; dry; 4" thick cemented, hard reddish sandstone at 6.5'.		



SCALE: 1" = 5'

REV. 8/14/90

CLIENT CHEMICAL WASTE MANAGEMENT, INC.

PROJECT NO. 89-977

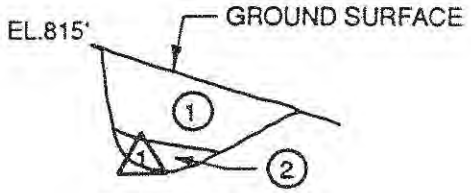
LOCATION KETTLEMAN, CALIFORNIA

TEST PIT NO. TP-23

STRIKE 1: N40°W, 31°SW DIP

SHEET 1 OF 1	LOCATION: SEE FIGURE 2.3 - SITE GEOLOGIC MAP		BEARING:
RIG: CAT 426 BACKHOE	PIT WIDTH: 30"	DATE: 3/19/90	LOGGED BY: A. S. B. (WAHLER)

TEST PIT NO.	DEPTH INTERVAL	SOIL TYPE	WATER DEPTH	MATERIAL DESCRIPTION EXCAVATION CHARACTERISTICS	SAMPLE NUMBER	SAMPLE DEPTH
				COLLUVIUM		
TP-23	0 - 4'			(1) SILTY SAND (sm): Moderate brown; fine sand; 15-20% slightly plastic to low plastic fines; dry.	B-1	
				SAN JOAQUIN FORMATION		
	4' - 5.5'			(2) INTERBEDDED CLAYSTONE and SILTSTONE (CS/SLT): Laminated to thinly bedded; olive-gray with yellow-orange to yellow-brown staining; thin (1/8") sand laminae.		



SCALE: 1" = 5'

REV. 8/14/90

CLIENT CHEMICAL WASTE MANAGEMENT, INC.

PROJECT NO. 89-977

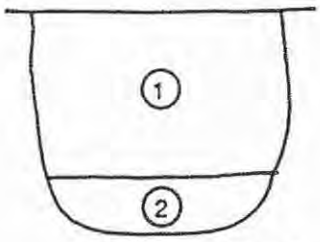
LOCATION KETTLEMAN, CALIFORNIA

TEST PIT NO. TP-24

STRIKE 1: N40°W, 31°SW DIP

SHEET 1 OF 1	LOCATION: SEE FIGURE 2.3 - SITE GEOLOGY MAP		BEARING:
RIG: CAT 426 BACKHOE	PIT WIDTH: 30"	DATE: 3/19/90	LOGGED BY: A. S. B. (WAHLER)

TEST PIT NO.	DEPTH INTERVAL	SOIL TYPE	WATER DEPTH	MATERIAL DESCRIPTION EXCAVATION CHARACTERISTICS	SAMPLE NUMBER	SAMPLE DEPTH
				COLLUVIUM		
TP-24	0 - 4.5'			(1) CLAYEY SAND (sm): Moderate brown; 15-20% non-plastic fines; fine sand; loose; dry.		
				SAN JOAQUIN FORMATION		
	4.5' - 6.0'			(2) SANDSTONE (SS): Light gray with yellow-brown streaks; fine sand; weakly cemented; old borrow holes in sandstone at contact (filled in with silty sand Qc) included "wavey" lenses of olive-gray claystone in sandstone).		



SCALE: 1"=5'

REV. 8/14/90

CLIENT CHEMICAL WASTE MANAGEMENT, INC.

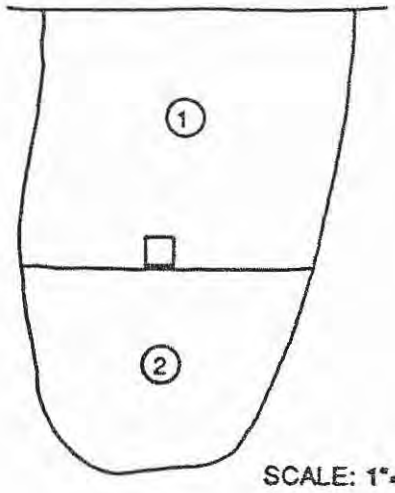
PROJECT NO. 89-977

LOCATION KETTLEMAN, CALIFORNIA

TEST PIT NO. TP-25

SHEET 1 OF 1	LOCATION: SEE FIGURE 2.3 - SITE GEOLOGIC MAP		BEARING:
RIG: CAT 426 BACKHOE	PIT WIDTH: 30"	DATE: 3/19/90	LOGGED BY: A. S. B. (WAHLER)

TEST PIT NO.	DEPTH INTERVAL	SOIL TYPE	WATER DEPTH	MATERIAL DESCRIPTION EXCAVATION CHARACTERISTICS	SAMPLE NUMBER	SAMPLE DEPTH
				COLLUVIUM		
TP-25	0 - 7'			(1) CLAYEY to SILTY SAND (sc-sm): Moderate brown; fine to very fine sand; pockets of sandy clay; ~20-25% slightly plastic fines.	B-1	0-7'
				SAN JOAQUIN FORMATION		
	7' - 12.5'			(2) INTERBEDDED CLAYSTONE/SANDSTONE (CS/SS): Thinly bedded; bioturbation; olive-gray.		



REV. 8/14/90

CLIENT CHEMICAL WASTE MANAGEMENT, INC.

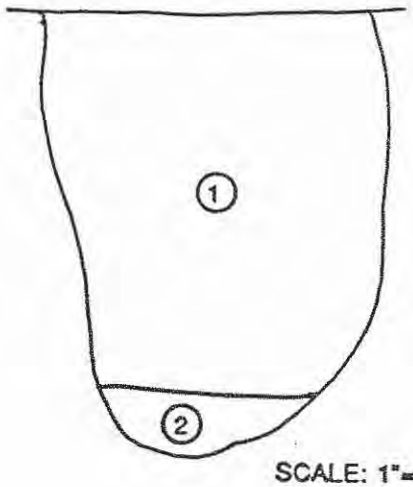
PROJECT NO. 89-977

LOCATION KETTLEMAN, CALIFORNIA

TEST PIT NO. TP-26

SHEET 1 OF 1	LOCATION: SEE FIGURE 2.3 - SITE GEOLOGIC MAP		BEARING:
RIG: CAT 426 BACKHOE	PIT WIDTH: 30"	DATE: 3/19/90	LOGGED BY: A. S. B. (WAHLER)

TEST PIT NO.	DEPTH INTERVAL	SOIL TYPE	WATER DEPTH	MATERIAL DESCRIPTION EXCAVATION CHARACTERISTICS	SAMPLE NUMBER	SAMPLE DEPTH
TP-26	0 - 10.5'			COLLUVIUM (1) CLAYEY SAND (sc): Moderate yellow-brown; fine to very fine sand; slightly to low plastic fines; dry; loose to moderately dense.	B-1	0-10.5'
	10.5' - 12'			SAN JOAQUIN FORMATION (2) SANDSTONE (SS): Moderate yellow-brown mottled with yellow-orange stains.		



SCALE: 1"=5'

REV. 8/14/90

CLIENT CHEMICAL WASTE MANAGEMENT, INC.

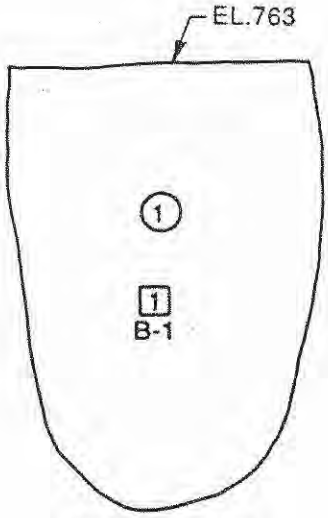
PROJECT NO. 89-977

LOCATION KETTLEMAN, CALIFORNIA

TEST PIT NO. TP-27

SHEET 1 OF 1	LOCATION: SEE FIGURE 2.3 - SITE GEOLOGIC MAP		BEARING:
RIG: CAT 426 BACKHOE	PIT WIDTH: 30"	DATE: 3/19/90	LOGGED BY: A. S. B. (WAHLER)

TEST PIT NO.	DEPTH INTERVAL	SOIL TYPE	WATER DEPTH	MATERIAL DESCRIPTION EXCAVATION CHARACTERISTICS	SAMPLE NUMBER	SAMPLE DEPTH
TP-27	0 - 12'			COLLUVIUM (1) SANDY CLAY (cl): Moderate yellow-brown; fine to very fine sand; low to moderate plastic fines; compact; dry; stiff.	B-1	0-12'



SCALE: 1" = 5'

REV. 8/14/90

CLIENT CHEMICAL WASTE MANAGEMENT, INC.

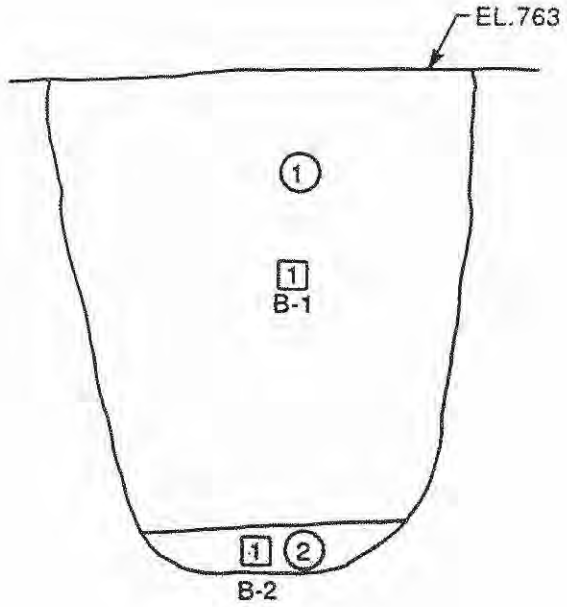
PROJECT NO. 89-977

LOCATION KETTLEMAN, CALIFORNIA

TEST PIT NO. TP-28

SHEET 1 OF 1	LOCATION: SEE FIGURE 2.3 - SITE GEOLOGIC MAP		BEARING:
RIG: CAT 426 BACKHOE	PIT WIDTH: 30"	DATE: 3/19/90	LOGGED BY: A. S. B. (WAHLER)

TEST PIT NO.	DEPTH INTERVAL	SOIL TYPE	WATER DEPTH	MATERIAL DESCRIPTION EXCAVATION CHARACTERISTICS	SAMPLE NUMBER	SAMPLE DEPTH
				COLLUVIUM		
TP-28	0 - 12.5'			(1) CLAYEY SAND (sc): Moderate yellow-brown; fine to very fine sand; ~25-30% slightly to low plastic fines; medium dense; dry.	B-1	0-12.5'
				SAN JOAQUIN FORMATION		
	12.5'-13.5'			(2) INTERBEDDED CLAYSTONE/SILTSTONE (CS/SLT): Light brownish gray; with yellow-orange laminates; thinly bedded.	B-2	12.5'-13.5'



REV. 8/14/90

CLIENT CHEMICAL WASTE MANAGEMENT, INC.

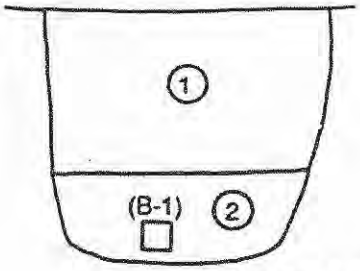
PROJECT NO. 89-977

LOCATION KETTLEMAN, CALIFORNIA

TEST PIT NO. TP-29

SHEET 1 OF 1	LOCATION: SEE FIGURE 2.3 - SITE GEOLOGIC MAP		BEARING:
RIG: CAT 426 BACKHOE	PIT WIDTH: 24"	DATE: 5/10/90	LOGGED BY: R. H. (WAHLER)

TEST PIT NO.	DEPTH INTERVAL	SOIL TYPE	WATER DEPTH	MATERIAL DESCRIPTION EXCAVATION CHARACTERISTICS	SAMPLE NUMBER	SAMPLE DEPTH
				COLLUVIUM		
TP-29	0 - 4'			(1) SILTY CLAY (cl)		
				SAN JOAQUIN FORMATION		
	4' - 6.5'			(2) Unit 18-10 CLAYSTONE (CS): Gray; highly plastic; excavates as angular; gravel to cobble-sized chunks of highly plastic, hard clay; chunk size increases with depth. NOTE: Claystone is only one lithologic member of Unit 18-10 (interbedded SS,CS, SLT, SILTY SS).	B-1	4-6.5' (composite)



SCALE: 1"=5'

REV. 8/14/90

CLIENT CHEMICAL WASTE MANAGEMENT, INC.

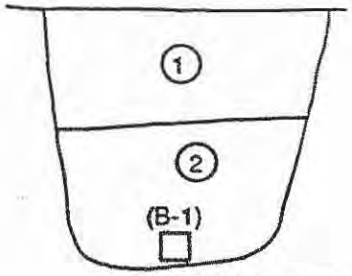
PROJECT NO. 89-977

LOCATION KETTLEMAN, CALIFORNIA

TEST PIT NO. TP-30

SHEET 1 OF 1	LOCATION: SEE FIGURE 2.3 - SITE GEOLOGIC MAP		BEARING:
RIG: CAT 426 BACKHOE	PIT WIDTH: 24"	DATE: 5/10/90	LOGGED BY: R. H. (WAHLER)

TEST PIT NO.	DEPTH INTERVAL	SOIL TYPE	WATER DEPTH	MATERIAL DESCRIPTION EXCAVATION CHARACTERISTICS	SAMPLE NUMBER	SAMPLE DEPTH
TP-30	0 - 3'			COLLUVIUM (1) SANDY CLAY (cl)		
	3' - 7'			SAN JOAQUIN FORMATION (2) Unit 18-11 INTERBEDDED SANDSTONE/CLAYSTONE (SS/CS): Tan, very fine, clean sandstone (excavates as loose SP) with lesser, interbedded gray claystone (thin beds up to 1.5" thick, highly plastic; excavating as angular chunks up to ~3" dia. hard clay). NOTE: Unit 18-11 is predominately clean SS.	B-1	~7'



SCALE: 1"=5'

REV. 8/14/90

CLIENT CHEMICAL WASTE MANAGEMENT, INC.

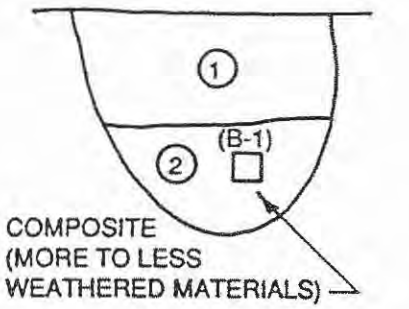
PROJECT NO. 89-977

LOCATION KETTLEMAN, CALIFORNIA

TEST PIT NO. TP-31

SHEET 1 OF 1	LOCATION: SEE FIGURE 2.3 - SITE GEOLOGIC MAP		BEARING:
RIG: CAT 426 BACKHOE	PIT WIDTH: 24"	DATE: 5/10/90	LOGGED BY: R. H. (WAHLER)

TEST PIT NO.	DEPTH INTERVAL	SOIL TYPE	WATER DEPTH	MATERIAL DESCRIPTION EXCAVATION CHARACTERISTICS	SAMPLE NUMBER	SAMPLE DEPTH
TP-31	0 - 3'			COLLUVIUM (1) SANDY CLAY (cl): Moderate-dark brown; moderate plasticity; very stiff to hard.		
	3' - 6'			SAN JOAQUIN FORMATION (2) Unit 18-12 CLAYSTONE (CS): Gray; highly plastic; moderate to severely weathered to ~3.5'; fresh-slightly weathered below 3.5' (size of excavated blocks increases with depth and with decreased weathering); excavates as hard, angular, gravel to cobble-sized blocks.	B-1	3'-6' composite



SCALE: 1"=5'

REV. 8/14/90

CLIENT CHEMICAL WASTE MANAGEMENT, INC.

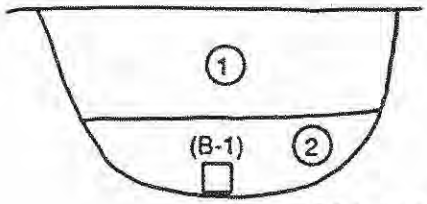
PROJECT NO. 89-977

LOCATION KETTLEMAN, CALIFORNIA

TEST PIT NO. TP-32

SHEET 1 OF 1	LOCATION: SEE FIGURE 2.3 - SITE GEOLOGIC MAP		BEARING:
RIG: CAT 426 BACKHOE	PIT WIDTH: 24"	DATE: 5/10/90	LOGGED BY: R. H. (WAHLER)

TEST PIT NO.	DEPTH INTERVAL	SOIL TYPE	WATER DEPTH	MATERIAL DESCRIPTION EXCAVATION CHARACTERISTICS	SAMPLE NUMBER	SAMPLE DEPTH
TP-32	0 - 3'			COLLUVIUM (1) CLAYEY SAND (SC)		
	3' - 5'			SAN JOAQUIN FORMATION (2) Unit 18-13 SANDSTONE (SS): Tan-white; occasional gypsum/caliche (thin, white cemented layers, up to ~.5" thick); excavates as clean, very fine sand (loose SP).	B-1	~5'



SCALE: 1"=5'

REV. 8/14/90

CLIENT CHEMICAL WASTE MANAGEMENT, INC.

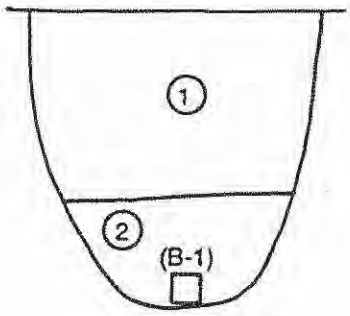
PROJECT NO. 89-977

LOCATION KETTLEMAN, CALIFORNIA

TEST PIT NO. TP-33

SHEET 1 OF 1	LOCATION: SEE FIGURE 2.3 - SITE GEOLOGIC MAP		BEARING:
RIG: CAT 426 BACKHOE	PIT WIDTH: 24"	DATE: 5/10/90	LOGGED BY: R. H. (WAHLER)

TEST PIT NO.	DEPTH INTERVAL	SOIL TYPE	WATER DEPTH	MATERIAL DESCRIPTION EXCAVATION CHARACTERISTICS	SAMPLE NUMBER	SAMPLE DEPTH
TP-33	0 - 5'			COLLUVIUM (1) SANDY CLAY (cl)		
	5' - 8'			SAN JOAQUIN FORMATION (2) Unit 18-13 SANDSTONE (SS): Tan, some orange mottling; excavates as clean, very fine to fine sand (loose SP); non-cemented with occasional thin cemented beds (up to ~2' thick)	B-1	~8'



SCALE: 1"=5'

REV. 8/14/90

CLIENT CHEMICAL WASTE MANAGEMENT, INC.

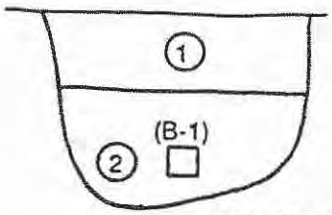
PROJECT NO. 89-977

LOCATION KETTLEMAN, CALIFORNIA

TEST PIT NO. TP-34

SHEET 1 OF 1	LOCATION: SEE FIGURE 2.3 - SITE GEOLOGIC MAP		BEARING:
RIG: CAT 426 BACKHOE	PIT WIDTH: 24"	DATE: 5/10/90	LOGGED BY: R. H. (WAHLER)

TEST PIT NO.	DEPTH INTERVAL	SOIL TYPE	WATER DEPTH	MATERIAL DESCRIPTION EXCAVATION CHARACTERISTICS	SAMPLE NUMBER	SAMPLE DEPTH
TP-34	0 - 2'			COLLUVIUM (1) SANDY CLAY (cl)		
	2' - 5'			SAN JOAQUIN FORMATION (2) Unit 18-12 CLAYSTONE (CS): Gray; moderate to severely weathered to 3'; slightly weathered below 3'; excavates as angular gravel to boulder sized blocks of hard claystone. Blocks become larger (up to 1') below the weathered zone.	B-1	~4'



SCALE: 1"=5'

REV. 8/14/90

CLIENT CHEMICAL WASTE MANAGEMENT, INC.

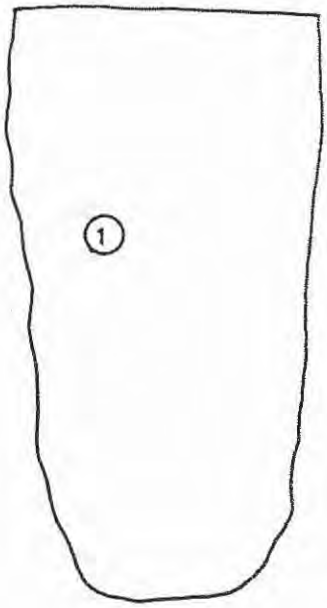
PROJECT NO. 89-977

LOCATION KETTLEMAN, CALIFORNIA

TEST PIT NO. TP-35

SHEET 1 OF 1	LOCATION: SEE FIGURE 2.3 - SITE GEOLOGIC MAP		BEARING:
RIG: CAT 426 BACKHOE	PIT WIDTH: 24"	DATE: 5/11/90	LOGGED BY: R. H. (WAHLER)

TEST PIT NO.	DEPTH INTERVAL	SOIL TYPE	WATER DEPTH	MATERIAL DESCRIPTION EXCAVATION CHARACTERISTICS	SAMPLE NUMBER	SAMPLE DEPTH
				COLLUVIUM		
TP-35	0 - >16'			(1) SILTY CLAY, SANDY CLAY, CLAYEY SAND (cl, sc)		



REV. 8/14/90

CLIENT CHEMICAL WASTE MANAGEMENT, INC.

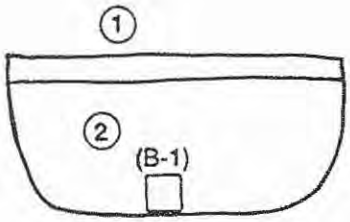
PROJECT NO. 89-977

LOCATION KETTLEMAN, CALIFORNIA

TEST PIT NO. TP-36

SHEET 1 OF 1	LOCATION: SEE FIGURE 2.3 - SITE GEOLOGIC MAP		BEARING:
RIG: CAT 426 BACKHOE	PIT WIDTH: 24"	DATE: 5/10-5/11/90	LOGGED BY: R. H. (WAHLER)

TEST PIT NO.	DEPTH INTERVAL	SOIL TYPE	WATER DEPTH	MATERIAL DESCRIPTION EXCAVATION CHARACTERISTICS	SAMPLE NUMBER	SAMPLE DEPTH
TP-36	0 - .5'			COLLUVIUM (1) SANDY CLAY (cl)		
	.5' - 4'			SAN JOAQUIN FORMATION (2) Unit 18-8 CLAYSTONE (CS): Gray, orange-brown; moderate to severely weathered to 1.5'; fresh, slightly weathered below 1.5'; excavates as angular, gravel to boulder-sized blocks & slabs of hard CH.	B-1	~4'



REV. 8/14/90

CLIENT CHEMICAL WASTE MANAGEMENT, INC.

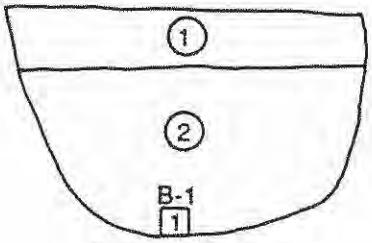
PROJECT NO. 89-977

LOCATION KETTLEMAN, CALIFORNIA

TEST PIT NO. TP-37

SHEET 1 OF 1	LOCATION: SEE FIGURE 2.3 - SITE GEOLOGIC MAP		BEARING:
RIG: CAT 426 BACKHOE	PIT WIDTH: 24"	DATE: 5/10-5/11/90	LOGGED BY: R. H. (WAHLER)

TEST PIT NO.	DEPTH INTERVAL	SOIL TYPE	WATER DEPTH	MATERIAL DESCRIPTION EXCAVATION CHARACTERISTICS	SAMPLE NUMBER	SAMPLE DEPTH
TP-37	0 - 1.5'			COLLUVIUM (1) SANDY CLAY (cl)		
	1.5' - 6'			SAN JOAQUIN FORMATION (2) Unit 18-8 CLAYSTONE (CS): Gray, orange-brown; laminated to thin bedded cl; moderate-severely weathered to 2.5'; fresh-slightly weathered below 2.5'; excavates as angular, gravel to boulder-sized blocks and slabs of hard CH (below 2.5').	B-1	~6'



SCALE: 1" = 5'

REV. 8/14/90

CLIENT CHEMICAL WASTE MANAGEMENT, INC.

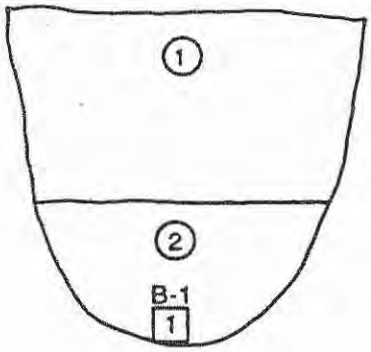
PROJECT NO. 89-977

LOCATION KETTLEMAN, CALIFORNIA

TEST PIT NO. TP-38

SHEET 1 OF 1	LOCATION: SEE FIGURE 2.3 - SITE GEOLOGIC MAP		BEARING:
RIG: CAT 426 BACKHOE	PIT WIDTH: 24"	DATE: 5/11/90	LOGGED BY: R. H. (WAHLER)

TEST PIT NO.	DEPTH INTERVAL	SOIL TYPE	WATER DEPTH	MATERIAL DESCRIPTION EXCAVATION CHARACTERISTICS	SAMPLE NUMBER	SAMPLE DEPTH
				COLLUVIUM		
TP-38	0 - 5'			(1) SANDY CLAY (cl)		
				SAN JOAQUIN FORMATION		
	5' - 9'			(2) Unit 18-8 CLAYSTONE (CS): Gray, orange-brown, light brown; laminated to thin bedded; occasional sand laminae (very minor); excavates as gravel-cobble-sized blocks.		



REV. 8/14/90

CLIENT CHEMICAL WASTE MANAGEMENT, INC.

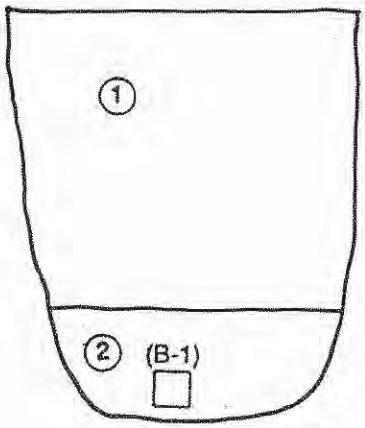
PROJECT NO. 89-977

LOCATION KETTLEMAN, CALIFORNIA

TEST PIT NO. TP-39

SHEET 1 OF 1	LOCATION: SEE FIGURE 2.3 - SITE GEOLOGIC MAP		BEARING:
RIG: CAT 426 BACKHOE	PIT WIDTH: 24"	DATE: 5/11/90	LOGGED BY: R. H. (WAHLER)

TEST PIT NO.	DEPTH INTERVAL	SOIL TYPE	WATER DEPTH	MATERIAL DESCRIPTION EXCAVATION CHARACTERISTICS	SAMPLE NUMBER	SAMPLE DEPTH
TP-39	0 - 8'			COLLUVIUM (1) SANDY CLAY (cl)		
	8' - 11'			SAN JOAQUIN FORMATION (2) Unit 18-8 CLAYSTONE (CS): Gray, highly plastic; hard, excavates as angular; gravel to cobble-sized blocks with 6" dia.; minor sand laminae.		



REV. 8/14/90

CLIENT CHEMICAL WASTE MANAGEMENT, INC.

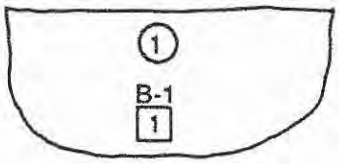
PROJECT NO. 89-977

LOCATION KETTLEMAN, CALIFORNIA

TEST PIT NO. TP-40

SHEET 1 OF 1	LOCATION: SEE FIGURE 2.3 - SITE GEOLOGIC MAP		BEARING:
RIG: CAT 426 BACKHOE	PIT WIDTH: 24"	DATE: 5/11/90	LOGGED BY: R. H. (WAHLER)

TEST PIT NO.	DEPTH INTERVAL	SOIL TYPE	WATER DEPTH	MATERIAL DESCRIPTION EXCAVATION CHARACTERISTICS	SAMPLE NUMBER	SAMPLE DEPTH
				SAN JOAQUIN FORMATION		
TP-40	0 - 4'			(1) Unit 18-8 CLAYSTONE (CS): Gray, brown, occasional orange; highly plastic; includes .5' thick cemented sandstone bed at 3'; laminated to thin bedded; excavates as gravel to cobble-sized slabs and blocks. NOTE: Excavated in cut slope.	B-1	~3'



SCALE: 1" = 5'

REV. 8/14/90

CLIENT CHEMICAL WASTE MANAGEMENT, INC.

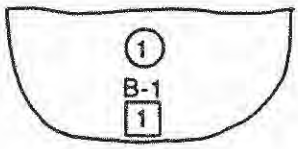
PROJECT NO. 89-977

LOCATION KETTLEMAN, CALIFORNIA

TEST PIT NO. TP-41

SHEET 1 OF 1	LOCATION: SEE FIGURE 2.3 - SITE GEOLOGIC MAP		BEARING:
RIG: CAT 426 BACKHOE	PIT WIDTH: 24"	DATE: 5/11/90	LOGGED BY: R. H. (WAHLER)

TEST PIT NO.	DEPTH INTERVAL	SOIL TYPE	WATER DEPTH	MATERIAL DESCRIPTION EXCAVATION CHARACTERISTICS	SAMPLE NUMBER	SAMPLE DEPTH
				SAN JOAQUIN FORMATION		
TP-41	0 - 3.5'			(1) Unit 18-8 CLAYSTONE (CS): Moderate brown - gray-brown, occasional orange laminae; highly plastic; excavates as gravel-cobble-sized chunks (to ~5"); minor very fine sand laminae. NOTE: Excavated in cut slope.	B-1	~3.5'



SCALE: 1" = 5'

REV. 8/14/90

CLIENT CHEMICAL WASTE MANAGEMENT, INC.

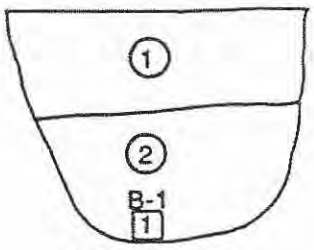
PROJECT NO. 89-977

LOCATION KETTLEMAN, CALIFORNIA

TEST PIT NO. TP-42

SHEET 1 OF 1	LOCATION: SEE FIGURE 2.3 - SITE GEOLOGIC MAP		BEARING:
RIG: CAT 426 BACKHOE	PIT WIDTH: 24"	DATE: 5/10-5/11/90	LOGGED BY: R. H. (WAHLER)

TEST PIT NO.	DEPTH INTERVAL	SOIL TYPE	WATER DEPTH	MATERIAL DESCRIPTION EXCAVATION CHARACTERISTICS	SAMPLE NUMBER	SAMPLE DEPTH
				COLLUVIUM		
TP-42	0 - 2.5'			(1) SANDY CLAY (cl)		
				SAN JOAQUIN FORMATION		
	2.5' - 6'			(2) Unit 18-9 SANDSTONE-SILTY SANDSTONE (SS): Tan, light brown, mottled orange; very fine; 5-20% fines; excavates as loose sand (SP-SM) or as friable chunks (easily crushed by hand).	B-1	~6'



SCALE: 1" = 5'

REV. 8/14/90

CLIENT CHEMICAL WASTE MANAGEMENT, INC.

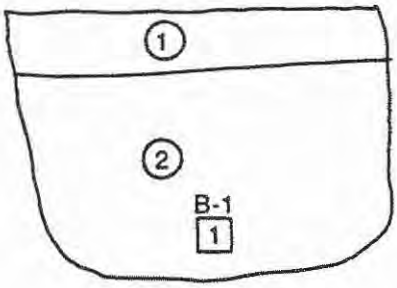
PROJECT NO. 89-977

LOCATION KETTLEMAN, CALIFORNIA

TEST PIT NO. TP-43

SHEET 1 OF 1	LOCATION: SEE FIGURE 2.3 - SITE GEOLOGIC MAP		BEARING:
RIG: CAT 426 BACKHOE	PIT WIDTH: 24"	DATE: 5/10-5/11/90	LOGGED BY: R. H. (WAHLER)

TEST PIT NO.	DEPTH INTERVAL	SOIL TYPE	WATER DEPTH	MATERIAL DESCRIPTION EXCAVATION CHARACTERISTICS	SAMPLE NUMBER	SAMPLE DEPTH
TP-43	0 - 1.5'			COLLUVIUM (1) SANDY CLAY (cl)		
	1.5' - 7'			SAN JOAQUIN FORMATION (2) Unit 18-9 SILTY SANDSTONE-SANDY SILTSTONE (SS/SLT): Light brown, mottled orange; very fine sand; excavates as friable (easily powdered by hand) chunks and loose soil (SM-ML) contains numerous pockets of gray, brown claystone (CH) - bioturbation.	B-1	~6'



SCALE: 1" = 5'

REV. 8/14/90

CLIENT CHEMICAL WASTE MANAGEMENT, INC.

PROJECT NO. 89-977

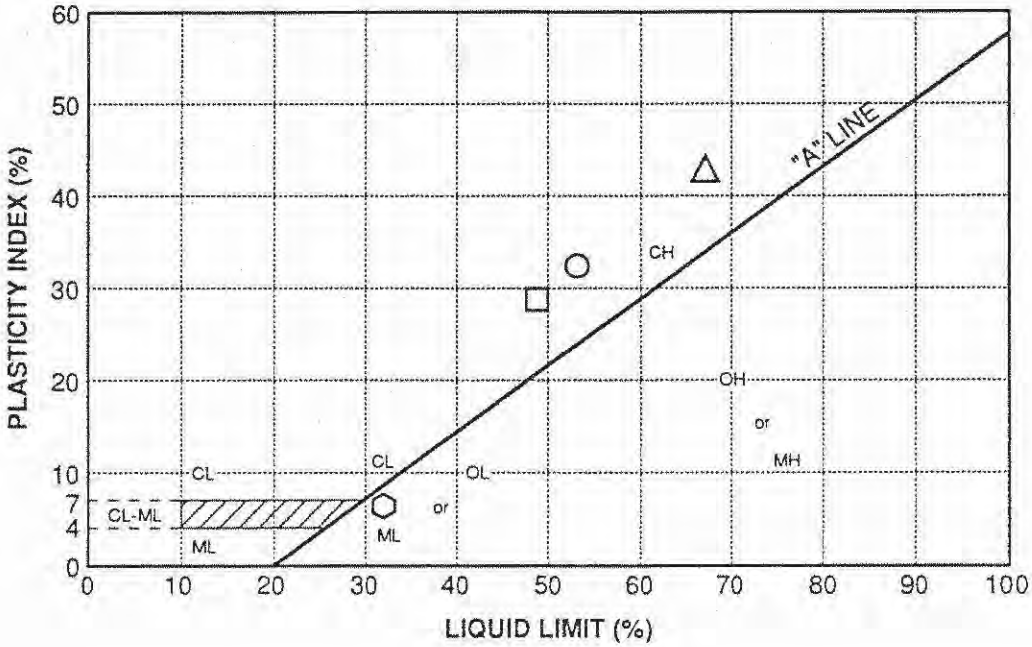
LOCATION KETTLEMAN, CALIFORNIA

APPENDIX D
LABORATORY DATA

APPENDIX D.1	PLASTICITY CHARTS
APPENDIX D.2	GRAIN SIZE DISTRIBUTIONS
APPENDIX D.3	MODIFIED PROCTOR COMPACTION TESTS
APPENDIX D.4	STANDARD PROCTOR COMPACTION TESTS
APPENDIX D.5	UU TRIAXIAL COMPRESSION TESTS (UNDISTURBED SAMPLES)
APPENDIX D.6	UU TRIAXIAL COMPRESSION TESTS (REMOLDED SAMPLES)
APPENDIX D.7	CU TRIAXIAL COMPRESSION TESTS
APPENDIX D.8	SUMMARY OF DIRECT SHEAR TESTS
APPENDIX D.9	CONSOLIDATION TESTS
APPENDIX D.10	GEOCHEMICAL TESTS

APPENDIX D.1
PLASTICITY CHARTS

89-97LTR/Fig D.1.1/PICh/U18-2-5 REV. 8/7/90



SYMBOL	STRATIGRAPHIC UNIT	BORING NO.	SAMPLE NO.	DEPTH (FT.)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USC SYMBOL
○	18-2	L18-E	S-8	60.0 - 62.5	53	32	CH
⬡	18-3	L18-E	S-6	43.0 - 45.0	32	6	ML
△	18-4	L18-D	S-6	52.0 - 54.3	67	42	CH
□	18-5	L18-D	S-2	22.0 - 24.3	49	29	CL/CH

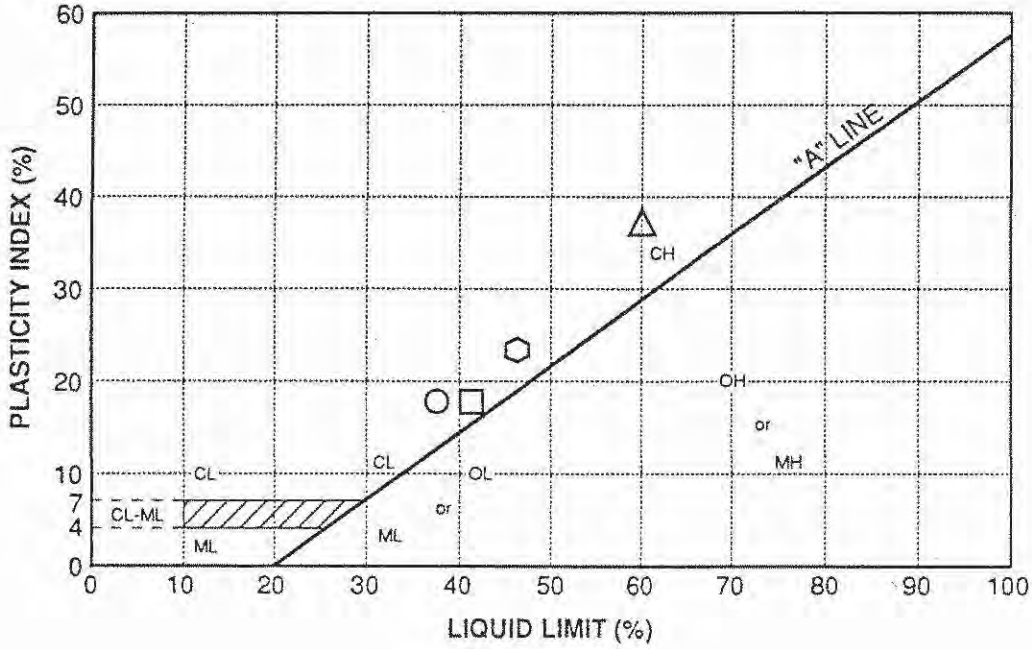
FIGURE D.1.1

PLASTICITY CHART
STRATIGRAPHIC UNITS
18-2 THROUGH 18-5

LANDFILL UNIT B-18
KETTLEMAN HILLS FACILITY

ENVIRONMENTAL SOLUTIONS, INC.

89-97LTR/Fig D.1.2/PICh/U18-7 REV. 8/7/90



SYMBOL	STRATIGRAPHIC UNIT	BORING NO.	SAMPLE NO.	DEPTH (FT.)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USC SYMBOL
○	18-7	L18-C	S-1	15.0 - 17.3	38	17	CL
⬡	18-7	L18-C	S-3	25.0 - 27.5	46	23	CL
△	18-7	L18-C	S-7	56.0 - 58.0	60	36	CH
□	18-7	L18-C	S-11	87.0 - 89.0	41	17	CL

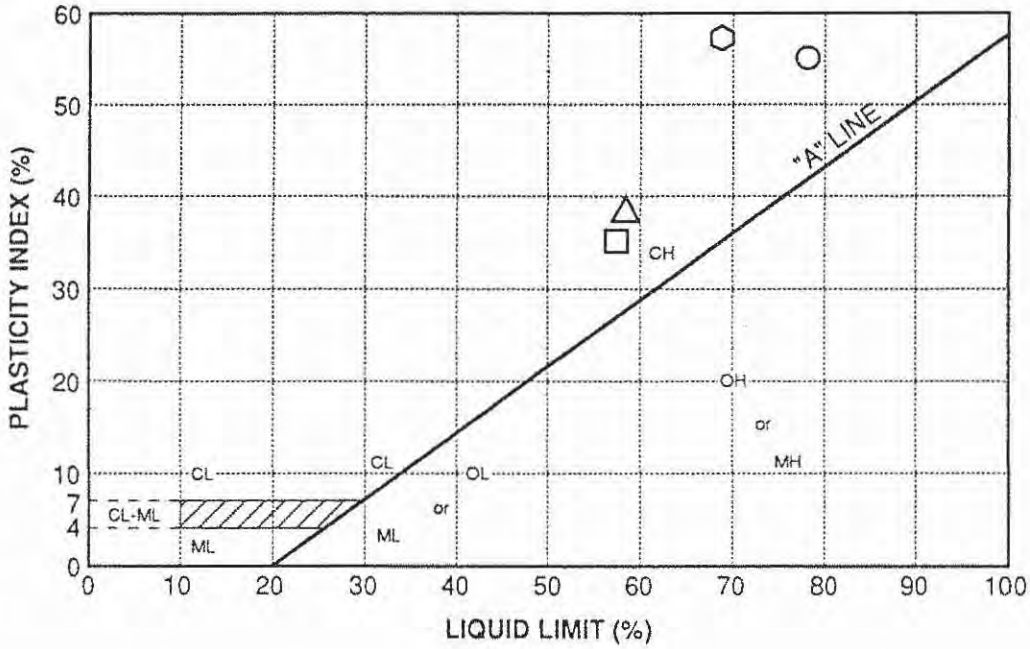
FIGURE D.1.2

PLASTICITY CHART
STRATIGRAPHIC UNIT 18-7

LANDFILL UNIT B-18
KETTLEMAN HILLS FACILITY

ENVIRONMENTAL SOLUTIONS, INC.

89-97/LTR/Fig D.1.3/PICh/U18-8 REV. 8/7/90



SYMBOL	STRATIGRAPHIC UNIT	BORING NO.	SAMPLE NO.	DEPTH (FT.)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USC SYMBOL
○	18-8	L18-F	S-1	6.0 - 8.5	78	55	CH
⬡	18-8	L18-F	S-3	26.0 - 28.5	69	57	CH
△	18-8	L18-F	S-6	56.0 - 58.5	59	39	CH
□	18-8	L18-I	S-2	16.0 - 18.5	58	36	CH

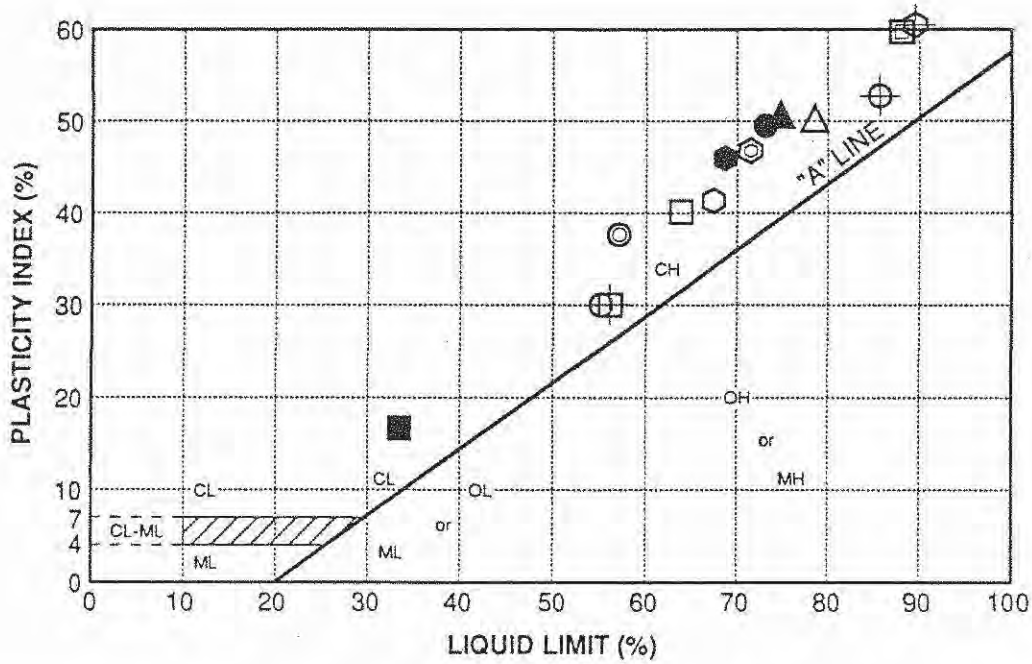
FIGURE D.1.3

PLASTICITY CHART
STRATIGRAPHIC UNIT 18-8

LANDFILL UNIT B-18
KETTLEMAN HILLS FACILITY

ENVIRONMENTAL SOLUTIONS, INC.

89-97/LTR/Fig D.1.4/PlCh/U18-8/2 REV. 8/7/90



SYMBOL	STRATIGRAPHIC UNIT	BORING NO.	SAMPLE NO.	DEPTH (FT.)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USC SYMBOL
○	18-8	L18-J	S-1	5.0 - 7.5	55	30	CH
⬡	18-8	L18-J	S-3	15.0 - 17.5	67	41	CH
△	18-8	L18-J	S-5	25.0 - 27.5	79	50	CH
□	18-8	L18-J	S-7	35.0 - 37.5	64	40	CH
●	18-8	L18-J	S-9	45.0 - 47.5	74	49	CH
⬢	18-8	L18-J	S-11	55.0 - 57.5	69	46	CH
▲	18-8	L18-J	S-13	65.0 - 67.5	74	50	CH
■	18-8	L18-J	S-15	75.0 - 77.5	33	17	CL
◎	18-8	L18-J	S-17	85.0 - 87.5	56	38	CH
⬡	18-8	L18-J	S-22	110.0-112.5	71	47	CH
△	18-8	L18-J	S-24	120.0-122.5	70	42	CH
□	18-8	L18-J	S-26	130.0-132.8	88	60	CH
⊕	18-8	L18-J	S-28	140.0-142.5	85	53	CH
⊕	18-8	L18-J	S-30	150.0-152.5	88	62	CH
⊞	18-8	L18-J	S-32	160.0-162.5	55	30	CH

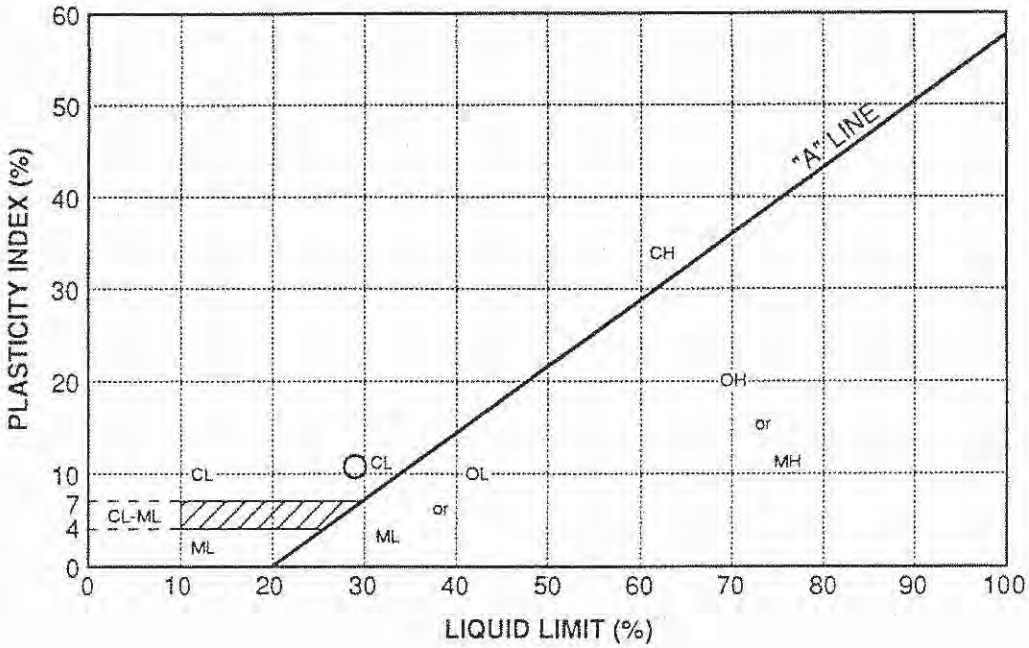
FIGURE D.1.4

PLASTICITY CHART
STRATIGRAPHIC UNIT 18-8

LANDFILL UNIT B-18
KETTLEMAN HILLS FACILITY

ENVIRONMENTAL SOLUTIONS, INC.

89-97LTR/Fig D.1.5/PICh/U18-9 REV. 8/7/90



SYMBOL	STRATIGRAPHIC UNIT	BORING NO.	SAMPLE NO.	DEPTH (FT.)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USC SYMBOL
○	18-9	18-K	S-10	80.0 - 82.3	30	11	CL

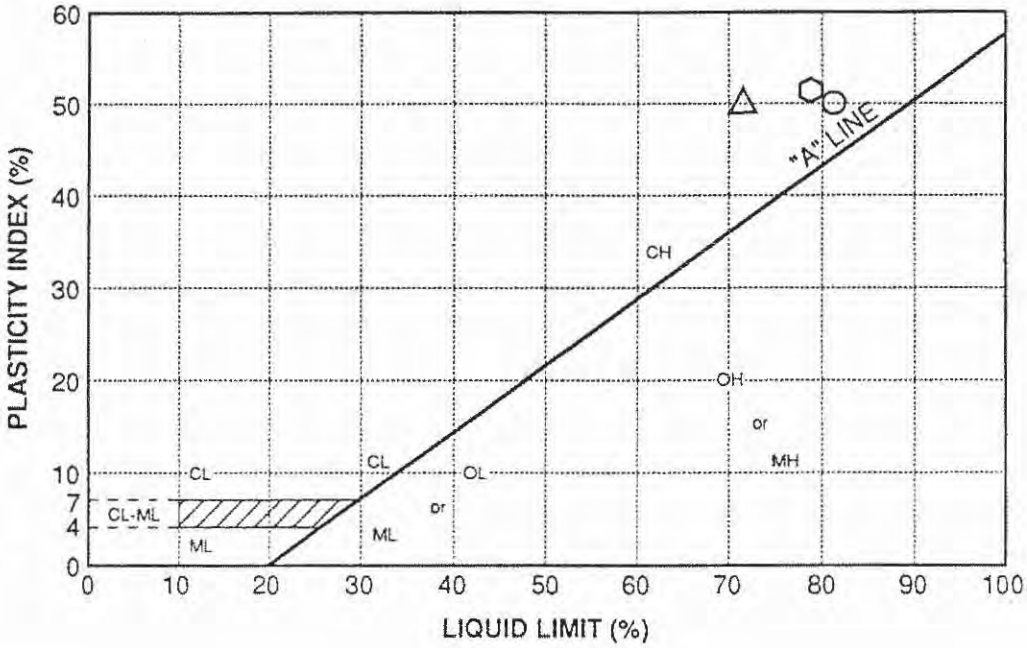
FIGURE D.1.5

PLASTICITY CHART
STRATIGRAPHIC UNIT 18-9

LANDFILL UNIT B-18
KETTLEMAN HILLS FACILITY

ENVIRONMENTAL SOLUTIONS, INC.

89-97LTR/Fig D.1.6/PlCh/U18-10 REV. 8/7/90



SYMBOL	STRATIGRAPHIC UNIT	BORING NO.	SAMPLE NO.	DEPTH (FT.)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USC SYMBOL
○	18-10	L18-H	S-1	6.0 - 8.5	81	50	CH
⬡	18-10	L18-H	S-4	35.0 - 37.5	78	51	CH
△	18-10	L18-H	S-6	55.0 - 57.5	71	49	CH

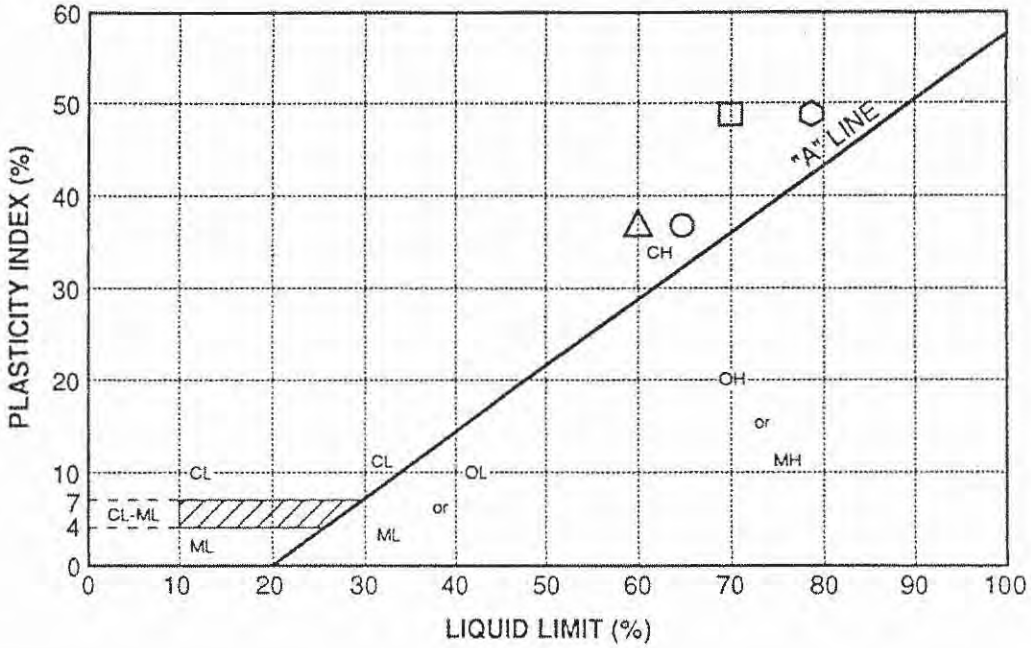
FIGURE D.1.6

PLASTICITY CHART
STRATIGRAPHIC UNIT 18-10

LANDFILL UNIT B-18
KETTLEMAN HILLS FACILITY

ENVIRONMENTAL SOLUTIONS, INC.

89-97LTR/Fig D.1.7/PlCh/U18-12 REV. 8/7/90



SYMBOL	STRATIGRAPHIC UNIT	BORING NO.	SAMPLE NO.	DEPTH (FT.)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USC SYMBOL
○	18-12	L18-B	S-1	6.0 - 8.5	64	36	CH
⬡	18-12	L18-G	S-7	50.0 - 51.8	78	49	CH
△	18-12	L18-G	S-9	65.0 - 67.0	60	36	CH
□	18-12	TP-31	B-1	3.5	70	49	CH

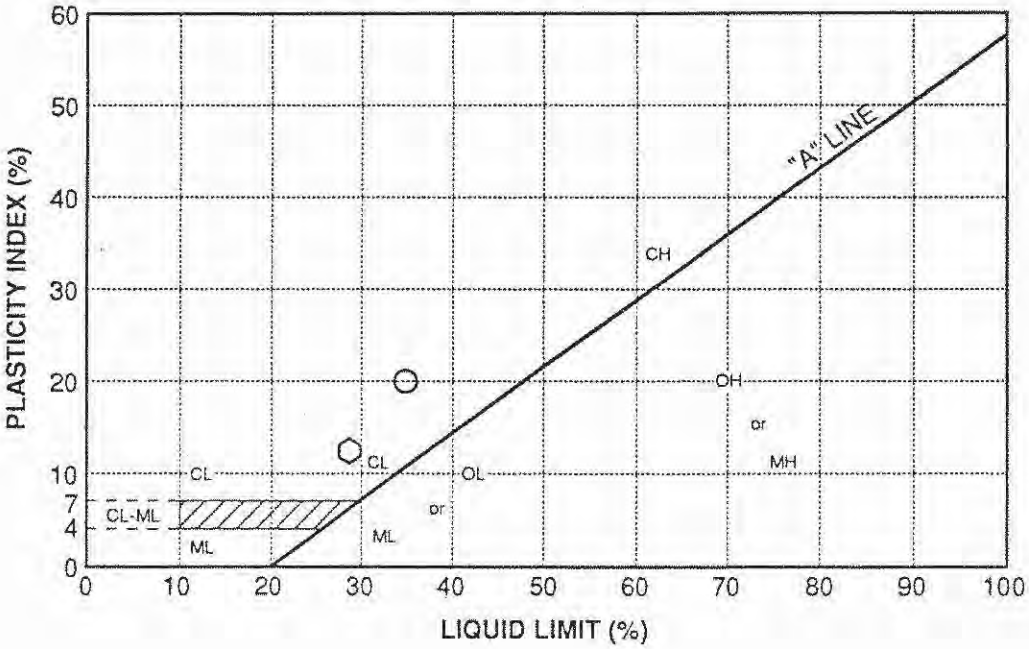
FIGURE D.1.7

PLASTICITY CHART
STRATIGRAPHIC UNIT 18-12

LANDFILL UNIT B-18
KETTLEMAN HILLS FACILITY

ENVIRONMENTAL SOLUTIONS, INC.

89-97LTR/Fig D.1.8/PlCh/Col REV. 8/7/90



SYMBOL	STRATIGRAPHIC UNIT	BORING NO.	SAMPLE NO.	DEPTH (FT.)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USC SYMBOL
○	COLLUVIUM	L18-C	B-1	6.0 - 7.5	35	19	CL
⬡	COLLUVIUM	L18-D	B-2	10.0 - 11.5	29	13	CL

FIGURE D.1.8

PLASTICITY CHART
COLLUVIUM

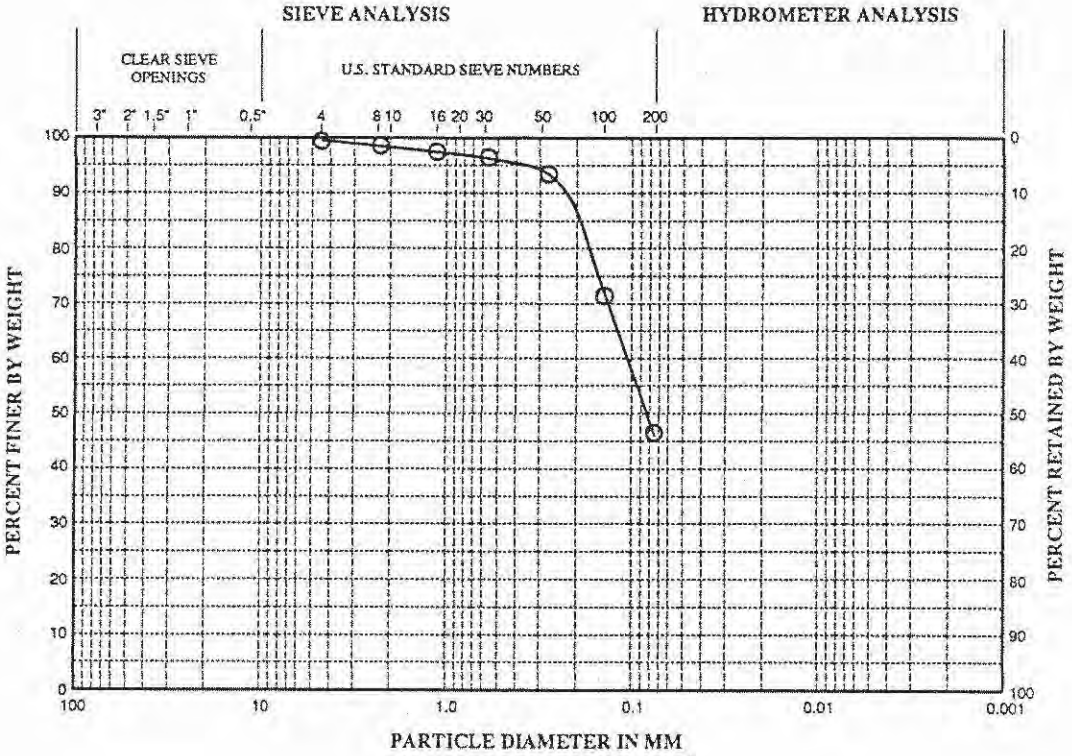
LANDFILL UNIT B-18
KETTLEMAN HILLS FACILITY

ENVIRONMENTAL SOLUTIONS, INC.

APPENDIX D.2
GRAIN SIZE DISTRIBUTIONS

89-977/Fig D.2.1/Gr/SID/Co REV. 8/7/90

SYMBOL	BORING	DEPTH (ft.)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	STRATIGRAPHIC UNIT	MATERIAL TYPE	USCS
O——O	L18-D	10.0 - 11.5	29	13	Colluvium	Clayey Sand	SC



COBBLES	GRAVEL		SAND			SILT AND CLAY FRACTION
	coarse	fine	coarse	medium	fine	

FIGURE D.2.1

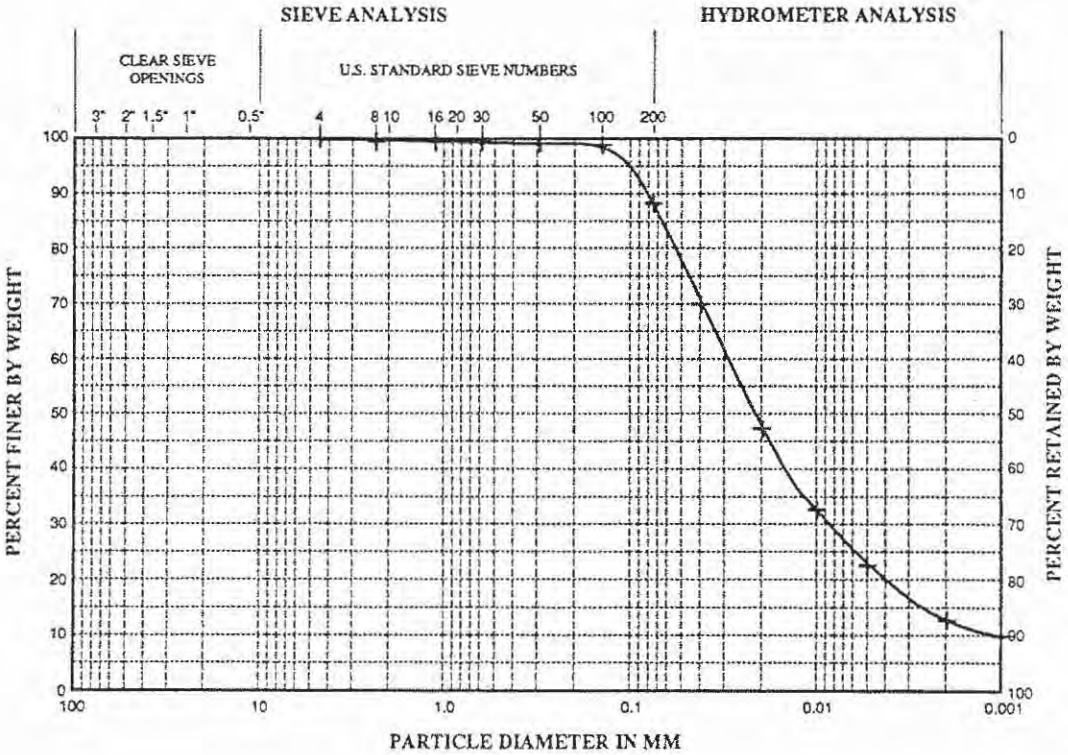
GRAIN SIZE DISTRIBUTION
COLLUVIUM

LANDFILL UNIT B-18
KETTLEMAN HILLS FACILITY

ENVIRONMENTAL SOLUTIONS, INC.

89-977/Fig D.2.2/GrSID/Co REV. 8/14/90

SYMBOL	BORING	DEPTH (ft.)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	STRATIGRAPHIC UNIT	MATERIAL TYPE	USCS
+——+	L18-D	22.0-24.3	49	29	18-5	Claystone	CL-CH



COBBLES	GRAVEL		SAND			SILT AND CLAY FRACTION
	coarse	fine	coarse	medium	fine	

FIGURE D.2.2

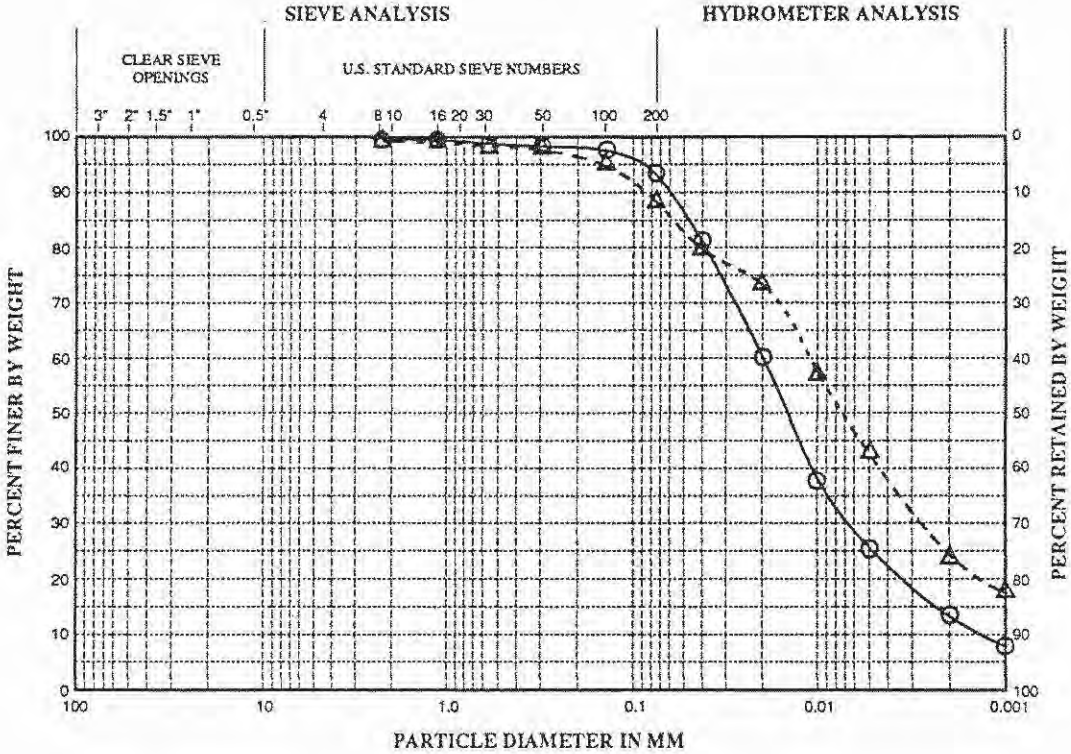
GRAIN SIZE DISTRIBUTION
STRATIGRAPHIC UNIT 18-5

LANDFILL UNIT B-18
KETTLEMAN HILLS FACILITY

ENVIRONMENTAL SOLUTIONS, INC.

89-977/Fig D.2.3/GrSIDVU18-7 REV. 8/14/90

SYMBOL	BORING	DEPTH (ft.)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	STRATIGRAPHIC UNIT	MATERIAL TYPE	USCS
O——O	L18-C	15.0-17.3	38	17	18-7	Claystone	CH
Δ- - - -Δ	L18-C	56.0-58.0	60	36	18-7	Claystone	CH



COBBLES	GRAVEL		SAND			SILT AND CLAY FRACTION
	coarse	fine	coarse	medium	fine	

FIGURE D.2.3

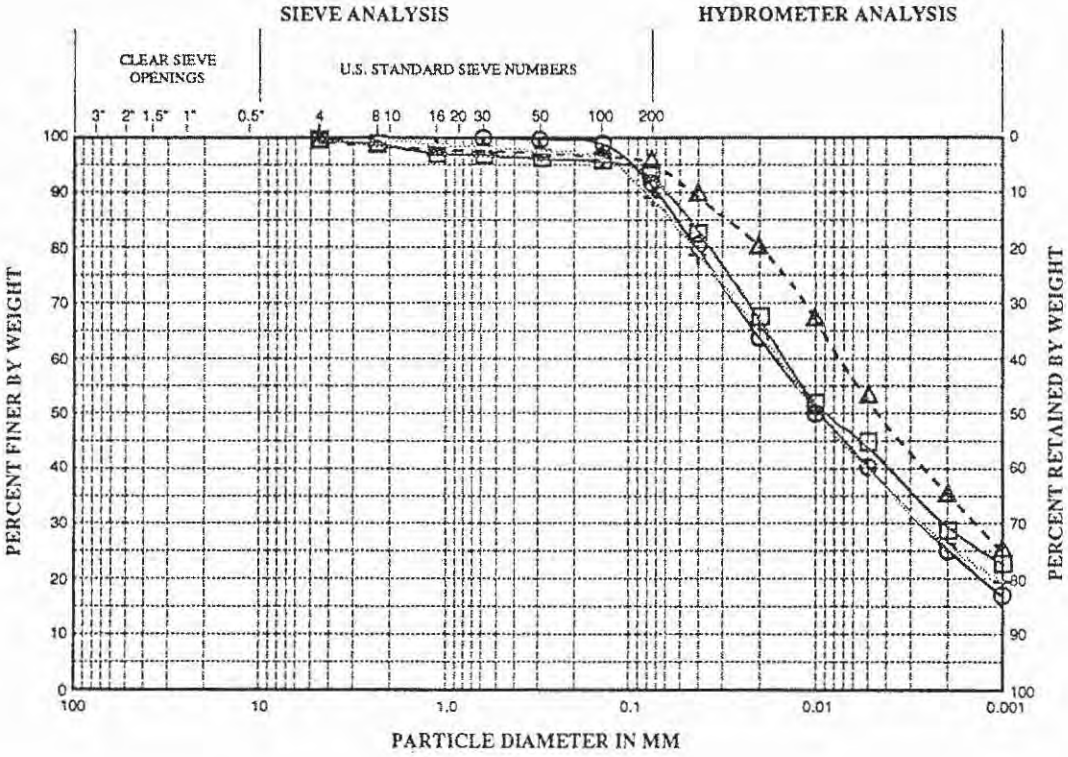
GRAIN SIZE DISTRIBUTION
STRATIGRAPHIC UNIT 18-7

LANDFILL UNIT B-18
KETTLEMAN HILLS FACILITY

ENVIRONMENTAL SOLUTIONS, INC.

89-977/Fig D.2.4/GrSID/U18-8 REV. 8/14/90

SYMBOL	BORING	DEPTH (ft.)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	STRATIGRAPHIC UNIT	MATERIAL TYPE	USCS
○——○	L18-I	16.0-18.5	58	36	18-8	Claystone	CH
△- - - -△	L18-F	6.0-8.5	78	55	18-8	Claystone	CH
□——□	L18-F	26.0-28.5	59	47	18-8	Claystone	CH
+·····+	L18-F	56.0-58.5	59	39	18-8	Claystone	CH



COBBLES	GRAVEL		SAND			SILT AND CLAY FRACTION
	coarse	fine	coarse	medium	fine	

FIGURE D.2.4

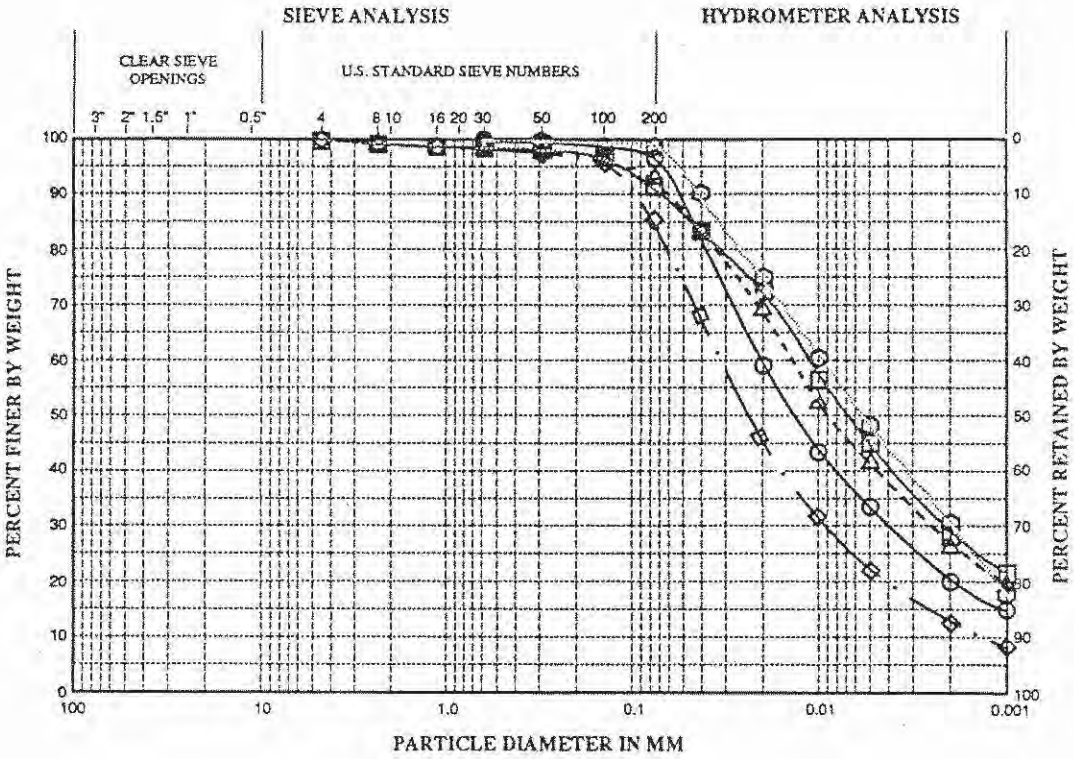
GRAIN SIZE DISTRIBUTION
STRATIGRAPHIC UNIT 18-8

LANDFILL UNIT B-18
KETTLEMAN HILLS FACILITY

ENVIRONMENTAL SOLUTIONS, INC.

89-977/Fig D.2.5/GrSID/U18-8/2 REV. 8/14/90

SYMBOL	BORING	DEPTH (ft.)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	STRATIGRAPHIC UNIT	MATERIAL TYPE	USCS
○——○	L18-J	5-7.5	55	30	18-8	Claystone	CH
△- - - -△	L18-J	35-37.5	64	40	18-8	Claystone	CH
□——□	L18-J	75-77.5	33	17	18-8	Claystone	CH
○·····○	L18-J	120-122.5	70	42	18-8	Claystone	CH
◇— · —◇	L18-J	160-162.5	55	30	18-8	Claystone	CH



COBBLES	GRAVEL		SAND			SILT AND CLAY FRACTION
	coarse	fine	coarse	medium	fine	

FIGURE D.2.5

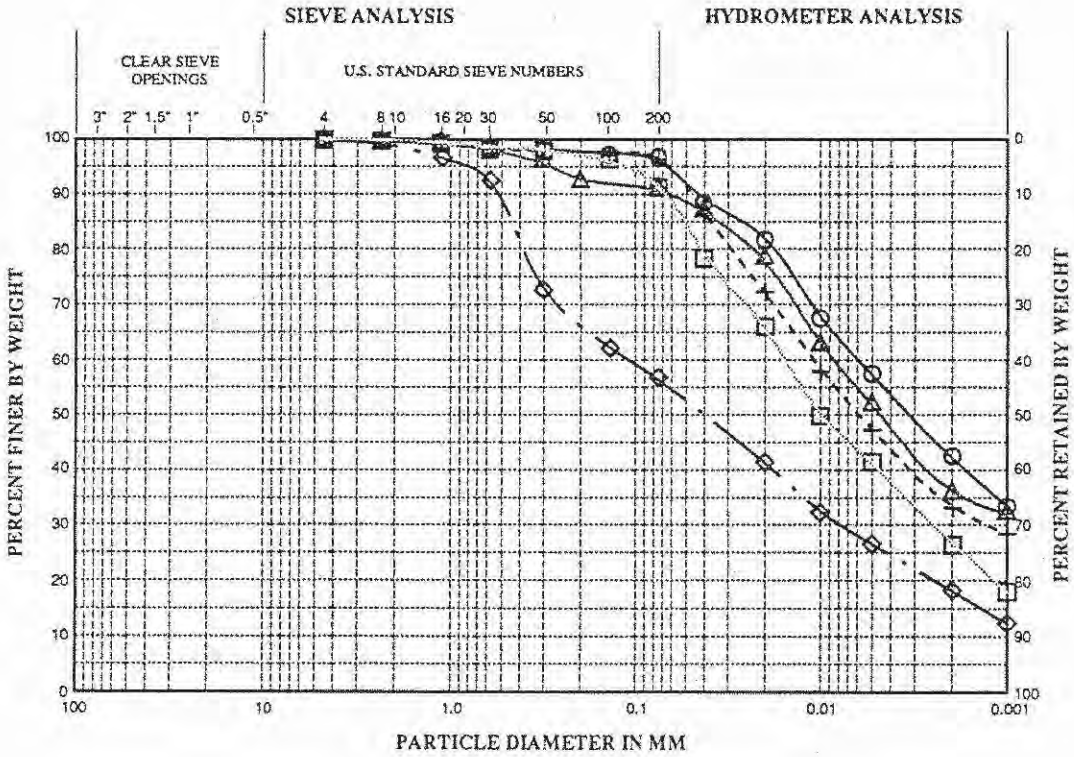
GRAIN SIZE DISTRIBUTION
STRATIGRAPHIC UNIT 18-8

LANDFILL UNIT B-18
KETTLEMAN HILLS FACILITY

ENVIRONMENTAL SOLUTIONS, INC.

89-977/Fig D.2.6/GrSID/U18-8/3 REV. 8/14/90

SYMBOL	TEST PIT	DEPTH (ft.)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	STRATIGRAPHIC UNIT	MATERIAL TYPE	USCS
○——○	DT-A,B-2	5.0	82	54	18-8	Claystone	CH
+------+	DT-C,B-1	8.0	78	56	18-8	Claystone	CH
△——△	TP-36,B-1	4.0	78	56	18-8	Claystone	CH
□·····□	TP-38,B-1	9.0	52	34	18-8	Claystone	CH
◇— · —◇	TP-40,B-1	3.0	28	7	18-8	Claystone	CH



COBBLES	GRAVEL		SAND			SILT AND CLAY FRACTION
	coarse	fine	coarse	medium	fine	

FIGURE D.2.6

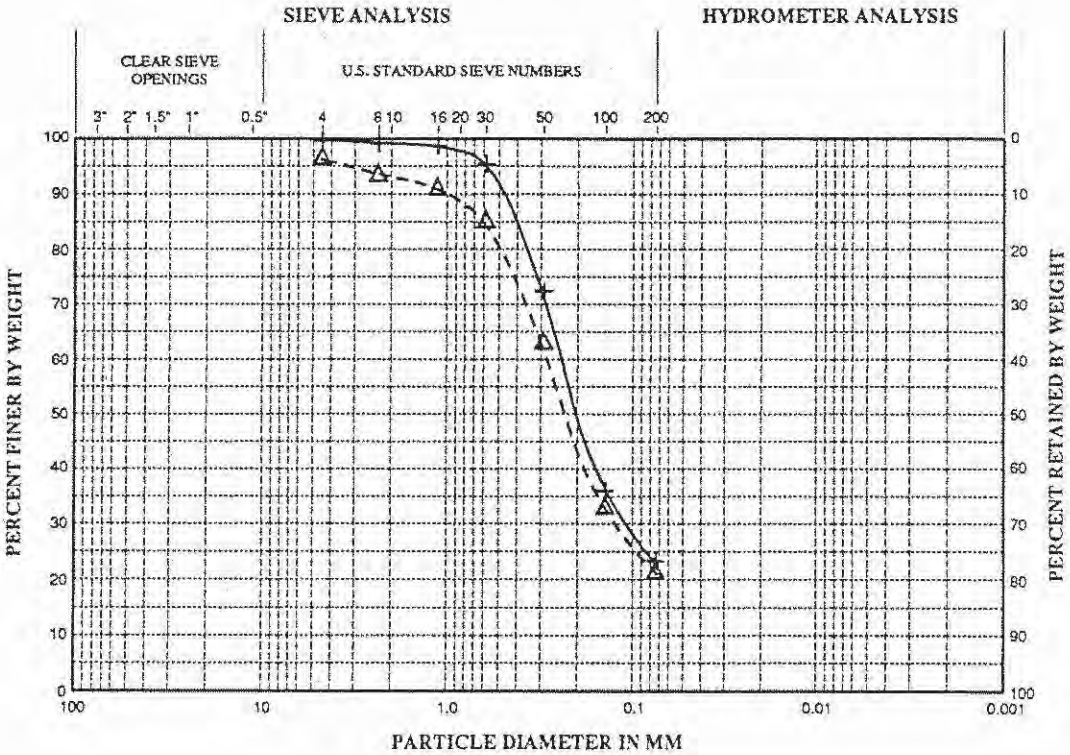
GRAIN SIZE DISTRIBUTION
STRATIGRAPHIC UNIT 18-8

LANDFILL UNIT B-18
KETTLEMAN HILLS FACILITY

ENVIRONMENTAL SOLUTIONS, INC.

89-977/Fig D.2.7/GrSID/U18-9 REV. 8/7/90

SYMBOL	TEST PIT TYPE	DEPTH (ft.)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	STRATIGRAPHIC UNIT	MATERIAL TYPE	USCS
+——+	TP-1, B-1	7.0	--	--	18-9	Sandstone	SM
△- - - -△	TP-42, B-1	6.0	--	--	18-9	Sandstone	SM



COBBLES	GRAVEL		SAND			SILT AND CLAY FRACTION
	coarse	fine	coarse	medium	fine	

FIGURE D.2.7

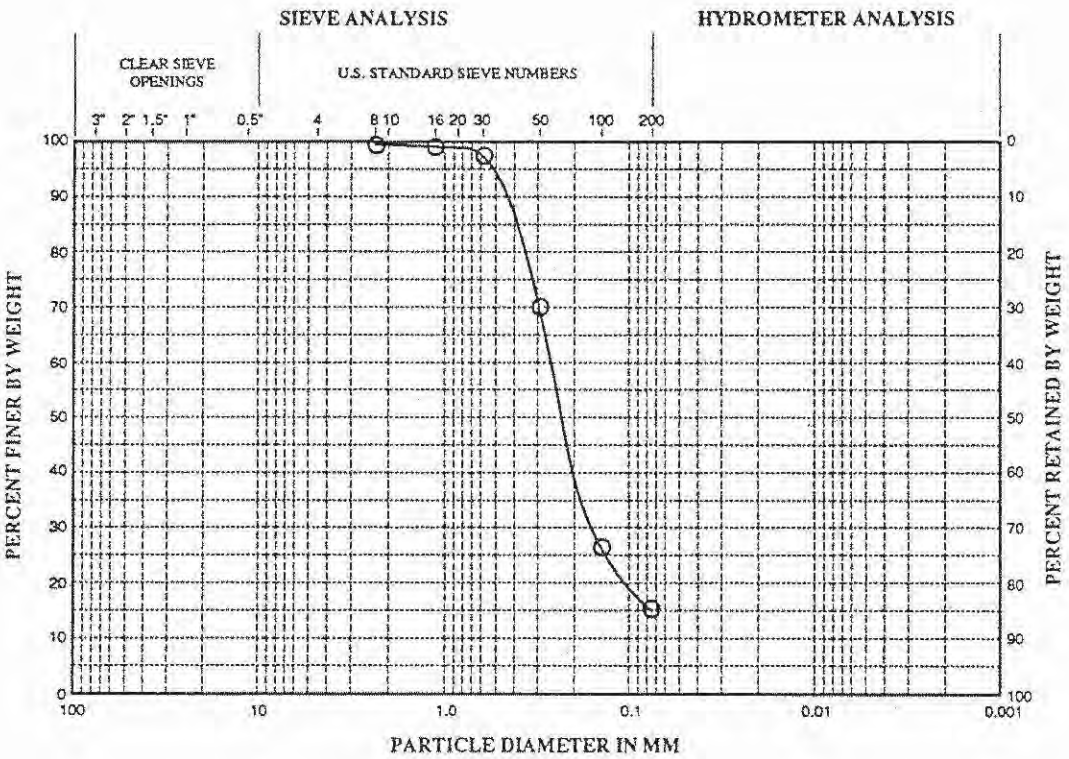
GRAIN SIZE DISTRIBUTION
STRATIGRAPHIC UNIT 18-9

LANDFILL UNIT B-18
KETTLEMAN HILLS FACILITY

ENVIRONMENTAL SOLUTIONS, INC.

89-977/Fig D.2.8/GrSID/U18-11 REV. 8/7/90

SYMBOL	BORING	DEPTH (ft.)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	STRATIGRAPHIC UNIT	MATERIAL TYPE	USCS
O——O	L18-B	37.0-39.5	--	--	18-11	Sandstone	SM



COBBLES	GRAVEL		SAND			SILT AND CLAY FRACTION
	coarse	fine	coarse	medium	fine	

FIGURE D.2.8

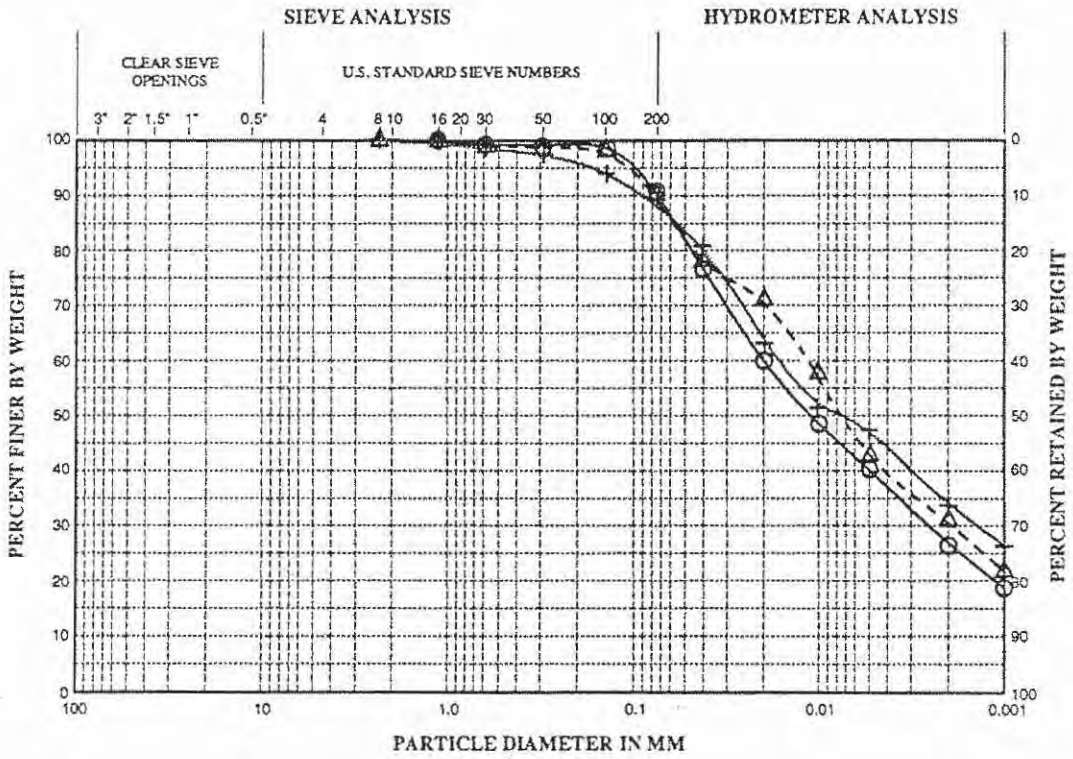
GRAIN SIZE DISTRIBUTION
STRATIGRAPHIC UNIT 18-11

LANDFILL UNIT B-18
KETTLEMAN HILLS FACILITY

ENVIRONMENTAL SOLUTIONS, INC.

89-977/Fig D.2.9/GrSID/U18-12 REV. 8/14/90

SYMBOL	BORING	DEPTH (ft.)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	STRATIGRAPHIC UNIT	MATERIAL TYPE	USCS
O——O	L18-B	6.0-8.5	64	36	18-12	Claystone	CH
Δ- - - -Δ	L18-G	50.0-51.8	78	44	18-12	Claystone	CH
+——+	L18-G	65.0-67.0	60	36	18-12	Claystone	CH



COBBLES	GRAVEL		SAND			SILT AND CLAY FRACTION
	coarse	fine	coarse	medium	fine	

FIGURE D.2.9

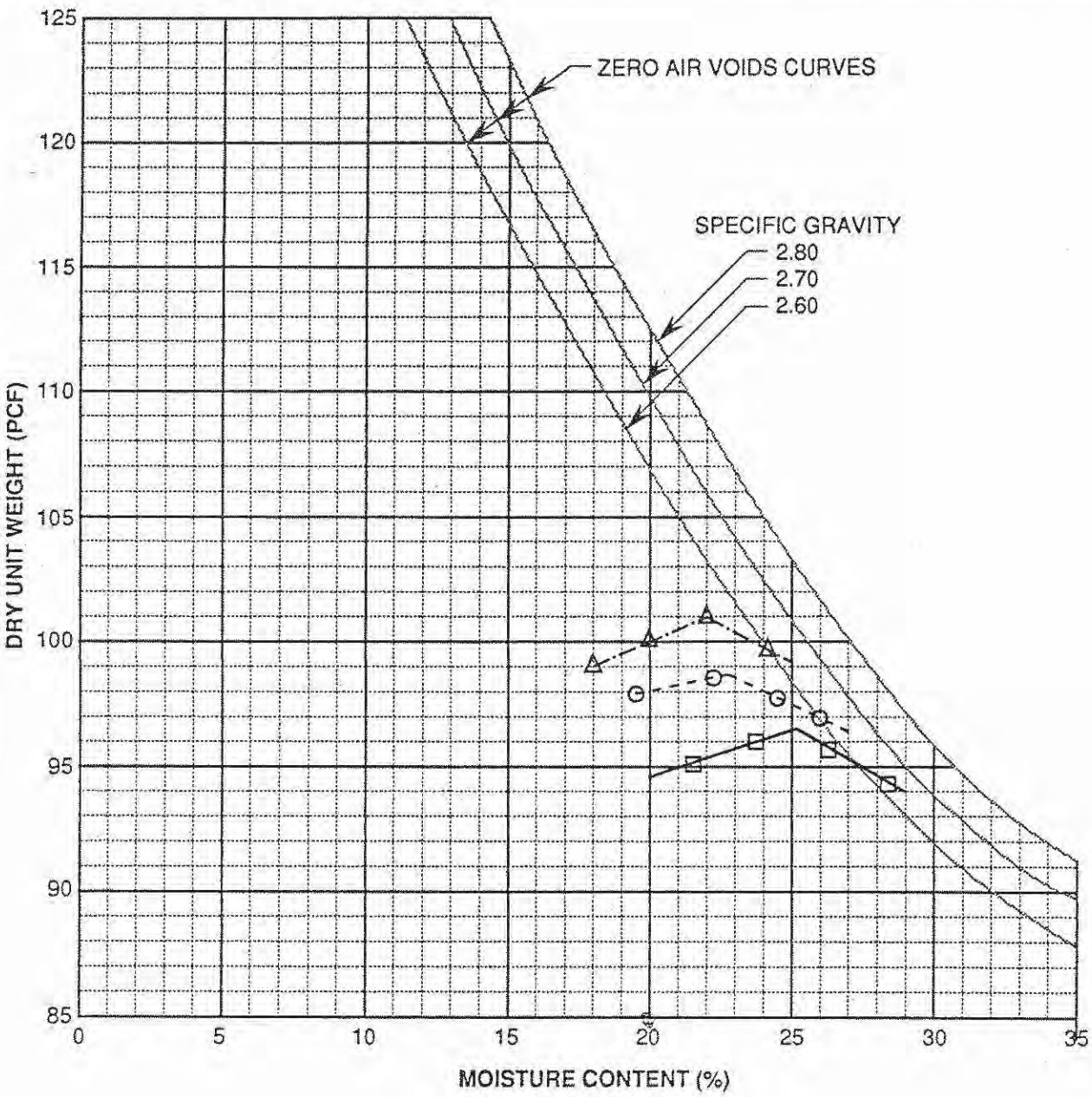
GRAIN SIZE DISTRIBUTION
STRATIGRAPHIC UNIT 18-12

LANDFILL UNIT B-18
KETTLEMAN HILLS FACILITY

ENVIRONMENTAL SOLUTIONS, INC.

APPENDIX D.3
MODIFIED PROCTOR COMPACTION TESTS

89-97/LTR/Fig D.3.1/MoPrTe REV. 8/7/90



SUMMARY OF COMPACTION TEST RESULTS			
SYMBOL	○	△	□
SAMPLE NO.	COMP. NO. 1	COMP. NO. 2	COMP. NO. 3
MATERIAL TYPE	CLAYSTONE	CLAYSTONE	CLAYSTONE
TEST METHOD	ASTM D1557, METHOD 78A		
MAXIMUM DRY DENSITY (PCF)	98.7	100.7	96.2
OPTIMUM MOISTURE CONTENT (%)	22.8	21.7	24.9
LIQUID LIMIT	67	63	76
PLASTICITY INDEX	40	40	50
SPECIFIC GRAVITY	2.79	2.79	2.79
UNIFIED SOILS CLASSIFICATION	CH	CH	CH

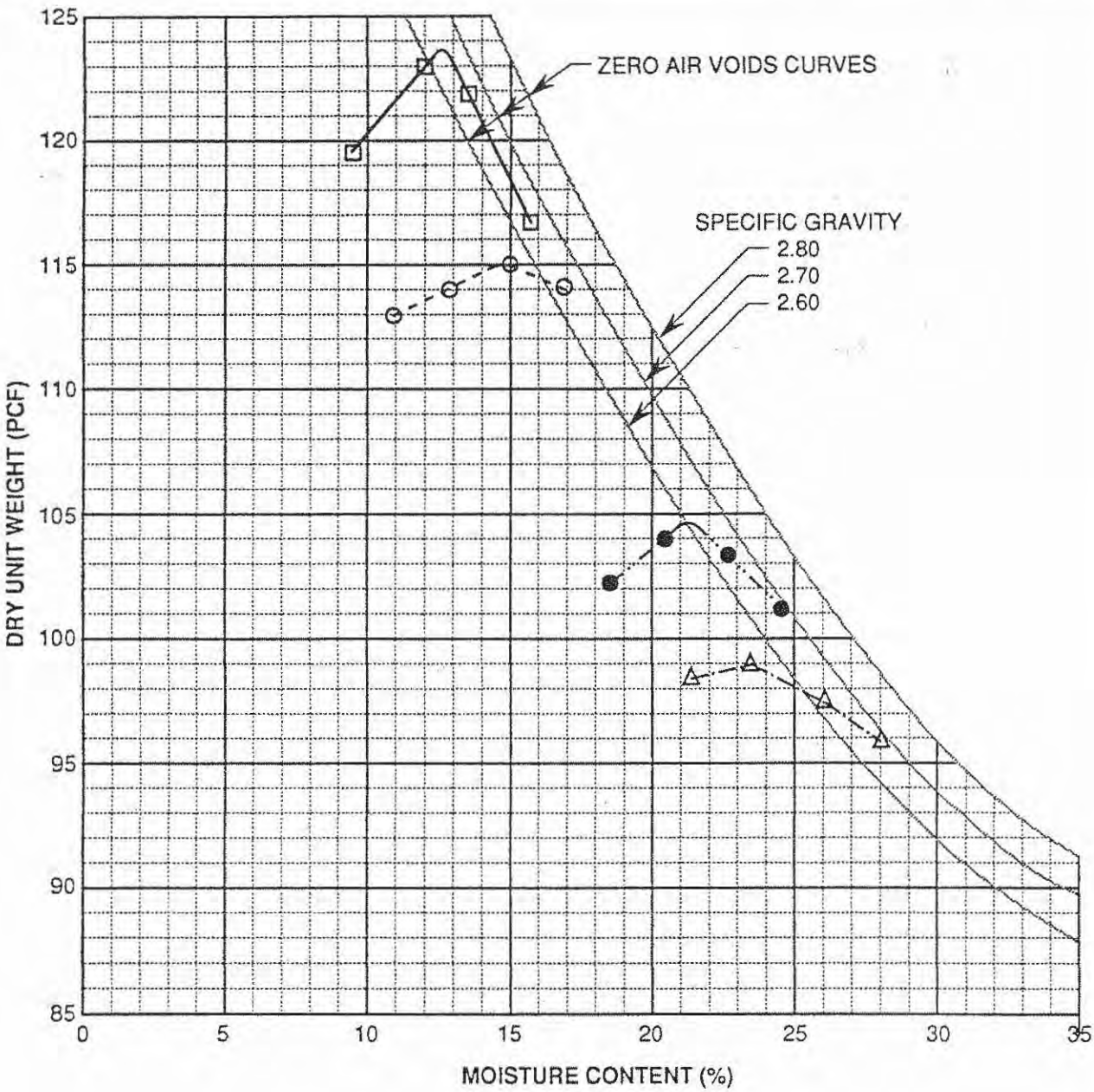
FIGURE D.3.1

MODIFIED PROCTOR TESTS

LANDFILL UNIT B-18
KETTLEMAN HILLS FACILITY

ENVIRONMENTAL SOLUTIONS, INC.

89-97LTR/Fig D.3.2/MoPrTe REV. 8/7/90



SUMMARY OF COMPACTION TEST RESULTS				
SYMBOL	○	△	□	●
SAMPLE NO.	TP-42, B-1	DT-C, B-1	COMP. NO. 10	DT-A, B-2
MATERIAL TYPE	SANDSTONE	CLAYSTONE	COLLUVIUM	CLAYSTONE
TEST METHOD	ASTM D1557, METHOD 78A			
MAXIMUM DRY DENSITY (PCF)	114.8	99.0	123.3	104.2
OPTIMUM MOISTURE CONTENT (%)	15.0	23.5	12.3	21.5
LIQUID LIMIT	--	76	--	82
PLASTICITY INDEX	--	45	--	54
SPECIFIC GRAVITY	2.8	2.8	2.7	2.7
UNIFIED SOILS CLASSIFICATION	SM	CL	SC	CH

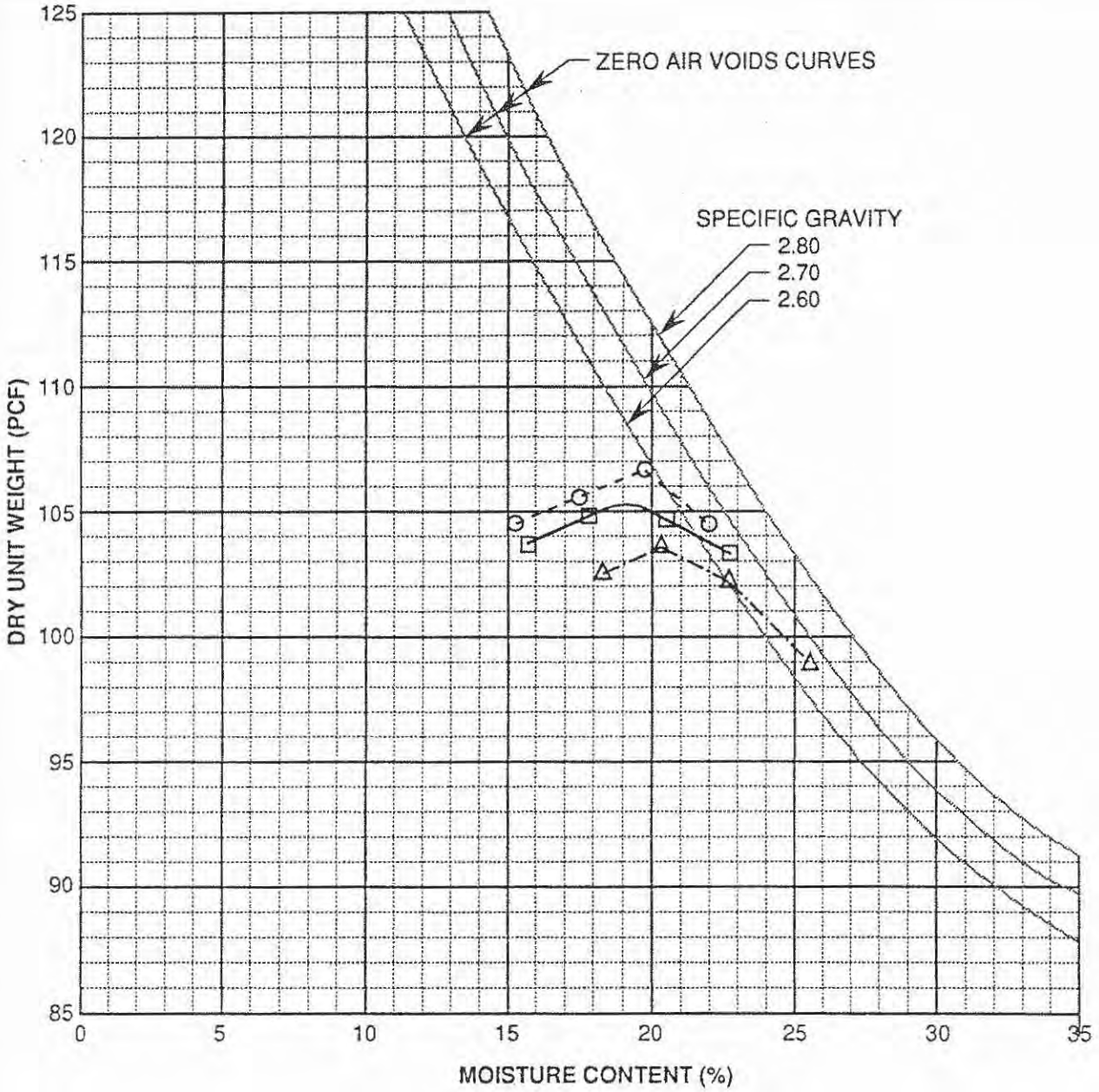
FIGURE D.3.2

MODIFIED PROCTOR TESTS

LANDFILL UNIT B-18
KETTLEMAN HILLS FACILITY

ENVIRONMENTAL SOLUTIONS, INC.

89-97LTR/Fig D.3.3/MoPrTe REV. 8/7/90



SUMMARY OF COMPACTION TEST RESULTS			
SYMBOL	○	△	□
SAMPLE NO.	COMP. NO. 5	COMP NO. 7	COMP. NO. 9
MATERIAL TYPE	50% cs/50% ss	50% cs/50% ss	50% cs/50% ss
TEST METHOD	ASTM D1557, METHOD 78A		
MAXIMUM DRY DENSITY (PCF)	106.6	103.7	105.3
OPTIMUM MOISTURE CONTENT (%)	19.8	20.3	19.0
LIQUID LIMIT	--	--	--
PLASTICITY INDEX	--	--	--
SPECIFIC GRAVITY	2.75	2.75	2.75
UNIFIED SOILS CLASSIFICATION	CL	CL	CL

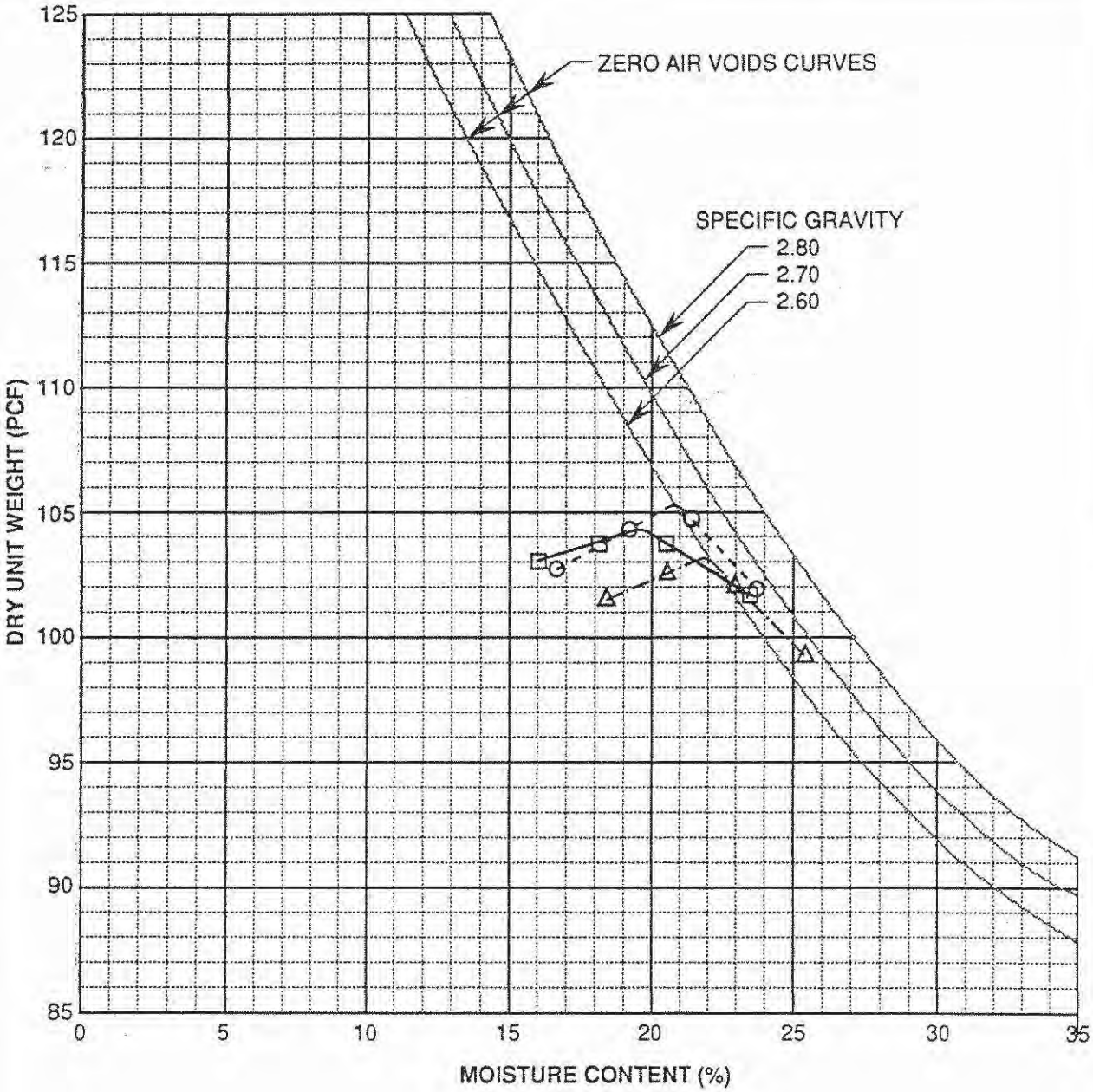
FIGURE D.3.3

MODIFIED PROCTOR TESTS

LANDFILL UNIT B-18
KETTLEMAN HILLS FACILITY

ENVIRONMENTAL SOLUTIONS, INC.

89-97LTR/Fig D.3.4/MoPrv REV. 8/7/90



SUMMARY OF COMPACTION TEST RESULTS			
SYMBOL	○	△	□
SAMPLE NO.	COMP. NO. 4	COMP. NO. 6	COMP. NO. 8
MATERIAL TYPE	70% cs/30% ss	70% cs/30% ss	70% cs/30% ss
TEST METHOD	ASTM D1557, METHOD 78A		
MAXIMUM DRY DENSITY (PCF)	104.9	102.9	104.0
OPTIMUM MOISTURE CONTENT (%)	20.8	21.9	19.8
LIQUID LIMIT	--	--	--
PLASTICITY INDEX	--	--	--
SPECIFIC GRAVITY	2.7	2.7	2.7
UNIFIED SOILS CLASSIFICATION	CL	CL	CL

FIGURE D.3.4

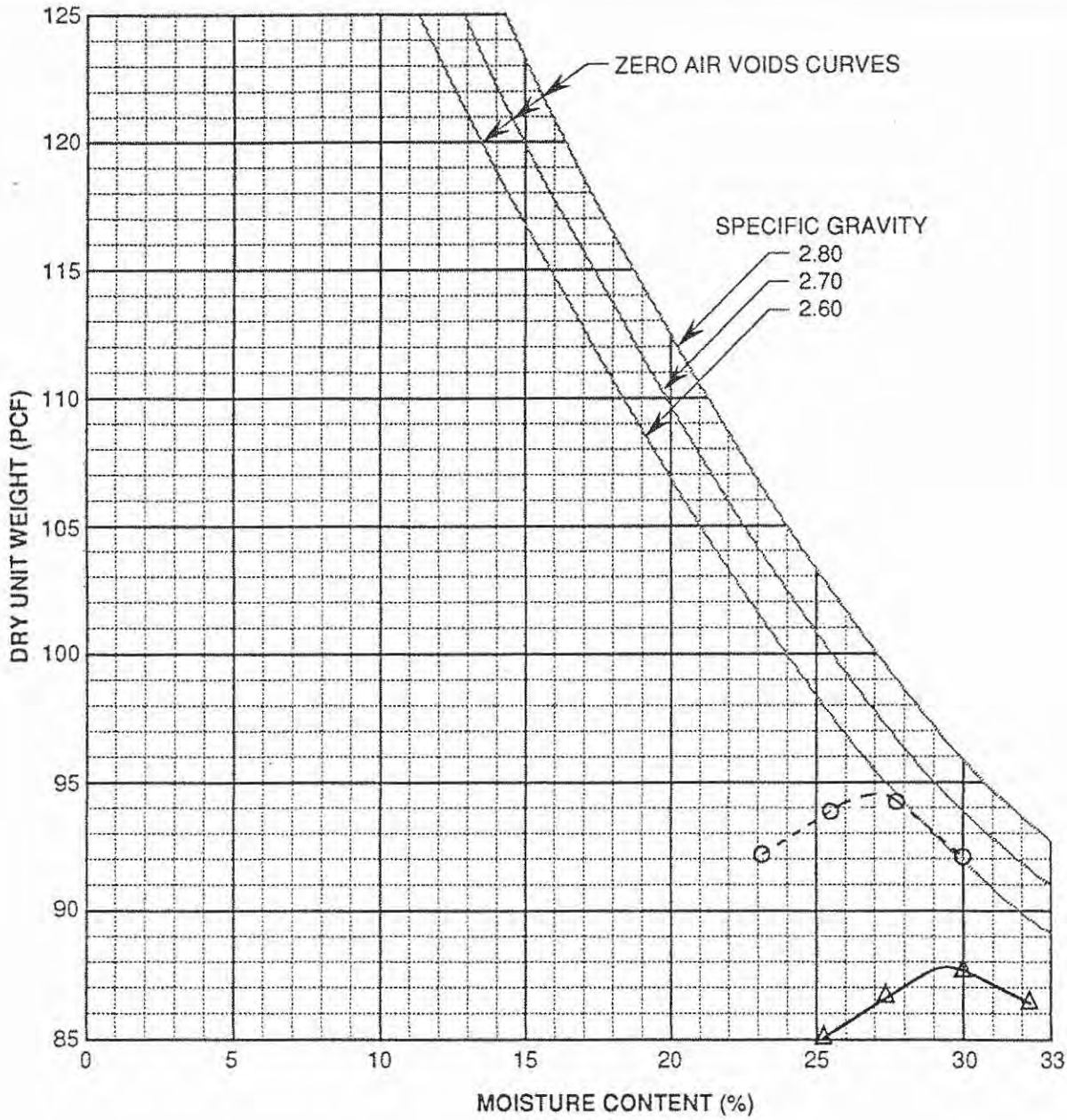
MODIFIED PROCTOR TESTS

LANDFILL UNIT B-18
KETTLEMAN HILLS FACILITY

ENVIRONMENTAL SOLUTIONS, INC.

APPENDIX D.4
STANDARD PROCTOR COMPACTION TESTS

89-97LTR/Fig D.4.1/StPrTe REV. 8/7/90



SUMMARY OF COMPACTION TEST RESULTS		
SYMBOL	○	△
SAMPLE NO.	COMP. NO. 1	COMP. NO. 11
MATERIAL TYPE	70% cs/30% ss	CLAYSTONE
TEST METHOD	ASTM D698 (STANDARD PROCTOR)	
MAXIMUM DRY DENSITY (PCF)	94.2	87.7
OPTIMUM MOISTURE CONTENT (%)	27.0	29.7
LIQUID LIMIT	--	76
PLASTICITY INDEX	--	45
SPECIFIC GRAVITY	2.8	2.8
UNIFIED SOILS CLASSIFICATION	CL	CH

FIGURE D.4.1

STANDARD PROCTOR TESTS

LANDFILL UNIT B-18
KETTLEMAN HILLS FACILITY

ENVIRONMENTAL SOLUTIONS, INC.

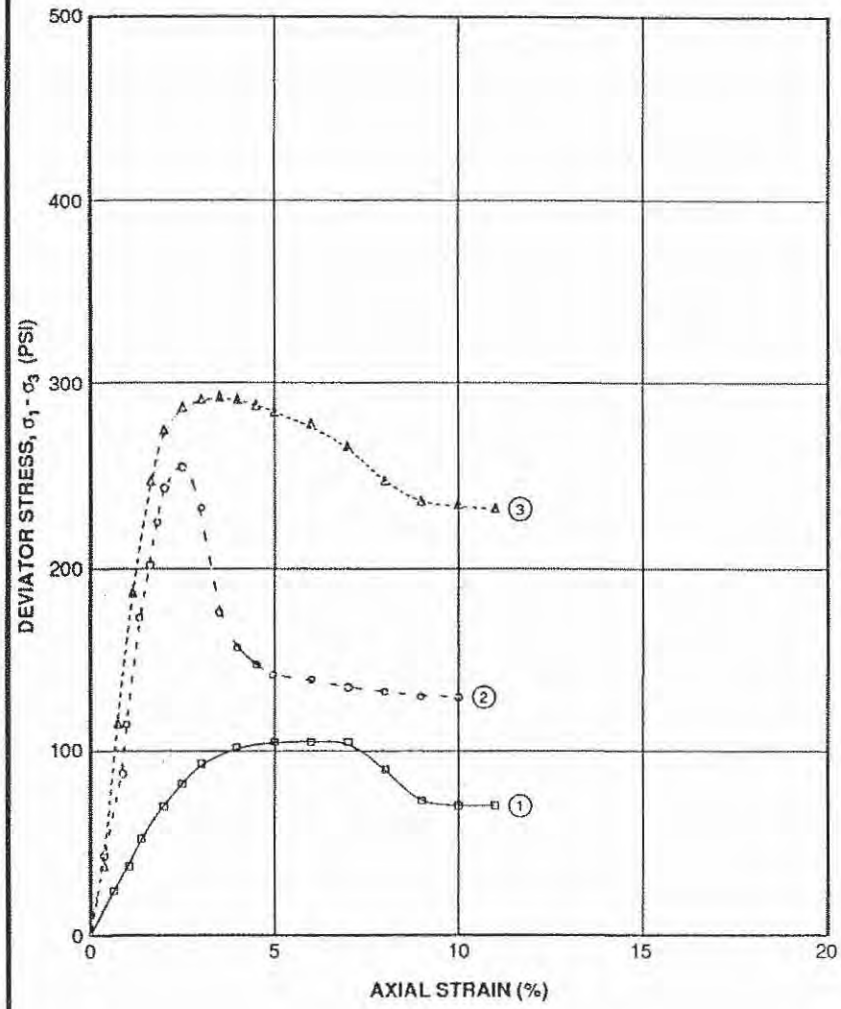
APPENDIX D.5

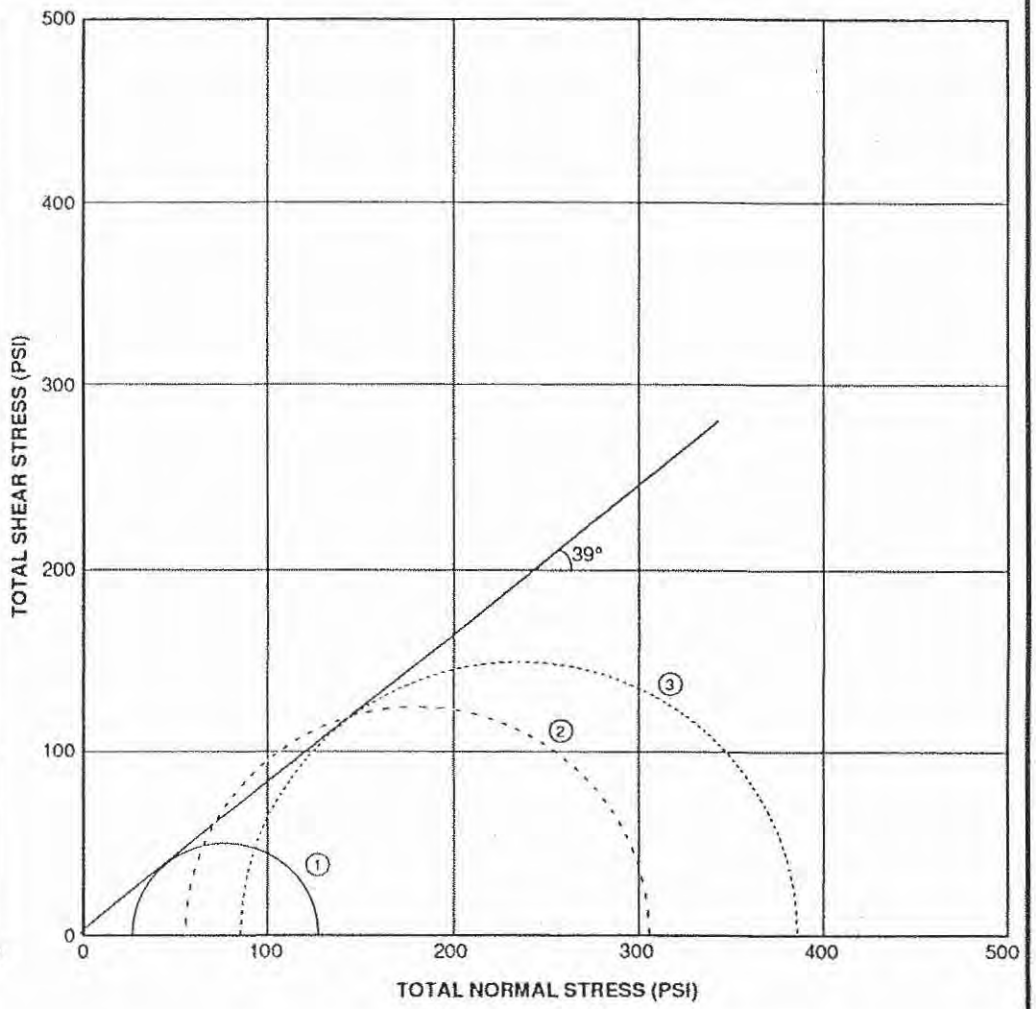
UU TRIAXIAL COMPRESSION TESTS (UNDISTURBED SAMPLES)

TABLE D.5.1

SUMMARY OF UNCONSOLIDATED UNDRAINED (UU) TRIAXIAL TEST (UNDISTURBED SAMPLES)

BORING NO.	SAMPLE NO.	SAMPLE DEPTH (FT)	STRATIGRAPHIC UNIT	MATERIAL TYPE	NATURAL		CONFINING PRESSURE (PSI)	DEVIATOR STRESS			
					WATER CONTENT (%)	DRY DENSITY (PCF)		PEAK (PSI)	STRAIN (%)	RESIDUAL (PSI)	STRAIN (%)
L18-B	S-3	20.0 - 22.5	18-11	Sandstone	20	101.0	27.8	106.4	6	71.1	11
L18-B	S-5	37.0 - 39.5	18-11	Sandstone	18	101.1	55.6	255.6	8	130.3	10
L18-B	S-5	37.0 - 39.5	18-11	Sandstone	13	102.9	83.3	291.7	4	231.4	11
L18-C	S-8	64.0 - 66.3	18-7	Claystone	22	98.5	27.8	142.7	4	81.4	10
L18-C	S-6	48.0 - 50.1	18-7	Claystone	19	102.8	55.6	221.2	4	142.9	10
L18-C	S-8	64.0 - 66.3	18-7	Claystone	19	105.0	83.3	179.7	4	124.6	10
L18-D	S-2	22.0 - 24.3	18-5	Claystone	19	95.1	27.8	143.8	3	101.9	8
L18-D	S-3	29.0 - 31.5	18-5	Claystone	19	100.4	55.6	214.0	5	144.8	10
L18-D	S-2	22.0 - 24.3	18-5	Claystone	17	93.0	83.3	254.1	5	232.0	10
L18-F	S-6	56.0 - 58.5	18-8	Claystone	26	95.0	27.8	182.2	2	73.6	8
L18-F	S-5	46.0 - 48.1	18-8	Claystone	26	94.9	55.6	163.3	2	65.1	7
L18-F	S-6	56.0 - 58.5	18-8	Claystone	29	88.3	83.3	123.9	3	72.7	7
L18-G	S-4	30.0 - 32.0	18-13	Sandstone	16	101.5	27.8	135.5	3	82.1	10
L18-G	S-5	40.0 - 41.3	18-13	Sandstone	12	101.5	55.6	235.6	4	176.1	10
L18-G	S-4	30.0 - 32.0	18-13	Sandstone	14	101.0	83.3	270.8	4	215.4	12.5
L18-G	S-6	45.0 - 47.5	18-12	Claystone	30	91.3	27.8	130.6	2	53.1	7
L18-G	S-7	50.0 - 51.8	18-12	Claystone	28	91.8	55.6	95.4	2	78.3	5
L18-G	S-6	45.0 - 47.5	18-12	Claystone	29	92.7	83.3	144.3	2	72.7	7





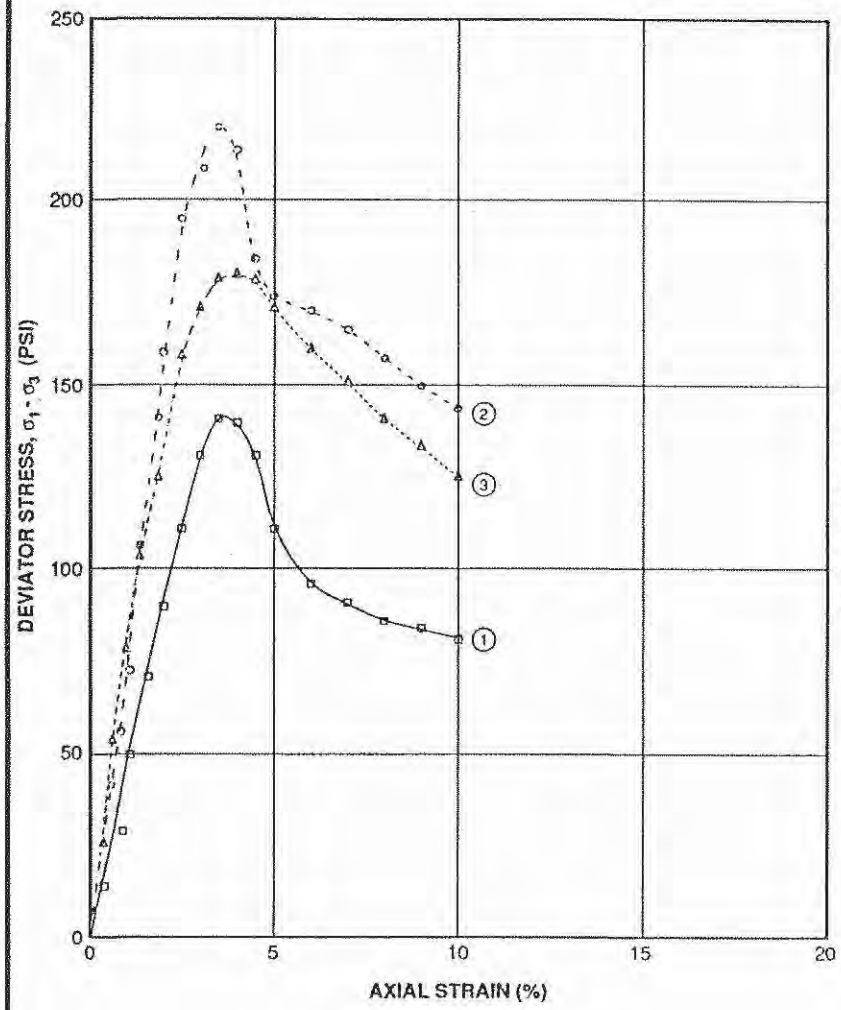
SPECIMEN NO.	SAMPLE NO.	DEPTH (FEET)	INITIAL STATE		CONFINING PRESSURE (PSI)	DEVIATOR STRESS AT FAILURE (PSI)	STRAIN AT FAILURE (%)	STRATIGRAPHIC UNIT	MATERIAL TYPE
			ω (%)	γ_d (PCF)					
1	S-3	20.0-22.5	19.6	101.0	27.8	106.4	6.0	18-11	UNDISTURBED SANDSTONE
2	S-5	37.0-39.5	17.9	101.1	55.6	255.6	2.5		
3	S-5	37.0-39.5	13.2	102.9	83.3	291.7	3.5		

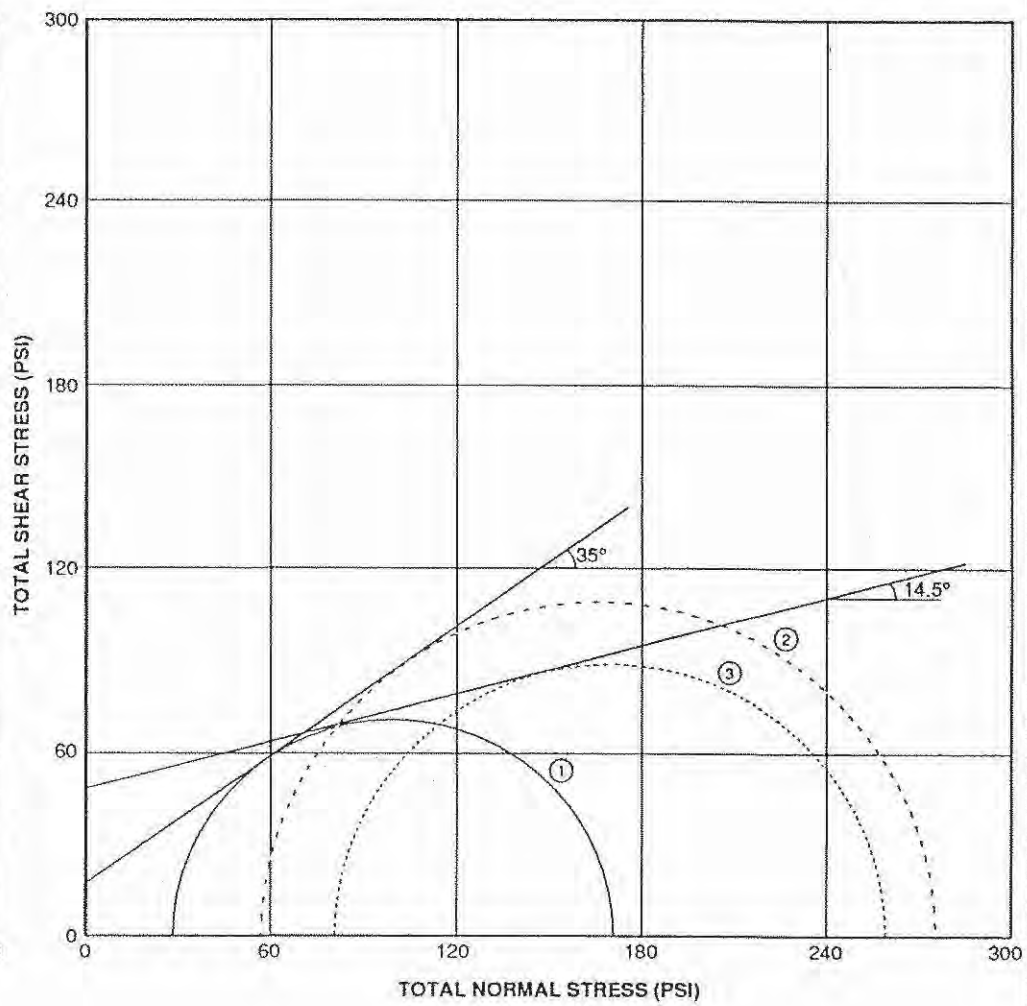
FIGURE D.5.1

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST RESULTS
BORING NO. L18-B

LANDFILL UNIT B-18
KETTLEMAN HILLS FACILITY

ENVIRONMENTAL SOLUTIONS, INC.





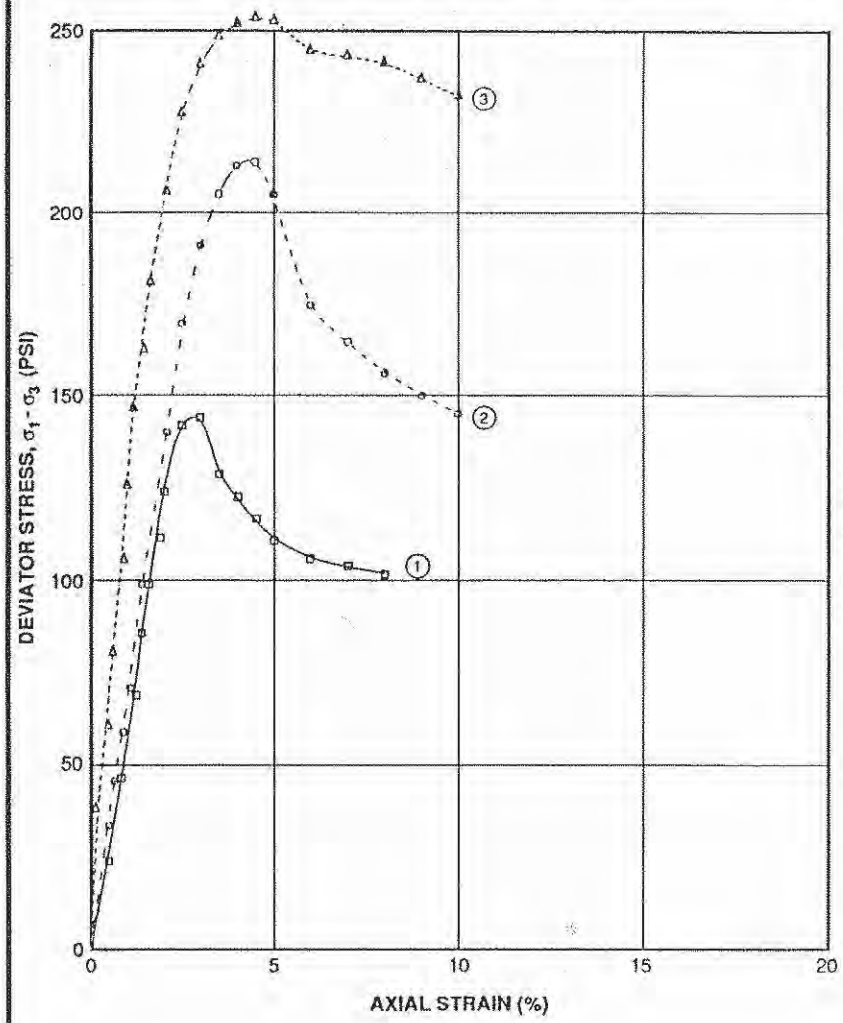
SPECIMEN NO.	SAMPLE NO.	DEPTH (FEET)	INITIAL STATE		CONFINING PRESSURE (PSI)	DEVIATOR STRESS AT FAILURE (PSI)	STRAIN AT FAILURE (%)	STRATIGRAPHIC UNIT	MATERIAL TYPE
			ω (%)	γ_d (PCF)					
1	S-8	64.0 - 66.3	21.7	98.5	27.8	142.7	3.5	18-7	UNDISTURBED SILTY CLAYSTONE
2	S-6	48.0 - 50.1	18.7	102.8	55.6	221.2	3.5		
3	S-8	64.0 - 66.3	19.3	105.0	83.3	179.7	4.0		

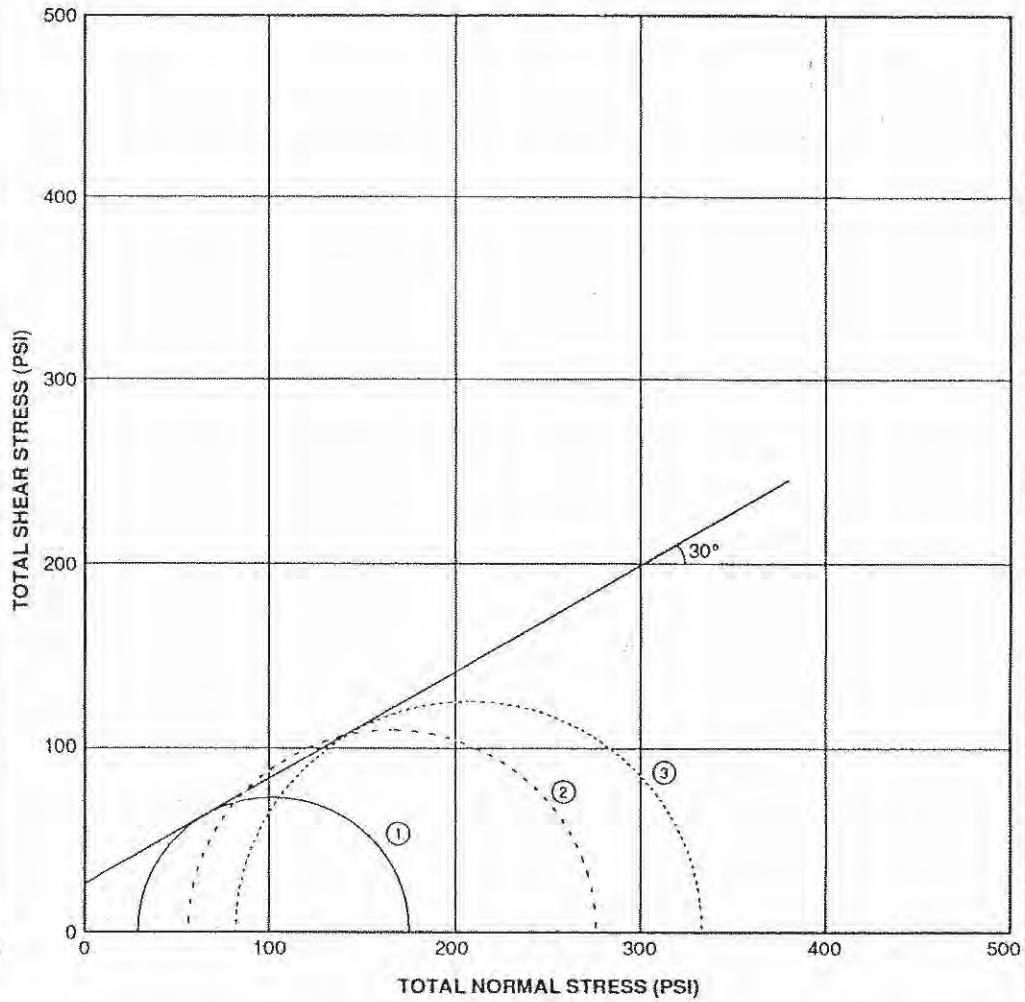
FIGURE D.5.2

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST RESULTS
BORING NO. L18-C

LANDFILL UNIT B-18
KETTLEMAN HILLS FACILITY

ENVIRONMENTAL SOLUTIONS, INC.





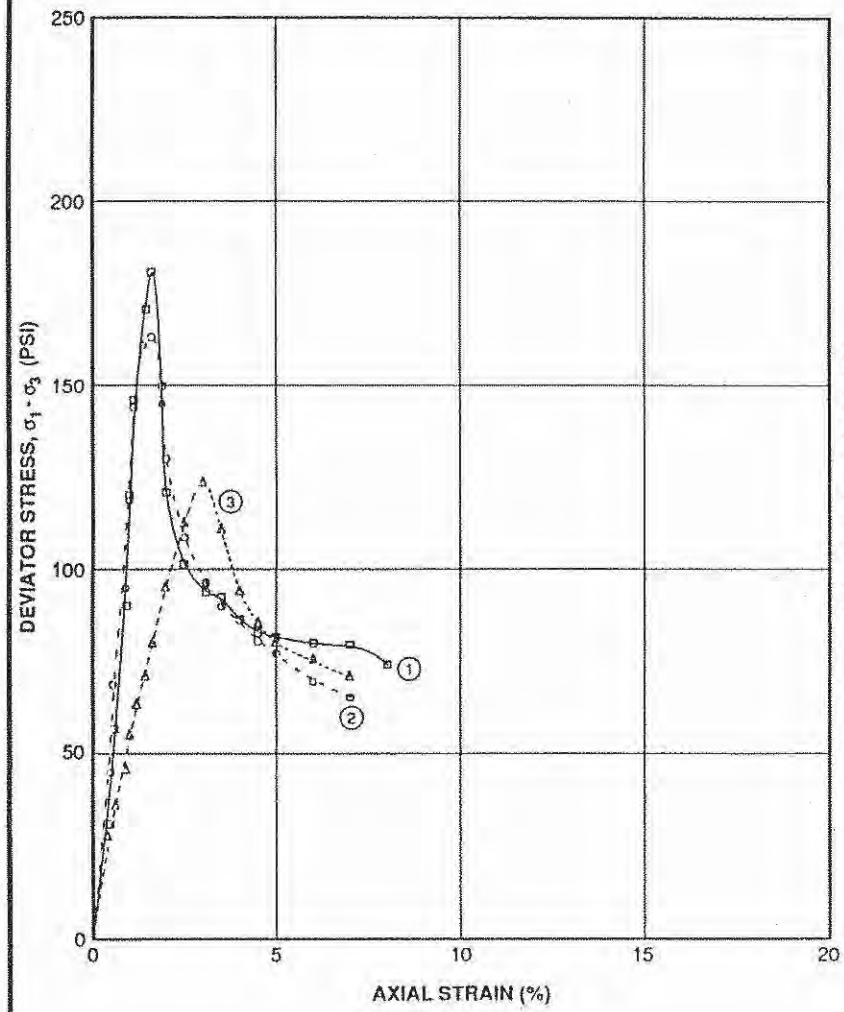
SPECIMEN NO.	SAMPLE NO.	DEPTH (FEET)	INITIAL STATE		CONFINING PRESSURE (PSI)	DEVIATOR STRESS AT FAILURE (PSI)	STRAIN AT FAILURE (%)	STRATIGRAPHIC UNIT	MATERIAL TYPE
			ω (%)	γ_d (PCF)					
1	S-2	22.0 - 24.3	18.6	95.1	27.8	143.8	3.0	18-5	UNDISTURBED CLAYSTONE
2	S-3	29.0 - 31.5	19.1	100.4	55.6	214.0	4.5		
3	S-2	22.0 - 24.3	17.4	93.0	83.3	254.1	4.5		

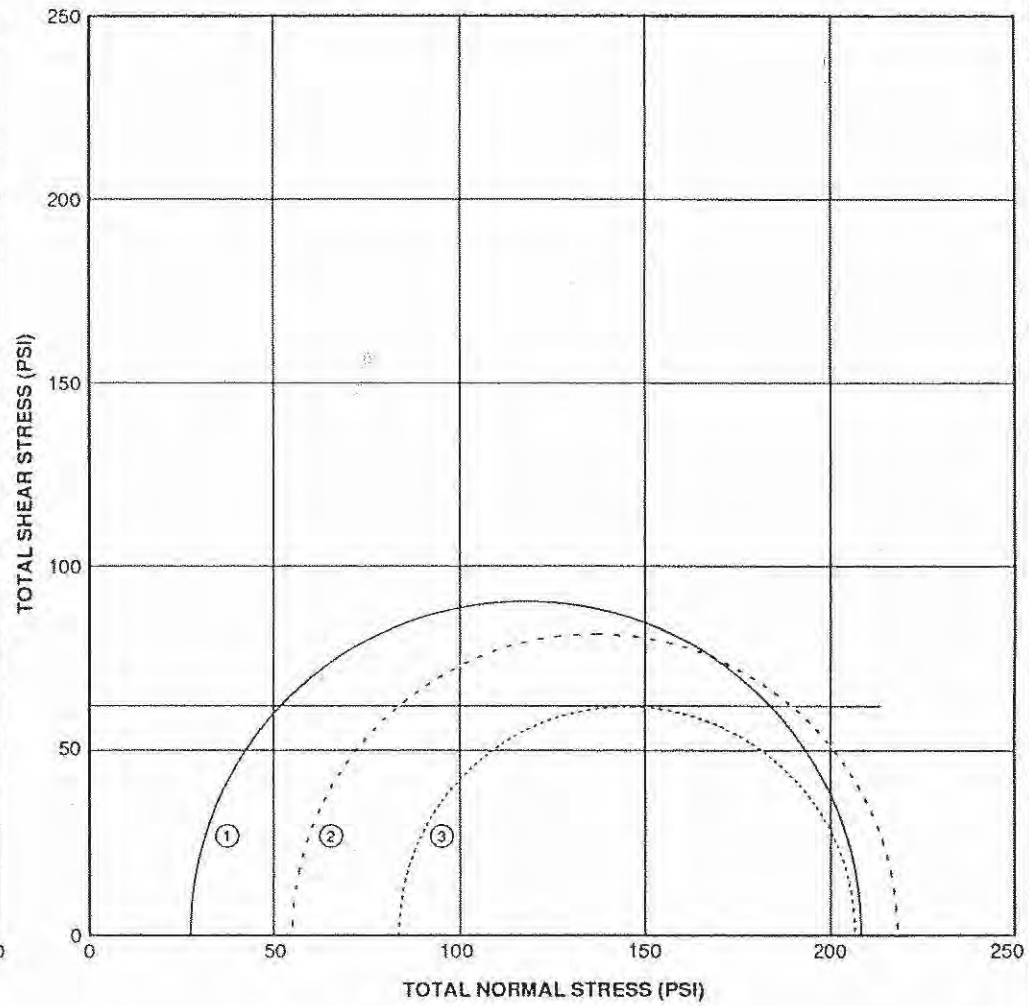
FIGURE D.5.3

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST RESULTS BORING NO. L18-D

LANDFILL UNIT B-18
KETTLEMAN HILLS FACILITY

ENVIRONMENTAL SOLUTIONS, INC.





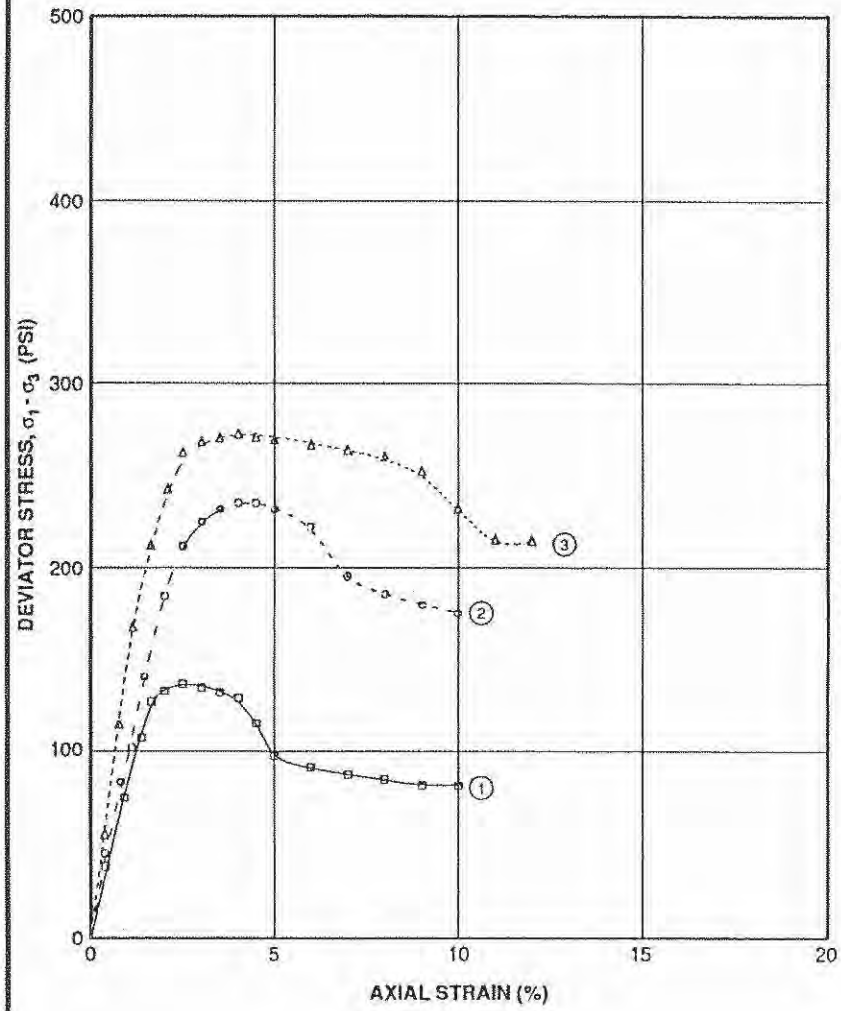
SPECIMEN NO.	SAMPLE NO.	DEPTH (FEET)	INITIAL STATE		CONFINING PRESSURE (PSI)	DEVIATOR STRESS AT FAILURE (PSI)	STRAIN AT FAILURE (%)	STRATIGRAPHIC UNIT	MATERIAL TYPE
			ω (%)	γ_d (PCF)					
1	S-6	56.0 - 58.5	25.9	95.0	27.8	182.2	1.6	18-8	UNDISTURBED CLAYSTONE
2	S-5	46.0 - 48.1	25.6	94.9	55.6	163.3	1.6		
3	S-6	56.0 - 58.5	28.8	88.3	83.3	123.9	3.0		

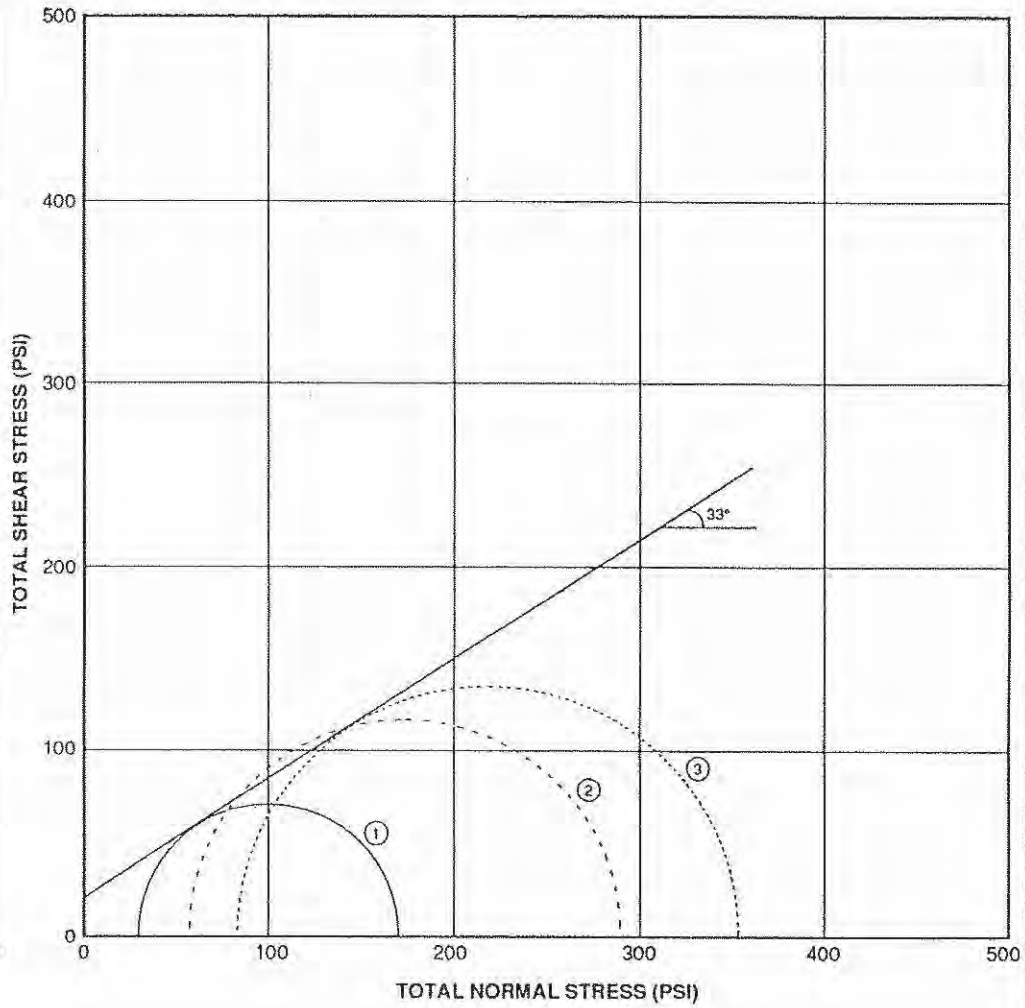
FIGURE D.5.4

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST RESULTS BORING NO. L18-F

LANDFILL UNIT B-18
KETTLEMAN HILLS FACILITY

ENVIRONMENTAL SOLUTIONS, INC.





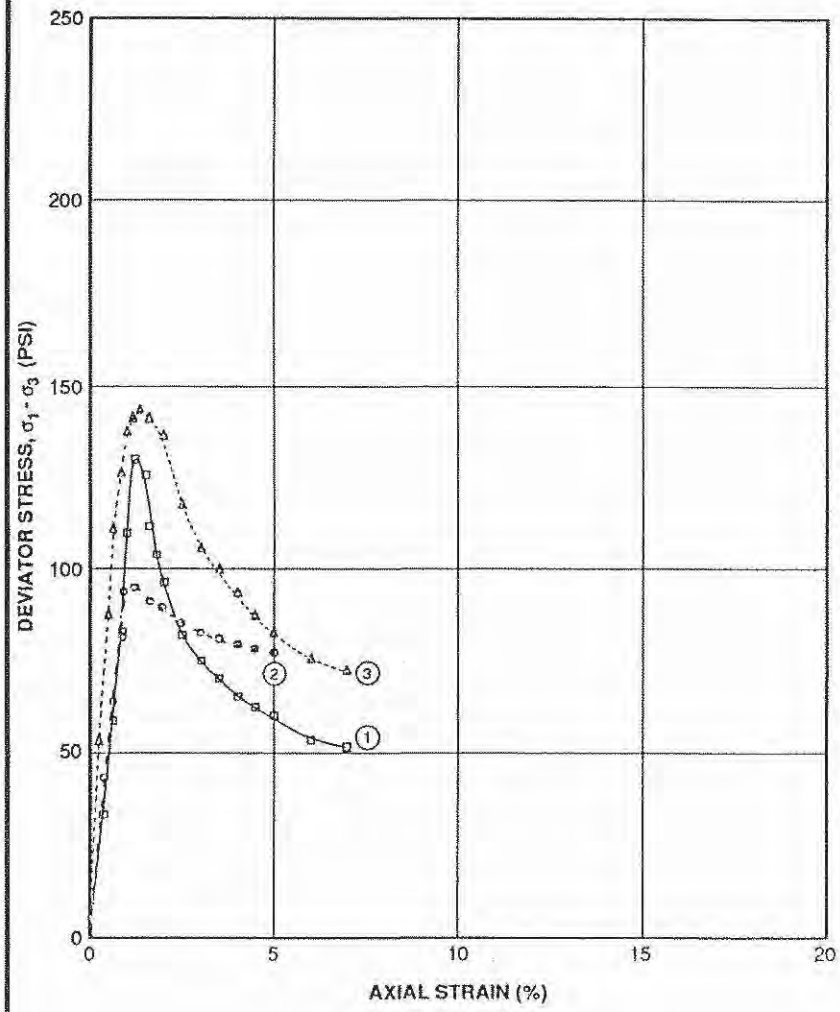
SPECIMEN NO.	SAMPLE NO.	DEPTH (FEET)	INITIAL STATE		CONFINING PRESSURE (PSI)	DEVIATOR STRESS AT FAILURE (PSI)	STRAIN AT FAILURE (%)	STRATIGRAPHIC UNIT	MATERIAL TYPE
			ω (%)	γ_d (PCF)					
1	S-4	30.0 - 32.0	16.2	101.5	27.8	135.5	2.5	18-13	UNDISTURBED SANDSTONE
2	S-5	40.0 - 41.3	12.1	101.5	55.6	235.6	4.0		
3	S-4	30.0 - 32.0	14.3	101.0	83.3	270.8	4.0		

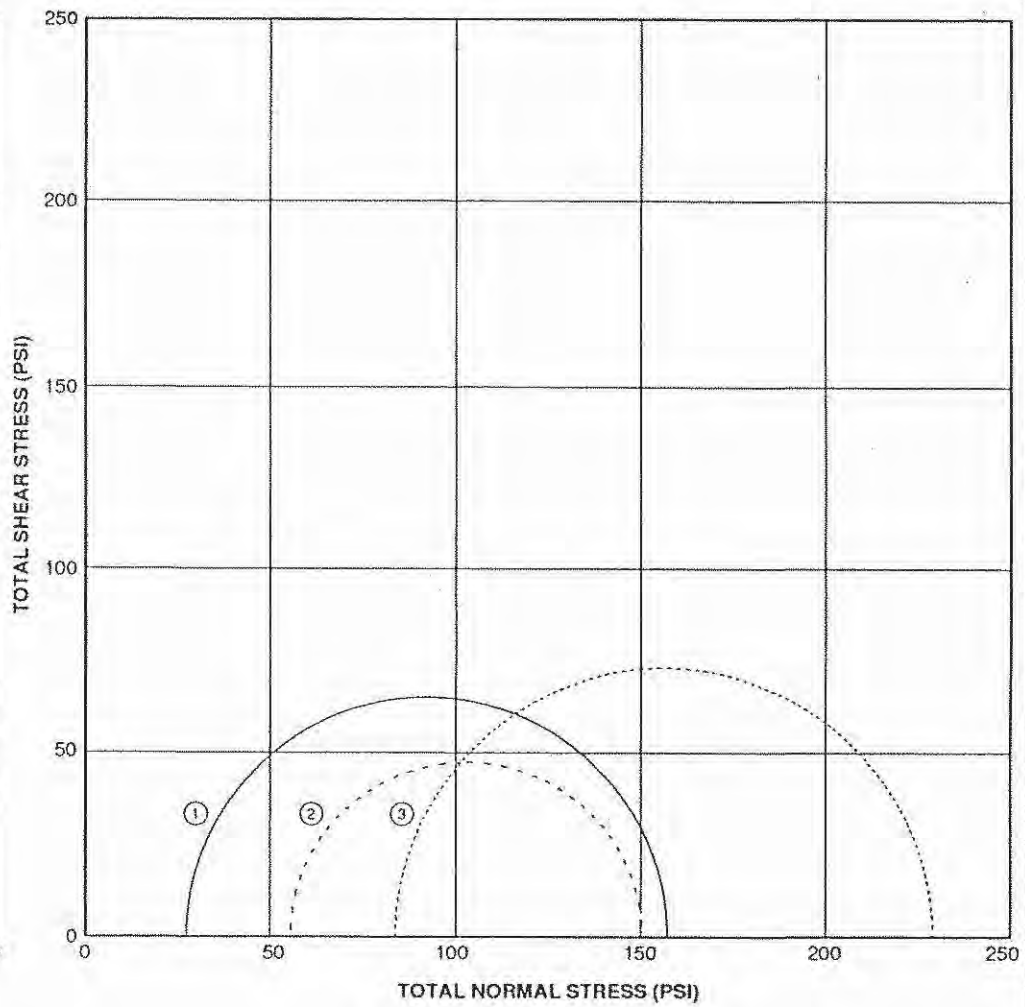
FIGURE D.5.5

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST RESULTS BORING NO. L18-G

LANDFILL UNIT B-18
KETTLEMAN HILLS FACILITY

ENVIRONMENTAL SOLUTIONS, INC.





SPECIMEN NO.	SAMPLE NO.	DEPTH (FEET)	INITIAL STATE		CONFINING PRESSURE (PSI)	DEVIATOR STRESS AT FAILURE (PSI)	STRAIN AT FAILURE (%)	STRATIGRAPHIC UNIT	MATERIAL TYPE
			ω (%)	γ_d (PCF)					
1	S-6	45.0 - 47.5	29.8	91.3	27.8	130.6	1.2	18-12	UNDISTURBED CLAYSTONE
2	S-7	50.0 - 51.8	28.4	91.8	55.6	95.4	1.2		
3	S-6	45.0 - 47.5	29.4	92.7	83.3	144.3	1.4		

FIGURE D.5.6

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST RESULTS BORING NO. L18-G

LANDFILL UNIT B-18
KETTLEMAN HILLS FACILITY

ENVIRONMENTAL SOLUTIONS, INC.

APPENDIX D.6

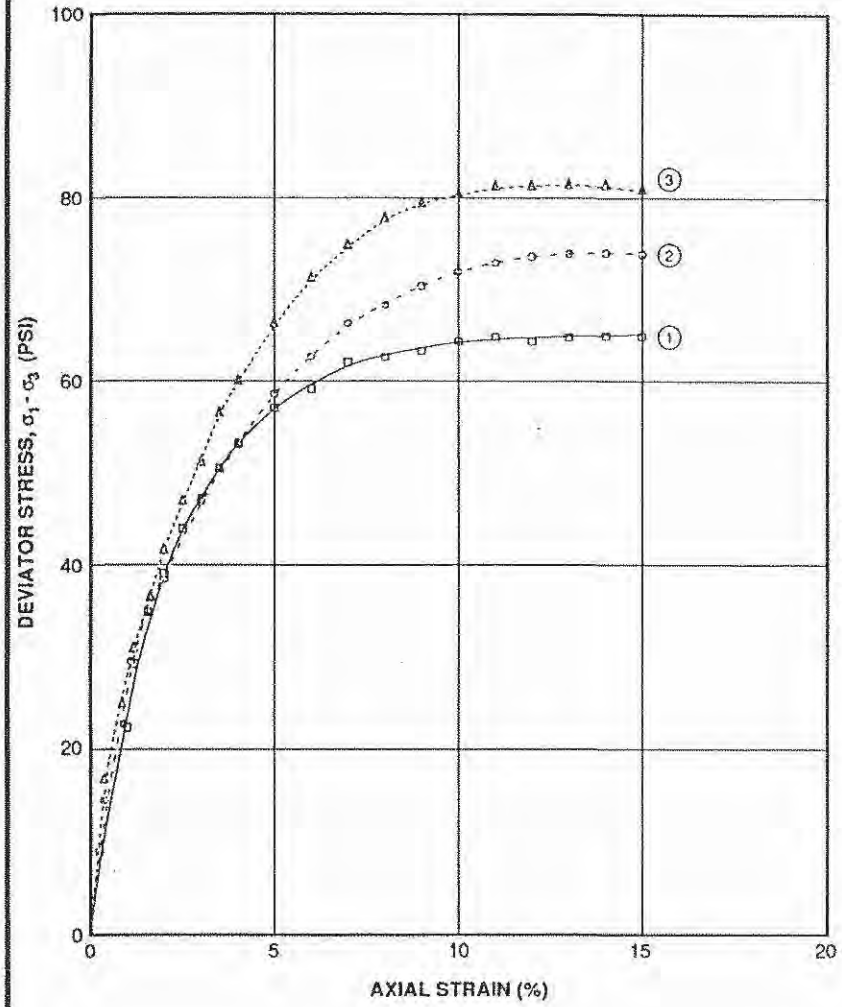
UU TRIAXIAL COMPRESSION TESTS (REMOLDED SAMPLES)

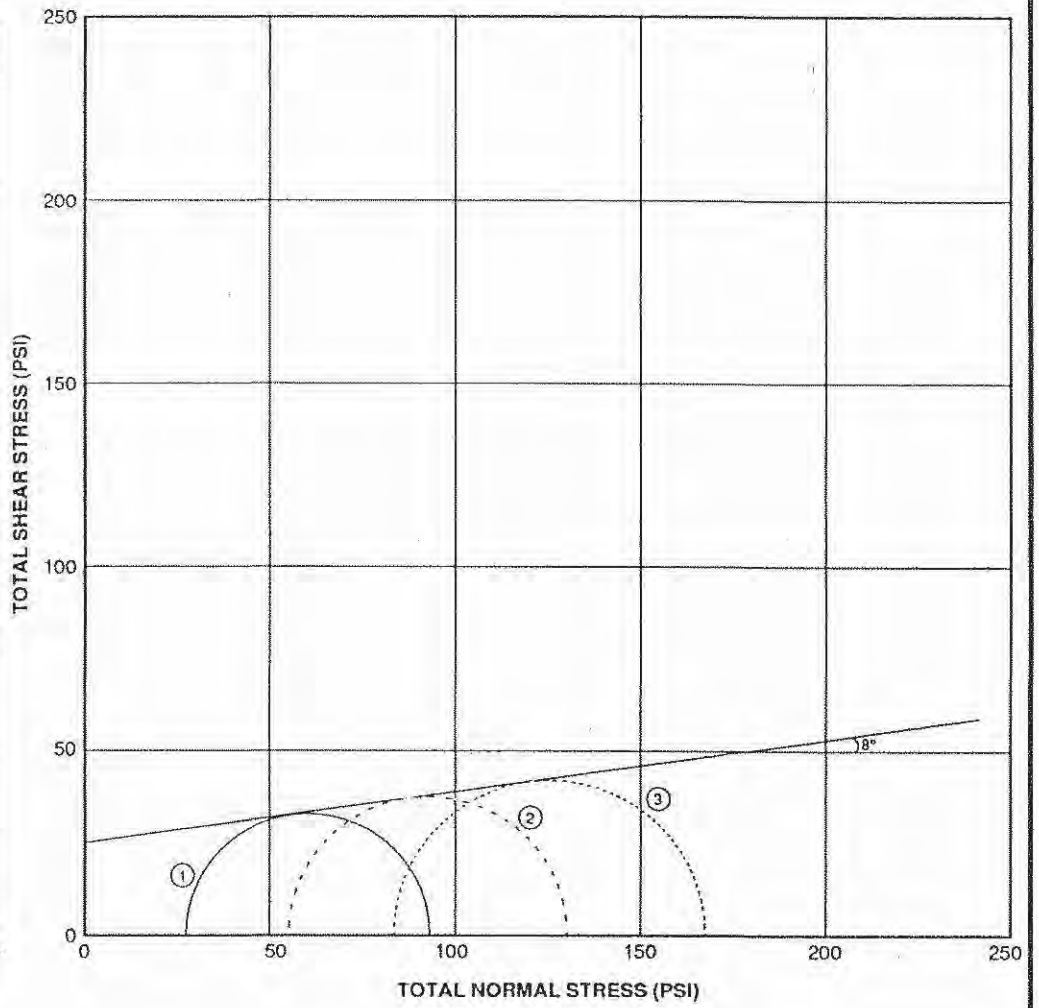
TABLE D.6.1

SUMMARY OF UNCONSOLIDATED UNDRAINED (UU) TRIAXIAL TEST (REMOLDED SAMPLES)

TEST PIT NO.	SAMPLE NO.	SAMPLE DEPTH (FT)	STRATIGRAPHIC UNIT	MATERIAL TYPE	INITIAL STATE		CONFINING PRESSURE (PSI)	DEVIATOR STRESS			
					WATER CONTENT (%)	DRY DENSITY (PCF)		PEAK (PSI)	STRAIN (%)	RESIDUAL (PSI)	STRAIN (%)
DT-A	B-2	5	18-8	Claystone compacted to 90% relative compaction (Modified Proctor) and 5% above optimum.	26.7	93.4	27.8	65.3	14	65.1	15
DT-A	B-2	5	18-8		26.5	93.7	55.6	74.1	14	74.0	15
DT-A	B-2	5	18-8		26.6	93.7	88.3	81.3	13	80.8	15
TP-42	B-1	6	18-9	Sandstone compacted to 95% relative compaction (Modified Proctor) at optimum.	14.9	108.7	27.8	127.2	4	108.0	10
TP-42	B-1	6	18-9		14.8	109.0	55.6	186.8	6	179.0	12
TP-42	B-1	6	18-9		14.8	109.0	83.3	244.6	8	201.9	15

89-977 (8/7/90)





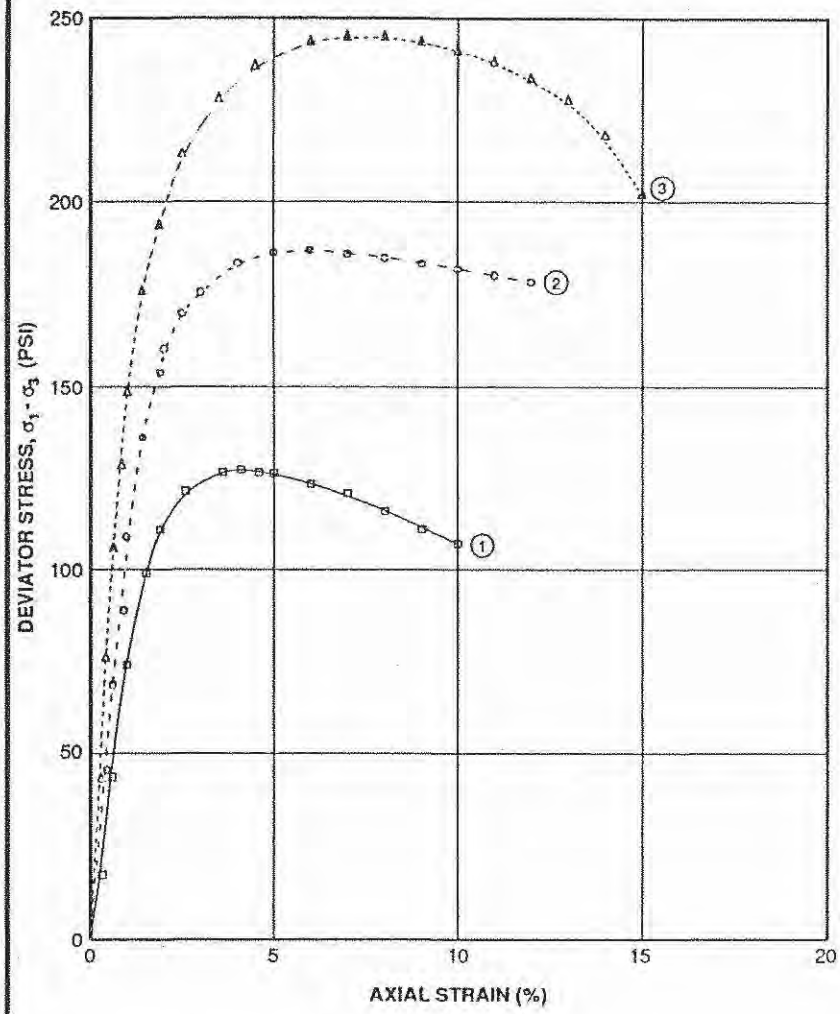
SPECIMEN NO.	SAMPLE NO.	DEPTH (FEET)	INITIAL STATE		CONFINING PRESSURE (PSI)	DEVIATOR STRESS AT FAILURE (PSI)	STRAIN AT FAILURE (%)	STRATIGRAPHIC UNIT	MATERIAL TYPE
			ω (%)	γ_d (PCF)					
1	B-2	5	26.7	93.4	27.8	65.3	14.0	18-8	CLAYSTONE COMPACTED TO 90% RELATIVE COMPACTION, 5% ABOVE OPTIMUM (MODIFIED PROCTOR)
2	B-2	5	26.5	93.7	55.6	74.1	14.0		
3	B-2	5	26.6	93.7	83.3	81.3	13.0		

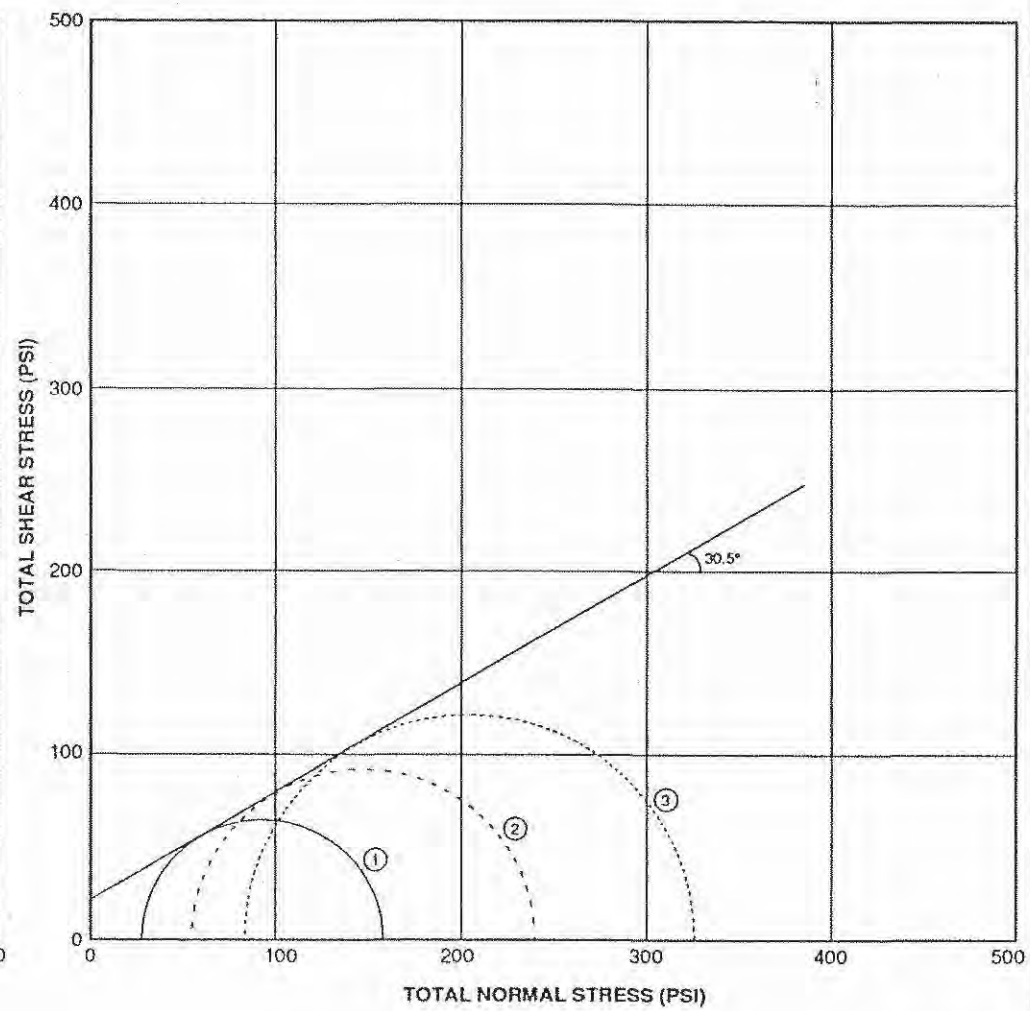
FIGURE D.6.1

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST RESULTS TEST PIT NO. DT-A

LANDFILL UNIT B-18
KETTLEMAN HILLS FACILITY

ENVIRONMENTAL SOLUTIONS, INC.





SPECIMEN NO.	SAMPLE NO.	DEPTH (FEET)	INITIAL STATE		CONFINING PRESSURE (PSI)	DEVIATOR STRESS AT FAILURE (PSI)	STRAIN AT FAILURE (%)	STRATIGRAPHIC UNIT	MATERIAL TYPE
			ω (%)	γ_d (PCF)					
1	B-1	6	14.9	108.7	27.8	127.2	4.0	18-9	SANDSTONE COMPACTED TO 95% RELATIVE COMPACTION (MODIFIED PROCTOR AT OPTIMUM MOISTURE CONTENT)
2	B-1	6	14.8	109.0	55.6	186.8	6.0		
3	B-1	6	14.8	109.0	83.3	244.6	8.0		

FIGURE D.6.2

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST RESULTS BOREHOLE NO. TP-42

LANDFILL UNIT B-18
KETTLEMAN HILLS FACILITY

ENVIRONMENTAL SOLUTIONS, INC.

APPENDIX D.7
CU TRIAXIAL COMPRESSION TESTS

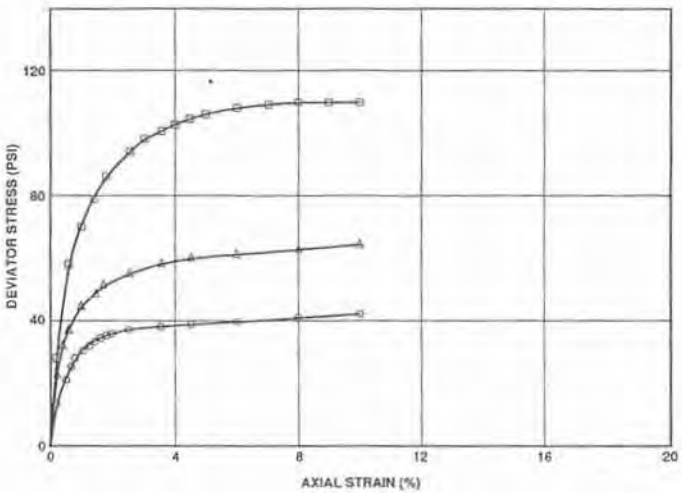
TABLE D.7.1

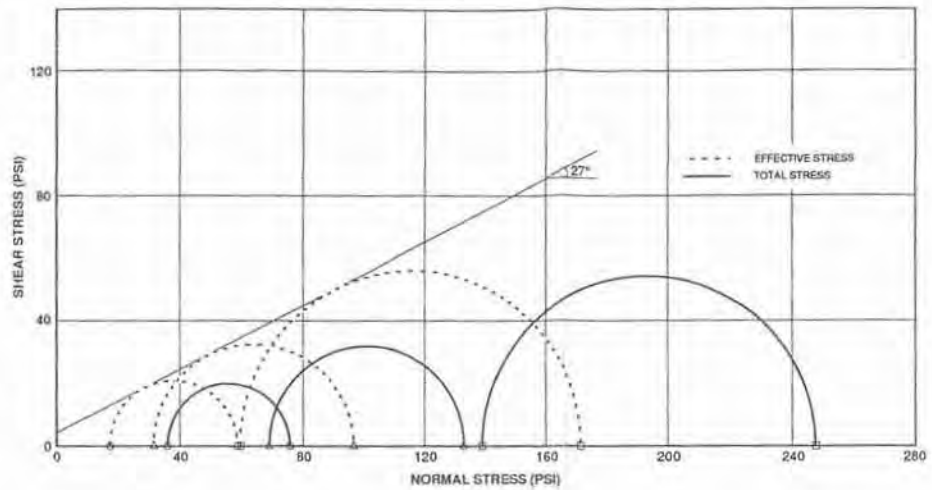
SUMMARY OF CONSOLIDATED UNDRAINED (CU) TRIAXIAL TEST (REMOLDED SAMPLES)

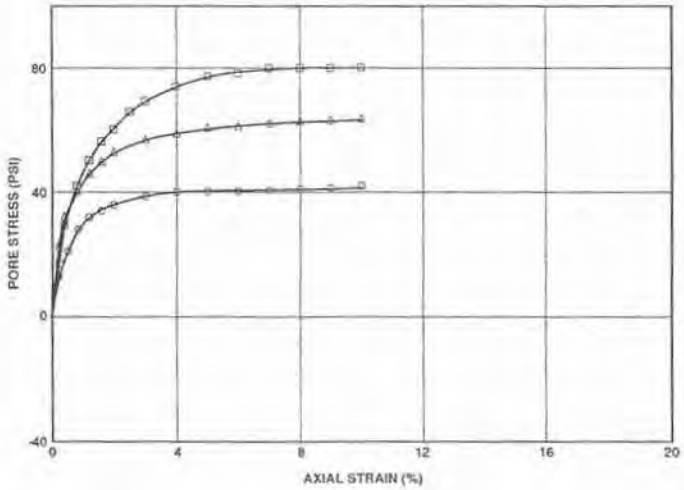
TEST PIT NO.	SAMPLE NO.	SAMPLE DEPTH (ft)	STRATI-GRAPHIC UNIT	MATERIAL TYPE	INITIAL STATE		CONFINING PRESSURE (PSI)	DEVIATOR STRESS		STRAIN RATE (%/Hour)
					WATER CONTENT (%)	DRY DENSITY (PCF)		PEAK (PSI)	STRAIN (%)	
DT-A	B-2	5	18-8	Claystone compacted to 90% relative compaction (Modified Proctor) and 5% above optimum.	26.4	93.8	34.7	42.38	5.01	3.87
DT-A	B-2	5	18-8		26.3	94.0	69.4	64.76	3.02	3.89
DT-A	B-2	5	18-8		26.7	93.6	138.9	97.44	8.99	3.97
DT-C	B-1	8	18-8	Claystone compacted to 90% relative compaction (Modified Proctor) at 5% above optimum.	28.2	89.1	34.7	40.18	6.0	3.90
DT-C	B-1	8	18-8		28.2	89.3	69.4	62.73	7.99	3.91
DT-C	B-1	8	18-8		28.2	89.3	138.9	108.75	6.97	3.95

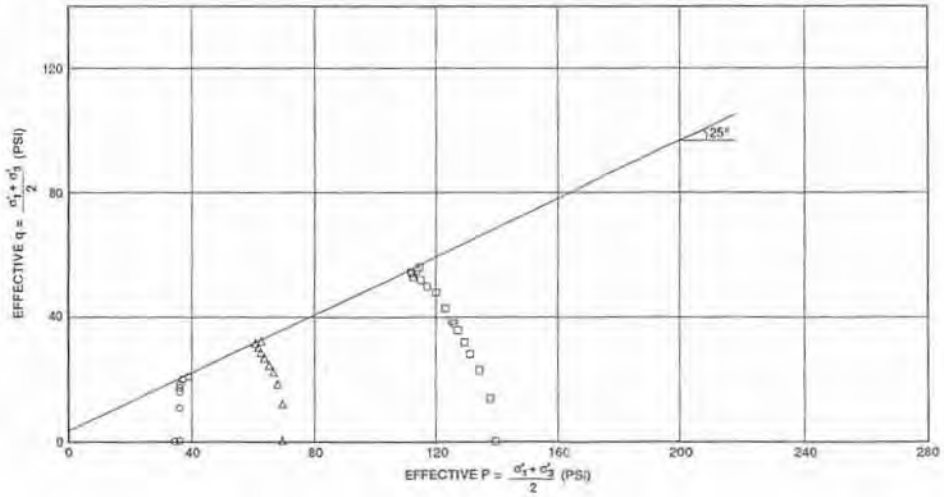
89-977 (8/14/90)

09-977DP/Fig/CoUnTrCoTe/1 REV. 8/13/90









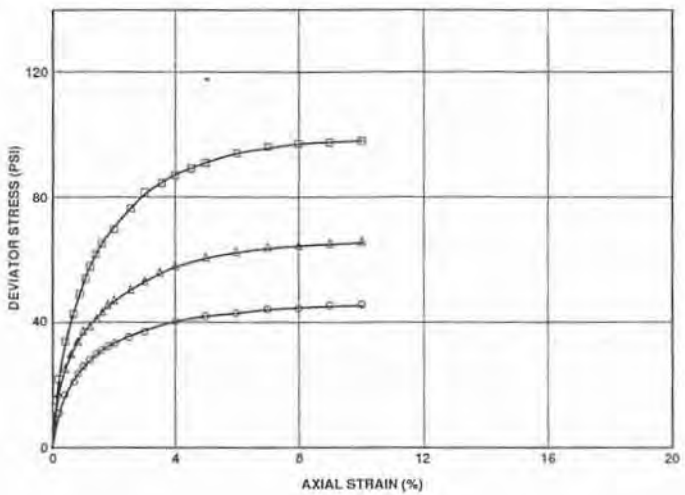
SYMBOL	BORING/ SAMPLE NO.	SPECIMEN NO.	DEPTH (FEET)	SAMPLE TYPE	SOIL TYPE	INITIAL STATE			FINAL STATE			EFFECTIVE CONFINING PRESSURE (PSI)	BACK PRESSURE (PSI)	FAILURE		STRAIN RATE (%/hr)
						γ_d (PCF)	w (%)	SATURATION (%)	γ_d (PCF)	w (%)	SATURATION (%)			DEV. STRESS (PSI)	STRAIN (%)	
○	DT-C, B-1	1	8	CLAYSTONE COMPACTED TO 90% RELATIVE COMPACTION (MODIFIED PROCTOR) AND 5% ABOVE OPTIMUM	CLAYSTONE	88.1	28.2	82.6	89.5	33.6	100.00	34.7	50.0	40.18	6.0	3.90
△	DT-C, B-1	2	8		CLAYSTONE	89.3	28.2	82.9	92.0	32.0	100.00	69.4	50.0	62.73	7.99	3.91
□	DT-C, B-1	3	8		CLAYSTONE	86.3	28.2	82.9	95.7	29.4	100.00	138.9	50.0	108.85	6.97	3.95

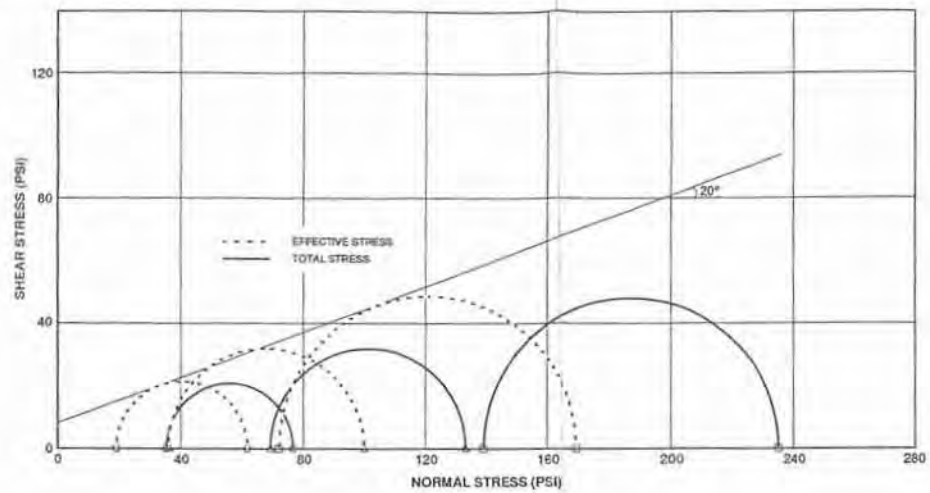
FIGURE D.7-2

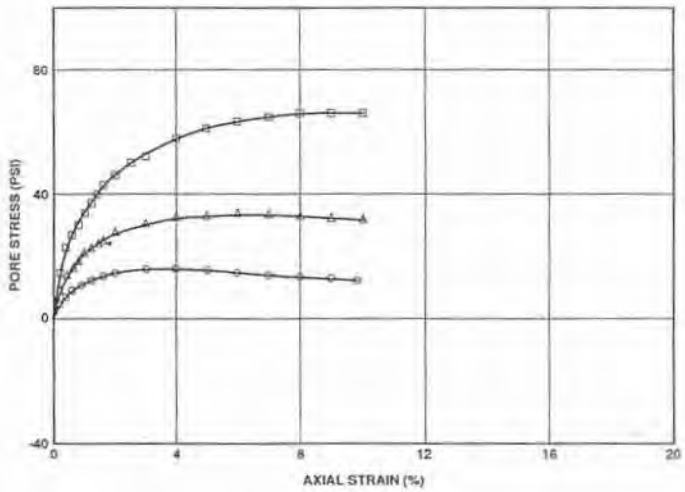
CONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST RESULTS

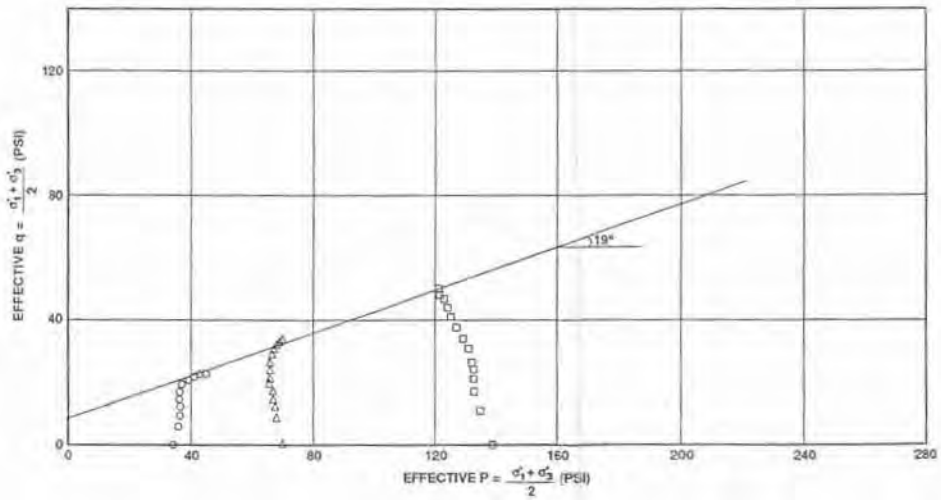
LANDFILL UNIT B-18
KETTLEMAN HILLS FACILITY

ENVIRONMENTAL SOLUTIONS INC.









SYMBOL	BORING/ SAMPLE NO.	SPECIMEN NO.	DEPTH (FEET)	SAMPLE TYPE	SOIL TYPE	INITIAL STATE			FINAL STATE			EFFECTIVE CONFINING PRESSURE (PSI)	BACK PRESSURE (PSI)	FAILURE		STRAIN RATE (%/hr)
						γ_d (PCF)	w (%)	SATURATION (%)	γ_d (PCF)	w (%)	SATURATION (%)			DEV. STRESS (PSI)	STRAIN (%)	
○	DT-A, B-2	1	5	CLAYSTONE COMPACTED TO 90% RELATIVE COMPACTION (MODIFIED PROCTOR) AND 5% ABOVE OPTIMUM	CLAYSTONE	93.8	26.4	84.5	94.0	31.1	100.00	34.7	50.0	42.38	5.01	3.87
△	DT-A, B-2	2	5		CLAYSTONE	94.0	26.3	84.2	95.8	29.5	100.00	69.4	50.0	64.76	8.02	3.89
□	DT-A, B-2	3	5		CLAYSTONE	93.6	26.7	85.0	96.7	29.0	100.00	138.9	50.0	97.44	8.99	3.97

FIGURE D.7-3

CONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST RESULTS

LANDFILL UNIT B-18
KETTLEMAN HILLS FACILITY

ENVIRONMENTAL SOLUTIONS INC.

89-977DR/Fig/CoUnTrCoTe.2 REV. 8/14/90

APPENDIX D.8
SUMMARY OF DIRECT SHEAR TESTS

TABLE D.8.1

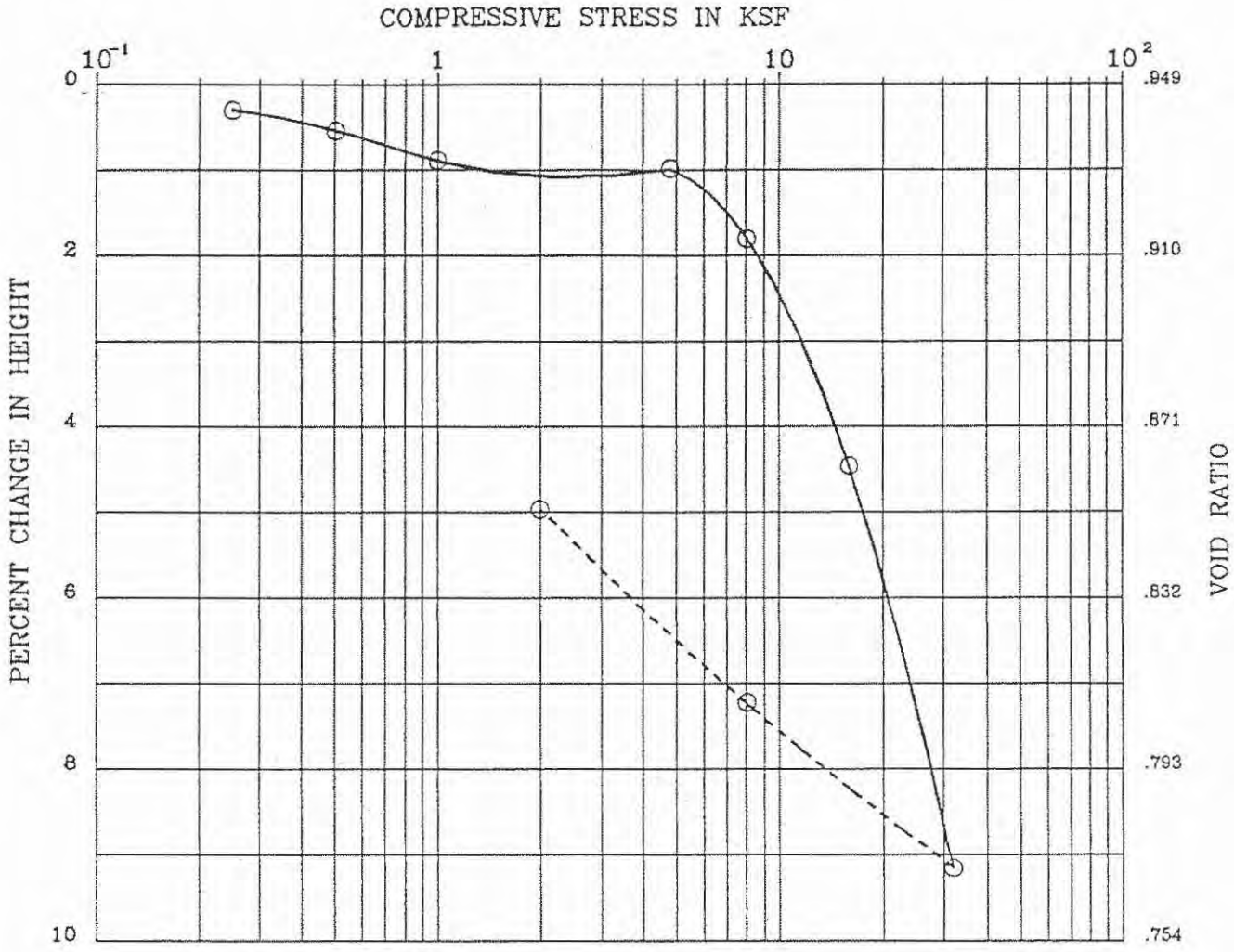
SUMMARY OF DIRECT SHEAR TEST RESULTS

BORING NO.	SAMPLE NO.	SAMPLE DEPTH (FT)	STRATIGRAPHIC UNIT	MATERIAL TYPE	NATURAL		NORMAL LOAD (PSF)	SHEAR STRESS (PSF)			
					WATER CONTENT (%)	DRY DENSITY (PCF)		PEAK (PSF)	STRAIN (%)	RESIDUAL (PSF)	STRAIN (%)
L18-B	S-3	20.0 - 22.5	18-11	Sandstone	18	96.8	4,000	5,377	7	3,253	16
L18-B	S-3	20.0 - 22.5	18-11	Sandstone	20	98.5	6,000	6,676	7	4,546	17
L18-B	S-3	20.0 - 22.5	18-11	Sandstone	20	98.3	8,000	9,297	7	5,653	14
L18-B	S-5	37.0 - 39.5	18-11	Sandstone	12	98.8	6,000*	7,908	5	6,228	17
L18-C	S-7	56.0 - 58.0	18-7	Claystone	21	103.4	4,000	6,161	6	5,377	17
L18-C	S-7	56.0 - 58.0	18-7	Claystone	26	98.5	8,000	7,146	4	5,287	17
L18-C	S-7	56.0 - 58.0	18-7	Claystone	27	96.0	11,500	7,371	3	4,234	17
L18-C	S-8	64.0 - 66.3	18-7	Claystone	21	100.3	8,000*	10,104	5	6,273	14
L18-D	S-2	22.0 - 24.5	18-5	Claystone	14	96.2	4,000	5,579	5	3,405	17
L18-D	S-2	22.0 - 24.5	18-5	Claystone	19	97.6	8,000	7,729	6	5,422	17
L18-D	S-2	22.0 - 24.5	18-5	Claystone	21	97.2	12,000	11,045	7	6,037	17
L18-D	S-2	22.0 - 24.5	18-5	Claystone	17	99.5	8,000*	10,908	6	9,947	14
L18-F	S-6	56.0 - 58.5	18-8	Claystone	26	94.8	4,000	8,715	5	3,562	17
L18-F	S-6	56.0 - 58.5	18-8	Claystone	32	87.7	8,000	6,900	7	4,951	17
L18-F	S-6	56.0 - 58.5	18-8	Claystone	29	92.0	12,000	13,532	6	4,862	17
L18-F	S-6	56.0 - 58.5	18-8	Claystone	30	91.7	8,000	7,729	4	4,010	14

89-977 (8/7/90)

* Unsaturated

APPENDIX D.9
CONSOLIDATION TESTS

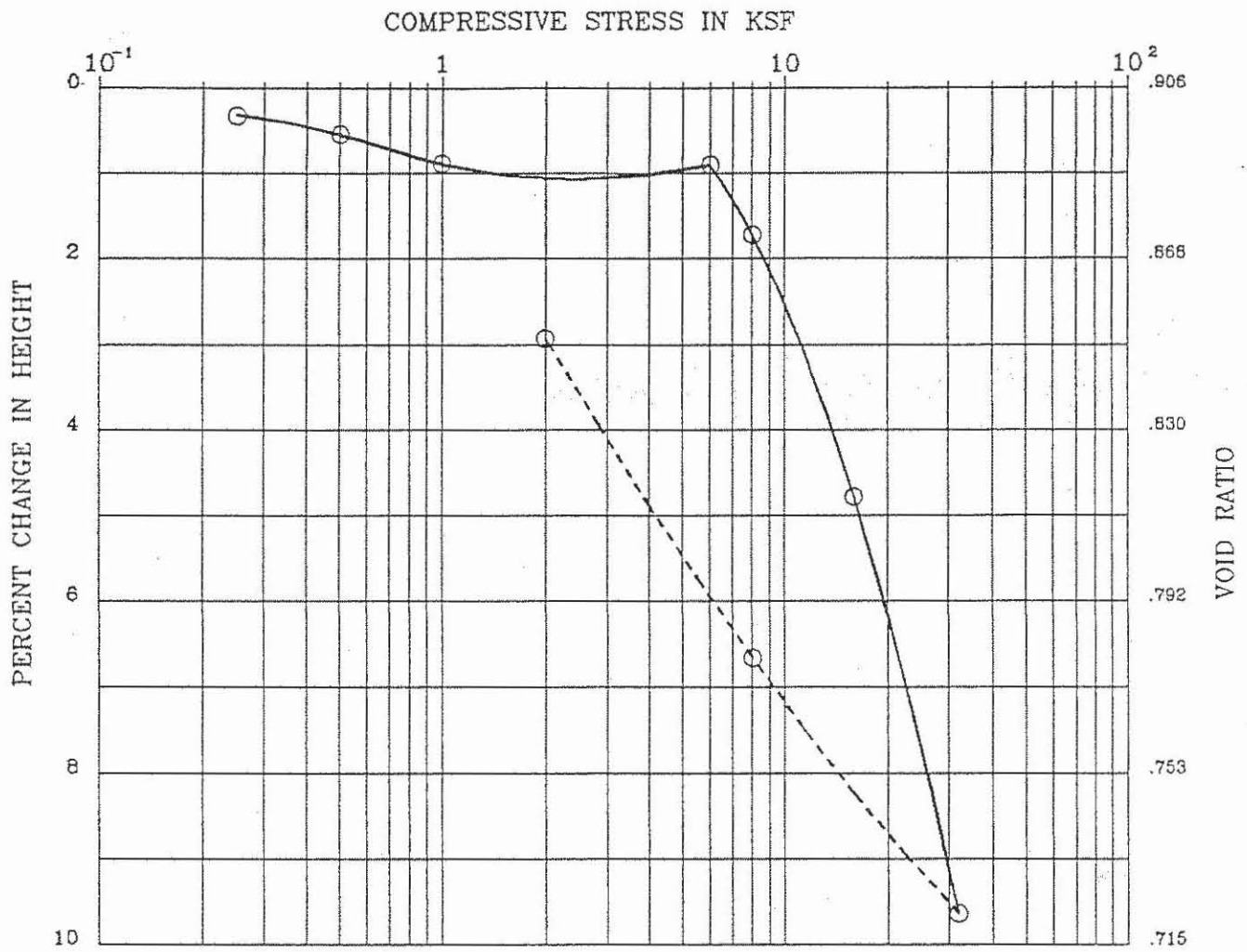


BORING	: DT-C, B-1	DESCRIPTION	: silty CLAYSTONE, yellow brn (CH)
DEPTH (ft)	: 8	LIQUID LIMIT	: 76
SPEC. GRAVITY	: 2.79	PLASTIC LIMIT	: 45

	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	PERCENT SATURATION	VOID RATIO
INITIAL	28.1	89.4	83	.949
FINAL	30.5	94.1	100	.852

Remark : July 1990

Project ESK-101A	Kettleman
Wahler Associates	CONSOLIDATION TEST Figure No.



BORING	: DT-A, B-2	DESCRIPTION	: silty CLAYSTONE, yellow brn (CH)
DEPTH (ft)	: 5	LIQUID LIMIT	: 82
SPEC. GRAVITY	: 2.84	PLASTIC LIMIT	: 54

	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	PERCENT SATURATION	VOID RATIO
INITIAL	27.3	93.1	86	.906
FINAL	29.9	95.9	100	.851

Remark : July 1990

Project ESK-101A	Kettleman
Wahler Associates	CONSOLIDATION TEST Figure No.

APPENDIX D.10
GEOCHEMICAL TESTS

Analytical Report

LOG NO: A90-06-087

Received: 15 JUN 90
Reported: 29 JUN 90

Mr. Julio Badel
Environmental Solutions,Inc.
21 Technology Drive
Irvine, California 92718

Project: 89-977

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
06-087-1	L18-A S-5	28 MAY 90
06-087-2	L18-C S-2	28 MAY 90
06-087-3	L18-F S-1	28 MAY 90

PARAMETER	06-087-1	06-087-2	06-087-3
Antimony, mg/kg	<0.2	<0.2	<0.2
Arsenic, mg/kg	6.8	9.9	11
Barium, mg/kg	15	27	17
Beryllium, mg/kg	<0.02	<0.02	<0.02
Cadmium, mg/kg	<0.06	<0.06	<0.06
Chromium, mg/kg	42	55	42
Cobalt, mg/kg	10	13	9.0
Copper, mg/kg	15	30	25
Lead, mg/kg	1.0	<0.8	<0.8
Mercury, mg/kg	<0.3	<0.3	<0.3
Molybdenum, mg/kg	<0.08	<0.08	<0.08
Nickel, mg/kg	55	88	56
Selenium, mg/kg	<0.4	<0.4	<0.4
Silver, mg/kg	<0.02	<0.02	<0.02
Thallium, mg/kg	31	42	36
Vanadium, mg/kg	23	34	20
Zinc, mg/kg	51	58	58
Cyanide, mg/kg	<0.5	<0.5	<0.5
Nitrate + Nitrite (as N03), mg/kg	6	120	24
Total Organic Carbon, mg/kg	800	1900	870
Specific Conductance, umhos/cm	1500	3300	40000
pH, Units	8.4	7.4	7.2
Chloride, mg/kg	11	68	170
Sulfate, mg/kg	360	1800	28000
Nitric Acid Digestion, Date	06/22/90	06/22/90	06/22/90

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06-087-2	L18-C S-2	28 MAY 90
06-087-3	L18-F S-1	28 MAY 90

PARAMETER	06-087-1	06-087-2	06-087-3
B/N,A Ext.Pri.Poll. (EPA-8270)			
Date Analyzed	06/21/90	06/21/90	06.21.90
Date Extracted	06/20/90	06/20/90	06.20.90
Dilution Factor, Times	1	1	1
1,2,4-Trichlorobenzene, mg/kg	<0.3	<0.3	<0.3
1,2-Dichlorobenzene, mg/kg	<0.3	<0.3	<0.3
1,2-Diphenylhydrazine, mg/kg	<0.3	<0.3	<0.3
1,3-Dichlorobenzene, mg/kg	<0.3	<0.3	<0.3
1,4-Dichlorobenzene, mg/kg	<0.3	<0.3	<0.3
2,4,5-Trichlorophenol, mg/kg	<0.3	<0.3	<0.3
2,4,6-Trichlorophenol, mg/kg	<0.3	<0.3	<0.3
2,4-Dichlorophenol, mg/kg	<0.3	<0.3	<0.3
2,4-Dimethylphenol, mg/kg	<0.3	<0.3	<0.3
2,4-Dinitrophenol, mg/kg	<0.8	<0.8	<0.8
2,4-Dinitrotoluene, mg/kg	<0.3	<0.3	<0.3
2,6-Dinitrotoluene, mg/kg	<0.3	<0.3	<0.3
2-Chloronaphthalene, mg/kg	<0.3	<0.3	<0.3
2-Chlorophenol, mg/kg	<0.3	<0.3	<0.3
2-Methyl-4,6-dinitrophenol, mg/kg	<2	<2	<2
2-Methylnaphthalene, mg/kg	<0.3	<0.3	<0.3
2-Methylphenol, mg/kg	<0.3	<0.3	<0.3
2-Nitroaniline, mg/kg	<2	<2	<2
2-Nitrophenol, mg/kg	<0.3	<0.3	<0.3
3,3'-Dichlorobenzidine, mg/kg	<0.3	<0.3	<0.3
3-Nitroaniline, mg/kg	<2	<2	<2

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06-087-2	L18-C S-2	28 MAY 90
06-087-3	L18-F S-1	28 MAY 90

PARAMETER	06-087-1	06-087-2	06-087-3
4-Bromophenylphenylether, mg/kg	<0.3	<0.3	<0.3
4-Chloro-3-methylphenol, mg/kg	<0.3	<0.3	<0.3
4-Chloroaniline, mg/kg	<0.6	<0.6	<0.6
4-Chlorophenylphenylether, mg/kg	<0.3	<0.3	<0.3
4-Methylphenol, mg/kg	<0.3	<0.3	<0.3
4-Nitroaniline, mg/kg	<2	<2	<2
4-Nitrophenol, mg/kg	<0.8	<0.8	<0.8
Acenaphthene, mg/kg	<0.3	<0.3	<0.3
Acenaphthylene, mg/kg	<0.3	<0.3	<0.3
Aniline, mg/kg	<0.6	<0.6	<0.6
Anthracene, mg/kg	<0.3	<0.3	<0.3
Benzidine, mg/kg	<1	<1	<1
Benzo(a)anthracene, mg/kg	<0.3	<0.3	<0.3
Benzo(a)pyrene, mg/kg	<0.3	<0.3	<0.3
Benzo(b)fluoranthene, mg/kg	<0.3	<0.3	<0.3
Benzo(g,h,i)perylene, mg/kg	<0.3	<0.3	<0.3
Benzo(k)fluoranthene, mg/kg	<0.3	<0.3	<0.3
Benzyl Alcohol, mg/kg	<0.6	<0.6	<0.6
Benzoic acid, mg/kg	<2	<2	<2
Butylbenzylphthalate, mg/kg	<0.3	<0.3	<0.3
Chrysene, mg/kg	<0.3	<0.3	<0.3
Di-n-octylphthalate, mg/kg	<0.3	<0.3	<0.3
Dibenzo(a,h)anthracene, mg/kg	<0.3	<0.3	<0.3
Dibenzofuran, mg/kg	<0.3	<0.3	<0.3
Dibutylphthalate, mg/kg	<2	<2	<2

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06-087-2	L18-C S-2	28 MAY 90
06-087-3	L18-F S-1	28 MAY 90

PARAMETER	06-087-1	06-087-2	06-087-3
Diethylphthalate, mg/kg	<0.3	<0.3	<0.3
Dimethylphthalate, mg/kg	<0.8	<0.8	<0.8
Fluoranthene, mg/kg	<0.3	<0.3	<0.3
Fluorene, mg/kg	<0.3	<0.3	<0.3
Hexachlorobenzene, mg/kg	<0.3	<0.3	<0.3
Hexachlorobutadiene, mg/kg	<0.3	<0.3	<0.3
Hexachlorocyclopentadiene, mg/kg	<0.8	<0.3	<0.3
Hexachloroethane, mg/kg	<0.3	<0.3	<0.3
Indeno(1,2,3-c,d)pyrene, mg/kg	<0.3	<0.3	<0.3
Isophorone, mg/kg	<0.3	<0.3	<0.3
N-Nitrosodimethylamine, mg/kg	<2	<2	<2
N-Nitrosodiphenylamine, mg/kg	<0.3	<0.3	<0.3
N-Nitrosodi-n-propylamine, mg/kg	<1	<1	<1
Nitrobenzene, mg/kg	<0.3	<0.3	<0.3
Naphthalene, mg/kg	<0.3	<0.3	<0.3
Phenanthrene, mg/kg	<0.3	<0.3	<0.3
Phenol, mg/kg	<0.3	<0.3	<0.3
Pentachlorophenol, mg/kg	<0.3	<0.3	<0.3
Pyrene, mg/kg	<0.3	<0.3	<0.3
Bis(2-chloroethoxy)methane, mg/kg	<0.3	<0.3	<0.3
Bis(2-chloroethyl)ether, mg/kg	<0.3	<0.3	<0.3
Bis(2-chloroisopropyl)ether, mg/kg	<0.3	<0.3	<0.3
Bis(2-ethylhexyl)phthalate, mg/kg	<0.3	0.4	<0.3

Semi-Quantified Results **

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06-087-2	L18-C S-2	28 MAY 90
06-087-3	L18-F S-1	28 MAY 90

PARAMETER	06-087-1	06-087-2	06-087-3
A C21 Hydrocarbon, mg/kg	2	---	---
A C22 Hydrocarbon, mg/kg	4	---	---
A C27 Hydrocarbon, mg/kg	10	---	---
Heptacosane, mg/kg	2	---	---

** Quantification based upon comparison of total ion count of the compound with that of the nearest internal standard.

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06-087-2	L18-C S-2	28 MAY 90
06-087-3	L18-F S-1	28 MAY 90

PARAMETER	06-087-1	06-087-2	06-087-3
Pesticides/PCBs (EPA 8080)			
Date Analyzed	06/22/90	06/22/90	06/22/90
Date Extracted	06/21/90	06/21/90	06/21/90
Dilution Factor, Times	1	1	1
Aldrin, mg/kg	<0.001	<0.001	<0.001
Chlordane, mg/kg	<0.01	<0.01	<0.01
p,p'-DDD, mg/kg	<0.001	<0.001	<0.001
p,p'-DDE, mg/kg	<0.001	<0.001	<0.001
p,p'-DDT, mg/kg	<0.002	<0.002	<0.001
Dieldrin, mg/kg	<0.001	<0.001	<0.001
Endosulfan I, mg/kg	<0.001	<0.001	<0.001
Endosulfan II, mg/kg	<0.002	<0.002	<0.002
Endosulfan Sulfate, mg/kg	<0.002	<0.002	<0.002
Endrin, mg/kg	<0.002	<0.002	<0.002
Endrin Aldehyde, mg/kg	<0.001	<0.001	<0.001
Heptachlor epoxide, mg/kg	<0.001	<0.001	<0.001
Heptachlor, mg/kg	<0.001	<0.001	<0.001
Methoxychlor, mg/kg	<0.007	<0.007	<0.007
Aroclor 1016, mg/kg	<0.02	<0.02	<0.02
Aroclor 1221, mg/kg	<0.02	<0.02	<0.02
Aroclor 1232, mg/kg	<0.02	<0.02	<0.02
Aroclor 1242, mg/kg	<0.02	<0.02	<0.02
Aroclor 1248, mg/kg	<0.02	<0.02	<0.02
Aroclor 1254, mg/kg	<0.02	<0.02	<0.02
Aroclor 1260, mg/kg	<0.02	<0.02	<0.02

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06-087-3	L18-F S-1	28 MAY 90

PARAMETER	06-087-1	06-087-2	06-087-3
Aroclor 1262, mg/kg	<0.02	<0.02	<0.02
Toxaphene, mg/kg	<0.02	<0.02	<0.02
BHC, alpha isomer, mg/kg	<0.001	<0.001	<0.001
BHC, beta isomer, mg/kg	<0.001	<0.001	<0.001
BHC, delta isomer, mg/kg	<0.001	<0.001	<0.001
BHC, gamma isomer (Lindane), mg/kg	<0.001	<0.001	<0.001

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06-087-3	L18-F S-1	28 MAY 90

PARAMETER	06-087-1	06-087-2	06-087-3
Vol.Pri.Poll. (EPA-8240)			
Date Analyzed	06/22/90	06/21/90	06/21/90
Date Extracted	06/22/90	06/21/90	06/21/90
Dilution Factor, Times	1	1	1
Tetrachloroethylene, ug/kg	<5	<5	<5
1,1,1-Trichloroethane, ug/kg	<5	<5	<5
1,1,2,2-Tetrachloroethane, ug/kg	<5	<5	<5
1,1,2-Trichloroethane, ug/kg	<5	<5	<5
1,1-Dichloroethane, ug/kg	<5	<5	<5
1,1-Dichloroethene, ug/kg	<5	<5	<5
1,2-Dichloroethane, ug/kg	<5	<5	<5
1,2-Dichlorobenzene, ug/kg	<5	<5	<5
1,2-Dichloropropane, ug/kg	<5	<5	<5
1,3-Dichlorobenzene, ug/kg	<5	<5	<5
1,4-Dichlorobenzene, ug/kg	<5	<5	<5
2-Chloroethylvinylether, ug/kg	<5	<5	<5
2-Hexanone, ug/kg	<50	<50	<50
Acetone, ug/kg	<50	<50	<50
Acrolein, ug/kg	<100	<100	<100
Acrylonitrile, ug/kg	<100	<100	<100
Bromodichloromethane, ug/kg	<5	<5	<5
Benzene, ug/kg	<5	<5	<5
Bromomethane, ug/kg	<5	<5	<5
Bromoform, ug/kg	<5	<5	<5
Chlorobenzene, ug/kg	<5	<5	<5

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06-087-2	L18-C S-2	28 MAY 90
06-087-3	L18-F S-1	28 MAY 90

PARAMETER	06-087-1	06-087-2	06-087-3
Carbon Tetrachloride, ug/kg	<5	<5	<5
Chloroethane, ug/kg	<5	<5	<5
Chloroform, ug/kg	<5	<5	<5
Chloromethane, ug/kg	<10	<10	<10
Carbon Disulfide, ug/kg	<10	<10	<10
Dibromochloromethane, ug/kg	<5	<5	<5
Ethylbenzene, ug/kg	<5	<5	<5
Freon 113, ug/kg	<5	<5	<5
Methyl ethyl ketone, ug/kg	<50	<50	<50
Methyl isobutyl ketone, ug/kg	<25	<25	<25
Methylene chloride, ug/kg	<5	<5	<5
Styrene, ug/kg	<5	<5	<5
Trichloroethene, ug/kg	<5	<5	<5
Trichlorofluoromethane, ug/kg	<5	<5	<5
Toluene, ug/kg	<5	<5	<5
Vinyl acetate, ug/kg	<25	<25	<25
Vinyl chloride, ug/kg	<5	<5	<5
Total Xylene Isomers, ug/kg	<25	<25	<25
cis-1,3-Dichloropropene, ug/kg	<5	<5	<5
trans-1,2-Dichloroethene, ug/kg	<5	<5	<5
trans-1,3-Dichloropropene, ug/kg	<5	<5	<5
Other Vol.Pri.Poll. (EPA-8240)	---	---	---

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The detection limit for p,p'-DDT on samples A90-06-087 -1 and -2 "L18-A S-5 and L18-C S-2" analyzed by EPA-8080 was elevated to 0.002 mg/kg. This was due to trace level contamination which carried over from the extraction of a sample containing high levels of p,p'-DDT.
-- G. Havalias 06/22/90

Based on historical data,the bis(2-ethylhexyl)phthalate found in the samples on the EPA-8270 analysis could have been introduced as a random laboratory contamination.
-- G. Havalias 06/29/90

Edward Wilson, Laboratory Manager

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