IHSS GROUP 000-5
PRESENT LANDFILL (IHSS-114)

ACCELERATED ACTION FOR THE PRESENT LANDFILL ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE CONSTRUCTION CERTIFICATION REPORT

ATTACHMENT A OF THE FINAL CLOSEOUT REPORT

VOLUME IV

Prepared for:

KAISER-HILL COMPANY, LLC
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
12101 Airport Way, Unit B
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September 2005

TETRA TECH, INC.

ADMIN RECORD

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KAISER·HILL
COMPANY

Final Closeout Report for IHSS Group 000-5 Present Landfill (IHSS-114)

Volume IV

Environmental Restoration
Rocky Flats Environmental Technology Site

September 2005

APPENDIX F-2: QC FIELD TESTS AND LOGS

APPENDIX F-2.1: EARTHWORK AND CONCRETE

ROCKY FLATS MATERIALS SUMMARY FOR THE PRESENT LANDFILL

Rock Flats/Field and Lab Testing/CO Summary of Soils Data Sheet.

CUSHION SOIL TESTING:

Cushion soil samples taken off site had Atterbergs limits, grain size, standard Proctor density, and moisture content tests conducted on them in an off site laboratory. In place cushion was subject to sand cone testing, and nuclear density gauge testing.

PF-1 to 10:	Cushion soil tested from Centennial's pit fine pile at random locations taken for lab testing. Listed as Cushion Soil Stockpile on aerial photos of Centennial pit.
CLP-1 to 3:	Atterberg limits, standard Proctor density, and grain size analysis testing on 6" cushion soils. See the Soils Test Location Map for sample locations.
CUP-1 to 3:	Atterberg grain, proctors, and grain size analysis testing on 10" cushion soils. See the Soils Test Location Map for sample locations.
Sand Cones:	CLS-1 to 11 were run on 6" cushion, CUS-1 to 11 were run on 10" cushion, and TFCS-1 and 2 were run on the 6" and 10" test fills respectively. See Paragons "Soils Test Location Map" for sample locations, or the "Field Density Test Log" for northings, eastings, and elevations.
Field Density Test Logs:	CL-1 to 209 were nuclear density tests run on the 6" cushion, and CU-1 to 220 were nuclear density tests run on the 10" cushion. Other nuclear density testing was conducted on the anchor trench (AT-1 to 22), backfill around the seep capture system (AEB-1 to 5), the northern and southern GIWS lines (GWN-1 & 2, and GWS-1 & 2), and in the north and south culverts (CPS-1 & 2). See Paragons "Soils Test Location Map" for sample locations, or the "Field Density Test Log" for northings, eastings, and elevations.
Moisture Contents:	Moistures were taken from various locations from the CL and CU nuclear density test locations to verify accuracy of the gauge for reading moistures. For this information see the Rocky Flats/Field and Lab Testing/CO Summary of Soils Data Sheet.

24-INCH FINAL SOIL COVER LAYER TESTING: All 24-inch final soil cover layer soil samples had Atterberg limits testing, and grain size testing performed on them. Standard Proctor density tests were not performed as more than 30% of the material was greater than ¾" thus making the material unsuitable for standard Proctor density testing.

280 Dirt Pile Sample Location Map

A1 to A10: 24-inch final soil layer soil sampled from the 280 Pile before the start of construction. See 280 Dirt Pile Sample Location Map.

Centennial Aggregate Pit Sample Location Map

APR1 & APR2: Samples pulled from Centennial to verify that their pit run was in fact Rocky Flats Alluvium and therefore suitable for 24-inch final soil cover layer. See Centennial Aggregate Pit Sample Location Map.

Shooting Range Berm Sample Location Map

BAE-1 & BAW-1: 24-inch final soil cover layer soil samples collected from the east and west berms around the old guard shooting range. See Shooting Range Berm Sample Location Map.

371 Dirt Pile Sample Location Map

371 DP-A1 & A2: 24-inch final soil cover layer soil samples collected from the demolished 371 building area. See 371 Dirt Pile Sample Location Map.

Present Landfill Sample Location Map

AV1 to AV4: Samples taken from perimeter channel to verify that the fill being used was Rocky Flats Alluvium and therefore suitable for the 24-inch final soil cover layer. See Present Landfill Sample Location Map.

AC2-1 24-inch final soil cover layer soil sample taken from the 2" cover on the cap. See Present Landfill Sample Location Map.

AC22-1 to AC22-6: 24-inch final soil cover layer soil samples taken from the 22" cover on the cap. See Present Landfill Sample Location Map.

Present Landfill Bulk Gradation Sample Locations Map

AM2-1 to 3: Bulk 24-inch final soil cover layer sample taken from to 2" Cover on the cap of the Present Landfill. See Present Landfill Bulk Gradation Sample Locations Map.

AM-22-1 to 12: Bulk 24-inch final soil cover layer samples taken from the 22" Cover on the cap of the Present Landfill. See Present Landfill Bulk Gradation Sample Locations Map.

Centennial Site Locations for 24-inch Final Soil Cover Layer Bulk Gradations

AMV-1 & 2: Bulk 24-inch final soil cover layer samples taken from Centennial to verify that the materials brought on site for use as 24-inch final soil cover layer soil matched with the sieves run on Present Landfill cap. See Present Landfill Bulk Gradation Sample Locations Map.

AMC-1 & 2: Bulk 24-inch final soil cover layer samples taken from Centennial to verify that the materials brought on site for use as 2" cover matched up wit the sieves run on the Present Landfill cap

ROCK LAYER TESTING:

All Rock Layer samples had grain size and uniaxial compressive strength tests performed on them. See the Rock Layer Sample Location Map for sample locations.

Rock layer Sample Location Map

RL-1 to 7 Gradations: All Rock Layer samples were taken at the Centennial Pit. See Rock Layer Sample Location Map.

RL-1 to 7 UCS: Uniaxial Compressive Strength Results for Coarse Rock. See Rock Layer Sample Location Map.

GRAVELS:

Gravels were subject to off-site laboratory testing for grain size analysis only.

GVG-1 & GV-1: Gravel installed in the gas vent trenches. For Locations see Paragons gas vent pipe as-built drawing.

PGD-1: Gravel installed as bedding material for the culverts. The sample was collected from the northeastern liner lay down yard.

RIP RAP:

Rip Rap was subject to gradation testing utilizing ASTM D-5519 Method B.

CONCRETE:

Concrete was tested for air content, slump and uniaxial compressive strength.

SVS-1 to 5:	Concrete sampled on base of seep capture system aeration structure on 4/8/05.
RF4/16 A to E:	Concrete sampled on side walls of seep capture system aeration structure on 4/16/05.
RF4/20 A to F:	Concrete sampled on the steps of seep capture system aeration structure on 4/20/05.
RF4/22 A to F:	Concrete sampled on the eastern wall of seep capture system aeration structure on 4/22/05.

TABLE 1
ROCKY FLATS/FIELD and LAB TESTING/CO
SUMMARY OF SOIL DATA

Sample Type	Sample Number	Sample Depth (ft)	U.S.C.S. Soil Classification	Delivered Moisture (%)	Atterberg Limits			Grain Size Distribution			Specific Gravity	Moist/Den Relationship Standard Proctor		Additional Test Comments (See Notes)
					LL	PL	PI	% Finer 3/4"	% Finer #4	% Finer #200		PCF (Dry)	Moist (%)	
Bulk	PF-1	1-2	SC	16.1	39	19	20	100	84	30	--	120.6*	10.7*	
Bulk	PF-2	1-2	SC	10.3	43	19	24	100	85	29	--	119.9*	11.7*	
Bulk	PF-3	1-2	SC	18.1	43	18	25	100	81	30	--	121.0*	10.9*	
Bulk	PF-4	1-2	SC	17.4	35	16	19	100	89	30	--	122.9*	10.6*	
Bulk	PF-5	1-2	SC	12.8	37	19	18	100	86	29	--	121.9*	10.8*	
Bulk	PF5-Dup	1-2	SC	11.4	40	19	21	100	87	28	--	122.3*	11.1*	
Bulk	PF-6	1-2	SC	11.5	45	20	25	100	82	30	--	120.3*	12.5*	
Bulk	PF-7	1-2	SC	13.5	35	18	17	100	87	24	--	125.1*	10.3*	
Bulk	PF-8	1-2	SC	14.9	41	19	22	100	82	28	--	117.9*	11.9*	
Bulk	PF-9	1-2	SC	13.8	38	18	20	100	87	25	--	125.1*	10.4*	
Bulk	PF-10	1-2	SC	14.8	43	18	25	100	83	28	--	122.1*	11.0*	
Bulk	A-1	3	GC	13.8	52	20	32	63	42	16	--	--	--	
Bulk	A-2	3	GC	9.2	43	16	27	63	43	18	--	--	--	
Bulk	A-3	6	GC	8.0	45	18	27	68	46	18	--	--	--	
Bulk	A-4	12	GC	14.3	47	16	31	69	48	21	--	--	--	
Bulk	A-5	3	GC	11.2	40	16	24	64	43	14	--	--	--	
Bulk	A-6	2	GC	10.2	45	17	28	58	40	16	--	--	--	
Bulk	A-7	6	GC	13.1	48	16	32	59	41	16	--	--	--	
Bulk	A-7Dup	6	GC	14.1	47	18	29	59	41	15	--	--	--	
Bulk	A-8	3	GC	11.6	47	18	29	64	44	18	--	--	--	
Bulk	A-9	10	GC	9.2	48	18	30	71	51	22	--	--	--	
Bulk	A-10	4	GC	7.8	52	21	31	52	34	16	--	--	--	
Bag	TFCS-1	--	--	9.9	--	--	--	--	--	--	--	--	--	
Bag	TFCS-2	--	--	9.8	--	--	--	--	--	--	--	--	--	
Bulk	AV-1	--	GC	6.8	43	17	26	49	31	11	--	--	--	
Bulk	AV-2	--	GC	7.4	44	17	27	53	36	15	--	--	--	
Bulk	AV-3	--	GC	6.7	57	21	36	59	35	17	--	--	--	
Bulk	AV-4	--	GC	12.0	66	25	41	60	42	21	--	--	--	

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					LL	PL	PI	% Finer 3/4"	% Finer #4	% Finer #200		PCF (Dry)	Moist (%)	
Bulk	APR-1	--	GC	10.4	39	17	22	57	40	11	--	--	--	
Bulk	APR-2	--	GC	9.8	38	17	21	52	34	11	--	--	--	
Bag	CLS-1	--	--	9.4	--	--	--	--	--	--	--	--	--	
Bag	CLS-2	--	--	10.2	--	--	--	--	--	--	--	--	--	
Bag	CLS-3	--	--	9.7	--	--	--	--	--	--	--	--	--	
Bag	CLS-4	--	--	10.7	--	--	--	--	--	--	--	--	--	
Bag	CLS-5	--	--	11.0	--	--	--	--	--	--	--	--	--	
Bag	CLS-6	--	--	10.8	--	--	--	--	--	--	--	--	--	
Bag	CLS-7	--	--	11.1	--	--	--	--	--	--	--	--	--	
Bag	CLS-8	--	--	12.1	--	--	--	--	--	--	--	--	--	
Bag	CLS-9	--	--	9.6	--	--	--	--	--	--	--	--	--	
Bag	CLS-10	--	--	10.7	--	--	--	--	--	--	--	--	--	
Bag	CLS-11	--	--	10.2	--	--	--	--	--	--	--	--	--	
Bulk	GV-1	--	--	1.0	--	--	--	78	2	0.3	--	--	--	
Bulk	GVG-1	--	GP	--	--	--	--	94	1.9	0.1	--	--	--	
Bulk	CLP-1	--	SC	--	46	17	29	98	77	26	--	122.9*	10.8*	
Bulk	CLP-2	--	SC	--	37	17	20	100	85	26	--	123.6*	10.6*	
Bulk	CLP-3	--	SC	--	37	15	22	100	87	25	--	123.3*	10.9*	
Bag	CL-049	--	--	10.6	--	--	--	--	--	--	--	--	--	
Bag	CL-073	--	--	11.7	--	--	--	--	--	--	--	--	--	
Bag	CL-079	--	--	10.8	--	--	--	--	--	--	--	--	--	
Bag	CL-118	--	--	9.9	--	--	--	--	--	--	--	--	--	
Bag	CL-121	--	--	12.1	--	--	--	--	--	--	--	--	--	
Bag	CL-150	--	--	11.9	--	--	--	--	--	--	--	--	--	
Bag	CL-156	--	--	10.0	--	--	--	--	--	--	--	--	--	
Bag	CL-178	--	--	11.2	--	--	--	--	--	--	--	--	--	

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					LL	PL	PI	% Finer 3/4"	% Finer #4	% Finer #200		PCF (Dry)	Moist (%)	
Bag	CL-187	--	--	12.9	--	--	--	--	--	--	--	--	--	
Bag	CL-188	--	--	10.9	--	--	--	--	--	--	--	--	--	
Bag	CL-194	--	--	11.4	--	--	--	--	--	--	--	--	--	
Bag	CL-203	--	--	10.8	--	--	--	--	--	--	--	--	--	
Bag	CL-208	--	--	11.0	--	--	--	--	--	--	--	--	--	
Bag	CUS-01	--	--	9.4	--	--	--	--	--	--	--	--	--	
Bag	CUS-02	--	--	10.8	--	--	--	--	--	--	--	--	--	
Bag	CUS-03	--	--	7.9	--	--	--	--	--	--	--	--	--	
Bag	CUS-04	--	--	8.9	--	--	--	--	--	--	--	--	--	
Bag	CUS-05	--	--	10.1	--	--	--	--	--	--	--	--	--	
Bag	CUS-06	--	--	11.2	--	--	--	--	--	--	--	--	--	
Bag	CUS-07	--	--	10.1	--	--	--	--	--	--	--	--	--	
Bag	CUS-08	--	--	9.6	--	--	--	--	--	--	--	--	--	
Bag	CUS-09	--	--	11.1	--	--	--	--	--	--	--	--	--	
Bag	CUS-10	--	--	10.8	--	--	--	--	--	--	--	--	--	
Bag	CUS-11	--	--	10.0	--	--	--	--	--	--	--	--	--	
Bag	CU-004	--	--	10.4	--	--	--	--	--	--	--	--	--	
Bag	CU-047	--	--	11.1	--	--	--	--	--	--	--	--	--	
Bag	CU-085	--	--	9.9	--	--	--	--	--	--	--	--	--	
Bag	CU-089	--	--	9.3	--	--	--	--	--	--	--	--	--	
Bag	CU-099	--	--	9.9	--	--	--	--	--	--	--	--	--	
Bag	CU-119	--	--	9.8	--	--	--	--	--	--	--	--	--	
Bag	CU-153	--	--	10.9	--	--	--	--	--	--	--	--	--	
Bag	CU-167	--	--	12.0	--	--	--	--	--	--	--	--	--	
Bag	CU-191	--	--	10.9	--	--	--	--	--	--	--	--	--	
Bag	CU-202	--	--	9.7	--	--	--	--	--	--	--	--	--	
Bag	CU-210	--	--	11.9	--	--	--	--	--	--	--	--	--	
Bag	CU-220	--	--	11.5	--	--	--	--	--	--	--	--	--	

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					LL	PL	PI	% Finer 3/4"	% Finer #4	% Finer #200		PCF (Dry)	Moist (%)	
Bulk	BAE-1	--	GC	9.3	52	18	34	59	37	16	--	--	--	
Bulk	BAW-1	--	GC	7.7	53	17	36	69	47	17	--	--	--	
Bulk	CUP-1	--	SC	--	46	17	29	100	84	27	--	123.1*	11.3*	
Bulk	CUP-2	--	SC	8.5	50	18	32	100	85	29	--	122.8*	12.2*	
Bulk	CUP-3	--	SC	--	44	17	27	100	85	27	--	124.5*	11.3*	
Bulk	CUP-4	--	SC	--	40	16	24	99	78	27	--	120.6*	12.1*	
Bulk	CUP-5	--	SC	--	38	15	23	100	84	25	--	123.8*	11.2*	
Bulk	CUP-6	--	SC	--	39	17	22	100	83	24	--	123.3*	10.5*	
Bulk	371DP-A1	--	GC	--	43	20	23	53	37	13	--	--	--	
Bulk	371DP-A2	--	GC	--	45	17	28	62	42	15	--	--	--	
Bulk	AC22-1	--	GP-GC	--	41	17	24	48	33	12	--	--	--	
Bulk	AC22-2	--	GP-GC	--	42	16	26	45	30	10	--	--	--	
Bulk	AC22-3	--	GP-GC	--	42	16	26	50	34	11	--	--	--	
Bulk	AC22-4	--	GP-GC	--	50	18	32	42	29	12	--	--	--	
Bulk	AC22-5	--	GC	--	51	18	33	49	34	14	--	--	--	
Bulk	AC22-6	--	GC	--	49	17	32	49	30	12	--	--	--	
Bulk	ANWF-1	--	GC	--	35	20	15	52	29	13	--	--	--	
Bulk	ANWF-2	--	GM	--	35	27	8	56	31	13	--	--	--	
Bulk	WBF-1	--	CH	--	50	16	34	88	76	60	--	--	--	
Bulk	WBF-2	--	GC	--	49	17	32	86	73	50	--	--	--	
Bulk	EBF-1	--	CL	--	49	16	33	88	77	54	--	--	--	
Bulk	EBF-2	--	SC	--	47	14	33	93	74	44	--	--	--	
Bulk	AM 2-01	0-2"	GC	--	44	17	27	66	42	19	--	--	--	
Bulk	AM2-02	0-2"	GC	10.8	40	19	21	60	38	15				
Bulk	AM2-03	0-2"	GP	8.5	40	23	17	31	13	5				

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Sample Type	Sample Number	Sample Depth (ft)	U.S.C.S. Soil Classi-fication	Delivered Moisture (%)	Atterberg Limits			Grain Size Distribution			Specific Gravity	Moist/Den Relationship Standard Proctor*		Additional Tests Comments (See Notes)
					LL	PL	PI	% Finer 3/4"	% Finer #4	% Finer #200		PCF (Dry)	Moist (%)	
Bulk	AM 22-01	0-22"	--	--	--	--	--	60	41	14	--	--	--	
Bulk	AM 22-02	0-22"	--	--	--	--	--	46	32	12	--	--	--	
Bulk	AM 22-03	0-22"	--	--	--	--	--	48	33	11	--	--	--	
Bulk	AM 22-04	0-22"	--	--	--	--	--	68	49	15	--	--	--	
Bulk	AM 22-05	0-22"	--	--	--	--	--	55	38	11	--	--	--	
Bulk	AM 22-06	0-22"	--	--	--	--	--	62	42	13	--	--	--	
Bulk	AM 22-07	0-22"	GW-GC	--	42	18	24	50	34	11	--	--	--	
Bulk	AM 22-08	0-22"	GW-GC	--	41	18	23	51	32	11	--	--	--	
Bulk	AM 22-09	0-22"	GW-GC	--	40	17	23	52	37	12	--	--	--	
Bulk	AM 22-10	0-22"	GP-GC	10.6	40	18	22	47	33	10				
Bulk	AM 22-11	0-22"	GC	10.1	46	17	29	58	41	13				
Bulk	AM 22-12	0-22"	GC	10.8	42	16	26	67	38	15				
Bulk	PDG-1	--	--	--	--	--	--	100	24	2				
Bulk	AMV-1	--	--	--	--	--	--	52	33	9	--	--	--	
Bulk	AMV-2	--	--	--	--	--	--	54	36	14	--	--	--	
Bulk	AMC2-1	--	SC		40	22	18	78	71	22				
Bulk	AMC2-2	--	SC		40	28	12	50	22	8				

NOTES:
LL = LIQUID LIMIT
PL = PLASTIC LIMIT
PI = PLASTIC INDEX
SL = SHRINKAGE LIMIT

T = TRIAXIAL TEST
U = UNCONFINED COMPRESSION TEST
C = CONSOLIDATION TEST
DS = DIRECT SHEAR TEST
PERM = PERMEABILITY

* ASTM D4718

CUSHION SOIL TESTING

Cushion soil samples taken off site had Atterbergs limits, grain size, standard Proctor density, and moisture content tests conducted on them in an off site laboratory. In place cushion was subject to sand cone testing, and nuclear density gauge testing.

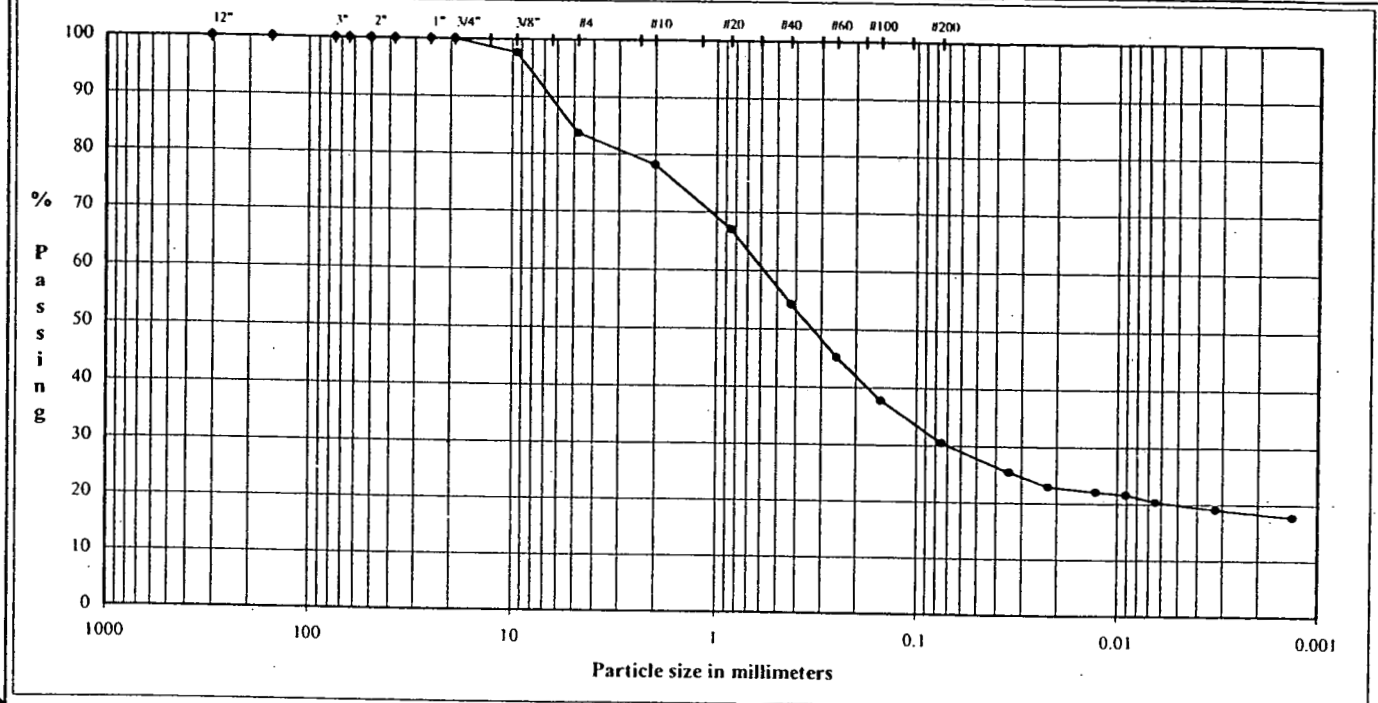
July-04

043-2246.0001

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **Rocky Flats/Field & Lab Testing/CO**
SAMPLE ID: **PF-1** Depth (ft): -
TYPE: **BULK**



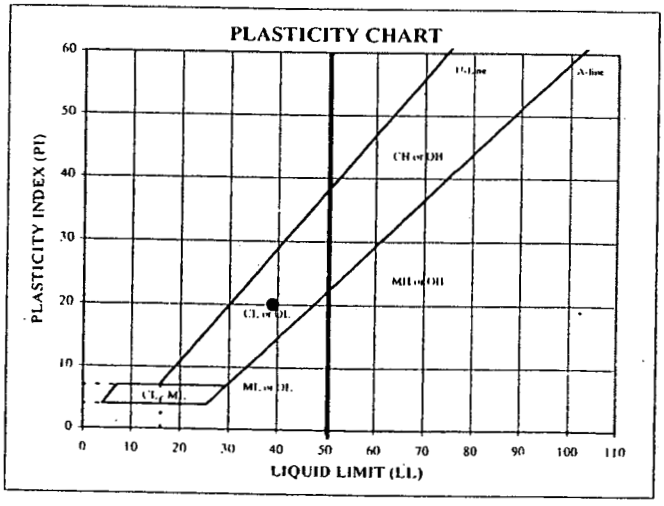
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	0.00
3.0"	75.0	100.0		
2.5"	63.5	100.0		
2.0"	50.0	100.0		
1.5"	37.5	100.0		
1.0"	25.0	100.0	Coarse Gravel	0.00
0.75"	19.0	100.0		
0.375"	9.5	97.7		
#4	4.8	83.5	Fine Gravel	16.46
#10	2.00	78.2	Coarse Sand	5.37
#20	0.85	67.0		
#40	0.43	54.3	Medium Sand	23.88
#60	0.25	45.1		
#100	0.15	37.7		
#200	0.075	30.4	Fine Sand	23.85

Hydrometer Analysis

(mm)	%Finer		
0.034	25.4		
0.022	22.8		
0.013	22.0	Fines	
0.0091	21.6	Silt or Clay	30.44
0.0064	20.3		
0.0032	19.0		
0.0013	17.8		



ATTERBERG LIMITS

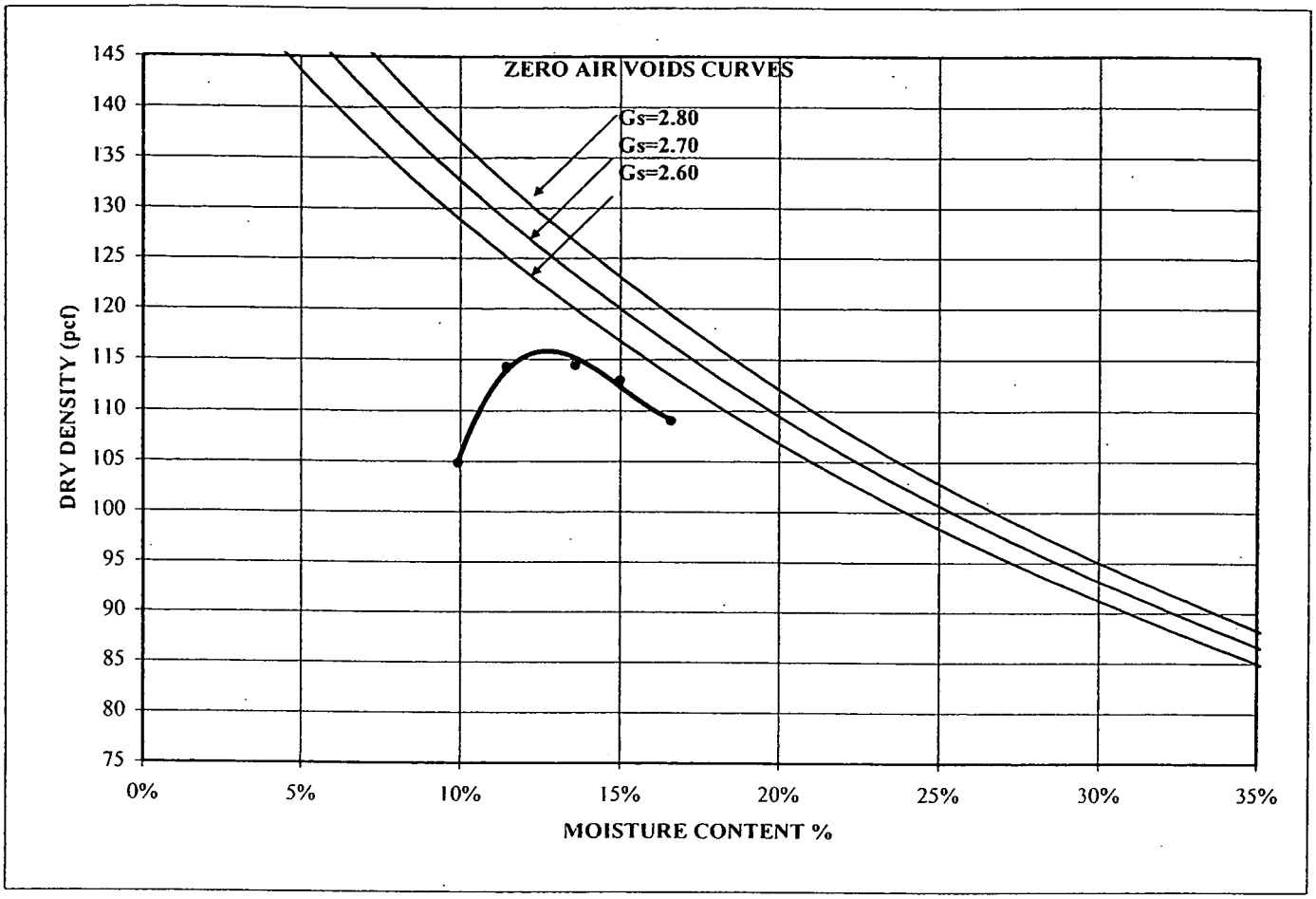
M_c	LL	PL	PI	SpG
16.1	39	19	20	

DESCRIPTION: Yellowish brown (10 YR 5/8) clayey sand with gravel

USCS: SC

TECH: JR
DATE: 7/15/2004
REVIEW: NG

MOISTURE / DRY DENSITY CURVE
D 698 METHOD A



MAXIMUM DRY DENSITY (pcf)	115.8	Corrected Maximum Dry Density (pcf)	120.6
OPTIMUM MOISTURE (%)	12.7	Corrected Optimum Moisture (%)	10.7

SAMPLE ID	PF-1
SAMPLE TYPE	BULK
SAMPLE DEPTH	-

LL	39
PL	19
PI	20
MC	16.1%

DESCRIPTION	Yellowish brown (10 YR 5/8) clayey sand with gravel
USCS	SC

Rocky Flats/Field & Lab Testing/CO
043-2246.0001

TECH	DT
DATE	7/16/04
REVIEW	NG

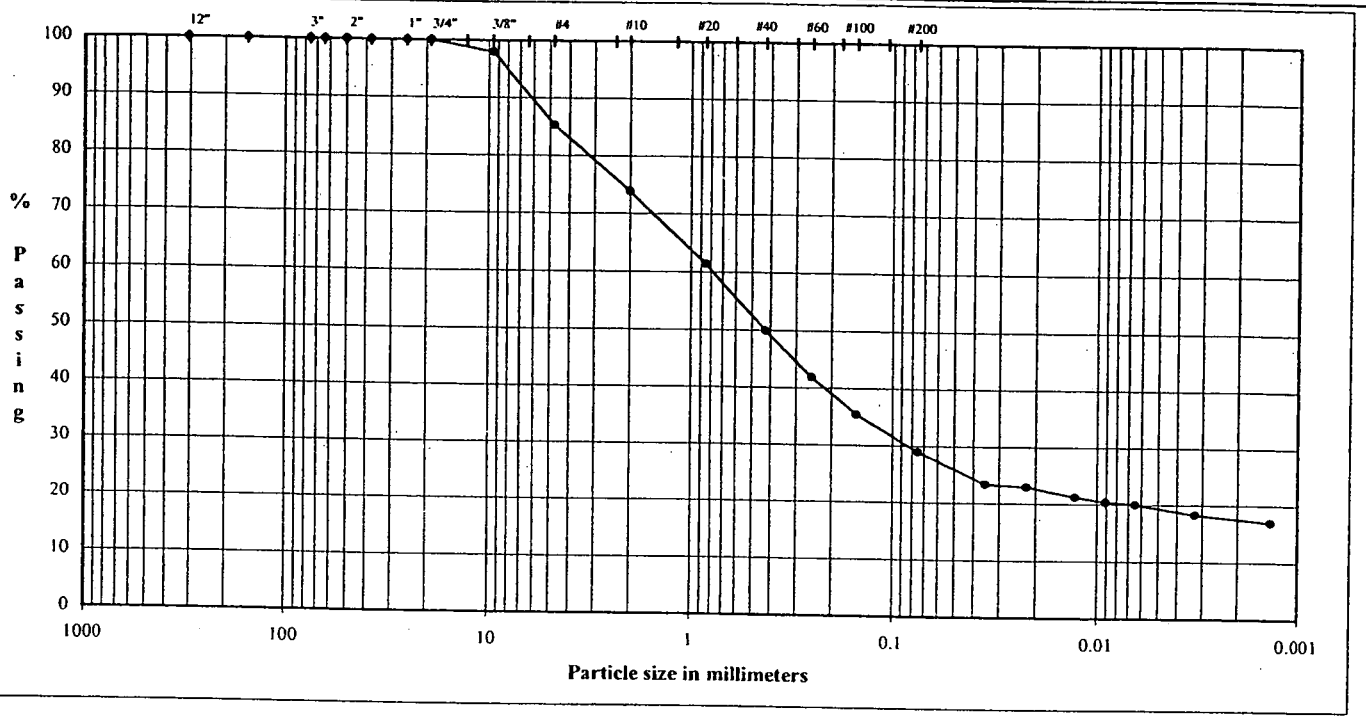
July-04

043-2246.0001

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **Rocky Flats/Field & Lab Testing/CO**
SAMPLE ID: **PF-2** Depth (ft): -
TYPE: **BULK**



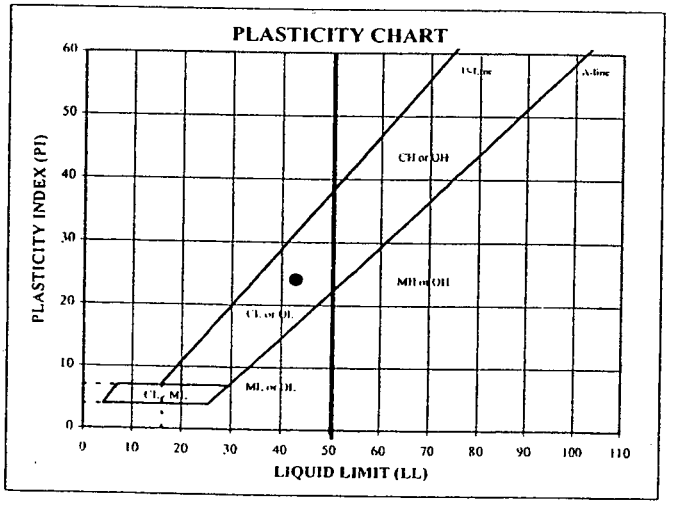
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	0.00
3.0"	75.0	100.0		
2.5"	63.5	100.0		
2.0"	50.0	100.0		
1.5"	37.5	100.0		
1.0"	25.0	100.0	Coarse Gravel	0.00
0.75"	19.0	100.0		
0.375"	9.5	97.9		
#4	4.8	85.2	Fine Gravel	14.78
#10	2.00	73.8	Coarse Sand	11.45
#20	0.85	61.4		
#40	0.43	49.9	Medium Sand	23.86
#60	0.25	41.8		
#100	0.15	35.4		
#200	0.075	28.9	Fine Sand	21.03

Hydrometer Analysis

(mm)	%Finer		
0.035	23.3		
0.022	22.9		
0.013	21.2	Fines	
0.0091	20.4	Silt or Clay	28.88
0.0065	19.9		
0.0033	18.2		
0.0014	17.0		



ATTERBERG LIMITS

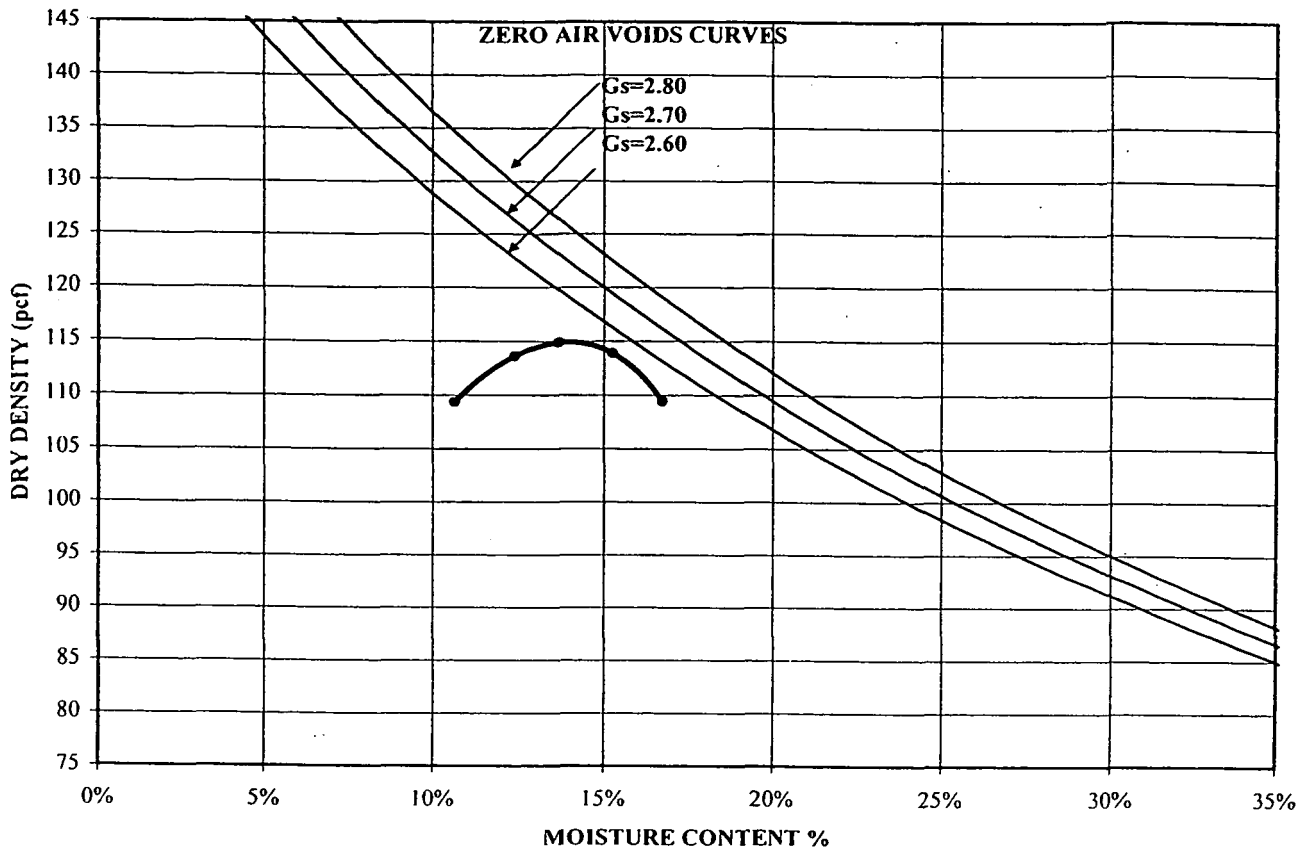
M_c	LL	PL	PI	SpG
10.3	43	19	24	

DESCRIPTION: Yellowish brown (10 YR 5/8) clayey sand

USCS: SC

TECH	DT
DATE	7/21/2004
REVIEW	MB

MOISTURE / DRY DENSITY CURVE
D 698 METHOD A



MAXIMUM DRY DENSITY (pcf)	114.9	Corrected Maximum Dry Density (pcf)	119.9
OPTIMUM MOISTURE (%)	13.9	Corrected Optimum Moisture (%)	11.7

SAMPLE ID	PF-2
SAMPLE TYPE	BULK
SAMPLE DEPTH	-

LL	43
PL	19
PI	24
MC	10.3

DESCRIPTION	Yellowish brown (10 YR 5/8) clayey sand
USCS	SC

Rocky Flats/Field & Lab Testing/CO
043-2246.0001

TECH	DT
DATE	7-22-04
REVIEW	MB

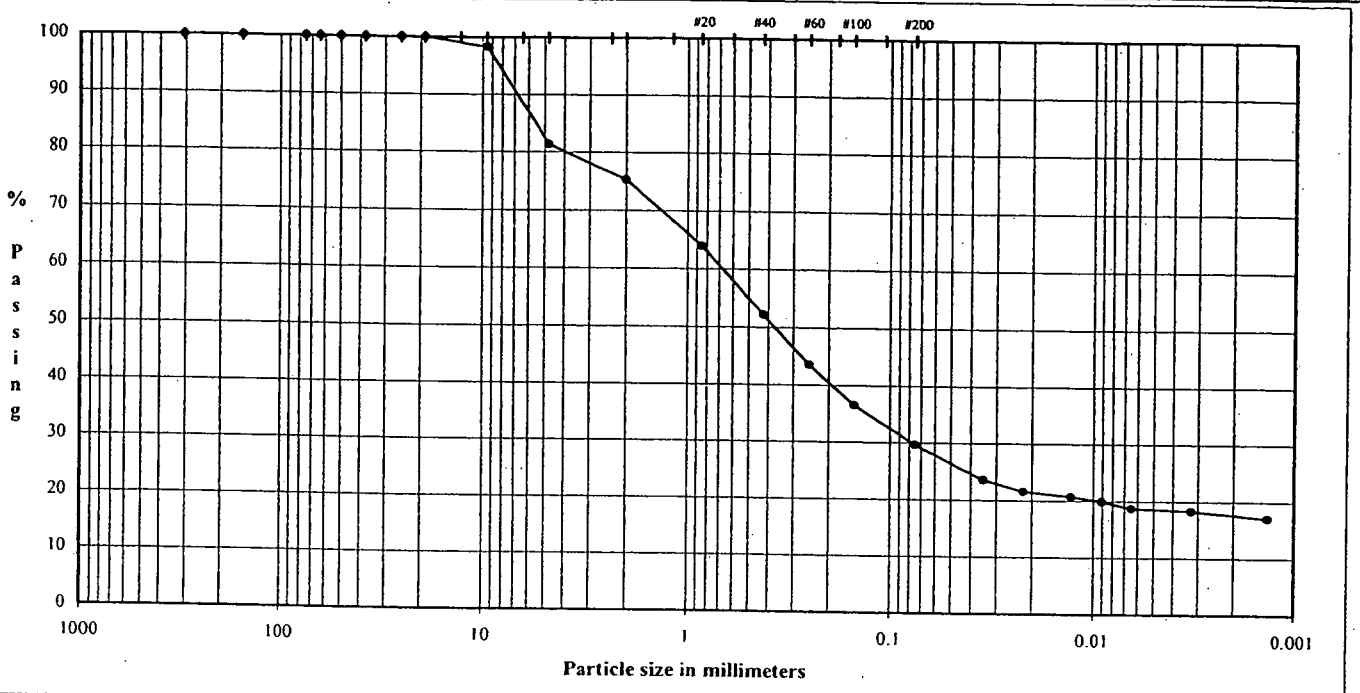
July-04

043-2246.0001

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **Rocky Flats/Field & Lab Testing/CO**
SAMPLE ID: **PF-3** Depth (ft): -
TYPE: **BULK**



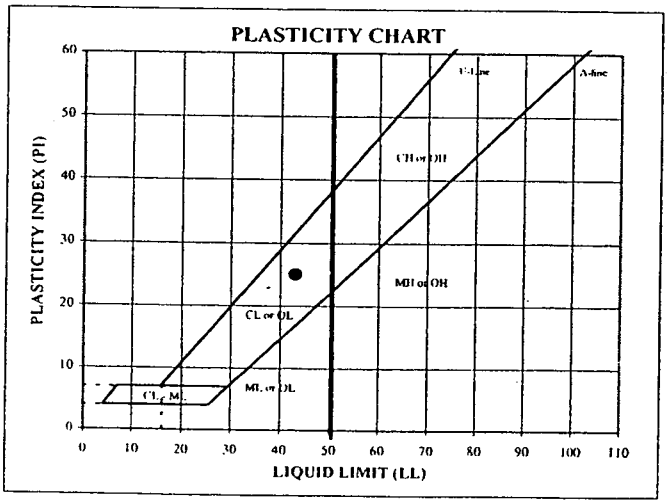
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	0.00
3.0"	75.0	100.0		
2.5"	63.5	100.0		
2.0"	50.0	100.0		
1.5"	37.5	100.0		
1.0"	25.0	100.0	Coarse Gravel	0.00
0.75"	19.0	100.0		
0.375"	9.5	98.3		
#4	4.8	81.2	Fine Gravel	18.76
#10	2.00	75.2	Coarse Sand	6.03
#20	0.85	64.0		
#40	0.43	52.1	Medium Sand	23.07
#60	0.25	43.5		
#100	0.15	36.5		
#200	0.075	29.6	Fine Sand	22.53

Hydrometer Analysis

(mm)	%Finer		
0.035	23.5		
0.022	21.5		
0.013	20.7	Fines	
0.0091	19.9	Silt or Clay	29.62
0.0065	18.7		
0.0032	18.3		
0.0013	17.0		



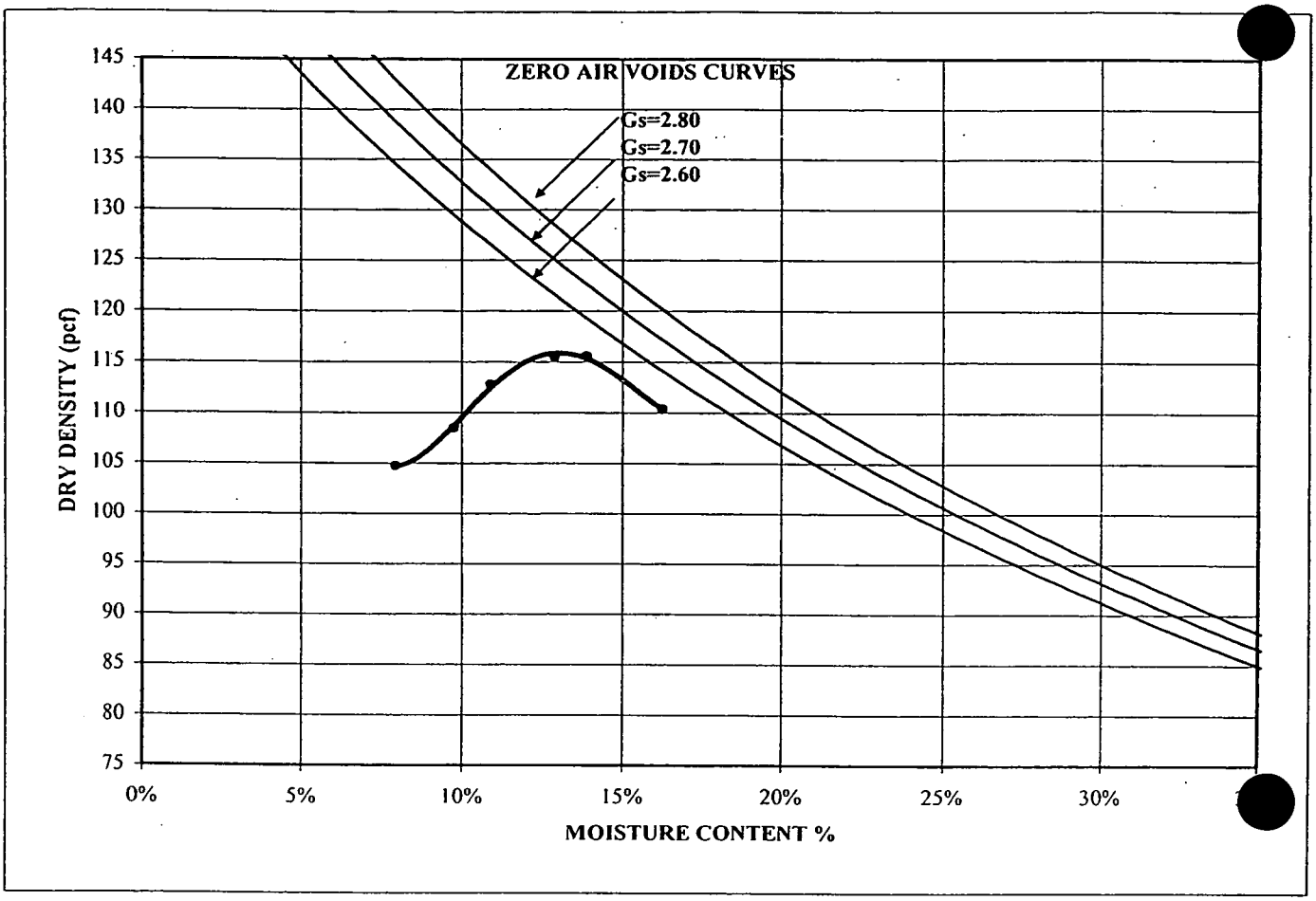
ATTERBERG LIMITS

M_c	LL	PL	PI	SpG
18.1	43	18	25	--

DESCRIPTION: Yellowish brown (10 YR 5/8) clayey sand with gravel
USCS: SC

TECH: JR
DATE: 7/15/2004
REVIEW: NG

MOISTURE / DRY DENSITY CURVE
D 698 METHOD A



MAXIMUM DRY DENSITY (pcf)	115.5	Corrected Maximum Dry Density (pcf)	121.0
OPTIMUM MOISTURE (%)	13.2	Corrected Optimum Moisture (%)	10.9

SAMPLE ID	PF-3
SAMPLE TYPE	BULK
SAMPLE DEPTH	-

LL	43
PL	18
PI	25
MC	18.1%

DESCRIPTION	Yellowish brown (10 YR 5/8) clayey sand with gravel
USCS	SC

Rocky Flats/Field & Lab Testing/CO
043-2246.0001

TECH	DT
DATE	7/16/04
REVIEW	NG

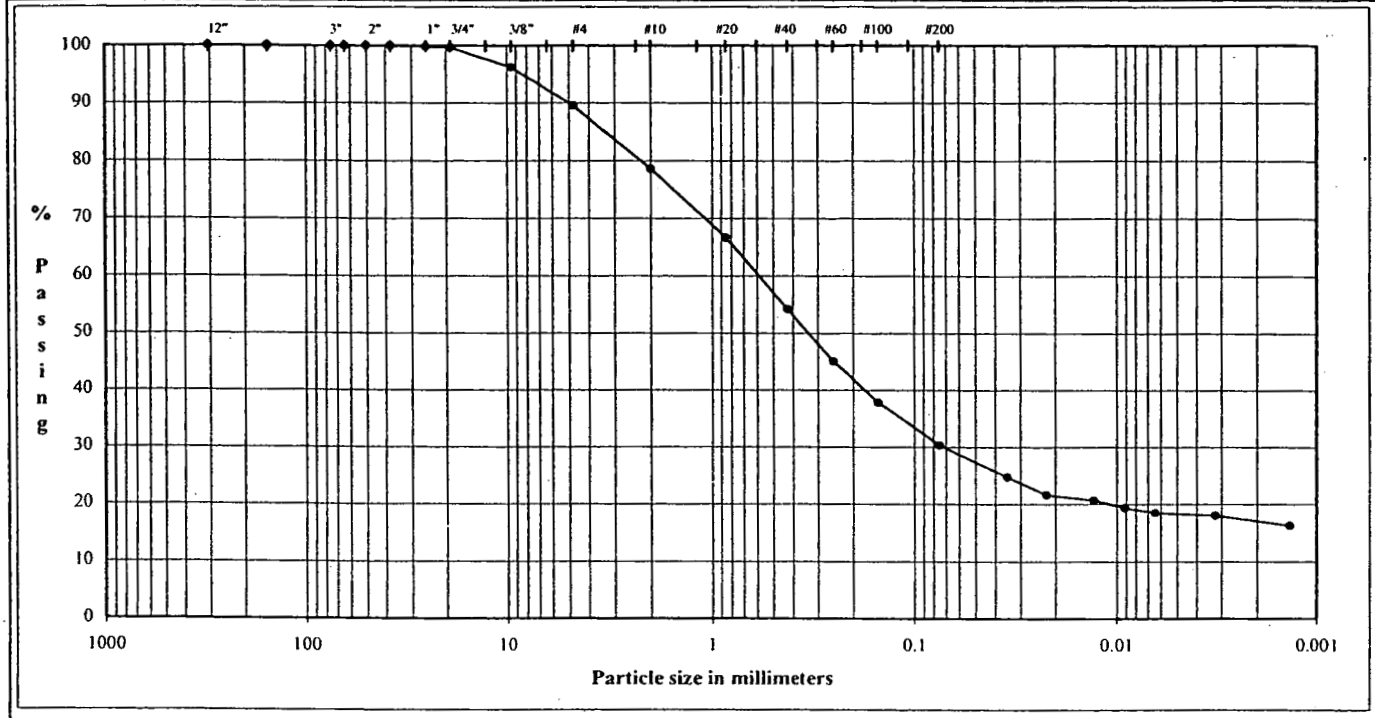
July-04

043-2246.0001

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **Rocky Flats/Field & Lab Testing/CO**
SAMPLE ID: **PF-4** Depth (ft): -
TYPE: **BULK**



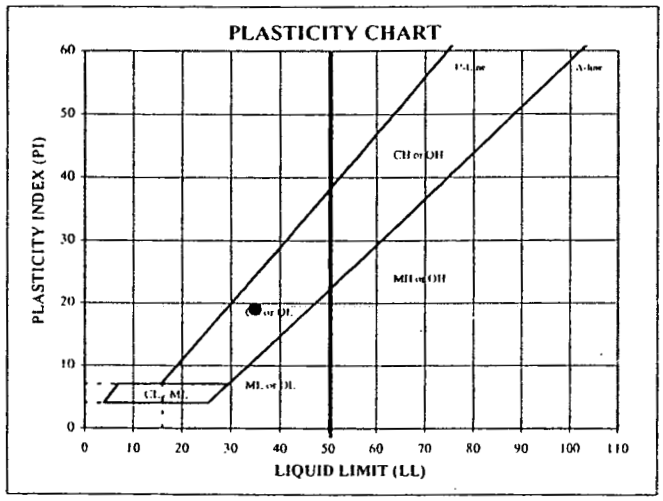
COBBLES	GRAVEL		SAND			FINES
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	0.00
3.0"	75.0	100.0		
2.5"	63.5	100.0		
2.0"	50.0	100.0		
1.5"	37.5	100.0		
1.0"	25.0	99.9	Coarse Gravel	0.34
0.75"	19.0	99.7		
0.375"	9.5	96.2		
#4	4.8	89.4	Fine Gravel	10.21
#10	2.00	78.6	Coarse Sand	10.87
#20	0.85	66.6		
#40	0.43	54.1	Medium Sand	24.43
#60	0.25	45.0		
#100	0.15	37.8		
#200	0.075	30.3	Fine Sand	23.89

Hydrometer Analysis

(mm)	%Finer		
0.035	24.6		
0.022	21.5		
0.013	20.7	Fines	
0.0091	19.3	Silt or Clay	30.25
0.0064	18.5		
0.0032	18.0		
0.0014	16.3		



ATTERBERG LIMITS

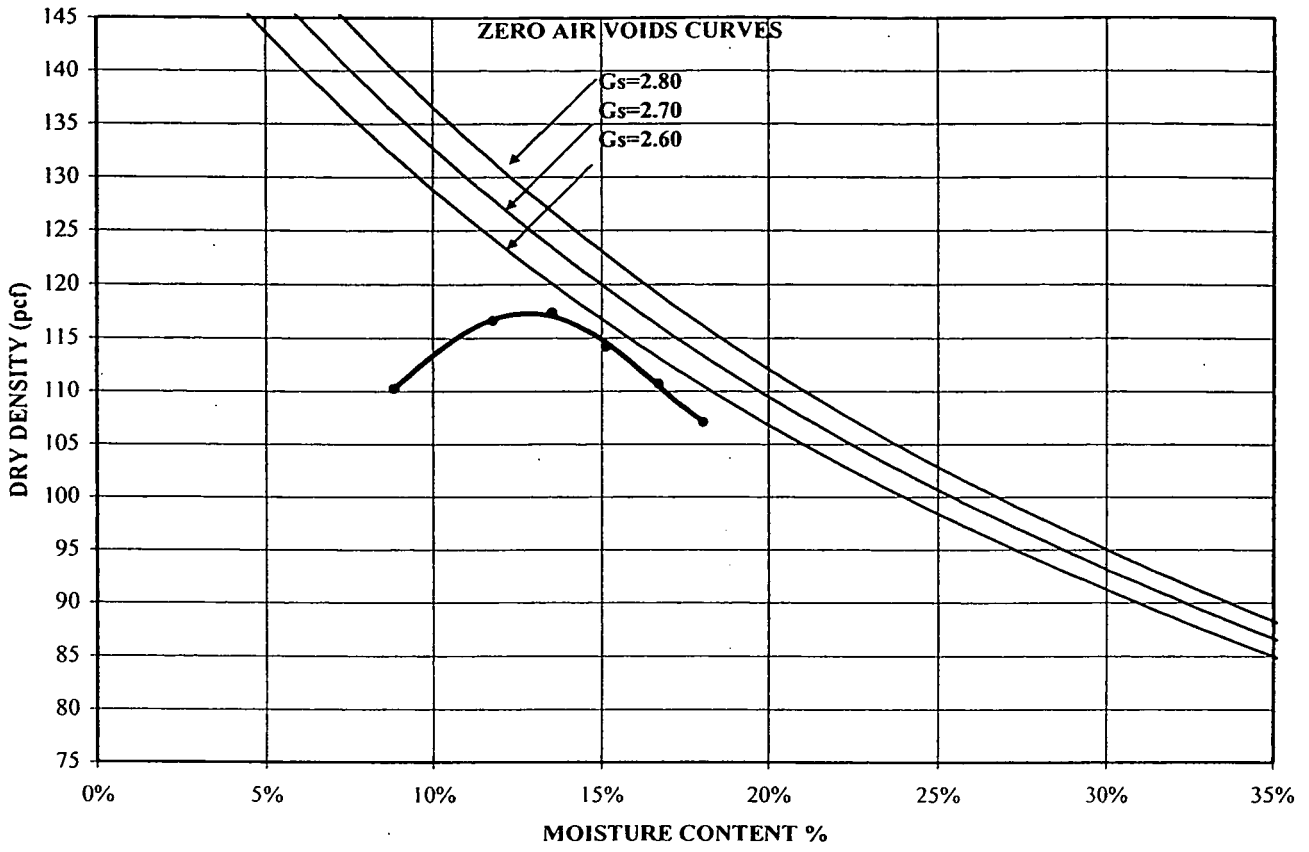
M,	LL	PL	PI	SpG
17.4	35	16	19	

DESCRIPTION: Yellowish brown (10YR 5/8) clayey sand

USCS: SC

TECH	JR
DATE	7/19/2004
REVIEW	MB

MOISTURE / DRY DENSITY CURVE
D 698 METHOD A



MAXIMUM DRY DENSITY (pcf)	117.6	Corrected Maximum Dry Density (pcf)	122.9
OPTIMUM MOISTURE (%)	12.9	Corrected Optimum Moisture (%)	10.6

SAMPLE ID	PF-4
SAMPLE TYPE	BULK
SAMPLE DEPTH	-

LL	35
PL	16
PI	19
MC	1.2%

DESCRIPTION	Yellowish brown (10YR 5/8) clayey sand
USCS	SC

Rocky Flats/Field & Lab Testing/CO
043-2246.0001

TECH	JR
DATE	7-20-04
REVIEW	MB

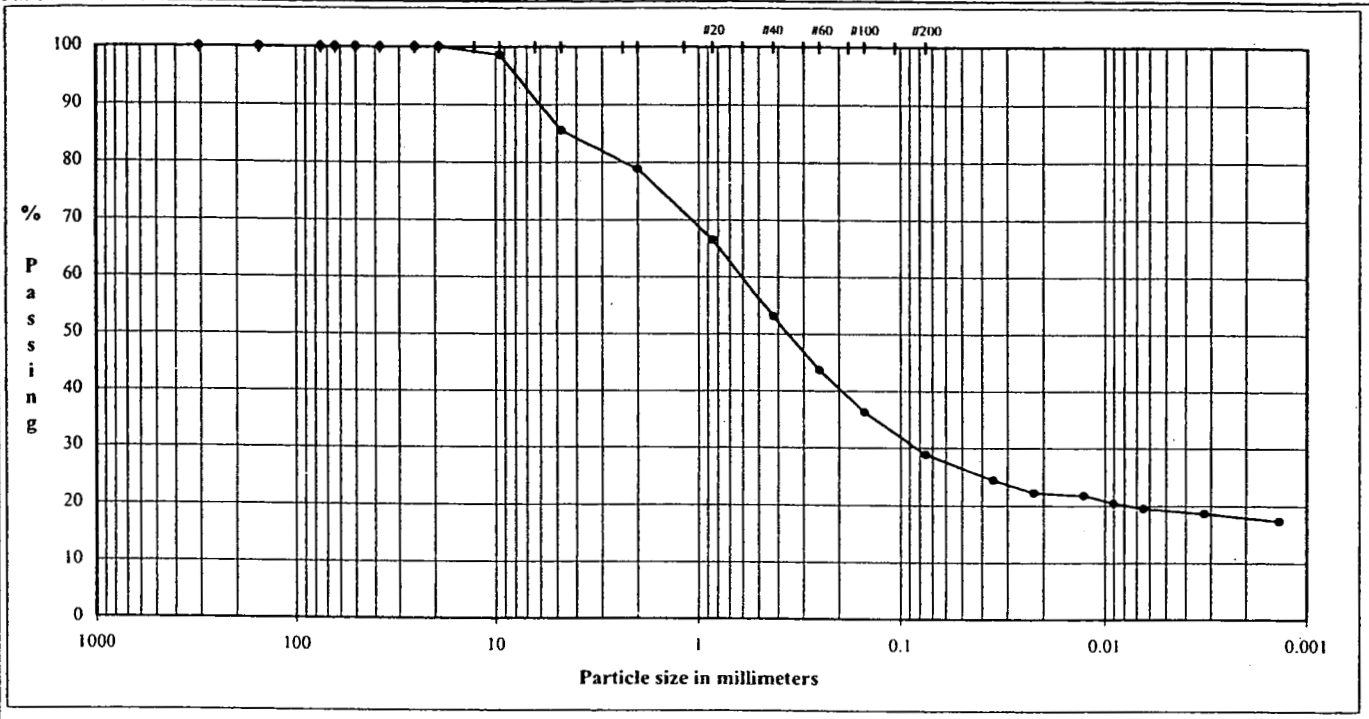
July-04

043-2246.0001

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **Rocky Flats/Field & Lab Testing/CO**
SAMPLE ID: **PF-5** Depth (ft): -
TYPE: **BULK**



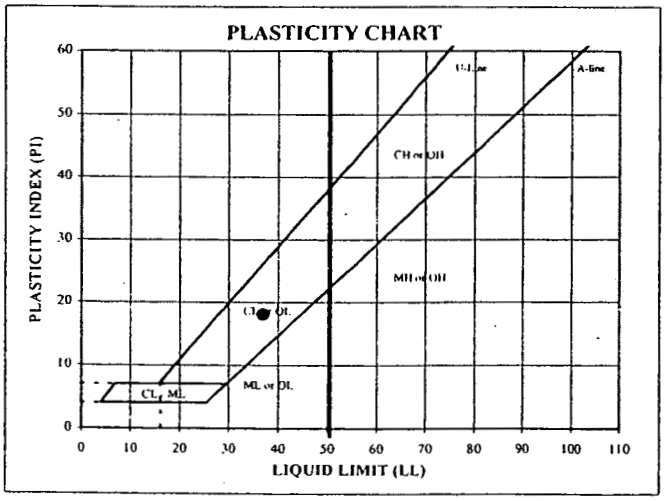
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	0.00
3.0"	75.0	100.0		
2.5"	63.5	100.0		
2.0"	50.0	100.0		
1.5"	37.5	100.0		
1.0"	25.0	100.0	Coarse Gravel	0.00
0.75"	19.0	100.0		
0.375"	9.5	98.6		
#4	4.8	85.5	Fine Gravel	14.49
#10	2.00	78.8	Coarse Sand	6.66
#20	0.85	66.4		
#40	0.43	53.1	Medium Sand	25.79
#60	0.25	43.6		
#100	0.15	36.2		
#200	0.075	28.8	Fine Sand	24.21

Hydrometer Analysis

(mm)	%Finer		
0.035	24.4		
0.022	22.2		
0.013	21.7	Fines	
0.0090	20.4	Silt or Clay	28.84
0.0065	19.5		
0.0032	18.6		
0.0014	17.3		



ATTERBERG LIMITS

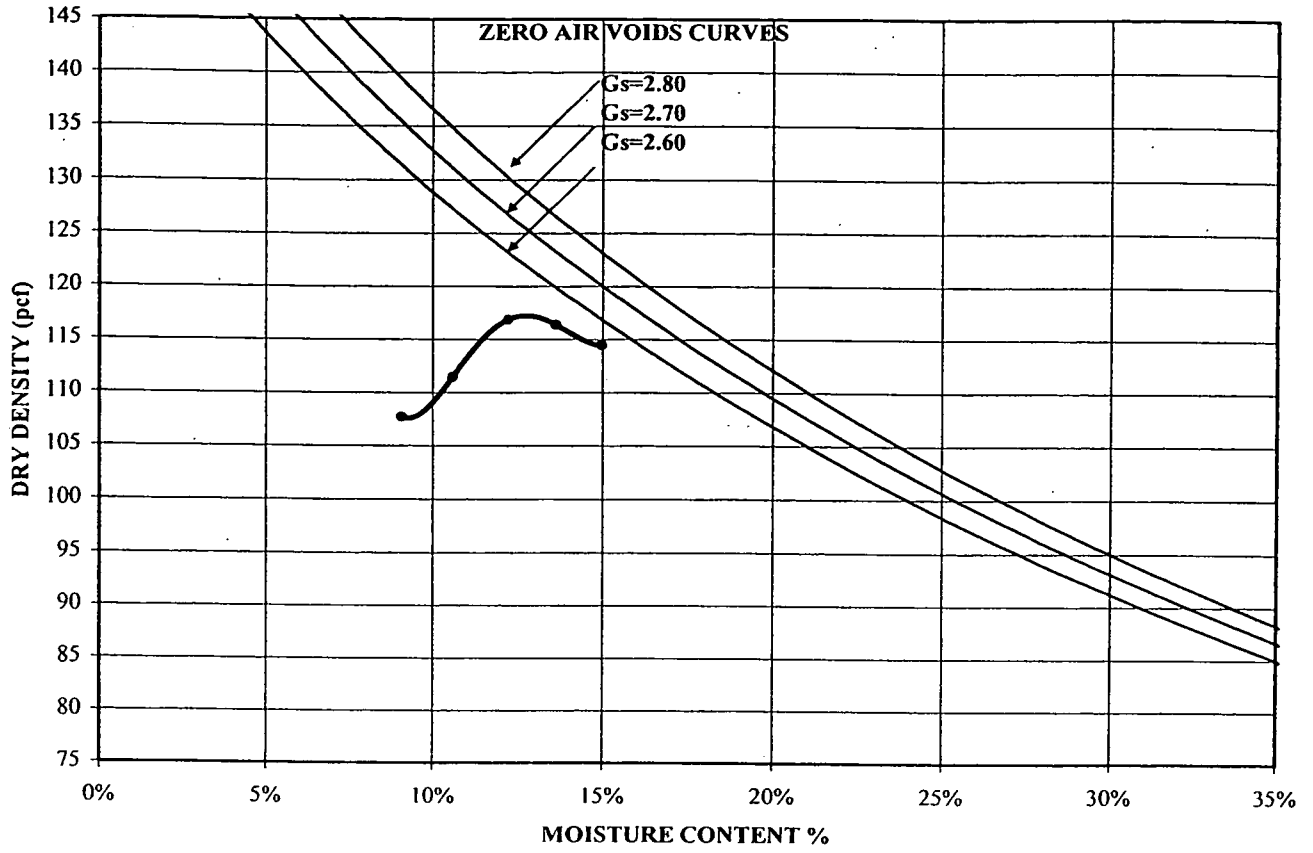
M_c	LL	PL	PI	SpG
12.8	37	19	18	

DESCRIPTION: Yellowish brown (10 YR 5/8)

USCS: SC

TECH: JR
DATE: 7/19/2004
REVIEW: MB

MOISTURE / DRY DENSITY CURVE
D 698 METHOD A



MAXIMUM DRY DENSITY (pcf)	117.4	Corrected Maximum Dry Density (pcf)	121.9
OPTIMUM MOISTURE (%)	12.7	Corrected Optimum Moisture (%)	10.8

SAMPLE ID	PF-5
SAMPLE TYPE	BULK
SAMPLE DEPTH	-

LL	37
PL	19
PI	18
MC	12.8

DESCRIPTION	Yellowish brown (10 YR 5/8)
USCS	SC

Rocky Flats/Field & Lab Testing/CO
043-2246.0001

TECH	JR
DATE	7-20-04
REVIEW	MB

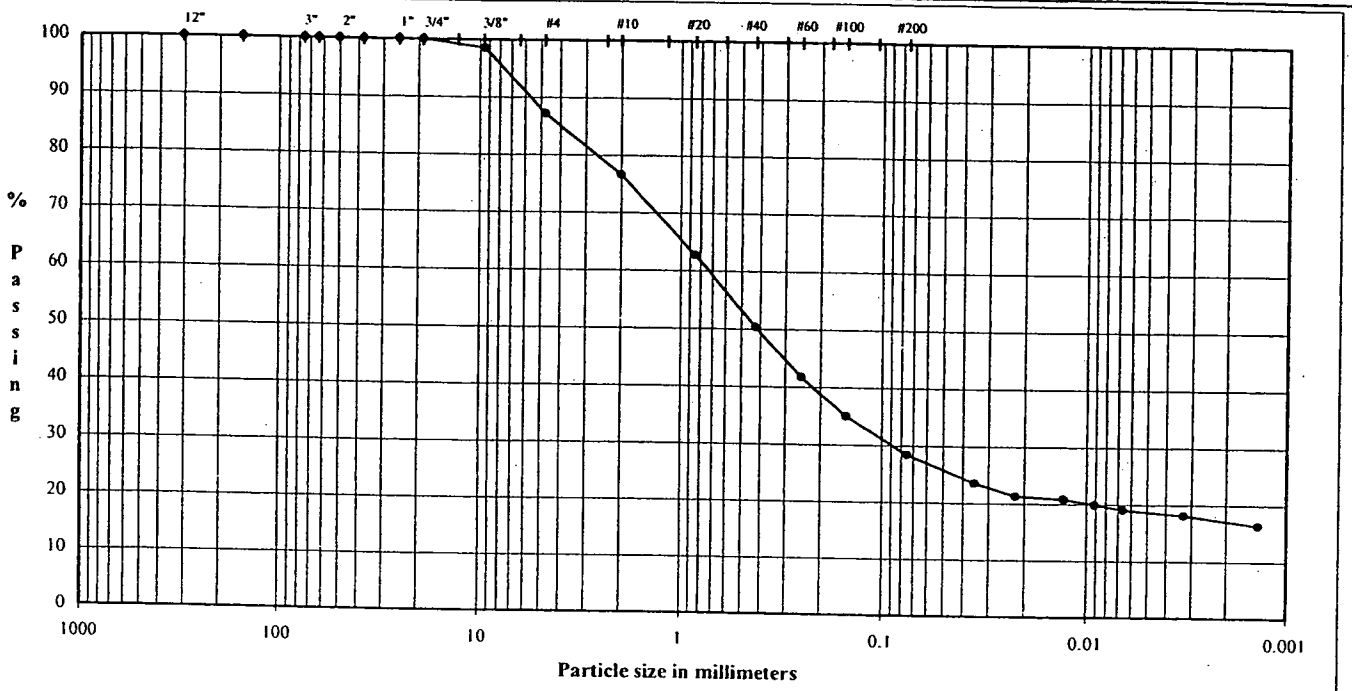
July-04

043-2246.0001

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **Rocky Flats/Field & Lab Testing/CO**
SAMPLE ID: **PF-5 Dup** Depth (ft): -
TYPE: **BULK**



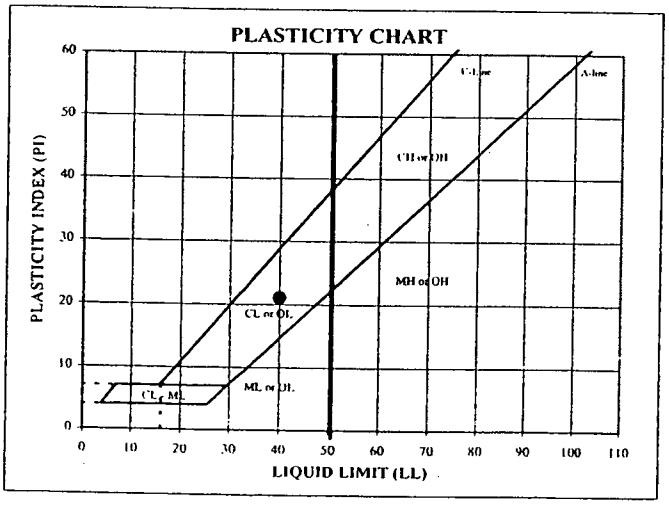
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	0.00
3.0"	75.0	100.0		
2.5"	63.5	100.0		
2.0"	50.0	100.0		
1.5"	37.5	100.0		
1.0"	25.0	100.0	Coarse Gravel	0.00
0.75"	19.0	100.0		
0.375"	9.5	98.6		
#4	4.8	87.2	Fine Gravel	12.78
#10	2.00	76.5	Coarse Sand	10.68
#20	0.85	62.7		
#40	0.43	50.3	Medium Sand	26.21
#60	0.25	41.7		
#100	0.15	35.0		
#200	0.075	28.4	Fine Sand	21.97

Hydrometer Analysis

(mm)	%Finer		
0.035	23.5		
0.022	21.3		
0.013	20.8	Fines	
0.0091	19.9	Silt or Clay	28.36
0.0066	19.0		
0.0033	18.2		
0.0014	16.4		



ATTERBERG LIMITS

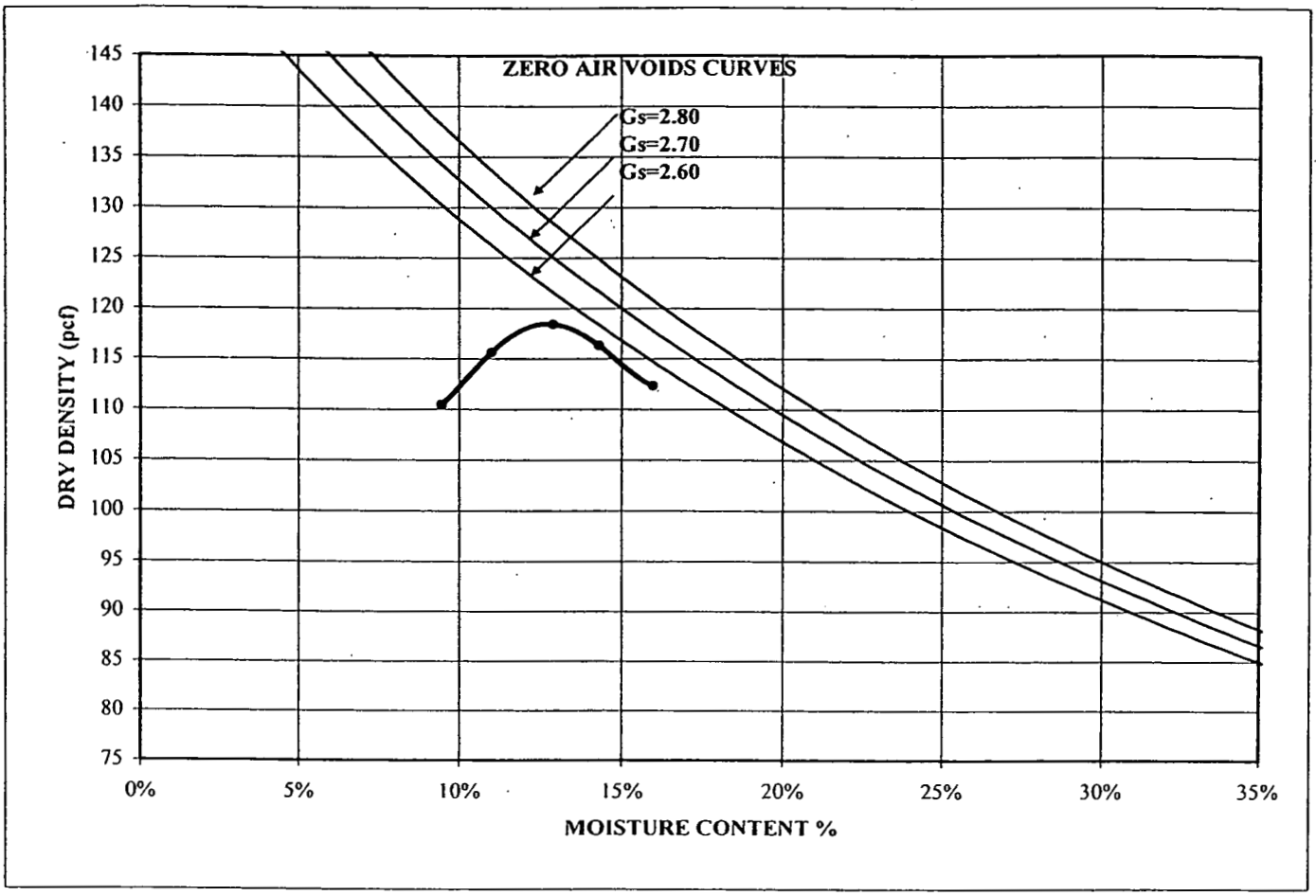
M.	LL	PL	PI	SpG
11.4	40	19	21	

DESCRIPTION: Yellowish brown (10 YR 5/8) clayey sand

USCS: SC

TECH: JR
DATE: 7/21/2004
REVIEW: MB

MOISTURE / DRY DENSITY CURVE
D 698 METHOD A



MAXIMUM DRY DENSITY (pcf)	118.4	Corrected Maximum Dry Density (pcf)	122.3
OPTIMUM MOISTURE (%)	12.8	Corrected Optimum Moisture (%)	11.1

SAMPLE ID	PF-5 Dup
SAMPLE TYPE	BULK
SAMPLE DEPTH	-

LL	40
PL	19
PI	21
MC	11.4

DESCRIPTION	Yellowish brown (10 YR 5/8) clayey sand
USCS	SC

Rocky Flats/Field & Lab Testing/CO
043-2246.0001

TECH	DT
DATE	7-22-04
REVIEW	MB

July-04

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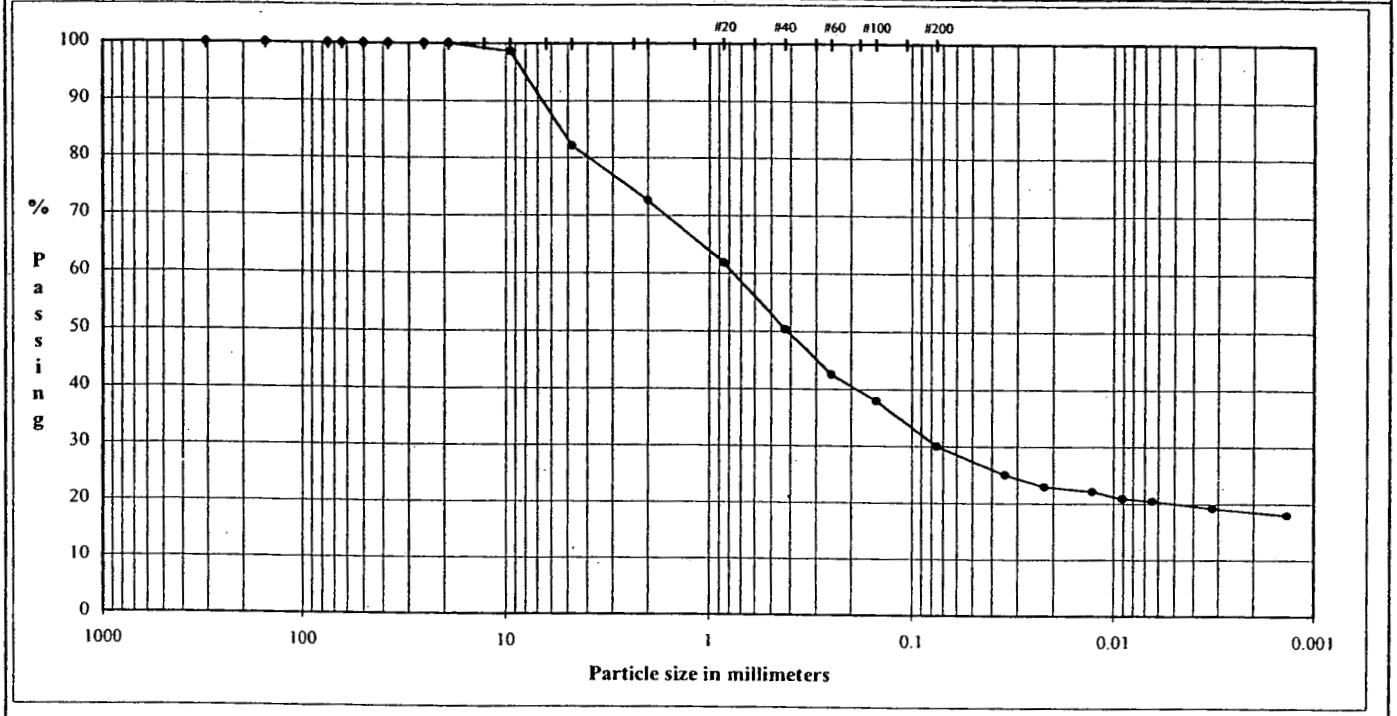
PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **Rocky Flats/Field & Lab Testing/CO**
SAMPLE ID: **PF-6** Depth (ft): -
TYPE: **BULK**



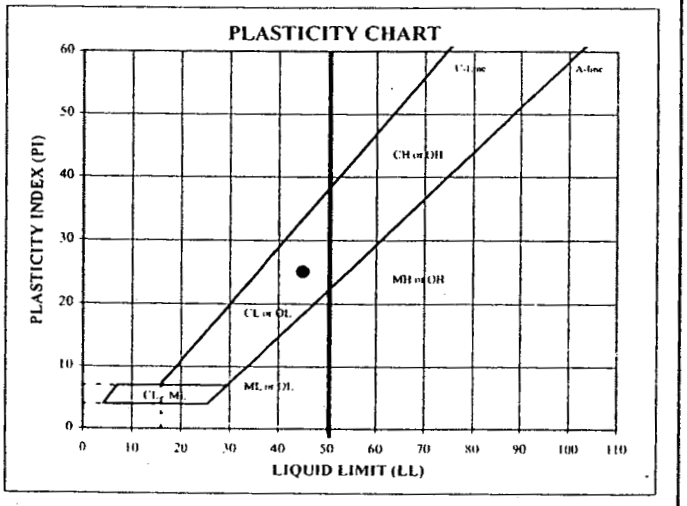
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	0.00
3.0"	75.0	100.0		
2.5"	63.5	100.0		
2.0"	50.0	100.0		
1.5"	37.5	100.0		
1.0"	25.0	100.0	Coarse Gravel	0.00
0.75"	19.0	100.0		
0.375"	9.5	98.6		
#4	4.8	82.1	Fine Gravel	17.91
#10	2.00	72.5	Coarse Sand	9.58
#20	0.85	61.8		
#40	0.43	50.4	Medium Sand	22.15
#60	0.25	42.5		
#100	0.15	37.9		
#200	0.075	30.0	Fine Sand	20.38

Hydrometer Analysis

(mm)	%Finer		
0.034	25.0		
0.022	22.9		
0.013	22.1	Fines	
0.0091	20.8	Silt or Clay	29.98
0.0064	20.4		
0.0032	19.2		
0.0014	17.9		



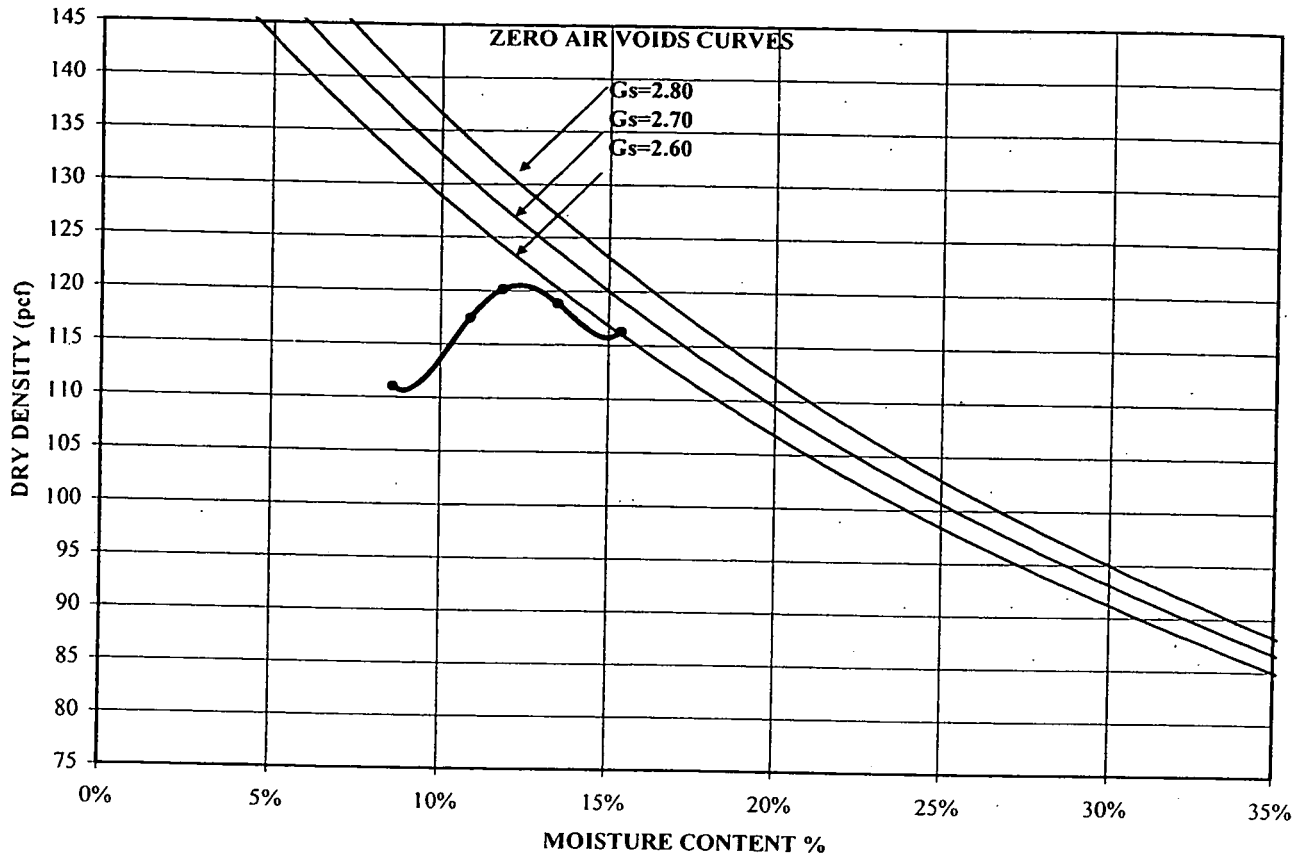
ATTERBERG LIMITS

M_c	LL	PL	PI	SpG
11.5	45	20	25	

DESCRIPTION: Yellowish brown (10 YR 5/8) clayey sand with gravel
USCS: SC

TECH	JR
DATE	7/19/2004
REVIEW	MB

MOISTURE / DRY DENSITY CURVE
D 698 METHOD B



MAXIMUM DRY DENSITY (pcf)	120.3	Corrected Maximum Dry Density (pcf)	120.3
OPTIMUM MOISTURE (%)	12.5	Corrected Optimum Moisture (%)	12.5

SAMPLE ID	PF-6
SAMPLE TYPE	BULK
SAMPLE DEPTH	-

LL	45
PL	20
PI	25
MC	11.5%

DESCRIPTION	Yellowish brown (10 YR 5/8) clayey sand with gravel
USCS	SC

Rocky Flats/Field & Lab Testing/CO
043-2246.0001

TECH	JR
DATE	7-20-04
REVIEW	MB

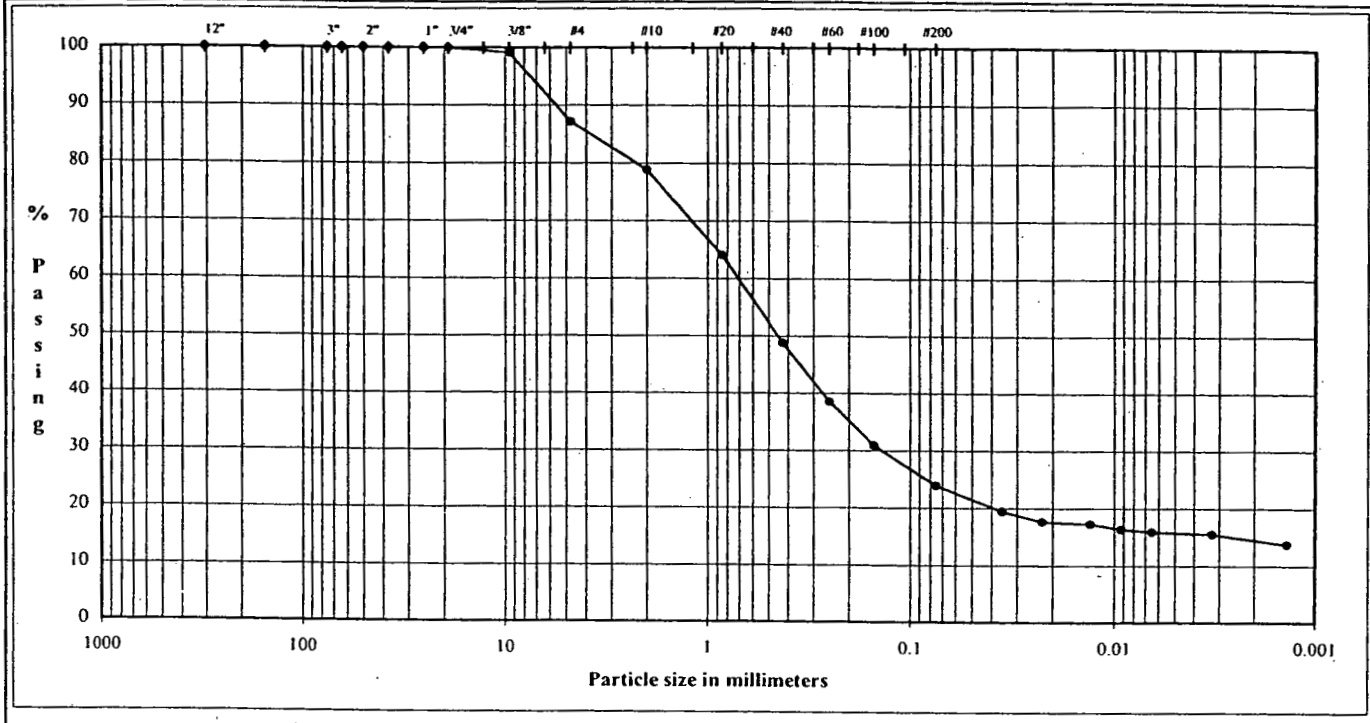
July-04

043-2246.0001

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **Rocky Flats/Field & Lab Testing/CO**
SAMPLE ID: **PF-7** Depth (ft): -
TYPE: **BULK**



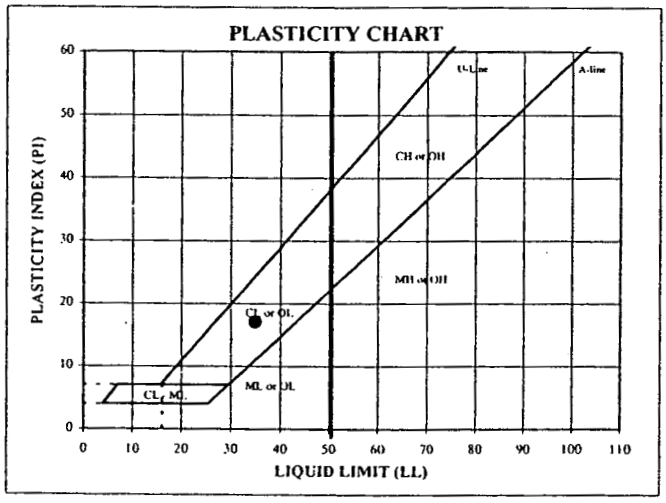
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	0.00
3.0"	75.0	100.0		
2.5"	63.5	100.0		
2.0"	50.0	100.0		
1.5"	37.5	100.0		
1.0"	25.0	100.0	Coarse Gravel	0.00
0.75"	19.0	100.0		
0.375"	9.5	99.1		
#4	4.8	87.1	Fine Gravel	12.89
#10	2.00	78.8	Coarse Sand	8.34
#20	0.85	64.0		
#40	0.43	48.7	Medium Sand	30.05
#60	0.25	38.5		
#100	0.15	30.8		
#200	0.075	23.8	Fine Sand	24.87

Hydrometer Analysis

(mm)	%Finer		
0.035	19.4		
0.023	17.7		
0.013	17.2	Fines	
0.0092	16.3	Silt or Clay	23.85
0.0064	15.9		
0.0033	15.4		
0.0014	13.7		



ATTERBERG LIMITS

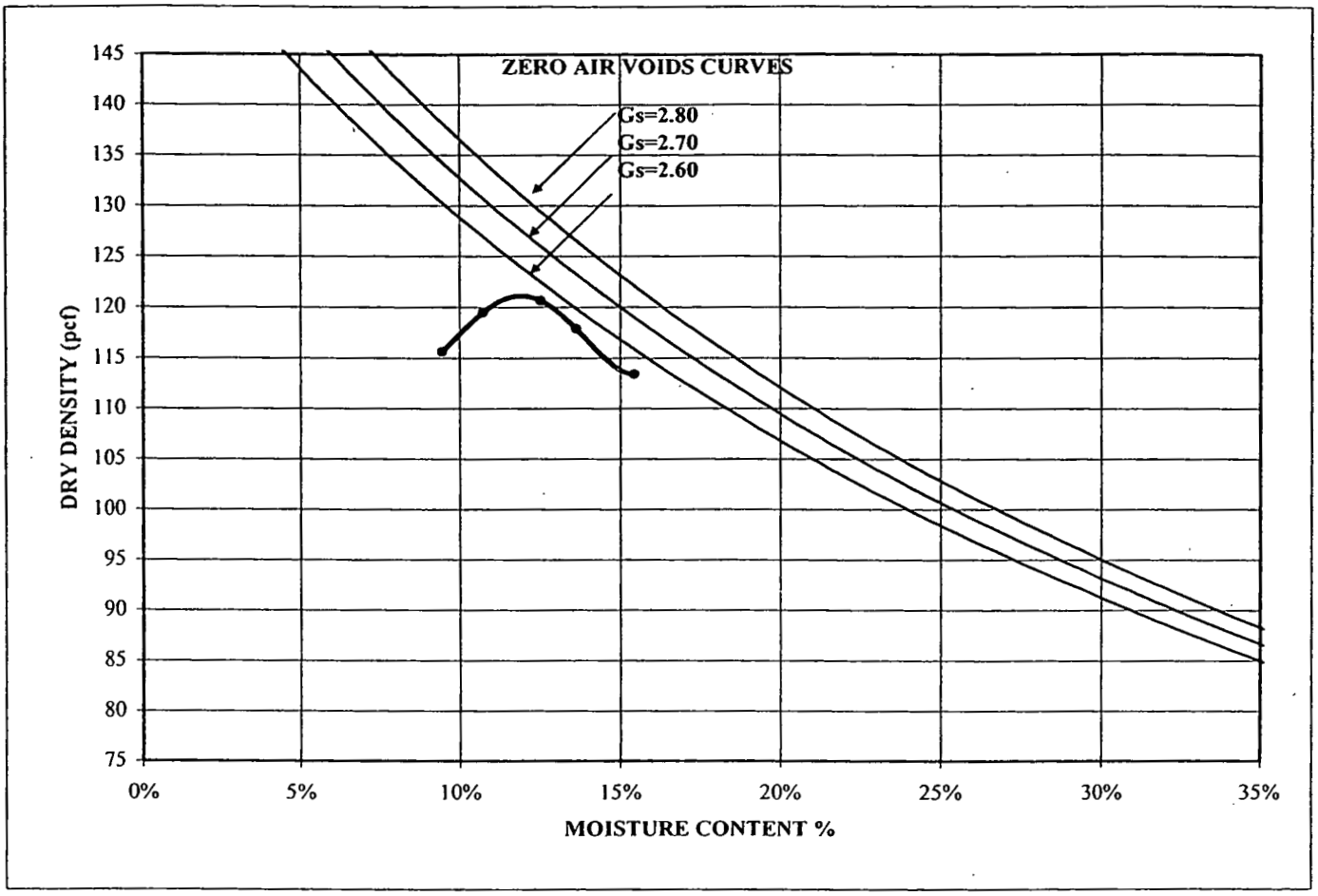
M,	LL	PL	PI	SpG
13.5	35	18	17	

DESCRIPTION: Yellowish brown (10 YR 5/8) clayey sand

USCS: SC

TECH	JR
DATE	7/19/2004
REVIEW	MB

MOISTURE / DRY DENSITY CURVE
D 698 METHOD A



MAXIMUM DRY DENSITY (pcf)	121.1	Corrected Maximum Dry Density (pcf)	125.1
OPTIMUM MOISTURE (%)	12.0	Corrected Optimum Moisture (%)	10.3

SAMPLE ID	PF-7
SAMPLE TYPE	BULK
SAMPLE DEPTH	-

LL	35
PL	18
PI	17
MC	13.5

DESCRIPTION	Yellowish brown (10 YR 5/8) clayey sand
USCS	SC

Rocky Flats/Field & Lab Testing/CO
043-2246.0001

TECH	JR
DATE	7-20-04
REVIEW	MB

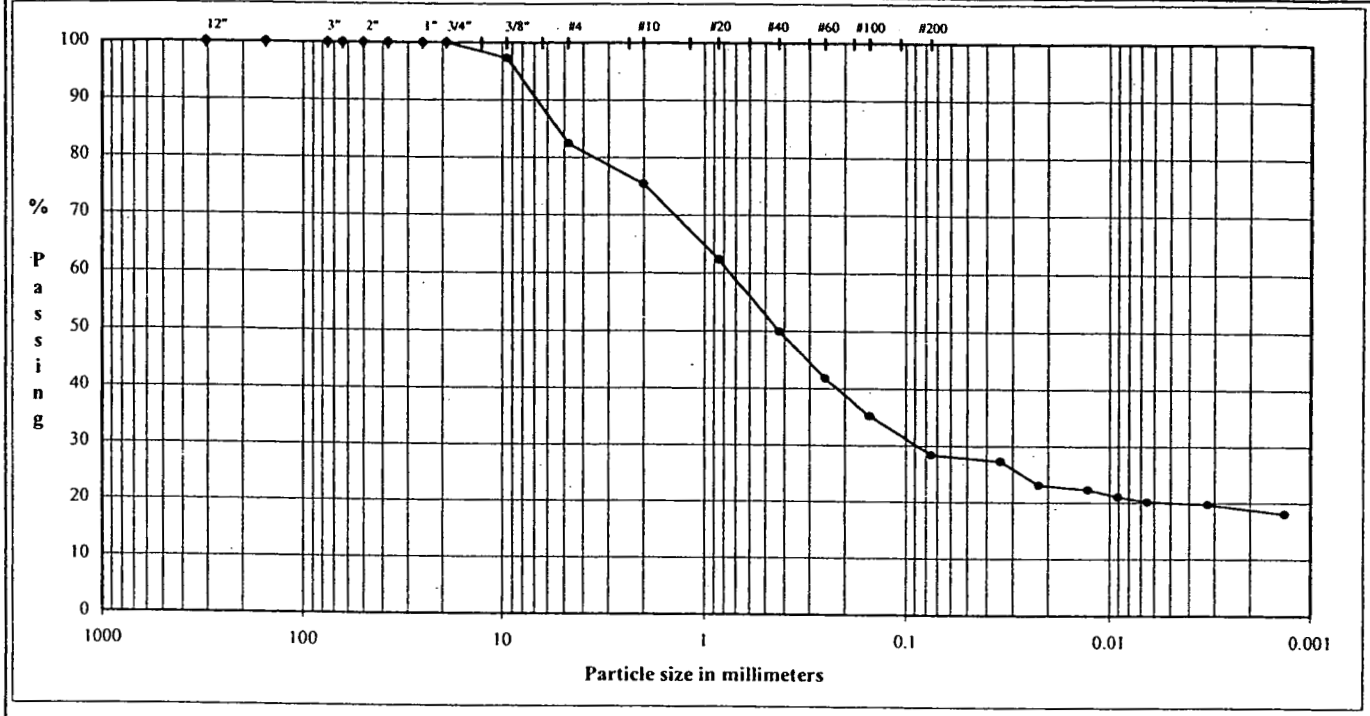
July-04

043-2246.0001

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **Rocky Flats/Field & Lab Testing/CO**
SAMPLE ID: **PF-8** Depth (ft): -
TYPE: **BULK**



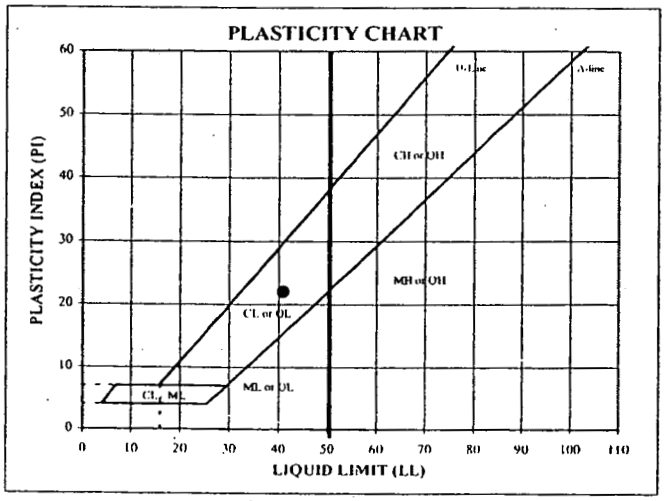
COBBLES	GRAVEL		SAND			FINES
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	0.00
3.0"	75.0	100.0		
2.5"	63.5	100.0		
2.0"	50.0	100.0		
1.5"	37.5	100.0		
1.0"	25.0	100.0	Coarse Gravel	0.00
0.75"	19.0	100.0		
0.375"	9.5	97.3		
#4	4.8	82.4	Fine Gravel	17.65
#10	2.00	75.3	Coarse Sand	7.03
#20	0.85	62.3		
#40	0.43	49.9	Medium Sand	25.41
#60	0.25	41.8		
#100	0.15	35.2		
#200	0.075	28.3	Fine Sand	21.57

Hydrometer Analysis

(mm)	%Finer		
0.034	27.3		
0.022	23.1		
0.013	22.2	Fines	
0.0091	21.0	Silt or Clay	28.34
0.0065	20.1		
0.0032	19.7		
0.0013	18.0		



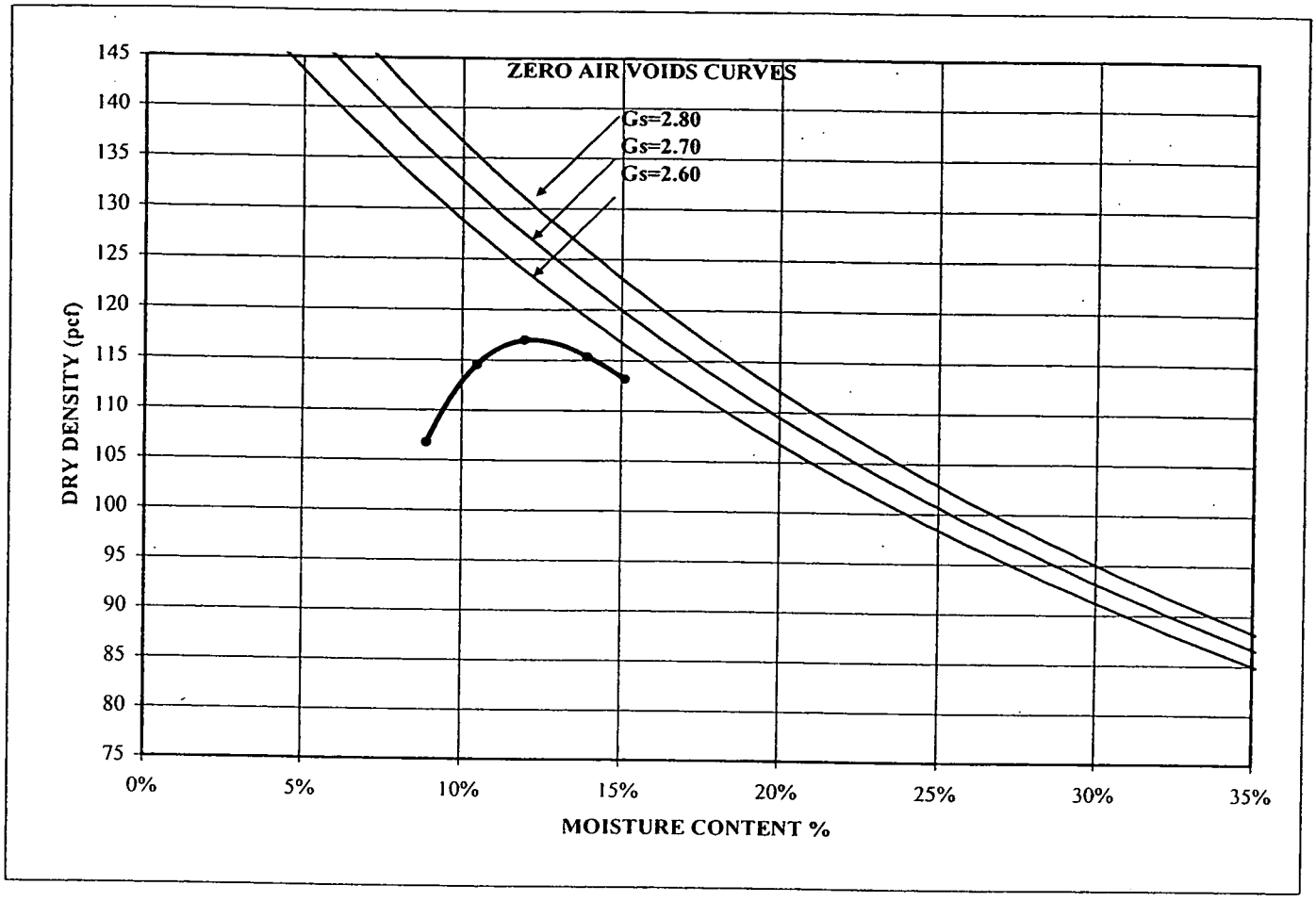
ATTERBERG LIMITS

M_c	LL	PL	PI	SpG
14.9	41	19	22	–

DESCRIPTION: Yellowish brown (10 YR 5/8) clayey sand with gravel
USCS: SC

TECH	JR
DATE	7/15/2004
REVIEW	NG

MOISTURE / DRY DENSITY CURVE
D 698 METHOD B



MAXIMUM DRY DENSITY (pcf)	117.2	Corrected Maximum Dry Density (pcf)	117.9
OPTIMUM MOISTURE (%)	12.2	Corrected Optimum Moisture (%)	11.9

SAMPLE ID	PF-8
SAMPLE TYPE	BULK
SAMPLE DEPTH	-

LL	41
PL	19
PI	22
MC	14.9%

DESCRIPTION	Yellowish brown (10 YR 5/8) clayey sand with gravel
USCS	SC

Rocky Flats/Field & Lab Testing/CO
043-2246.0001

TECH	DT
DATE	7/16/04
REVIEW	NG

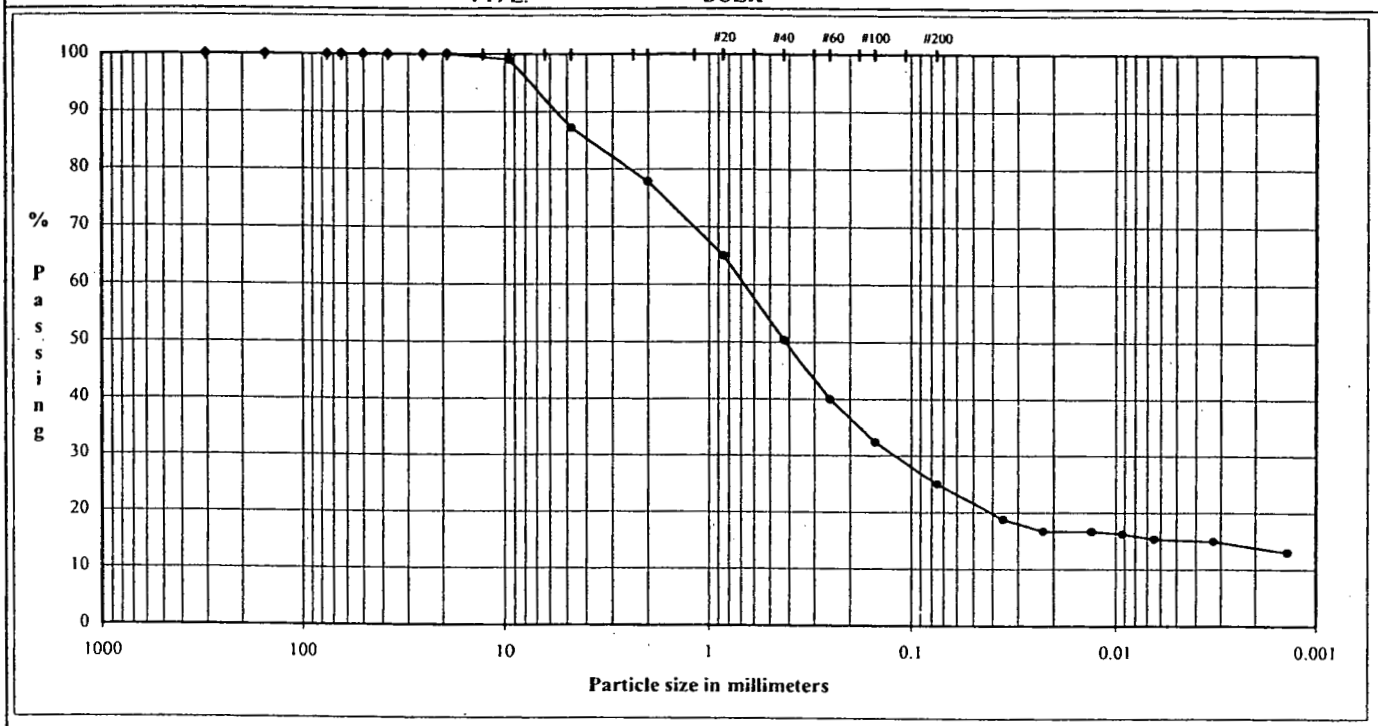
July-04

043-2246.0001

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **Rocky Flats/Field & Lab Testing/CO**
SAMPLE ID: **PF-9** Depth (ft): -
TYPE: **BULK**



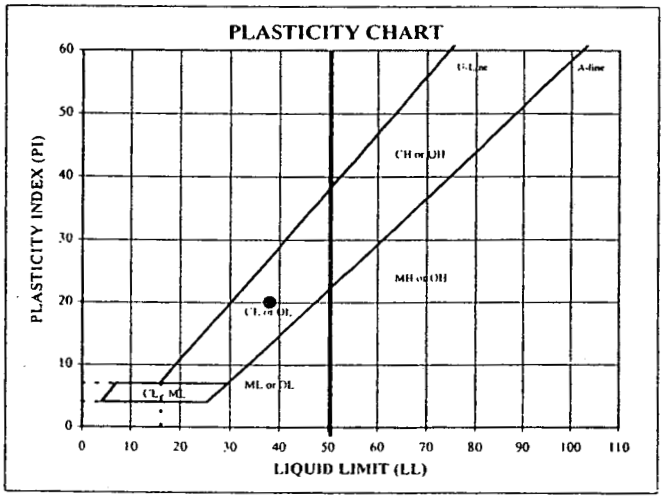
COBBLES	GRAVEL		SAND			FINES
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	0.00
3.0"	75.0	100.0		
2.5"	63.5	100.0		
2.0"	50.0	100.0		
1.5"	37.5	100.0		
1.0"	25.0	100.0	Coarse Gravel	0.00
0.75"	19.0	100.0		
0.375"	9.5	99.0		
#4	4.8	87.2	Fine Gravel	12.85
#10	2.00	77.8	Coarse Sand	9.38
#20	0.85	65.0		
#40	0.43	50.3	Medium Sand	27.47
#60	0.25	39.9		
#100	0.15	32.3		
#200	0.075	24.9	Fine Sand	25.38

Hydrometer Analysis

(mm)	%Finer		
0.035	18.8		
0.023	16.6		
0.013	16.6	Fines	
0.0092	16.2	Silt or Clay	24.92
0.0064	15.3		
0.0033	14.9		
0.0014	13.0		



ATTERBERG LIMITS

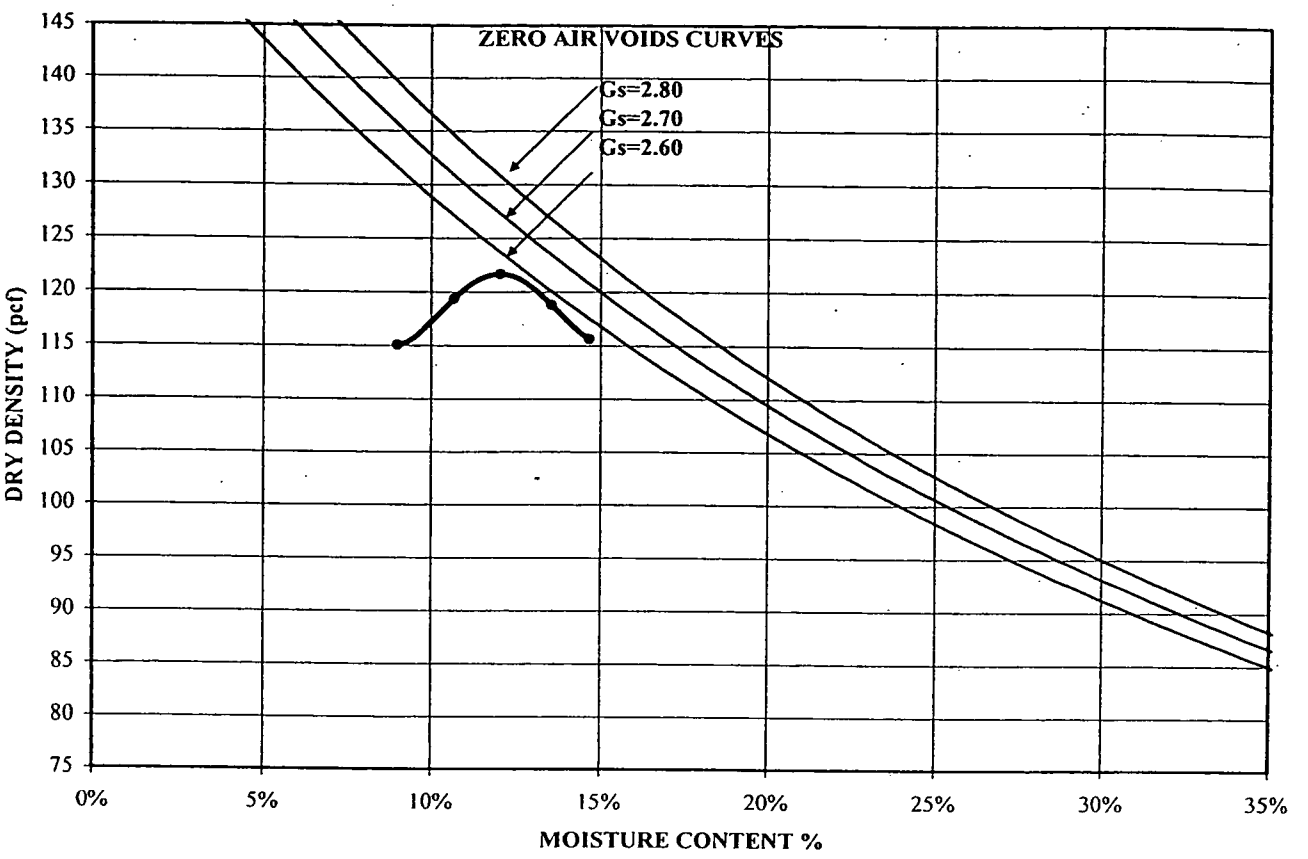
M_c	LL	PL	PI	SpG
13.8	38	18	20	

DESCRIPTION: Yellowish brown (10 YR 5/8) clayey sand

USCS: SC

TECH	JR
DATE	7/19/2004
REVIEW	MB

MOISTURE / DRY DENSITY CURVE
D 698 METHOD A



MAXIMUM DRY DENSITY (pcf)	121.6	Corrected Maximum Dry Density (pcf)	125.1
OPTIMUM MOISTURE (%)	12.0	Corrected Optimum Moisture (%)	10.4

SAMPLE ID	PF-9
SAMPLE TYPE	BULK
SAMPLE DEPTH	-

LL	38
PL	18
PI	20
MC	13.8%

DESCRIPTION	Yellowish brown (10 YR 5/8) clayey sand
USCS	SC

Rocky Flats/Field & Lab Testing/CO
043-2246.0001

TECH	JR
DATE	7-20-04
REVIEW	MB

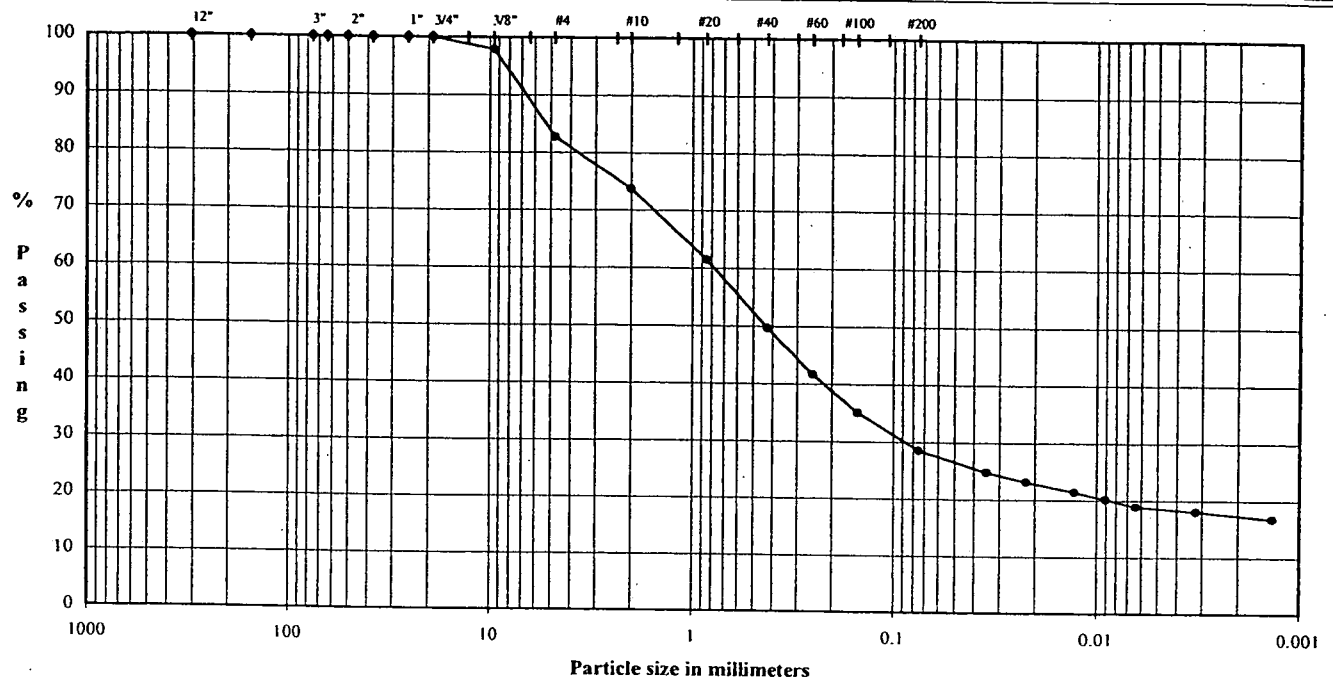
July-04

043-2246.0001

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **Rocky Flats/Field & Lab Testing/CO**
SAMPLE ID: **PF-10** Depth (ft): -
TYPE: **BULK**



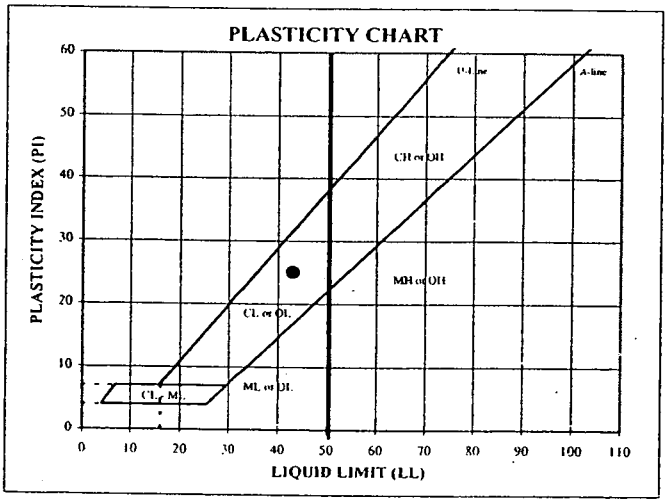
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	0.00
3.0"	75.0	100.0		
2.5"	63.5	100.0		
2.0"	50.0	100.0		
1.5"	37.5	100.0		
1.0"	25.0	100.0	Coarse Gravel	0.00
0.75"	19.0	100.0		
0.375"	9.5	97.9		
#4	4.8	82.7	Fine Gravel	17.34
#10	2.00	73.7	Coarse Sand	8.92
#20	0.85	61.4		
#40	0.43	49.6	Medium Sand	24.10
#60	0.25	41.6		
#100	0.15	35.1		
#200	0.075	28.5	Fine Sand	21.13

Hydrometer Analysis

(mm)	%Finer		
0.035	24.8		
0.022	23.1		
0.013	21.4	Fines	
0.0091	20.1	Silt or Clay	28.52
0.0064	18.9		
0.0032	18.0		
0.0014	16.8		



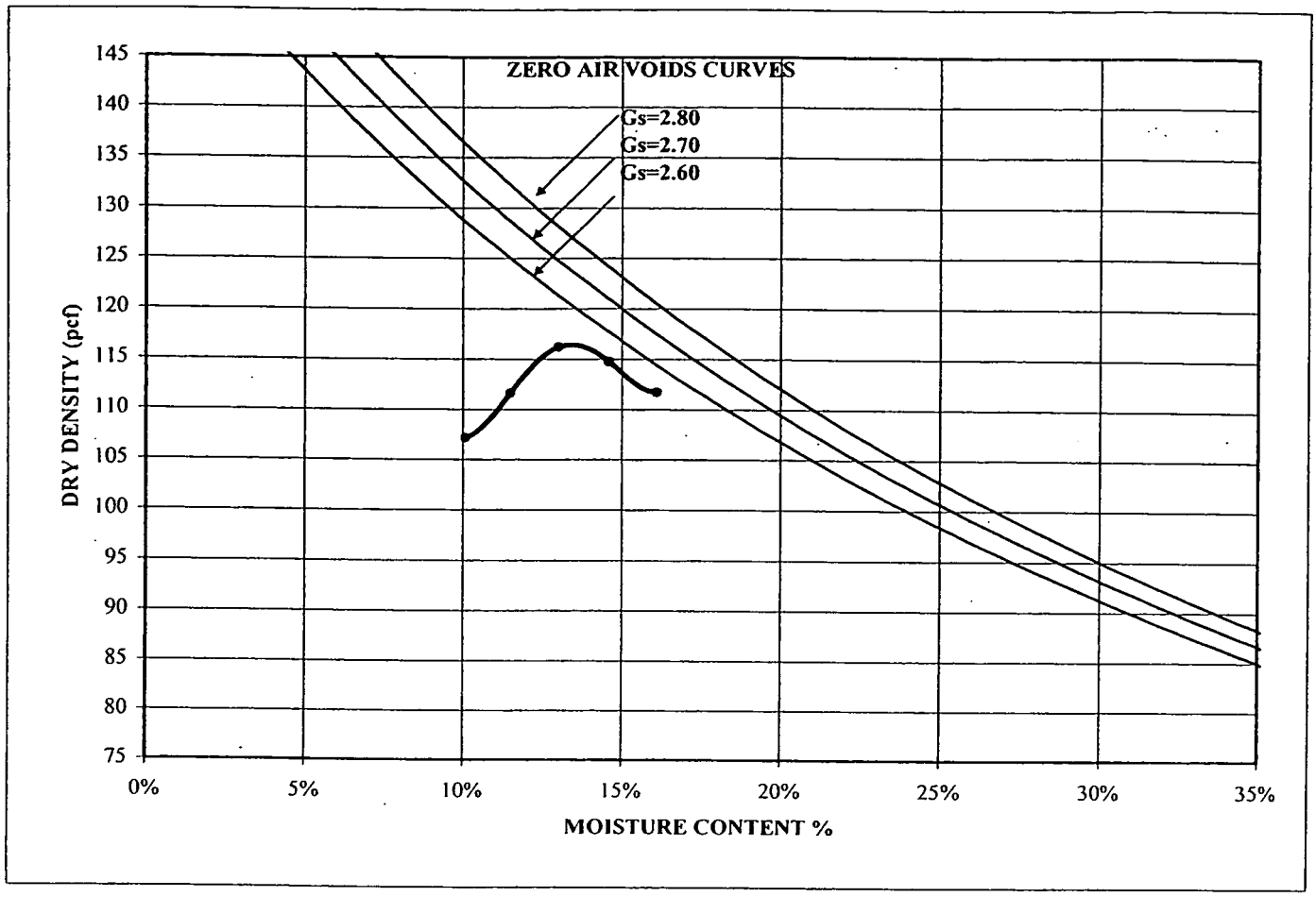
ATTERBERG LIMITS

M_c	LL	PL	PI	SpG
14.8	43	18	25	

DESCRIPTION: Yellowish brown (10 YR 5/8) clayey sand with gravel
USCS: SC

TECH: JR
DATE: 7/21/2004
REVIEW: MB

MOISTURE / DRY DENSITY CURVE
D 698 METHOD A



MAXIMUM DRY DENSITY (pcf)	116.4	Corrected Maximum Dry Density (pcf)	122.1
OPTIMUM MOISTURE (%)	13.5	Corrected Optimum Moisture (%)	11.0

SAMPLE ID	PF-10
SAMPLE TYPE	BULK
SAMPLE DEPTH	-

LL	43
PL	18
PI	25
MC	14.8

DESCRIPTION	Yellowish brown (10 YR 5/8) clayey sand with gravel
USCS	SC

Rocky Flats/Field & Lab Testing/CO
043-2246.0001

TECH	DT
DATE	7-22-04
REVIEW	MB

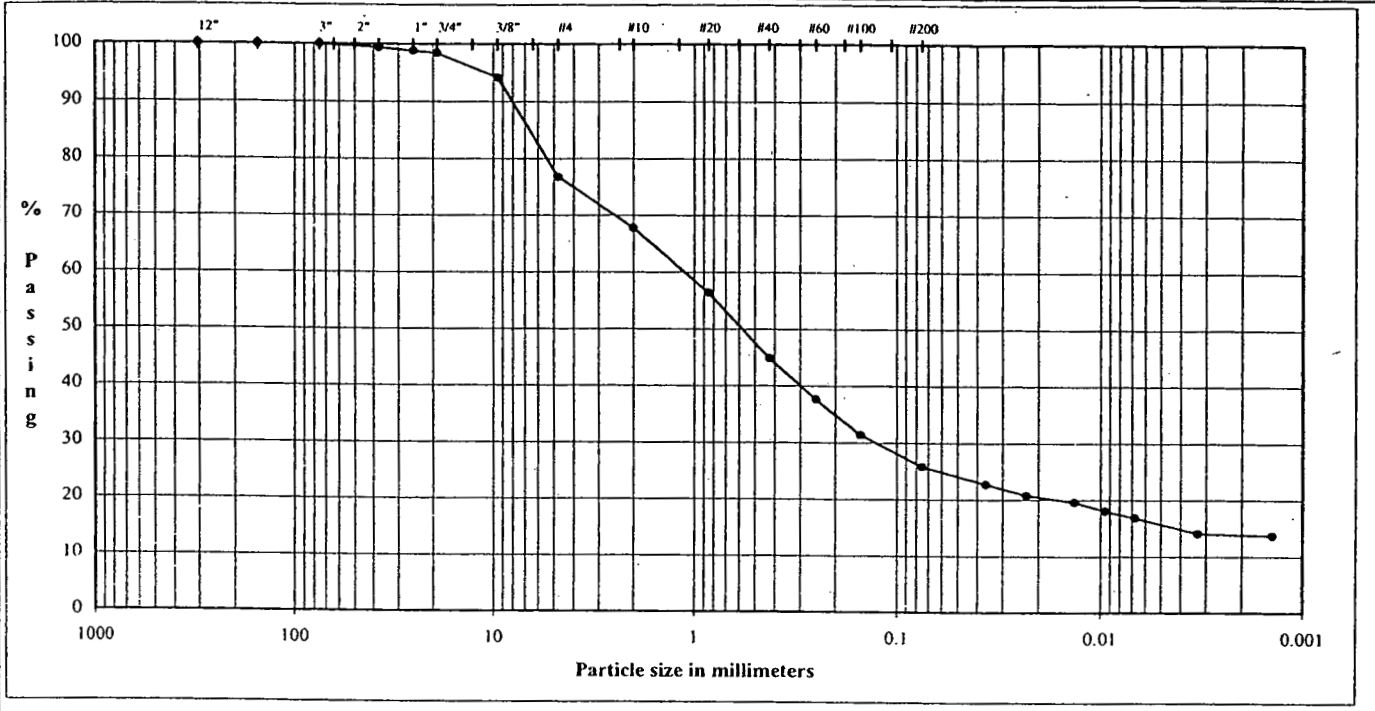
##########

043-2246.0001

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **Rocky Flats/Field & Lab Testing/CO**
SAMPLE ID: **CLP-1** Depth (ft): –
TYPE: **BULK**



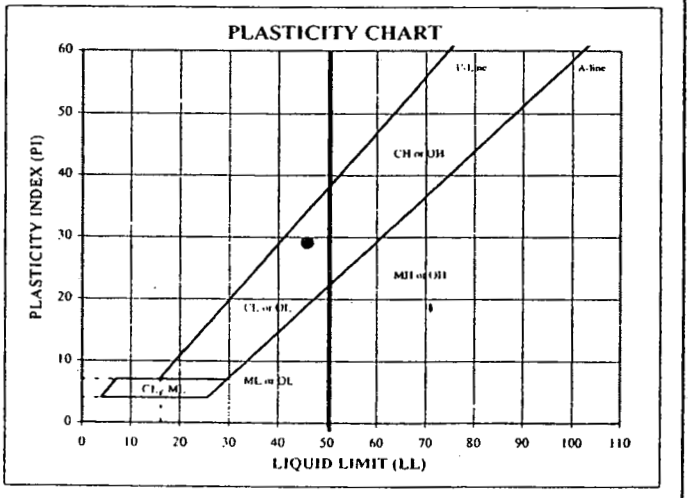
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	0.00
6.0"	154.2	100.0		
6.0"	154.2	100.0		
3.0"	75.0	100.0		
1.5"	37.5	99.4		
1.0"	25.0	98.8	Coarse Gravel	1.59
0.75"	19.0	98.4		
0.375"	9.5	94.1		
#4	4.8	76.7	Fine Gravel	21.76
#10	2.00	67.8	Coarse Sand	8.88
#20	0.85	56.4		
#40	0.43	44.8	Medium Sand	22.97
#60	0.25	37.6		
#100	0.15	31.3		
#200	0.075	25.8	Fine Sand	19.01

Hydrometer Analysis

(mm)	%Finer		
0.036	22.7		
0.023	20.8		
0.013	19.6	Fines	
0.0095	18.0	Silt or Clay	25.80
0.0067	16.8		
0.0033	14.1		
0.0014	13.7		



ATTERBERG LIMITS

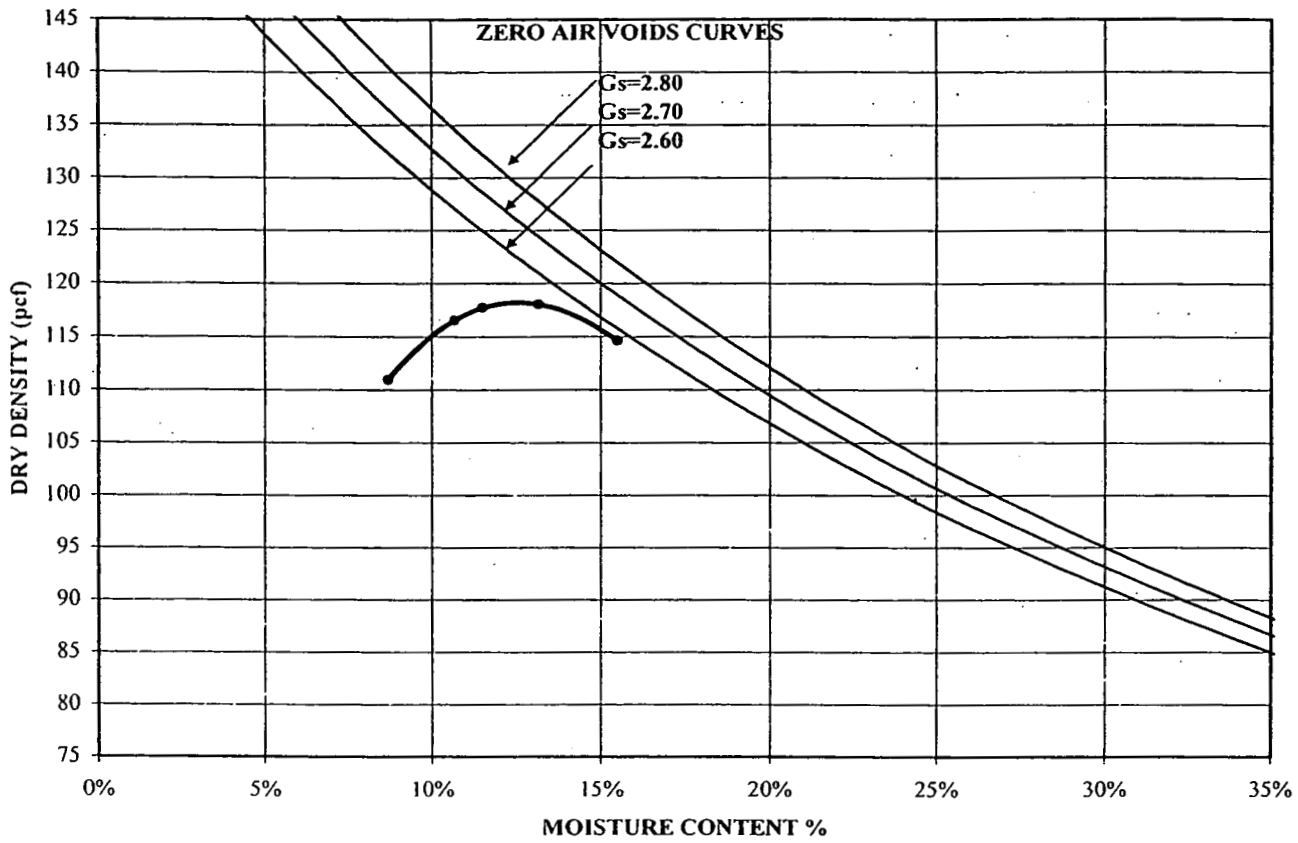
M,	LL	PL	PI	SpG
–	46	17	29	–

DESCRIPTION: Moderate brown (5YR 4/4) clayey sand with gravel

USCS: SC

TECH	MKS
DATE	11/17/2004
REVIEW	MB

MOISTURE / DRY DENSITY CURVE
D 698 METHOD A



MAXIMUM DRY DENSITY (pcf)	118.3	Corrected Maximum Dry Density (pcf)	122.9
OPTIMUM MOISTURE (%)	12.8	Corrected Optimum Moisture (%)	10.8

SAMPLE ID	CLP-1
SAMPLE TYPE	BULK
SAMPLE DEPTH	-

LL	46
PL	17
PI	29
MC	--

DESCRIPTION	Moderate brown (5YR 4/4) clayey sand with gravel
USCS	SC

Rocky Flats/Field & Lab Testing/CO
043-2246.0001

TECH	JR
DATE	11-18-04
REVIEW	MB

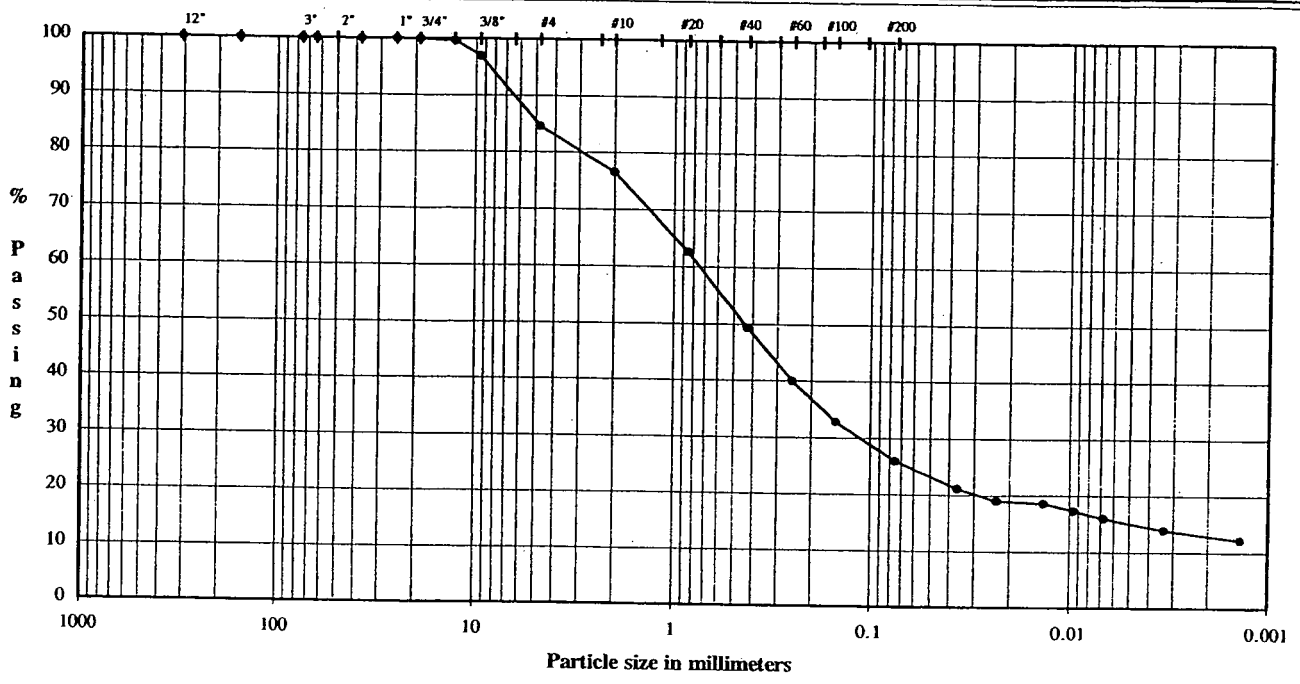
12 05

043-2246-0001

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **Rocky Flats/Field & Lab Testing/CO**
SAMPLE ID: **CLP-2** Depth (ft): -
TYPE: **BULK**



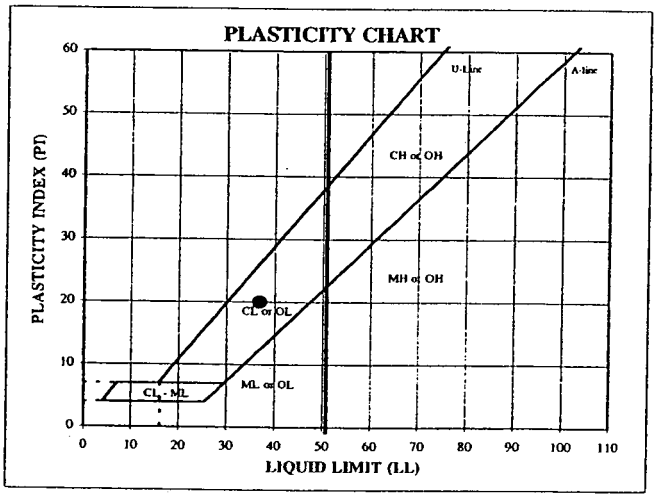
COBBLES	GRAVEL: Coarse	GRAVEL: Fine	SAND: Coarse	SAND: Medium	SAND: Fine	FINES: Silt or Clay

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Particle Size Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	0.00
3.0"	75.0	100.0		
2.5"	63.5	100.0		
1.5"	37.5	100.0		
1.0"	25.0	100.0		
0.75"	19.0	100.0	Coarse Gravel	0.00
0.5"	12.6	99.7		
0.375"	9.5	97.1		
#4	4.8	84.6	Fine Gravel	15.36
#10	2.00	76.7	Coarse Sand	7.98
#20	0.85	62.7		
#40	0.43	49.5	Medium Sand	27.20
#60	0.25	40.1		
#100	0.15	32.9		
#200	0.075	26.0	Fine Sand	23.45

Hydrometer Analysis

(mm)	%Finer		
0.036	21.2		
0.023	19.1		
0.013	18.7	Fines	
0.0095	17.4	Silt or Clay	26.01
0.0068	16.1		
0.0033	14.0		
0.0014	12.3		



ATTERBERG LIMITS

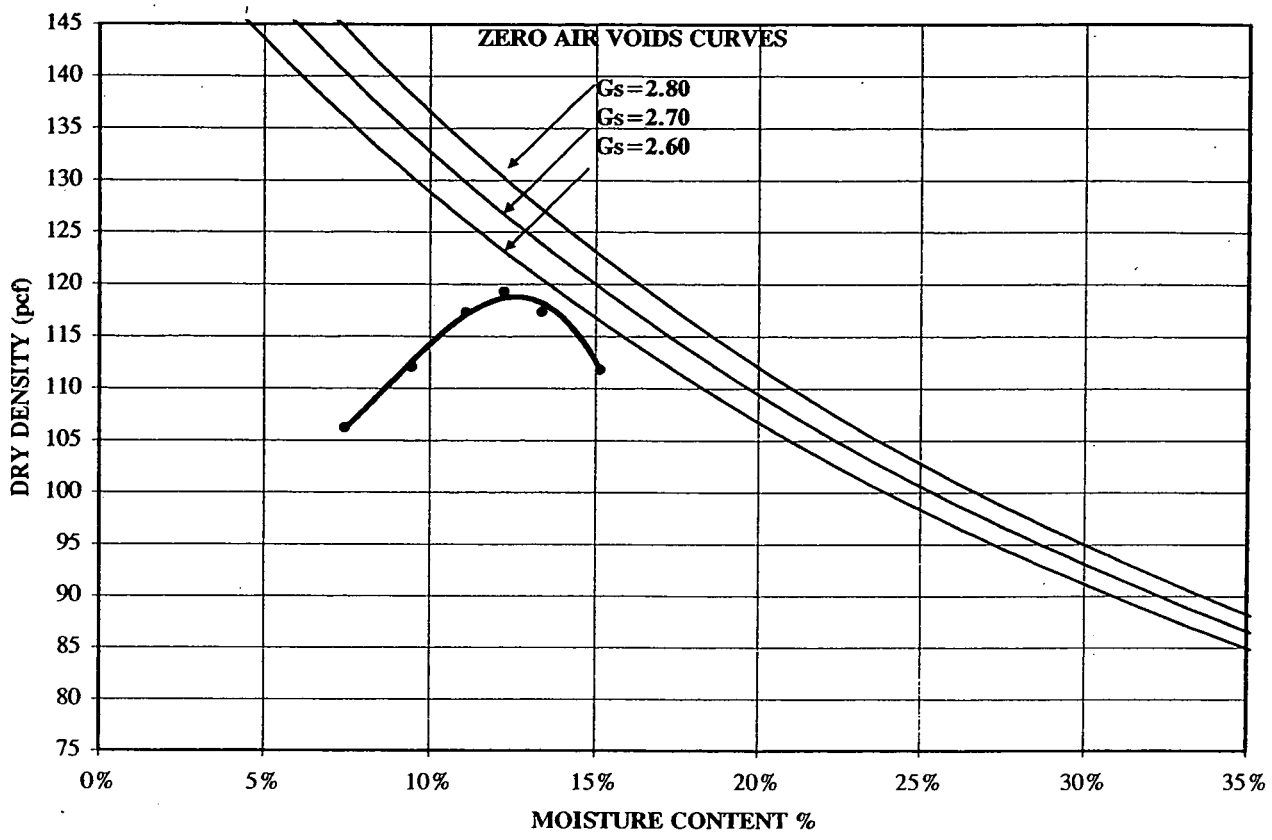
M_c	LL	PL	PI	SpG (assumed)
–	37	17	20	2.70

DESCRIPTION: Moderate yellowish brown (10yr 5/6) clayey sand

USCS: SC

TECH	JR
DATE	12/20/2004
REVIEW	NG

MOISTURE / DRY DENSITY CURVE
D 698 METHOD A



MAXIMUM DRY DENSITY (pcf)	119.3		123.6
OPTIMUM MOISTURE (%)	12.4	Corrected Optimum Moisture (%)	10.6

SAMPLE ID	CLP-2
SAMPLE TYPE	BULK
SAMPLE DEPTH	-

LL	37
PL	17
PI	20
MC	--

DESCRIPTION	Moderate yellowish brown (10yr 5/6) clayey sand
USCS	SC

Rocky Flats/Field & Lab Testing/CO
043-2246-0001

TECH	MKS
DATE	12/22/04
REVIEW	NG

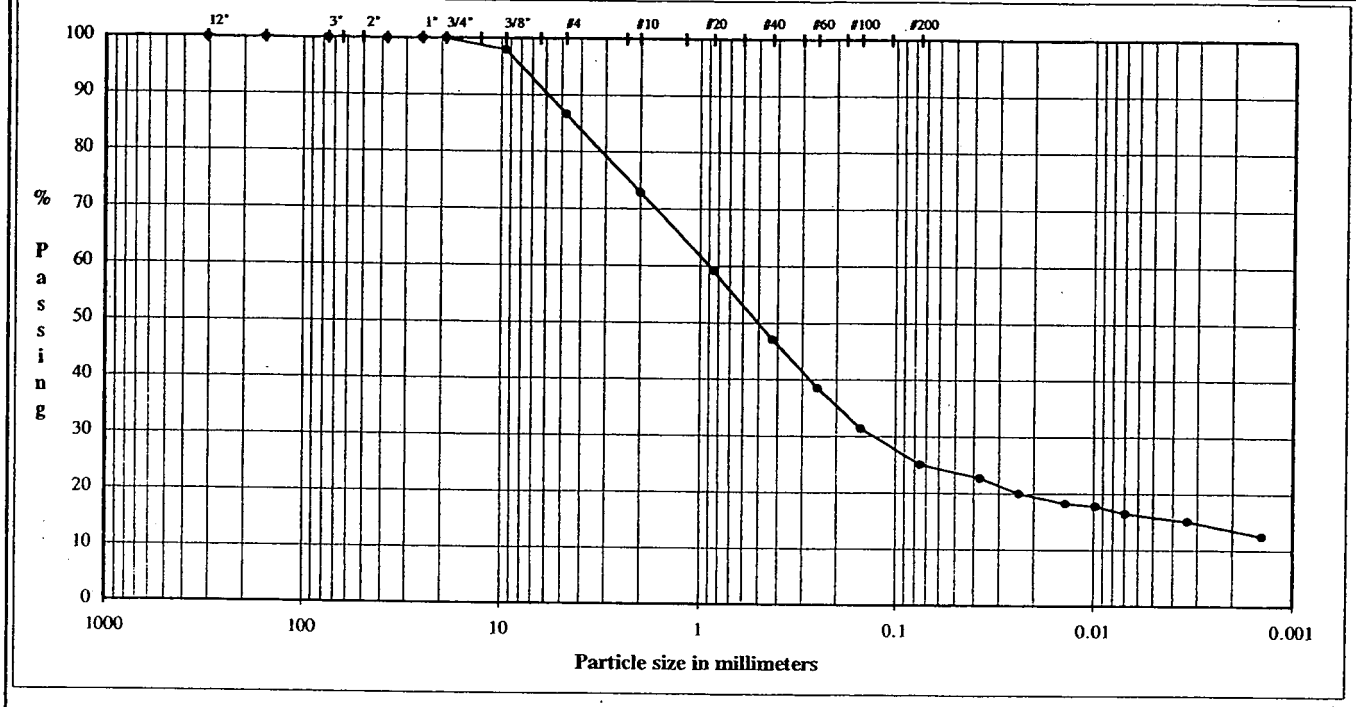
April-05

043-2246.0002

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **Rocky Flats/Field & Lab Testing/CO**
SAMPLE ID: **CLP-3** Depth (ft): -
TYPE: **Bulk**



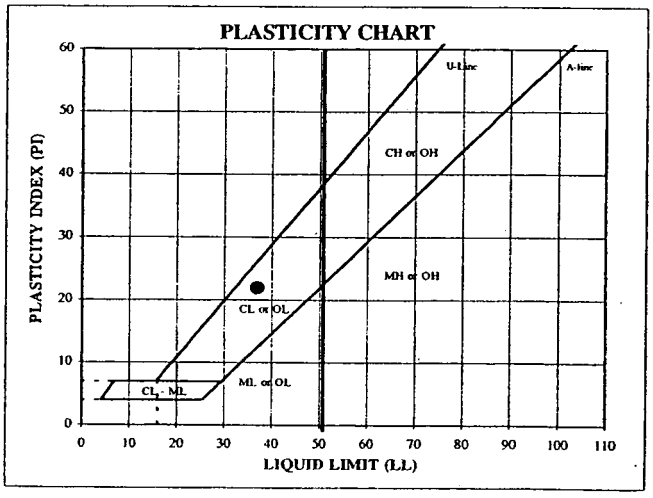
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	0.00
6.0"	154.2	100.0		
6.0"	154.2	100.0		
3.0"	75.0	100.0		
1.5"	37.5	100.0		
1.0"	25.0	100.0	Coarse Gravel	0.00
0.75"	19.0	100.0		
0.375"	9.5	98.0		
#4	4.8	86.7	Fine Gravel	13.33
#10	2.00	72.9	Coarse Sand	13.74
#20	0.85	59.3		
#40	0.43	47.1	Medium Sand	25.80
#60	0.25	38.6		
#100	0.15	31.5		
#200	0.075	25.2	Fine Sand	21.95

Hydrometer Analysis

(mm)	%Finer		
0.037	22.8		
0.024	20.1		
0.014	18.3	Fines	
0.0098	17.9	Silt or Clay	25.19
0.0069	16.6		
0.0034	15.2		
0.0014	12.5		



ATTERBERG LIMITS

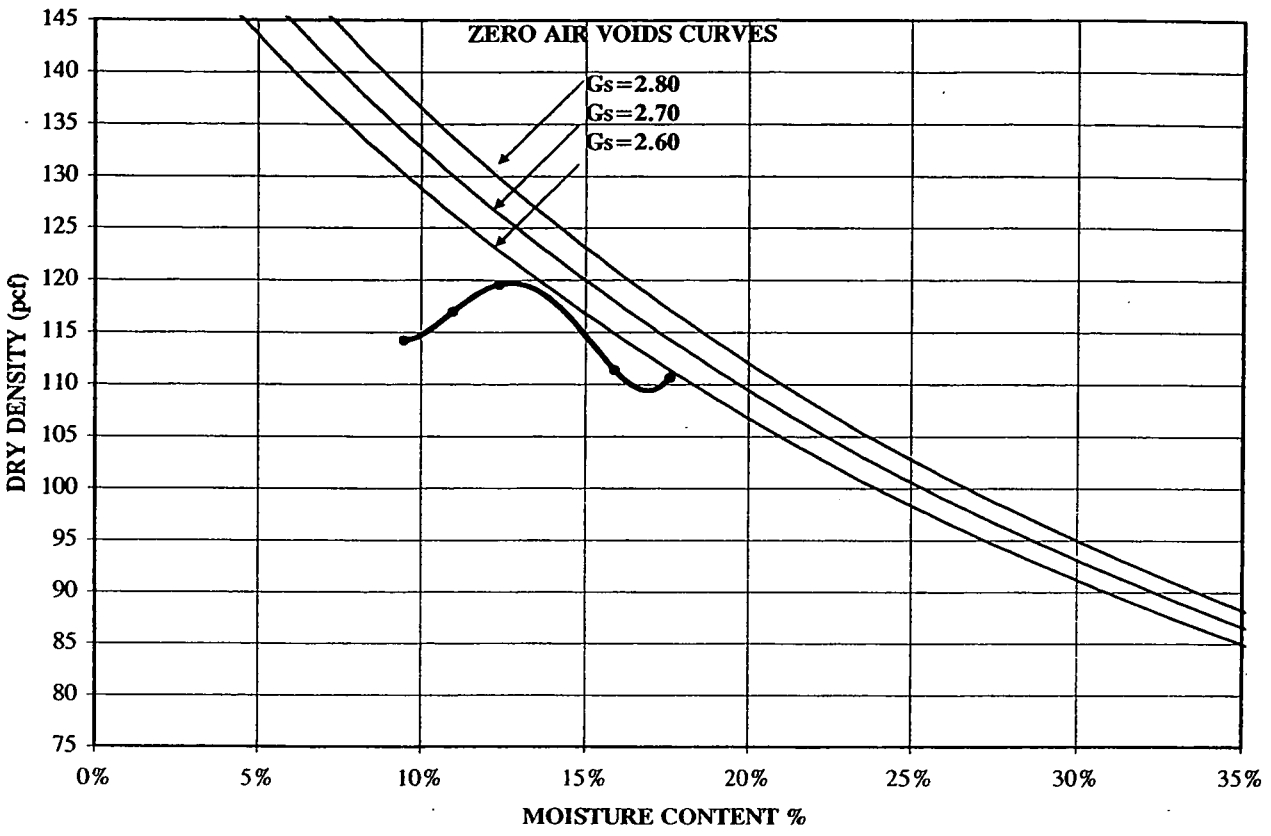
M_c	LL	PL	PI	SpG
--	37	15	22	--

DESCRIPTION: Yellowish brown (10 YR 5/6) clayey sand

USCS: SC

TECH	AGE
DATE	04/07/2005
REVIEW	MB

MOISTURE / DRY DENSITY CURVE
D 698 METHOD A



MAXIMUM DRY DENSITY (pcf)	119.6	Corrected Maximum Dry Density (pcf)	123.3
OPTIMUM MOISTURE (%)	12.5	Corrected Optimum Moisture (%)	10.9

SAMPLE ID	CLP-3
SAMPLE TYPE	Bulk
SAMPLE DEPTH	-

LL	37
PL	15
PI	22
MC	--

DESCRIPTION	Yellowish brown (10 YR 5/6) clayey sand
USCS	SC

Rocky Flats/Field & Lab Testing/CO
043-2246.0002

TECH	MKS
DATE	4-9-05
REVIEW	MB

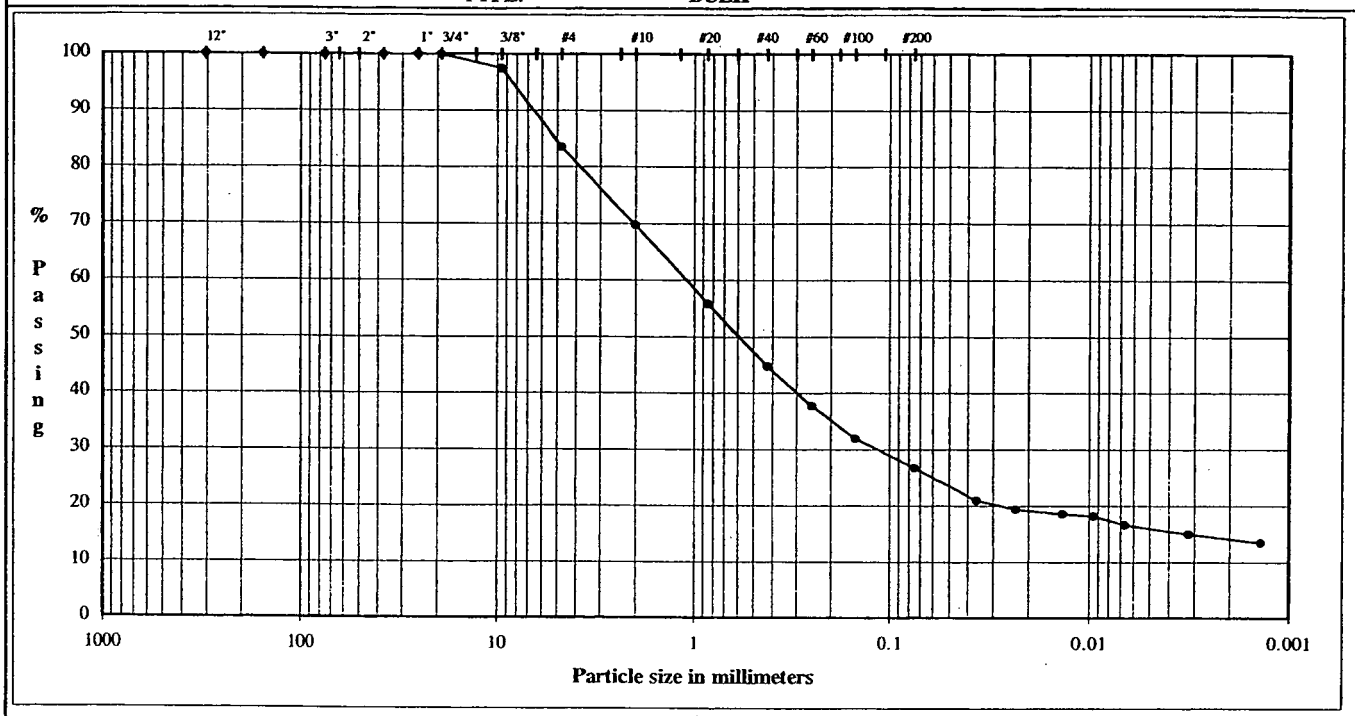
January-05

043-2246.0002

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **Rocky Flats/Field & Lab Testing/CO**
SAMPLE ID: **CUP-1** Depth (ft): --
TYPE: **BULK**



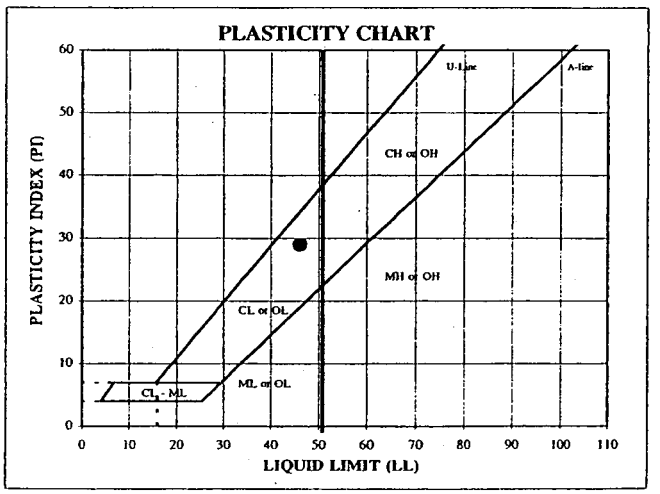
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	0.00
6.0"	154.2	100.0		
6.0"	154.2	100.0		
3.0"	75.0	100.0		
1.5"	37.5	100.0		
1.0"	25.0	100.0	Coarse Gravel	0.00
0.75"	19.0	100.0		
0.375"	9.5	97.5		
#4	4.8	83.6	Fine Gravel	16.37
#10	2.00	69.8	Coarse Sand	13.83
#20	0.85	56.0		
#40	0.43	44.9	Medium Sand	24.94
#60	0.25	37.8		
#100	0.15	32.1		
#200	0.075	26.8	Fine Sand	18.06

Hydrometer Analysis

(mm)	%Finer		
0.036	21.1		
0.023	19.5		
0.013	18.7	Fines	
0.0095	18.3	Silt or Clay	26.80
0.0067	16.7		
0.0032	15.1		
0.0014	13.5		



ATTERBERG LIMITS

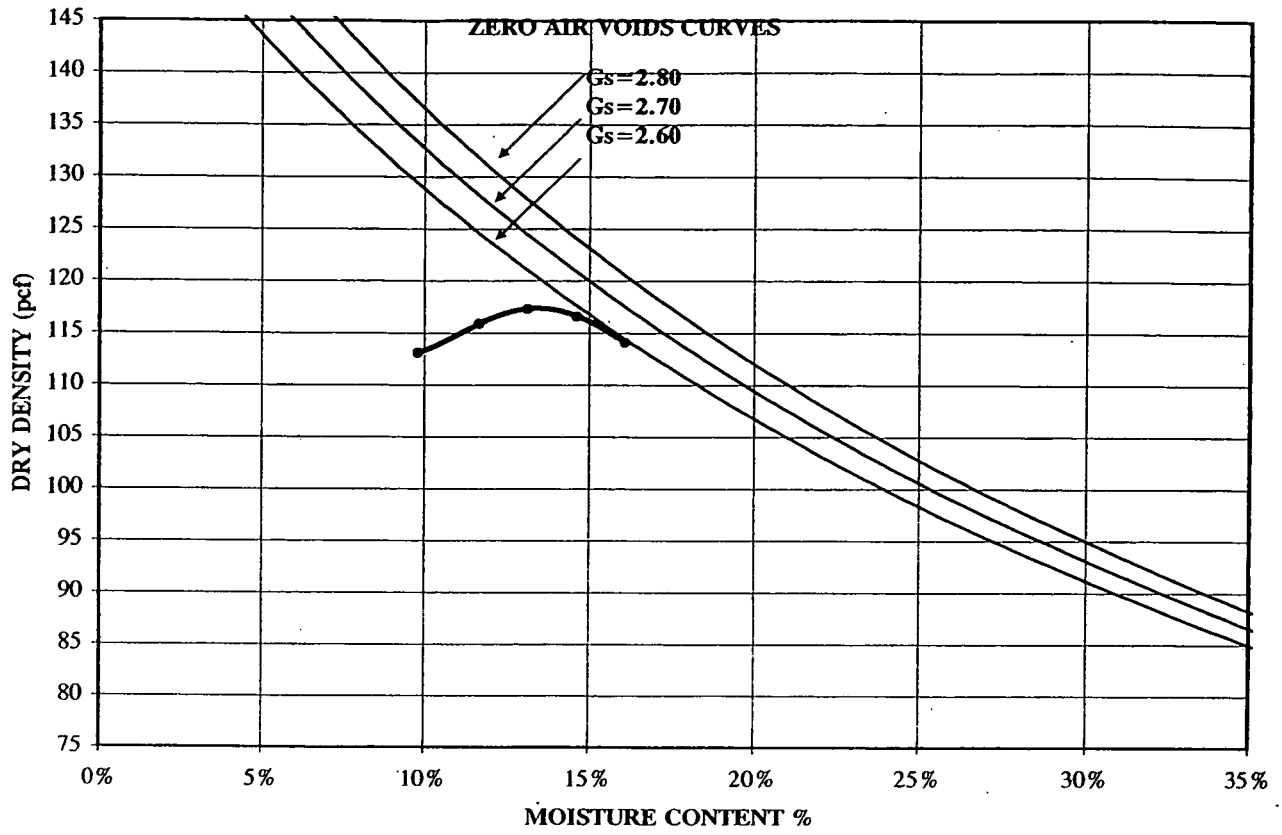
M_c	LL	PL	PI	SpG
--	46	17	29	--

DESCRIPTION: Moderate yellowish brown (10YR 5/4) clayey sand with gravel

USCS: SC

TECH	MKS
DATE	01/19/2005
REVIEW	MB

MOISTURE / DRY DENSITY CURVE
D 698 METHOD A



MAXIMUM DRY DENSITY (pcf)	117.4	Corrected Maximum Dry Density (pcf)	123.1
OPTIMUM MOISTURE (%)	13.3	Corrected Optimum Moisture (%)	11.3

SAMPLE ID	CUP-1
SAMPLE TYPE	BULK
SAMPLE DEPTH	-

LL	46
PL	17
PI	29
MC	--

DESCRIPTION	Moderate yellowish brown (10YR 5/4) clayey sand with gravel
USCS	SC

Rocky Flats/Field & Lab Testing/CO
043-2246.0002

TECH	NG
DATE	1-12-05
REVIEW	MB

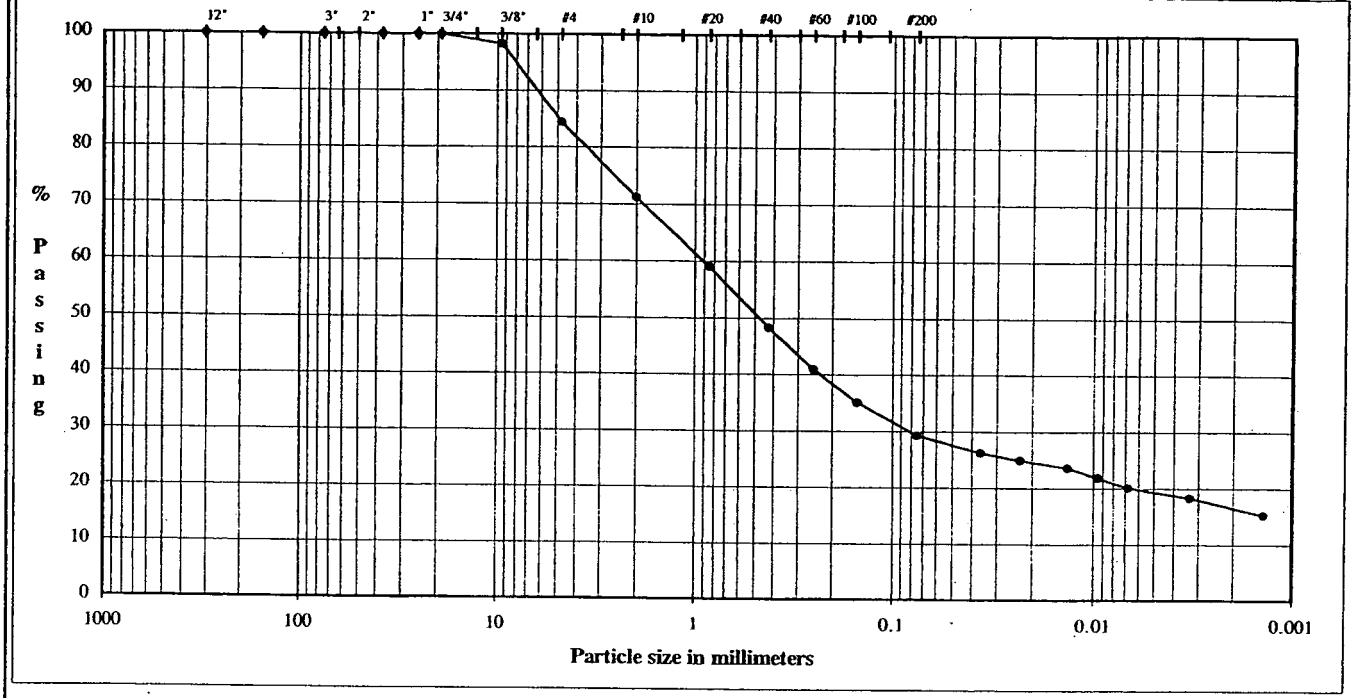
January-05

043-2246.0002

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **Rocky Flats/Field & Lab Testing/CO**
SAMPLE ID: **CUP-2** Depth (ft): --
TYPE: **BULK**



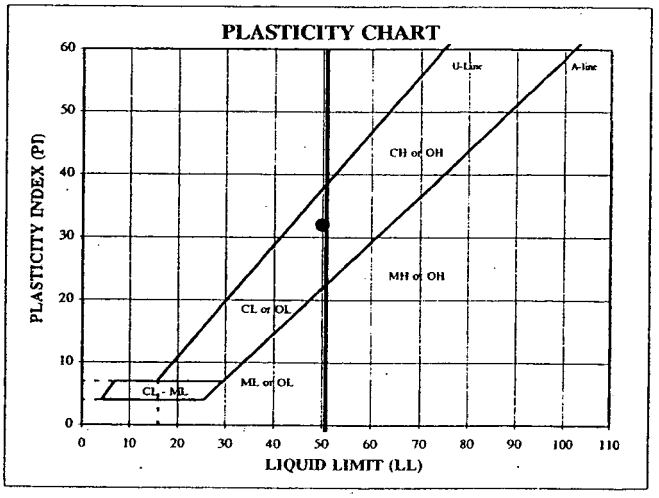
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	0.00
6.0"	154.2	100.0		
6.0"	154.2	100.0		
3.0"	75.0	100.0		
1.5"	37.5	100.0		
1.0"	25.0	100.0	Coarse Gravel	0.00
0.75"	19.0	100.0		
0.375"	9.5	98.3		
#4	4.8	84.5	Fine Gravel	15.51
#10	2.00	71.3	Coarse Sand	13.18
#20	0.85	59.1		
#40	0.43	48.4	Medium Sand	22.94
#60	0.25	41.0		
#100	0.15	35.2		
#200	0.075	29.3	Fine Sand	19.02

Hydrometer Analysis

(mm)	%Finer		
0.036	26.4		
0.023	25.0		
0.013	23.7	Fines	
0.0095	22.0	Silt or Clay	29.34
0.0068	20.2		
0.0033	18.4		
0.0014	15.4		



ATTERBERG LIMITS

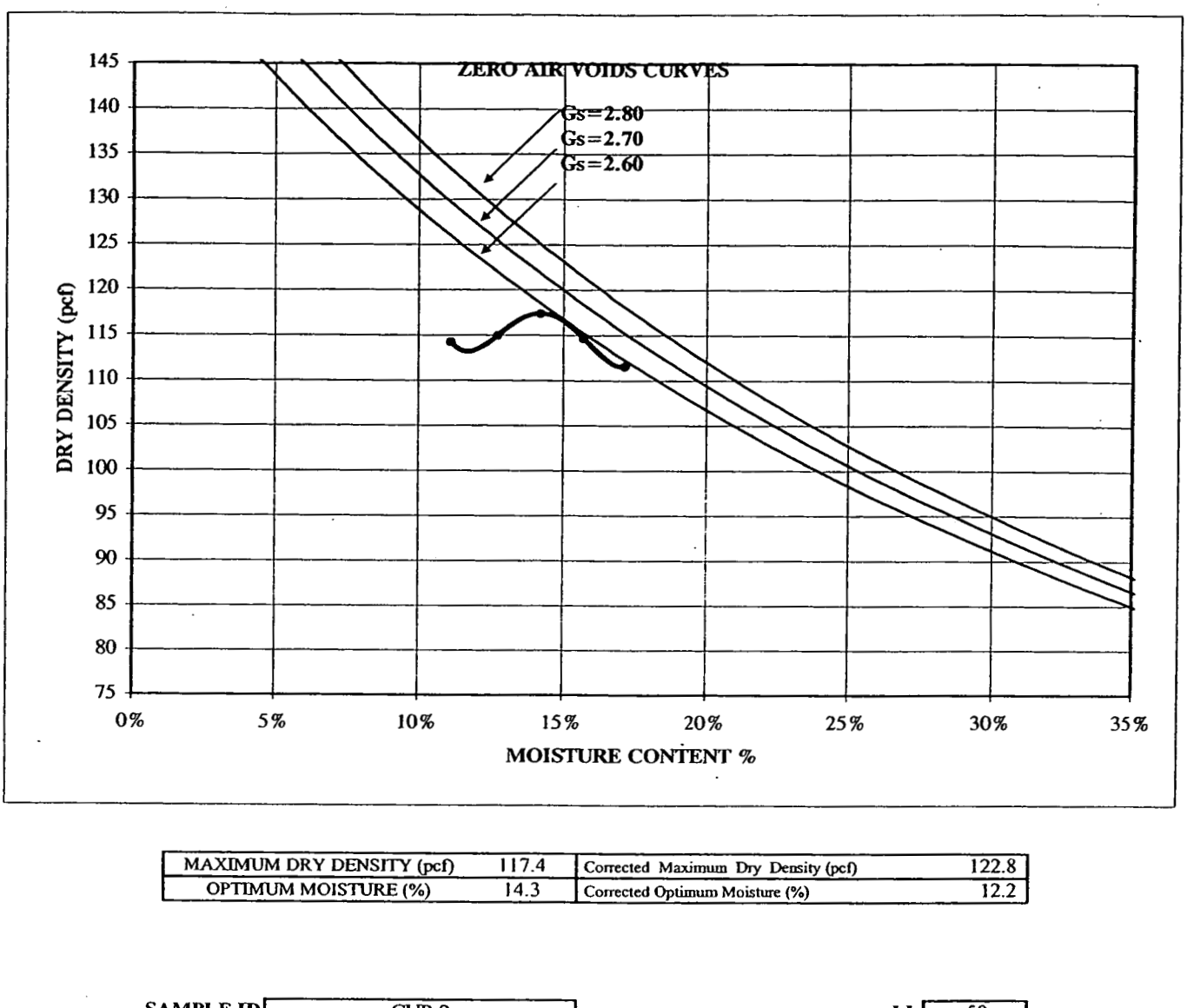
M_c	LL	PL	PI	SpG
--	50	18	32	--

DESCRIPTION: Moderate yellowish brown (10YR 4/4) clayey sand with gravel

USCS: SC

TECH	MKS
DATE	01/31/2005
REVIEW	MB

MOISTURE / DRY DENSITY CURVE
D 698 METHOD A



MAXIMUM DRY DENSITY (pcf)	117.4	Corrected Maximum Dry Density (pcf)	122.8
OPTIMUM MOISTURE (%)	14.3	Corrected Optimum Moisture (%)	12.2

SAMPLE ID	CUP-2
SAMPLE TYPE	BULK
SAMPLE DEPTH	-

LL	50
PL	18
PI	32
MC	--

DESCRIPTION	Moderate yellowish brown (10YR 4/4) clayey sand with gravel
USCS	SC

Rocky Flats/Field & Lab Testing/CO
043-2246.0002

TECH	AGE
DATE	2-1-05
REVIEW	MB

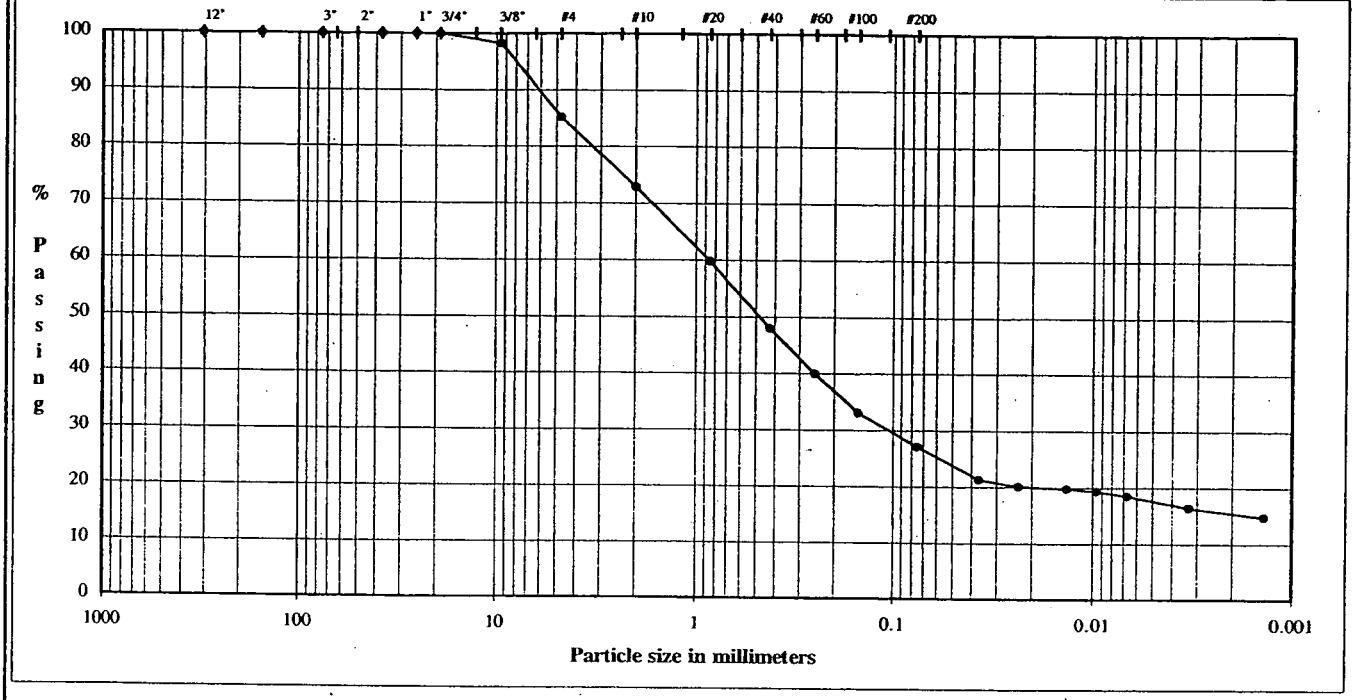
January-05

043-2246.0002

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **Rocky Flats/Field & Lab Testing/CO**
SAMPLE ID: **CUP-3** Depth (ft): –
TYPE: **BULK**



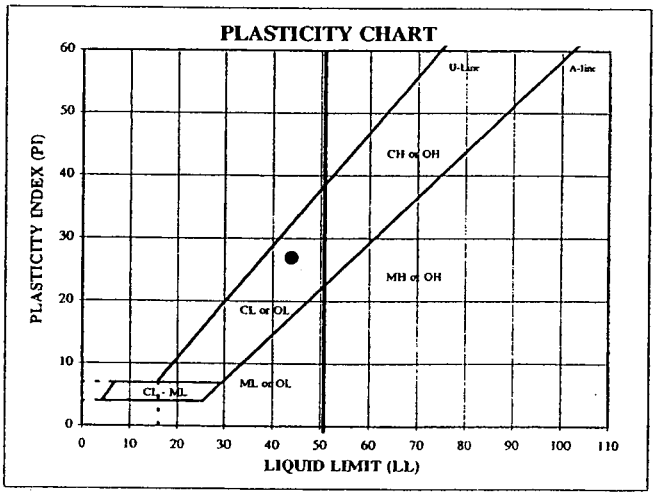
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	0.00
6.0"	154.2	100.0		
6.0"	154.2	100.0		
3.0"	75.0	100.0		
1.5"	37.5	100.0		
1.0"	25.0	100.0	Coarse Gravel	0.00
0.75"	19.0	100.0		
0.375"	9.5	98.3		
#4	4.8	85.3	Fine Gravel	14.73
#10	2.00	73.0	Coarse Sand	12.26
#20	0.85	59.9		
#40	0.43	48.1	Medium Sand	24.86
#60	0.25	40.1		
#100	0.15	33.2		
#200	0.075	27.2	Fine Sand	20.91

Hydrometer Analysis

(mm)	%Finer		
0.037	21.5		
0.023	20.2		
0.013	19.8	Fines	
0.0096	19.4	Silt or Clay	27.24
0.0067	18.6		
0.0033	16.5		
0.0014	14.9		



ATTERBERG LIMITS

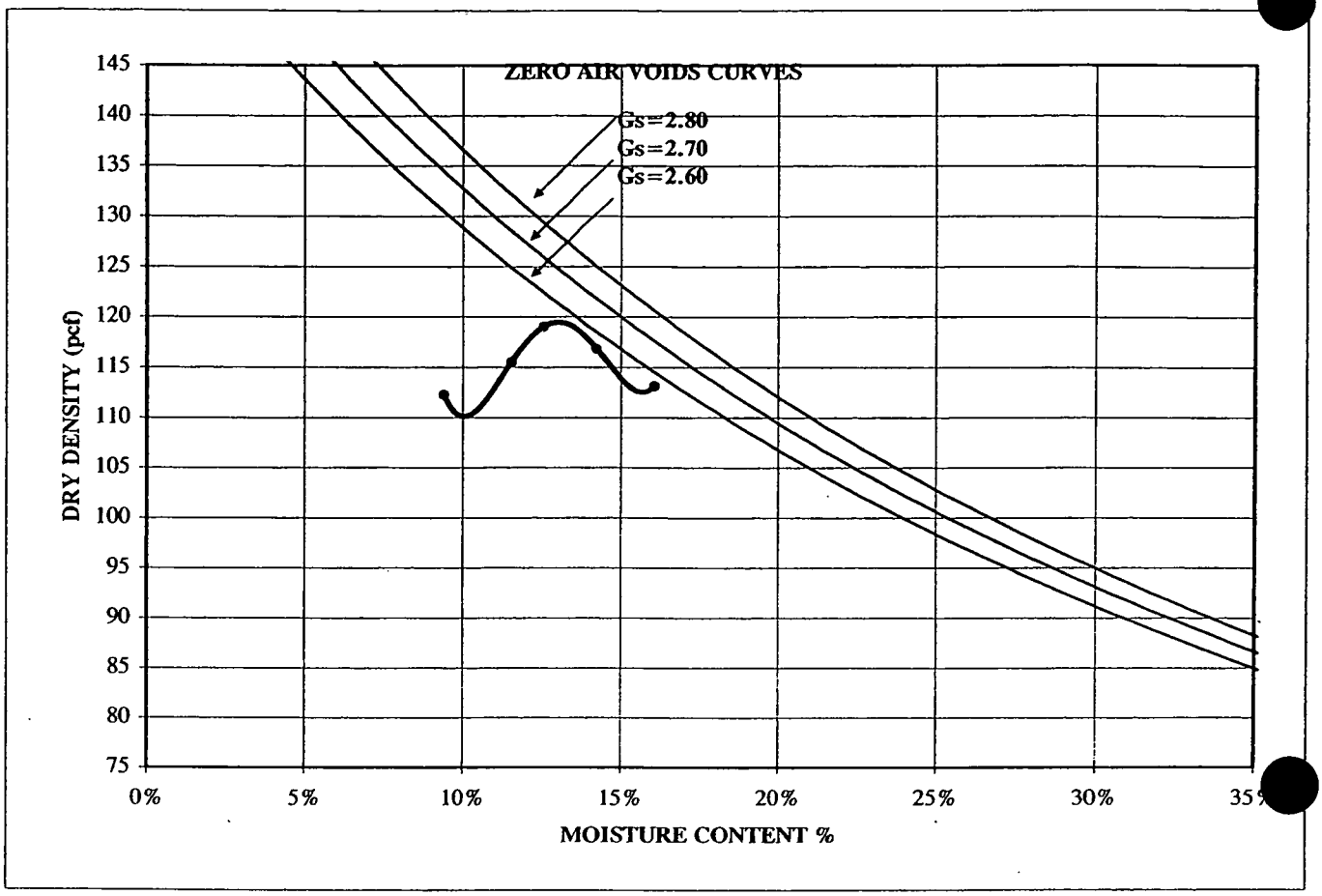
M_c	LL	PL	PI	SpG
--	44	17	27	--

DESCRIPTION: Moderate yellowish brown (10YR 5/4) clayey sand

USCS: SC

TECH: MKS
DATE: 01/29/2005
REVIEW: MB

MOISTURE / DRY DENSITY CURVE
D 698 METHOD A



MAXIMUM DRY DENSITY (pcf)	119.5	Corrected Maximum Dry Density (pcf)	124.5
OPTIMUM MOISTURE (%)	13.1	Corrected Optimum Moisture (%)	11.3

SAMPLE ID	CUP-3
SAMPLE TYPE	BULK
SAMPLE DEPTH	-

LL	44
PL	17
PI	27
MC	--

DESCRIPTION	Moderate yellowish brown (10YR 5/4) clayey sand
USCS	SC

Rocky Flats/Field & Lab Testing/CO
043-2246.0002

TECH	MKS
DATE	1-31-05
REVIEW	MB

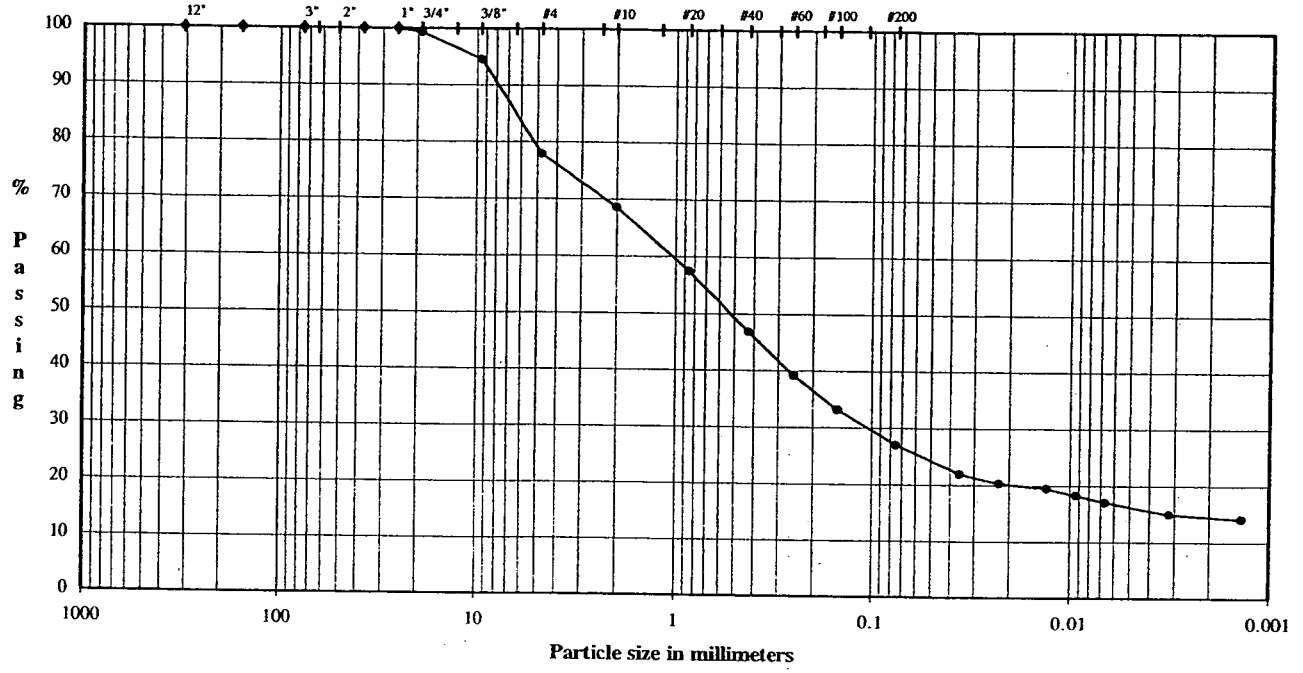
April-05

043-2246.0002

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **Rocky Flats/Field & Lab Testing/CO**
SAMPLE ID: **CUP-4** Depth (ft): -
TYPE: **Bulk**



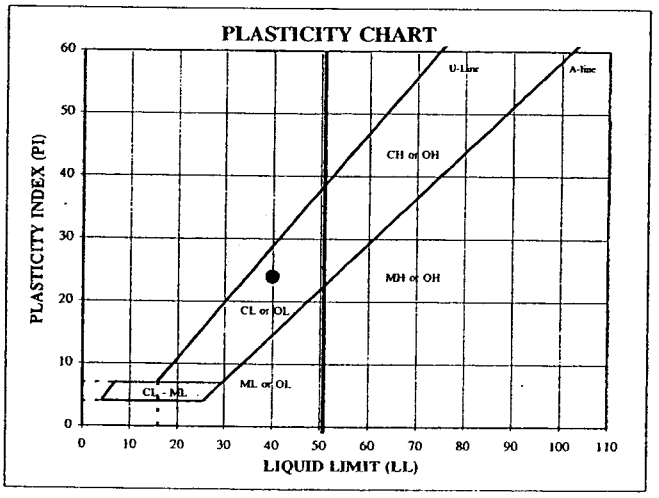
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	0.00
6.0"	154.2	100.0		
6.0"	154.2	100.0		
3.0"	75.0	100.0		
1.5"	37.5	100.0		
1.0"	25.0	100.0	Coarse Gravel	0.70
0.75"	19.0	99.3		
0.375"	9.5	94.6		
#4	4.8	78.0	Fine Gravel	21.26
#10	2.00	68.7	Coarse Sand	9.32
#20	0.85	57.6		
#40	0.43	46.9	Medium Sand	21.79
#60	0.25	39.3		
#100	0.15	33.3		
#200	0.075	27.1	Fine Sand	19.83

Hydrometer Analysis

(mm)	% Finer		
0.036	22.0		
0.023	20.4		
0.013	19.6	Fines	
0.0093	18.3	Silt or Clay	27.11
0.0067	17.1		
0.0032	15.1		
0.0014	14.3		



ATTERBERG LIMITS

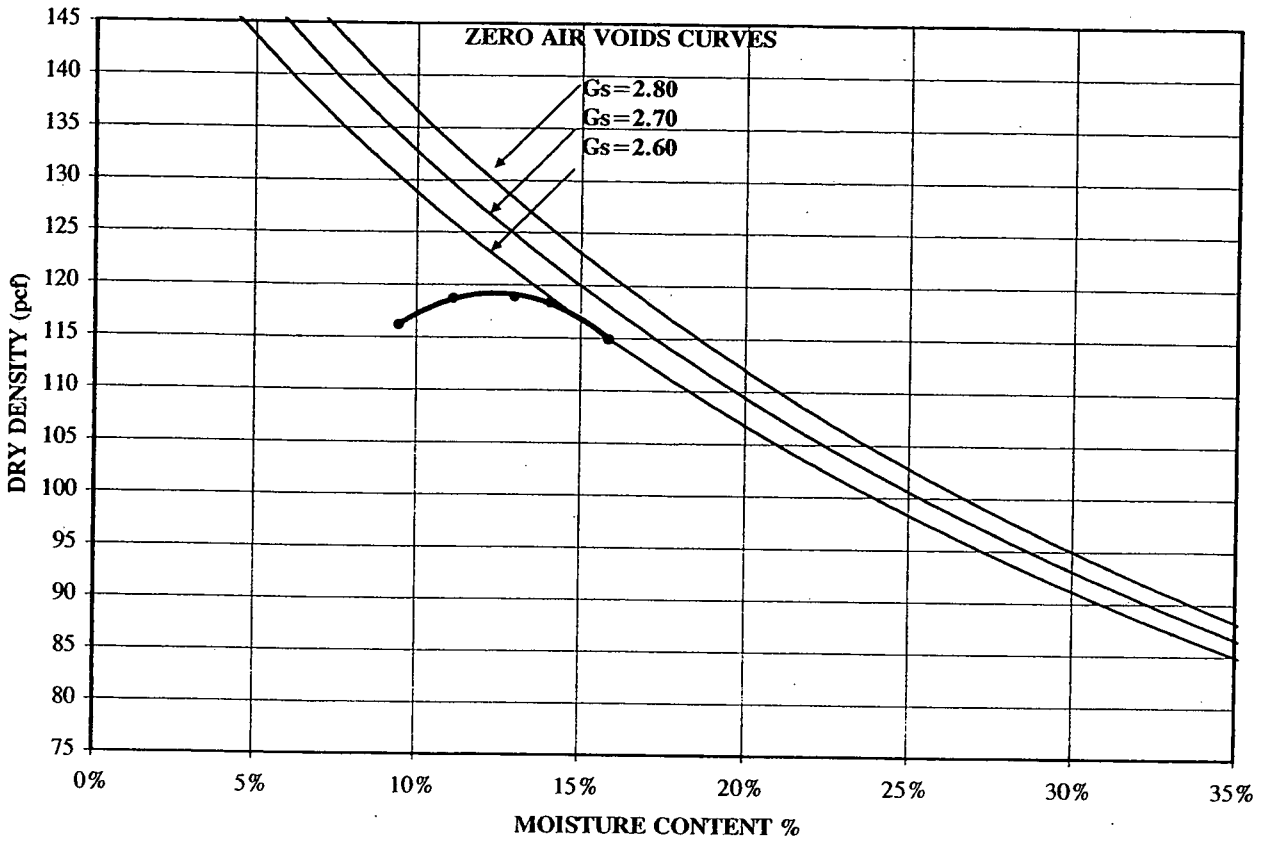
M_c	LL	PL	PI	SpG
--	40	16	24	--

DESCRIPTION: Yellowish brown (10 YR 5/6) clayey sand with gra

USCS: SC

TECH	MKS
DATE	04/13/2005
REVIEW	MB

MOISTURE / DRY DENSITY CURVE
D 698 METHOD B



MAXIMUM DRY DENSITY (pcf)	119.1	Corrected Maximum Dry Density (pcf)	120.6
OPTIMUM MOISTURE (%)	12.8	Corrected Optimum Moisture (%)	12.1

SAMPLE ID	CUP-4
SAMPLE TYPE	Bulk
SAMPLE DEPTH	-

LL	40
PL	16
PI	24
MC	--

DESCRIPTION	Yellowish brown (10 YR 5/6) clayey sand with gravel
USCS	SC

Rocky Flats/Field & Lab Testing/CO
043-2246.0002

TECH	PRH
DATE	4-14-05
REVIEW	MB

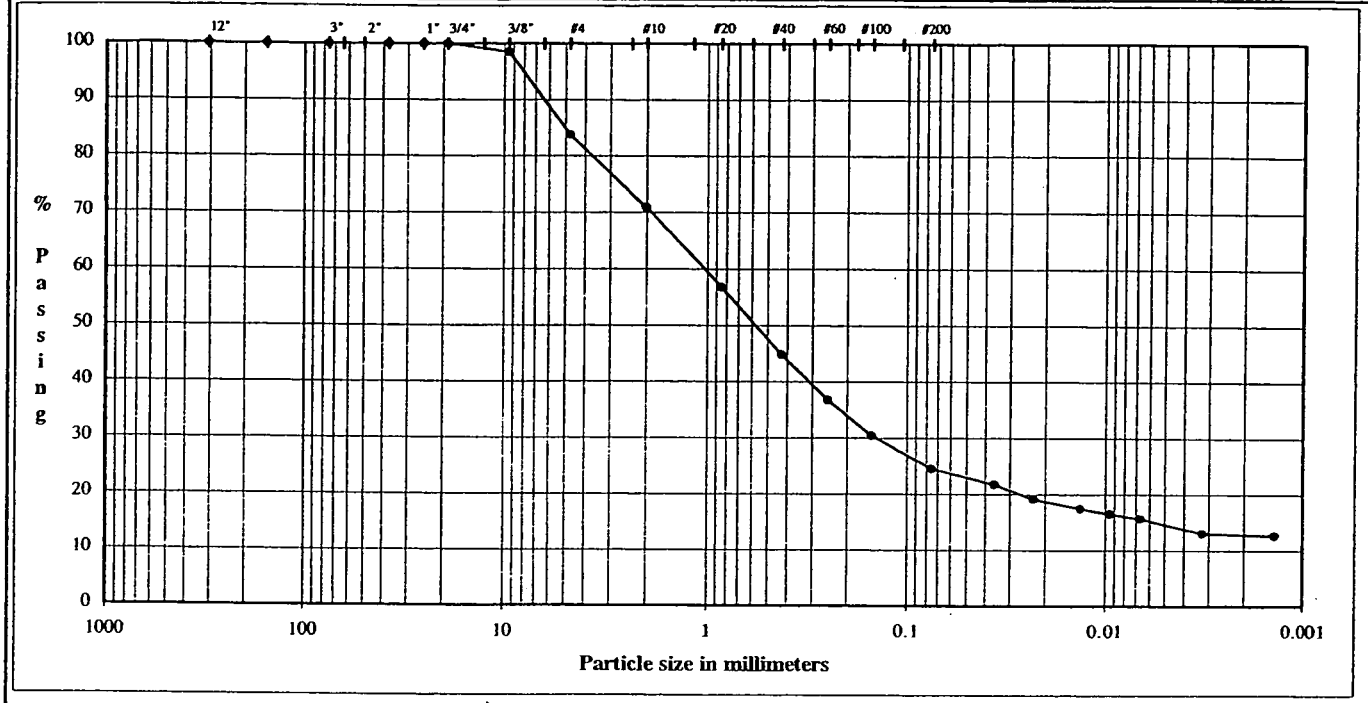
April-05

043-2246.0002

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **Rocky Flats/Field & Lab Testing/CO**
SAMPLE ID: **CUP-5** Depth (ft): -
TYPE: **Bulk**



COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

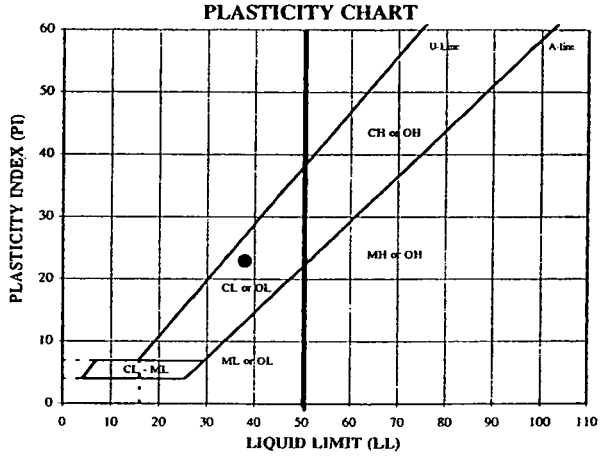
U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	0.00
6.0"	154.2	100.0		
6.0"	154.2	100.0		
3.0"	75.0	100.0		
1.5"	37.5	100.0		
1.0"	25.0	100.0	Coarse Gravel	0.00
0.75"	19.0	100.0		
0.375"	9.5	98.6		
#4	4.8	83.9	Fine Gravel	16.15
#10	2.00	71.0	Coarse Sand	12.89
#20	0.85	56.9		
#40	0.43	44.9	Medium Sand	26.02
#60	0.25	36.9		
#100	0.15	30.6		
#200	0.075	24.6	Fine Sand	20.31

Hydrometer Analysis

(mm)	%Finer		
0.036	21.9		
0.023	19.3		
0.013	17.5	Fines	
0.0094	16.6	Silt or Clay	24.63
0.0067	15.8		
0.0032	13.1		
0.0014	12.7		

PLASTICITY CHART



ATTERBERG LIMITS

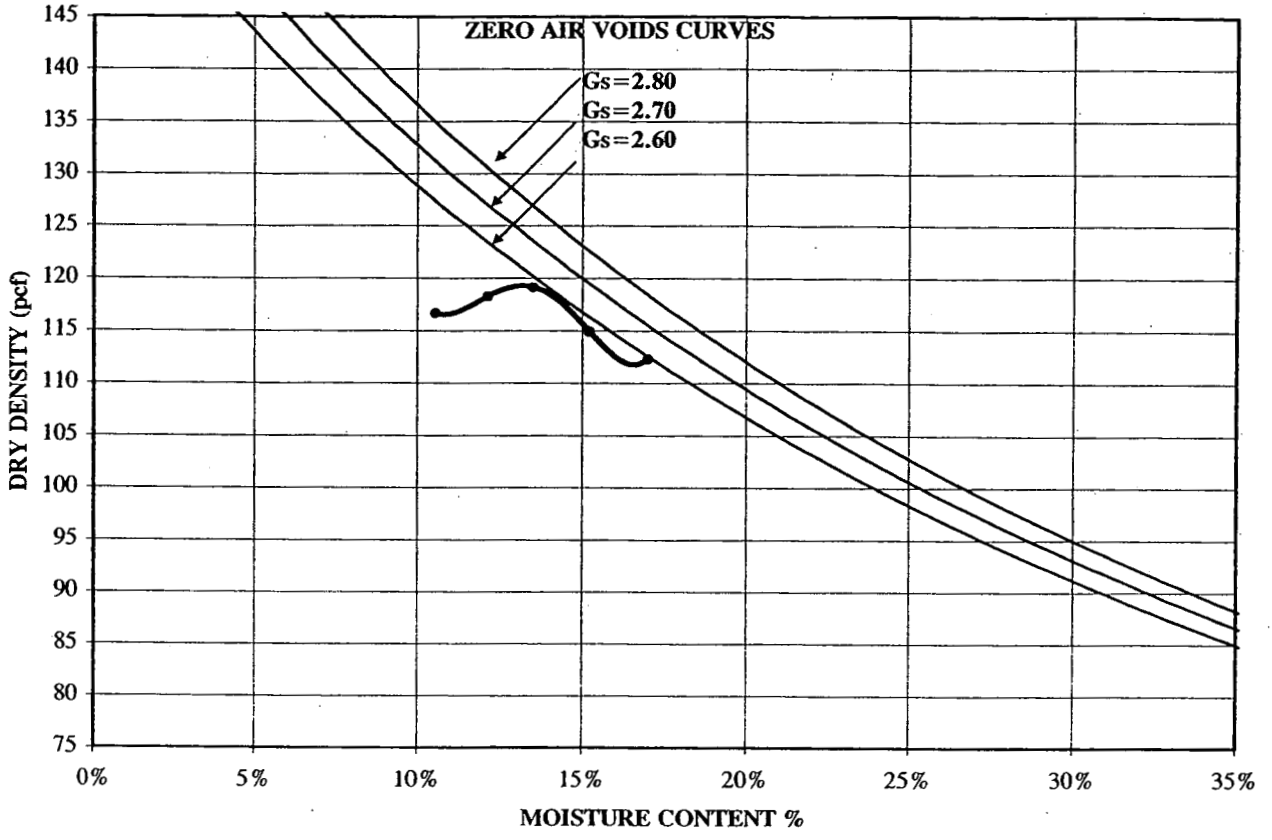
M_c	LL	PL	PI	SpG
–	38	15	23	–

DESCRIPTION: Yellowish brown (10 YR 5/6) clayey sand with gra

USCS: SC

TECH	JR
DATE	04/18/2005
REVIEW	MB

MOISTURE / DRY DENSITY CURVE
D 698 METHOD A



MAXIMUM DRY DENSITY (pcf)	119.3	Corrected Maximum Dry Density (pcf)	123.8
OPTIMUM MOISTURE (%)	13.3	Corrected Optimum Moisture (%)	11.2

SAMPLE ID	CUP-5
SAMPLE TYPE	Bulk
SAMPLE DEPTH	-

LL	38
PL	15
PI	23
MC	--

DESCRIPTION	Yellowish brown (10 YR 5/6) clayey sand with gravel
USCS	SC

Rocky Flats/Field & Lab Testing/CO
043-2246.0002

TECH	AGE
DATE	4-19-05
REVIEW	MB

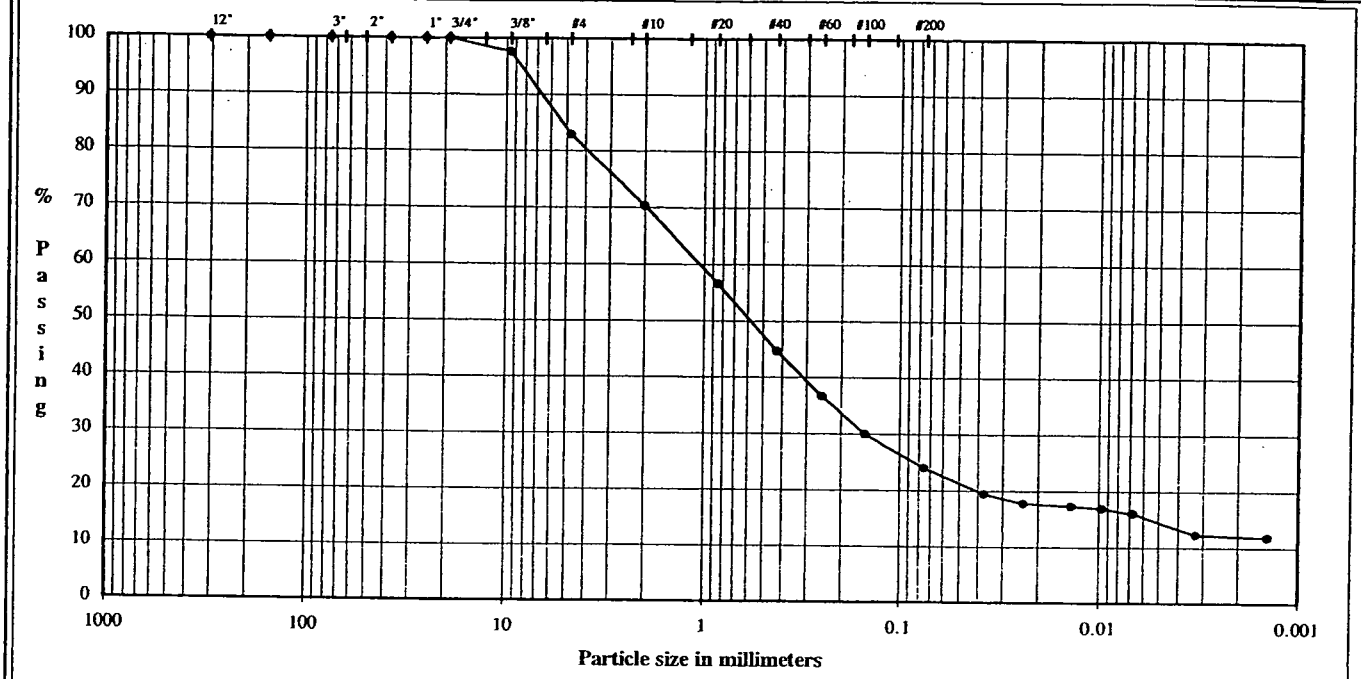
April-05

043-2246.0002

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **Rocky Flats/Field & Lab Testing/CO**
SAMPLE ID: **CUP-6** Depth (ft): -
TYPE: **Bulk**



COBBLES	GRAVEL		SAND			FINES
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay

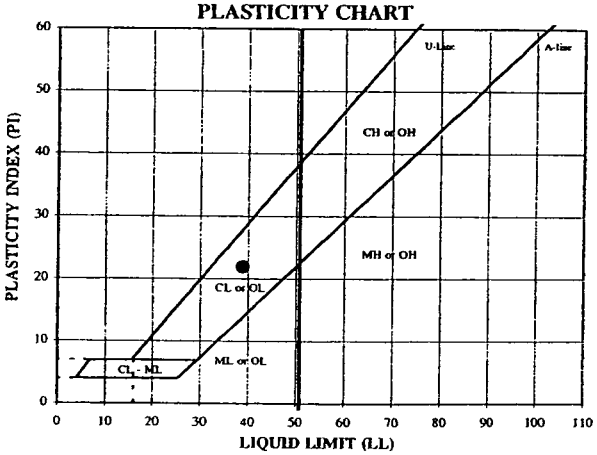
U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	0.00
6.0"	154.2	100.0		
6.0"	154.2	100.0		
3.0"	75.0	100.0		
1.5"	37.5	100.0		
1.0"	25.0	100.0	Coarse Gravel	0.00
0.75"	19.0	100.0		
0.375"	9.5	97.7		
#4	4.8	83.0	Fine Gravel	17.01
#10	2.00	70.4	Coarse Sand	12.59
#20	0.85	56.7		
#40	0.43	44.8	Medium Sand	25.56
#60	0.25	36.9		
#100	0.15	30.1		
#200	0.075	24.1	Fine Sand	20.70

Hydrometer Analysis

(mm)	% Finer		
0.037	19.6		
0.024	17.9		
0.014	17.4	Fines	
0.0096	17.0	Silt or Clay	24.14
0.0068	16.2		
0.0033	12.3		
0.0014	11.9		

PLASTICITY CHART



ATTERBERG LIMITS

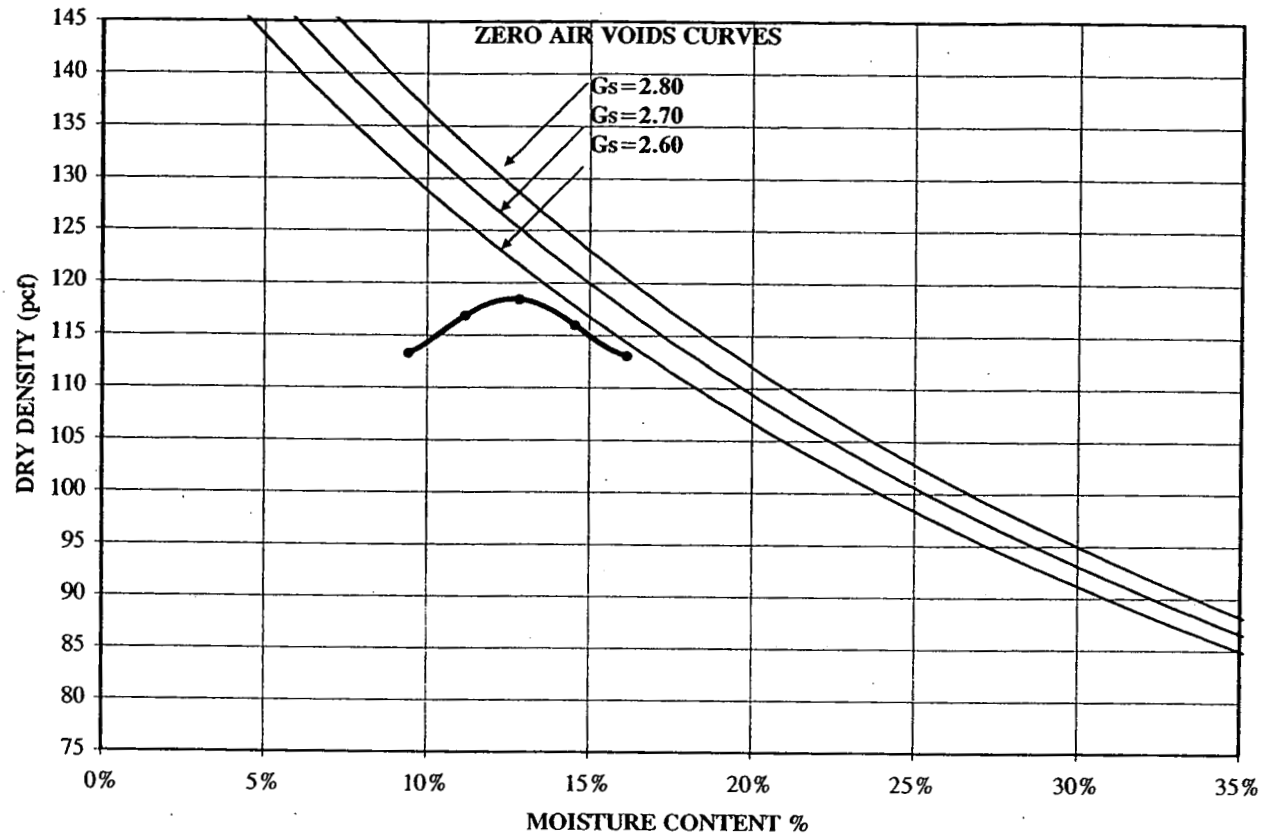
M_c	LL	PL	PI	SpG
--	39	17	22	--

DESCRIPTION: Moderate brown (7.5 YR 5/6) clayey sand with gra

USCS: SC

TECH	MKS
DATE	04/20/2005
REVIEW	0

MOISTURE / DRY DENSITY CURVE
D 698 METHOD A



MAXIMUM DRY DENSITY (pcf)	118.5	Corrected Maximum Dry Density (pcf)	123.3
OPTIMUM MOISTURE (%)	12.6	Corrected Optimum Moisture (%)	10.5

SAMPLE ID	CUP-6
SAMPLE TYPE	Bulk
SAMPLE DEPTH	-

LL	39
PL	17
PI	22
MC	--

DESCRIPTION	Moderate brown (7.5 YR 5/6) clayey sand with gravel
USCS	SC

Rocky Flats/Field & Lab Testing/CO
043-2246.0002

TECH	JR
DATE	4-21-05
REVIEW	MB

SAND CONE DENSITY TEST
Golder Associates

Test #	TFCS-2

Date	6-Oct-04

Weight of Wet Material	1443.5	g

Cone and Plate #	2	
Bottle ID	A	
Start wt of Bottle and Sand	6035.2	g
Finish wt of Bottle and Sand	3327.9	g

Density of Sand	96.1	lb/ft^3
Soil ID	TF-10	
Optimum Dry Density	122.1	lb/ft^3
Optimum Moisture	11	%

Moisture Content

Tare Wt	101.8	g
Tare + Wet Soil	1545.3	g
Tare + Dry Soil	1416.6	g
Dry Soil	1314.8	g
Moisture	128.7	g
% Moisture	9.8	%

Volume Calculation

Wt of Sand Used	2707.3	g
Wt of Sand Used	6.0	lb
Volume of Sand	0.0621	ft^3
Volume of Cone & Plate	0.0379	ft^3
Sand Volume Minus Cone & Plate	0.0242	ft^3

Wet Density	131.3	lb/ft^3
Dry Density	119.6	lb/ft^3

Specifications

		Pass/Fail
95% of Standard Proctor	98%	Pass
+2% Moisture Content	-1.2	Pass

Tech	MSP
Reviewed by	MGC

SAND CONE DENSITY TEST
Golder Associates

Test #	CLS-1

Date	5-Nov-04

Weight of Wet Material	1633.1	g

Density of Sand	96.1	lb/ft^3
Soil ID	TF-09	
Optimum Dry Density	125.1	lb/ft^3
Optimum Moisture	10.4	%

Cone and Plate #	2	
Bottle ID	Q	
Start wt of Bottle and Sand	6622.2	g
Finish wt of Bottle and Sand	3786.3	g

Moisture Content

Tare Wt	97.0	g
Tare + Wet Soil	1730.1	g
Tare + Dry Soil	1589.9	g
Dry Soil	1492.9	g
Moisture	140.2	g
% Moisture	9.4	%

Volume Calculation

Wt of Sand Used	2835.9	g
Wt of Sand Used	6.3	lb
Volume of Sand	0.0651	ft^3
Volume of Cone & Plate	0.0379	ft^3
Sand Volume Minus Cone & Plate	0.0272	ft^3

Wet Density	132.4	lb/ft^3
Dry Density	121.1	lb/ft^3

Specifications

		Pass/Fail
95% of Standard Proctor	97%	Pass
+2% Moisture Content	-1.0	Pass

Tech	MSP
Reviewed by	MGC

SAND CONE DENSITY TEST
Golder Associates

Test #	CLS-2

Date	18-Nov-04

Weight of Wet Material	1445.9	g

Cone and Plate #	2	
Bottle ID	Q	
Start wt of Bottle and Sand	5299.2	g
Finish wt of Bottle and Sand	2665.7	g

Density of Sand	95.6	lb/ft^3
Soil ID	TF-09	
Optimum Dry Density	125.1	lb/ft^3
Optimum Moisture	10.4	%

Moisture Content

Tare Wt	96.7	g
Tare + Wet Soil	1542.5	g
Tare + Dry Soil	1406.3	g
Dry Soil	1309.6	g
Moisture	136.3	g
% Moisture	10.4	%

Volume Calculation

Wt of Sand Used	2633.5	g
Wt of Sand Used	5.8	lb
Volume of Sand	0.0607	ft^3
Volume of Cone & Plate	0.0379	ft^3
Sand Volume Minus Cone & Plate	0.0229	ft^3

Wet Density	139.4	lb/ft^3
Dry Density	126.3	lb/ft^3

Specifications

		Pass/Fail
≥95% of Standard Proctor	101%	Pass
±2% Moisture Content	0.0	Pass

Tech	MSP
Reviewed by	MGC

SAND CONE DENSITY TEST
Golder Associates

Test #	CLS-3

Date	8-Dec-04

Weight of Wet Material	2990.9	g

Density of Sand	95.6	lb/ft^3
Soil ID	TF-10	
Optimum Dry Density	122.9	lb/ft^3
Optimum Moisture	10.8	%

Cone and Plate #	2	
Bottle ID	Q	
Start wt of Bottle and Sand	5753.6	g
Finish wt of Bottle and Sand	1924.4	g

Moisture Content

Tare Wt	308.0	g
Tare + Wet Soil	3298.9	g
Tare + Dry Soil	3035.0	g
Dry Soil	3035.4	g
Moisture	263.9	g
% Moisture	9.7	%

Volume Calculation

Wt of Sand Used	3829.2	g
Wt of Sand Used	8.4	lb
Volume of Sand	0.0883	ft^3
Volume of Cone & Plate	0.0379	ft^3
Sand Volume Minus Cone & Plate	0.0504	ft^3

Wet Density	130.7	lb/ft^3
Dry Density	119.2	lb/ft^3

Specifications

		Pass/Fail
>95% of Standard Proctor	97%	Pass
+2% Moisture Content	1.1	Pass

Tech	MSP
Reviewed by	MGC

SAND CONE DENSITY TEST
Golder Associates

Test #	CLS-4

Date	8-Dec-04

Weight of Wet Material	2990.3	g

Cone and Plate #	2	
Bottle ID	F	
Start wt of Bottle and Sand	5201.9	g
Finish wt of Bottle and Sand	1389.2	g

Density of Sand	95.6	lb/ft^3
Soil ID	TF-10	
Optimum Dry Density	122.9	lb/ft^3
Optimum Moisture	10.8	%

Moisture Content

Tare Wt	326.1	g
Tare + Wet Soil	3673.0	g
Tare + Dry Soil	3350.7	g
Dry Soil	3024.6	g
Moisture	322.3	g
% Moisture	10.7	%

Volume Calculation

Wt of Sand Used	3812.7	g
Wt of Sand Used	8.4	lb
Volume of Sand	0.0879	ft^3
Volume of Cone & Plate	0.0379	ft^3
Sand Volume Minus Cone & Plate	0.0501	ft^3

Wet Density	131.7	lb/ft^3
Dry Density	119.0	lb/ft^3

Specifications

		Pass/Fail
>95% of Standard Proctor	97%	Pass
±2% Moisture Content	-0.1	Pass

Tech	MSP
Reviewed by	MGC

SAND CONE DENSITY TEST
Golder Associates

Test #	CLS-5

Date	14-Dec-04

Weight of Wet Material	3026.7	g

Density of Sand	95.6	lb/ft^3
Soil ID	TF-10	
Optimum Dry Density	122.1	lb/ft^3
Optimum Moisture	11	%

Cone and Plate #	2	
Bottle ID	Q	
Start wt of Bottle and Sand	5732.4	g
Finish wt of Bottle and Sand	1879.3	g

Moisture Content

Tare Wt	92.3	g
Tare + Wet Soil	487.4	g
Tare + Dry Soil	448.1	g
Dry Soil	355.8	g
Moisture	39.3	g
% Moisture	11.0	%

Volume Calculation

Wt of Sand Used	3853.1	g
Wt of Sand Used	8.5	lb
Volume of Sand	0.0889	ft^3
Volume of Cone & Plate	0.0379	ft^3
Sand Volume Minus Cone & Plate	0.0510	ft^3

Wet Density	130.9	lb/ft^3
Dry Density	117.9	lb/ft^3

Specifications

		Pass/Fail
>95% of Standard Proctor	97%	Pass
±2% Moisture Content	0.0	Pass

Tech	MSP
Reviewed by	MGC

SAND CONE DENSITY TEST
Golder Associates

Test#	CLS-6

Date	18-Dec-05

Weight of Wet Material	3107.4	g

Cone and Plate #	2	
Bottle ID	C	
Start wt of Bottle and Sand	5387.7	g
Finish wt of Bottle and Sand	1562.8	g

Density of Sand	95.6	lb/ft^3
Soil ID	CLP-1	
Optimum Dry Density	122.9	lb/ft^3
Optimum Moisture	10.8	%

Moisture Content

Tare Wt	84.6	g
Tare + Wet Soil	710.0	g
Tare + Dry Soil	648.9	g
Dry Soil	564.3	g
Moisture	61.1	g
% Moisture	10.8	%

Volume Calculation

Wt of Sand Used	3824.9	g
Wt of Sand Used	8.4	lb
Volume of Sand	0.0882	ft^3
Volume of Cone & Plate	0.0379	ft^3
Sand Volume Minus Cone & Plate	0.0503	ft^3

Wet Density	136.1	lb/ft^3
Dry Density	122.8	lb/ft^3

Specifications

		Pass/Fail
≥95% of Standard Proctor	100%	Pass
±2% Moisture Content	0.0	Pass

Tech	MSP
Reviewed by	MGC

SAND CONE DENSITY TEST
Golder Associates

Test#	CLS-7

Date	10-Feb-05

Weight of Wet Material	3112.5	g

Cone and Plate #	A	
Bottle ID	J	
Start wt of Bottle and Sand	6466.0	g
Finish wt of Bottle and Sand	2598.7	g

Density of Sand	96.32	lb/ft^3
Soil ID	CUP-3	
Optimum Dry Density	124.5	lb/ft^3
Optimum Moisture	11.3	%

Moisture Content

Tare Wt	312.5	g
Tare + Wet Soil	3425.0	g
Tare + Dry Soil	3114.3	g
Dry Soil	2801.8	g
Moisture	310.7	g
% Moisture	11.1	%

Volume Calculation

Wt of Sand Used	3867.3	g
Wt of Sand Used	8.5	lb
Volume of Sand	0.0885	ft^3
Volume of Cone & Plate	0.0379	ft^3
Sand Volume Minus Cone & Plate	0.0506	ft^3

Wet Density	135.5	lb/ft^3
Dry Density	122.0	lb/ft^3

Specifications

		Pass/Fail
95% of Standard Proctor	98%	Pass
±2% Moisture Content	0.2	Pass

Tech	MSP
Reviewed by	PRH

SAND CONE DENSITY TEST
Golder Associates

Test #	CLS-8

Date	11-Feb-05

Weight of Wet Material	3413.6	g

Density of Sand	96.32	lb/ft^3
Soil ID	CUP-2	
Optimum Dry Density	122.8	lb/ft^3
Optimum Moisture	12.2	%

Cone and Plate #	A	
Bottle ID	J	
Start wt of Bottle and Sand	6438.2	g
Finish wt of Bottle and Sand	2286.8	g

Moisture Content

Tare Wt	311.5	g
Tare + Wet Soil	3825.1	g
Tare + Dry Soil	3445.6	g
Dry Soil	3134.1	g
Moisture	379.5	g
% Moisture	12.1	%

Volume Calculation

Wt of Sand Used	4151.4	g
Wt of Sand Used	9.2	lb
Volume of Sand	0.0950	ft^3
Volume of Cone & Plate	0.0379	ft^3
Sand Volume Minus Cone & Plate	0.0571	ft^3

Wet Density	131.7	lb/ft^3
Dry Density	117.5	lb/ft^3

Specifications

		Pass/Fail
95% of Standard Proctor	96%	Pass
±2% Moisture Content	0.1	Pass

Tech	MSP
Reviewed by	MGC

SAND CONE DENSITY TEST
Golder Associates

Test #	CLS-9

Date	22-Mar-05

Weight of Wet Material	3455.1	g

Cone and Plate #	A	
Bottle ID	J	
Start wt of Bottle and Sand	4716.6	g
Finish wt of Bottle and Sand	597.1	g

Density of Sand	96.32	lb/ft^3
Soil ID	PF-9	
Optimum Dry Density	125.1	lb/ft^3
Optimum Moisture	10.4	%

Moisture Content

Tare Wt	83.6	g
Tare + Wet Soil	1182.3	g
Tare + Dry Soil	1086.2	g
Dry Soil	1002.6	g
Moisture	96.1	g
% Moisture	9.6	%

Volume Calculation

Wt of Sand Used	4119.5	g
Wt of Sand Used	9.1	lb
Volume of Sand	0.0943	ft^3
Volume of Cone & Plate	0.0379	ft^3
Sand Volume Minus Cone & Plate	0.0564	ft^3

Wet Density	135.0	lb/ft^3
Dry Density	123.2	lb/ft^3

Specifications

		Pass/Fail
95% of Standard Proctor	98%	Pass
±2% Moisture Content	0.8	Pass

Tech	MSP
Reviewed by	MGC

SAND CONE DENSITY TEST
Golder Associates

Test #	CUS-1

Date	11-Jan-05

Weight of Wet Material	3258.0	g

Cone and Plate #	2	
Bottle ID	Q	
Start wt of Bottle and Sand	6664.6	g
Finish wt of Bottle and Sand	2599	g

Density of Sand	96.32	lb/ft^3
Soil ID	CLP-1	
Optimum Dry Density	122.9	lb/ft^3
Optimum Moisture	10.8	%

Moisture Content

Tare Wt	104.5	g
Tare + Wet Soil	560.3	g
Tare + Dry Soil	521.1	g
Dry Soil	416.6	g
Moisture	39.2	g
% Moisture	9.4	%

Volume Calculation

Wt of Sand Used	4065.6	g
Wt of Sand Used	9.0	lb
Volume of Sand	0.0931	ft^3
Volume of Cone & Plate	0.0379	ft^3
Sand Volume Minus Cone & Plate	0.0552	ft^3

Wet Density	130.2	lb/ft^3
Dry Density	119.0	lb/ft^3

Specifications

		Pass/Fail
>95% of Standard Proctor	97%	Pass
±2% Moisture Content	-1.4	Pass

Tech	MSP
Reviewed by	MGC

SAND CONE DENSITY TEST

Golder Associates

Test #	CUS-2

Date	17-Jan-05

Weight of Wet Material	3554.6	g

Cone and Plate #	A	
Bottle ID	Q	
Start wt of Bottle and Sand	5996.5	g
Finish wt of Bottle and Sand	1696.1	g

Density of Sand	96.32	lb/ft^3
Soil ID	CLP-1	
Optimum Dry Density	122.9	lb/ft^3
Optimum Moisture	10.8	%

Moisture Content

Tare Wt	104.5	g
Tare + Wet Soil	560.3	g
Tare + Dry Soil	515.9	g
Dry Soil	411.4	g
Moisture	44.4	g
% Moisture	10.8	%

Volume Calculation

Wt of Sand Used	4300.4	g
Wt of Sand Used	9.5	lb
Volume of Sand	0.0984	ft^3
Volume of Cone & Plate	0.0393	ft^3
Sand Volume Minus Cone & Plate	0.0592	ft^3

Wet Density	132.4	lb/ft^3
Dry Density	119.5	lb/ft^3

Specifications

		Pass/Fail
≥95% of Standard Proctor	97%	Pass
±2% Moisture Content	0.0	Pass

Tech	MSP
Reviewed by	PRH

SAND CONE DENSITY TEST
Golder Associates

Test #	CUS-3

Date	20-Jan-05

Weight of Wet Material	3021.6	g

Cone and Plate #	A	
Bottle ID	J	
Start wt of Bottle and Sand	6008.7	g
Finish wt of Bottle and Sand	2127.8	g

Density of Sand	96.32	lb/ft^3
Soil ID	PF-9	
Optimum Dry Density	125.1	lb/ft^3
Optimum Moisture	10.4	%

Moisture Content

Tare Wt	312.3	g
Tare + Wet Soil	3333.9	g
Tare + Dry Soil	3112.3	g
Dry Soil	2800.0	g
Moisture	221.6	g
% Moisture	7.9	%

Volume Calculation

Wt of Sand Used	3880.9	g
Wt of Sand Used	8.6	lb
Volume of Sand	0.0888	ft^3
Volume of Cone & Plate	0.0393	ft^3
Sand Volume Minus Cone & Plate	0.0496	ft^3

Wet Density	134.4	lb/ft^3
Dry Density	124.5	lb/ft^3

Specifications

		Pass/Fail
≥95% of Standard Proctor	100%	Pass
±2% Moisture Content	2.5	Pass ?

Fail for moisture; However, because compaction is 100% of MDD, the material compaction is adequate J.H. Rabe CQAE

Tech	PRH
Reviewed by	MSP

SAND CONE DENSITY TEST
Golder Associates

Test #	CUS-4

Date	24-Jan-05

Weight of Wet Material	2801.0	g

Density of Sand	96.32	lb/ft^3
Soil ID	PF-9	
Optimum Dry Density	125.1	lb/ft^3
Optimum Moisture	10.4	%

Cone and Plate #	A	
Bottle ID	Q	
Start wt of Bottle and Sand	6459.0	g
Finish wt of Bottle and Sand	2835.5	g

Moisture Content

Tare Wt	319.8	g
Tare + Wet Soil	3120.8	g
Tare + Dry Soil	2898.4	g
Dry Soil	2578.6	g
Moisture	222.4	g
% Moisture	8.6	%

Volume Calculation

Wt of Sand Used	36235	g
Wt of Sand Used	79.8	lb
Volume of Sand	0.0829	ft^3
Volume of Cone & Plate	0.0393	ft^3
Sand Volume Minus Cone & Plate	0.0437	ft^3

Wet Density	141.4	lb/ft^3
Dry Density	130.2	lb/ft^3

Specifications

		Pass/Fail
>95% of Standard Proctor	104%	Pass
+2% Moisture Content	1.8	Pass

Tech	PRH
Reviewed by	MSP

SAND CONE DENSITY TEST
Golder Associates

Test #	CUS-5

Date	26-Jan-05

Weight of Wet Material	3047.4	g

Cone and Plate #	A	
Bottle ID	J	
Start wt of Bottle and Sand	5550.6	g
Finish wt of Bottle and Sand	1732.3	g

Density of Sand	96.32	lb/ft^3
Soil ID	CLP-2	
Optimum Dry Density	123.6	lb/ft^3
Optimum Moisture	10.6	%

Moisture Content

Tare Wt	312.1	g
Tare + Wet Soil	3359.5	g
Tare + Dry Soil	3080.2	g
Dry Soil	2768.1	g
Moisture	279.3	g
% Moisture	10.1	%

Volume Calculation

Wt of Sand Used	3818.3	g
Wt of Sand Used	8.4	lb
Volume of Sand	0.0874	ft^3
Volume of Cone & Plate	0.0393	ft^3
Sand Volume Minus Cone & Plate	0.0481	ft^3

Wet Density	139.6	lb/ft^3
Dry Density	126.8	lb/ft^3

Specifications

		Pass/Fail
>95% of Standard Proctor	103%	Pass
±2% Moisture Content	0.5	Pass

Tech	MSP
Reviewed by	PRH

SAND CONE DENSITY TEST
Golder Associates

Test #	CUS-6

Date	27-Jan-05

Weight of Wet Material	3052.0	g

Cone and Plate #	A	
Bottle ID	J	
Start wt of Bottle and Sand	6554.2	g
Finish wt of Bottle and Sand	2744.9	g

Density of Sand	96.32	lb/ft^3
Soil ID	CLP-2	
Optimum Dry Density	123.6	lb/ft^3
Optimum Moisture	10.6	%

Moisture Content

Tare Wt	319.8	g
Tare + Wet Soil	3371.8	g
Tare + Dry Soil	3100.0	g
Dry Soil	2780.2	g
Moisture	271.8	g
% Moisture	9.8	%

Volume Calculation

Wt of Sand Used	3809.3	g
Wt of Sand Used	8.4	lb
Volume of Sand	0.0872	ft^3
Volume of Cone & Plate	0.0393	ft^3
Sand Volume Minus Cone & Plate	0.0479	ft^3

Wet Density	140.4	lb/ft^3
Dry Density	127.9	lb/ft^3

Specifications

		Pass/Fail
≥95% of Standard Proctor	103%	Pass
±2% Moisture Content	0.8	Pass

Tech	MSP
Reviewed by	PRH

SAND CONE DENSITY TEST
Golder Associates

Test #	CUS-7

Date	24-Feb-05

Weight of Wet Material	3261.1	g

Cone and Plate #	A	
Bottle ID	J	
Start wt of Bottle and Sand	6228.4	g
Finish wt of Bottle and Sand	2251.6	g

Density of Sand	96.32	lb/ft^3
Soil ID	CUP-3	
Optimum Dry Density	124.5	lb/ft^3
Optimum Moisture	11.3	%

Moisture Content

Tare Wt	306.2	g
Tare + Wet Soil	3567.3	g
Tare + Dry Soil	3268.3	g
Dry Soil	2962.1	g
Moisture	299.0	g
% Moisture	10.1	%

Volume Calculation

Wt of Sand Used	3976.8	g
Wt of Sand Used	8.8	lb
Volume of Sand	0.0910	ft^3
Volume of Cone & Plate	0.0393	ft^3
Sand Volume Minus Cone & Plate	0.0518	ft^3

Wet Density	138.9	lb/ft^3
Dry Density	126.2	lb/ft^3

Specifications

		Pass/Fail
>95% of Standard Proctor	101%	Pass
±2% Moisture Content	1.2	Pass

Tech	MSP
Reviewed by	MGC

SAND CONE DENSITY TEST
Golder Associates

Test #	CUS-8

Date	7-Apr-05

Weight of Wet Material	3573.0	g

Density of Sand	96.39	lb/ft^3
Soil ID	PF-9	
Optimum Dry Density	125.1	lb/ft^3
Optimum Moisture	10.4	%

Cone and Plate #	A	
Bottle ID	H	
Start wt of Bottle and Sand	6652.9	g
Finish wt of Bottle and Sand	2508.1	g

Moisture Content

Tare Wt	98.2	g
Tare + Wet Soil	804.5	g
Tare + Dry Soil	742.6	g
Dry Soil	644.4	g
Moisture	61.9	g
% Moisture	9.6	%

Volume Calculation

Wt of Sand Used	4144.8	g
Wt of Sand Used	9.1	lb
Volume of Sand	0.0948	ft^3
Volume of Cone & Plate	0.0393	ft^3
Sand Volume Minus Cone & Plate	0.0555	ft^3

Wet Density	141.8	lb/ft^3
Dry Density	129.4	lb/ft^3

Specifications

		Pass/Fail
>95% of Standard Proctor	103%	Pass
±2% Moisture Content	0.8	Pass

Tech	MSP
Reviewed by	MGC

SAND CONE DENSITY TEST
Golder Associates

Test #	CUS-9

Date	7-Apr-05

Weight of Wet Material	3573.0	g

Cone and Plate #	A	
Bottle ID	H	
Start wt of Bottle and Sand	5811.2	g
Finish wt of Bottle and Sand	1641.3	g

Density of Sand	96.39	lb/ft^3
Soil ID	PF-10	
Optimum Dry Density	122.1	lb/ft^3
Optimum Moisture	11	%

Moisture Content

Tare Wt	98.2	g
Tare + Wet Soil	804.5	g
Tare + Dry Soil	734.1	g
Dry Soil	635.9	g
Moisture	70.4	g
% Moisture	11.1	%

Volume Calculation

Wt of Sand Used	4169.9	g
Wt of Sand Used	9.2	lb
Volume of Sand	0.0954	ft^3
Volume of Cone & Plate	0.0393	ft^3
Sand Volume Minus Cone & Plate	0.0561	ft^3

Wet Density	140.4	lb/ft^3
Dry Density	126.4	lb/ft^3

Specifications

		Pass/Fail
>95% of Standard Proctor	104%	Pass
±2% Moisture Content	0.1	Pass

Tech	MSP
Reviewed by	MGC

SAND CONE DENSITY TEST
Golder Associates

Test #	CUS-10

Date	16-Apr-05

Weight of Wet Material	3476.7	g

Density of Sand	96.39	lb/ft^3
Soil ID	PF-18	
Optimum Dry Density	123.8	lb/ft^3
Optimum Moisture	11.2	%

Cone and Plate #	A	
Bottle ID	F	
Start wt of Bottle and Sand	6554.6	g
Finish wt of Bottle and Sand	2348.4	g

Moisture Content

Tare Wt	84.3	g
Tare + Wet Soil	930.6	g
Tare + Dry Soil	848.2	g
Dry Soil	763.9	g
Moisture	82.4	g
% Moisture	10.8	%

Volume Calculation

Wt of Sand Used	4206.2	g
Wt of Sand Used	9.3	lb
Volume of Sand	0.0962	ft^3
Volume of Cone & Plate	0.0393	ft^3
Sand Volume Minus Cone & Plate	0.0569	ft^3

Wet Density	134.6	lb/ft^3
Dry Density	121.5	lb/ft^3

Specifications

		Pass/Fail
>95% of Standard Proctor	98%	Pass
±2% Moisture Content	0.4	Pass

Tech	MSP
Reviewed by	MGC

SAND CONE DENSITY TEST
Golder Associates

Test #	CUS-11

Date	18-Apr-05

Weight of Wet Material	3418.0	g

Cone and Plate #	A	
Bottle ID	F	
Start wt of Bottle and Sand	6129.0	g
Finish wt of Bottle and Sand	1982.4	g

Density of Sand	96.39	lb/ft^3
Soil ID	PF-9	
Optimum Dry Density	125.1	lb/ft^3
Optimum Moisture	10.4	%

Moisture Content

Tare Wt	79.4	g
Tare + Wet Soil	856.0	g
Tare + Dry Soil	785.5	g
Dry Soil	706.1	g
Moisture	70.5	g
% Moisture	10.0	%

Volume Calculation

Wt of Sand Used	4146.6	g
Wt of Sand Used	9.1	lb
Volume of Sand	0.0948	ft^3
Volume of Cone & Plate	0.0393	ft^3
Sand Volume Minus Cone & Plate	0.0556	ft^3

Wet Density	135.6	lb/ft^3
Dry Density	123.3	lb/ft^3

Specifications

		Pass/Fail
>95% of Standard Proctor	99%	Pass
±2% Moisture Content	-0.4	Pass

Tech.	MSP
Reviewed by	MGC

FIELD DENSITY TEST LOG FOR 6" CUSHION AND OTHER MATERIALS

Date	Soil ID	Test #	Northing	Easting	Elevation	WD	Moisture Contents		DD	Proctor Results		-2 to 2	> 95%	Pass/Fail
							Nuke MC	Oven MC		Optimum MC	Optimum DD	% off MC	% Comp.	
10/4/2004	10	TFC-1	39411.87	19615.91	5993.77	131.3	10.4	-	118.9	11	122.1	-0.6	97%	PASS
10/4/2004	10	TFC-2	39450.4	19594.76	5993.09	135.9	11.4	-	122.0	11	122.1	0.4	100%	PASS
10/4/2004	10	TFC-3	39388.58	19636.89	5993.76	136.6	12.2	-	121.7	11	122.1	1.2	100%	PASS
10/4/2004	9	TFC-4	39467.99	19626.77	5992.89	137.3	10.6	-	124.1	10.4	125.1	0.2	99%	PASS
10/4/2004	10	TFC-5	39428.47	19651.32	5993.26	129.7	11.0	-	116.8	11	122.1	0.0	96%	PASS
10/4/2004	10	TFCS-1	39410.89	19615.98	5993.79	129.4	-	9.9	117.7	11	122.1	-1.1	96%	PASS
10/5/2004	9	TFC-6	39380.05	19612.07	5994.89	137.4	11.0	-	123.8	10.4	125.1	0.6	99%	PASS
10/5/2004	9	TFC-7	39405	19630.06	5994.8	136.1	9.8	-	124.0	10.4	125.1	-0.6	99%	PASS
10/5/2004	10	TFC-8	39425.6	19606.05	5994.82	134.9	11.4	-	121.1	11	122.1	0.4	99%	PASS
10/5/2004	9	TFC-9	39453.45	19628.11	5994.09	141	10.7	-	127.4	10.4	125.1	0.3	102%	PASS
10/5/2004	10	TFC-10	39483.86	19608.22	5993.69	135.9	11.1	-	122.3	11	122.1	0.1	100%	PASS
10/5/2004	10	TFCS-2	39404.14	19630.29	5994.76	131.3	-	9.8	119.6	11	122.1	-1.2	98%	PASS
10/27/2004	9	CL-001	39385.28	19552.98	5995.06	139	9.8	-	126.6	10.4	125.1	-0.6	101%	PASS
10/27/2004	9	CL-002	39448.58	19530.62	5993.33	139.9	10.2	-	127.0	10.4	125.1	-0.2	101%	PASS
10/27/2004	9	CL-003	39537.29	19487.6	5989.65	133.8	10.7	-	120.9	10.4	125.1	0.3	97%	PASS
10/27/2004	9	CL-004	39509.86	19443.74	5990.31	135.7	10.3	-	123.0	10.4	125.1	-0.1	98%	PASS
10/27/2004	9	CL-005	39432.35	19463.61	5993.27	135.4	10.8	-	122.2	10.4	125.1	0.4	98%	PASS
10/27/2004	9	CL-006	39582.12	19527.69	5988.31	130.3	9.4	-	119.1	10.4	125.1	-1.0	95%	PASS
10/27/2004	9	CL-007	39498.23	19563.94	5991.79	136.7	9.6	-	124.7	10.4	125.1	-0.8	100%	PASS
10/27/2004	9	CL-008	39442.19	19584.36	5994.24	134	10.7	-	121.0	10.4	125.1	0.3	97%	PASS
10/27/2004	9	CL-009	39343.07	19646.31	5995.18	140.1	9.8	-	127.6	10.4	125.1	-0.6	102%	PASS
11/4/2004	9	CL-010	39378.69	19529.17	5994.71	133.2	8.7	-	122.5	10.4	125.1	-1.7	98%	PASS
11/4/2004	8	CL-011	39476.49	19535.76	5992.69	130.3	11.4	-	117.0	11.9	117.9	-0.5	99%	PASS
11/4/2004	8	CL-012	39548.22	19527.19	5989.68	130.6	12.0	-	116.6	11.9	117.9	0.1	99%	PASS
11/4/2004	9	CL-013	39493.78	19602.27	5992.92	133.2	10.8	-	120.2	10.4	125.1	0.4	96%	PASS
11/4/2004	9	CL-014	39344.32	19589.36	5994.89	136.5	11.7	-	122.2	10.4	125.1	1.3	98%	PASS
11/5/2004	9	CL-015	39330.59	19633.98	5994.57	144	9.4	-	131.6	10.4	125.1	-1.0	105%	PASS
11/5/2004	9	CL-016	39377.92	19629.57	5996.14	135.6	10.4	-	122.8	10.4	125.1	0.0	98%	PASS
11/5/2004	9	CL-017	39566.45	19638.19	5990.51	135.1	10.1	-	122.7	10.4	125.1	-0.3	98%	PASS
11/5/2004	9	CL-018	39553.32	19653.14	5991.05	129.8	8.8	-	119.3	10.4	125.1	-1.6	95%	PASS
11/5/2004	9	CL-019	39394.2	19697.4	5996.94	130.3	8.9	-	119.7	10.4	125.1	-1.5	96%	PASS
11/5/2004	9	CL-020	39319.26	19682.97	5994.13	135.4	11.5	-	121.4	10.4	125.1	1.1	97%	PASS
11/5/2004	9	CLS-001	39319.26	19682.97	5994.13	132.4	-	9.4	121.0	10.4	125.1	-1.0	97%	PASS

Date	Soil ID	Test #	Northing	Easting	Elevation	WD	Moisture Contents		DD	Proctor Results		-2 to 2	> 95%	Pass/Fail
							Nuke MC	Oven MC		Optimum MC	Optimum DD	% off MC	% Comp.	
11/8/2004	9	CL-021	39615.854	19705.069	5989.359	132.9	8.5	-	122.5	10.4	125.1	-1.9	98%	PASS
11/8/2004	9	CL-022	39249.101	19779.512	5991.988	134.9	8.9	-	123.9	10.4	125.1	-1.5	99%	PASS
11/8/2004	9	CL-023	39595.906	19764.932	5991.088	135	10.1	-	122.6	10.4	125.1	-0.3	98%	PASS
11/8/2004	9	CL-024	39496.708	19772.499	5995.029	135	9.9	-	122.8	10.4	125.1	-0.5	98%	PASS
11/8/2004	9	CL-025	39326.888	19811.512	5994.659	130.2	8.7	-	119.8	10.4	125.1	-1.7	96%	PASS
11/8/2004	9	CL-026	39266.602	19792.031	5992.489	134.1	10.1	-	121.8	10.4	125.1	-0.3	97%	PASS
11/15/2004	10	AT-001	39726.13	19836.88	5987.61	134.7	12.4	-	119.8	11	122.1	1.4	98%	PASS
11/16/2004	10	CL-027	39726.13	19836.88	5987.61	135.9	9.1	-	124.6	11	122.1	-1.9	102%	PASS
11/16/2004	10	CL-028	39728.61	19883.5	5987.93	138.6	12.4	-	123.3	11	122.1	1.4	101%	PASS
11/16/2004	10	CL-029	39641.52	19860.94	5990.84	137.9	12.5	-	122.6	11	122.1	1.5	100%	PASS
11/16/2004	10	CL-030	39558.05	19883.18	5994.5	134.5	12.7	-	119.3	11	122.1	1.7	98%	PASS
11/16/2004	10	CL-031	39465.07	19874.89	5998.44	133.4	12.0	-	119.1	11	122.1	1.0	98%	PASS
11/16/2004	10	CL-032	39355.14	19882.02	5996.22	136.8	11.6	11.4	122.8	11	122.1	0.4	101%	PASS
11/16/2004	11	CL-033	39293.91	19883.87	5993.43	139.3	11.9	-	124.5	10.8	122.9	1.1	101%	PASS
11/16/2004	9	AT-002	39269.64	19710.27	5992.48	130.5	8.8	-	119.9	10.4	125.1	-1.6	96%	PASS
11/17/2004	9	CL-034	39248	19967.37	5991.62	138.3	11.6	-	123.9	10.4	125.1	1.2	99%	PASS
11/17/2004	10	CL-035	39350.15	19980.12	5995.27	131.6	12.1	-	117.4	11	122.1	1.1	96%	PASS
11/17/2004	9	CL-036	39441.24	19973.38	5998.79	138.6	11.3	-	124.5	10.4	125.1	0.9	100%	PASS
11/17/2004	10	CL-037	39607.6	19980.68	5994.27	135.3	11.1	-	121.8	11	122.1	0.1	100%	PASS
11/17/2004	9	CL-038	39700.47	19973.76	5990.43	135.5	11.2	-	121.9	10.4	125.1	0.8	97%	PASS
11/17/2004	10	CL-039	39814.86	19983.92	5986.52	136.3	12.6	-	121.0	11	122.1	1.6	99%	PASS
11/18/2004	10	AT-3	39229.6	19875.39	5990.6	130.5	10.7	-	117.9	11	122.1	-0.3	97%	PASS
11/18/2004	9	AT-4	39235.44	19823.44	5990.98	141.2	11.0	-	127.2	10.4	125.1	0.6	102%	PASS
11/18/2004	10	AT-5	39232.53	19843.59	5991.83	135.1	12.5	-	120.1	11	122.1	1.5	98%	PASS
11/18/2004	9	CL-040	39463.61	20019.29	5998.57	140.7	10.7	-	127.1	10.4	125.1	0.3	102%	PASS
11/18/2004	9	CLS-002	39463.61	20019.29	5998.57	139.4	-	10.4	126.3	10.4	125.1	0.0	101%	PASS
11/18/2004	9	CL-041	39358.61	20017.79	5994.78	135.1	9.6	-	123.3	10.4	125.1	-0.8	99%	PASS
11/18/2004	9	CL-042	39273.16	20023.04	5991.47	141.2	9.2	-	129.3	10.4	125.1	-1.2	103%	PASS
11/18/2004	9	CL-043	39558.31	20030.26	5997.32	132.7	9.1	-	121.6	10.4	125.1	-1.3	97%	PASS
11/18/2004	9	CL-044	39637.59	20031.39	5993.98	137.2	10.4	-	124.3	10.4	125.1	0.0	99%	PASS
11/18/2004	9	CL-045	39728.86	20029.03	5990.35	130.8	9.5	-	119.5	10.4	125.1	-0.9	95%	PASS
11/18/2004	9	CL-046	39829.21	20032.49	5986.46	135	8.9	-	124.0	10.4	125.1	-1.5	99%	PASS
11/19/2004	10	AT-006	39741.88	19797.28	5985.46	136.8	11.9	-	122.3	11	122.1	0.9	100%	PASS
11/19/2004	10	AT-007	39778.2	19852.31	5984.67	130.4	12.0	-	116.4	11	122.1	1.0	95%	PASS

Date	Soil ID	Test #	Northing	Easting	Elevation	WD	Moisture Contents		DD	Proctor Results		-2 to 2	> 95%	Pass/Fail
							Nuke MC	Oven MC		Optimum MC	Optimum DD	% off MC	% Comp.	
11/19/2004	10	AT-008	39837.32	19939.09	5983.58	131.5	12.6	-	116.8	11	122.1	1.6	96%	PASS
11/19/2004	10	AT-009	39743.3	19799.97	5986.41	132.3	9.8	-	120.5	11	122.1	-1.2	99%	PASS
11/19/2004	10	AT-010	39827.92	19925.24	5985.12	136.2	11.6	-	122.0	11	122.1	0.6	100%	PASS
12/6/2004	10	CL-047	39872.29	20035.64	5984.38	136.8	10.4	-	123.9	11	122.1	-0.6	101%	PASS
12/6/2004	10	CL-048	39823.39	20024.25	5986.32	130.1	11.5	-	116.7	11	122.1	0.5	96%	PASS
12/6/2004	10	CL-049	39765.44	20048.23	5988.98	137.9	11.5	10.6	124.7	11	122.1	-0.4	102%	PASS
12/6/2004	9	CL-050	39715.91	20028.81	5990.6	135.4	9.4	-	123.8	10.4	125.1	-1.0	99%	PASS
12/6/2004	9	CL-051	39647.25	20044.63	5993.53	137.6	10.8	-	124.2	10.4	125.1	0.4	99%	PASS
12/6/2004	9	CL-052	39591.39	20037.98	5995.98	130.8	9.1	-	119.9	10.4	125.1	-1.3	96%	PASS
12/6/2004	9	CL-053	39511.1	20042.77	5998.98	135.9	9.5	-	124.1	10.4	125.1	-0.9	99%	PASS
12/6/2004	10	CL-054	39454.51	20053.76	5997.63	133.7	11.3	-	120.1	11	122.1	0.3	98%	PASS
12/6/2004	9	CL-055	39395.48	20041.08	5995.73	137.5	11.1	-	123.8	10.4	125.1	0.7	99%	PASS
12/6/2004	9	CL-056	39396.68	20041.05	5993.87	140.6	11.9	-	125.6	10.4	125.1	1.5	100%	PASS
12/6/2004	9	CL-057	39295.29	20042.76	5991.91	135.2	11.1	-	121.7	10.4	125.1	0.7	97%	PASS
12/6/2004	9	CL-058	39258.49	20027.61	5990.79	141.4	11.6	-	126.7	10.4	125.1	1.2	101%	PASS
12/7/2004	11	CL-059	39280.73	20119.49	5990.09	130.7	10.0	-	118.8	10.8	122.9	-0.8	97%	PASS
12/7/2004	11	CL-060	39265.17	20194.15	5988.2	134.7	11.3	-	121.0	10.8	122.9	0.5	98%	PASS
12/8/2004	11	CLS-003	39265.17	20194.15	5988.2	130.7	-	9.7	119.1	10.8	122.9	-1.1	97%	PASS
12/7/2004	10	CL-061	39363.13	20182.08	5990.35	130.7	12.2	-	116.5	11	122.1	1.2	95%	PASS
12/7/2004	10	CL-062	39363.43	20114.62	5993.4	129.9	11.4	-	116.6	11	122.1	0.4	96%	PASS
12/7/2004	11	CL-063	39428.52	20122.07	5995.41	134.7	11.3	-	121.0	10.8	122.9	0.5	98%	PASS
12/7/2004	10	CL-064	39483.71	20155.24	5995.69	129.8	11.8	-	116.1	11	122.1	0.8	95%	PASS
12/7/2004	11	CL-065	39531.42	20109.38	5998.71	133.1	10.5	-	120.5	10.8	122.9	-0.3	98%	PASS
12/7/2004	11	CL-066	39572.56	20165.04	5998.2	133.5	10.5	-	120.8	10.8	122.9	-0.3	98%	PASS
12/7/2004	11	CL-067	39616.39	20104.55	5995.44	133	10.7	-	120.1	10.8	122.9	-0.1	98%	PASS
12/7/2004	11	CL-068	39646.6	20164.15	5994.67	132	10.0	-	120.0	10.8	122.9	-0.8	98%	PASS
12/7/2004	10	CL-069	39718.35	20166.24	5991.59	129.5	10.8	-	116.9	11	122.1	-0.2	96%	PASS
12/7/2004	11	CL-070	39723.91	20108.82	5990.99	130.7	10.5	-	118.3	10.8	122.9	-0.3	96%	PASS
12/7/2004	11	CL-071	39770.8	20098.63	5989.16	136	11.1	-	122.4	10.8	122.9	0.3	100%	PASS
12/7/2004	11	CL-072	39823.45	20143.35	5987.24	132.3	9.8	-	120.5	10.8	122.9	-1.0	98%	PASS
12/7/2004	11	CL-073	39876.88	20094.62	5984.88	134.4	11.4	11.7	120.3	10.8	122.9	0.9	98%	PASS
12/7/2004	11	CL-074	39938.75	20145.54	5982.63	132.3	9.7	-	120.6	10.8	122.9	-1.1	98%	PASS
12/8/2004	9	CL-075	39260.34	20226.08	5987.366	133.1	9.8	-	121.2	10.4	125.1	-0.6	97%	PASS
12/8/2004	9	CL-076	3960.04	20225.58	5989.8	132.5	9.7	-	120.8	10.4	125.1	-0.7	97%	PASS

Date	Soil ID	Test #	Northing	Easting	Elevation	WD	Moisture Contents		DD	Proctor Results		-2 to 2	> 95%	Pass/Fail
							Nuke MC	Oven MC		Optimum MC	Optimum DD	% off MC	% Comp.	
12/8/2004	9	CL-077	39417.97	20218.25	5992.311	133.9	10.3	-	121.4	10.4	125.1	-0.1	97%	PASS
12/8/2004	9	CL-078	39516.44	20217.2	5995.142	136.2	9.4	-	124.5	10.4	125.1	-1.0	100%	PASS
12/8/2004	9	CL-079	39614.69	20221.4	5996.629	133.9	11.4	10.8	120.8	10.4	125.1	0.4	97%	PASS
12/8/2004	10	CL-080	39691.4	20224.03	5993.664	128.8	11.0	-	116.0	11	122.1	0.0	95%	PASS
12/8/2004	10	CLS-04	39691.4	20224.03	5993.664	131.7	-	10.7	119.0	11	122.1	-0.3	97%	PASS
12/8/2004	10	CL-081	39825.56	20231.83	5988.132	134.7	11.0	-	121.4	11	122.1	0.0	99%	PASS
12/8/2004	10	CL-082	39968.79	20219.2	5982.537	135	11.4	-	121.2	11	122.1	0.4	99%	PASS
12/9/2004	10	CL-083	39675.89	20280.19	5994.01	134.1	10.2	-	121.7	11	122.1	-0.8	100%	PASS
12/9/2004	11	CL-084	39756.26	20297.76	5991.18	130.4	9.8	-	118.8	10.8	122.9	-1.0	97%	PASS
12/9/2004	11	CL-085	40026.26	20283.87	5980.55	135.2	10.4	-	122.5	10.8	122.9	-0.4	100%	PASS
12/9/2004	9	CL-086	39889.35	20288.4	5985.9	135.3	9.7	-	123.3	10.4	125.1	-0.7	99%	PASS
12/9/2004	9	CL-087	39630.3	20305.58	5993.49	135.7	10.1	-	123.3	10.4	125.1	-0.3	99%	PASS
12/9/2004	9	CL-088	39534.38	20302.97	5993.33	133.1	9.3	-	121.8	10.4	125.1	-1.1	97%	PASS
12/9/2004	9	CL-089	39420.57	20291.89	5990.34	135.7	10.6	-	122.7	10.4	125.1	0.2	98%	PASS
12/9/2004	9	CL-090	39314.27	20288.4	5987.36	138.1	10.2	-	125.3	10.4	125.1	-0.2	100%	PASS
12/13/2004	11	CL-091	39307.03	20317.69	5986.44	130.6	9.0	-	119.8	10.8	122.9	-1.8	97%	PASS
12/13/2004	11	CL-092	39410.27	20340.67	5988.76	127.5	8.9	-	117.1	10.8	122.9	-1.9	95%	PASS
12/13/2004	9	CL-093	39496.39	20309.12	5992.17	138.2	9.6	-	126.1	10.4	125.1	-0.8	101%	PASS
12/13/2004	9	CL-094	39576.81	20333.31	5992.54	136	10.0	-	123.6	10.4	125.1	-0.4	99%	PASS
12/13/2004	9	CL-095	39692.69	20334.13	5991.82	136.9	9.6	-	124.9	10.4	125.1	-0.8	100%	PASS
12/13/2004	9	CL-096	39794.74	20304.36	5989.62	136.2	10.4	-	123.4	10.4	125.1	0.0	99%	PASS
12/13/2004	9	CL-097	39879.55	20339.48	5986.74	137.2	10.2	-	124.5	10.4	125.1	-0.2	100%	PASS
12/13/2004	9	CL-098	39984.93	20301.2	5982.35	136.5	9.8	-	124.3	10.4	125.1	-0.6	99%	PASS
12/13/2004	11	CL-099	40065.55	20325.35	5979.36	131	9.1	-	120.1	10.8	122.9	-1.7	98%	PASS
12/14/2004	10	CL-100	40047.78	20366.69	5980.55	129.1	11.3	-	116.0	11	122.1	0.3	95%	PASS
12/14/2004	10	CLS-05	40047.78	20366.69	5980.55	130.9	-	11.0	117.9	11	122.1	0.0	97%	PASS
12/14/2004	11	CL-101	39962.31	20358.69	5983.52	129.8	9.0	-	119.1	10.8	122.9	-1.8	97%	PASS
12/14/2004	11	CL-102	39890.85	20360.99	5986.52	133.1	9.6	-	121.4	10.8	122.9	-1.2	99%	PASS
12/14/2004	9	CL-103	39803	20370.58	5989.12	129.7	9.0	-	119.0	10.4	125.1	-1.4	95%	PASS
12/14/2004	11	CL-104	39707.38	20376.75	5989.36	133.4	8.7	-	122.7	10.8	122.9	-2.1	100%	PASS
12/14/2004	9	CL-105	39634.69	20383.63	5989.82	138.4	11.4	-	124.2	10.4	125.1	1.0	99%	PASS
12/14/2004	9	CL-106	39503	20356.53	5990.53	133.1	9.0	-	122.1	10.4	125.1	-1.4	98%	PASS
12/14/2004	9	CL-107	39398.64	20372.64	5987.55	136.3	9.5	-	124.5	10.4	125.1	-0.9	100%	PASS
12/14/2004	9	CL-108	39312.44	20369.66	5984.99	139	10.1	-	126.2	10.4	125.1	-0.3	101%	PASS

Date	Soil ID	Test #	Northing	Easting	Elevation	WD	Moisture Contents		DD	Proctor Results		-2 to 2	> 95%	Pass/Fail
							Nuke MC	Oven MC		Optimum MC	Optimum DD	% off MC	% Comp.	
12/15/2004	9	CL-109	39351.78	20440.27	5984.38	130.6	9.6	-	119.2	10.4	125.1	-0.8	95%	PASS
12/15/2004	9	CL-110	39451.92	20421.73	5987.77	131.9	10.4	-	119.5	10.4	125.1	0.0	96%	PASS
12/15/2004	9	CL-111	39521.5	20423.8	5988.56	130.6	9.5	-	119.3	10.4	125.1	-0.9	95%	PASS
12/15/2004	9	CL-112	39584.97	20423.77	5988.07	133.2	9.6	-	121.5	10.4	125.1	-0.8	97%	PASS
12/15/2004	9	CL-113	39678.18	20431.51	5986.78	131.4	10.5	-	118.9	10.4	125.1	0.1	95%	PASS
12/15/2004	9	CL-114	39792.65	20428.95	5986.23	135.7	11.1	-	122.1	10.4	125.1	0.7	98%	PASS
12/15/2004	9	CL-115	39909.91	20420.74	5985.8	132.1	9.5	-	120.6	10.4	125.1	-0.9	96%	PASS
12/15/2004	9	CL-116	4001.31	20427.9	5982.71	137.1	11.6	-	122.8	10.4	125.1	1.2	98%	PASS
12/15/2004	9	CL-117	40096.34	20428.39	5979.15	138.7	11.0	-	125.0	10.4	125.1	0.6	100%	PASS
12/16/2005	11	CL-118	39402.68	20419.25	5986.24	130.7	11.5	9.9	118.9	10.8	122.9	-0.9	97%	PASS
12/16/2004	9	CL-119	39954.89	21421.52	5984.35	135.2	11.3	-	121.5	10.4	125.1	0.9	97%	PASS
12/18/2004	11	CL-120	39364.57	20469.41	5983.92	135	11.6	-	121.0	10.8	122.9	0.8	98%	PASS
12/18/2004	11	CLS-06	39364.57	20469.41	5983.92	136.1	-	10.8	122.8	10.8	122.9	0.0	100%	PASS
12/18/2004	11	CL-121	39352.37	20529.38	5982.07	136.7	11.4	12.1	121.9	10.8	122.9	1.3	99%	PASS
12/18/2004	11	CL-122	39443.83	20522.98	5984.56	132.9	9.3	-	121.6	10.8	122.9	-1.5	99%	PASS
12/18/2004	11	CL-123	39458	20460.43	5986.68	136.3	10.9	-	122.9	10.8	122.9	0.1	100%	PASS
12/18/2004	11	CL-124	39538	20463	5986.49	139.1	9.5	-	127.0	10.8	122.9	-1.3	103%	PASS
12/18/2004	9	CL-125	39597.62	20458.2	5986.35	134.9	9.9	-	122.7	10.4	125.1	-0.5	98%	PASS
12/18/2004	9	CL-126	39604.92	20537.81	5982.48	141.4	9.4	-	129.3	10.4	125.1	-1.0	103%	PASS
12/18/2004	11	CL-127	39696.27	20509.24	5982.77	138.1	8.9	-	126.8	10.8	122.9	-1.9	103%	PASS
12/18/2004	9	CL-128	39707.61	20451.77	5985.58	135.2	11.8	-	120.9	10.4	125.1	1.4	97%	PASS
12/18/2004	9	CL-129	39782.86	20466.4	5984.63	135.1	9.0	-	123.9	10.4	125.1	-1.4	99%	PASS
12/18/2004	11	CL-130	39809.73	20527.03	5981.32	135.8	11.1	-	122.2	10.8	122.9	0.3	99%	PASS
12/18/2004	11	CL-131	39894.2	20510.65	5981.31	139.1	9.8	-	126.7	10.8	122.9	-1.0	103%	PASS
12/18/2004	11	CL-132	39926.24	20454.37	5984.12	137.3	9.7	-	125.2	10.8	122.9	-1.1	102%	PASS
12/18/2004	9	CL-133	39959.68	20518.2	5980.88	139.5	9.7	-	127.2	10.4	125.1	-0.7	102%	PASS
12/18/2004	9	CL-134	40018.53	20526.46	5980.22	134.7	10.6	-	121.8	10.4	125.1	0.2	97%	PASS
12/18/2004	9	CL-135	40024.89	20455.36	5981.87	134.4	9.0	-	123.3	10.4	125.1	-1.4	99%	PASS
12/18/2004	12	CL-136	40102.97	20473.39	5979.17	136.6	9.5	-	124.7	10.6	123.6	-1.1	101%	PASS
12/18/2004	12	CL-137	40119.7	20527.16	5978.6	134.3	11.9	-	120.0	10.6	123.6	1.3	97%	PASS
2/10/2005	15	CL-138	39382.66	20548.09	5982.59	132.5	11.2	-	119.2	11.3	124.5	-0.1	96%	PASS
2/10/2005	15	CL-139	39462.48	20572.71	5983.09	137.1	9.7	-	125.0	11.3	124.5	-1.6	100%	PASS
2/10/2005	15	CL-140	39545.11	20573.68	5981.95	138.4	10.1	-	125.7	11.3	124.5	-1.2	101%	PASS
2/10/2005	15	CLS-07	39545.11	20573.68	5981.95	135.5	-	11.1	122.0	11.3	124.5	-0.2	98%	PASS

Date	Soil ID	Test #	Northing	Easting	Elevation	WD	Moisture Contents		DD	Proctor Results		-2 to 2	> 95%	Pass/Fail
							Nuke MC	Oven MC		Optimum MC	Optimum DD	% off MC	% Comp.	
2/10/2005	14	CL-141	39629.29	20573.91	5980.75	130.6	11.3	-	117.3	12.2	122.8	-0.9	96%	PASS
2/10/2005	15	CL-142	39741.84	20561.39	5979.96	133.8	10.1	-	121.5	11.3	124.5	-1.2	98%	PASS
2/10/2005	15	CL-143	39858.61	20582.46	5978.57	137.8	12.0	-	123.0	11.3	124.5	0.7	99%	PASS
2/10/2005	15	CL-144	39966.61	20582.46	5977.325	133.6	10.9	-	120.5	11.3	124.5	-0.4	97%	PASS
2/10/2005	14	CL-145	40061.8	20592.48	5979.29	132.3	13.0	-	117.1	12.2	122.8	0.8	95%	PASS
2/10/2005	15	CL-146	40114.81	20581.71	5976.735	133.6	10.3	-	121.1	11.3	124.5	-1.0	97%	PASS
2/11/2005	15	CL-147	40145.01	20601.89	5975.555	133.7	12.1	-	119.3	11.3	124.5	0.8	96%	PASS
2/11/2005	15	CL-148	40063.93	20624.03	5974.751	136.5	9.8	-	124.3	11.3	124.5	-1.5	100%	PASS
2/11/2005	14	CL-149	39973.69	20623.57	5975.183	130.9	11.8	-	117.1	12.2	122.8	-0.4	95%	PASS
2/11/2005	14	CL-150	39877.2	20634.55	5975.254	134.8	12.2	11.9	120.5	12.2	122.8	-0.3	98%	PASS
2/11/2005	14	CL-151	39794.3	20625.17	5976.226	135.1	11.5	-	121.2	12.2	122.8	-0.7	99%	PASS
2/11/2005	14	CL-152	39702.44	20627.53	5977.219	134.1	11.5	-	120.3	12.2	122.8	-0.7	98%	PASS
2/11/2005	14	CL-153	39610.66	20629.03	5978.617	134.6	12.7	-	119.4	12.2	122.8	0.5	97%	PASS
2/11/2005	15	CL-154	39521.39	20626.89	5980.192	134.2	11.0	-	120.9	11.3	124.5	-0.3	97%	PASS
2/11/2005	15	CL-155	39433.81	20618.14	5981.324	133.2	11.6	-	119.4	11.3	124.5	0.3	96%	PASS
2/11/2005	15	CL-156	39462.01	20671.29	5979.612	136.6	10.8	10.0	124.2	11.3	124.5	-1.3	100%	PASS
2/11/2005	15	CL-157	39542.62	20693.86	5977.16	136.1	12.7	-	120.8	11.3	124.5	1.4	97%	PASS
2/11/2005	15	CL-158	39635.72	20672.39	5976.414	135.5	11.4	-	121.6	11.3	124.5	0.1	98%	PASS
2/11/2005	15	CL-159	39733.45	2067.01	5975.031	136.2	10.2	-	123.6	11.3	124.5	-1.1	99%	PASS
2/11/2005	14	CL-160	39819.58	20658.24	5974.757	135.9	13.3	-	119.9	12.2	122.8	1.1	98%	PASS
2/11/2005	14	CLS-08	39819.58	20658.24	5974.757	135.5	-	12.1	120.9	12.2	122.8	-0.1	98%	PASS
2/11/2005	15	CL-161	39894.19	20669.86	5973.821	138	12.1	-	123.1	11.3	124.5	0.8	99%	PASS
2/11/2005	14	CL-162	39982.95	20668.29	5973.212	133.2	12.8	-	118.1	12.2	122.8	0.6	96%	PASS
2/11/2005	14	CL-163	40067.84	20670.76	5972.473	133	10.5	-	120.4	12.2	122.8	-1.7	98%	PASS
2/11/2005	14	CL-164	40138.03	20671.55	5972.489	129.8	10.3	-	117.7	12.2	122.8	-1.9	96%	PASS
2/14/2005	12	AT-11	40156.06	20598.9	5971.14	130	8.7	-	119.6	10.6	123.6	-1.9	97%	PASS
2/14/2005	12	AT-12	40151.67	20557.09	5977.41	132.6	8.8	-	121.9	10.6	123.6	-1.8	99%	PASS
2/14/2005	12	AT-13	39369.5	20594.59	5979.73	128.9	9.7	-	117.5	10.6	123.6	-0.9	95%	PASS
2/14/2005	12	AT-14	39386.23	20626.23	5979.93	130.3	9.0	-	119.5	10.6	123.6	-1.6	97%	PASS
3/19/2005	12	CL-165	39686.77	20932.74	5951.15	135.3	11.8	-	121.0	10.6	123.6	1.2	98%	PASS
3/19/2005	12	CL-166	39673.04	20991.75	5951.77	130	9.7	-	118.5	10.6	123.6	-0.9	96%	PASS
3/19/2005	12	CL-167	39628.39	21066.33	5963.08	132.3	10.5	-	119.7	10.6	123.6	-0.1	97%	PASS
3/19/2005	12	CL-168	39619.24	20945.55	5965.6	130.3	9.7	-	118.8	10.6	123.6	-0.9	96%	PASS
3/19/2005	12	CL-169	39629.83	20883.05	5969.12	137.6	10.5	-	124.5	10.6	123.6	-0.1	101%	PASS

Date	Soil ID	Test #	Northing	Easting	Elevation	WD	Moisture Contents		DD	Proctor Results		-2 to 2	> 95%	Pass/Fail
							Nuke MC	Oven MC		Optimum MC	Optimum DD	% off MC	% Comp.	
3/19/2005	12	CL-170	39684.39	20832.78	5968.66	131.9	9.7	-	120.2	10.6	123.6	-0.9	97%	PASS
3/19/2005	12	CL-171	39741.97	20810.68	5967.81	131.8	9.4	-	120.5	10.6	123.6	-1.2	97%	PASS
3/19/2005	12	CL-172	39779.14	20854.74	5954.1	135.9	10.0	-	123.5	10.6	123.6	-0.6	100%	PASS
3/19/2005	14	CL-173	39739.42	20901.5	5947.06	138.2	13.0	-	122.3	12.2	122.8	0.8	100%	PASS
3/22/2005	9	CL-174	39572.66	21081.19	5966.66	142.9	9.5	-	130.5	10.4	125.1	-0.9	104%	PASS
3/22/2005	9	CL-175	39540.95	21010.96	5968.53	136.2	9.2	-	124.7	10.4	125.1	-1.2	100%	PASS
3/22/2005	9	CL-176	39556.07	20962.29	5968.18	135.8	9.0	-	124.6	10.4	125.1	-1.4	100%	PASS
3/22/2005	9	CL-177	39526.19	20899.11	5969.9	137.2	8.8	-	126.1	10.4	125.1	-1.6	101%	PASS
3/22/2005	9	CL-178	39481.79	20858.92	5972.22	140.4	10.1	11.2	126.3	10.4	125.1	0.8	101%	PASS
3/22/2005	9	CL-179	39467.95	20793.27	5974.85	141.4	9.5	-	129.1	10.4	125.1	-0.9	103%	PASS
3/22/2005	9	CL-180	39547.01	20847.28	5971.65	139.9	9.9	-	127.3	10.4	125.1	-0.5	102%	PASS
3/22/2005	9	CLS-09	39547.01	20847.28	5971.65	140.4	-	11.1	126.4	10.4	125.1	0.7	101%	PASS
3/22/2005	9	CL-181	39644.1	20819.13	5971.26	138.3	9.2	-	126.6	10.4	125.1	-1.2	101%	PASS
3/22/2005	9	CL-182	39589.5	20774.5	5973.71	137.5	8.9	-	126.3	10.4	125.1	-1.5	101%	PASS
3/22/2005	10	CL-183	39441.24	20716.93	5978.02	128.2	9.6	-	117.0	11	122.1	-1.4	96%	PASS
3/22/2005	10	CL-184	39530.47	20711.86	5976.7	136.5	12.0	-	121.9	11	122.1	1.0	100%	PASS
3/22/2005	10	CL-185	39623.66	20714.46	5975.46	134.9	10.3	-	122.3	11	122.1	-0.7	100%	PASS
3/22/2005	9	CL-186	39702.91	20710.26	5974.12	139.6	11.0	-	125.8	10.4	125.1	0.6	101%	PASS
3/22/2005	10	CL-187	39757.03	20760.11	5971.75	140.3	9.2	12.9	124.3	11	122.1	1.9	102%	PASS
3/22/2005	10	CL-188	39811.21	20715.24	5972.82	138.4	9.7	10.9	124.8	11	122.1	-0.1	102%	PASS
3/23/2005	9	CL-189	39765.85	20894.61	5945.65	138.9	9.7	-	126.6	10.4	125.1	-0.7	101%	PASS
3/23/2005	9	CL-190	39828.18	20832.85	5954.51	137.9	9.7	-	125.7	10.4	125.1	-0.7	100%	PASS
3/23/2005	9	CL-191	39866.99	20770.63	5965.31	132.3	9.4	-	120.9	10.4	125.1	-1.0	97%	PASS
3/23/2005	9	CL-192	39912.26	20786.62	5959.08	130.9	9.3	-	119.8	10.4	125.1	-1.1	96%	PASS
3/23/2005	9	CL-193	39927.59	20852.07	5942.06	133.5	9.4	-	122.0	10.4	125.1	-1.0	98%	PASS
3/29/2005	10	AT-15	39817.94	20912.45	5936.2	130.4	10.4	-	118.1	11	122.1	-0.6	97%	PASS
3/29/2005	10	AT-16	39734.59	20937.83	5941.56	135	10.6	-	122.1	11	122.1	-0.4	100%	PASS
4/1/2005	11	CL-194	39897.13	20752.35	5967.65	134.5	10.7	11.4	120.7	10.8	122.9	0.6	98%	PASS
4/1/2005	11	CL-195	39937.37	20725.97	5970.73	139.2	10.4	-	126.1	10.8	122.9	-0.4	103%	PASS
4/1/2005	11	CL-196	39977.74	20771.1	5961.67	130	9.7	-	118.5	10.8	122.9	-1.1	96%	PASS
4/1/2005	14	CL-197	39953.18	20842.95	5943.84	131.7	11.0	-	118.6	12.2	122.8	-1.2	97%	PASS
4/1/2005	14	CL-198	40017.79	20835.42	5945.02	130.9	11.4	-	117.5	12.2	122.8	-0.8	96%	PASS
4/1/2005	14	CL-199	40038.27	20762.55	5962.61	134.6	10.5	-	121.8	12.2	122.8	-1.7	99%	PASS
4/1/2005	14	CL-200	40108.47	20753.56	5969.25	132.9	11.1	-	119.6	12.2	122.8	-1.1	97%	PASS

Date	Soil ID	Test #	Northing	Easting	Elevation	WD	Moisture Contents		DD	Proctor Results		-2 to 2	> 95%	Pass/Fail
							Nuke MC	Oven MC		Optimum MC	Optimum DD	% off MC	% Comp.	
4/1/2005	11	CLS-10	40108.47	20753.56	5969.25	133.5	-	10.7	120.6	10.8	122.9	-0.1	98%	PASS
4/1/2005	11	CL-201	40087.06	20810.02	5963.1	128.5	9.0	-	117.9	10.8	122.9	-1.8	96%	PASS
4/1/2005	14	CL-202	40068.99	20869.52	5954.22	130.9	11.4	-	117.5	12.2	122.8	-0.8	96%	PASS
4/1/2005	11	CL-203	40078.31	20925.31	5952.63	131.5	10.2	10.8	118.7	10.8	122.9	0.0	97%	PASS
4/1/2005	11	CL-204	40127.52	20923.94	5962.95	135.5	10.9	-	122.2	10.8	122.9	0.1	99%	PASS
4/1/2005	16	CL-205	40170.89	20900.89	5965.11	135.6	11.6	-	121.5	11.3	124.5	0.3	98%	PASS
4/1/2005	16	CL-206	40161.48	20834.24	5966.73	133.9	12.2	-	119.3	11.3	124.5	0.9	96%	PASS
4/1/2005	14	CL-207	40156.6	20775.41	5968.24	132.7	12.3	-	118.2	12.2	122.8	0.1	96%	PASS
4/1/2005	11	CL-208	40145.64	20694.65	5971.65	136.2	10.7	11.0	122.7	10.8	122.9	0.2	100%	PASS
4/1/2005	11	CL-209	40038.16	20762.56	5962.71	137.9	10.3	-	125.0	10.8	122.9	-0.5	102%	PASS
4/1/2005	11	CLS-11	40038.16	20762.56	5962.71	134	-	10.2	121.6	10.8	122.9	-0.6	99%	PASS
4/4/2005	11	AT-17	40182.94	20832.07	5965.55	130.9	11.4	-	117.5	10.8	122.9	0.6	96%	PASS
4/4/2005	11	AT-18	40177.91	20784.05	5966.41	132.1	12.3	-	117.6	10.8	122.9	1.5	96%	PASS
4/4/2005	11	AT-19	40179.9	20803.33	5967.54	137.2	10.4	-	124.3	10.8	122.9	-0.4	101%	PASS
4/4/2005	11	AT-20	40186.89	20873.31	5966.02	135.7	10.1	-	123.3	10.8	122.9	-0.7	100%	PASS
4/4/2005	11	AT-21	40161.6	20961.36	5963.29	135	10.5	-	122.2	10.8	122.9	-0.3	99%	PASS
4/4/2005	11	AT-22	40136.51	20955.58	5961.79	136	10.7	-	122.9	10.8	122.9	-0.1	100%	PASS
4/21/2005	11	AEB-1	39896.74	20959.31	5918.495	135.2	12.1	-	120.6	10.8	122.9	1.3	98%	PASS
4/21/2005	11	AEB-2	39884.69	20958.69	5919.9	132.6	11.7	-	118.7	10.8	122.9	0.9	97%	PASS
4/26/2005	14	GWN-1	40021.18	20980.97	5936.075	126.6	14.0	-	111.1	12.2	122.8	1.8	90%	PASS
4/26/2005	14	GWN-2	39991.22	20971.8	5933.18	125.4	13.4	-	110.6	12.2	122.8	1.2	90%	PASS
4/27/2005	14	AEB-3	3981.74	20961.03	5919.93	126.9	12.6	-	112.7	12.2	122.8	0.4	92%	PASS
4/27/2005	14	AEB-4	39889.16	20971.47	5919.755	126.3	14.0	-	110.8	12.2	122.8	1.8	90%	PASS
4/27/2005	14	AEB-5	39901.72	20950.1	5923.365	132.2	12.2	-	117.8	12.2	122.8	0.0	96%	PASS
5/4/2005	16	GWS-1	39785.45	21025.16	5932.075	126.8	14.1	-	111.1	12.5	119.6	1.6	93%	PASS
5/4/2005	16	GWS-2	39838.87	20959.93	5927.41	133.4	14.0	-	117.0	12.5	119.6	1.5	98%	PASS
5/10/2005	16	CPS-1	39694.97	21635.77	5929.117	132.3	13.2	-	116.9	12.5	119.6	0.7	98%	PASS
5/10/2005	16	CPS-2	39699.19	21629.14	5930.193	125.6	13.0	-	111.2	12.5	119.6	0.5	93%	PASS
5/12/2005	16	CPN-1	40208.248	20364.085	5973.28	129.7	14.1	-	113.7	12.5	119.6	1.6	95%	PASS
5/12/2005	16	CPN-2	40230.766	20403.654	5974.459	126	14.5	-	110.0	12.5	119.6	2.0	92%	PASS

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FIELD DENSITY TEST LOG FOR 10" CUSHION

Date	Soil ID	Test #	Northing	Easting	Elevation	WD	Moisture Contents		DD	Proctor Results		-2 to 2	> 95%	Pass/Fail
							Nuke MC	Oven MC		Optimum MC	Optimum DD	% off MC	% Comp.	
1/3/2005	9	CU-001	39428.24	19447.5	5994	133.5	8.6	-	122.9	10.4	125.1	-1.8	98%	PASS
1/3/2005	9	CU-002	39515.41	19463.74	5990.94	137.5	9.3	-	125.8	10.4	125.1	-1.1	101%	PASS
1/3/2005	9	CU-003	39398.43	19491.1	5995.06	137.6	8.7	-	126.6	10.4	125.1	-1.7	101%	PASS
1/3/2005	9	CU-004	39344.85	19531.49	5994.99	136.8	10.2	10.4	123.9	10.4	125.1	0.0	99%	PASS
1/3/2005	9	CU-005	39442.27	19541.54	5994.5	133.7	9.5	-	122.1	10.4	125.1	-0.9	98%	PASS
1/3/2005	9	CU-006	39532.67	19531.37	5990.99	137.6	8.7	-	126.6	10.4	125.1	-1.7	101%	PASS
1/3/2005	9	CU-007	39534.48	19589.48	5991.64	135.8	9.8	-	123.7	10.4	125.1	-0.6	99%	PASS
1/3/2005	9	CU-008	39413.38	19586.94	5995.88	140.1	9.3	-	128.2	10.4	125.1	-1.1	102%	PASS
1/3/2005	9	CU-009	39352.29	19586.45	5995.49	140.5	9.1	-	128.8	10.4	125.1	-1.3	103%	PASS
1/3/2005	9	CU-010	39296.28	19630.51	5993.72	130.1	8.9	-	119.5	10.4	125.1	-1.5	95%	PASS
1/7/2004	11	CU-011	39597.08	19650.98	5990.36	140.5	9.8	-	128.0	10.8	122.9	-1.0	104%	PASS
1/7/2004	11	CU-012	39664.11	19671.17	5985.27	128.5	9.3	-	117.6	10.8	122.9	-1.5	96%	PASS
1/7/2004	9	CU-013	39511.6	19691.55	5995.97	137.4	9.0	-	126.1	10.4	125.1	-1.4	101%	PASS
1/7/2004	11	CU-014	39454.84	19636.57	5995.15	130.1	9.3	-	119.0	10.8	122.9	-1.5	97%	PASS
1/7/2004	9	CU-015	39445.58	19738.04	5996.99	130.3	8.7	-	119.9	10.4	125.1	-1.7	96%	PASS
1/7/2004	9	CU-016	39364.43	19690.96	5996.23	135	8.7	-	124.2	10.4	125.1	-1.7	99%	PASS
1/7/2004	11	CU-017	39313.89	19751.04	5994.63	132.7	9.5	-	121.2	10.8	122.9	-1.3	99%	PASS
1/7/2004	11	CU-018	39249.56	19774.68	5992.35	134.7	9.9	-	122.6	10.8	122.9	-0.9	100%	PASS
1/10/2005	9	CU-019	39261.94	19806.93	5993.45	134.8	9.2	-	123.4	10.4	125.1	-1.2	99%	PASS
1/10/2005	12	CU-020	39350.25	19809.56	5996.63	136.8	8.9	-	125.6	10.6	123.6	-1.7	102%	PASS
1/11/2005	12	CUS-01	39350.25	19809.56	5996.63	130.2	-	9.4	119.0	10.6	123.6	-1.2	96%	PASS
1/10/2005	9	CU-021	39259.27	19884.61	5993.03	133.2	9.9	-	121.2	10.4	125.1	-0.5	97%	PASS
1/10/2005	9	CU-022	39350.52	19864.46	5996.81	135.8	8.8	-	124.8	10.4	125.1	-1.6	100%	PASS
1/10/2005	9	CU-023	39427.46	19804.5	5999.25	139.8	8.5	-	128.8	10.4	125.1	-1.9	103%	PASS
1/10/2005	9	CU-024	39405.98	19877.09	5999.25	134.6	9.5	-	122.9	10.4	125.1	-0.9	98%	PASS
1/10/2005	9	CU-025	39469.45	19867.94	5999.04	135.4	9.6	-	123.5	10.4	125.1	-0.8	99%	PASS
1/10/2005	9	CU-026	39514.08	19792.21	5996.01	135.4	9.6	-	123.5	10.4	125.1	-0.8	99%	PASS
1/10/2005	9	CU-027	39593.74	19778.64	5992.39	137.9	8.9	-	126.6	10.4	125.1	-1.5	101%	PASS
1/10/2005	9	CU-028	39671.56	19772.1	5989.56	135	8.5	-	124.4	10.4	125.1	-1.9	99%	PASS
1/10/2005	11	CU-029	39771.35	19866.35	5987.43	130.1	11.0	-	117.2	10.8	122.9	0.2	95%	PASS
1/10/2005	11	CU-030	39704.34	19874.5	5989.93	137.1	10.3	-	124.3	10.8	122.9	-0.5	101%	PASS
1/10/2005	11	CU-031	39633.41	19867.67	5992.43	135.8	10.8	-	122.6	10.8	122.9	0.0	100%	PASS
1/10/2005	9	CU-032	39545.62	19876.35	5995.78	138.2	9.6	-	126.1	10.4	125.1	-0.8	101%	PASS

Date	Soil ID	Test #	Northing	Easting	Elevation	WD	Moisture Contents		DD	Proctor Results		-2 to 2	> 95%	Pass/Fail
							Nuke MC	Oven MC		Optimum MC	Optimum DD	% off MC	% Comp.	
1/11/2005	11	CU-033	39308.83	19909.9	5994	130.4	11.2	-	117.3	10.8	122.9	0.4	95%	PASS
1/11/2005	11	CU-034	39391.83	19916.42	5998	130.7	10.1	-	118.7	10.8	122.9	-0.7	97%	PASS
1/11/2005	9	CU-035	39488.54	19919.33	5999	130.9	8.6	-	120.5	10.4	125.1	-1.8	96%	PASS
1/11/2005	11	CU-036	39568.76	19933.08	5996	135.4	11.1	-	121.9	10.8	122.9	0.3	99%	PASS
1/11/2005	9	CU-037	39648.99	19933.8	5993	132.5	9.0	-	121.6	10.4	125.1	-1.4	97%	PASS
1/11/2005	11	CU-038	39753.27	19920.77	5988	132.1	12.0	-	117.9	10.8	122.9	1.2	96%	PASS
1/18/2005	11	CU-039	39232.63	19970.51	5991.74	128.7	9.5	-	117.5	10.8	122.9	-1.3	96%	PASS
1/18/2005	13	CU-040	39311.97	19970.27	5994.88	132.9	10.0	-	120.8	11.3	123.1	-1.3	98%	PASS
1/18/2005	13	CUS-02	39311.97	19970.27	5994.88	132.4	-	10.8	119.5	11.3	123.1	-0.5	97%	PASS
1/18/2005	11	CU-041	39400.25	19955.7	5998.18	131.1	9.1	-	120.2	10.8	122.9	-1.7	98%	PASS
1/18/2005	9	CU-042	39486.9	19971.28	5999.55	134.4	8.6	-	123.8	10.4	125.1	-1.8	99%	PASS
1/18/2005	11	CU-043	39576.3	19989.98	5996.72	131.4	9.6	-	119.9	10.8	122.9	-1.2	98%	PASS
1/18/2005	11	CU-044	39650.02	19977.12	5993.47	131.4	8.9	-	120.7	10.8	122.9	-1.9	98%	PASS
1/18/2005	9	CU-045	39765.49	19970.51	5988.63	130.1	8.6	-	119.8	10.4	125.1	-1.8	96%	PASS
1/18/2005	9	CU-046	39838.81	19937.88	5985.63	133.3	8.6	-	122.7	10.4	125.1	-1.8	98%	PASS
1/18/2005	9	CU-047	39850.36	20011.67	5986.08	133.1	10.1	11.1	119.8	10.4	125.1	0.7	96%	PASS
1/18/2005	9	CU-048	39750.96	20026.49	5990.35	133	8.7	-	122.4	10.4	125.1	-1.7	98%	PASS
1/18/2005	11	CU-049	39647.81	20031.07	5994.44	131.2	9.9	-	119.4	10.8	122.9	-0.9	97%	PASS
1/18/2005	11	CU-050	39552.36	20029.71	5998.18	132.6	9.0	-	121.7	10.8	122.9	-1.8	99%	PASS
1/18/2005	9	CU-051	39468.99	20034.31	5999.38	136.9	9.4	-	125.1	10.4	125.1	-1.0	100%	PASS
1/18/2005	9	CU-052	39374.1	20025.59	5996.33	135.1	9.7	-	123.2	10.4	125.1	-0.7	98%	PASS
1/18/2005	11	CU-053	39264.77	20025.44	5992.15	133.7	10.2	-	121.3	10.8	122.9	-0.6	99%	PASS
1/20/2005	9	CU-054	39248.05	20052.79	5991.1	136	8.8	-	125.0	10.4	125.1	-1.6	100%	PASS
1/20/2005	9	CU-055	39351.76	20053.61	5994.99	141.2	9.0	-	129.5	10.4	125.1	-1.4	104%	PASS
1/20/2005	9	CU-056	39443.47	20062.41	5997.92	137.5	9.7	-	125.3	10.4	125.1	-0.7	100%	PASS
1/20/2005	11	CU-057	39536.44	20049.42	5999.345	130.9	8.8	-	120.3	10.8	122.9	-2.0	98%	PASS
1/20/2005	9	CU-058	39650.68	20058.31	5994.62	139	8.8	-	127.8	10.4	125.1	-1.6	102%	PASS
1/20/2005	9	CU-059	39774.74	20051.88	5989.805	137.1	9.3	-	125.4	10.4	125.1	-1.1	100%	PASS
1/20/2005	9	CU-060	39894.01	20076.6	5985.19	136.8	9.5	-	124.9	10.4	125.1	-0.9	100%	PASS
1/20/2005	9	CUS-03	39894.01	20076.6	5985.19	134.4	-	7.9	124.6	10.4	125.1	-2.5	100%	FAIL
1/20/2005	9	CU-061	39285	20106.57	5991.52	139	8.8	-	127.8	10.4	125.1	-1.6	102%	PASS
1/20/2005	9	CU-062	39358.62	20120.62	5994.125	142.4	9.1	-	130.5	10.4	125.1	-1.3	104%	PASS
1/20/2005	9	CU-063	39465.77	20137	5997.05	135.4	8.6	-	124.7	10.4	125.1	-1.8	100%	PASS
1/21/2005	9	CU-064	39598.6	20112.98	5997.61	138.4	10.3	-	125.5	10.4	125.1	-0.1	100%	PASS

Date	Soil ID	Test #	Northing	Easting	Elevation	WD	Moisture Contents		DD	Proctor Results		-2 to 2	> 95%	Pass/Fail
							Nuke MC	Oven MC		Optimum MC	Optimum DD	% off MC	% Comp.	
1/21/2005	9	CU-065	39689.2	20142.71	5993.62	139.1	8.9	-	127.7	10.4	125.1	-1.5	102%	PASS
1/21/2005	9	CU-066	39802.61	20127.38	5989.06	136.9	8.5	-	126.2	10.4	125.1	-1.9	101%	PASS
1/21/2005	11	CU-067	39893.76	20128.63	5985.44	130.3	9.0	-	119.5	10.8	122.9	-1.8	97%	PASS
1/21/2005	9	CU-068	39967.84	20122.82	5981.88	134	10.5	-	121.3	10.4	125.1	0.1	97%	PASS
1/21/2005	9	CU-069	39232.81	20181.34	5987.19	130.8	8.7	-	120.3	10.4	125.1	-1.7	96%	PASS
1/21/2005	9	CU-070	39338.78	20188.33	5991.79	138.6	9.4	-	126.7	10.4	125.1	-1.0	101%	PASS
1/21/2005	9	CU-071	39441.54	20174.13	5995.07	136.2	10.2	-	123.6	10.4	125.1	-0.2	99%	PASS
1/21/2005	9	CU-072	39547.96	20193.64	5997.88	131.1	8.5	-	120.8	10.4	125.1	-1.9	97%	PASS
1/21/2005	9	CU-073	39641.54	20176.06	5996.12	138.2	10.4	-	125.2	10.4	125.1	0.0	100%	PASS
1/21/2005	9	CU-074	39742.76	20160.18	5991.85	143.7	10.0	-	130.6	10.4	125.1	-0.4	104%	PASS
1/21/2005	9	CU-075	39842.49	20186.69	5988	136.5	10.3	-	123.8	10.4	125.1	-0.1	99%	PASS
1/21/2005	9	CU-076	39942.08	20173.47	5984.19	140.7	9.4	-	128.6	10.4	125.1	-1.0	103%	PASS
1/24/2005	11	CU-077	39371.27	20211.16	5992.09	134.8	9.3	-	123.3	10.8	122.9	-1.5	100%	PASS
1/24/2005	9	CU-078	39476.42	20210.94	5995.27	139.8	8.7	-	128.6	10.4	125.1	-1.7	103%	PASS
1/24/2005	9	CU-079	39561.32	20245.88	5996.88	142.8	8.9	-	131.1	10.4	125.1	-1.5	105%	PASS
1/24/2005	9	CU-080	39263.39	20224.21	5988.56	139.6	9.1	-	128.0	10.4	125.1	-1.3	102%	PASS
1/24/2005	9	CUS-04	39681.58	20227.61	5994.82	141.4	-	8.9	129.8	10.4	125.1	-1.5	104%	PASS
1/24/2005	11	CU-081	39769.83	20246.02	5991.35	134.3	8.9	-	123.3	10.8	122.9	-1.9	100%	PASS
1/24/2005	9	CU-082	39870.8	20227.04	5987.02	140.4	9.2	-	128.6	10.4	125.1	-1.2	103%	PASS
1/24/2005	14	CU-083	39979.09	20236.47	5983.19	132.1	10.6	-	119.4	12.2	122.8	-1.6	97%	PASS
1/24/2005	14	CU-084	39252.01	20288.7	5985.71	137.8	8.9	-	126.5	12.2	122.8	-3.3	103%	~~PASS~~ * Fail
1/25/2005	14	CU-085	39344.16	20293.39	5989.4	131.7	9.0	9.9	119.8	12.2	122.8	-2.3	98%	~~PASS~~ * Fail
1/25/2005	9	CU-086	39436.32	20285.49	5992.12	134.7	10.1	-	122.3	10.4	125.1	-0.3	98%	PASS
1/25/2005	9	CU-087	39537.13	20266.17	5995.74	133.3	8.7	-	122.6	10.4	125.1	-1.7	98%	PASS
1/25/2005	9	CU-088	39643.01	20278.4	5995.855	141.2	9.3	-	129.2	10.4	125.1	-1.1	103%	PASS
1/25/2005	9	CU-089	39733.99	20294.13	5993.24	139.7	9.4	9.3	127.8	10.4	125.1	-1.1	102%	PASS
1/25/2005	9	CU-090	39834.95	20263.29	5989.14	139.8	9.6	-	127.6	10.4	125.1	-0.8	102%	PASS
1/25/2005	9	CU-091	39927.34	20268.97	5985.43	137.7	10.1	-	125.1	10.4	125.1	-0.3	100%	PASS
1/25/2005	9	CU-092	40036.57	20283.61	5981.2	130.9	9.0	-	120.1	10.4	125.1	-1.4	96%	PASS
1/25/2005	9	CU-093	39319.97	20346.25	5987.04	138.9	8.8	-	127.7	10.4	125.1	-1.6	102%	PASS
1/26/2005	12	CU-094	39391.63	20309	5990.07	139	10.4	-	125.9	10.6	123.6	-0.2	102%	PASS
1/26/2005	9	CU-095	39471.37	20330.53	5991.88	130	10.0	-	118.2	10.4	125.1	-0.4	94%	PASS
1/26/2005	9	CU-096	39544.42	20329.51	5993.48	139	8.8	-	127.8	10.4	125.1	-1.6	102%	PASS
1/26/2005	9	CU-097	39636.45	20335.53	5993.14	135.3	10.0	-	123.0	10.4	125.1	-0.4	98%	PASS

* CU-084 & CU-085 Failed for moisture content (too dry), but compactions are above 95% (98% & 103%); therefore, the compactions are acceptable CAKE / Hale

Date	Soil ID	Test #	Northing	Easting	Elevation	WD	Moisture Contents		DD	Proctor Results		-2 to 2	> 95%	Pass/Fail
							Nuke MC	Oven MC		Optimum MC	Optimum DD	% off MC	% Comp.	
2/5/2005	15	CU-130	39990.99	20403.06	5983.86	138.3	11.2	-	124.4	11.3	124.5	-0.1	100%	PASS
2/5/2005	15	CU-131	40085.73	20440.15	5980.59	137.8	10.3	-	124.9	11.3	124.5	-1.0	100%	PASS
2/24/2005	9	CU-132	40082.36	20471.9	5980.963	140.5	9.2	-	128.7	10.4	125.1	-1.2	103%	PASS
2/24/2005	9	CU-133	40021.42	20478.97	5982.84	142.3	9.0	-	130.6	10.4	125.1	-1.4	104%	PASS
2/24/2005	9	CU-134	39922.48	20482.91	5983.983	141.5	8.9	-	129.9	10.4	125.1	-1.5	104%	PASS
2/24/2005	9	CU-135	39806.57	20482.21	5984.301	139.7	9.2	-	127.9	10.4	125.1	-1.2	102%	PASS
2/24/2005	9	CU-136	39698.43	20488.94	5984.806	141.1	8.9	-	129.6	10.4	125.1	-1.5	104%	PASS
2/24/2005	9	CU-137	39597.28	20495.53	5985.214	139	9.7	-	126.7	10.4	125.1	-0.7	101%	PASS
2/24/2005	9	CU-138	39478.6	20489.35	5986.871	136.5	9.8	-	124.3	10.4	125.1	-0.6	99%	PASS
2/24/2005	9	CU-139	39376.64	20386.64	5984.511	137.3	9.9	-	124.9	10.4	125.1	-0.5	100%	PASS
2/24/2005	15	CU-140	39374.08	20529.55	5983.757	134.2	10.4	-	121.6	11.3	124.5	-0.9	98%	PASS
2/24/2005	15	CUS-07	39374.08	20529.55	5983.757	138.9	-	10.1	126.2	11.3	124.5	-1.2	101%	PASS
2/24/2005	15	CU-141	39474.04	20531.53	5985.31	139.1	10.3	-	126.1	11.3	124.5	-1.0	101%	PASS
2/24/2005	15	CU-142	39578.42	20513.86	5984.648	133.1	10.1	-	120.9	11.3	124.5	-1.2	97%	PASS
2/24/2005	15	CU-143	39664.74	20539.79	5982.557	133	9.4	-	121.6	11.3	124.5	-1.9	98%	PASS
2/24/2005	15	CU-144	39746.09	20526.21	5982.785	128.8	9.9	-	117.2	11.3	124.5	-1.4	94%	PASS
2/24/2005	15	CU-145	39825.96	20532.42	5981.87	134.1	9.4	-	122.6	11.3	124.5	-1.9	98%	PASS
2/24/2005	14	CU-146	39971.3	20523.29	5981.378	131.9	10.8	-	119.0	12.2	122.8	-1.4	97%	PASS
2/24/2005	14	CU-147	40041.45	20514.12	5981.513	131.6	11.1	-	118.5	12.2	122.8	-1.1	96%	PASS
2/24/2005	15	CU-148	40151.11	20495.04	5977.499	133.6	9.9	-	121.6	11.3	124.5	-1.4	98%	PASS
2/26/2005	9	CU-149	40150.02	20589.88	5976.952	132.6	9.3	-	121.3	10.4	125.1	-1.1	97%	PASS
2/26/2005	9	CU-150	40050.94	20589.41	5977.726	134.9	9.7	-	123.0	10.4	125.1	-0.7	98%	PASS
2/26/2005	9	CU-151	39966.5	20572.65	5979.234	146.2	8.5	-	134.7	10.4	125.1	-1.9	108%	PASS
2/26/2005	9	CU-152	39872.01	20578.83	5979.475	136.1	9.9	-	123.8	10.4	125.1	-0.5	99%	PASS
2/26/2005	17	CU-153	39783.96	20587.39	5979.506	134.7	10.4	10.9	121.5	11.3	124.5	-0.4	98%	PASS
2/26/2005	17	CU-154	39684.81	20575.13	5980.686	133.4	11.2	-	120.0	11.3	124.5	-0.1	96%	PASS
2/26/2005	9	CU-155	39593.24	20577.81	5982.157	130	8.5	-	119.8	10.4	125.1	-1.9	96%	PASS
2/26/2005	9	CU-156	39496.29	20583.52	5983.38	137.9	8.6	-	127.0	10.4	125.1	-1.8	102%	PASS
2/26/2005	9	CU-157	39418.73	20593.97	5982.82	137	8.9	-	125.8	10.4	125.1	-1.5	101%	PASS
4/5/2005	9	CU-158	39623.05	21083.05	5965.165	139.5	8.5	-	128.6	10.4	125.1	-1.9	103%	PASS
4/5/2005	9	CU-159	39633.41	21050.17	5963.09	133.2	9.2	-	122.0	10.4	125.1	-1.2	98%	PASS
4/5/2005	9	CU-160	39614.82	21020.47	5966.47	140.2	8.8	-	128.9	10.4	125.1	-1.6	103%	PASS
4/5/2005	9	CUS-8	39614.82	21020.47	5966.47	141.8	-	9.6	129.4	10.4	125.1	-0.8	103%	PASS
4/5/2005	9	CU-161	39690.39	21009.38	5948.55	136.3	8.4	-	125.7	10.4	125.1	-2.0	101%	PASS

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							Nuke MC	Oven MC		Optimum MC	Optimum DD	% off MC	% Comp.	
4/5/2005	9	CU-162	39656.88	20973.4	5957.27	137.7	8.6	-	126.8	10.4	125.1	-1.8	101%	PASS
4/5/2005	9	CU-163	39643.45	20944.52	5961.055	136.9	10.5	-	123.9	10.4	125.1	0.1	99%	PASS
4/5/2005	9	CU-164	39650.81	20900.99	5963.98	134	9.3	-	122.6	10.4	125.1	-1.1	98%	PASS
4/5/2005	9	CU-165	39679.11	20860.94	5966.105	132.3	9.8	-	120.5	10.4	125.1	-0.6	96%	PASS
4/5/2005	9	CU-166	39698.05	20966.81	5947.285	133.5	9.8	-	121.6	10.4	125.1	-0.6	97%	PASS
4/6/2005	17	CU-167	39589.77	21106.47	5967.05	138.1	12.7	12.0	123.3	12.1	120.6	-0.1	102%	PASS
4/6/2005	9	CU-168	39599.45	20999.97	5967.12	140.1	9.3	-	128.2	10.4	125.1	-1.1	102%	PASS
4/6/2005	9	CU-169	39542.53	21033.36	5968.96	131.3	9.4	-	120.0	10.4	125.1	-1.0	96%	PASS
4/6/2005	9	CU-170	39546.14	20951.35	5969.46	130.3	9.0	-	119.5	10.4	125.1	-1.4	96%	PASS
4/6/2005	9	CU-171	39485.37	20943.74	5968.3	133.2	9.2	-	122.0	10.4	125.1	-1.2	98%	PASS
4/6/2005	10	CU-172	39509.38	20897.57	5971.57	132.2	10.1	-	120.1	11	122.1	-0.9	98%	PASS
4/6/2005	9	CU-173	39458.86	20840.08	5972.69	132.4	8.4	-	122.1	10.4	125.1	-2.0	98%	PASS
4/6/2005	10	CU-174	39522.58	20770.01	5976.29	132.7	11.7	-	118.8	11	122.1	0.7	97%	PASS
4/6/2005	9	CU-175	39480.58	20770.01	5979.55	131.4	8.9	-	120.7	10.4	125.1	-1.5	96%	PASS
4/6/2005	9	CU-176	39404.55	20645.66	5980.83	142.9	8.9	-	131.2	10.4	125.1	-1.5	105%	PASS
4/6/2005	9	CU-177	39489.38	20625.64	5981.81	141.6	8.7	-	130.3	10.4	125.1	-1.7	104%	PASS
4/6/2005	10	CU-178	39522.56	20756.17	5976.67	132.7	12.1	-	118.4	11	122.1	1.1	97%	PASS
4/6/2005	10	CU-179	39558.21	20910.33	5970.07	136.3	11.1	-	122.7	11	122.1	0.1	100%	PASS
4/6/2005	10	CU-180	39540.65	20813.99	5974.08	137.9	11.5	-	123.7	11	122.1	0.5	101%	PASS
4/7/2005	10	CUS-09	39540.65	20813.99	5974.08	140.4	-	11.1	126.4	11	122.1	0.1	103%	PASS
4/7/2005	10	CU-181	39614.76	20833.97	5971.92	129.5	10.7	-	117.0	11	122.1	-0.3	96%	PASS
4/7/2005	9	CU-182	39590.2	20769.94	5974.58	136.6	8.6	-	125.8	10.4	125.1	-1.8	101%	PASS
4/7/2005	9	CU-183	39659.81	20799.65	5972.61	138	8.9	-	126.7	10.4	125.1	-1.5	101%	PASS
4/7/2005	9	CU-184	39643.73	20760.03	5974.46	133.1	8.5	-	122.7	10.4	125.1	-1.9	98%	PASS
4/7/2005	9	CU-185	39659.43	20696.9	5976.3	138.6	8.4	-	127.9	10.4	125.1	-2.0	102%	PASS
4/7/2005	9	CU-186	39658.01	20626.53	5978.72	141.6	9.1	-	129.8	10.4	125.1	-1.3	104%	PASS
4/7/2005	9	CU-187	39575.36	20656.97	5979.19	136.8	8.5	-	126.1	10.4	125.1	-1.9	101%	PASS
4/9/2005	9	CU-188	39701.44	20833.44	5967.65	133.9	8.4	-	123.5	10.4	125.1	-2.0	99%	PASS
4/9/2005	9	CU-189	39775.76	20902.87	5944.115	133.6	9.1	-	122.5	10.4	125.1	-1.3	98%	PASS
4/9/2005	9	CU-190	39787.63	20862.13	5952.345	130.4	8.9	-	119.7	10.4	125.1	-1.5	96%	PASS
4/15/2005	9	CU-191	39830.38	20691.69	5974.35	141.5	10.7	10.9	127.6	10.4	125.1	0.5	102%	PASS
4/15/2005	9	CU-192	39736.33	20738.05	5973.97	138.5	10.7	-	125.1	10.4	125.1	0.3	100%	PASS
4/15/2005	9	CU-193	39634.83	20843.44	5971.135	138.9	9.3	-	127.1	10.4	125.1	-1.1	102%	PASS
4/15/2005	9	CU-194	39517.1	20861.74	5972.795	138	10.3	-	125.1	10.4	125.1	-0.1	100%	PASS

Date	Soil ID	Test #	Northing	Easting	Elevation	WD	Moisture Contents		DD	Proctor Results		-2 to 2	> 95%	Pass/Fail
							Nuke MC	Oven MC		Optimum MC	Optimum DD	% off MC	% Comp.	
4/5/2005	9	CU-162	39656.88	20973.4	5957.27	137.7	8.6	-	126.8	10.4	125.1	-1.8	101%	PASS
4/5/2005	9	CU-163	39643.45	20944.52	5961.055	136.9	10.5	-	123.9	10.4	125.1	0.1	99%	PASS
4/5/2005	9	CU-164	39650.81	20900.99	5963.98	134	9.3	-	122.6	10.4	125.1	-1.1	98%	PASS
4/5/2005	9	CU-165	39679.11	20860.94	5966.105	132.3	9.8	-	120.5	10.4	125.1	-0.6	96%	PASS
4/5/2005	9	CU-166	39698.05	20966.81	5947.285	133.5	9.8	-	121.6	10.4	125.1	-0.6	97%	PASS
4/6/2005	17	CU-167	39589.77	21106.47	5967.05	138.1	12.7	12.0	123.3	12.1	120.6	-0.1	102%	PASS
4/6/2005	9	CU-168	39599.45	20999.97	5967.12	140.1	9.3	-	128.2	10.4	125.1	-1.1	102%	PASS
4/6/2005	9	CU-169	39542.53	21033.36	5968.96	131.3	9.4	-	120.0	10.4	125.1	-1.0	96%	PASS
4/6/2005	9	CU-170	39546.14	20951.35	5969.46	130.3	9.0	-	119.5	10.4	125.1	-1.4	96%	PASS
4/6/2005	9	CU-171	39485.37	20943.74	5968.3	133.2	9.2	-	122.0	10.4	125.1	-1.2	98%	PASS
4/6/2005	10	CU-172	39509.38	20897.57	5971.57	132.2	10.1	-	120.1	11	122.1	-0.9	98%	PASS
4/6/2005	9	CU-173	39458.86	20840.08	5972.69	132.4	8.4	-	122.1	10.4	125.1	-2.0	98%	PASS
4/6/2005	10	CU-174	39522.58	20770.01	5976.29	132.7	11.7	-	118.8	11	122.1	0.7	97%	PASS
4/6/2005	9	CU-175	39480.58	20770.01	5979.55	131.4	8.9	-	120.7	10.4	125.1	-1.5	96%	PASS
4/6/2005	9	CU-176	39404.55	20645.66	5980.83	142.9	8.9	-	131.2	10.4	125.1	-1.5	105%	PASS
4/6/2005	9	CU-177	39489.38	20625.64	5981.81	141.6	8.7	-	130.3	10.4	125.1	-1.7	104%	PASS
4/6/2005	10	CU-178	39522.56	20756.17	5976.67	132.7	12.1	-	118.4	11	122.1	1.1	97%	PASS
4/6/2005	10	CU-179	39558.21	20910.33	5970.07	136.3	11.1	-	122.7	11	122.1	0.1	100%	PASS
4/6/2005	10	CU-180	39540.65	20813.99	5974.08	137.9	11.5	-	123.7	11	122.1	0.5	101%	PASS
4/7/2005	10	CUS-09	39540.65	20813.99	5974.08	140.4	-	11.1	126.4	11	122.1	0.1	103%	PASS
4/7/2005	10	CU-181	39614.76	20833.97	5971.92	129.5	10.7	-	117.0	11	122.1	-0.3	96%	PASS
4/7/2005	9	CU-182	39590.2	20769.94	5974.58	136.6	8.6	-	125.8	10.4	125.1	-1.8	101%	PASS
4/7/2005	9	CU-183	39659.81	20799.65	5972.61	138	8.9	-	126.7	10.4	125.1	-1.5	101%	PASS
4/7/2005	9	CU-184	39643.73	20760.03	5974.46	133.1	8.5	-	122.7	10.4	125.1	-1.9	98%	PASS
4/7/2005	9	CU-185	39659.43	20696.9	5976.3	138.6	8.4	-	127.9	10.4	125.1	-2.0	102%	PASS
4/7/2005	9	CU-186	39658.01	20626.53	5978.72	141.6	9.1	-	129.8	10.4	125.1	-1.3	104%	PASS
4/7/2005	9	CU-187	39575.36	20656.97	5979.19	136.8	8.5	-	126.1	10.4	125.1	-1.9	101%	PASS
4/9/2005	9	CU-188	39701.44	20833.44	5967.65	133.9	8.4	-	123.5	10.4	125.1	-2.0	99%	PASS
4/9/2005	9	CU-189	39775.76	20902.87	5944.115	133.6	9.1	-	122.5	10.4	125.1	-1.3	98%	PASS
4/9/2005	9	CU-190	39787.63	20862.13	5952.345	130.4	8.9	-	119.7	10.4	125.1	-1.5	96%	PASS
4/15/2005	9	CU-191	39830.38	20691.69	5974.35	141.5	10.7	10.9	127.6	10.4	125.1	0.5	102%	PASS
4/15/2005	9	CU-192	39736.33	20738.05	5973.97	138.5	10.7	-	125.1	10.4	125.1	0.3	100%	PASS
4/15/2005	9	CU-193	39634.83	20843.44	5971.135	138.9	9.3	-	127.1	10.4	125.1	-1.1	102%	PASS
4/15/2005	9	CU-194	39517.1	20861.74	5972.795	138	10.3	-	125.1	10.4	125.1	-0.1	100%	PASS

Date	Soil ID	Test #	Northing	Easting	Elevation	WD	Moisture Contents		DD	Proctor Results		-2 to 2	> 95%	Pass/Fail
							Nuke MC	Oven MC		Optimum MC	Optimum DD	% off MC	% Comp.	
4/15/2005	9	CU-195	39540.45	21030.1	5969.29	139.2	9.4	-	127.2	10.4	125.1	-1.0	102%	PASS
4/15/2005	10	CU-196	39817.5	20822.22	5958.86	133	11.4	-	119.4	11	122.1	0.4	98%	PASS
4/16/2005	9	CU-197	39941.23	20623.49	5976.87	142.2	8.5	-	131.1	10.4	125.1	-1.9	105%	PASS
4/16/2005	9	CU-198	39900.07	20691.63	5973.73	138.2	10.0	-	125.6	10.4	125.1	-0.4	100%	PASS
4/16/2005	9	CU-199	39977.71	20692.11	5973.42	133.7	8.7	-	123.0	10.4	125.1	-1.7	98%	PASS
4/16/2005	18	CU-200	40053.96	20718.97	5971.76	135.3	10.5	-	122.4	11.2	123.8	-0.7	99%	PASS
4/16/2005	18	CUS-10	40053.96	20718.97	5971.76	134.6	-	10.8	121.5	11.2	123.8	-0.4	98%	PASS
4/16/2005	18	CU-201	40034.22	20635.68	5975.96	132.4	11.1	-	119.2	11.2	123.8	-0.1	96%	PASS
4/16/2005	18	CU-202	40118.02	20651.07	5974.44	137.3	10.6	9.7	125.2	11.2	123.8	-1.5	101%	PASS
4/16/2005	18	CU-203	40158.2	20678.75	5972.91	133.3	10.8	-	120.3	11.2	123.8	-0.4	97%	PASS
4/16/2005	18	CU-204	40190.43	20637.97	5972.49	131.6	10.5	-	119.1	11.2	123.8	-0.7	96%	PASS
4/16/2005	18	CU-205	39873.76	20849.75	5947.03	133.6	9.8	-	121.7	11.2	123.8	-1.4	98%	PASS
4/16/2005	9	CU-206	39886.38	20805.78	5956.49	137.6	9.1	-	126.1	10.4	125.1	-1.3	101%	PASS
4/18/2005	9	CU-207	40157.48	20951.4	5964.56	138.7	8.9	-	127.4	10.4	125.1	-1.5	102%	PASS
4/18/2005	9	CU-208	40111.64	20925.87	5961.65	139.2	8.8	-	127.9	10.4	125.1	-1.6	102%	PASS
4/18/2005	10	CU-209	40084.01	20877.66	5958.15	133.4	10.1	-	121.2	11	122.1	-0.9	99%	PASS
4/18/2005	10	CU-210	40064.81	20854.19	5955.34	133.4	10.3	11.9	119.2	11	122.1	0.9	98%	PASS
4/18/2005	9	CU-211	40050.2	20786.29	595798	138.6	8.6	-	127.6	10.4	125.1	-1.8	102%	PASS
4/18/2005	9	CU-212	39982.12	20807.22	5953.78	137.3	8.4	-	126.7	10.4	125.1	-2.0	101%	PASS
4/18/2005	9	CU-213	39936.47	20807.86	5954.28	136.3	9.2	-	124.8	10.4	125.1	-1.2	100%	PASS
4/18/2005	9	CU-214	39952.84	20851.41	5943.44	131	8.9	-	120.3	10.4	125.1	-1.5	96%	PASS
4/18/2005	9	CU-215	40138.25	20888.76	5966.01	133.9	8.4	-	123.5	10.4	125.1	-2.0	99%	PASS
4/18/2005	9	CU-216	40116.73	20846.33	5967.11	138.8	9.3	-	127.0	10.4	125.1	-1.1	102%	PASS
4/18/2005	9	CU-217	40176.23	20816.36	5968.32	136	8.7	-	125.1	10.4	125.1	-1.7	100%	PASS
4/18/2005	9	CU-218	40182.85	20753.27	5969.66	134.6	8.4	-	124.2	10.4	125.1	-2.0	99%	PASS
4/18/2005	19	CU-219	40192	20714.54	5969.44	136.1	12.1	-	121.4	10.5	123.3	1.6	98%	PASS
4/18/2005	19	CU-220	40087.27	20719.8	5971.82	136.7	9.4	11.5	122.6	10.5	123.3	1.0	99%	PASS
4/18/2005	19	CUS-11	40087.27	20719.8	5971.82	135.6	-	10.0	123.3	10.5	123.3	-0.5	100%	PASS

24-inch FINAL SOIL COVER LAYER TESTING

All 24-inch final soil cover layer soil samples had Atterberg limits testing, and grain size testing performed on them. Standard Proctor density tests were not performed as more than 30% of the material was greater than ¾" thus making the material unsuitable for standard Proctor density testing.

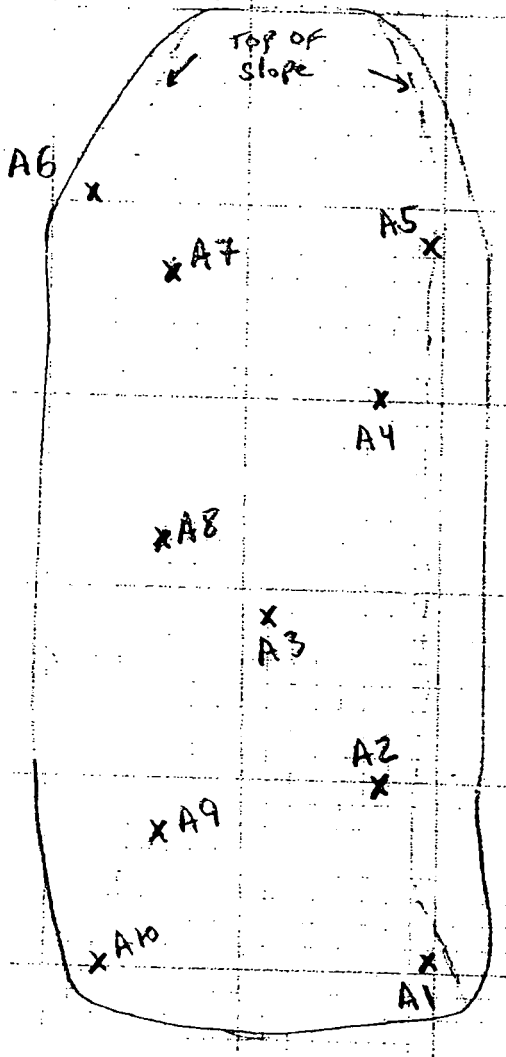
Stoller

JOB NO.: 3938 DATE: 7/27/04

JOB NAME: Present Landfill 280 Dirt Pile

PREPARED: Steve B REVIEWED:

SHEET NO.: 1 OF 1



N

280 Dirt Pile

Scale 1" = 100'

estimated volume

60,000 cu yds

(1) sample per 6,500 yds

minimum ⇒ 11 samples

280 Dirt Pile Sample Location Map

280 Dirt Pile Sampling

Date: July 27, 2004

Persons present: Bob Davis, Paul Kreitz, Steve Brinkman, Keith Dyer, Mark Mclane, Micheal Place, Ryan Archibald, and 3 Kaiser Hill construction .

On Site at 10:30
Pre Ev 10:45 – 11:00

Sample Identification and details
Each Sample is 2, 5-gallon buckets of material

A1 – Taken at 12:10, sample depth 3'

A2 – Taken at 12:20, sample depth 3'

A3 – Taken at 12:30, sample depth 6'

A4 – Taken at 12:50, sample depth 12'

A5 – Taken at 1:35, sample depth 3'

A6 – Taken at 1:50, sample depth 2'

A7 – Taken at 1:15, sample depth 6' – Duplicate taken

A8 – Taken at 12:40, sample depth 3'

A9 – Taken at 2:10, sample depth 12'

A10 - Taken at 2:25, sample depth 4'

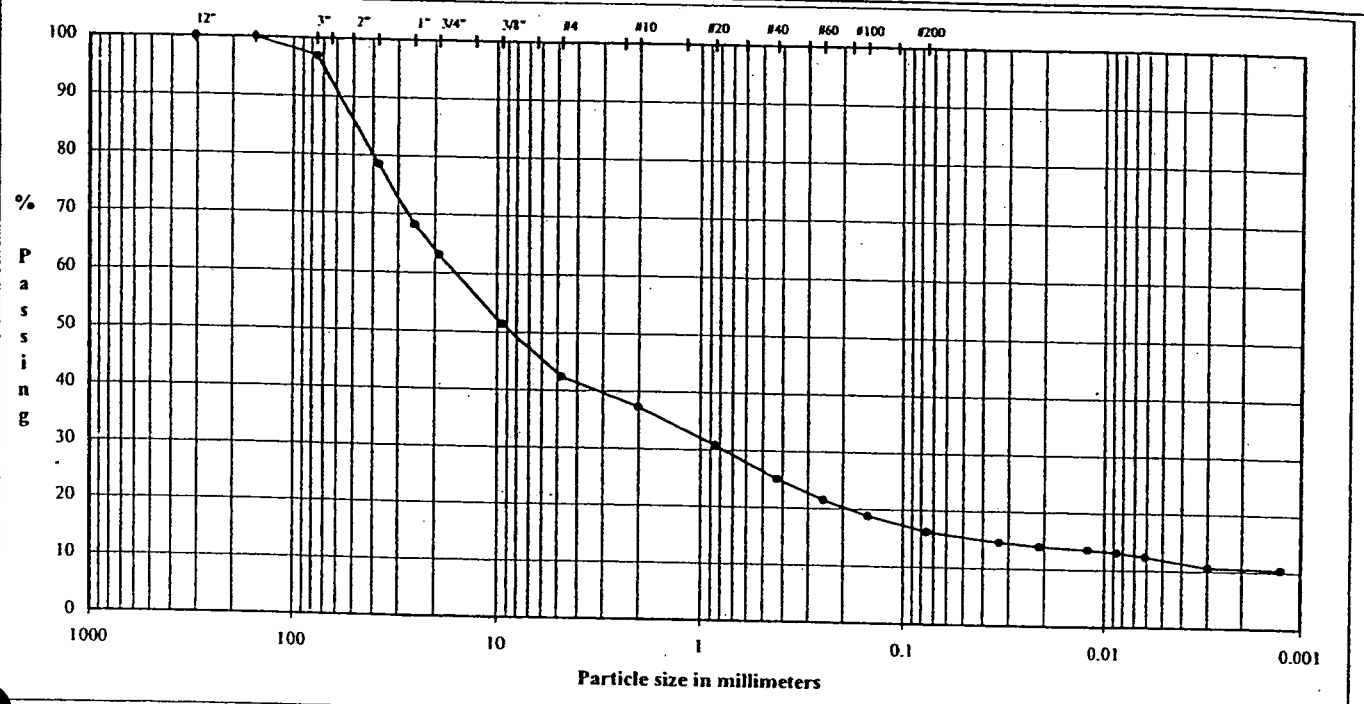
August-04

043-2246.0001

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: Rocky Flats/Field & Lab Testing/CO
SAMPLE ID: A-1 Depth (ft): 3
TYPE: BULK



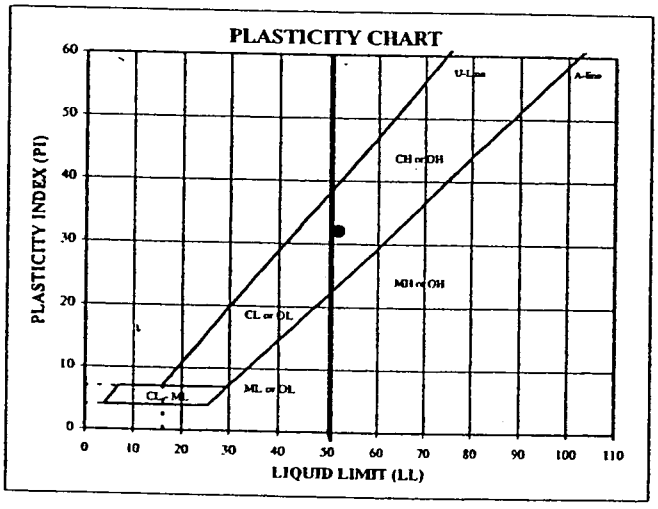
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	3.03
6.0"	154.2	100.0		
6.0"	154.2	100.0		
3.0"	75.0	97.0		
1.5"	37.5	78.4		
1.0"	25.0	68.2	Coarse Gravel	33.87
0.75"	19.0	63.1		
0.375"	9.5	51.4		
#4	4.8	42.3	Fine Gravel	20.79
#10	2.00	37.2	Coarse Sand	5.07
#20	0.85	30.7		
#40	0.43	25.1	Medium Sand	12.19
#60	0.25	21.4		
#100	0.15	18.8		
#200	0.075	16.2	Fine Sand	8.84

Hydrometer Analysis

(mm)	%Finer		
0.033	14.6		
0.021	13.9		
0.012	13.5	Fines	
0.0087	13.0	Silt or Clay	16.22
0.0061	12.4		
0.0030	10.6		
0.0013	10.4		



ATTERBERG LIMITS

M_c	LL	PL	PI	SpG
13.8	52	20	32	

DESCRIPTION: Light to moderate yellowish brown (5 YR 5/6, 4/4) clayey gravel with sand

USCS: GC

TECH: DT
DATE: 7/29/2004
REVIEW: MB

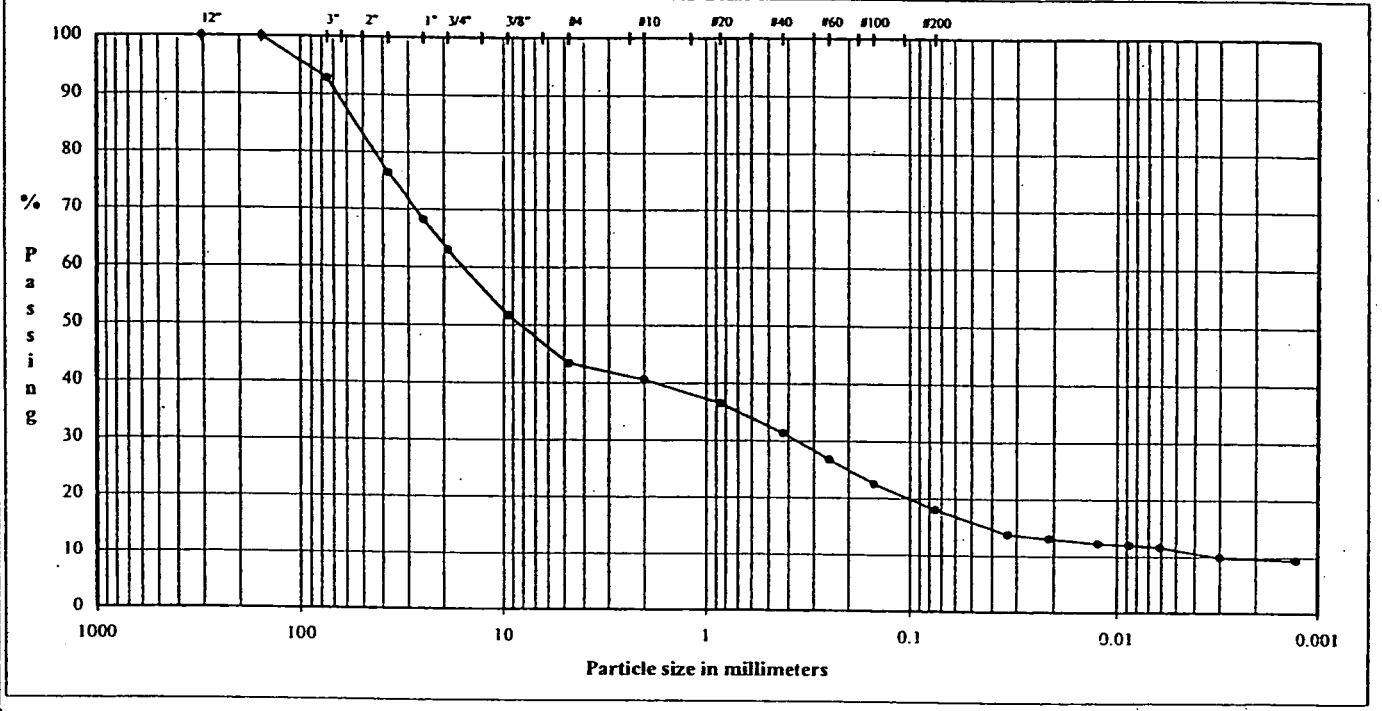
August-04

043-2246.0001

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: Rocky Flats/Field & Lab Testing/CO
SAMPLE ID: A-2 Depth (ft): 3
TYPE: BULK



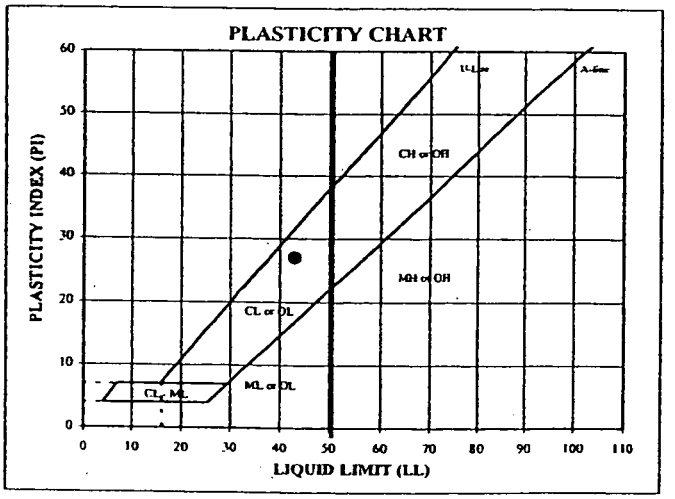
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	7.20
6.0"	154.2	100.0		
6.0"	154.2	100.0		
3.0"	75.0	92.8		
1.5"	37.5	76.4		
1.0"	25.0	68.1	Coarse Gravel	29.89
0.75"	19.0	62.9		
0.375"	9.5	51.7		
#4	4.8	43.3	Fine Gravel	19.57
#10	2.00	40.5	Coarse Sand	2.84
#20	0.85	36.5		
#40	0.43	31.3	Medium Sand	9.20
#60	0.25	26.7		
#100	0.15	22.5		
#200	0.075	18.1	Fine Sand	13.25

Hydrometer Analysis

(mm)	%Finer		
0.033	13.8		
0.021	13.1		
0.012	12.2	Fines	
0.0087	12.0	Silt or Clay	18.06
0.0061	11.6		
0.0030	9.8		
0.0013	9.4		



ATTERBERG LIMITS

M,	LL	PL	PI	SpG
9.2	43	16	27	–

DESCRIPTION: Moderate yellowish brown (10 YR 5/4) clayey gravel with sand

USCS: GC

TECH	DT
DATE	7/30/2004
REVIEW	MB

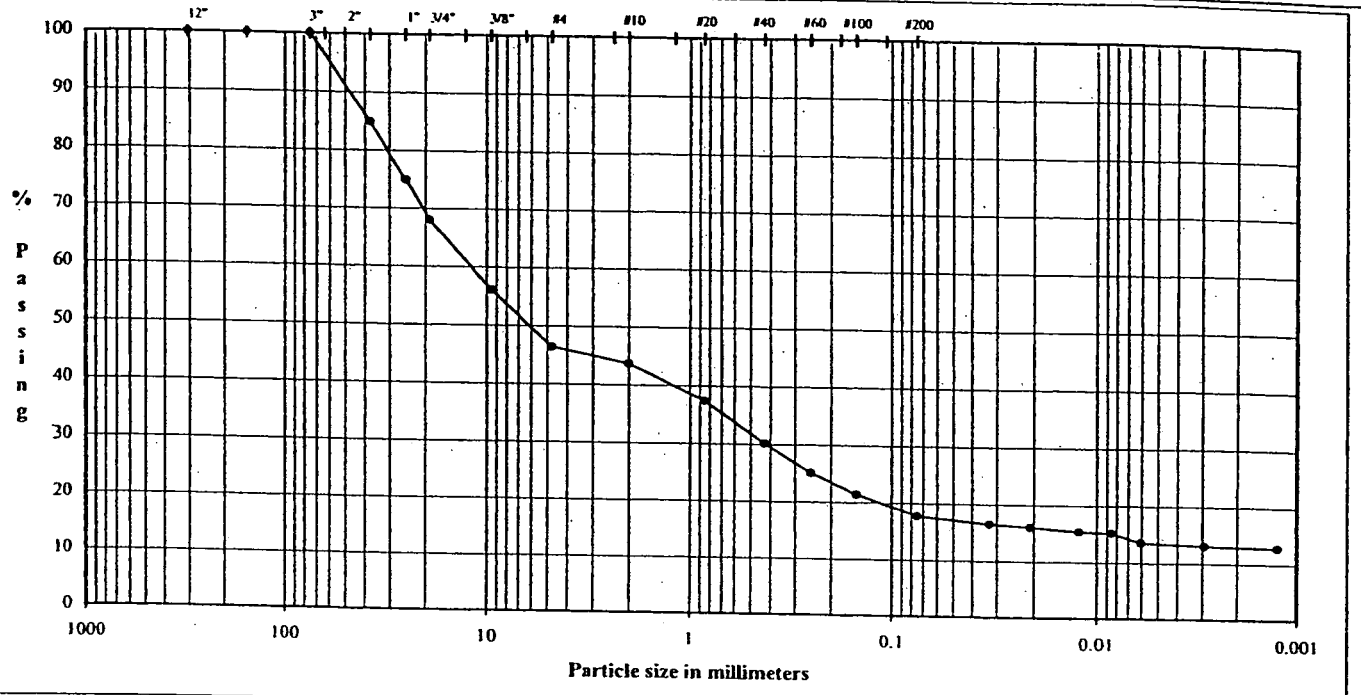
August-04

043-2246.0001

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: Rocky Flats/Field & Lab Testing/CO
SAMPLE ID: A-3 Depth (ft): 6
TYPE: BULK



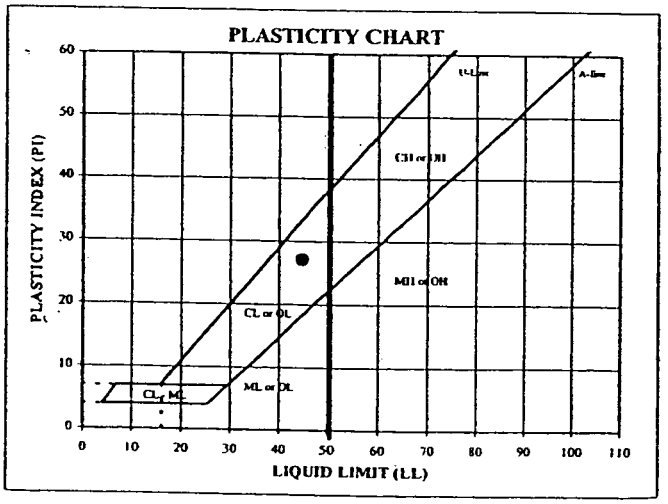
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	0.00
6.0"	154.2	100.0		
6.0"	154.2	100.0		
3.0"	75.0	100.0		
1.5"	37.5	84.9		
1.0"	25.0	74.9	Coarse Gravel	31.98
0.75"	19.0	68.0		
0.375"	9.5	56.1		
#4	4.8	46.4	Fine Gravel	21.67
#10	2.00	43.6	Coarse Sand	2.71
#20	0.85	37.4		
#40	0.43	30.1	Medium Sand	13.52
#60	0.25	25.1		
#100	0.15	21.4		
#200	0.075	17.8	Fine Sand	12.32

Hydrometer Analysis

(mm)	%Finer		
0.033	16.5		
0.021	16.1		
0.012	15.4	Fines	
0.0085	15.2	Silt or Clay	17.80
0.0061	13.6		
0.0029	13.1		
0.0012	12.9		



ATTERBERG LIMITS

M_c	LL	PL	PI	SpG
8.0	45	18	27	

DESCRIPTION: Moderate yellowish brown (10 YR 5/4) clayey gravel with sand

USCS: GC

TECH	DT
DATE	7/29/2004
REVIEW	MB

August-04

043-2246.0001

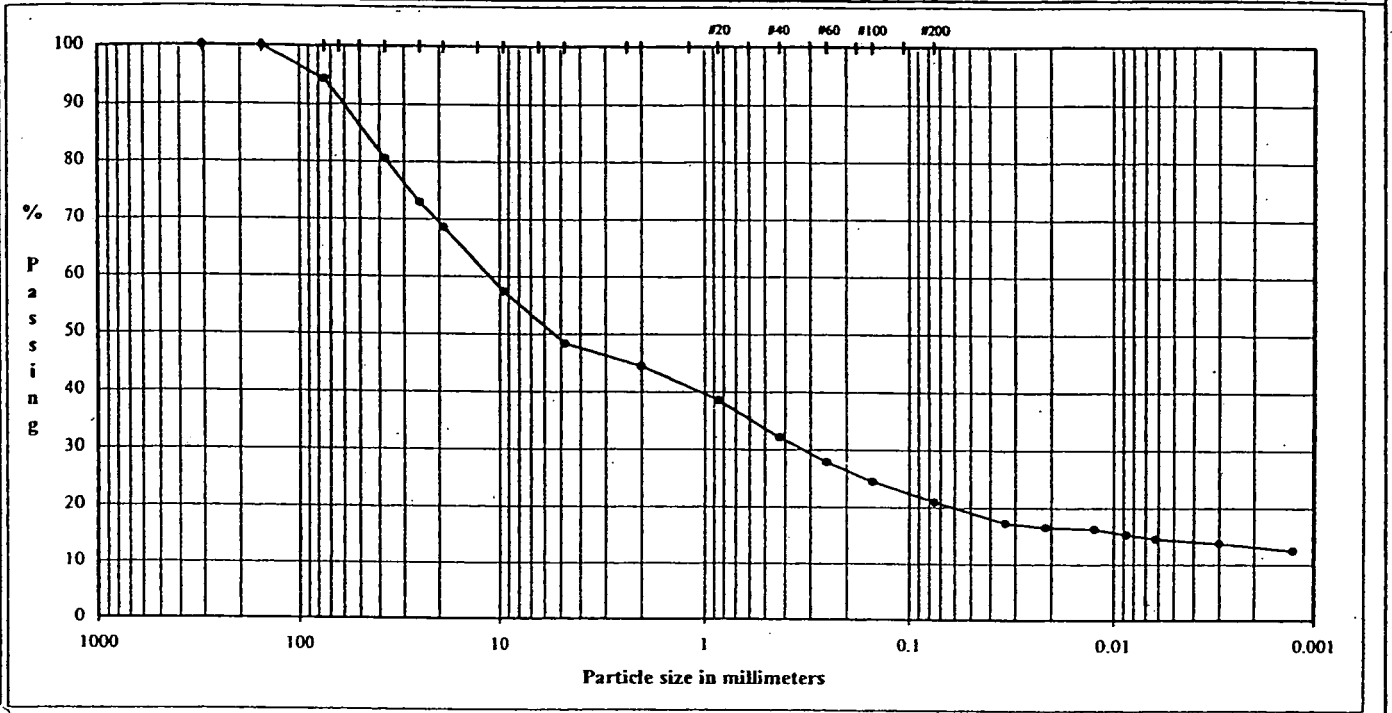
PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **Rocky Flats/Field & Lab Testing/CO**

SAMPLE ID: **A-4** Depth (ft): **12**

TYPE: **BULK**



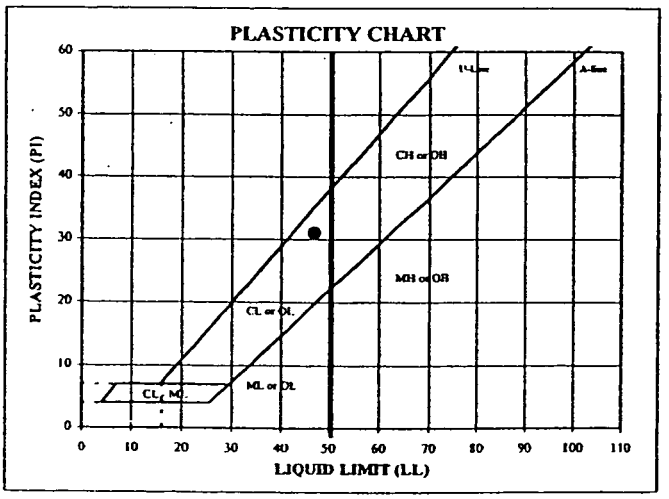
COBBLES	Coarse GRAVEL	Fine GRAVEL	Coarse SAND	Medium SAND	Fine SAND	Silt or Clay FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	5.69
6.0"	154.2	100.0		
6.0"	154.2	100.0		
3.0"	75.0	94.3		
1.5"	37.5	80.4		
1.0"	25.0	72.8	Coarse Gravel	25.73
0.75"	19.0	68.6		
0.375"	9.5	57.4		
#4	4.8	48.4	Fine Gravel	20.23
#10	2.00	44.4	Coarse Sand	3.96
#20	0.85	38.5		
#40	0.43	32.1	Medium Sand	12.27
#60	0.25	27.9		
#100	0.15	24.5		
#200	0.075	20.9	Fine Sand	11.22

Hydrometer Analysis

(mm)	%Finer		
0.033	17.2		
0.021	16.5		
0.012	16.2	Fines	
0.0087	15.2	Silt or Clay	20.90
0.0062	14.5		
0.0030	13.7		
0.0013	12.5		



ATTERBERG LIMITS

M,	LL	PL	PI	SpG
14.3	47	16	31	--

DESCRIPTION: Pale olive and moderate yellowish brown (10YR 6/2 and 10YR 5/4) clayey gravel with sand

USCS: GC

TECH: DT

DATE: 8/2/2004

REVIEW: MB

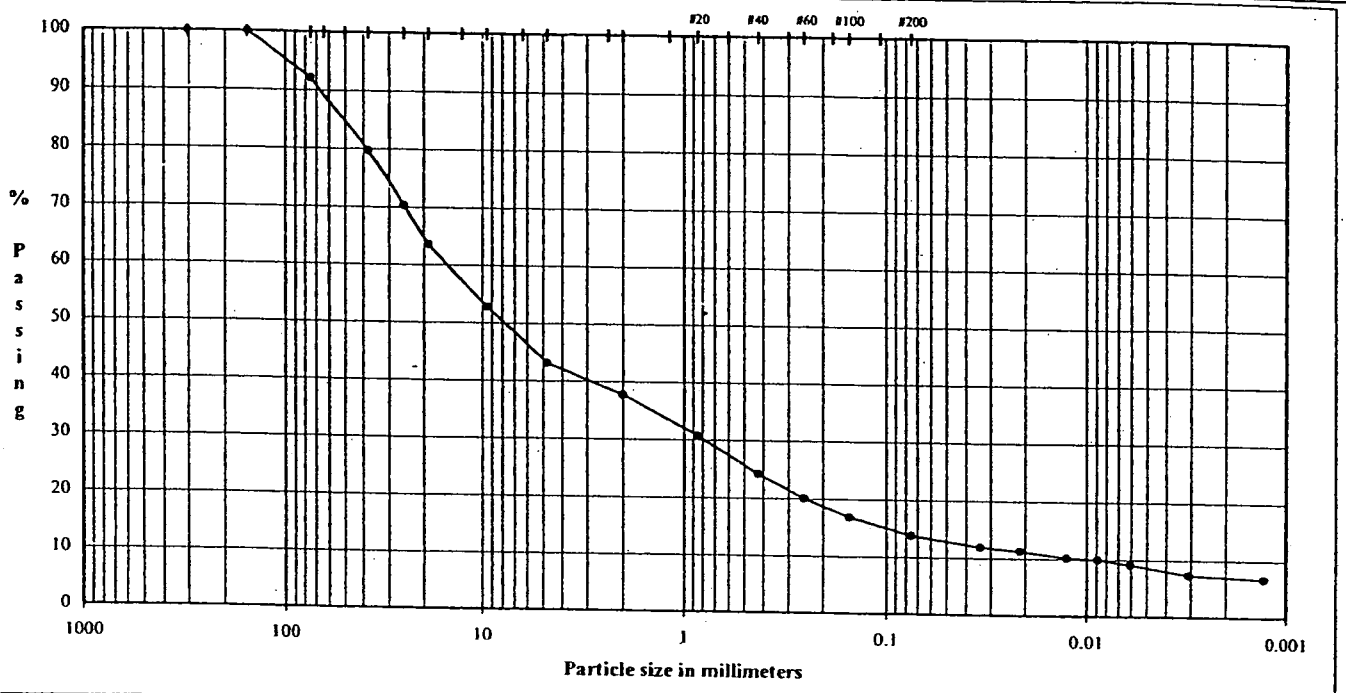
August-04

043-2246.0001

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: Rocky Flats/Field & Lab Testing/CO
SAMPLE ID: A-5 Depth (ft): 3
TYPE: BULK



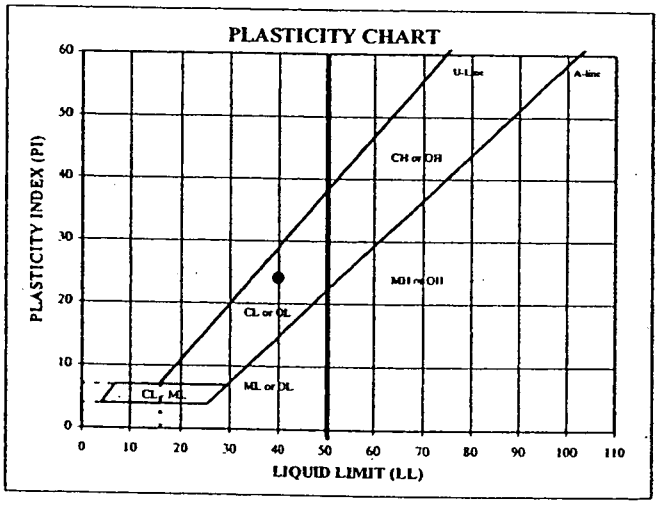
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	7.99
6.0"	154.2	100.0		
6.0"	154.2	100.0		
3.0"	75.0	92.0		
1.5"	37.5	79.7		
1.0"	25.0	70.3	Coarse Gravel	28.49
0.75"	19.0	63.5		
0.375"	9.5	52.8		
#4	4.8	43.1	Fine Gravel	20.43
#10	2.00	37.7	Coarse Sand	5.42
#20	0.85	30.7		
#40	0.43	24.2	Medium Sand	13.48
#60	0.25	20.0		
#100	0.15	16.8		
#200	0.075	13.8	Fine Sand	10.42

Hydrometer Analysis

(mm)	%Finer		
0.034	11.9		
0.021	11.3		
0.012	10.2	Fines	
0.0088	10.0	Silt or Clay	13.78
0.0061	9.1		
0.0031	7.4		
0.0013	6.7		



ATTERBERG LIMITS

M_c	LL	PL	PI	SpG
11.2	40	16	24	–

DESCRIPTION: Moderate brown (5YR 4/4) clayey gravel with sand

USCS: GC

TECH	DT
DATE	8/4/2004
REVIEW	MB

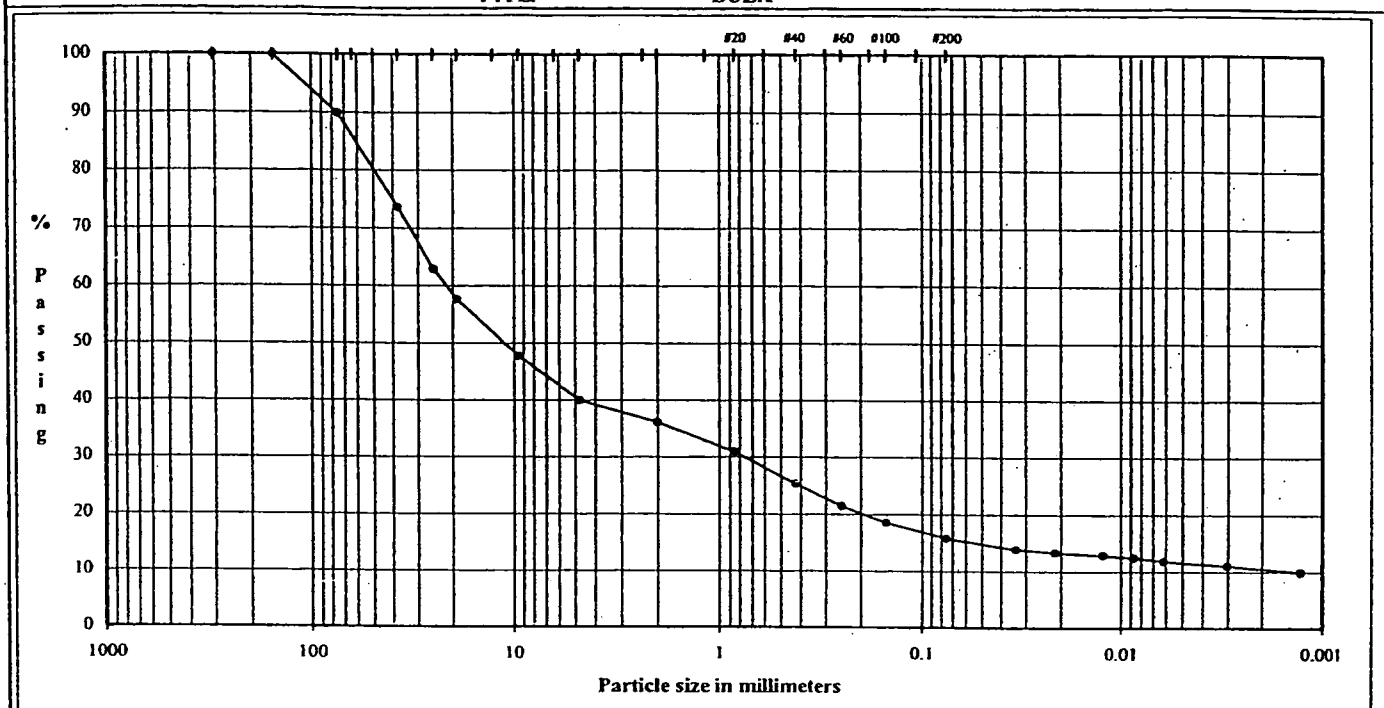
August-04

043-2246.0001

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: Rocky Flats/Field & Lab Testing/CO
SAMPLE ID: A-6 Depth (ft): 2
TYPE: BULK



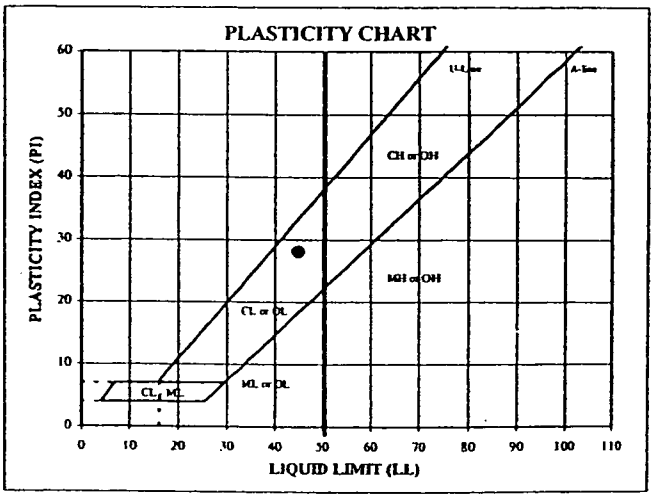
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	10.17
6.0"	154.2	100.0		
6.0"	154.2	100.0		
3.0"	75.0	89.8		
1.5"	37.5	73.5		
1.0"	25.0	62.9	Coarse Gravel	32.24
0.75"	19.0	57.6		
0.375"	9.5	47.7		
#4	4.8	39.9	Fine Gravel	17.70
#10	2.00	36.1	Coarse Sand	3.82
#20	0.85	30.9		
#40	0.43	25.2	Medium Sand	10.86
#60	0.25	21.4		
#100	0.15	18.5		
#200	0.075	15.7	Fine Sand	9.51

Hydrometer Analysis

(mm)	%Finer		
0.034	13.9		
0.021	13.2		
0.012	12.8	Fines	
0.0087	12.4	Silt or Clay	15.70
0.0062	11.8		
0.0030	11.0		
0.0013	9.9		



ATTERBERG LIMITS

M_c	LL	PL	PI	SpG
10.2	45	17	28	–

DESCRIPTION: Pale greenish yellow and light brown (10YR 8/2, 5YR 5/6) clayey gravel with sand

USCS: GC

TECH: DT
DATE: 8/5/2004
REVIEW: MB

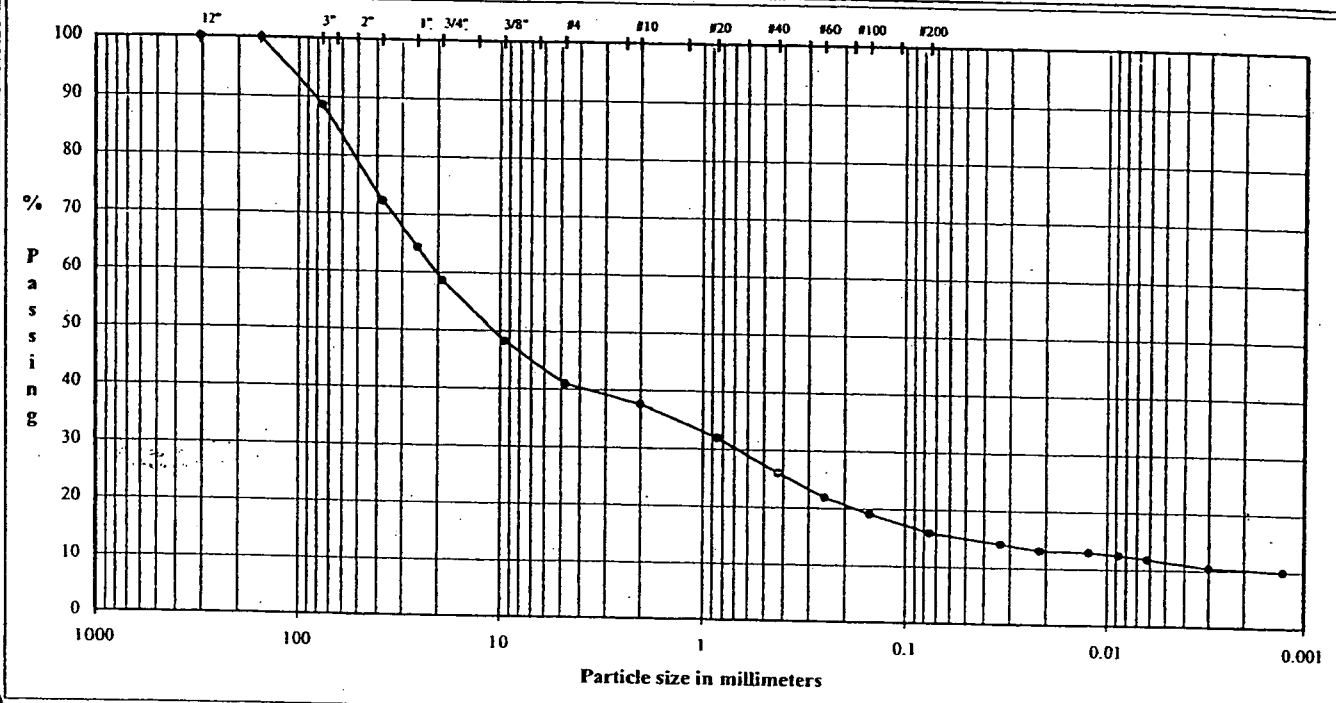
August-04

043-2246.0001

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: Rocky Flats/Field & Lab Testing/CO
SAMPLE ID: A-7 Depth (ft): 6
TYPE: BULK



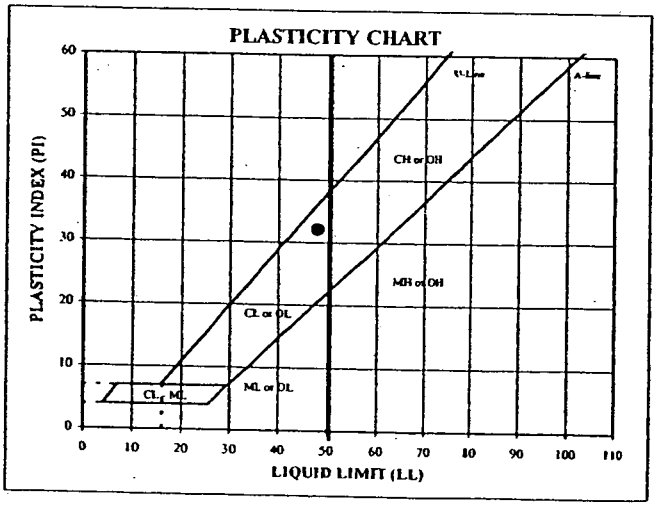
COBBLES	GRAVEL		SAND			FINES
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	11.44
6.0"	154.2	100.0		
6.0"	154.2	100.0		
3.0"	75.0	88.6		
1.5"	37.5	72.3		
1.0"	25.0	64.3	Coarse Gravel	29.94
0.75"	19.0	58.6		
0.375"	9.5	48.2		
#4	4.8	40.9	Fine Gravel	17.70
#10	2.00	37.5	Coarse Sand	3.37
#20	0.85	31.9		
#40	0.43	26.0	Medium Sand	11.58
#60	0.25	21.9		
#100	0.15	19.1		
#200	0.075	15.9	Fine Sand	10.06

Hydrometer Analysis

(mm)	%Finer		
0.033	14.1		
0.021	13.1		
0.012	12.9	Fines	
0.0087	12.5	Silt or Clay	15.91
0.0062	11.9		
0.0030	10.4		
0.0013	10.0		



ATTERBERG LIMITS

M_c	LL	PL	PI	SpG
13.1	48	16	32	–

DESCRIPTION: Dark yellowish orange (10YR 6/6) clayey gravel with sand

USCS: GC

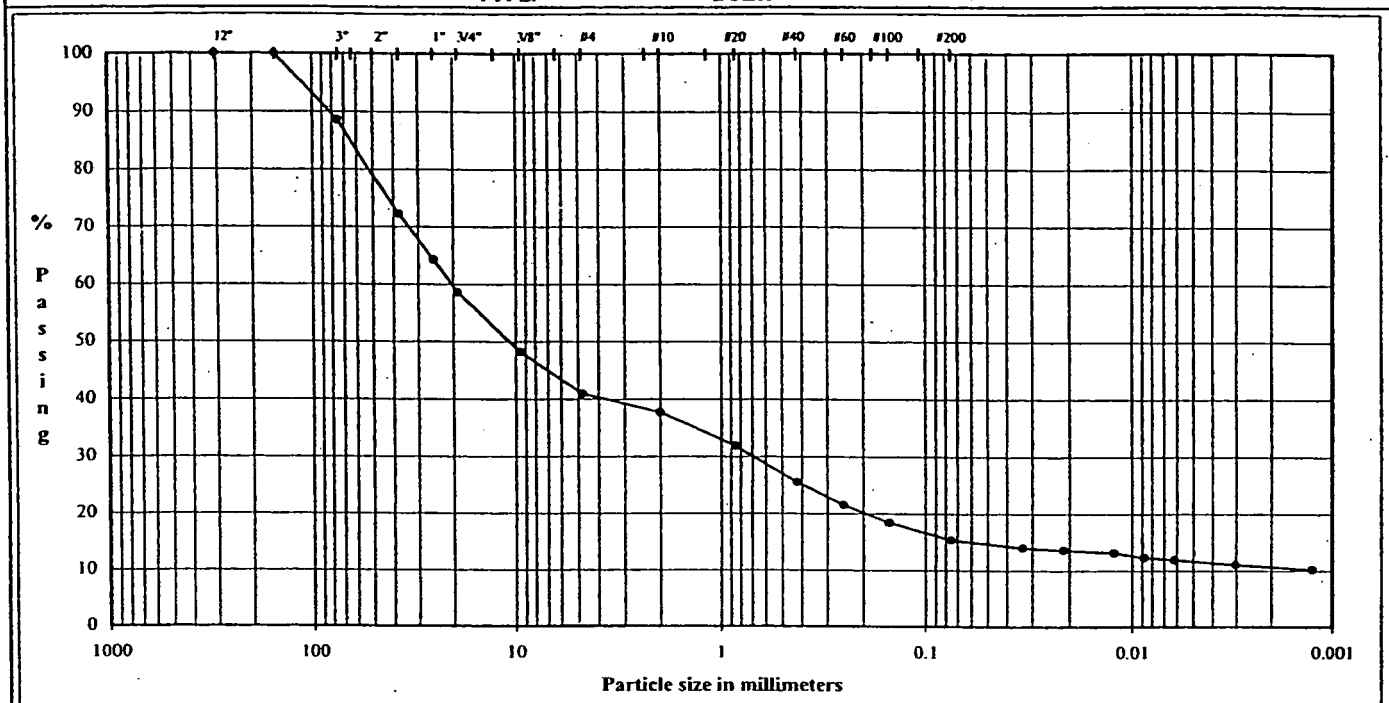
TECH	DT
DATE	8/5/2004
REVIEW	MB

August-04 043-2246.0001

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: Rocky Flats/Field & Lab Testing/CO
SAMPLE ID: A-7 Dup Depth (ft): 6
TYPE: BULK



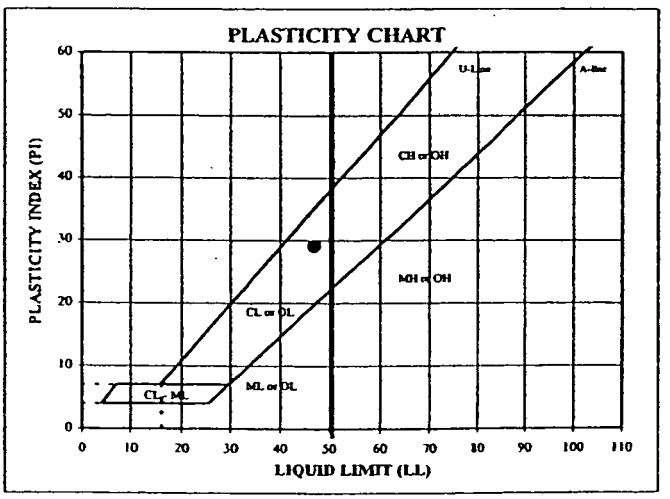
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	11.44
6.0"	154.2	100.0		
6.0"	154.2	100.0		
3.0"	75.0	88.6		
1.5"	37.5	72.3		
1.0"	25.0	64.3	Coarse Gravel	29.94
0.75"	19.0	58.6		
0.375"	9.5	48.2		
#4	4.8	40.9	Fine Gravel	17.70
#10	2.00	37.7	Coarse Sand	3.23
#20	0.85	31.8		
#40	0.43	25.5	Medium Sand	12.20
#60	0.25	21.5		
#100	0.15	18.4		
#200	0.075	15.3	Fine Sand	10.16

Hydrometer Analysis

(mm)	%Finer		
0.034	14.0		
0.021	13.6		
0.012	13.1	Fines	
0.0088	12.3	Silt or Clay	15.33
0.0062	11.9		
0.0030	11.0		
0.0013	10.2		



ATTERBERG LIMITS

M_c	LL	PL	PI	SpG
14.1	47	18	29	–

DESCRIPTION: Dark yellowish orange (10YR 6/6) clayey gravel with sand
USCS: GC

TECH	JR
DATE	8/9/2004
REVIEW	MB

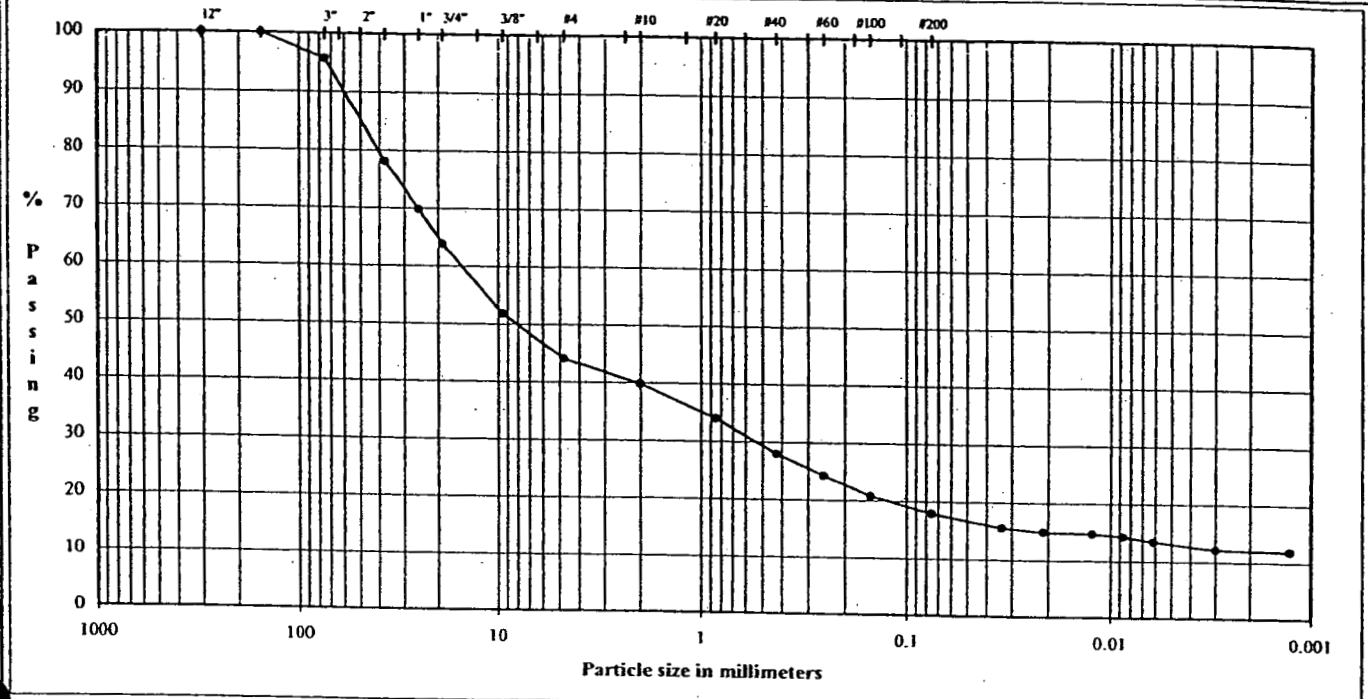
August-04

043-2246.0001

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **Rocky Flats/Field & Lab Testing/CO**
SAMPLE ID: **A-8** Depth (ft): **3**
TYPE: **BULK**



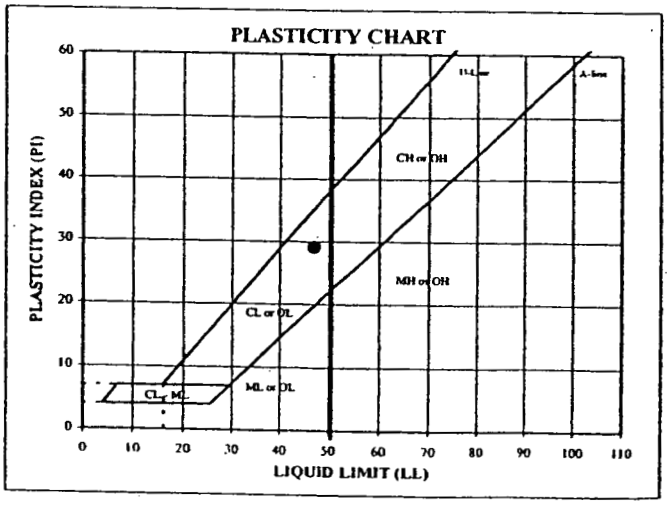
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	4.33
6.0"	154.2	100.0		
6.0"	154.2	100.0		
3.0"	75.0	95.7		
1.5"	37.5	78.1		
1.0"	25.0	69.8	Coarse Gravel	31.89
0.75"	19.0	63.8		
0.375"	9.5	51.8		
#4	4.8	44.0	Fine Gravel	19.74
#10	2.00	39.8	Coarse Sand	4.25
#20	0.85	34.0		
#40	0.43	28.0	Medium Sand	11.83
#60	0.25	24.2		
#100	0.15	20.8		
#200	0.075	17.9	Fine Sand	10.06

Hydrometer Analysis

(mm)	%Finer		
0.033	15.6		
0.021	14.9		
0.012	14.7	Fines	
0.0087	14.3	Silt or Clay	17.89
0.0061	13.4		
0.0030	12.1		
0.0013	11.9		



ATTERBERG LIMITS

M_c	LL	PL	PI	SpG
11.6	47	18	29	–

DESCRIPTION: Dark yellowish orange to moderate brown (10YR6/6, 5YR4/4) clayey gravel with sand

USCS: GC

TECH	DT
DATE	8/6/2004
REVIEW	MB

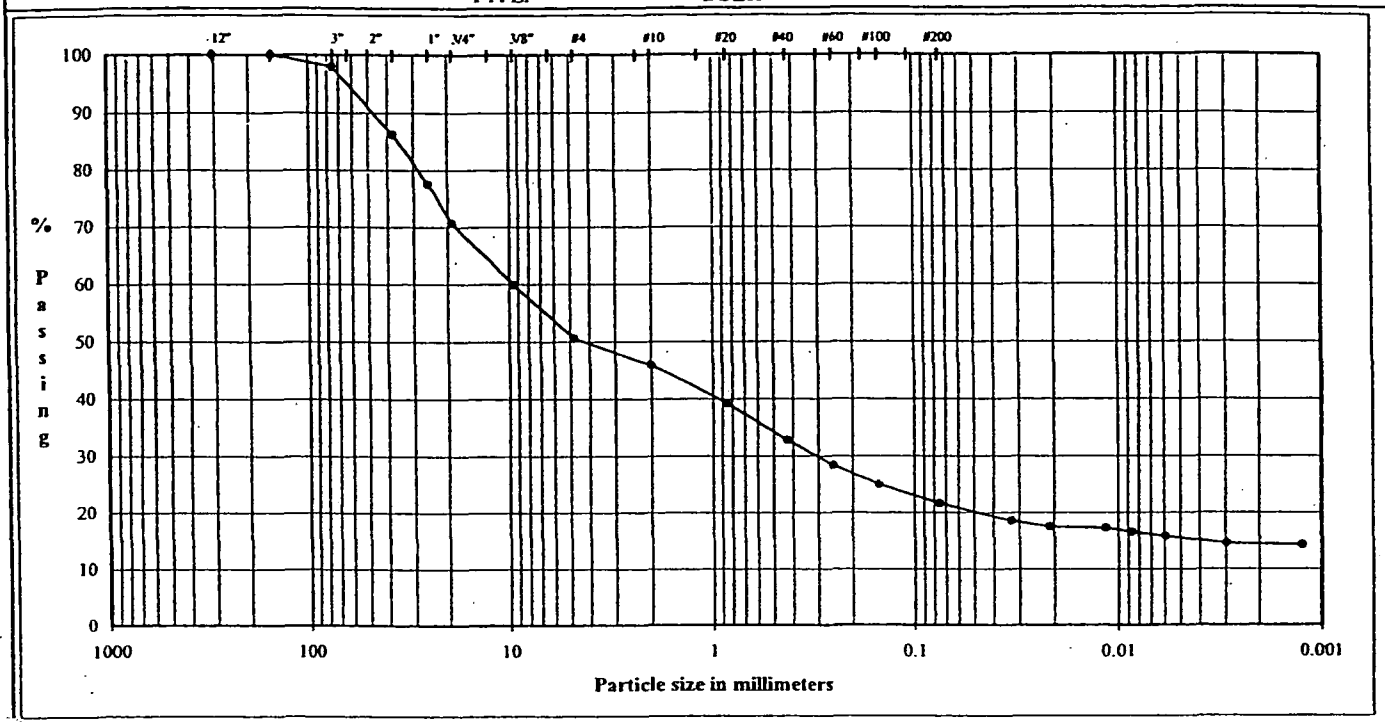
August-04

043-2246.0001

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: Rocky Flats/Field & Lab Testing/CO
SAMPLE ID: A-9 Depth (ft): 10
TYPE: BULK



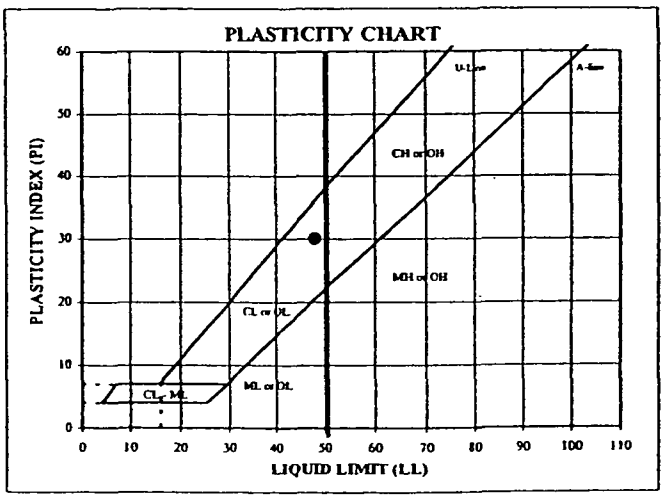
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
COBBLES	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	2.06
6.0"	154.2	100.0		
6.0"	154.2	100.0		
3.0"	75.0	97.9		
1.5"	37.5	86.2		
1.0"	25.0	77.5	Coarse Gravel	27.27
0.75"	19.0	70.7		
0.375"	9.5	59.9		
#4	4.8	50.5	Fine Gravel	20.12
#10	2.00	45.9	Coarse Sand	4.66
#20	0.85	39.1		
#40	0.43	32.7	Medium Sand	13.20
#60	0.25	28.3		
#100	0.15	25.0		
#200	0.075	21.6	Fine Sand	11.05

Hydrometer Analysis

(mm)	%Finer		
0.033	18.5		
0.021	17.5		
0.011	17.3	Fines	
0.0086	16.5	Silt or Clay	21.64
0.0059	15.8		
0.0030	14.5		
0.0012	14.3		



ATTERBERG LIMITS

M_c	LL	PL	PI	SpG
9.2	48	18	30	–

DESCRIPTION: Moderate yellowish brown (5YR 4/4) clayey gravel with sand

USCS: GC

TECH	DT
DATE	8/4/2004
REVIEW	MB

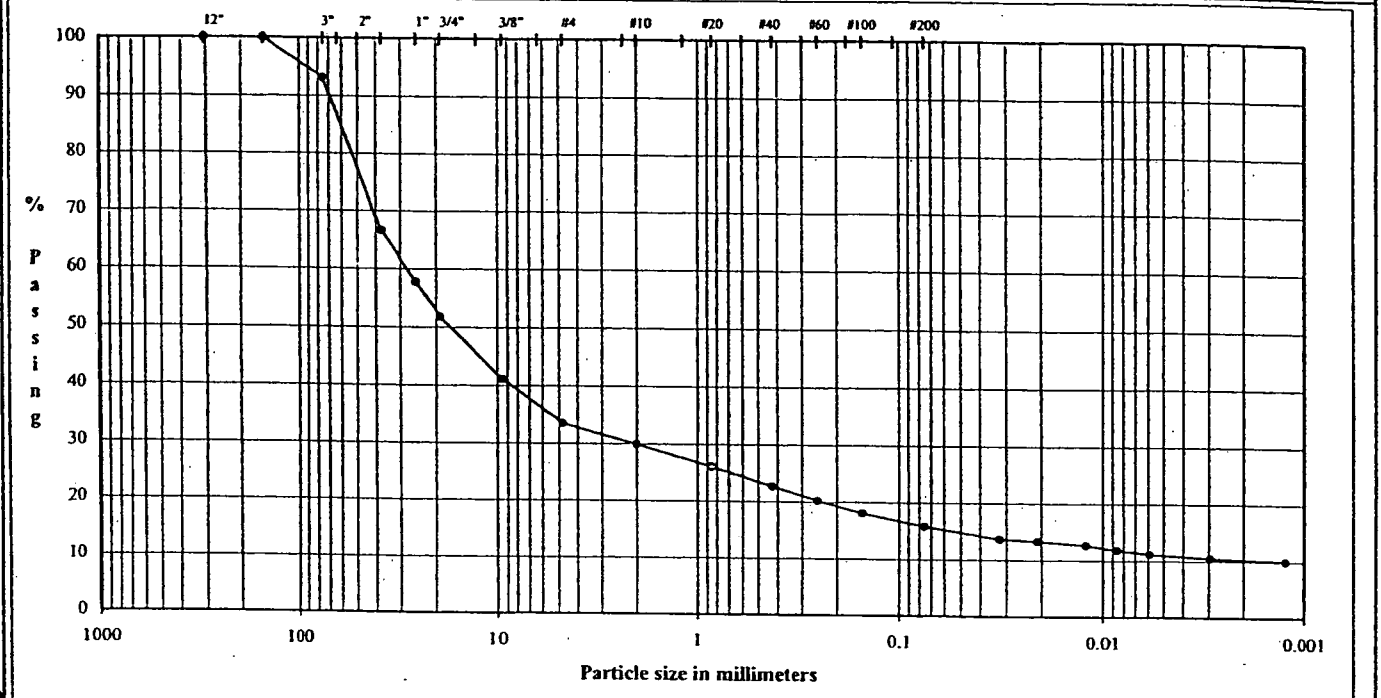
August-04

043-2246.0001

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: Rocky Flats/Field & Lab Testing/CO
SAMPLE ID: A-10 Depth (ft): 4
TYPE: BULK



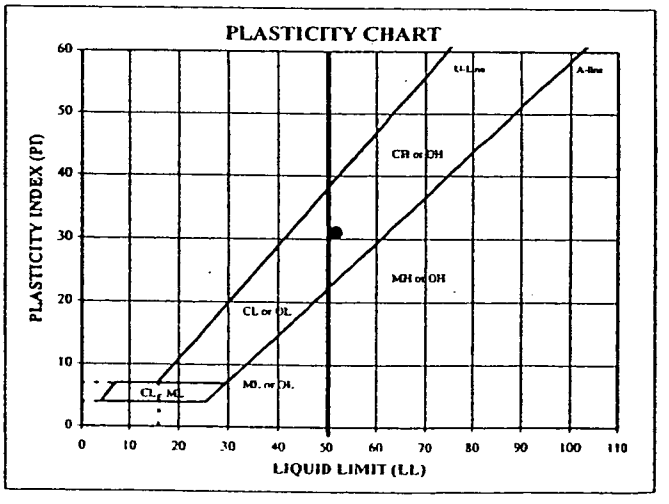
COBBLES	GRAVEL		SAND			FINES
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	6.87
6.0"	154.2	100.0		
6.0"	154.2	100.0		
3.0"	75.0	93.1		
1.5"	37.5	66.6		
1.0"	25.0	57.8	Coarse Gravel	41.37
0.75"	19.0	51.8		
0.375"	9.5	41.1		
#4	4.8	33.5	Fine Gravel	18.31
#10	2.00	29.9	Coarse Sand	3.60
#20	0.85	26.1		
#40	0.43	22.6	Medium Sand	7.22
#60	0.25	20.2		
#100	0.15	18.0		
#200	0.075	15.7	Fine Sand	6.89

Hydrometer Analysis

(mm)	%Finer		
0.032	13.7		
0.021	13.3		
0.012	12.6	Fines	
0.0086	11.8	Silt or Clay	15.75
0.0059	11.1		
0.0029	10.5		
0.0012	9.9		



ATTERBERG LIMITS

M_c	LL	PL	PI	SpG
7.8	52	21	31	–

DESCRIPTION: Moderate brown (5YR 3/4) clayey gravel with sand

USCS: GC

TECH	DT
DATE	8/3/2004
REVIEW	MB

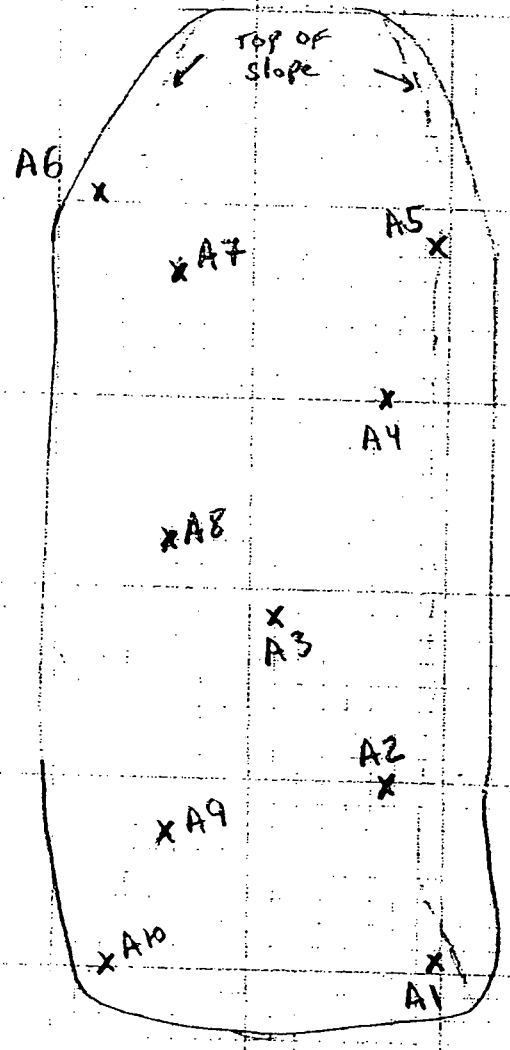
Stoller

JOB NO.: 3938 DATE: 7/27/04

JOB NAME: Present Landfill 280 Dirt Pile

PREPARED: Steve B REVIEWED: _____

SHEET NO.: 1 OF 1



N

280 Dirt Pile

Scale 1" = 100'

estimated volume

60,000 cu yds

(1) sample per 6,500 yds

minimum ⇒ 11 samples

280 Dirt Pile Sample Location Map.

280 Dirt Pile Sampling

Date: July 27, 2004

Persons present: Bob Davis, Paul Kreitz, Steve Brinkman, Keith Dyer, Mark Mclane, Micheal Place, Ryan Archibald, and 3 Kaiser Hill construction .

On Site at 10:30
Pre Ev 10:45 – 11:00

Sample Identification and details
Each Sample is 2, 5-gallon buckets of material

A1 – Taken at 12:10, sample depth 3'

A2 – Taken at 12:20, sample depth 3'

A3 – Taken at 12:30, sample depth 6'

A4 – Taken at 12:50, sample depth 12'

A5 – Taken at 1:35, sample depth 3'

A6 – Taken at 1:50, sample depth 2'

A7 – Taken at 1:15, sample depth 6' – Duplicate taken

A8 – Taken at 12:40, sample depth 3'

A9 – Taken at 2:10, sample depth 12'

A10 - Taken at 2:25, sample depth 4'

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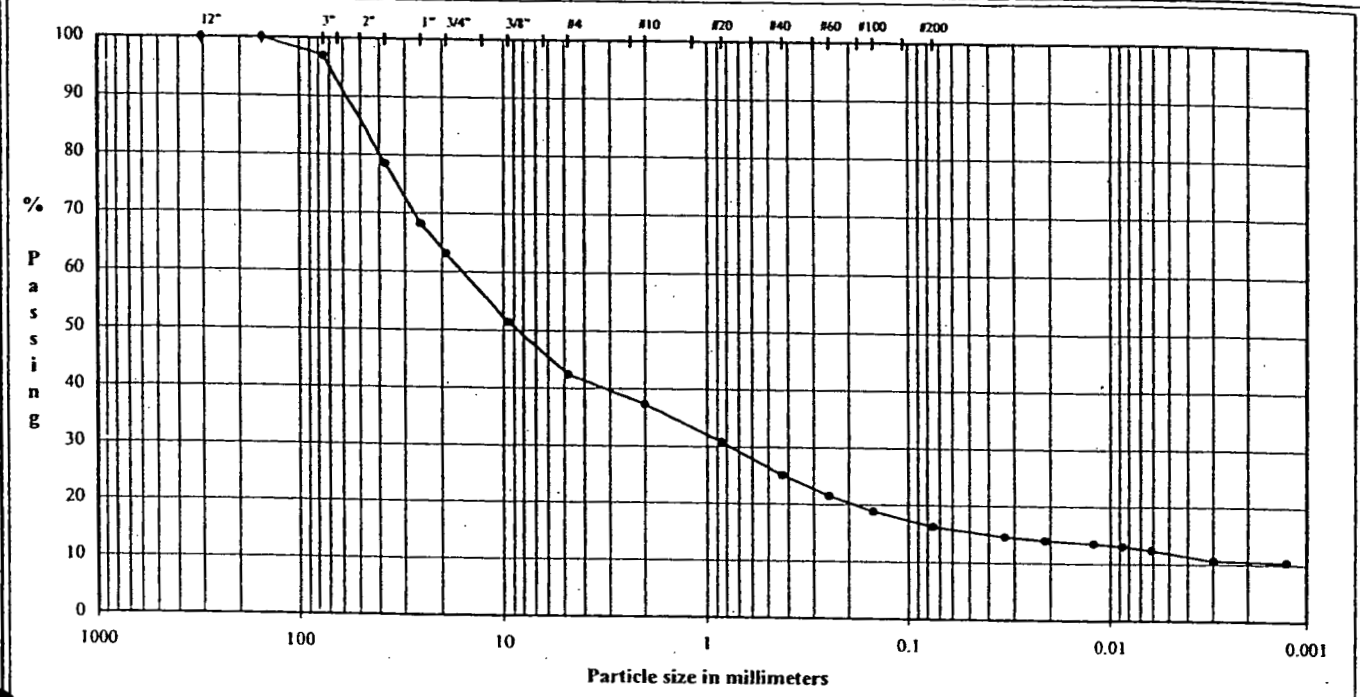
PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: Rocky Flats/Field & Lab Testing/CO
SAMPLE ID: A-1 Depth (ft): 3
TYPE: BULK



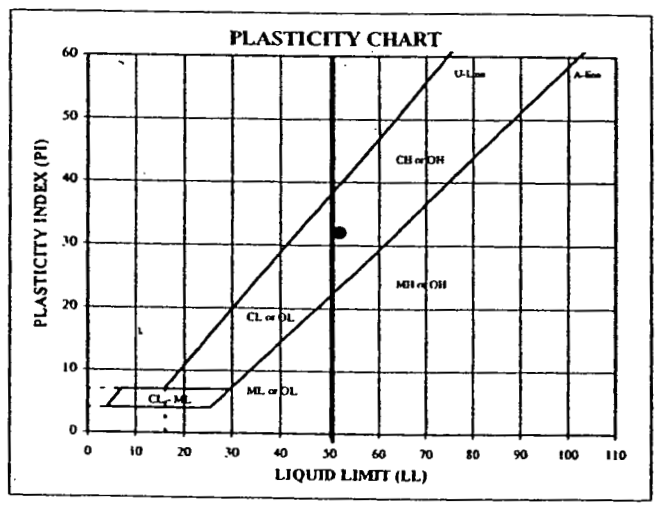
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	3.03
6.0"	154.2	100.0		
6.0"	154.2	100.0		
3.0"	75.0	97.0		
1.5"	37.5	78.4		
1.0"	25.0	68.2	Coarse Gravel	33.87
0.75"	19.0	63.1		
0.375"	9.5	51.4		
#4	4.8	42.3	Fine Gravel	20.79
#10	2.00	37.2	Coarse Sand	5.07
#20	0.85	30.7		
#40	0.43	25.1	Medium Sand	12.19
#60	0.25	21.4		
#100	0.15	18.8		
#200	0.075	16.2	Fine Sand	8.84

Hydrometer Analysis

(mm)	%Finer		
0.033	14.6		
0.021	13.9		
0.012	13.5	Fines	
0.0087	13.0	Silt or Clay	16.22
0.0061	12.4		
0.0030	10.6		
0.0013	10.4		



ATTERBERG LIMITS

M_c	LL	PL	PI	SpG
13.8	52	20	32	

DESCRIPTION: Light to moderate yellowish brown (5 YR 5/6, 4/4) clayey gravel with sand

USCS: GC

TECH	DT
DATE	7/29/2004
REVIEW	MB

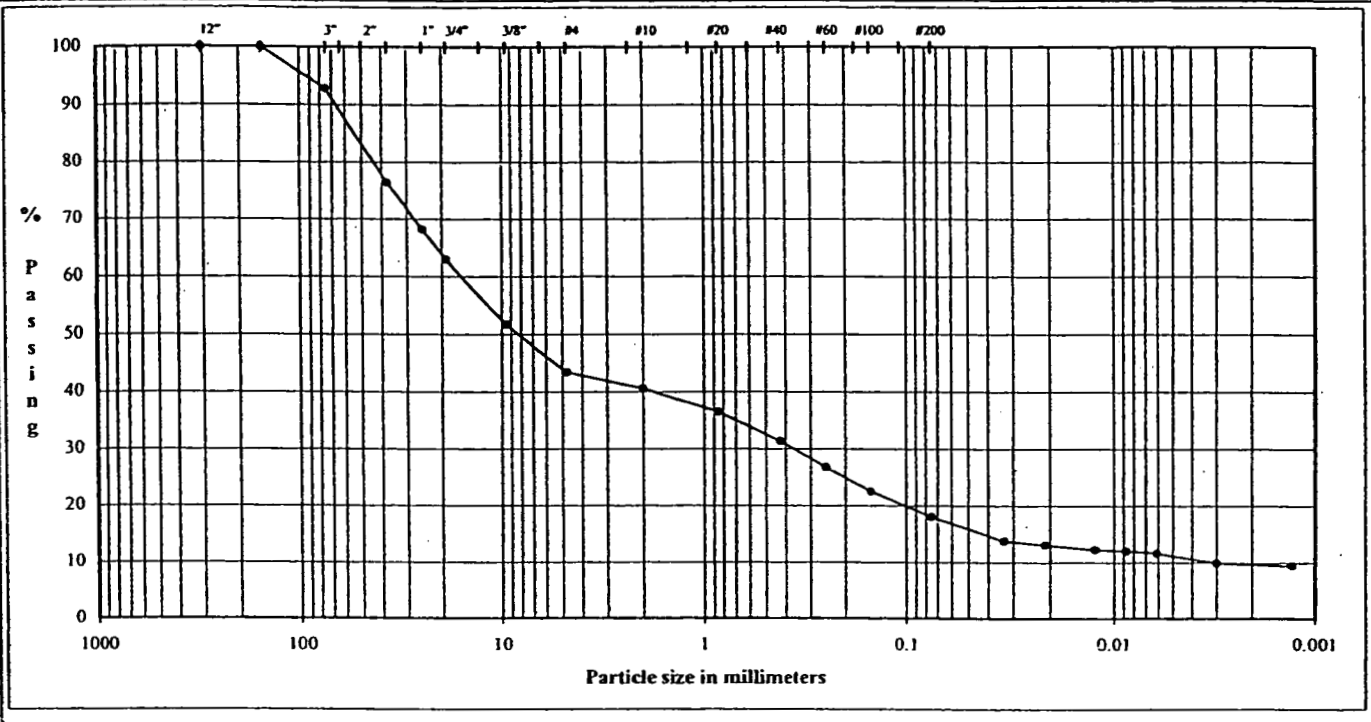
August-04

043-2246.0001

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: Rocky Flats/Field & Lab Testing/CO
SAMPLE ID: A-2 Depth (ft): 3
TYPE: BULK



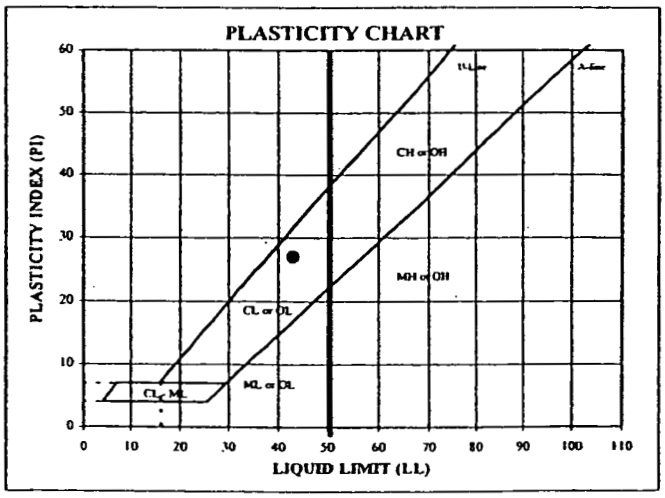
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
COBBLES	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	7.20
6.0"	154.2	100.0		
6.0"	154.2	100.0		
3.0"	75.0	92.8		
1.5"	37.5	76.4		
1.0"	25.0	68.1	Coarse Gravel	29.89
0.75"	19.0	62.9		
0.375"	9.5	51.7		
#4	4.8	43.3	Fine Gravel	19.57
#10	2.00	40.5	Coarse Sand	2.84
#20	0.85	36.5		
#40	0.43	31.3	Medium Sand	9.20
#60	0.25	26.7		
#100	0.15	22.5		
#200	0.075	18.1	Fine Sand	13.25

Hydrometer Analysis

(mm)	%Finer		
0.033	13.8		
0.021	13.1		
0.012	12.2	Fines	
0.0087	12.0	Silt or Clay	18.06
0.0061	11.6		
0.0030	9.8		
0.0013	9.4		



ATTERBERG LIMITS

M_c	LL	PL	PI	SpG
9.2	43	16	27	–

DESCRIPTION: Moderate yellowish brown (10 YR 5/4) clayey gravel with sand

USCS: GC

TECH	DT
DATE	7/30/2004
REVIEW	MB

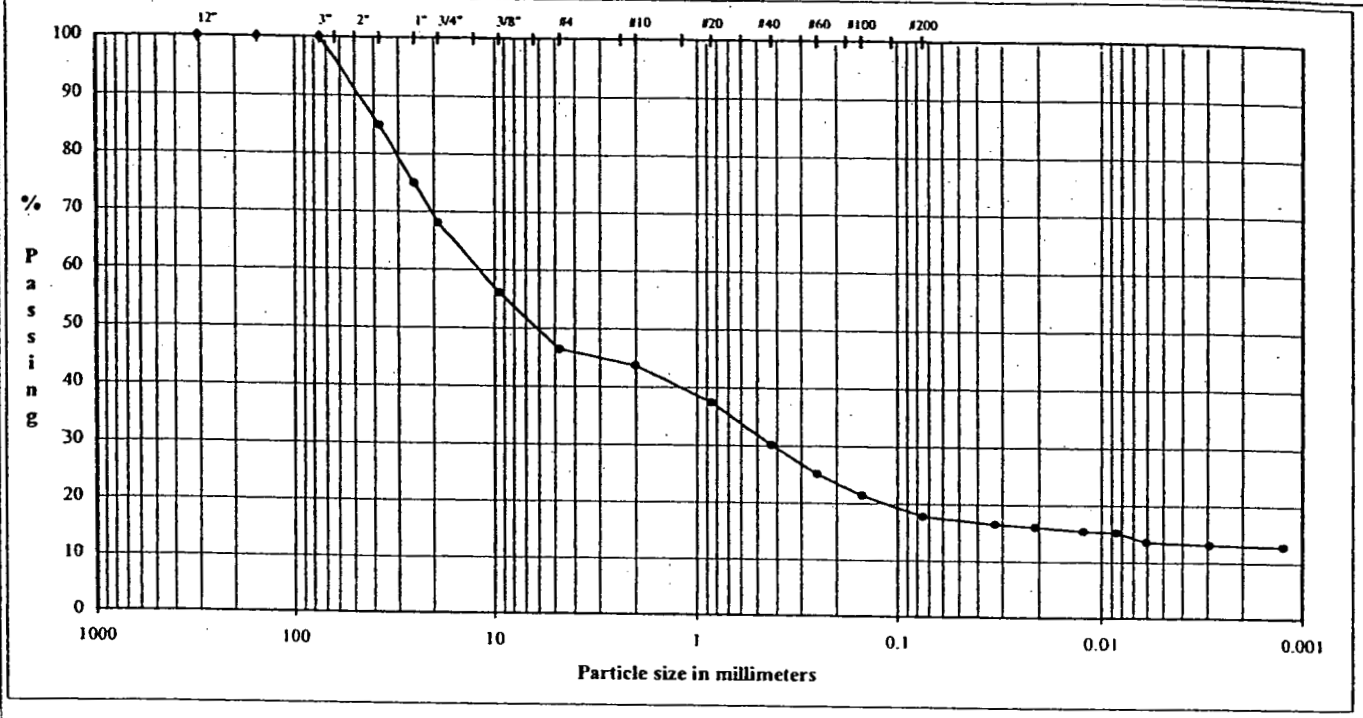
August-04

043-2246.0001

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: Rocky Flats/Field & Lab Testing/CO
SAMPLE ID: A-3 Depth (ft): 6
TYPE: BULK



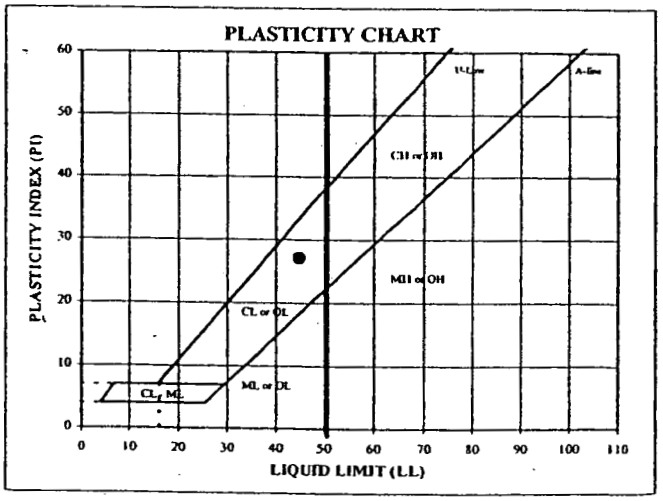
COBBLES	GRAVEL		SAND			FINES
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	0.00
6.0"	154.2	100.0		
6.0"	154.2	100.0		
3.0"	75.0	100.0		
1.5"	37.5	84.9		
1.0"	25.0	74.9	Coarse Gravel	31.98
0.75"	19.0	68.0		
0.375"	9.5	56.1		
#4	4.8	46.4	Fine Gravel	21.67
#10	2.00	43.6	Coarse Sand	2.71
#20	0.85	37.4		
#40	0.43	30.1	Medium Sand	13.52
#60	0.25	25.1		
#100	0.15	21.4		
#200	0.075	17.8	Fine Sand	12.32

Hydrometer Analysis

(mm)	%Finer		
0.033	16.5		
0.021	16.1		
0.012	15.4	Fines	
0.0085	15.2	Silt or Clay	17.80
0.0061	13.6		
0.0029	13.1		
0.0012	12.9		



ATTERBERG LIMITS

M_c	LL	PL	PI	SpG
8.0	45	18	27	

DESCRIPTION: Moderate yellowish brown (10 YR 5/4) clayey gravel with sand

USCS: GC

TECH	DT
DATE	7/29/2004
REVIEW	MB

August-04

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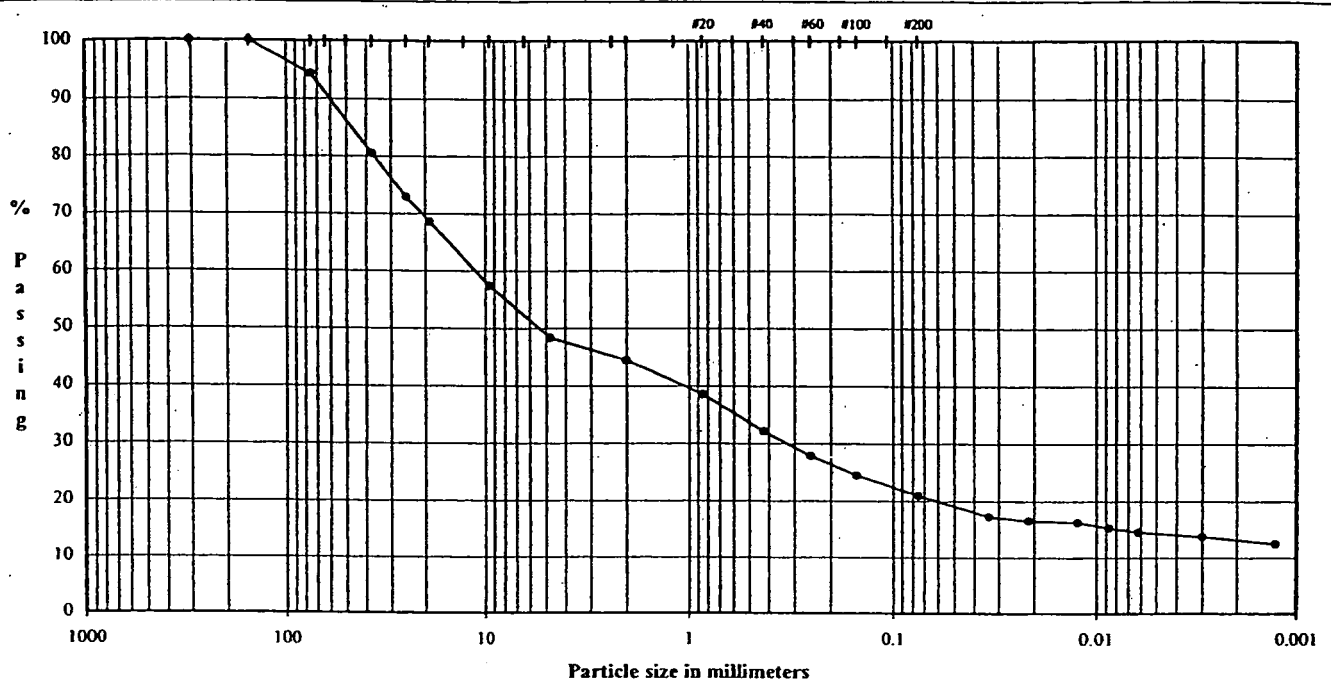
PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: Rocky Flats/Field & Lab Testing/CO

SAMPLE ID: A-4 Depth (ft): 12

TYPE: BULK



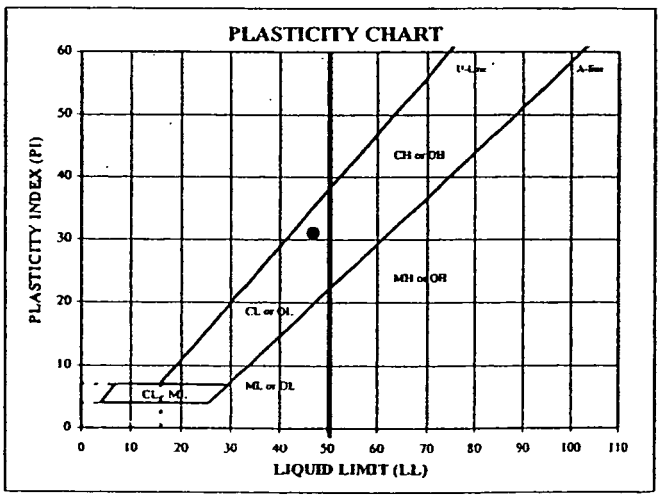
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
COBBLES	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	5.69
6.0"	154.2	100.0		
6.0"	154.2	100.0		
3.0"	75.0	94.3		
1.5"	37.5	80.4		
1.0"	25.0	72.8	Coarse Gravel	25.73
0.75"	19.0	68.6		
0.375"	9.5	57.4		
#4	4.8	48.4	Fine Gravel	20.23
#10	2.00	44.4	Coarse Sand	3.96
#20	0.85	38.5		
#40	0.43	32.1	Medium Sand	12.27
#60	0.25	27.9		
#100	0.15	24.5		
#200	0.075	20.9	Fine Sand	11.22

Hydrometer Analysis

(mm)	%Finer		
0.033	17.2		
0.021	16.5		
0.012	16.2	Fines	
0.0087	15.2	Silt or Clay	20.90
0.0062	14.5		
0.0030	13.7		
0.0013	12.5		



ATTERBERG LIMITS

M.	LL	PL	PI	SpG
14.3	47	16	31	–

DESCRIPTION: Pale olive and moderate yellowish brown (10YR 6/2 and 10YR 5/4) clayey gravel with sand

USCS: GC

TECH	DT
DATE	8/2/2004
REVIEW	MB

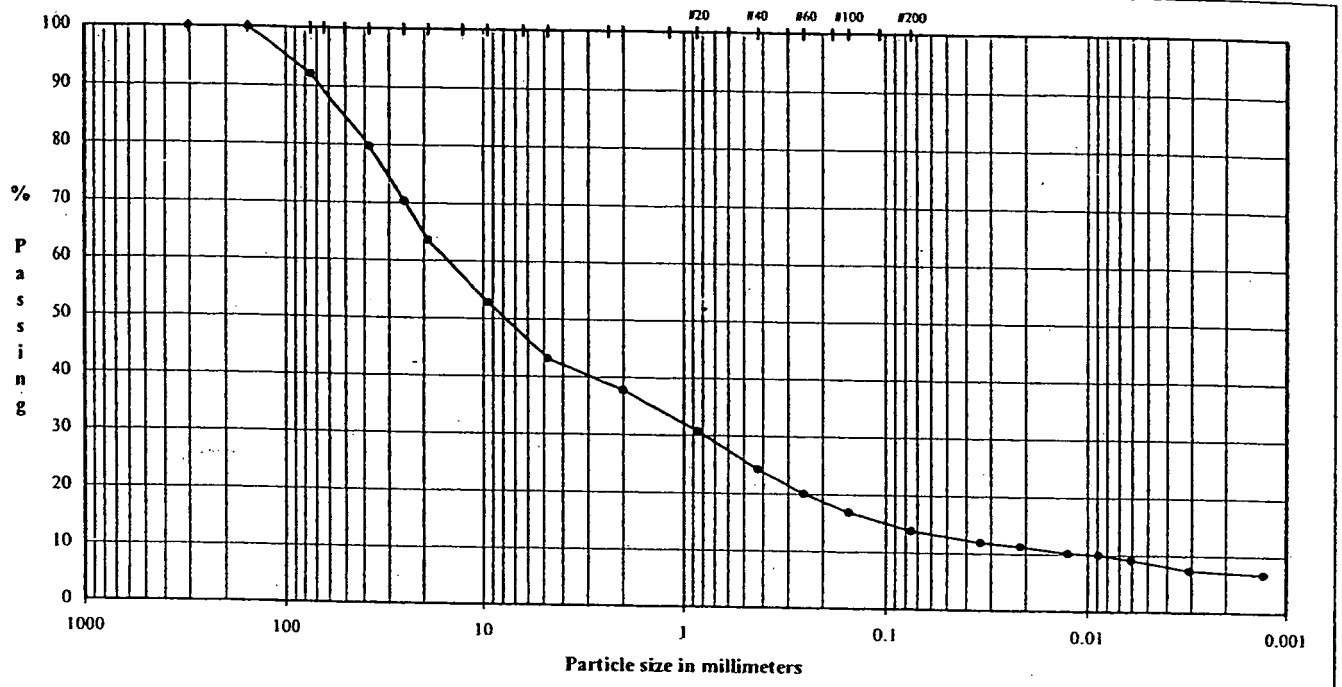
August-04

043-2246.0001

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: Rocky Flats/Field & Lab Testing/CO
SAMPLE ID: A-5 Depth (ft): 3
TYPE: BULK



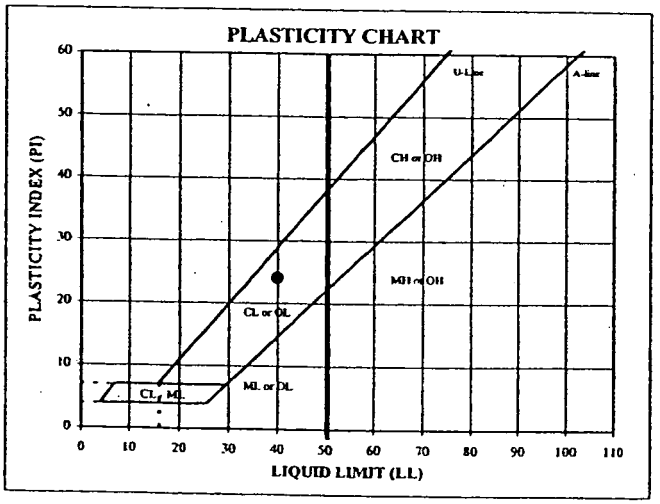
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	7.99
6.0"	154.2	100.0		
6.0"	154.2	100.0		
3.0"	75.0	92.0		
1.5"	37.5	79.7		
1.0"	25.0	70.3	Coarse Gravel	28.49
0.75"	19.0	63.5		
0.375"	9.5	52.8		
#4	4.8	43.1	Fine Gravel	20.43
#10	2.00	37.7	Coarse Sand	5.42
#20	0.85	30.7		
#40	0.43	24.2	Medium Sand	13.48
#60	0.25	20.0		
#100	0.15	16.8		
#200	0.075	13.8	Fine Sand	10.42

Hydrometer Analysis

(mm)	%Finer		
0.034	11.9		
0.021	11.3		
0.012	10.2	Fines	
0.0088	10.0	Silt or Clay	13.78
0.0061	9.1		
0.0031	7.4		
0.0013	6.7		



ATTERBERG LIMITS

M_c	LL	PL	PI	SpG
11.2	40	16	24	–

DESCRIPTION: Moderate brown (5YR 4/4) clayey gravel with sand

USCS: GC

TECH: DT
DATE: 8/4/2004
REVIEW: MB

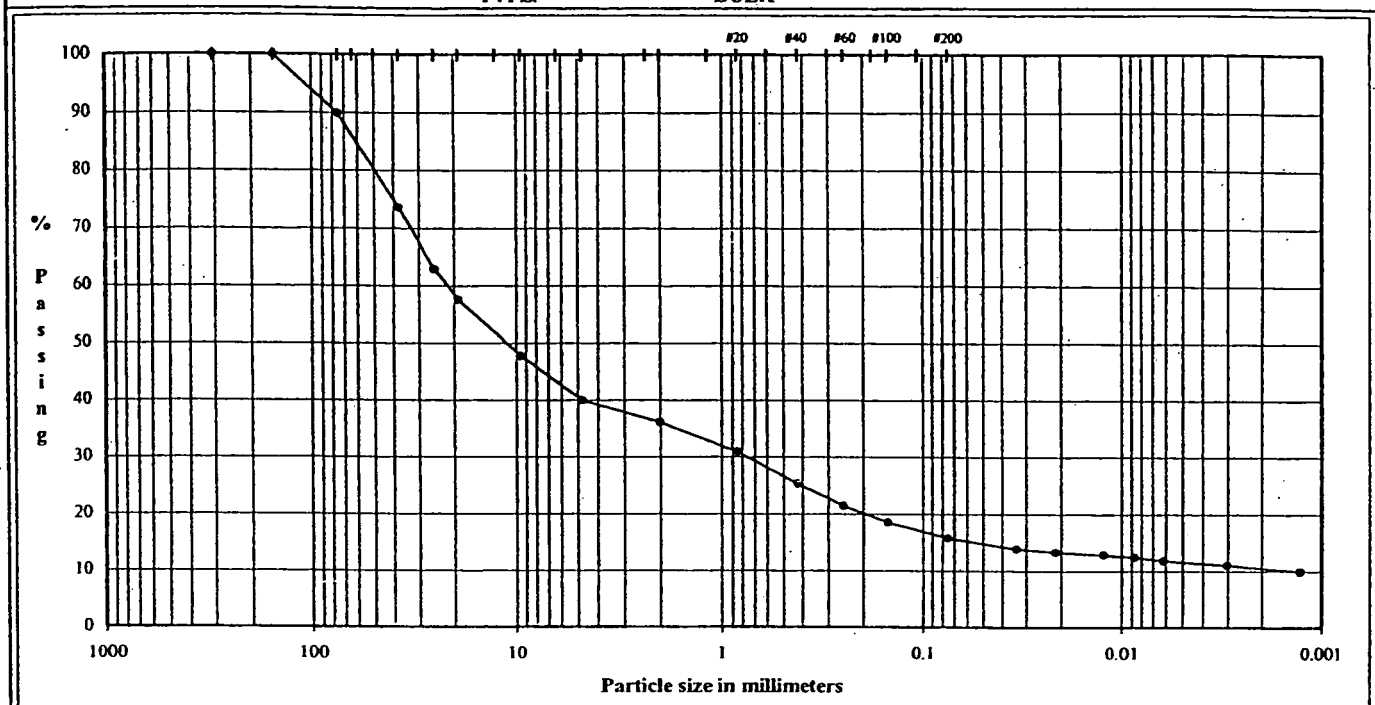
August-04

043-2246.0001

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: Rocky Flats/Field & Lab Testing/CO
SAMPLE ID: A-6 Depth (ft): 2
TYPE: BULK



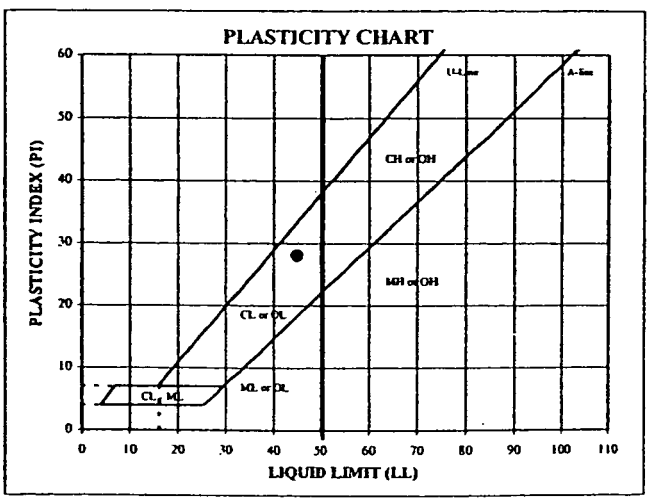
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
COBBLES	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	10.17
6.0"	154.2	100.0		
6.0"	154.2	100.0		
3.0"	75.0	89.8		
1.5"	37.5	73.5		
1.0"	25.0	62.9	Coarse Gravel	32.24
0.75"	19.0	57.6		
0.375"	9.5	47.7		
#4	4.8	39.9	Fine Gravel	17.70
#10	2.00	36.1	Coarse Sand	3.82
#20	0.85	30.9		
#40	0.43	25.2	Medium Sand	10.86
#60	0.25	21.4		
#100	0.15	18.5		
#200	0.075	15.7	Fine Sand	9.51

Hydrometer Analysis

(mm)	%Finer		
0.034	13.9		
0.021	13.2		
0.012	12.8	Fines	
0.0087	12.4	Silt or Clay	15.70
0.0062	11.8		
0.0030	11.0		
0.0013	9.9		



ATTERBERG LIMITS

M_c	LL	PL	PI	SpG
10.2	45	17	28	–

DESCRIPTION: Pale greenish yellow and light brown (10YR 8/2, 5YR 5/6) clayey gravel with sand

USCS: GC

TECH: DT
DATE: 8/5/2004
REVIEW: MB

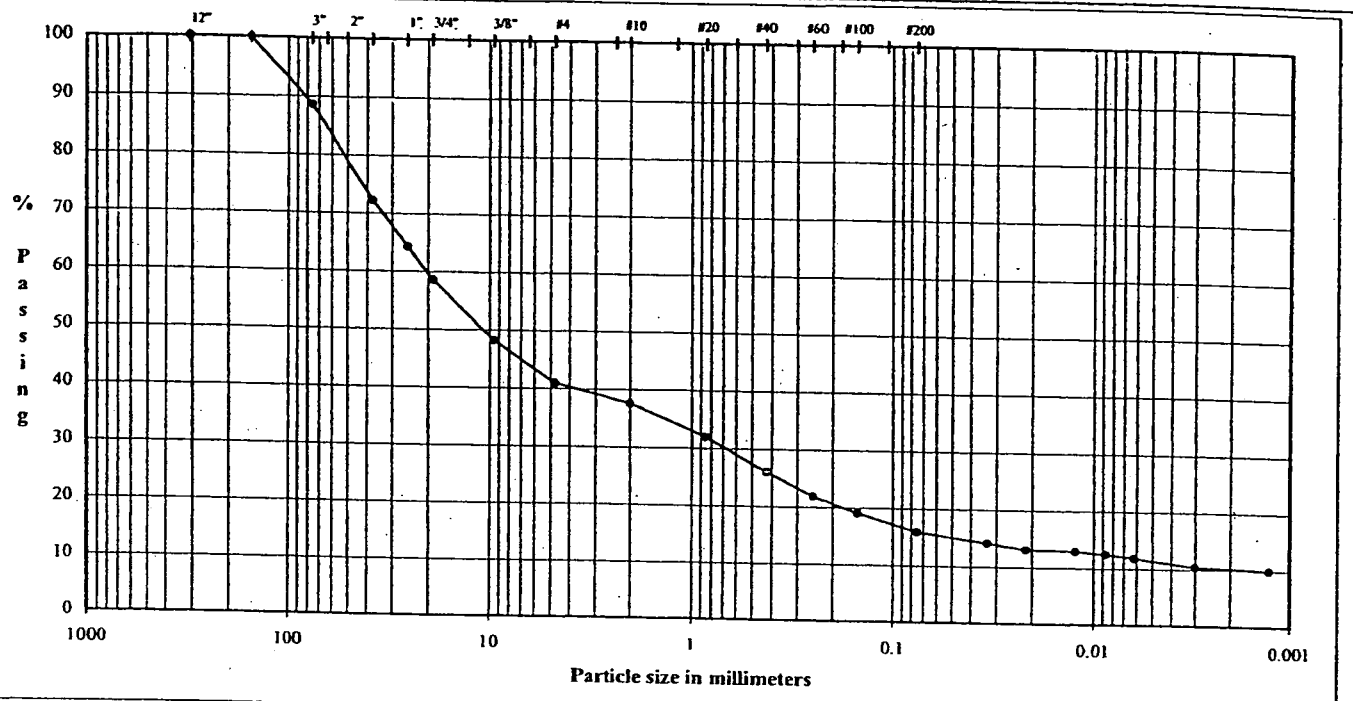
August-04

043-2246.0001

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **Rocky Flats/Field & Lab Testing/CO**
SAMPLE ID: **A-7** Depth (ft): **6**
TYPE: **BULK**



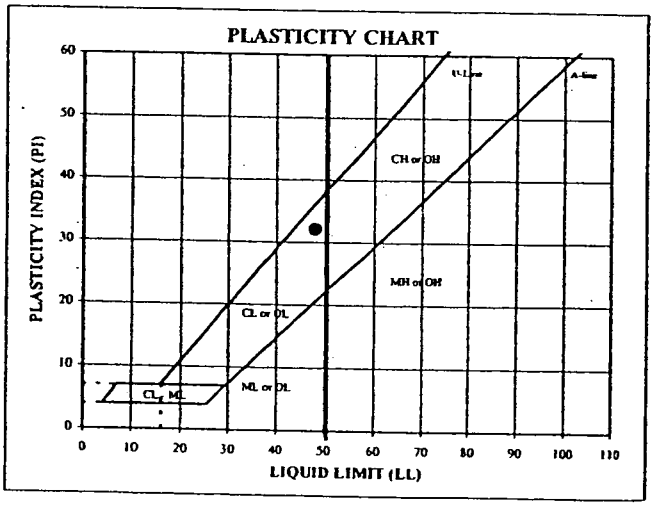
COBBLES	GRAVEL		SAND			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	11.44
6.0"	154.2	100.0		
6.0"	154.2	100.0		
3.0"	75.0	88.6		
1.5"	37.5	72.3		
1.0"	25.0	64.3	Coarse Gravel	29.94
0.75"	19.0	58.6		
0.375"	9.5	48.2		
#4	4.8	40.9	Fine Gravel	17.70
#10	2.00	37.5	Coarse Sand	3.37
#20	0.85	31.9		
#40	0.43	26.0	Medium Sand	11.58
#60	0.25	21.9		
#100	0.15	19.1		
#200	0.075	15.9	Fine Sand	10.06

Hydrometer Analysis

(mm)	%Finer		
0.033	14.1		
0.021	13.1		
0.012	12.9	Fines	
0.0087	12.5	Silt or Clay	15.91
0.0062	11.9		
0.0030	10.4		
0.0013	10.0		



ATTERBERG LIMITS

M_c	LL	PL	PI	SpG
13.1	48	16	32	–

DESCRIPTION: Dark yellowish orange (10YR 6/6) clayey gravel with sand

USCS: GC

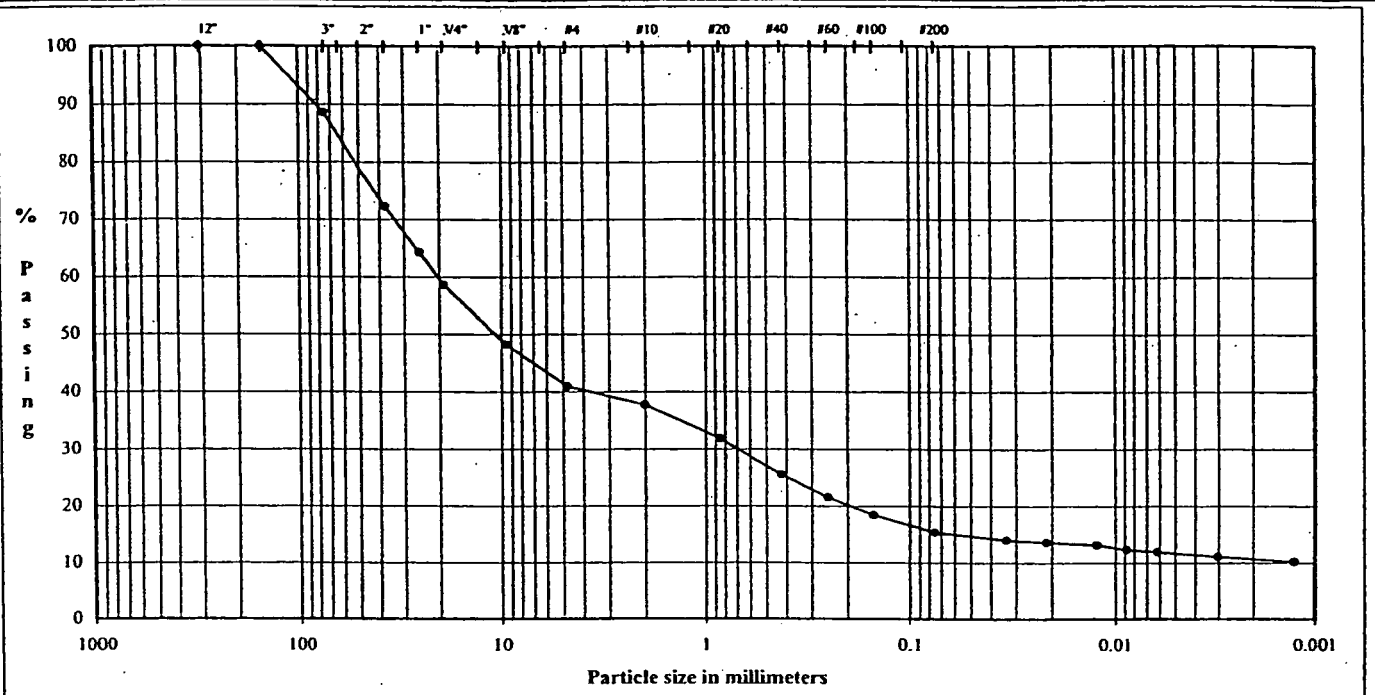
TECH	DT
DATE	8/5/2004
REVIEW	MB

August-04 043-2246.0001

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: Rocky Flats/Field & Lab Testing/CO
SAMPLE ID: A-7 Dup Depth (ft): 6
TYPE: BULK



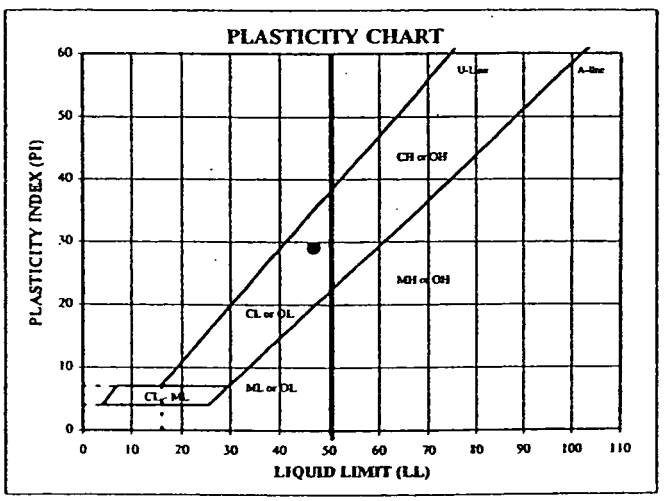
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	11.44
6.0"	154.2	100.0		
6.0"	154.2	100.0		
3.0"	75.0	88.6		
1.5"	37.5	72.3		
1.0"	25.0	64.3	Coarse Gravel	29.94
0.75"	19.0	58.6		
0.375"	9.5	48.2		
#4	4.8	40.9	Fine Gravel	17.70
#10	2.00	37.7	Coarse Sand	3.23
#20	0.85	31.8		
#40	0.43	25.5	Medium Sand	12.20
#60	0.25	21.5		
#100	0.15	18.4		
#200	0.075	15.3	Fine Sand	10.16

Hydrometer Analysis

(mm)	%Finer		
0.034	14.0		
0.021	13.6		
0.012	13.1	Fines	
0.0088	12.3	Silt or Clay	15.33
0.0062	11.9		
0.0030	11.0		
0.0013	10.2		



ATTERBERG LIMITS

M_c	LL	PL	PI	SpG
14.1	47	18	29	–

DESCRIPTION: Dark yellowish orange (10YR 6/6) clayey gravel with sand
USCS: GC

TECH: JR
DATE: 8/9/2004
REVIEW: MB

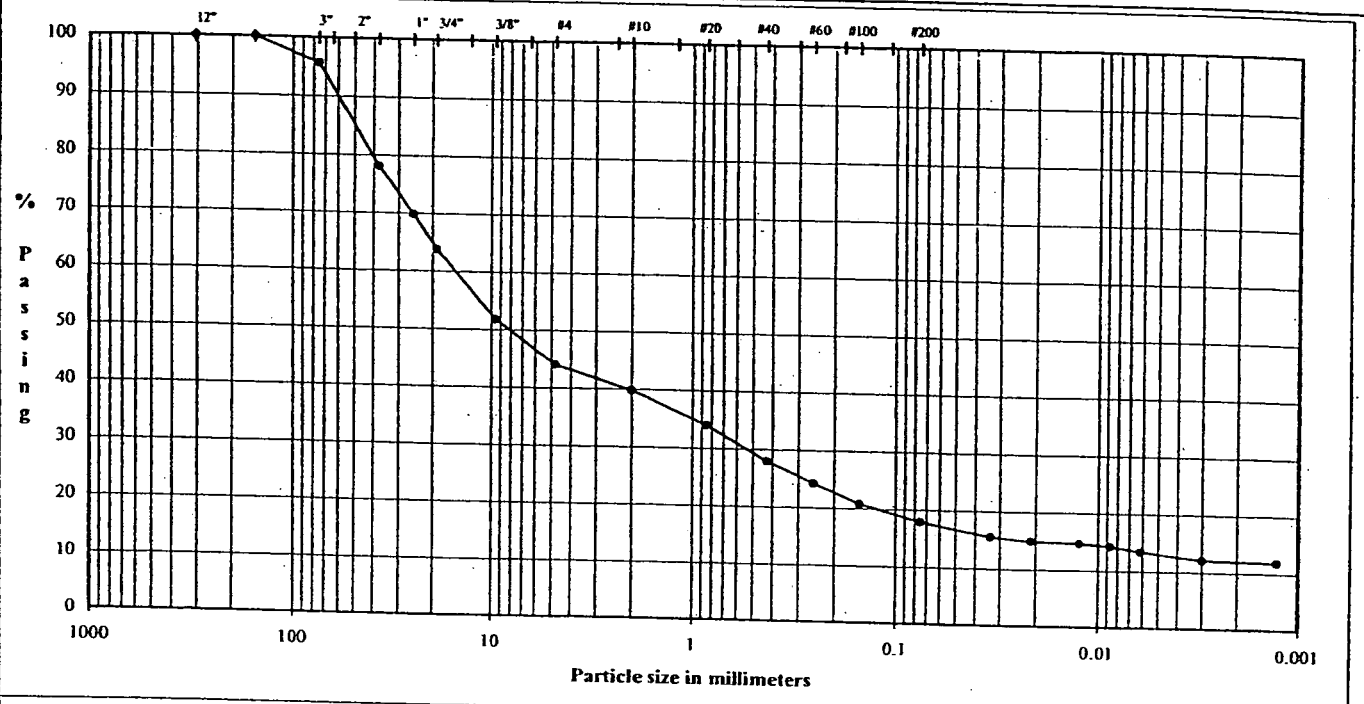
August-04

043-2246.0001

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **Rocky Flats/Field & Lab Testing/CO**
SAMPLE ID: **A-8** Depth (ft): **3**
TYPE: **BULK**



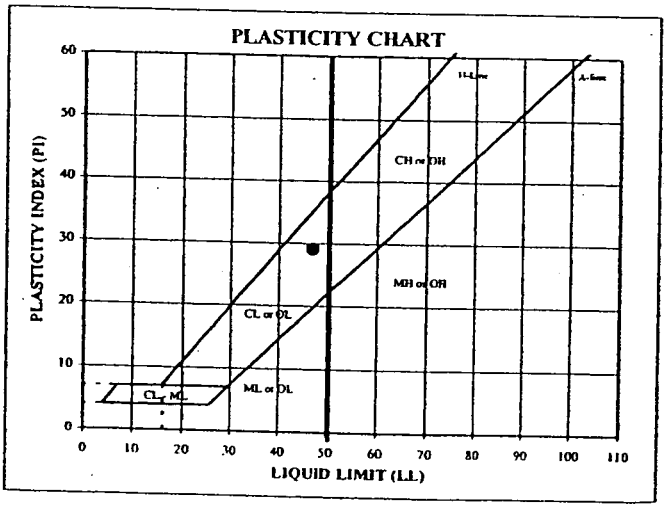
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	4.33
6.0"	154.2	100.0		
6.0"	154.2	100.0		
3.0"	75.0	95.7		
1.5"	37.5	78.1		
1.0"	25.0	69.8	Coarse Gravel	31.89
0.75"	19.0	63.8		
0.375"	9.5	51.8		
#4	4.8	44.0	Fine Gravel	19.74
#10	2.00	39.8	Coarse Sand	4.25
#20	0.85	34.0		
#40	0.43	28.0	Medium Sand	11.83
#60	0.25	24.2		
#100	0.15	20.8		
#200	0.075	17.9	Fine Sand	10.06

Hydrometer Analysis

(mm)	%Finer		
0.033	15.6		
0.021	14.9		
0.012	14.7	Fines	
0.0087	14.3	Silt or Clay	17.89
0.0061	13.4		
0.0030	12.1		
0.0013	11.9		



ATTERBERG LIMITS

M_c	LL	PL	PI	SpG
11.6	47	18	29	–

DESCRIPTION: Dark yellowish orange to moderate brown (10YR6/6, 5YR4/4) clayey gravel with sand

USCS: GC

TECH	DT
DATE	8/6/2004
REVIEW	MB

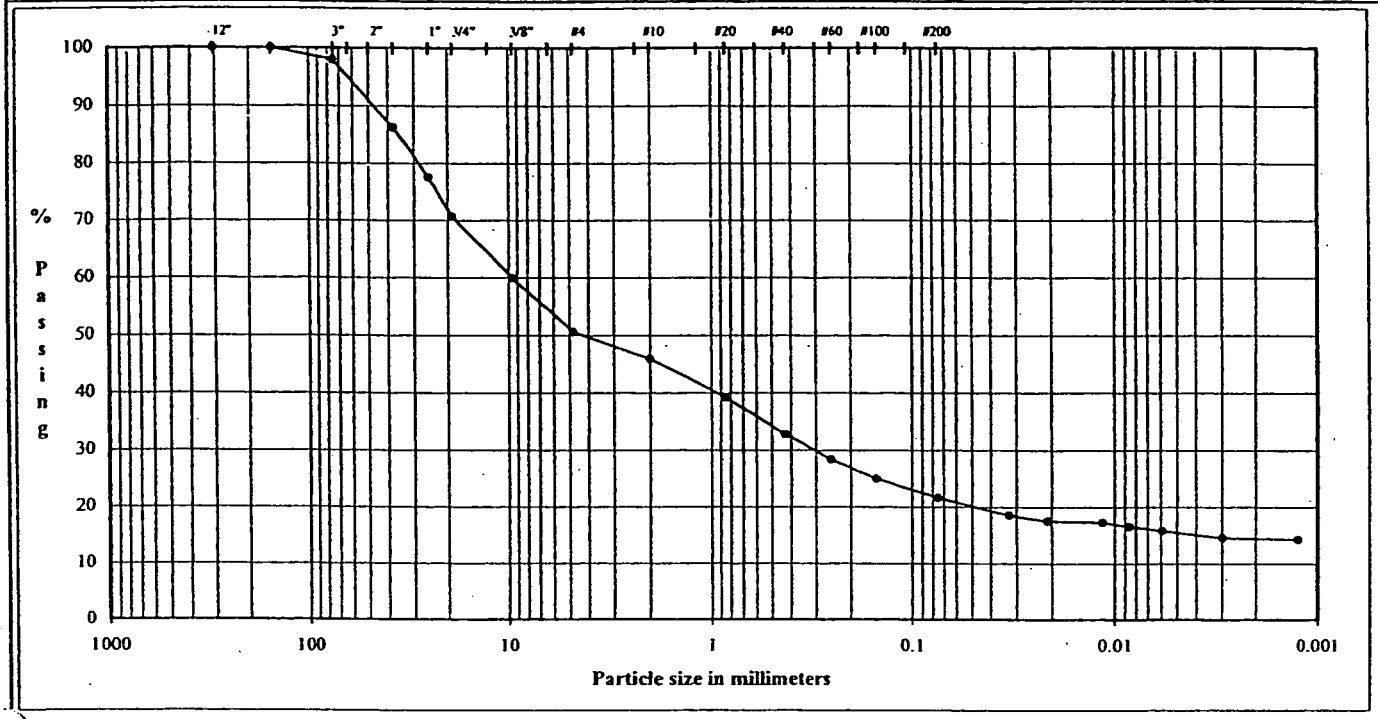
August-04

043-2246.0001

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: Rocky Flats/Field & Lab Testing/CO
SAMPLE ID: A-9 Depth (ft): 10
TYPE: BULK



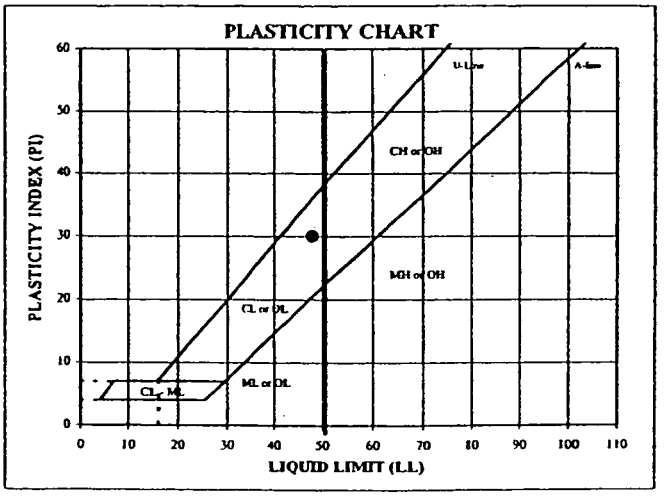
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
COBBLES	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	2.06
6.0"	154.2	100.0		
6.0"	154.2	100.0		
3.0"	75.0	97.9		
1.5"	37.5	86.2		
1.0"	25.0	77.5	Coarse Gravel	27.27
0.75"	19.0	70.7		
0.375"	9.5	59.9		
#4	4.8	50.5	Fine Gravel	20.12
#10	2.00	45.9	Coarse Sand	4.66
#20	0.85	39.1		
#40	0.43	32.7	Medium Sand	13.20
#60	0.25	28.3		
#100	0.15	25.0		
#200	0.075	21.6	Fine Sand	11.05

Hydrometer Analysis

(mm)	%Finer		
0.033	18.5		
0.021	17.5		
0.011	17.3	Fines	
0.0086	16.5	Silt or Clay	21.64
0.0059	15.8		
0.0030	14.5		
0.0012	14.3		



ATTERBERG LIMITS

M_c	LL	PL	PI	SpG
9.2	48	18	30	–

DESCRIPTION: Moderate yellowish brown (5YR 4/4) clayey gravel with sand

USCS: GC

TECH	DT
DATE	8/4/2004
REVIEW	MB

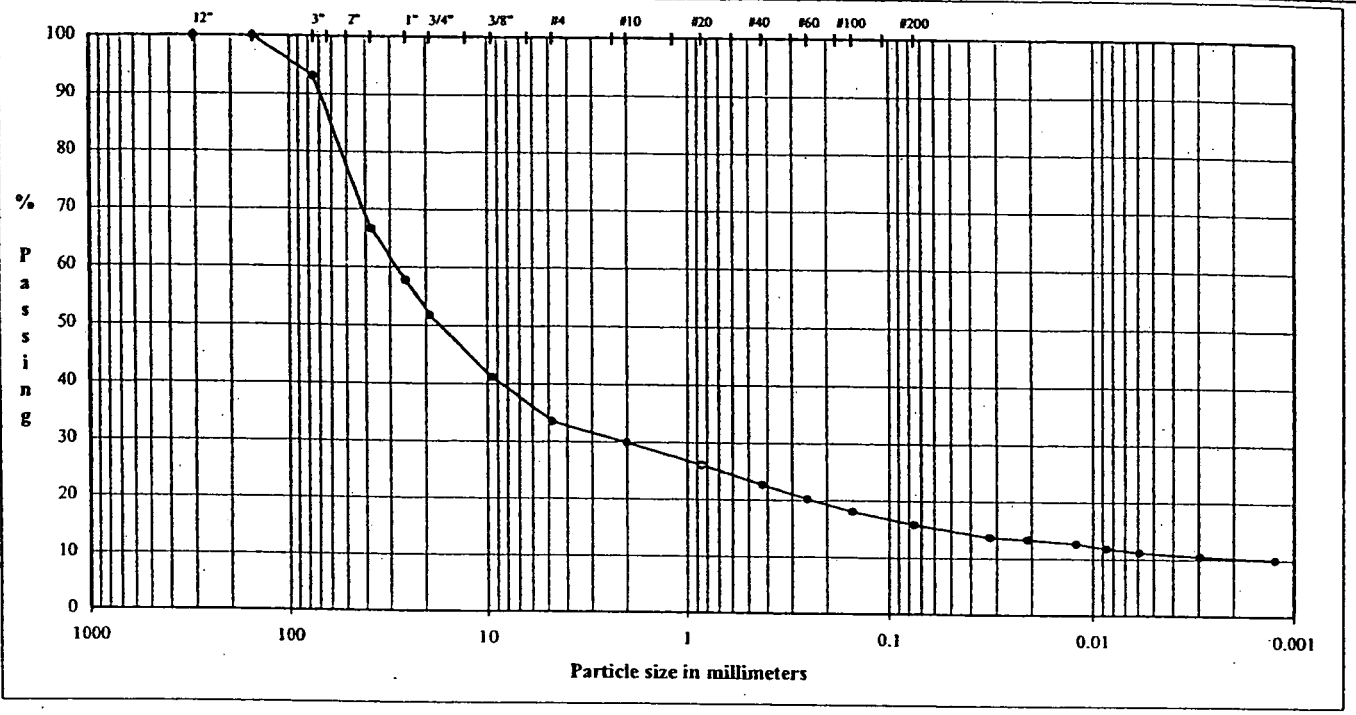
August-04

043-2246.0001

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **Rocky Flats/Field & Lab Testing/CO**
SAMPLE ID: **A-10** Depth (ft): **4**
TYPE: **BULK**



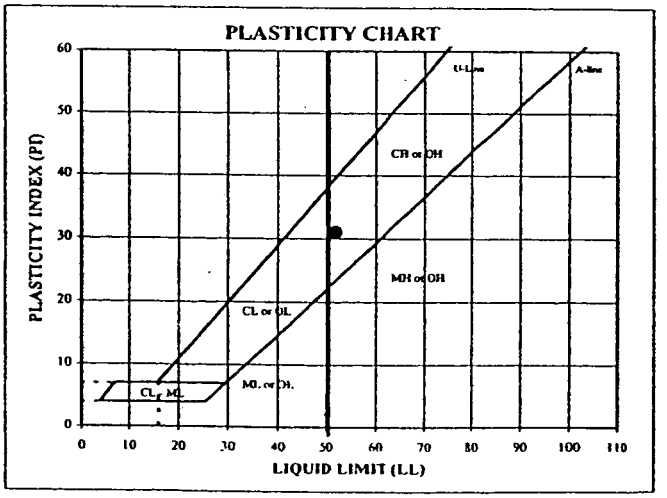
COBBLES	GRAVEL		SAND			FINES
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	6.87
6.0"	154.2	100.0		
6.0"	154.2	100.0		
3.0"	75.0	93.1		
1.5"	37.5	66.6		
1.0"	25.0	57.8	Coarse Gravel	41.37
0.75"	19.0	51.8		
0.375"	9.5	41.1		
#4	4.8	33.5	Fine Gravel	18.31
#10	2.00	29.9	Coarse Sand	3.60
#20	0.85	26.1		
#40	0.43	22.6	Medium Sand	7.22
#60	0.25	20.2		
#100	0.15	18.0		
#200	0.075	15.7	Fine Sand	6.89

Hydrometer Analysis

(mm)	%Finer		
0.032	13.7		
0.021	13.3		
0.012	12.6	Fines	
0.0086	11.8	Silt or Clay	15.75
0.0059	11.1		
0.0029	10.5		
0.0012	9.9		



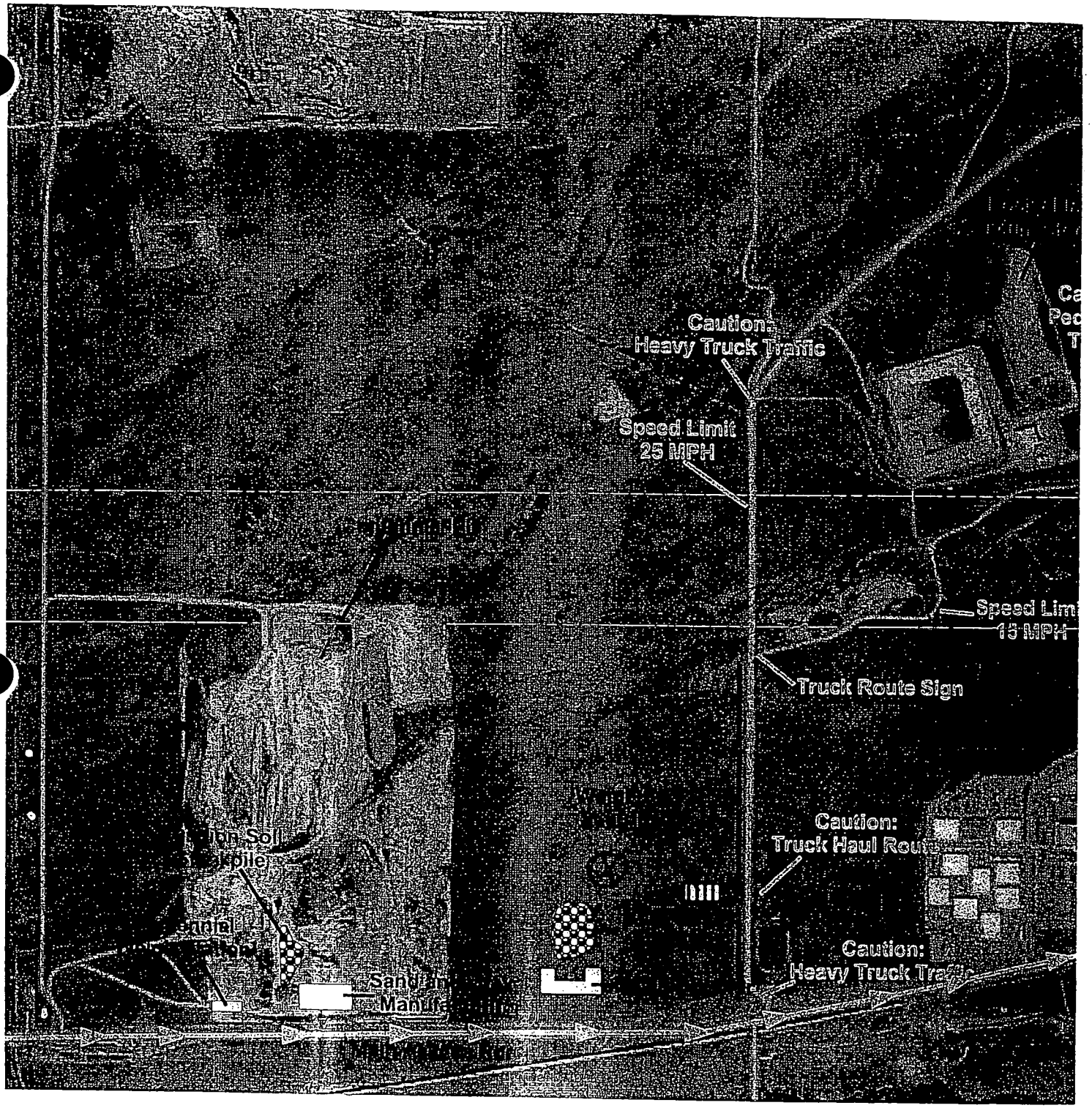
ATTERBERG LIMITS

M_c	LL	PL	PI	SpG
7.8	52	21	31	–

DESCRIPTION: Moderate brown (5YR 3/4) clayey gravel with sand

USCS: GC

TECH	DT
DATE	8/3/2004
REVIEW	MB



Present Landfill
Accelerated Action

N

Centennial Aggregate Pit
Sample location

Explanation:

Traffic Control Signs
Haul Route
Power Lines
Preble's Protection Area

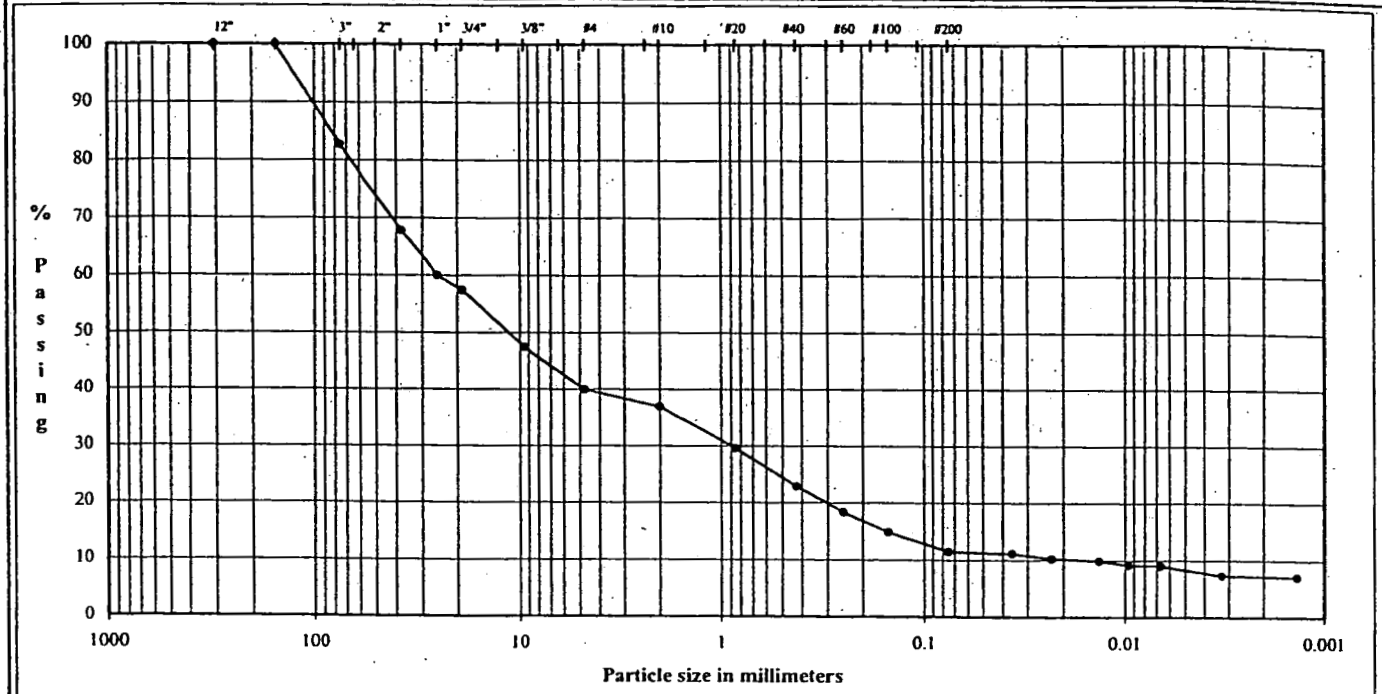
October-04

043-2246.0001

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: Rocky Flats/Field & Lab Testing/CO
SAMPLE ID: APR-1 Depth (ft): --
TYPE: BULK



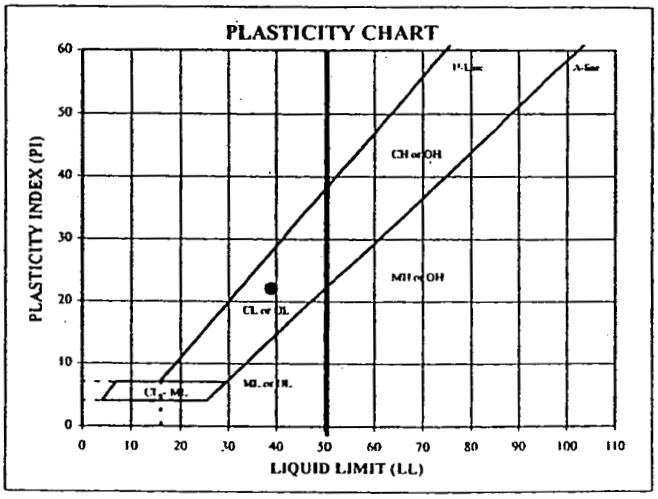
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	17.40
6.0"	154.2	100.0		
6.0"	154.2	100.0		
3.0"	75.0	82.6		
1.5"	37.5	67.7		
1.0"	25.0	60.0	Coarse Gravel	25.22
0.75"	19.0	57.4		
0.375"	9.5	47.4		
#4	4.8	39.9	Fine Gravel	17.51
#10	2.00	36.9	Coarse Sand	2.98
#20	0.85	29.5		
#40	0.43	22.8	Medium Sand	14.07
#60	0.25	18.3		
#100	0.15	14.9		
#200	0.075	11.4	Fine Sand	11.38

Hydrometer Analysis

(mm)	%Finer		
0.036	11.1		
0.023	10.2		
0.013	9.8	Fines	
0.0095	9.2	Silt or Clay	11.44
0.0067	9.0		
0.0033	7.3		
0.0014	7.0		



ATTERBERG LIMITS

M,	LL	PL	PI	SpG (assumed)
10.4	39	17	22	2.70

DESCRIPTION: Strong brown (7.55 YR 5/6) clayey gravel with sand

USCS: GC

TECH	JR
DATE	11/3/2004
REVIEW	MB

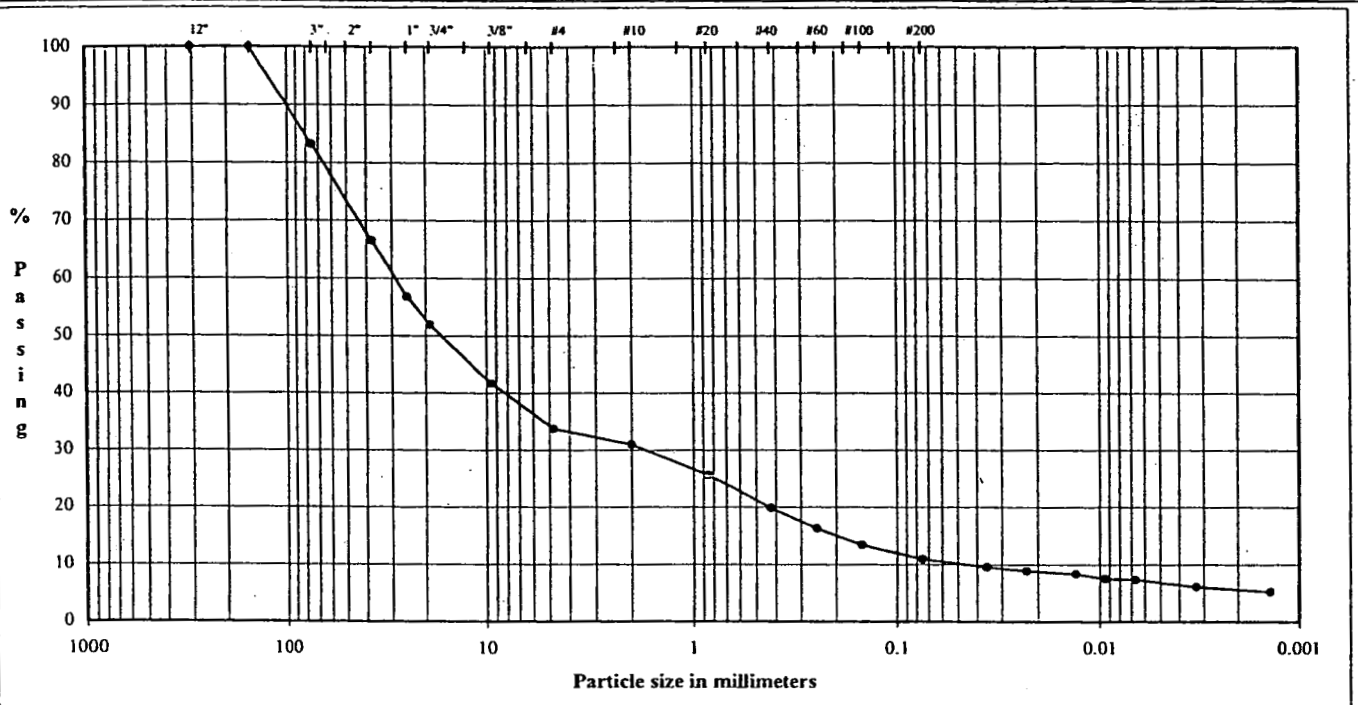
October-04

043-2246.0001

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: Rocky Flats/Field & Lab Testing/CO
SAMPLE ID: APR-2 Depth (ft): –
TYPE: BULK



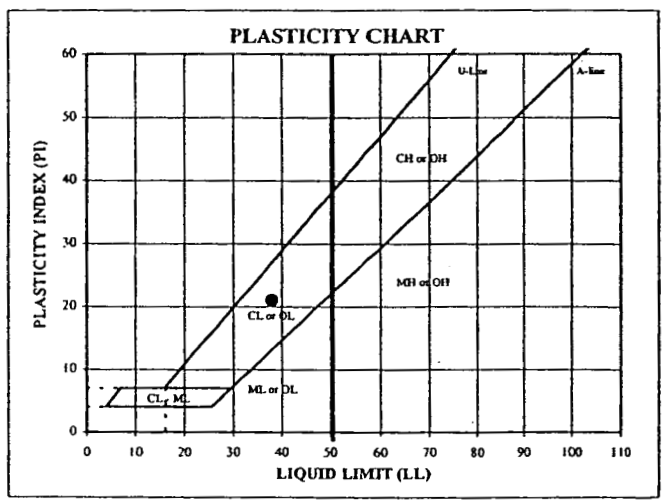
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	16.90
6.0"	154.2	100.0		
6.0"	154.2	100.0		
3.0"	75.0	83.1		
1.5"	37.5	66.5		
1.0"	25.0	56.7	Coarse Gravel	31.22
0.75"	19.0	51.9		
0.375"	9.5	41.7		
#4	4.8	33.7	Fine Gravel	18.23
#10	2.00	30.9	Coarse Sand	2.77
#20	0.85	25.6		
#40	0.43	19.9	Medium Sand	11.03
#60	0.25	16.3		
#100	0.15	13.4		
#200	0.075	10.9	Fine Sand	8.91

Hydrometer Analysis

(mm)	%Finer		
0.036	9.6		
0.023	8.9		
0.013	8.4	Fines	
0.0094	7.5	Silt or Clay	10.94
0.0067	7.3		
0.0033	6.1		
0.0014	5.2		



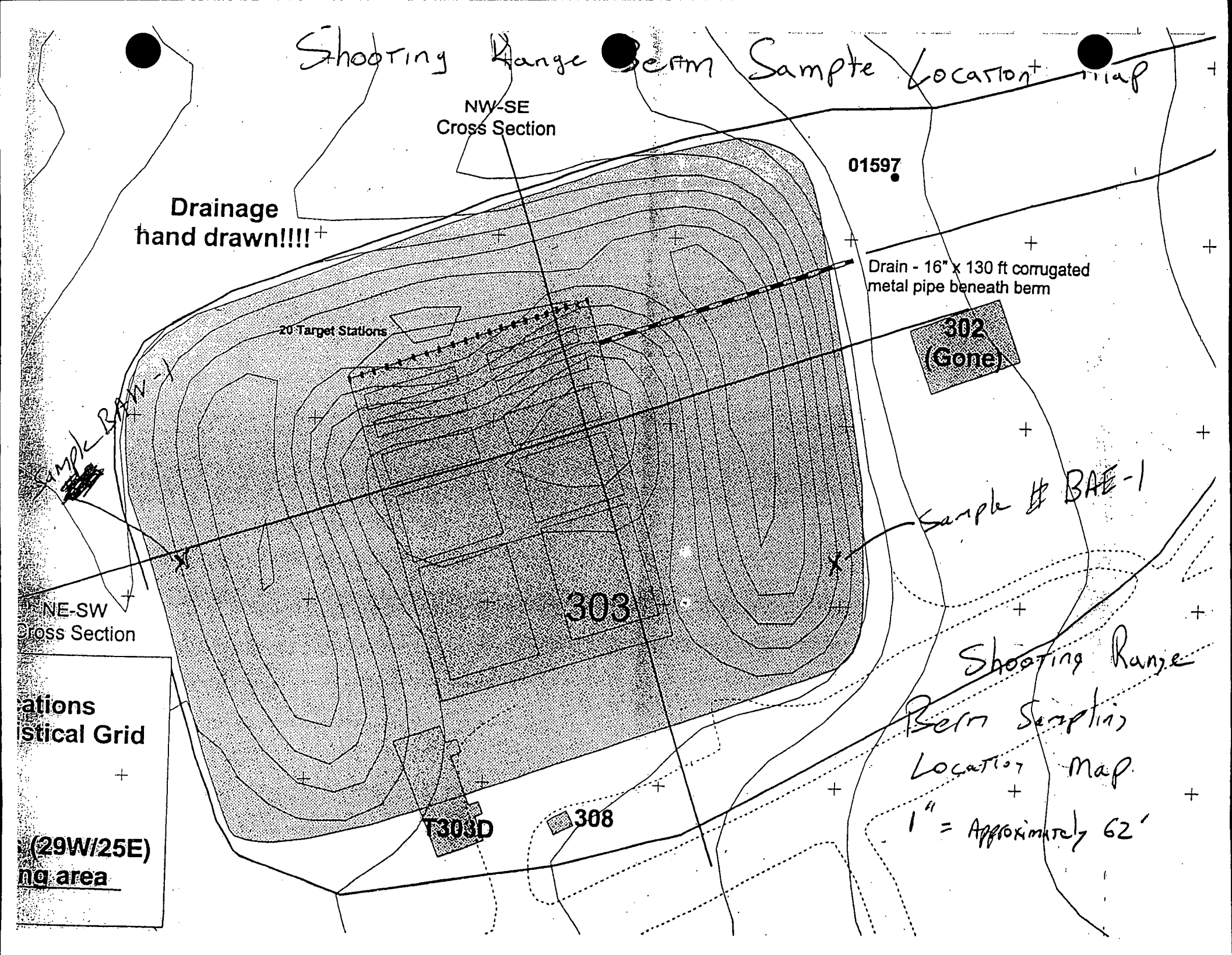
ATTERBERG LIMITS

M_c	LL	PL	PI	SpG (assumed)
9.8	38	17	21	2.70

DESCRIPTION: Strong brown (7.55 YR 5/6) clayey gravel with sand

USCS: GC

TECH	JR
DATE	11/3/2004
REVIEW	MB


Shooting Range Berm Sample Location Map
NW-SE
Cross Section
01597
Drainage
hand drawn!!!!
Drain - 16" x 130 ft corrugated
metal pipe beneath berm
20 Target Stations
302
(Gone)
Sample BAE-1
Sample # BAE-1
NE-SW
ross Section
303
ations
istical Grid
(29W/25E)
ng area
T303D
308
Shooting Range
Berm Sampling
Location Map
1" = Approximately 62'

January-05

043-2246.0002

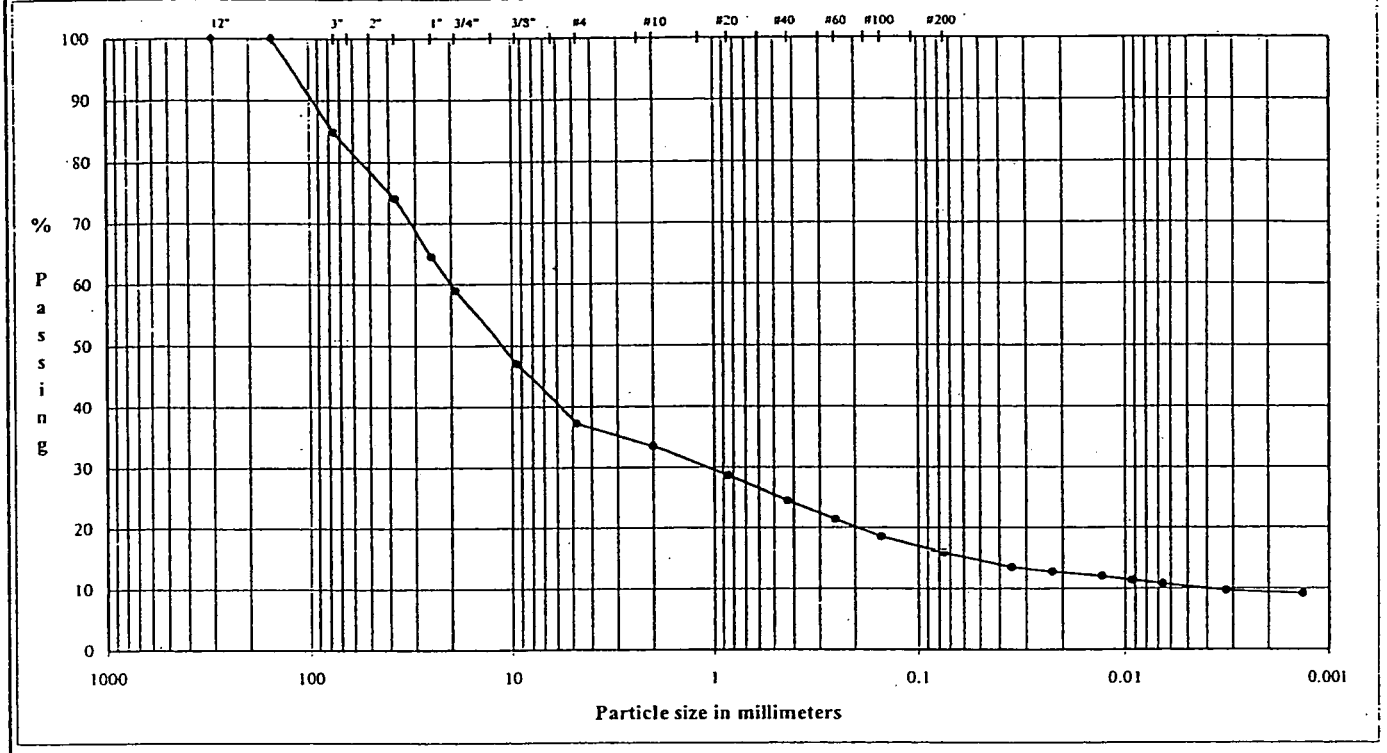
PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: Rocky Flats/Field & Lab Testing/CO

SAMPLE ID: BAE-1 Depth (ft): –

TYPE: BULK



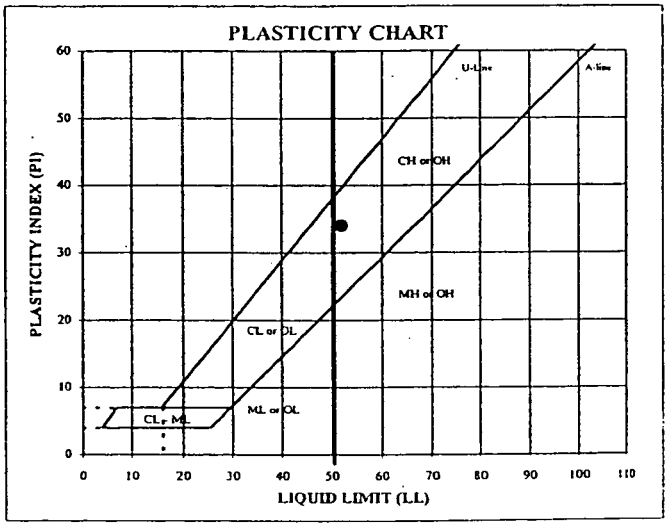
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	15.25
6.0"	154.2	100.0		
6.0"	154.2	100.0		
3.0"	75.0	84.8		
1.5"	37.5	74.0		
1.0"	25.0	64.5	Coarse Gravel	25.79
0.75"	19.0	59.0		
0.375"	9.5	47.0		
#4	4.8	37.2	Fine Gravel	21.79
#10	2.00	33.5	Coarse Sand	3.68
#20	0.85	28.6		
#40	0.43	24.4	Medium Sand	9.07
#60	0.25	21.3		
#100	0.15	18.5		
#200	0.075	15.8	Fine Sand	8.62

Hydrometer Analysis

(mm)	%Finer		
0.035	13.5		
0.022	12.7		
0.013	12.0	Fines	
0.0092	11.3	Silt or Clay	15.81
0.0066	10.7		
0.0032	9.6		
0.0014	9.1		



ATTERBERG LIMITS

M_c	LL	PL	PI	SpG
9.3	52	18	34	–

DESCRIPTION: Moderate yellowish brown (10YR 5/4) clayey gravel with sand

USCS: GC

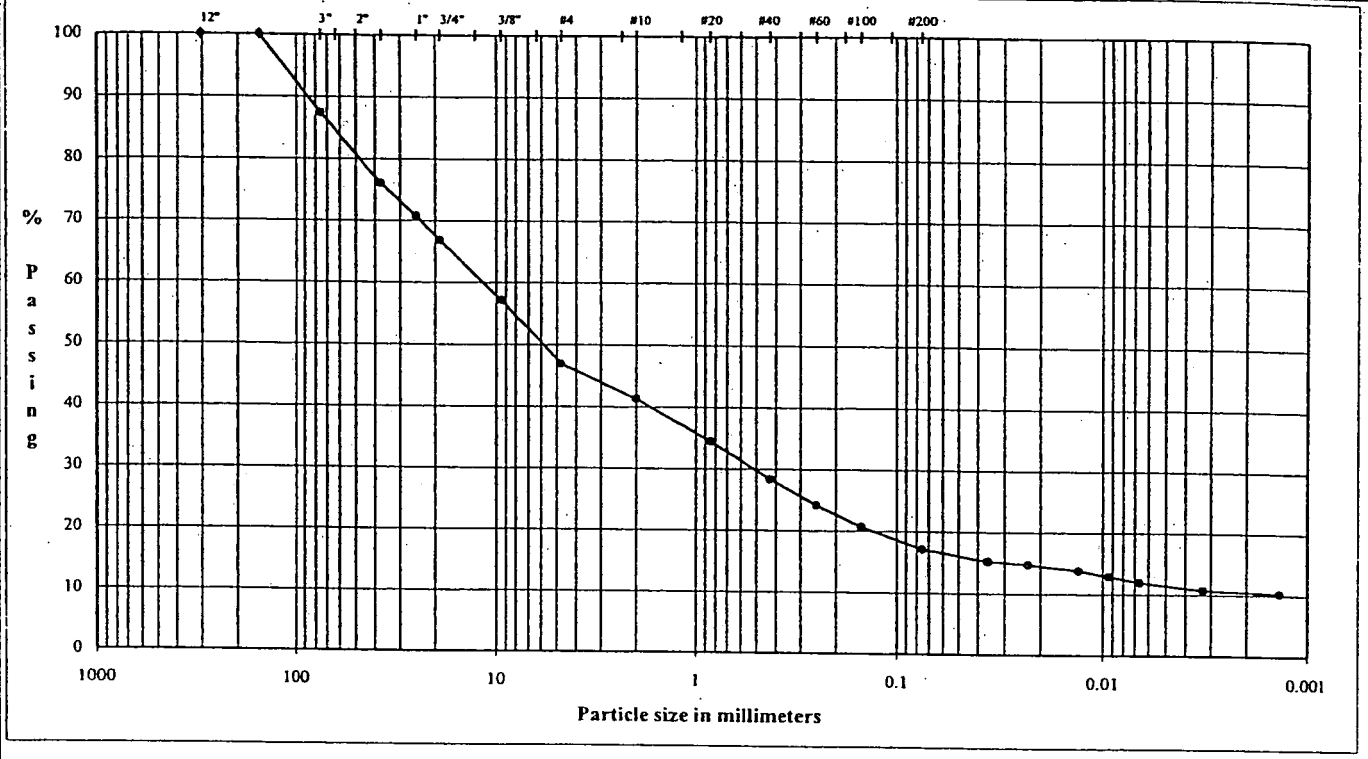
TECH	MKS
DATE	1/13/2005
REVIEW	MB

043-2246.0002

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **Rocky Flats/Field & Lab Testing/CO**
SAMPLE ID: **BAW-1** Depth (ft): –
TYPE: **BULK**



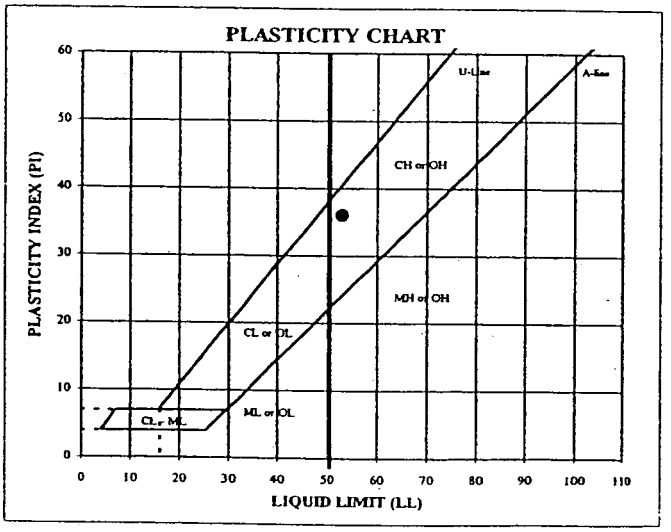
COBBLES	GRAVEL		SAND			FINES
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	12.62
6.0"	154.2	100.0		
6.0"	154.2	100.0		
3.0"	75.0	87.4		
1.5"	37.5	76.1		
1.0"	25.0	70.7	Coarse Gravel	20.54
0.75"	19.0	66.8		
0.375"	9.5	57.2		
#4	4.8	46.9	Fine Gravel	19.95
#10	2.00	41.3	Coarse Sand	5.58
#20	0.85	34.5		
#40	0.43	28.4	Medium Sand	12.93
#60	0.25	24.2		
#100	0.15	20.7		
#200	0.075	17.1	Fine Sand	11.25

Hydrometer Analysis

(mm)	%Finer		
0.036	15.2		
0.023	14.8		
0.013	13.8	Fines	
0.0094	12.9	Silt or Clay	17.13
0.0066	11.9		
0.0033	10.7		
0.0014	10.2		



ATTERBERG LIMITS

M_c	LL	PL	PI	SpG
7.7	53	17	36	–

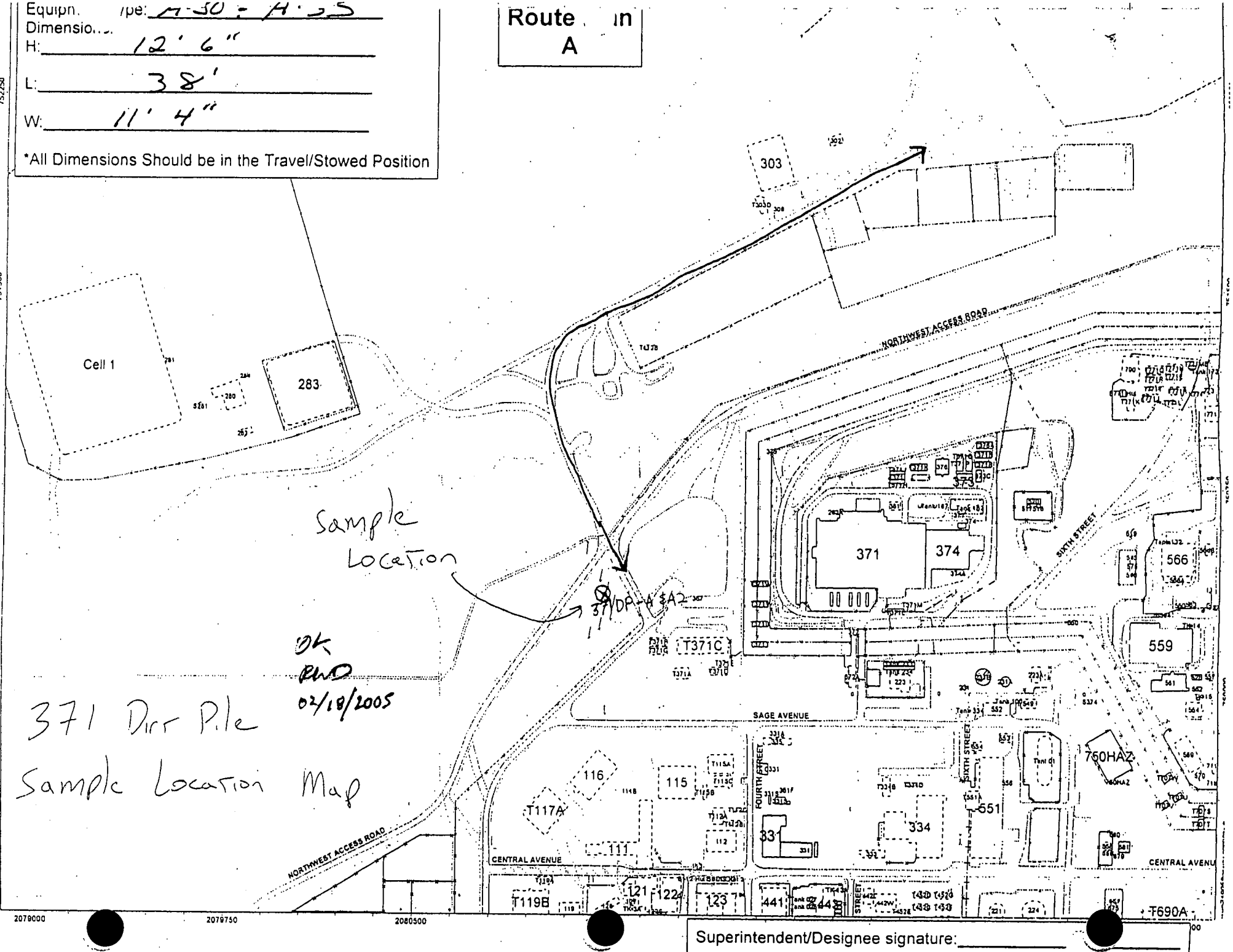
DESCRIPTION: Moderate yellowish brown (10YR 5/4) clayey gravel with sand

USCS: GC

TECH	MKS
DATE	1/13/2005
REVIEW	MB

Equipn. Type: H-50 : H-35
Dimensions
H: 12' 6"
L: 38'
W: 11' 4"
*All Dimensions Should be in the Travel/Stowed Position

Route ... in
A

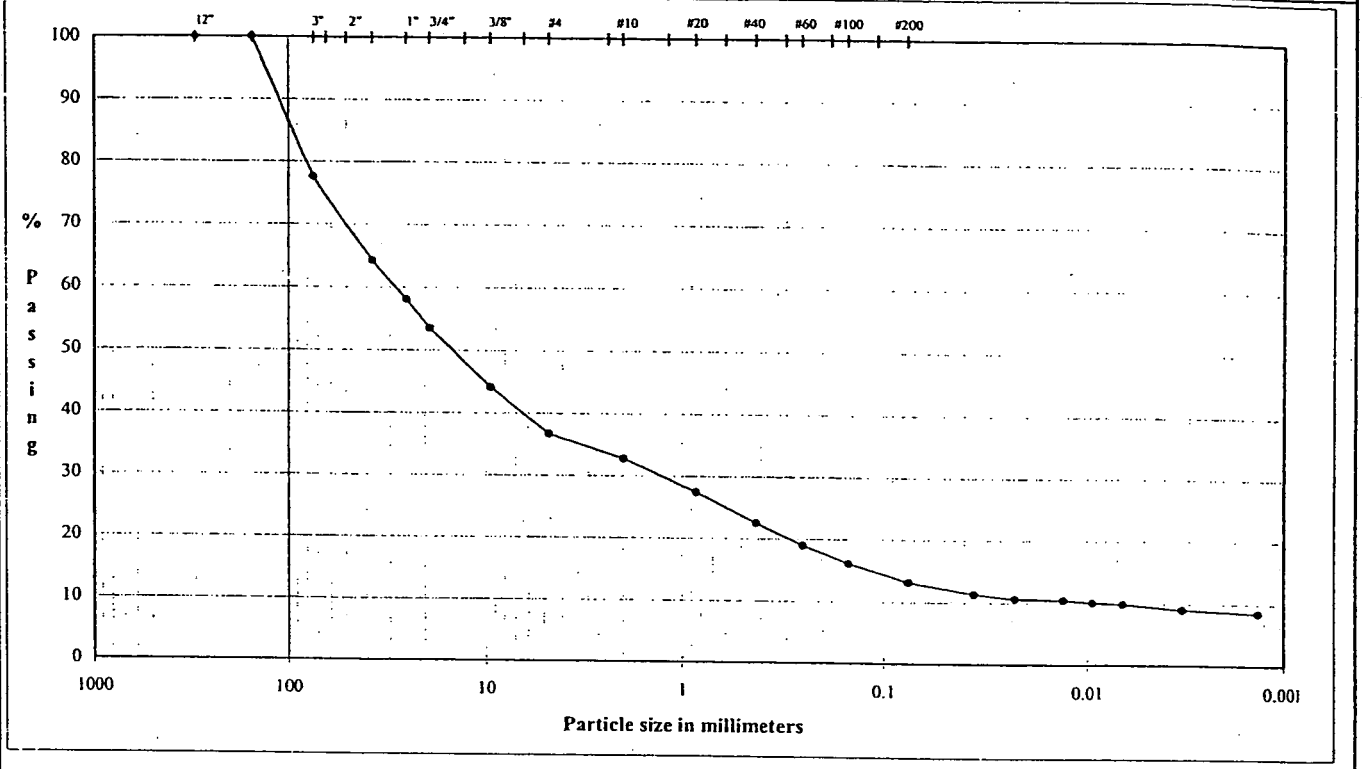


Superintendent/Designee signature: _____

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: Rocky Flats/Field & Lab Testing/CO
SAMPLE ID: 371DP-A1 Depth (ft): –
TYPE: BULK



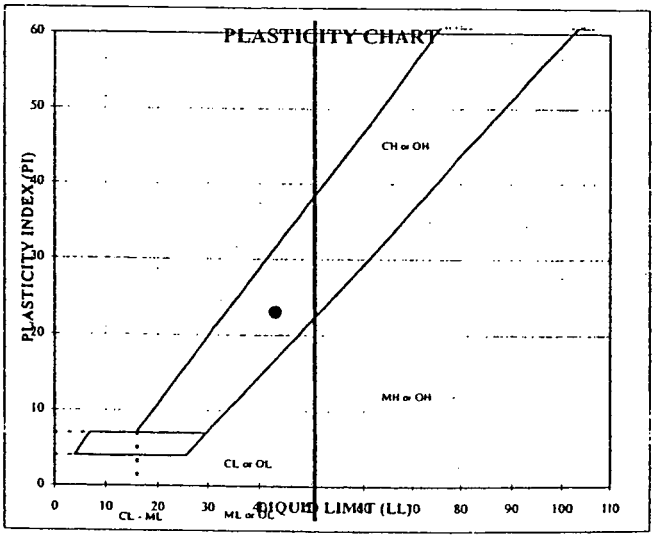
COBBLES	GRAVEL		SAND			FINES
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	22.43
6.0"	154.2	100.0		
6.0"	154.2	100.0		
3.0"	75.0	77.6		
1.5"	37.5	64.2		
1.0"	25.0	58.1	Coarse Gravel	24.12
0.75"	19.0	53.4		
0.375"	9.5	44.1		
#4	4.8	36.7	Fine Gravel	16.75
#10	2.00	32.8	Coarse Sand	3.93
#20	0.85	27.4		
#40	0.43	22.5	Medium Sand	10.29
#60	0.25	19.0		
#100	0.15	16.1		
#200	0.075	13.1	Fine Sand	9.33

Hydrometer Analysis

(mm)	%Finer		
0.036	11.3		
0.023	10.6		
0.013	10.4	Fines	
0.0094	10.1	Silt or Clay	13.14
0.0066	9.9		
0.0033	9.0		
0.0014	8.5		



ATTERBERG LIMITS

M_c	LL	PL	PI	SpG
–	43	20	23	–

DESCRIPTION: Moderate yellowish brown (10YR 5/4) clayey gravel with sand

USCS: GC

TECH	MKS
DATE	1/28/2005
REVIEW	MB

January-05

043-2246.0002

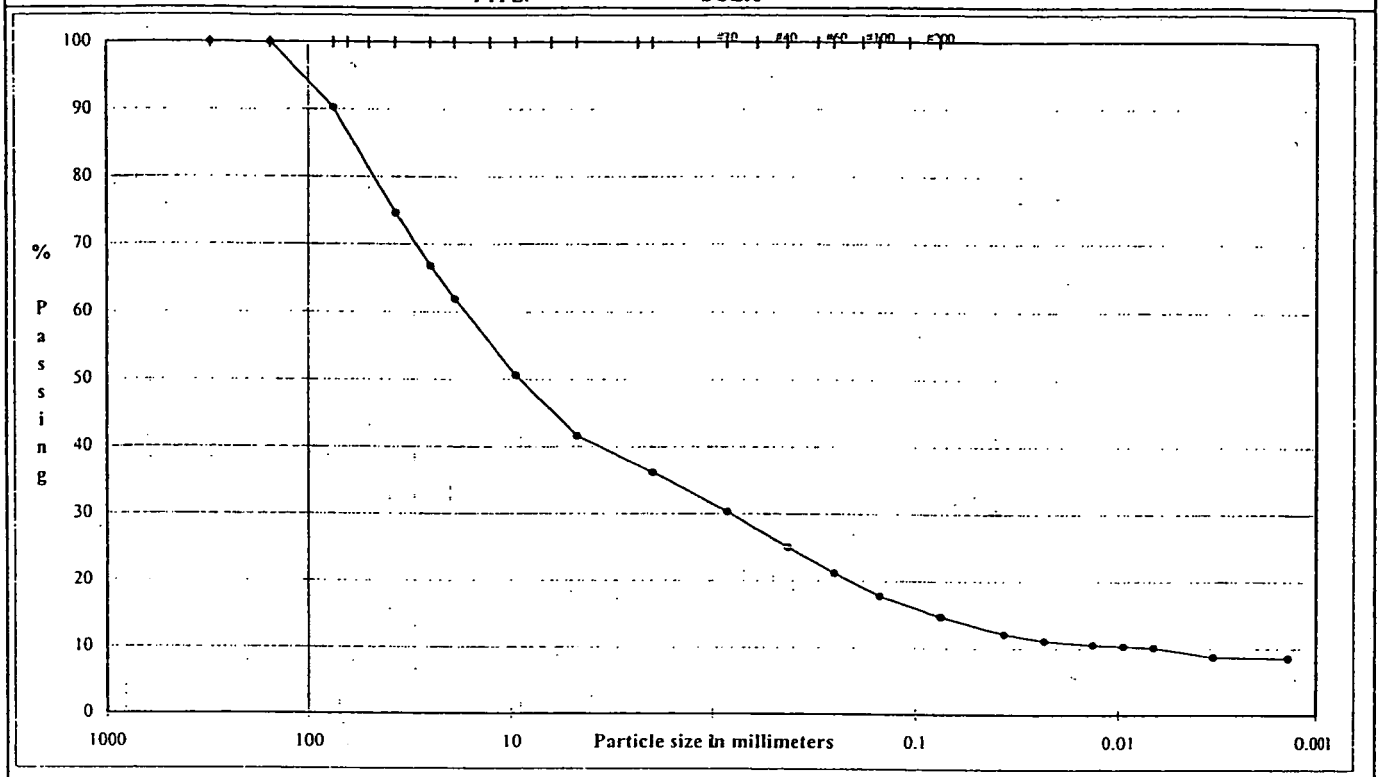
PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: Rocky Flats/Field & Lab Testing/CO

SAMPLE ID: 371DP-A2 Depth (ft): –

TYPE: BULK



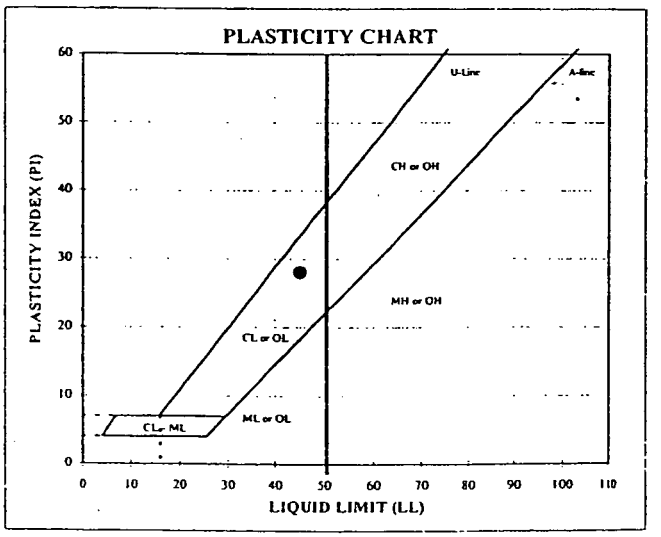
	Coarse	Fine	Coarse	Medium	Fine	
COBBLES	GRAVEL		SAND			Silt or Clay
						FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	9.78
6.0"	154.2	100.0		
6.0"	154.2	100.0		
3.0"	75.0	90.2		
1.5"	37.5	74.6		
1.0"	25.0	66.7	Coarse Gravel	28.28
0.75"	19.0	61.9		
0.375"	9.5	50.6		
#4	4.8	41.6	Fine Gravel	20.35
#10	2.00	36.2	Coarse Sand	5.40
#20	0.85	30.3		
#40	0.43	25.0	Medium Sand	11.22
#60	0.25	21.1		
#100	0.15	17.7		
#200	0.075	14.7	Fine Sand	10.30

Hydrometer Analysis

(mm)	%Finer		
0.036	12.1		
0.023	11.1		
0.013	10.5	Fines	
0.0095	10.3	Silt or Clay	14.66
0.0066	10.1		
0.0033	8.7		
0.0014	8.5		



ATTERBERG LIMITS

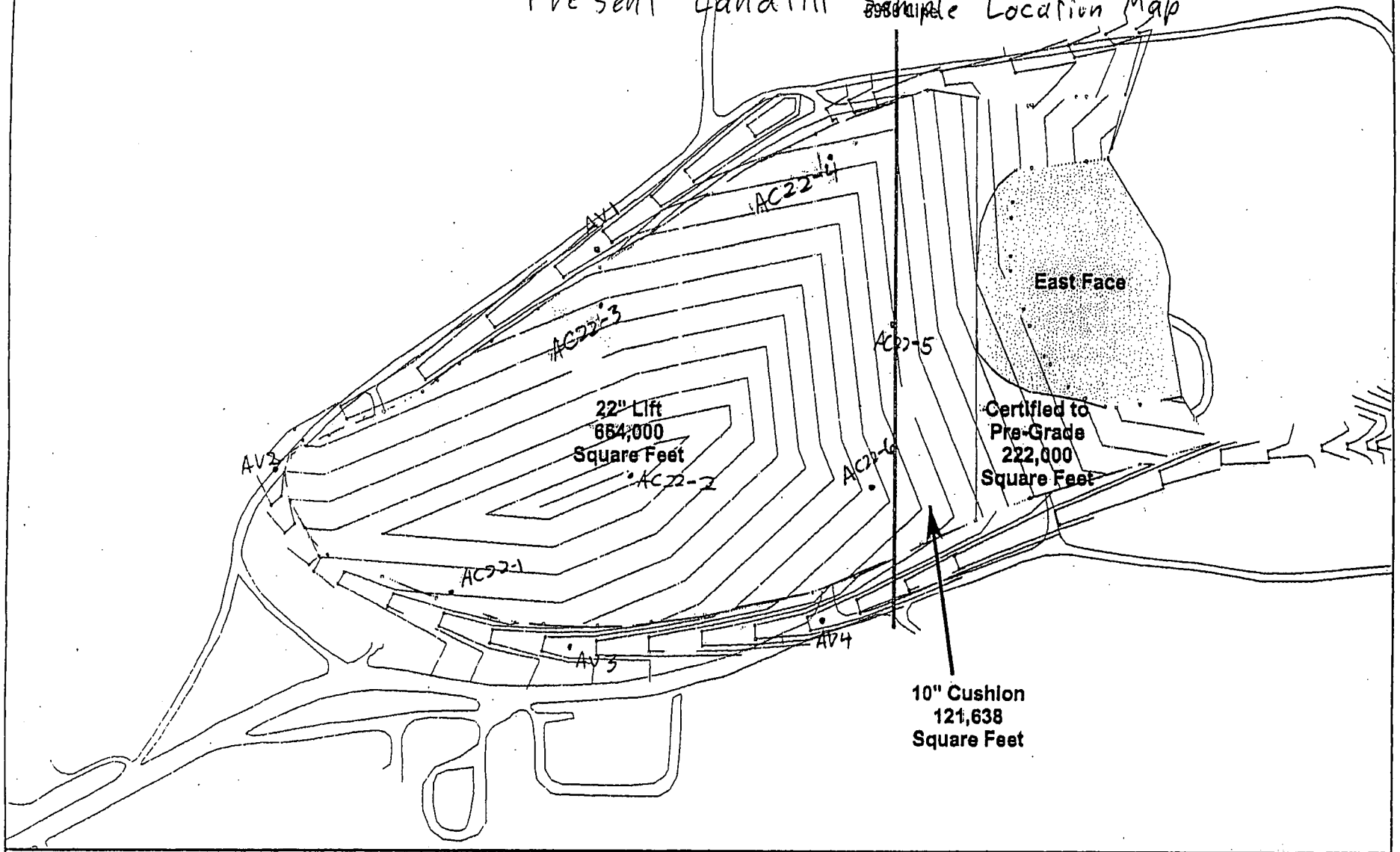
M_c	LL	PL	PI	SpG
–	45	17	28	–

DESCRIPTION: Moderate yellowish brown (10YR 5/4) clayey gravel with sand

USCS: GC

TECH	MKS
DATE	1/28/2005
REVIEW	MB

Present Landfill Sample Location Map



Present Landfill
Accelerated Action

N

Explanation:

- East/West Line
- 10" Cushion
- 6" Cushion
- Rock Layer
- 22" Layer
- 2" Layer
- Certified to Pre-Grade
- East Face
- GCL&FML
- GDN

Scale:

200 0 200 Feet

Printed on: (2.22.2005) 16:4

Present Landfill
Accelerated Action Progress

February 22, 2005

October-04

043-2246.0001

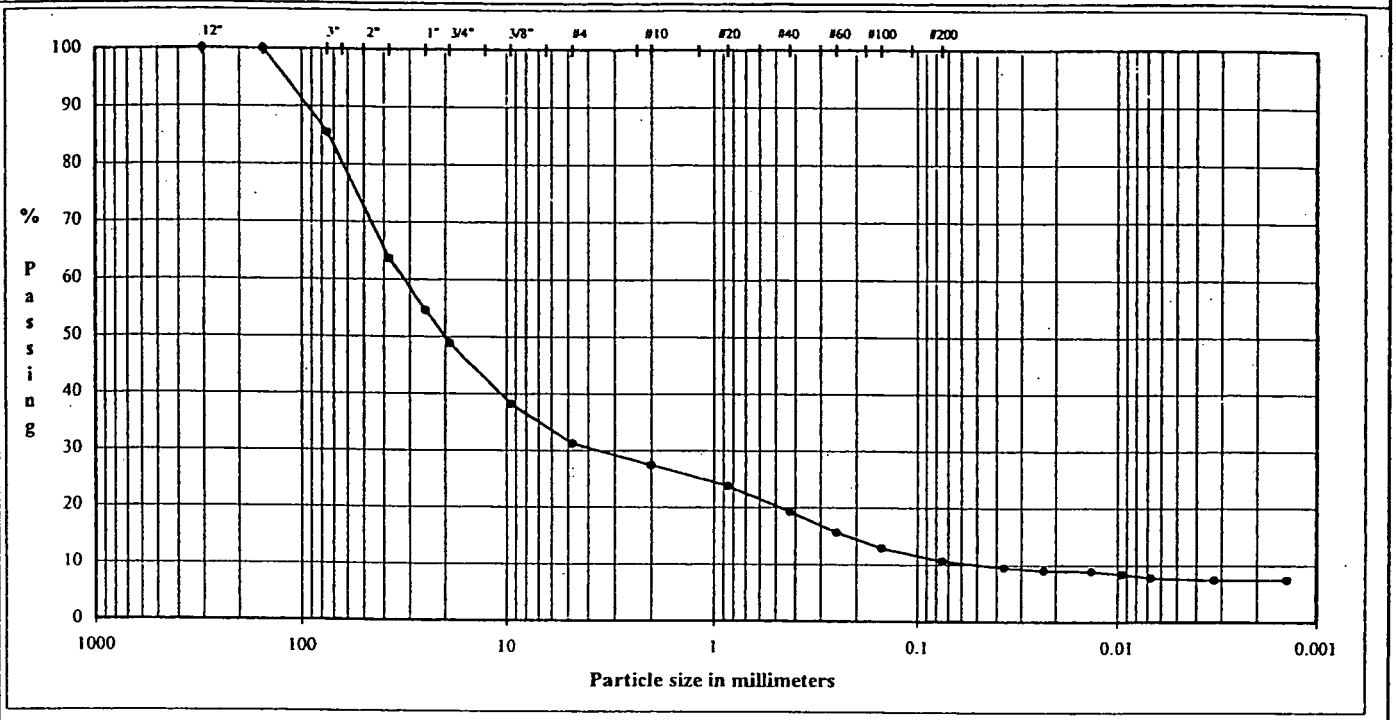
PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **Rocky Flats/Field & Lab Testing/CO**

SAMPLE ID: **AV-1** Depth (ft): –

TYPE: **BULK**



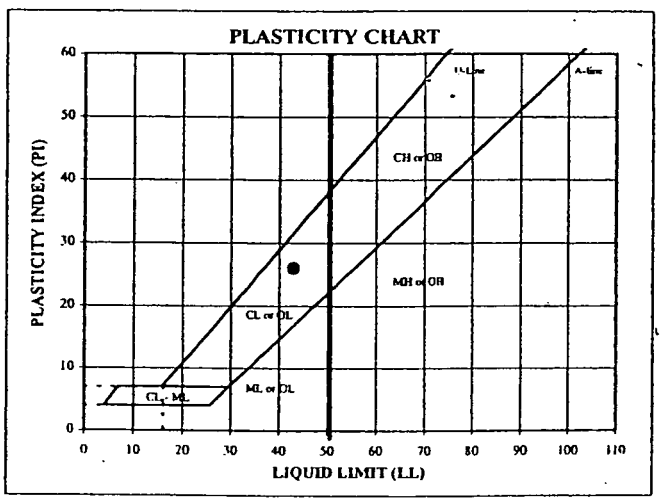
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	14.59
6.0"	154.2	100.0		
6.0"	154.2	100.0		
3.0"	75.0	85.4		
1.5"	37.5	63.6		
1.0"	25.0	54.6	Coarse Gravel	36.52
0.75"	19.0	48.9		
0.375"	9.5	38.2		
#4	4.8	31.2	Fine Gravel	17.73
#10	2.00	27.4	Coarse Sand	3.79
#20	0.85	23.7		
#40	0.43	19.2	Medium Sand	8.13
#60	0.25	15.6		
#100	0.15	12.8		
#200	0.075	10.6	Fine Sand	8.62

Hydrometer Analysis

(mm)	%Finer		
0.036	9.5		
0.023	9.0		
0.013	8.9	Fines	
0.0095	8.4	Silt or Clay	10.62
0.0067	7.7		
0.0032	7.4		
0.0014	7.4		



ATTERBERG LIMITS

M_c	LL	PL	PI	SpG (assumed)
6.8	43	17	26	2.70

DESCRIPTION: Moderate brown (5 YR 4/4) clayey gravel with sand

USCS: GC

TECH	MKS
DATE	10/15/2004
REVIEW	MB

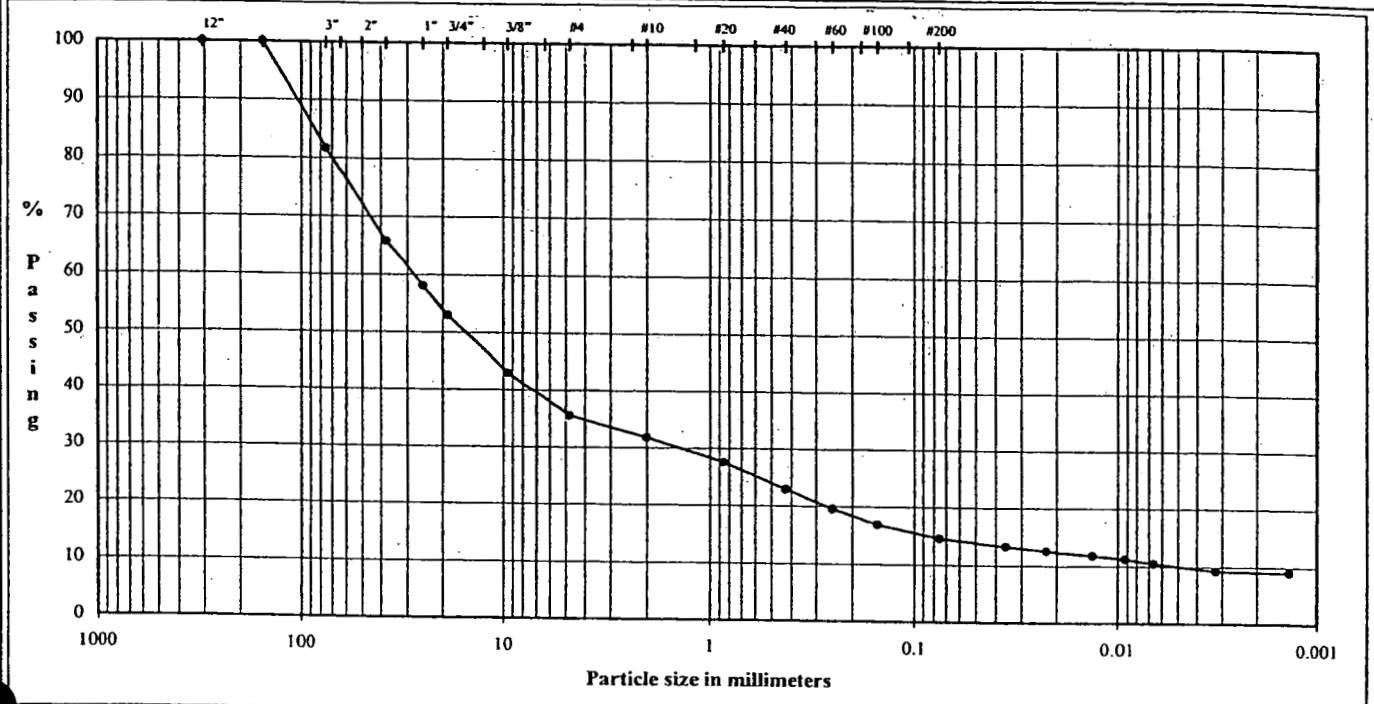
October-04

043-2246.0001

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: Rocky Flats/Field & Lab Testing/CO
SAMPLE ID: AV-2 Depth (ft): –
TYPE: BULK



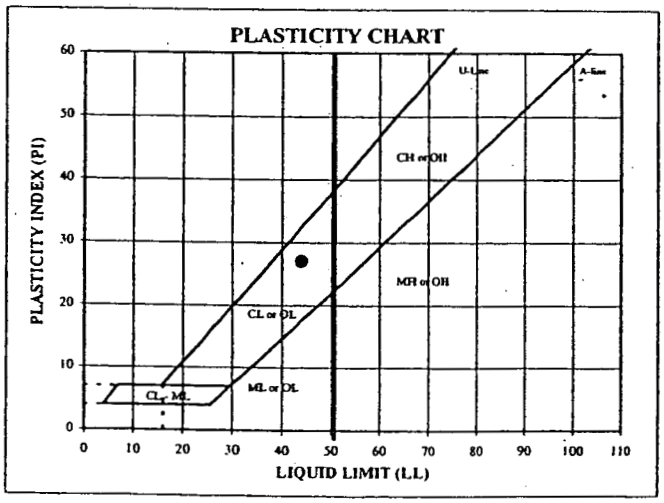
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	18.42
6.0"	154.2	100.0		
6.0"	154.2	100.0		
3.0"	75.0	81.6		
1.5"	37.5	65.7		
1.0"	25.0	58.1	Coarse Gravel	28.60
0.75"	19.0	53.0		
0.375"	9.5	42.9		
#4	4.8	35.5	Fine Gravel	17.46
#10	2.00	31.8	Coarse Sand	3.75
#20	0.85	27.5		
#40	0.43	22.9	Medium Sand	8.88
#60	0.25	19.6		
#100	0.15	16.9		
#200	0.075	14.6	Fine Sand	8.31

Hydrometer Analysis

(mm)	%Finer		
0.036	13.2		
0.023	12.5		
0.013	11.8	Fines	
0.0092	11.2	Silt or Clay	14.58
0.0066	10.5		
0.0032	9.2		
0.0014	9.0		



ATTERBERG LIMITS

M_c	LL	PL	PI	SpG (assumed)
7.4	44	17	27	2.70

DESCRIPTION: Dark yellowish brown (10 YR 4/2) clayey gravel with sand

USCS: GC

TECH: MKS
DATE: 10/15/2004
REVIEW: MB

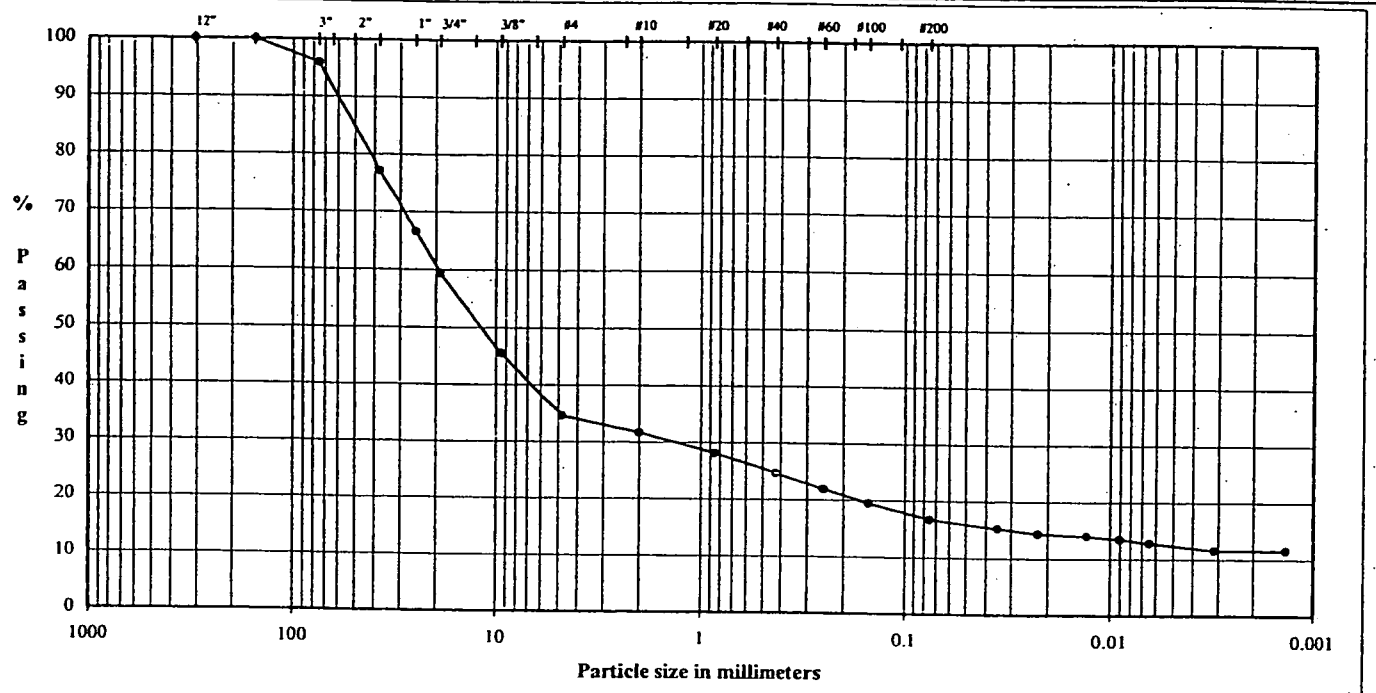
October-04

043-2246.0001

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: Rocky Flats/Field & Lab Testing/CO
SAMPLE ID: AV-3 Depth (ft): –
TYPE: BULK



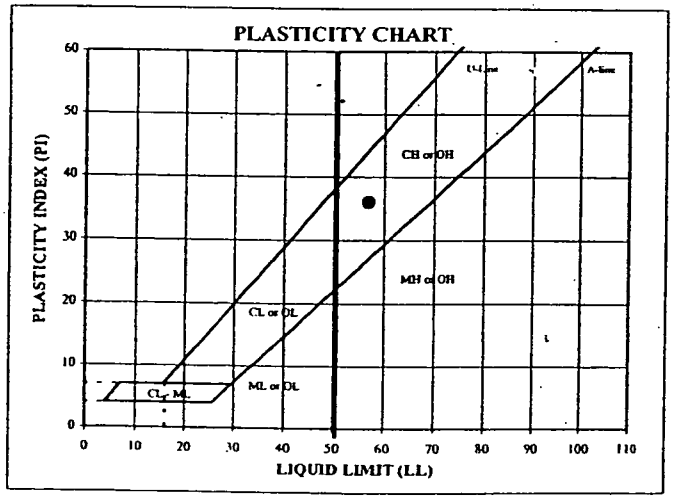
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	4.11
6.0"	154.2	100.0		
6.0"	154.2	100.0		
3.0"	75.0	95.9		
1.5"	37.5	77.0		
1.0"	25.0	66.5	Coarse Gravel	36.48
0.75"	19.0	59.4		
0.375"	9.5	45.5		
#4	4.8	34.6	Fine Gravel	24.80
#10	2.00	31.7	Coarse Sand	2.96
#20	0.85	28.1		
#40	0.43	24.7	Medium Sand	7.00
#60	0.25	21.9		
#100	0.15	19.4		
#200	0.075	16.7	Fine Sand	7.90

Hydrometer Analysis

(mm)	%Finer		
0.035	15.3		
0.022	14.4		
0.013	14.0	Fines	
0.0090	13.5	Silt or Clay	16.75
0.0064	12.8		
0.0031	11.5		
0.0014	11.5		



ATTERBERG LIMITS

M_c	LL	PL	PI	SpG (assumed)
6.7	57	21	36	2.70

DESCRIPTION: Moderate yellowish brown (10 YR 5/4) clayey gravel with sand

USCS: GC

TECH	MKS
DATE	10/15/2004
REVIEW	MB

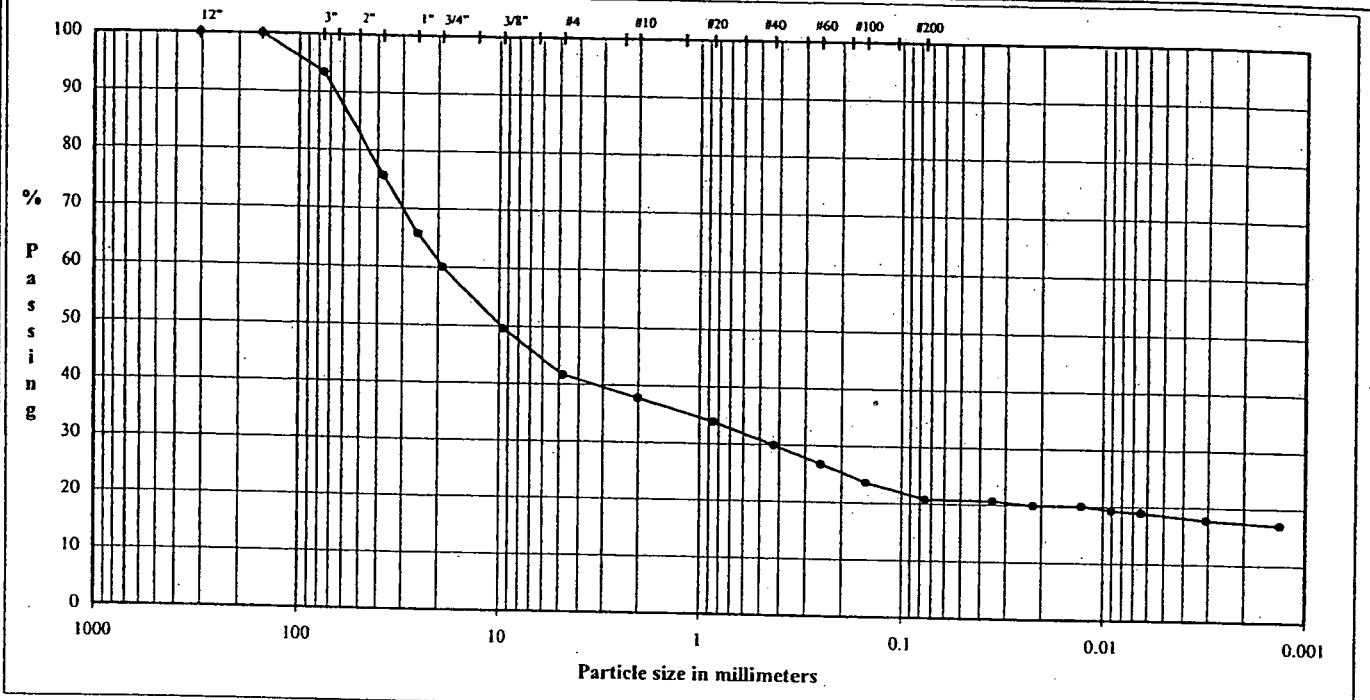
October-04

043-2246.0001

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: Rocky Flats/Field & Lab Testing/CO
SAMPLE ID: AV-4
TYPE: BULK
Depth (ft): –



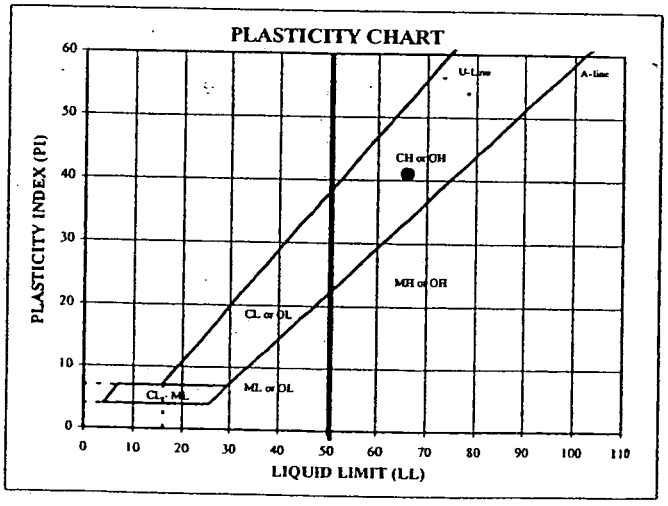
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	6.67
6.0"	154.2	100.0		
6.0"	154.2	100.0		
3.0"	75.0	93.3		
1.5"	37.5	75.6		
1.0"	25.0	65.7	Coarse Gravel	33.33
0.75"	19.0	60.0		
0.375"	9.5	49.6		
#4	4.8	41.6	Fine Gravel	18.41
#10	2.00	37.8	Coarse Sand	3.81
#20	0.85	33.8		
#40	0.43	29.9	Medium Sand	7.92
#60	0.25	26.7		
#100	0.15	23.6		
#200	0.075	20.8	Fine Sand	9.11

Hydrometer Analysis

(mm)	%Finer		
0.034	20.6		
0.022	20.0		
0.013	20.0	Fines	
0.0090	19.3	Silt or Clay	20.75
0.0064	18.9		
0.0031	17.7		
0.0013	17.1		



ATTERBERG LIMITS

M_c	LL	PL	PI	SpG (assumed)
12.0	66	25	41	2.70

DESCRIPTION: Moderate brown (5 YR 4/4) clayey gravel with sand

USCS: GC

TECH	MKS
DATE	10/18/2004
REVIEW	MB

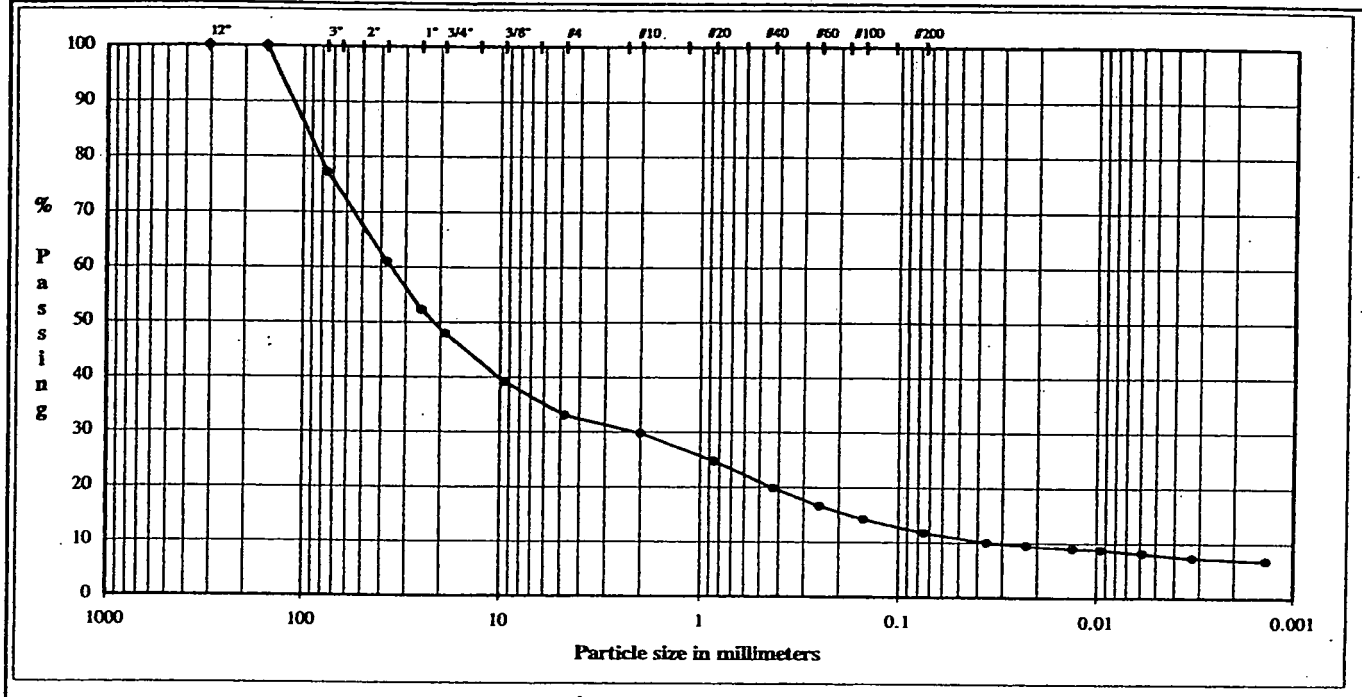
February-05

043-2246-0002

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: Rocky Flats/Field & Lab Testing/CO
SAMPLE ID: AC22-1 Depth: -
TYPE: Pail



COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

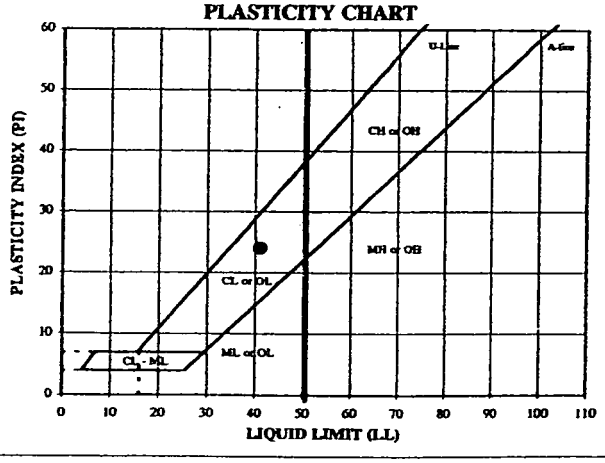
U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	22.86
6.0"	154.2	100.0		
6.0"	154.2	100.0		
3.0"	75.0	77.1		
1.5"	37.5	61.0		
1.0"	25.0	52.3	Coarse Gravel	29.17
0.75"	19.0	48.0		
0.375"	9.5	39.1		
#4	4.8	33.1	Fine Gravel	14.91
#10	2.00	29.8	Coarse Sand	3.26
#20	0.85	24.8		
#40	0.43	19.8	Medium Sand	9.99
#60	0.25	16.6		
#100	0.15	14.2		
#200	0.075	11.8	Fine Sand	8.04

Hydrometer Analysis

(mm)	%Finer		
0.036	10.1		
0.023	9.5		
0.013	9.0	Fines	
0.0095	8.9	Silt or Clay	11.78
0.0059	8.2		
0.0033	7.3		
0.0014	6.8		

PLASTICITY CHART



ATTERBERG LIMITS

M_c	LL	PL	PI	SpG (assumed)
–	41	17	24	2.70

DESCRIPTION: Moderate yellowish brown (10YR 5/4) poorly graded gravel with clay and sand

USCS: GP-GC

TECH	MKS
DATE	02/18/2005
REVIEW	MB

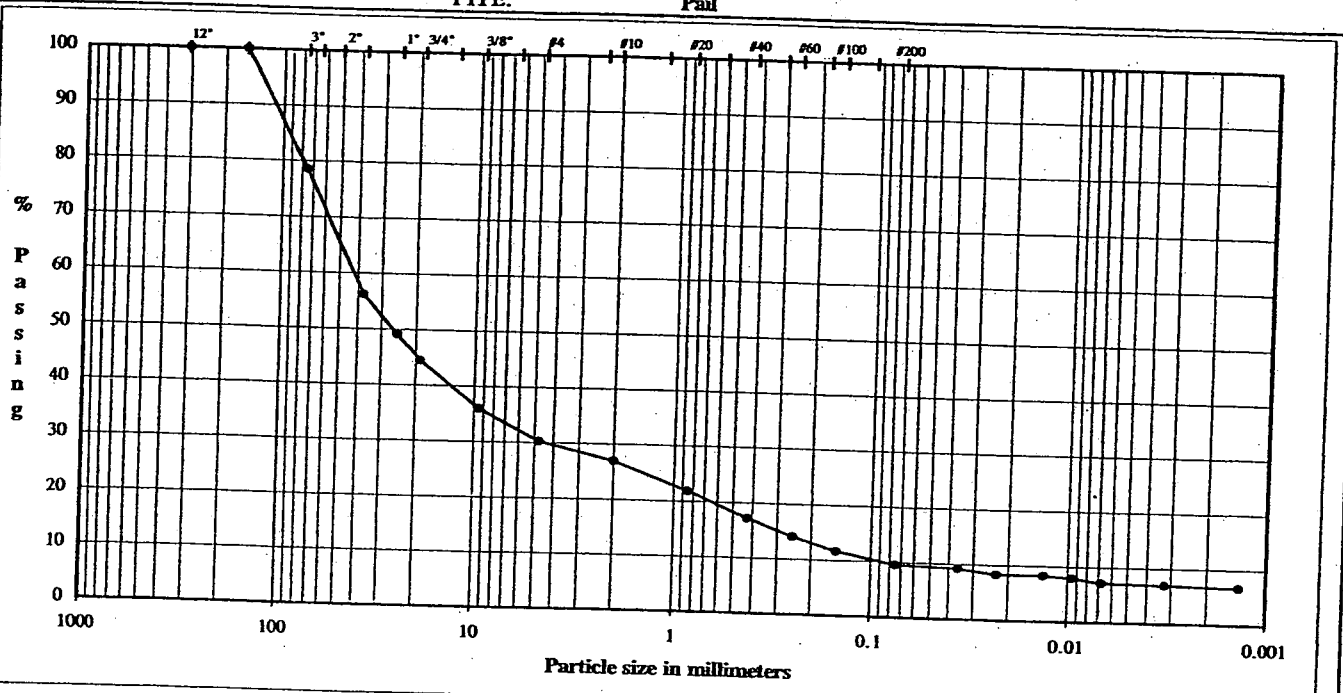
February-05

043-2246-0002

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: Rocky Flats/Field & Lab Testing/CO
SAMPLE ID: AC22-2
TYPE: Pail
Depth: –



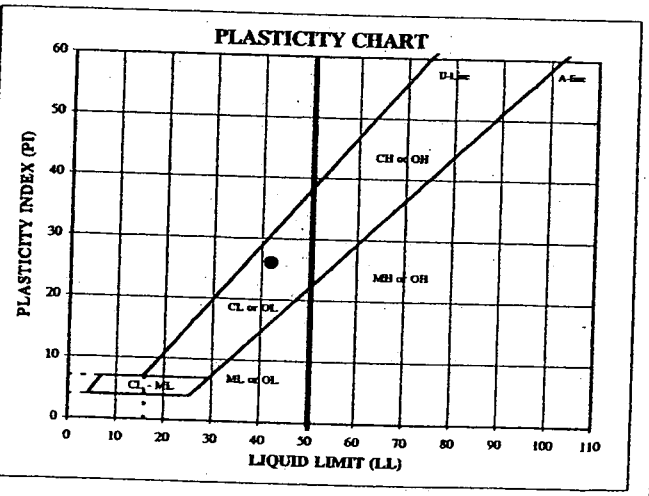
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	21.41
6.0"	154.2	100.0		
6.0"	154.2	100.0		
3.0"	75.0	78.6		
1.5"	37.5	56.3		
1.0"	25.0	49.2	Coarse Gravel	34.09
0.75"	19.0	44.5		
0.375"	9.5	36.0		
#4	4.8	30.2	Fine Gravel	14.27
#10	2.00	27.0	Coarse Sand	3.28
#20	0.85	21.9		
#40	0.43	17.3	Medium Sand	9.71
#60	0.25	14.1		
#100	0.15	11.7		
#200	0.075	9.6	Fine Sand	7.67

Hydrometer Analysis

(mm)	%Finer		
0.036	9.2		
0.023	8.3		
0.013	8.3	Fines	
0.0095	8.0	Silt or Clay	9.58
0.0068	7.2		
0.0032	7.0		
0.0014	6.7		



ATTERBERG LIMITS

M_c	LL	PL	PI	SpG (assumed)
–	42	16	26	2.70

DESCRIPTION: Moderate yellowish brown (10YR 5/4) poorly graded gravel with clay and sand

USCS: GP-GC

TECH	PRH
DATE	02/20/2005
REVIEW	MB

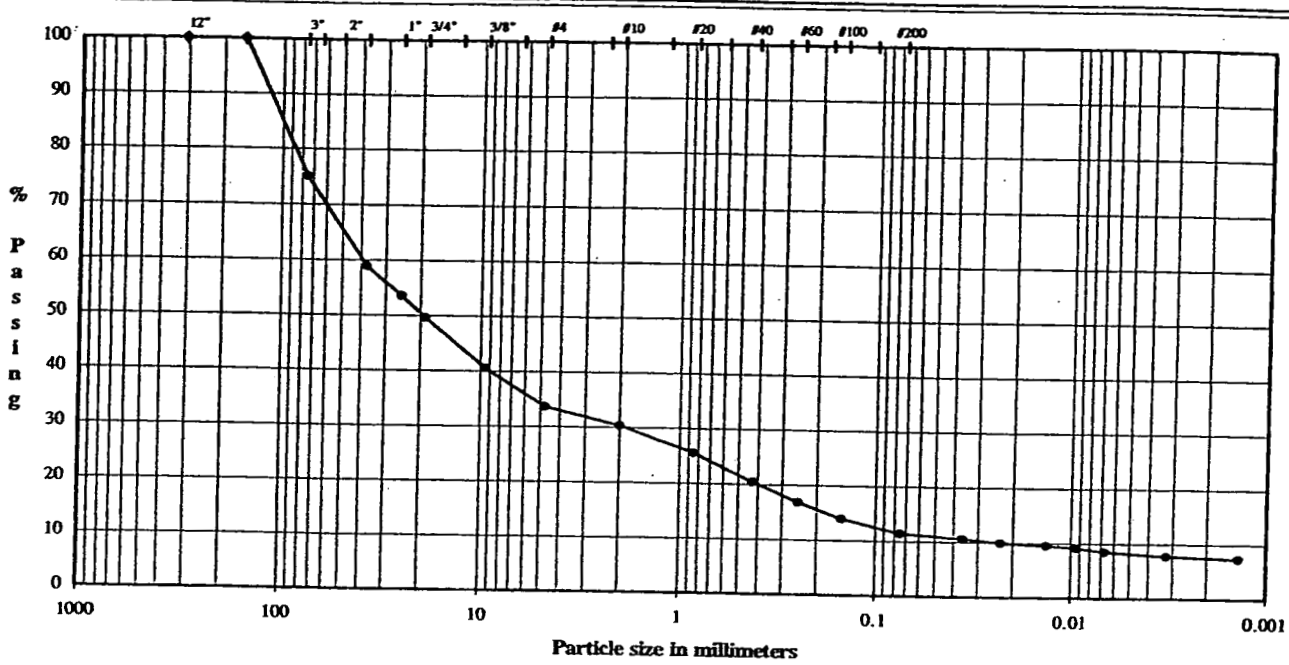
February-05

043-2246-0002

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: Rocky Flats/Field & Lab Testing/CO
SAMPLE ID: AC22-3 Depth: -
TYPE: Pail



COBBLES	GRAVEL		SAND			FINES
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay

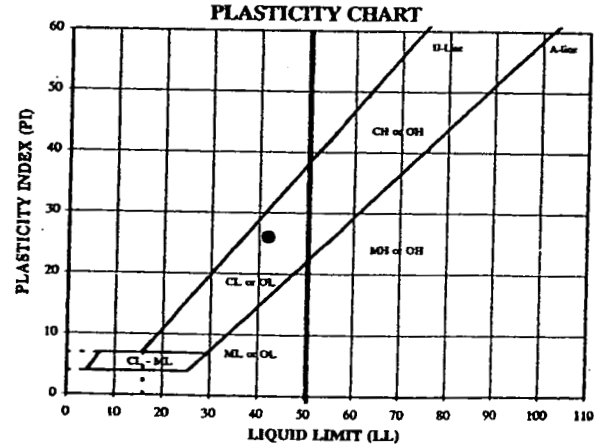
U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	24.89
6.0"	154.2	100.0		
6.0"	154.2	100.0		
3.0"	75.0	75.1		
1.5"	37.5	58.9		
1.0"	25.0	53.5	Coarse Gravel	25.46
0.75"	19.0	49.7		
0.375"	9.5	40.5		
#4	4.8	33.7	Fine Gravel	15.93
#10	2.00	30.3	Coarse Sand	3.38
#20	0.85	25.6		
#40	0.43	20.5	Medium Sand	9.90
#60	0.25	16.9		
#100	0.15	14.0		
#200	0.075	11.4	Fine Sand	9.02

Hydrometer Analysis

(mm)	%Finer		
0.036	10.6		
0.023	9.9		
0.013	9.6		
0.0095	9.2	Fines Silt or Clay	11.43
0.0067	8.5		
0.0032	7.8		
0.0014	7.4		

PLASTICITY CHART



ATTERBERG LIMITS

M.	LL	PL	PI	SpG (assumed)
–	42	16	26	2.70

DESCRIPTION: Moderate yellowish brown (10YR 5/4) poorly graded gravel with clay and sand

USCS: GP-GC

TECH	PRH
DATE	02/20/2005
REVIEW	MB

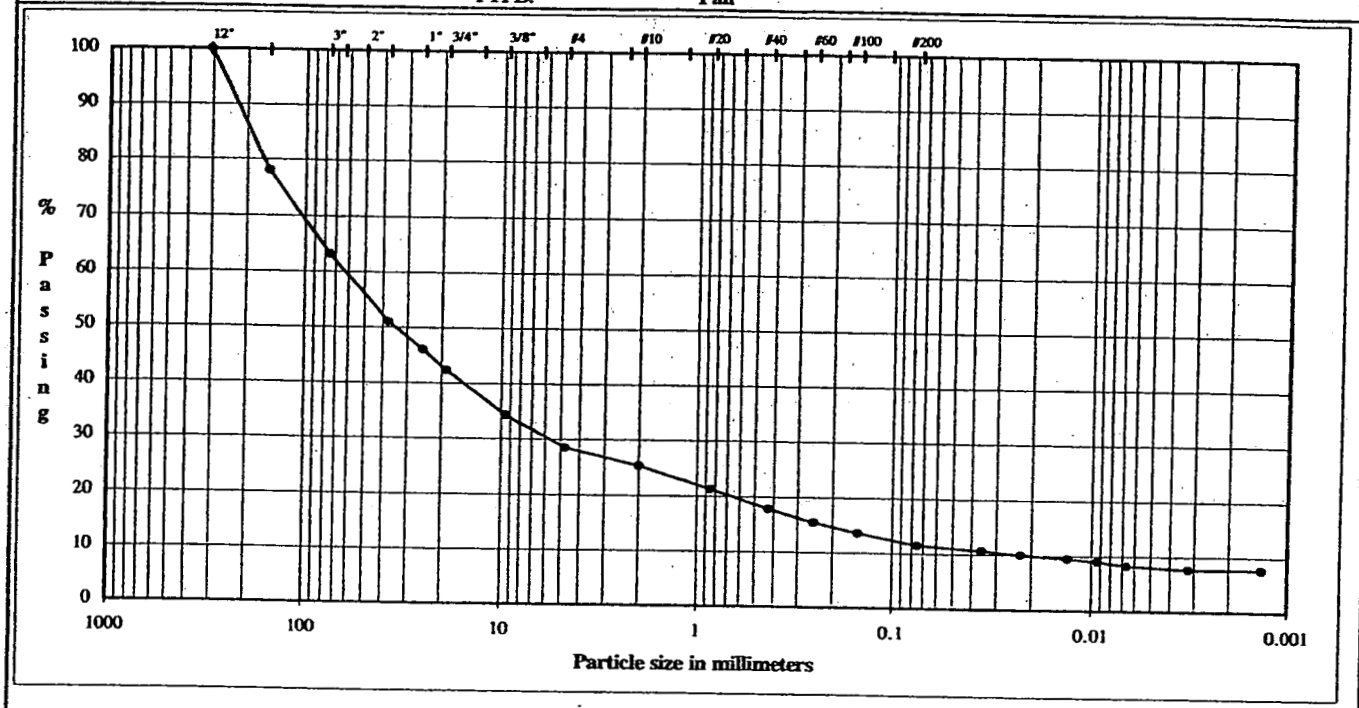
February-05

043-2246-0002

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: Rocky Flats/Field & Lab Testing/CO
SAMPLE ID: AC22-4 Depth: -
TYPE: Pail



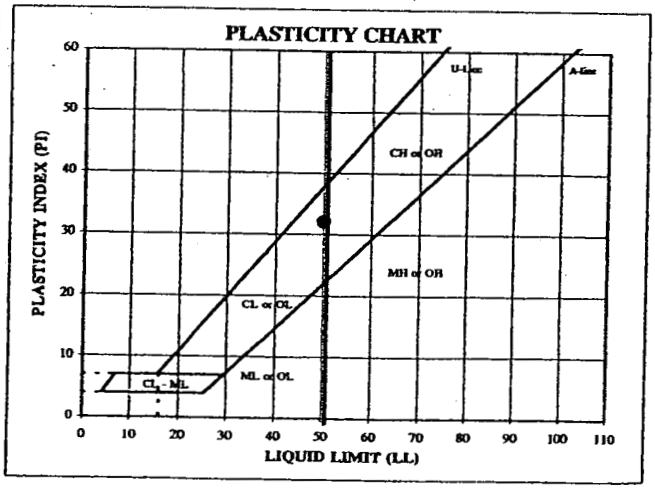
COBBLES	GRAVEL		SAND			FINES
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	78.1	Cobbles	36.80
6.0"	154.2	78.1		
6.0"	154.2	78.1		
3.0"	75.0	63.2		
1.5"	37.5	51.0		
1.0"	25.0	46.1	Coarse Gravel	20.83
0.75"	19.0	42.4		
0.375"	9.5	34.3		
#4	4.8	28.5	Fine Gravel	13.85
#10	2.00	25.4	Coarse Sand	3.14
#20	0.85	21.3		
#40	0.43	17.8	Medium Sand	7.56
#60	0.25	15.5		
#100	0.15	13.6		
#200	0.075	11.6	Fine Sand	6.28

Hydrometer Analysis

(mm)	%Finer		
0.036	10.7		
0.023	10.1		
0.013	9.5	Fines	
0.0093	9.0	Silt or Clay	11.55
0.0067	8.3		
0.0032	7.7		
0.0014	7.7		



ATTERBERG LIMITS

M,	LL	PL	PI	SpG (assumed)
–	50	18	32	2.70

DESCRIPTION: Moderate yellowish brown (10 YR 5/4) poorly graded gravel with clay and sand

USCS: GP-GC

TECH	AGE
DATE	03/01/2005
REVIEW	NG

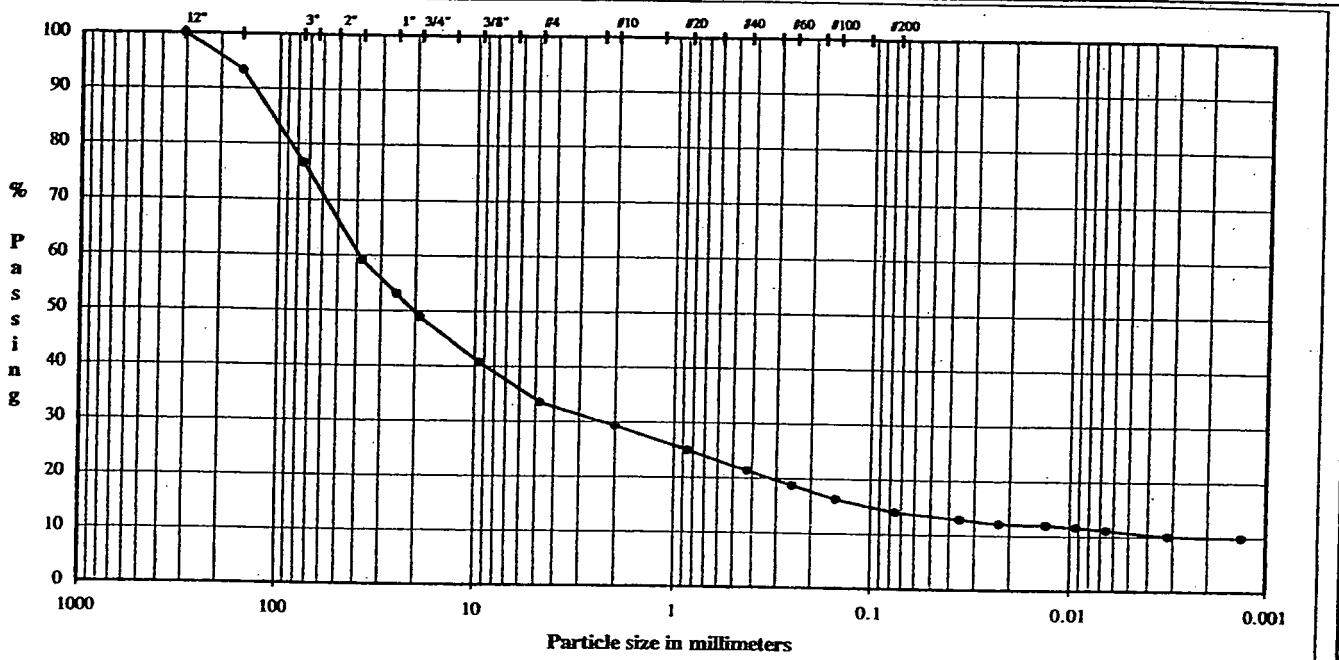
March-05

043-2246-0002

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: Rocky Flats/Field & Lab Testing/CO
SAMPLE ID: AC22-5 Depth: -
TYPE: Pail



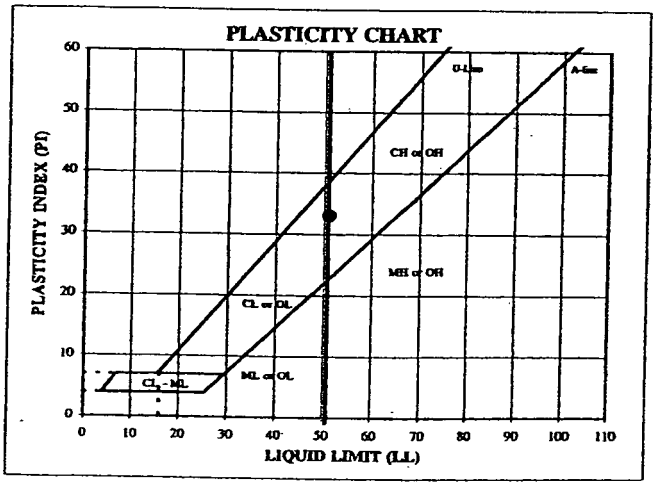
COBBLES	GRAVEL		SAND			FINES
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	93.3	Cobbles	23.32
6.0"	154.2	93.3		
6.0"	154.2	93.3		
3.0"	75.0	76.7		
1.5"	37.5	59.1		
1.0"	25.0	53.1	Coarse Gravel	27.77
0.75"	19.0	48.9		
0.375"	9.5	40.7		
#4	4.8	33.5	Fine Gravel	15.39
#10	2.00	29.3	Coarse Sand	4.19
#20	0.85	25.0		
#40	0.43	21.3	Medium Sand	8.00
#60	0.25	18.8		
#100	0.15	16.3		
#200	0.075	14.1	Fine Sand	7.28

Hydrometer Analysis

(mm)	%Finer		
0.036	12.8		
0.023	12.1		
0.013	12.0	Fines	
0.0093	11.6	Silt or Clay	14.06
0.0065	11.1		
0.0032	10.0		
0.0013	9.8		



ATTERBERG LIMITS

M_c	LL	PL	PI	SpG (assumed)
--	51	18	33	2.70

DESCRIPTION: Moderate brown (10 YR 4/6) clayey gravel with sand

USCS: GC

TECH: AGE
DATE: 03/01/2005
REVIEW: NG

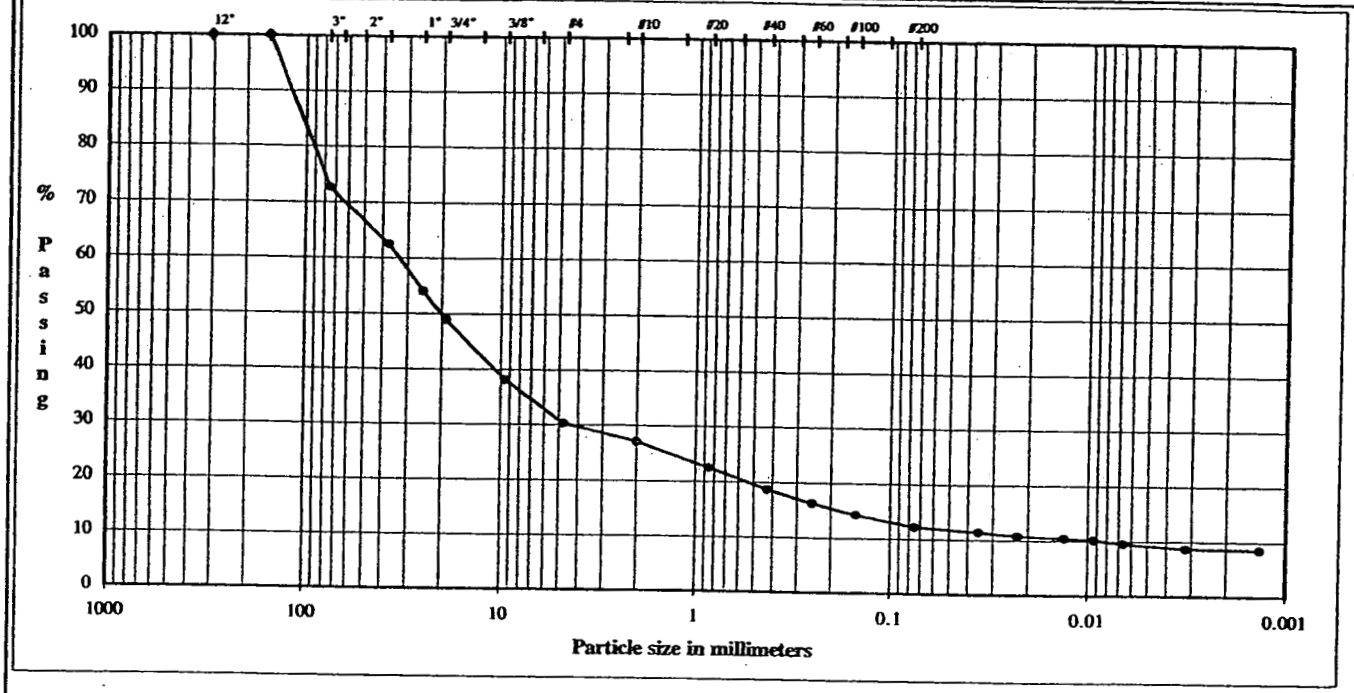
February-05

043-2246-0002

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: Rocky Flats/Field & Lab Testing/CO
SAMPLE ID: AC22-6 Depth: -
TYPE: Pail



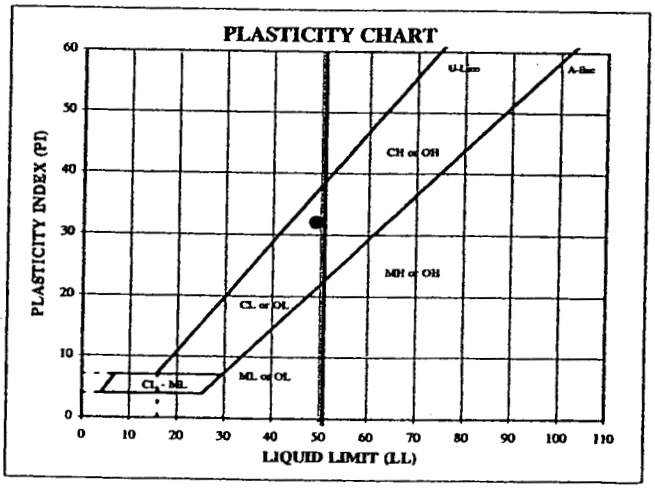
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	27.37
6.0"	154.2	100.0		
6.0"	154.2	100.0		
3.0"	75.0	72.6		
1.5"	37.5	62.6		
1.0"	25.0	54.0	Coarse Gravel	23.70
0.75"	19.0	48.9		
0.375"	9.5	38.1		
#4	4.8	30.3	Fine Gravel	18.63
#10	2.00	27.1	Coarse Sand	3.19
#20	0.85	22.5		
#40	0.43	18.7	Medium Sand	8.38
#60	0.25	16.3		
#100	0.15	14.3		
#200	0.075	12.2	Fine Sand	6.53

Hydrometer Analysis

(mm)	%Finer		
0.036	11.4		
0.023	10.8		
0.013	10.5	Fines	
0.0093	10.2	Silt or Clay	12.20
0.0066	9.5		
0.0032	8.7		
0.0014	8.6		



ATTERBERG LIMITS

M_c	LL	PL	PI	SpG (assumed)
--	49	17	32	2.70

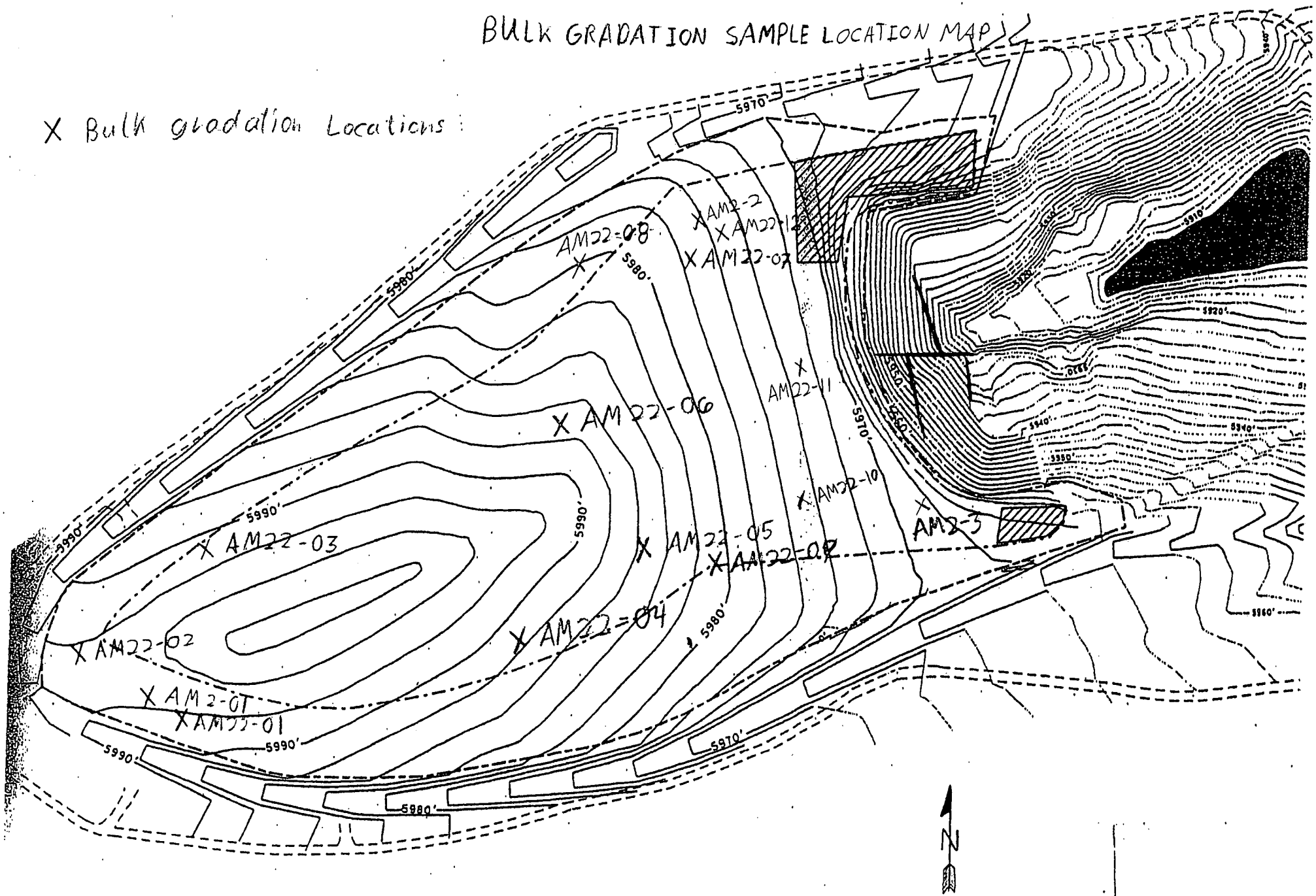
DESCRIPTION: Moderate brown (10YR 4/6) clayey gravel with sand
USCS: GC

TECH: JR
DATE: 02/28/2005
REVIEW: NG

PRESENT LANDFILL

ROCKY FLATS

BULK GRADATION SAMPLE LOCATION MAP



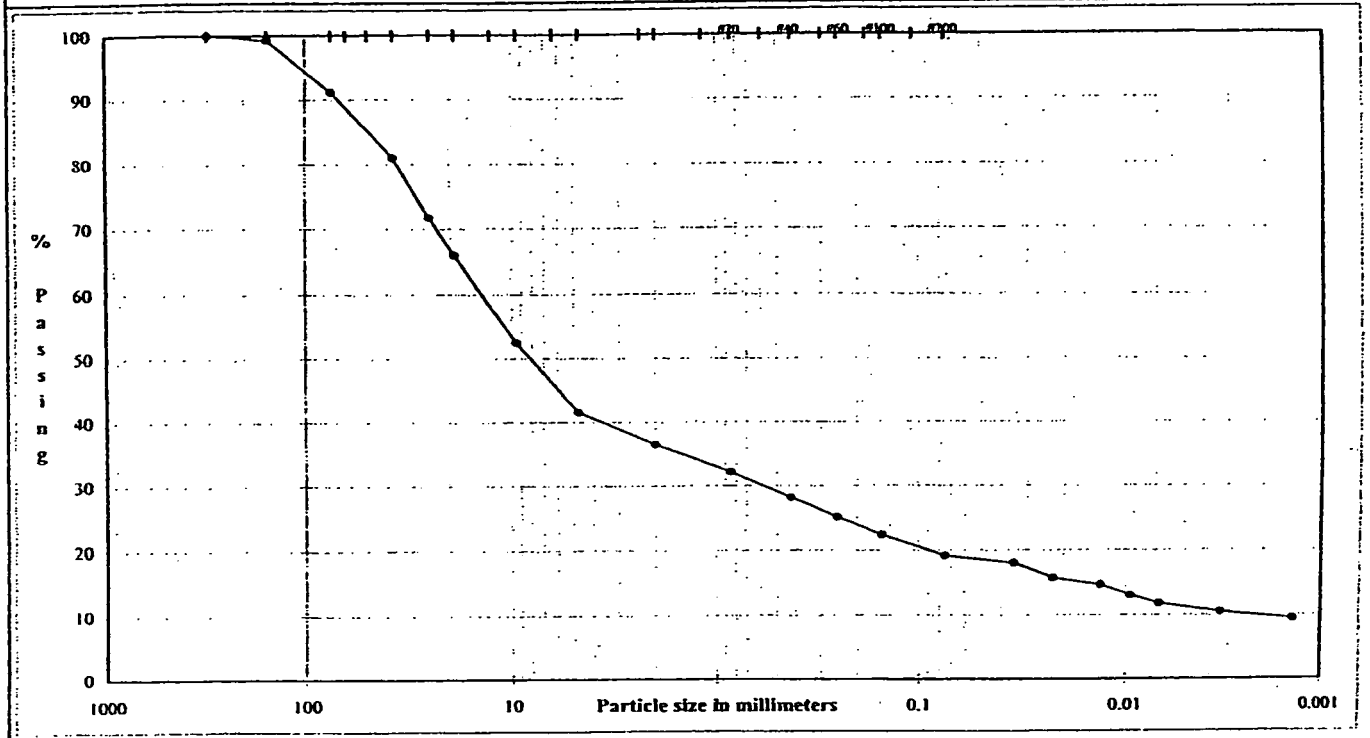
March-05

043-2246-0002

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318, D5519

PROJECT NAME: Rocky Flats/Field & Lab Testing/CO
SAMPLE ID: AM 2-01 Depth: 0-2"
TYPE: Pail



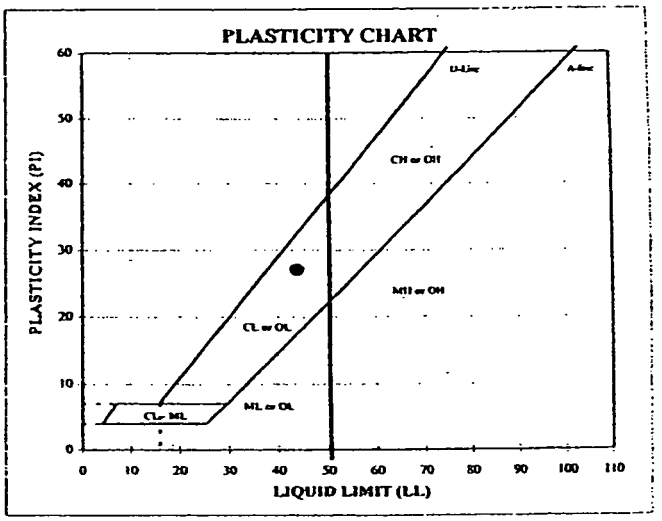
COBBLES	GRAVEL		SAND			FINES
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
12.0"	304.8	100.0	Cobbles	8.83
12.0"	304.8	100.0		
6.0"	154.2	99.3		
3.0"	75.0	91.2		
1.5"	37.5	81.0		
1.0"	25.0	71.7	Coarse Gravel	25.21
0.75"	19.0	66.0		
0.375"	9.5	52.5		
#4	4.8	41.5	Fine Gravel	24.46
#10	2.00	36.5	Coarse Sand	5.02
#20	0.85	32.1		
#40	0.43	28.2	Medium Sand	8.32
#60	0.25	25.1		
#100	0.15	22.4		
#200	0.075	19.1	Fine Sand	9.02

Hydrometer Analysis

(mm)	%Finer		
0.035	18.0		
0.023	15.7		
0.013	14.7	Fines	
0.0095	13.0	Silt or Clay	19.13
0.0067	11.7		
0.0033	10.5		
0.0014	9.4		



ATTERBERG LIMITS

M_c	LL	PL	PI	SpG (assumed)
–	44	17	27	2.70

DESCRIPTION: Dark yellowish brown (10 YR 4/2) clayey gravel with sand

USCS: GC

TECH	MGC
DATE	3/14/2005
REVIEW	NG

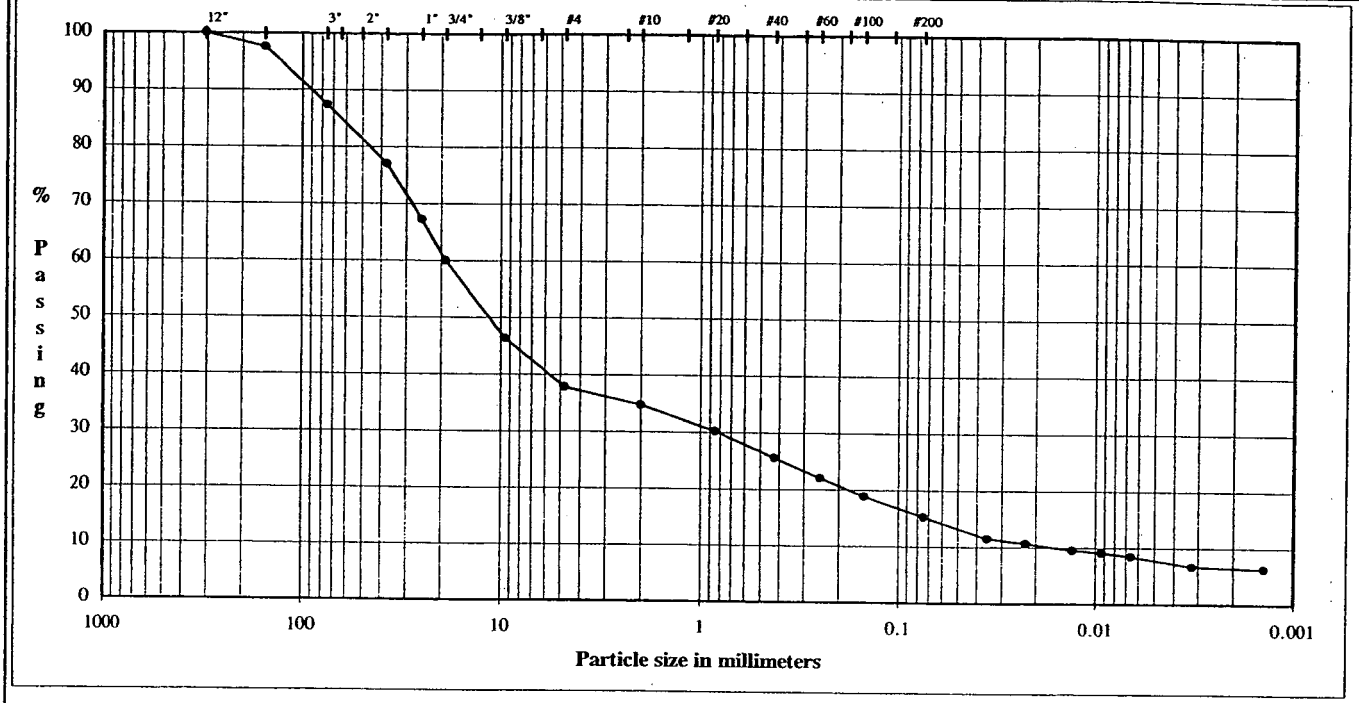
May-05

043-2246-0002

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318, D5519

PROJECT NAME: **Rocky Flats/Field & Lab Testing/CO**
SAMPLE ID: **AM 2-2** Depth: –
TYPE: **Pail**



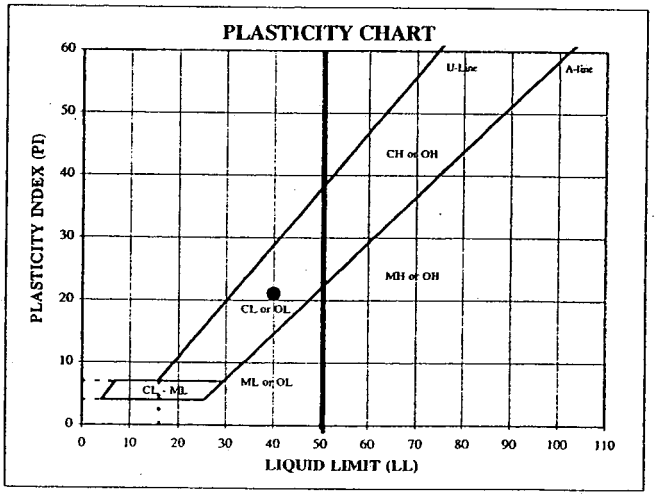
COBBLES	GRAVEL		SAND			FINES
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
12.0"	304.8	100.0	Cobbles	12.57
12.0"	304.8	100.0		
6.0"	154.2	97.6		
3.0"	75.0	87.4		
1.5"	37.5	77.1		
1.0"	25.0	67.2	Coarse Gravel	27.43
0.75"	19.0	60.0		
0.375"	9.5	46.4		
#4	4.8	37.8	Fine Gravel	22.19
#10	2.00	34.7	Coarse Sand	3.12
#20	0.85	30.2		
#40	0.43	25.5	Medium Sand	9.17
#60	0.25	22.0		
#100	0.15	18.8		
#200	0.075	15.2	Fine Sand	10.31

Hydrometer Analysis

(mm)	%Finer		
0.036	11.5		
0.023	10.7		
0.013	9.5	Fines	
0.0093	9.1	Silt or Clay	15.22
0.0066	8.5		
0.0032	6.7		
0.0014	6.3		



ATTERBERG LIMITS

M_c	LL	PL	PI	SpG (assumed)
10.8	40	19	21	2.70

DESCRIPTION: Dark yellowish brown (10 YR 4/2) clayey gravel with sand

USCS: GC

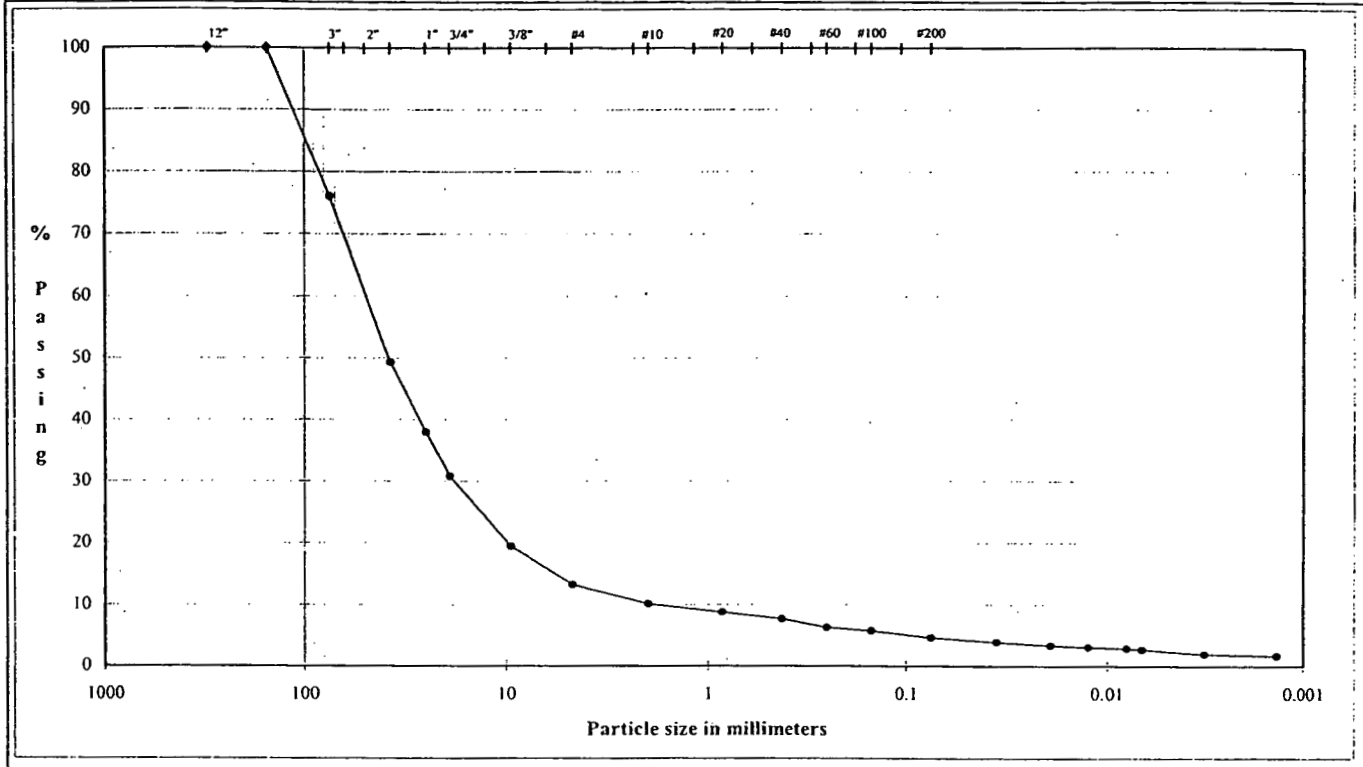
TECH: MKS
DATE: 05/01/2005
REVIEW: MB

May-05 043-2246-0002

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318, D5519

PROJECT NAME: **Rocky Flats/Field & Lab Testing/CO**
SAMPLE ID: **AM 2-3** Depth: --
TYPE: **Pail**



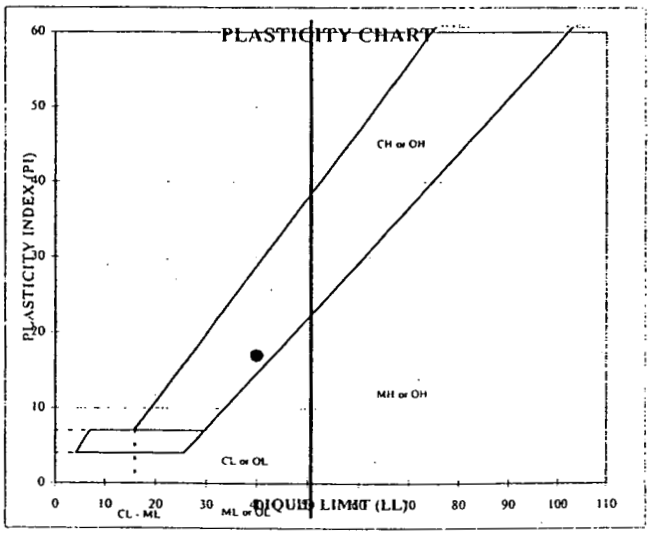
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
12.0"	304.8	100.0	Cobbles	24.00
12.0"	304.8	100.0		
6.0"	154.2	100.0		
3.0"	75.0	76.0		
1.5"	37.5	49.3		
1.0"	25.0	37.9	Coarse Gravel	45.25
0.75"	19.0	30.8		
0.375"	9.5	19.4		
#4	4.8	13.2	Fine Gravel	17.51
#10	2.00	10.1	Coarse Sand	3.12
#20	0.85	8.7		
#40	0.43	7.7	Medium Sand	2.44
#60	0.25	6.3		
#100	0.15	5.7		
#200	0.075	4.6	Fine Sand	3.03

Hydrometer Analysis

(mm)	%Finer		
0.036	3.9		
0.019	3.4		
0.012	3.1	Fines	
0.0080	2.9	Silt or Clay	4.64
0.0067	2.7		
0.0032	1.9		
0.0014	1.7		



ATTERBERG LIMITS

M_c	LL	PL	PI	SpG (assumed)
8.5	40	23	17	2.70

DESCRIPTION: Dark yellowish brown (10 YR 4/2) poorly graded gravel

USCS: GP

TECH	DS/DT
DATE	5/12/2005
REVIEW	MB

March-05

043-2246-0002

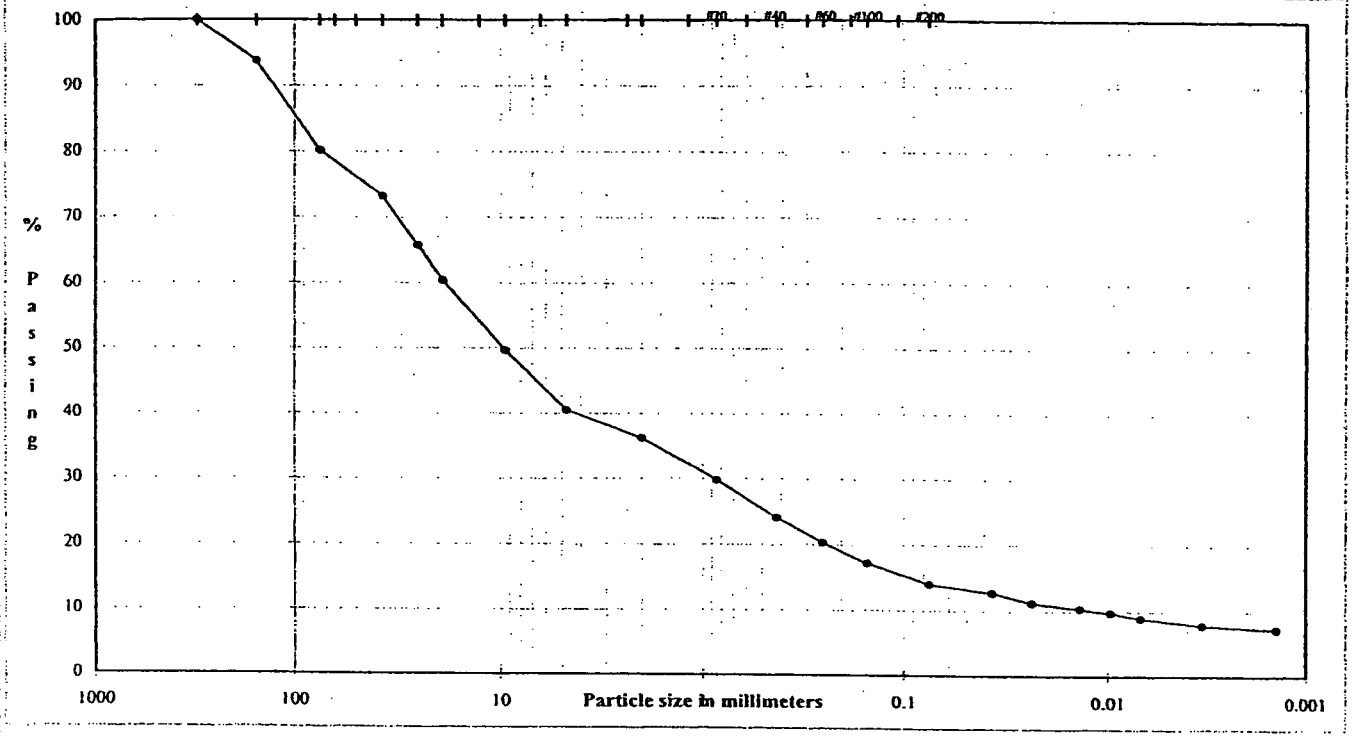
PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318, D5519

PROJECT NAME: Rocky Flats/Field & Lab Testing/CO

SAMPLE ID: AM 22-01 Depth: 0-22"

TYPE: Pail



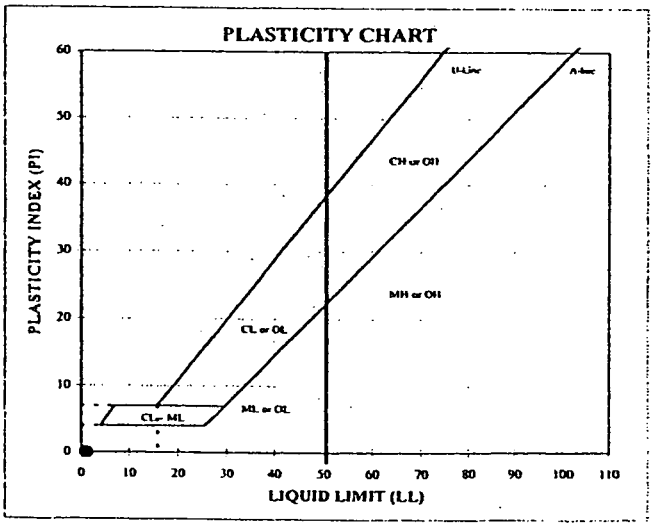
COBBLES	GRAVEL		SAND			FINES
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
12.0"	304.8	100.0	Cobbles	19.87
12.0"	304.8	100.0		
6.0"	154.2	93.8		
3.0"	75.0	80.1		
1.5"	37.5	73.2		
1.0"	25.0	65.7	Coarse Gravel	19.76
0.75"	19.0	60.4		
0.375"	9.5	49.6		
#4	4.8	40.5	Fine Gravel	19.90
#10	2.00	36.2	Coarse Sand	4.31
#20	0.85	29.8		
#40	0.43	24.1	Medium Sand	12.06
#60	0.25	20.3		
#100	0.15	17.2		
#200	0.075	14.0	Fine Sand	10.09

Hydrometer Analysis

(mm)	%Finer		
0.037	12.7		
0.024	11.2		
0.014	10.4	Fines	
0.0097	9.8	Silt or Clay	14.01
0.0069	8.9		
0.0034	7.8		
0.0014	7.2		



ATTERBERG LIMITS

M_c	LL	PL	PI	SpG (assumed)
–	–	–	–	2.70

DESCRIPTION: Dark yellowish brown (10 YR 5/6)

USCS: –

TECH	JR
DATE	3/12/2005
REVIEW	NG

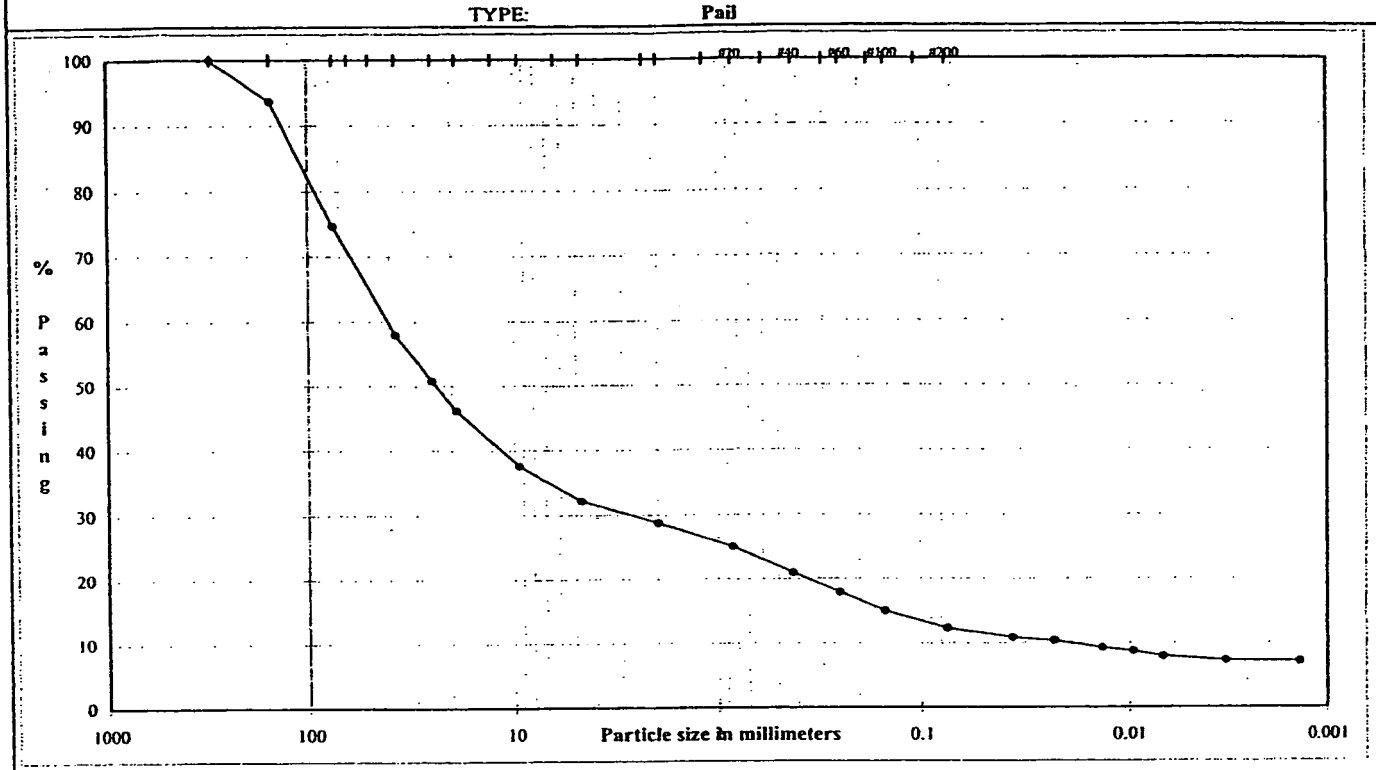
March-05

043-2246-0002

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318, D5519

PROJECT NAME: Rocky Flats/Field & Lab Testing/CO
SAMPLE ID: AM 22-02 Depth: 0-22"
TYPE: Pail



COBBLES	GRAVEL		SAND			FINES
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay

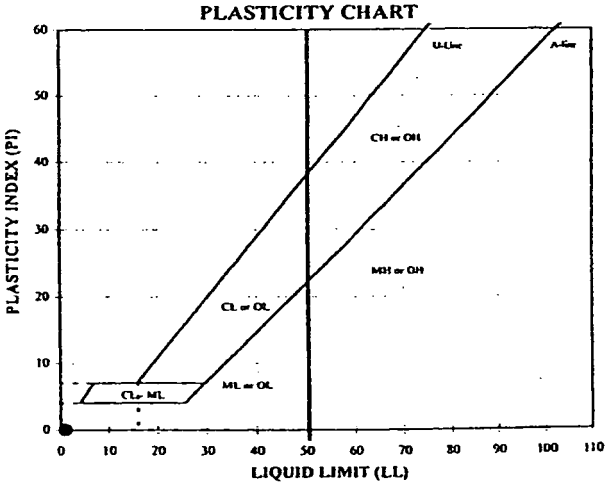
U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
12.0"	304.8	100.0	Cobbles	25.34
12.0"	304.8	100.0		
6.0"	154.2	93.7		
3.0"	75.0	74.7		
1.5"	37.5	58.0		
1.0"	25.0	50.8	Coarse Gravel	28.55
0.75"	19.0	46.1		
0.375"	9.5	37.6		
#4	4.8	32.2	Fine Gravel	13.93
#10	2.00	28.7	Coarse Sand	3.43
#20	0.85	25.0		
#40	0.43	20.9	Medium Sand	7.82
#60	0.25	17.9		
#100	0.15	15.0		
#200	0.075	12.3	Fine Sand	8.57

Hydrometer Analysis

(mm)	%Finer		
0.037	10.9		
0.023	10.4		
0.013	9.2	Fines	
0.0096	8.8	Silt or Clay	12.35
0.0068	7.9		
0.0033	7.3		
0.0014	7.1		

PLASTICITY CHART



ATTERBERG LIMITS

M.	LL	PL	PI	SpG (assumed)
–	–	–	–	2.70

DESCRIPTION: Dark yellowish brown (10 YR 6/6)

USCS: –

TECH	MGC
DATE	3/14/2005
REVIEW	NG

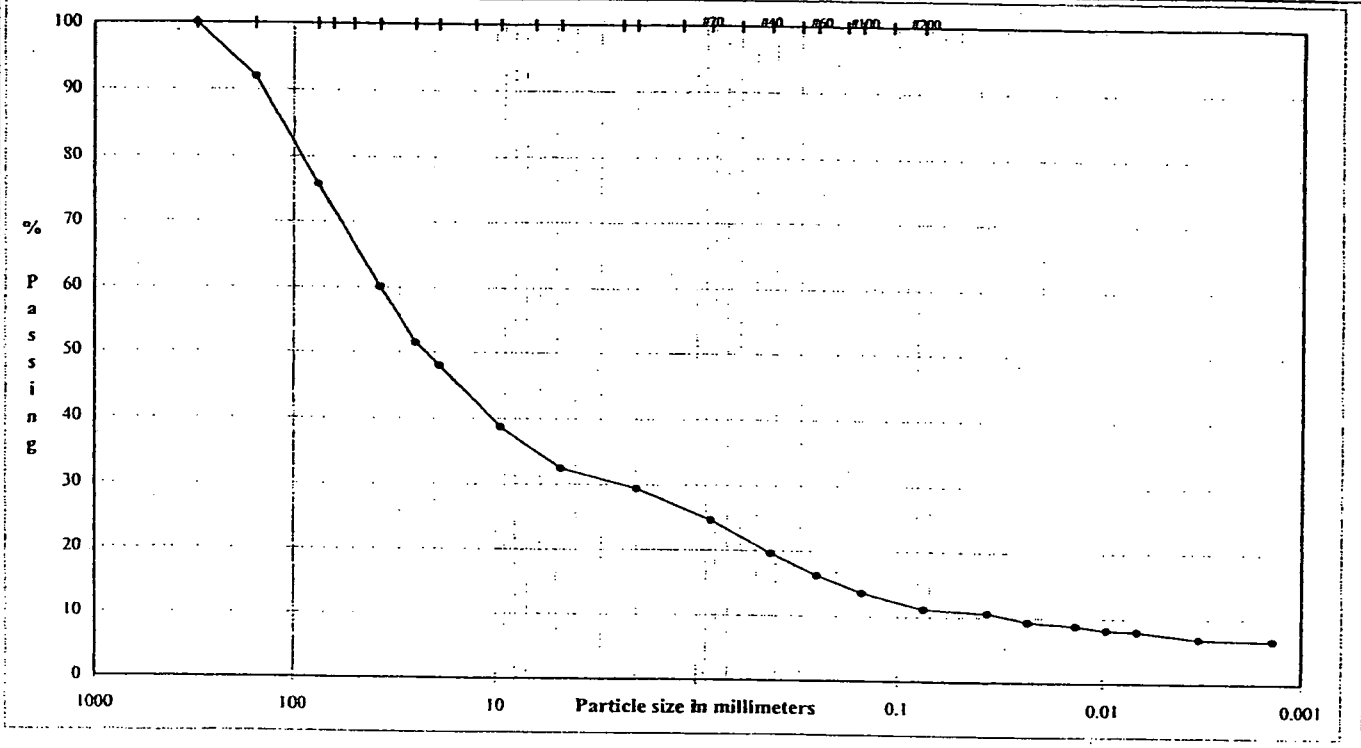
March-05

043-2246-0002

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318, D5519

PROJECT NAME: **Rocky Flats/Field & Lab Testing/CO**
SAMPLE ID: **AM 22-03** Depth: **0-22"**
TYPE: **Pail**



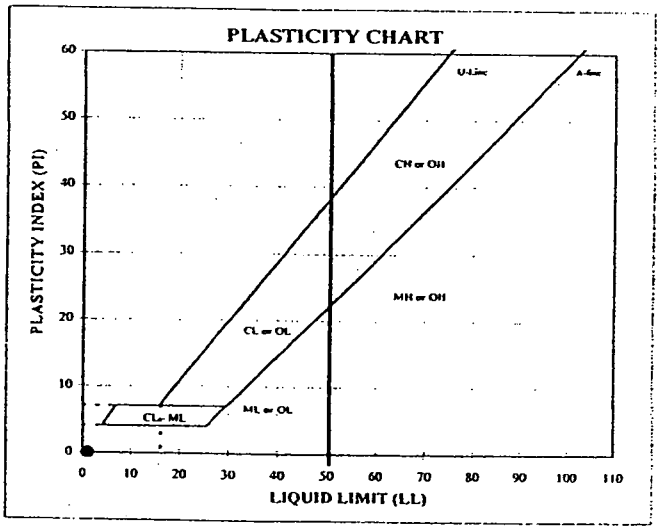
COBBLES	GRAVEL		SAND			FINES
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
12.0"	304.8	100.0	Cobbles	24.28
12.0"	304.8	100.0		
6.0"	154.2	91.9		
3.0"	75.0	75.7		
1.5"	37.5	60.1		
1.0"	25.0	51.5	Coarse Gravel	27.76
0.75"	19.0	48.0		
0.375"	9.5	38.7		
#4	4.8	32.5	Fine Gravel	15.50
#10	2.00	29.4	Coarse Sand	3.04
#20	0.85	24.6		
#40	0.43	19.6	Medium Sand	9.83
#60	0.25	16.3		
#100	0.15	13.6		
#200	0.075	11.2	Fine Sand	8.41

Hydrometer Analysis

(mm)	%Finer		
0.037	10.6		
0.023	9.3		
0.014	8.8	Fines	
0.0096	8.1	Silt or Clay	11.17
0.0068	8.0		
0.0033	6.8		
0.0014	6.7		



ATTERBERG LIMITS

M_c	LL	PL	PI	SpG (assumed)
–	–	–	–	2.70

DESCRIPTION: Dark yellowish orange (10 YR 6/6)

USCS: –

TECH	MGC
DATE	3/14/2005
REVIEW	NG

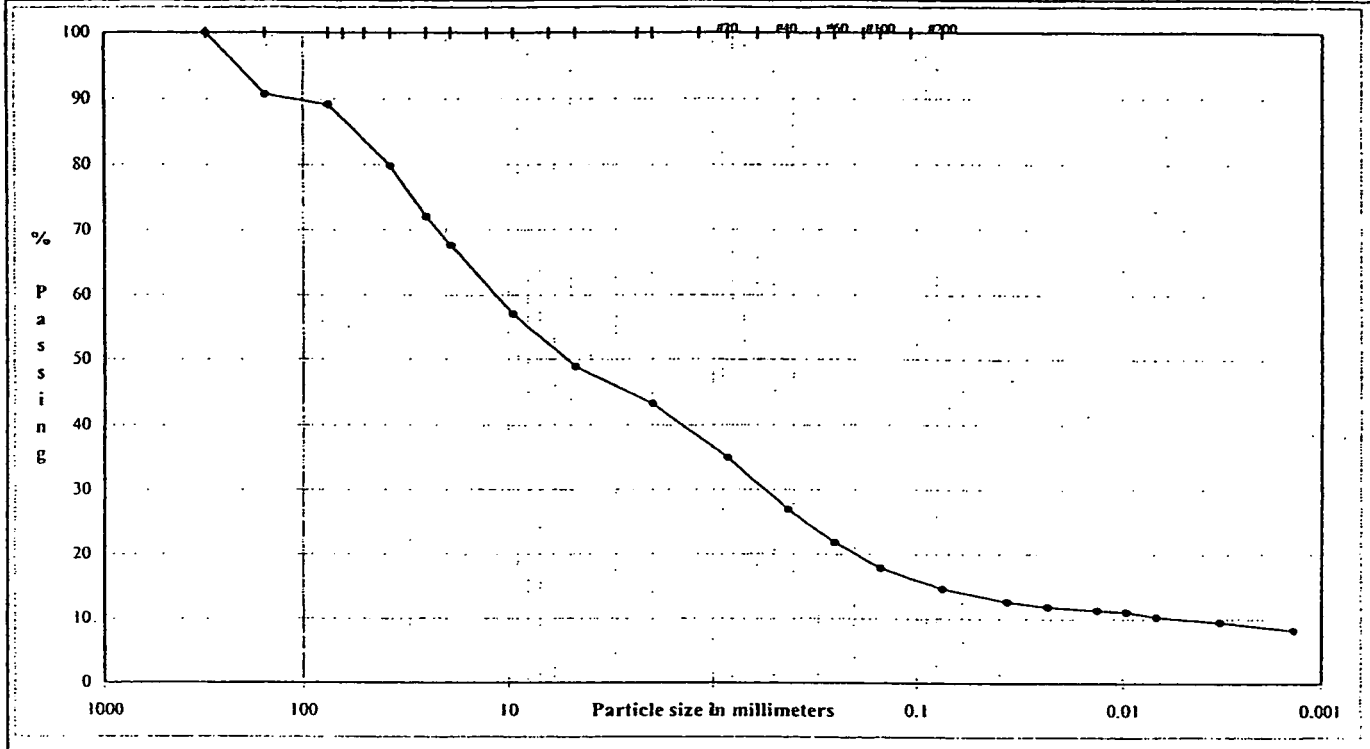
March-05

043-2246-0002

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318, D5519

PROJECT NAME: Rocky Flats/Field & Lab Testing/CO
SAMPLE ID: AM 22-04 Depth: 0-22"
TYPE: Pail



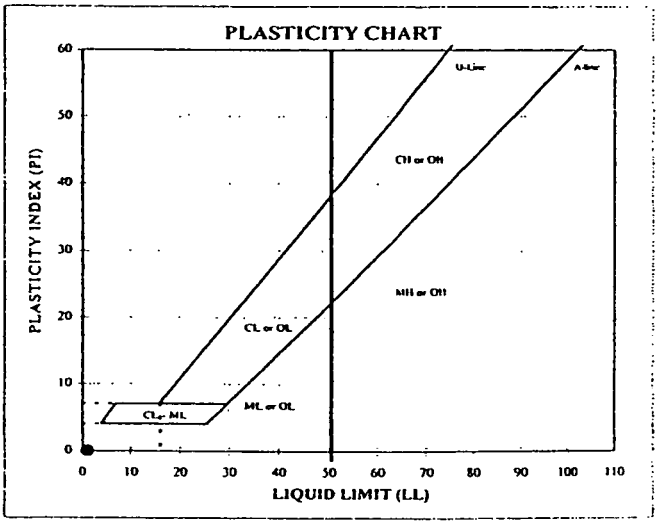
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
12.0"	304.8	100.0	Cobbles	10.86
12.0"	304.8	100.0		
6.0"	154.2	90.7		
3.0"	75.0	89.1		
1.5"	37.5	79.8		
1.0"	25.0	72.0	Coarse Gravel	21.57
0.75"	19.0	67.6		
0.375"	9.5	57.0		
#4	4.8	48.8	Fine Gravel	18.73
#10	2.00	43.2	Coarse Sand	5.63
#20	0.85	34.9		
#40	0.43	26.9	Medium Sand	16.31
#60	0.25	21.8		
#100	0.15	17.8		
#200	0.075	14.6	Fine Sand	12.34

Hydrometer Analysis

(mm)	%Finer		
0.037	12.6		
0.023	11.8		
0.014	11.3	Fines	
0.0096	11.1	Silt or Clay	14.57
0.0068	10.3		
0.0033	9.5		
0.0014	8.2		



ATTERBERG LIMITS

M_c	LL	PL	PI	SpG (assumed)
--	--	--	--	2.70

DESCRIPTION: Dark yellowish orange (10 YR 6/6)

USCS: --

TECH	MGC
DATE	3/15/2005
REVIEW	NG

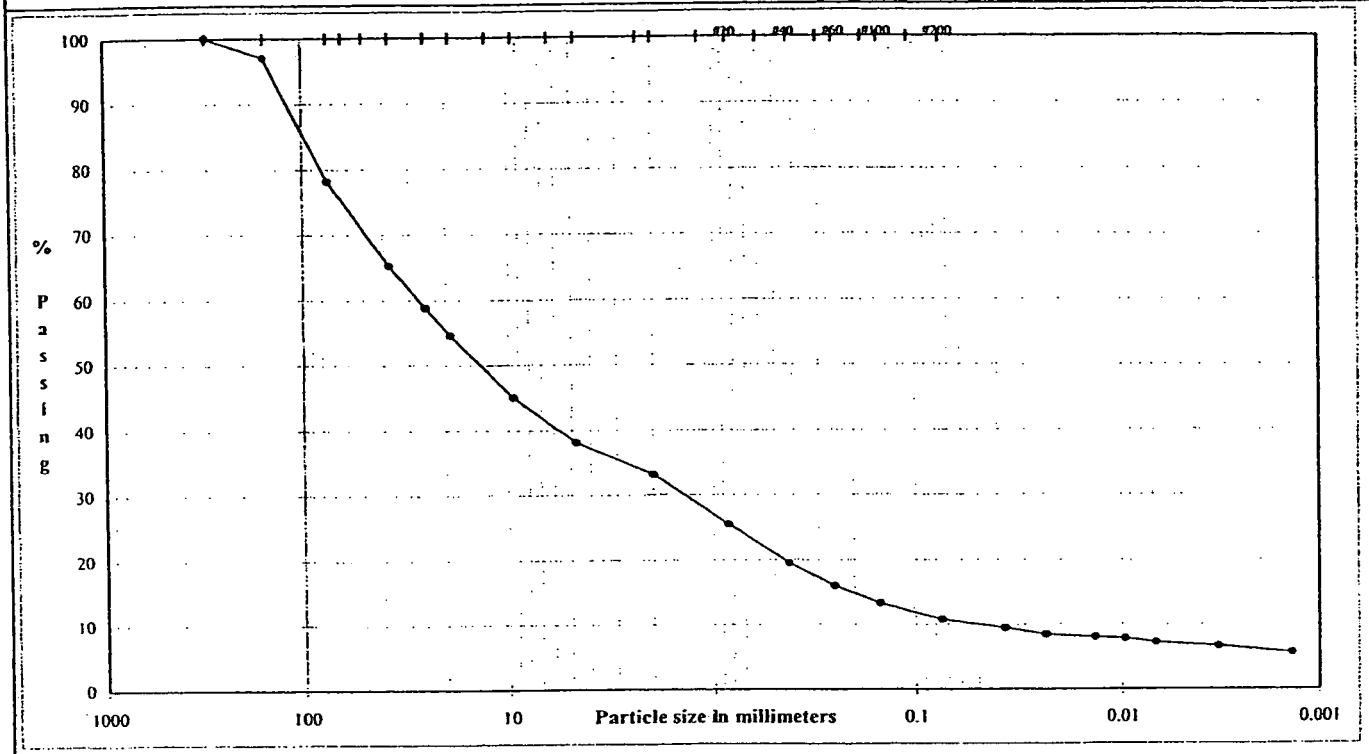
March-05

043-2246-0002

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318, D5519

PROJECT NAME: Rocky Flats/Field & Lab Testing/CO
SAMPLE ID: AM 22-05 Depth: 0-22"
TYPE: Pail



COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

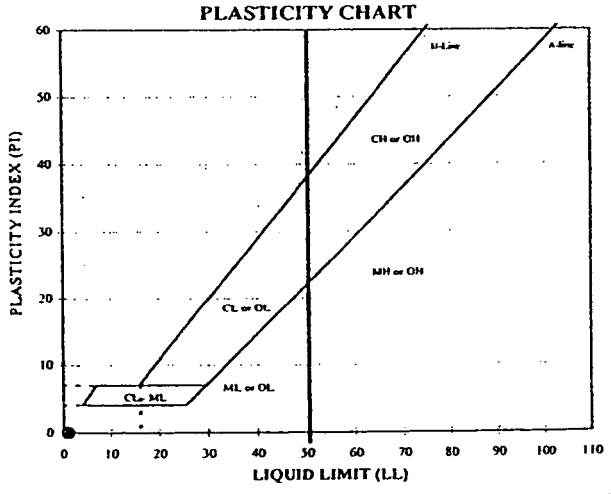
U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
12.0"	304.8	100.0	Cobbles	21.78
12.0"	304.8	100.0		
6.0"	154.2	97.1		
3.0"	75.0	78.2		
1.5"	37.5	65.2		
1.0"	25.0	58.8	Coarse Gravel	23.68
0.75"	19.0	54.5		
0.375"	9.5	45.0		
#4	4.8	38.1	Fine Gravel	16.43
#10	2.00	33.1	Coarse Sand	4.95
#20	0.85	25.4		
#40	0.43	19.5	Medium Sand	13.64
#60	0.25	15.9		
#100	0.15	13.3		
#200	0.075	10.8	Fine Sand	8.75

Hydrometer Analysis

(mm)	%Finer		
0.037	9.4		
0.024	8.4		
0.014	8.0	Fines	
0.0097	7.8	Silt or Clay	10.76
0.0068	7.2		
0.0033	6.6		
0.0014	5.6		

PLASTICITY CHART



ATTERBERG LIMITS

M_c	LL	PL	PI	SpG (assumed)
–	–	–	–	2.70

DESCRIPTION: Dark yellowish orange (10 YR 6/6)

USCS: –

TECH: MGC
DATE: 3/15/2005
REVIEW: NG

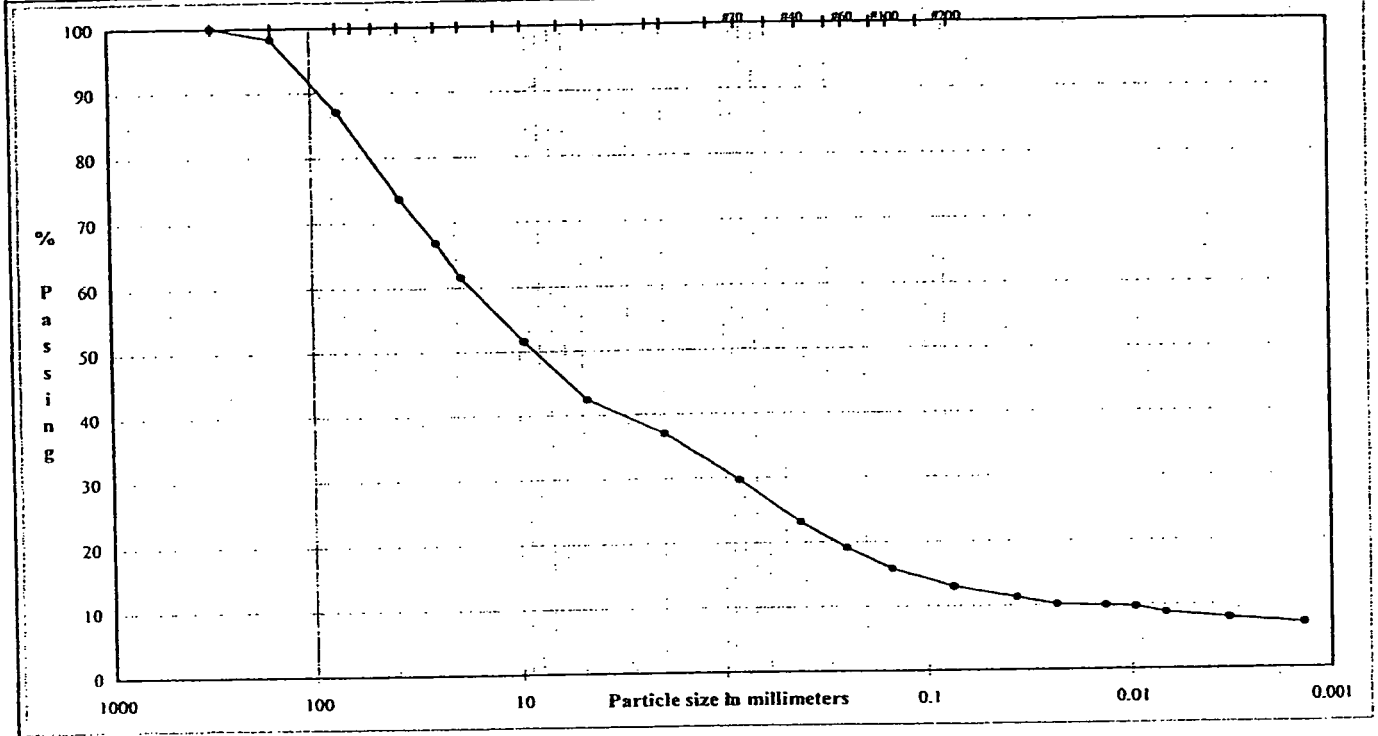
March-05

043-2246-0002

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318, D5519

PROJECT NAME: Rocky Flats/Field & Lab Testing/CO
SAMPLE ID: AM 22-06 Depth: 0-22"
TYPE: Pail



COBBLES	GRAVEL		SAND			FINES
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay

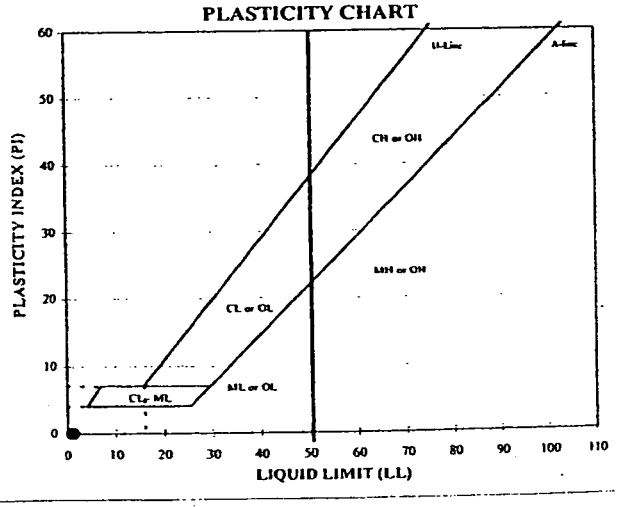
U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
12.0"	304.8	100.0	Cobbles	12.98
12.0"	304.8	100.0		
6.0"	154.2	98.3		
3.0"	75.0	87.0		
1.5"	37.5	73.7		
1.0"	25.0	66.8	Coarse Gravel	25.49
0.75"	19.0	61.5		
0.375"	9.5	51.5		
#4	4.8	42.4	Fine Gravel	19.12
#10	2.00	37.0	Coarse Sand	5.43
#20	0.85	29.7		
#40	0.43	23.2	Medium Sand	13.82
#60	0.25	19.1		
#100	0.15	15.8		
#200	0.075	12.9	Fine Sand	10.21

Hydrometer Analysis

(mm)	%Finer		
0.037	11.3		
0.023	10.1		
0.014	9.9	Fines	
0.0096	9.7	Silt or Clay	12.94
0.0068	8.8		
0.0033	7.9		
0.0014	7.0		

PLASTICITY CHART



ATTERBERG LIMITS

M_c	LL	PL	PI	SpG (assumed)
--	--	--	--	2.70

DESCRIPTION: Dark yellowish orange (10 YR 6/6)

USCS: --

TECH: MGC
DATE: 3/15/2005
REVIEW: NG

March-05

043-2246-0002

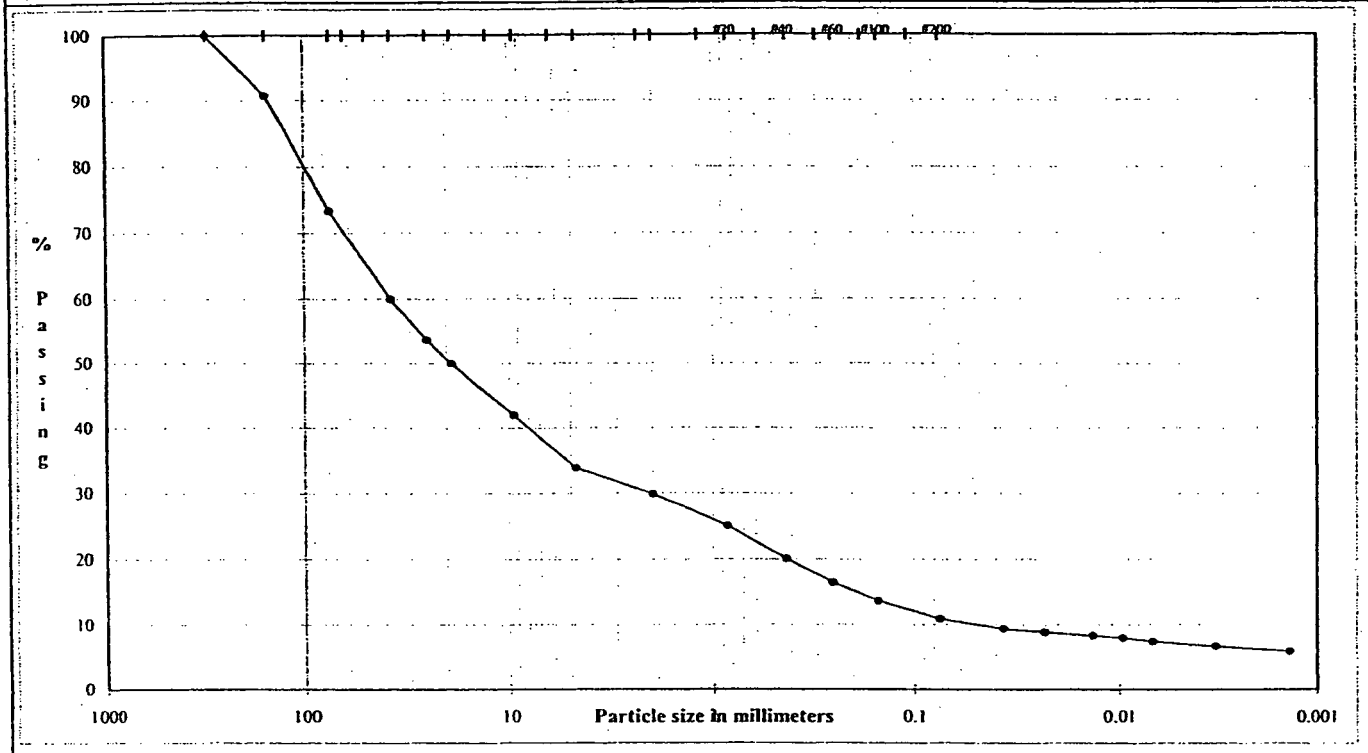
PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318, D5519

PROJECT NAME: **Rocky Flats/Field & Lab Testing/CO**

SAMPLE ID: **AM 22-07** Depth: **0-22"**

TYPE: **Pail**



	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
COBBLES	GRAVEL		SAND			FINES

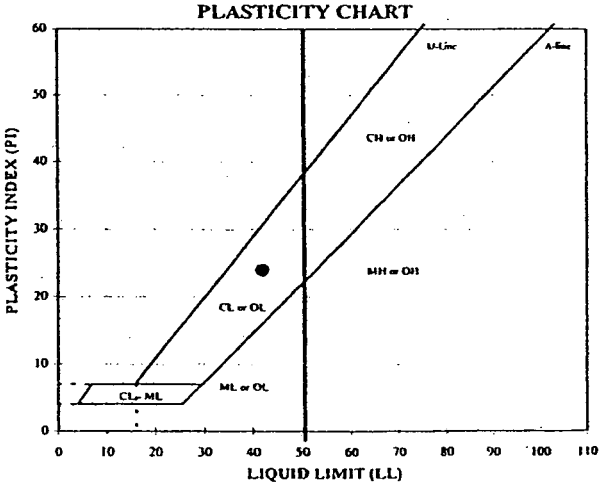
U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
12.0"	304.8	100.0	Cobbles	26.70
12.0"	304.8	100.0		
6.0"	154.2	90.7		
3.0"	75.0	73.3		
1.5"	37.5	59.9		
1.0"	25.0	53.6	Coarse Gravel	23.36
0.75"	19.0	49.9		
0.375"	9.5	41.9		
#4	4.8	33.9	Fine Gravel	16.08
#10	2.00	29.9	Coarse Sand	3.97
#20	0.85	25.1		
#40	0.43	20.0	Medium Sand	9.87
#60	0.25	16.4		
#100	0.15	13.6		
#200	0.075	10.8	Fine Sand	9.18

Hydrometer Analysis

(mm)	%Finer		
0.037	9.4		
0.023	8.8		
0.014	8.3	Fines	
0.0096	7.9	Silt or Clay	10.84
0.0068	7.3		
0.0033	6.6		
0.0014	5.9		

PLASTICITY CHART



ATTERBERG LIMITS

M_c	LL	PL	PI	SpG (assumed)
–	42	18	24	2.70

DESCRIPTION: Moderate yellowish orange (10 YR 5/4) well-graded gravel with clay and sand

USCS: GW-GC

TECH	MGC
DATE	3/15/2005
REVIEW	NG

March-05

043-2246-0002

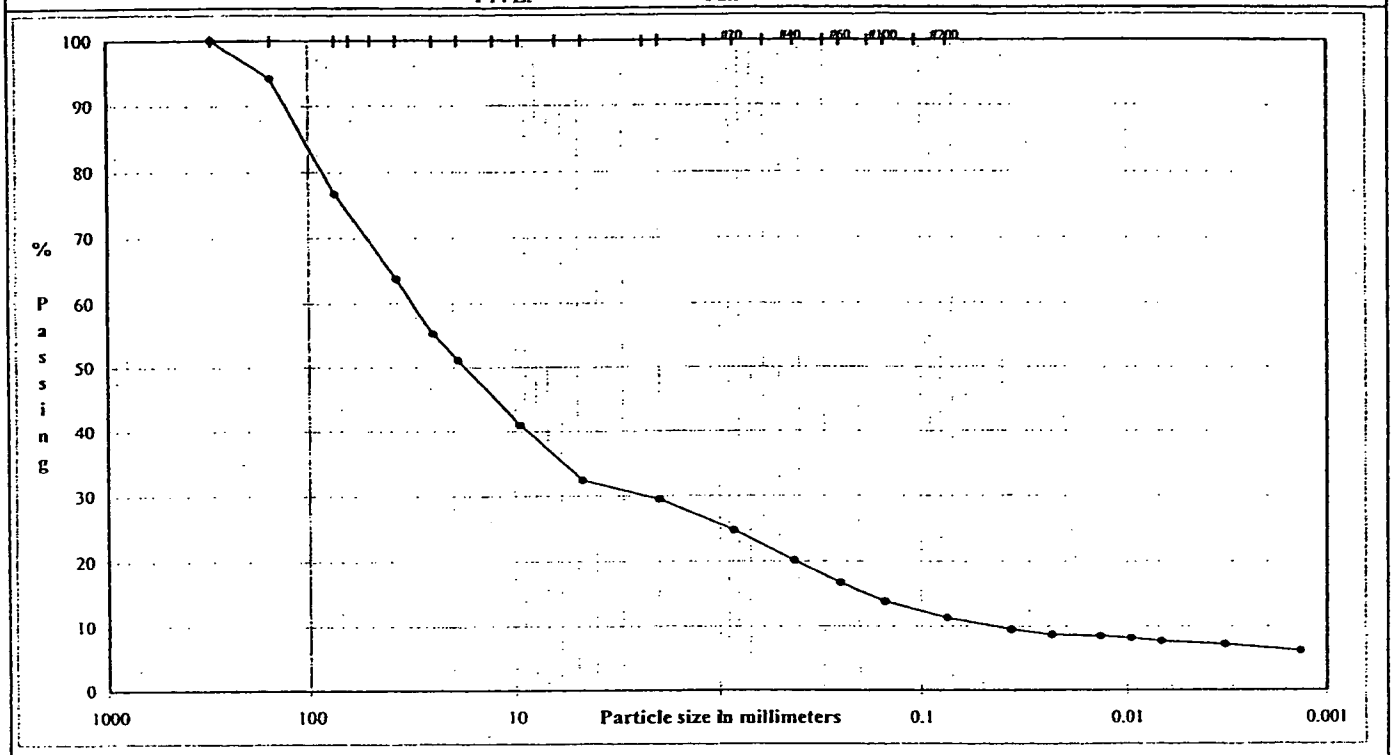
PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318, D5519

PROJECT NAME: **Rocky Flats/Field & Lab Testing/CO**

SAMPLE ID: **AM 22-08** Depth: **0-22"**

TYPE: **Pail**



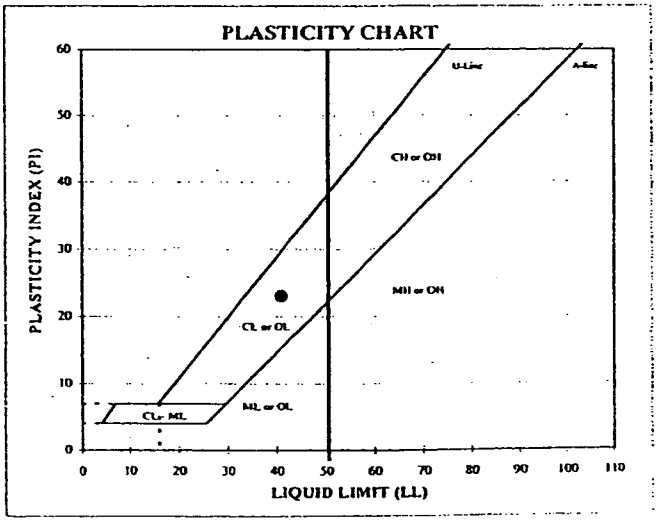
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
12.0"	304.8	100.0	Cobbles	23.35
12.0"	304.8	100.0		
6.0"	154.2	94.2		
3.0"	75.0	76.7		
1.5"	37.5	63.7		
1.0"	25.0	55.3	Coarse Gravel	25.57
0.75"	19.0	51.1		
0.375"	9.5	41.0		
#4	4.8	32.4	Fine Gravel	18.67
#10	2.00	29.5	Coarse Sand	2.90
#20	0.85	24.7		
#40	0.43	20.1	Medium Sand	9.39
#60	0.25	16.7		
#100	0.15	13.8		
#200	0.075	11.3	Fine Sand	8.79

Hydrometer Analysis

(mm)	%Finer		
0.036	9.5		
0.023	8.7		
0.013	8.5	Fines	
0.0095	8.2	Silt or Clay	11.32
0.0068	7.7		
0.0033	7.2		
0.0014	6.2		



ATTERBERG LIMITS

M_c	LL	PL	PI	SpG (assumed)
--	41	18	23	2.70

DESCRIPTION: Dark yellowish orange (10 YR 6/6/) well-graded gravel with clay and sand

USCS: GW-GC

TECH	MGC
DATE	3/15/2005
REVIEW	NG

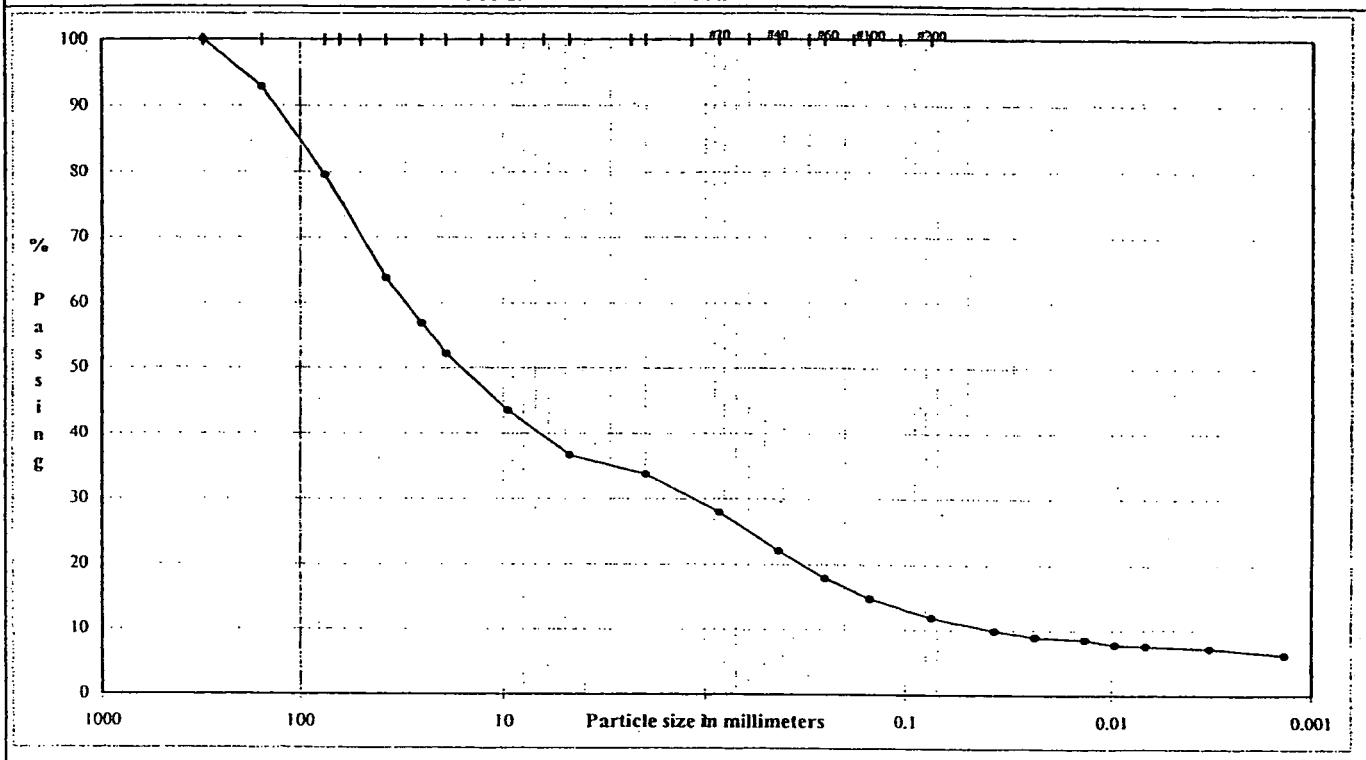
March-05

043-2246-0002

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318, D5519

PROJECT NAME: Rocky Flats/Field & Lab Testing/CO
SAMPLE ID: AM 22-09 Depth: 0-22"
TYPE: Pail



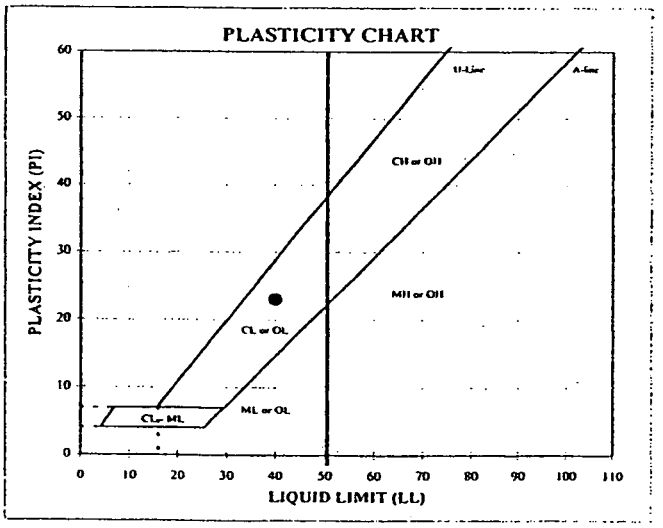
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
COBBLES	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
12.0"	304.8	100.0	Cobbles	20.46
12.0"	304.8	100.0		
6.0"	154.2	92.8		
3.0"	75.0	79.5		
1.5"	37.5	63.8		
1.0"	25.0	56.9	Coarse Gravel	27.40
0.75"	19.0	52.1		
0.375"	9.5	43.5		
#4	4.8	36.7	Fine Gravel	15.49
#10	2.00	33.7	Coarse Sand	2.93
#20	0.85	27.9		
#40	0.43	22.1	Medium Sand	11.67
#60	0.25	17.9		
#100	0.15	14.8		
#200	0.075	11.9	Fine Sand	10.19

Hydrometer Analysis

(mm)	%Finer		
0.037	9.9		
0.023	8.9		
0.014	8.5	Fines	
0.0096	7.7	Silt or Clay	11.86
0.0068	7.5		
0.0033	7.2		
0.0014	6.2		



ATTERBERG LIMITS

M_c	LL	PL	PI	SpG (assumed)
--	40	17	23	2.70

DESCRIPTION: Dark yellowish orange (10 YR 6/6)well-graded gravel with clay and sand

USCS: GW-GC

TECH	MGC
DATE	3/15/2005
REVIEW	NG

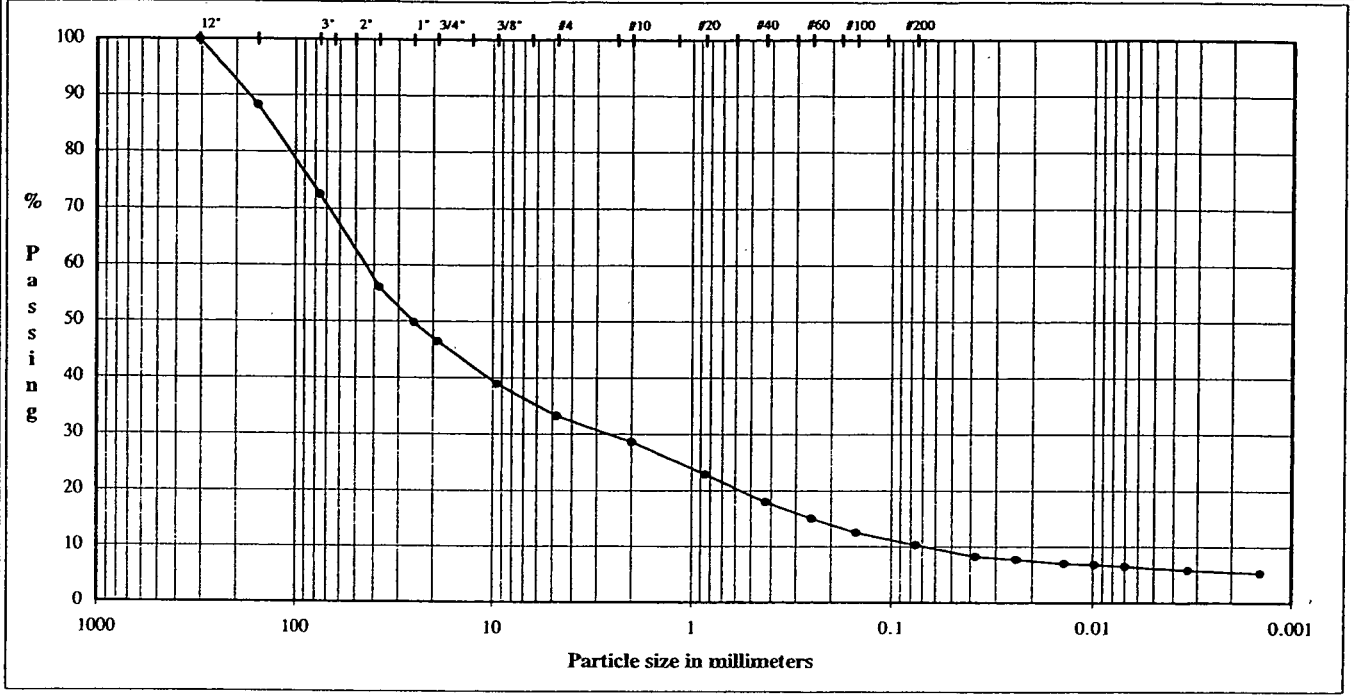
March-05

043-2246-0002

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318, D5519

PROJECT NAME: Rocky Flats/Field & Lab Testing/CO
SAMPLE ID: AM 22-10 Depth: --
TYPE: Pail



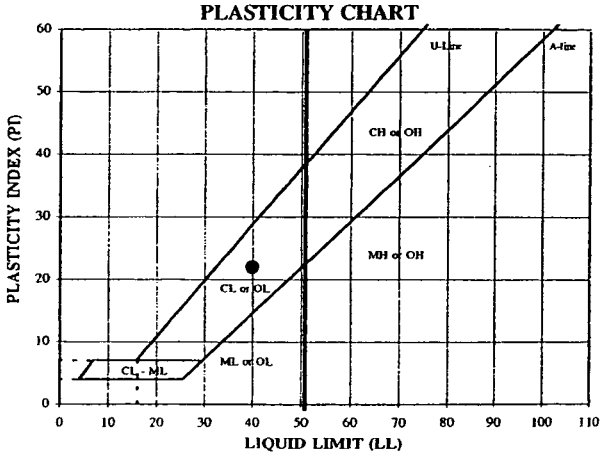
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
12.0"	304.8	100.0	Cobbles	27.51
12.0"	304.8	100.0		
6.0"	154.2	88.3		
3.0"	75.0	72.5		
1.5"	37.5	56.1		
1.0"	25.0	49.9	Coarse Gravel	25.99
0.75"	19.0	46.5		
0.375"	9.5	38.9		
#4	4.8	33.2	Fine Gravel	13.33
#10	2.00	28.6	Coarse Sand	4.60
#20	0.85	22.9		
#40	0.43	18.0	Medium Sand	10.60
#60	0.25	15.0		
#100	0.15	12.6		
#200	0.075	10.3	Fine Sand	7.63

Hydrometer Analysis

(mm)	%Finer		
0.038	8.3		
0.024	7.8		
0.014	7.1	Fines	
0.0098	6.9	Silt or Clay	10.35
0.0069	6.5		
0.0033	5.8		
0.0014	5.3		



ATTERBERG LIMITS

M_c	LL	PL	PI	SpG (assumed)
10.6	40	18	22	2.70

DESCRIPTION: Moderate yellowish brown (10 YR 5/4) poorly graded gravel with clay and sand

USCS: GP-GC

TECH: AGE
DATE: 04/28/2005
REVIEW: MB

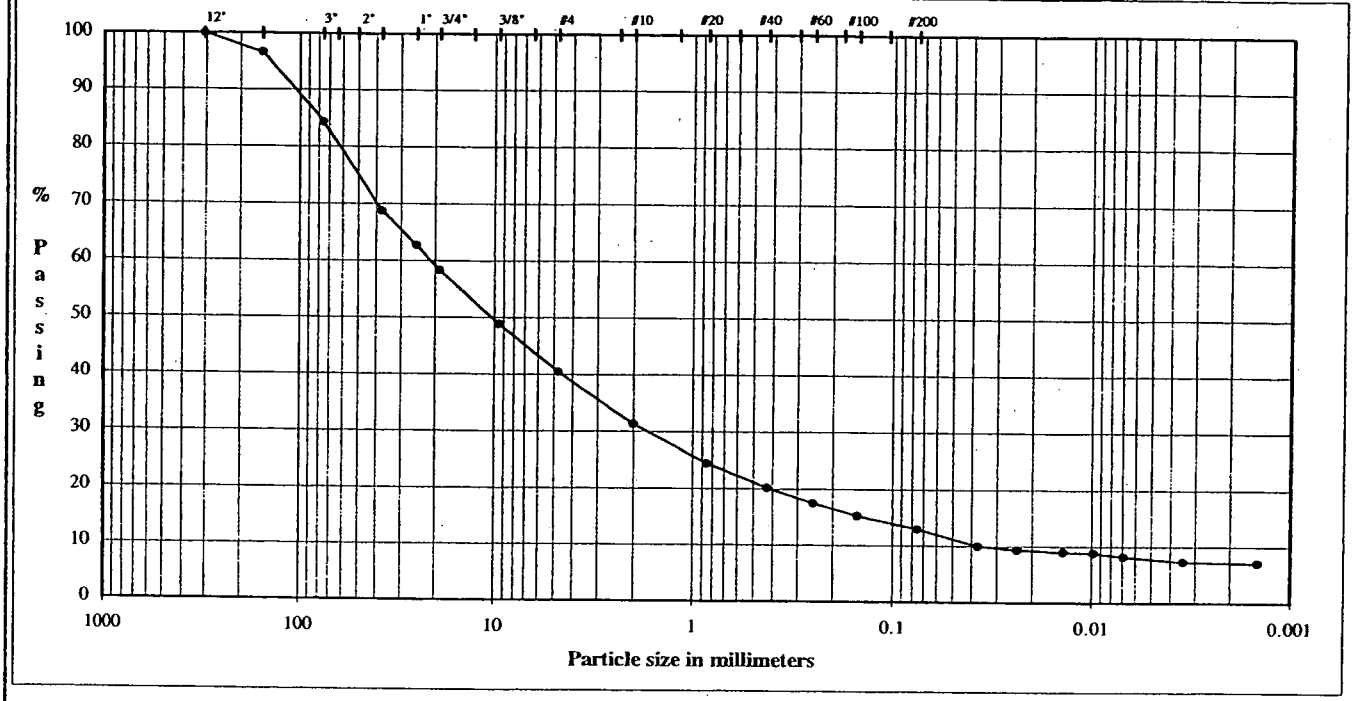
March-05

043-2246-0002

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318, D5519

PROJECT NAME: Rocky Flats/Field & Lab Testing/CO
SAMPLE ID: AM 22-11 Depth: –
TYPE: Pail



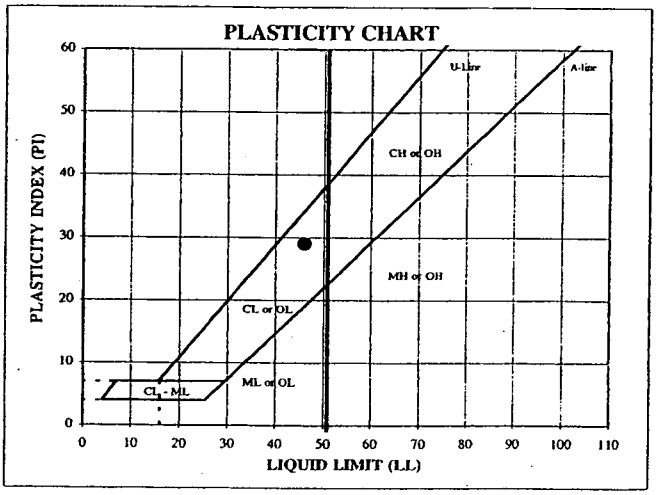
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
12.0"	304.8	100.0	Cobbles	15.64
12.0"	304.8	100.0		
6.0"	154.2	96.6		
3.0"	75.0	84.4		
1.5"	37.5	68.7		
1.0"	25.0	62.7	Coarse Gravel	26.05
0.75"	19.0	58.3		
0.375"	9.5	48.9		
#4	4.8	40.5	Fine Gravel	17.78
#10	2.00	31.4	Coarse Sand	9.10
#20	0.85	24.5		
#40	0.43	20.2	Medium Sand	11.23
#60	0.25	17.5		
#100	0.15	15.3		
#200	0.075	13.1	Fine Sand	7.14

Hydrometer Analysis

(mm)	%Finer		
0.037	10.1		
0.024	9.4		
0.014	9.0	Fines	
0.0098	8.8	Silt or Clay	13.06
0.0069	8.2		
0.0035	7.3		
0.0015	7.1		



ATTERBERG LIMITS

M_c	LL	PL	PI	SpG (assumed)
10.1	46	17	29	2.70

DESCRIPTION: Moderate yellowish brown (10 YR 5/4) clayey gravel with sand

USCS: GC

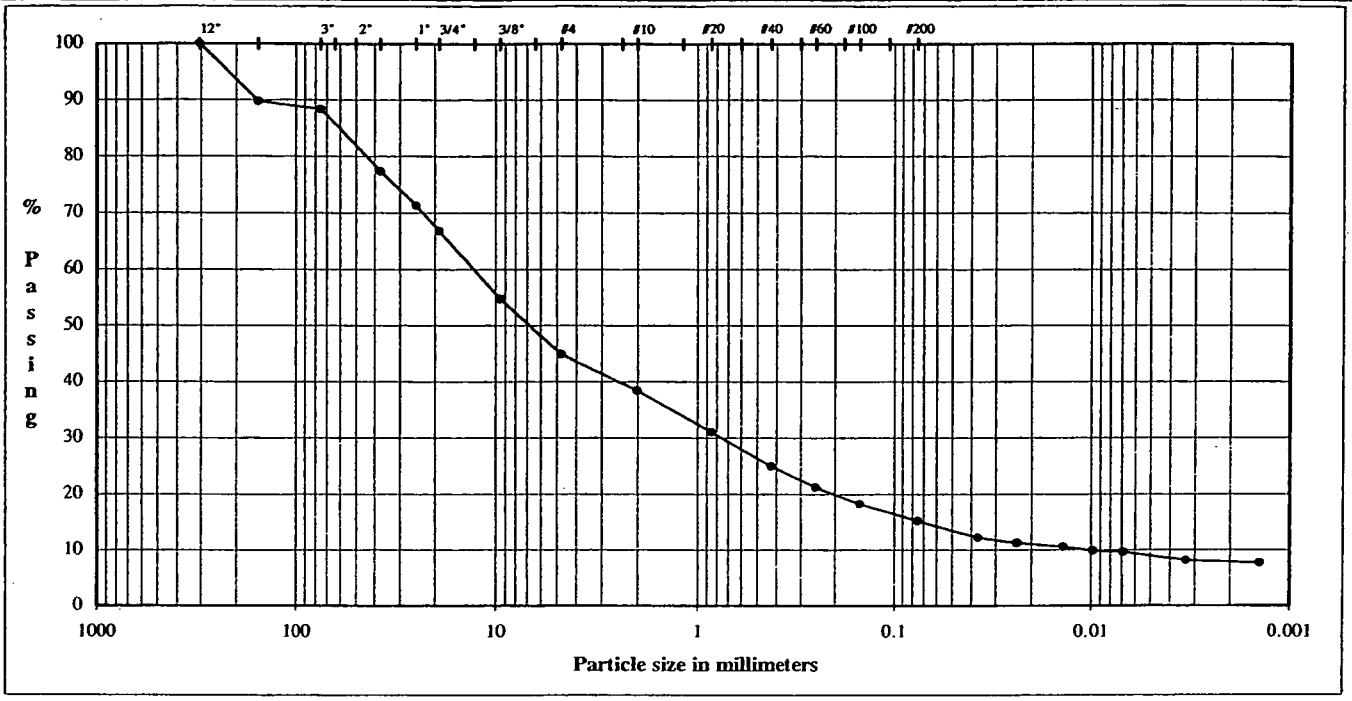
TECH	MKS
DATE	04/28/2005
REVIEW	MB

March-05 043-2246-0002

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318, D5519

PROJECT NAME: Rocky Flats/Field & Lab Testing/CO
SAMPLE ID: AM 22-12 Depth: –
TYPE: Pail



COBBLES	Coarse GRAVEL	Fine GRAVEL	Coarse SAND	Medium SAND	Fine SAND	Silt or Clay FINES

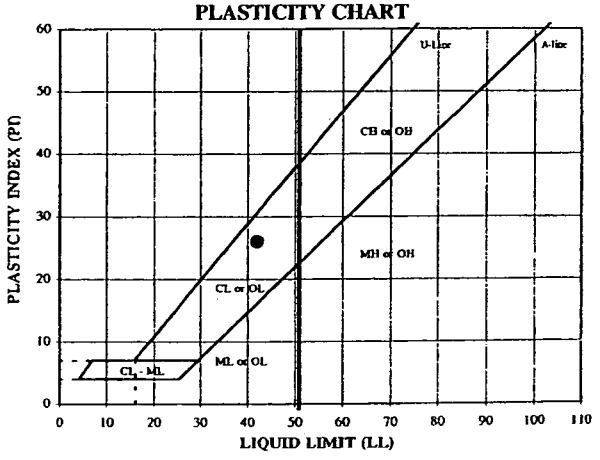
U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
12.0"	304.8	100.0	Cobbles	11.62
12.0"	304.8	100.0		
6.0"	154.2	89.8		
3.0"	75.0	88.4		
1.5"	37.5	77.4		
1.0"	25.0	71.3	Coarse Gravel	21.55
0.75"	19.0	66.8		
0.375"	9.5	54.7		
#4	4.8	44.9	Fine Gravel	21.89
#10	2.00	38.5	Coarse Sand	6.45
#20	0.85	31.1		
#40	0.43	25.0	Medium Sand	13.46
#60	0.25	21.2		
#100	0.15	18.3		
#200	0.075	15.2	Fine Sand	9.80

Hydrometer Analysis

(mm)	%Finer		
0.037	12.2		
0.024	11.3		
0.014	10.6	Fines Silt or Clay	15.24
0.0098	9.9		
0.0069	9.6		
0.0033	8.2		
0.0014	7.7		

PLASTICITY CHART



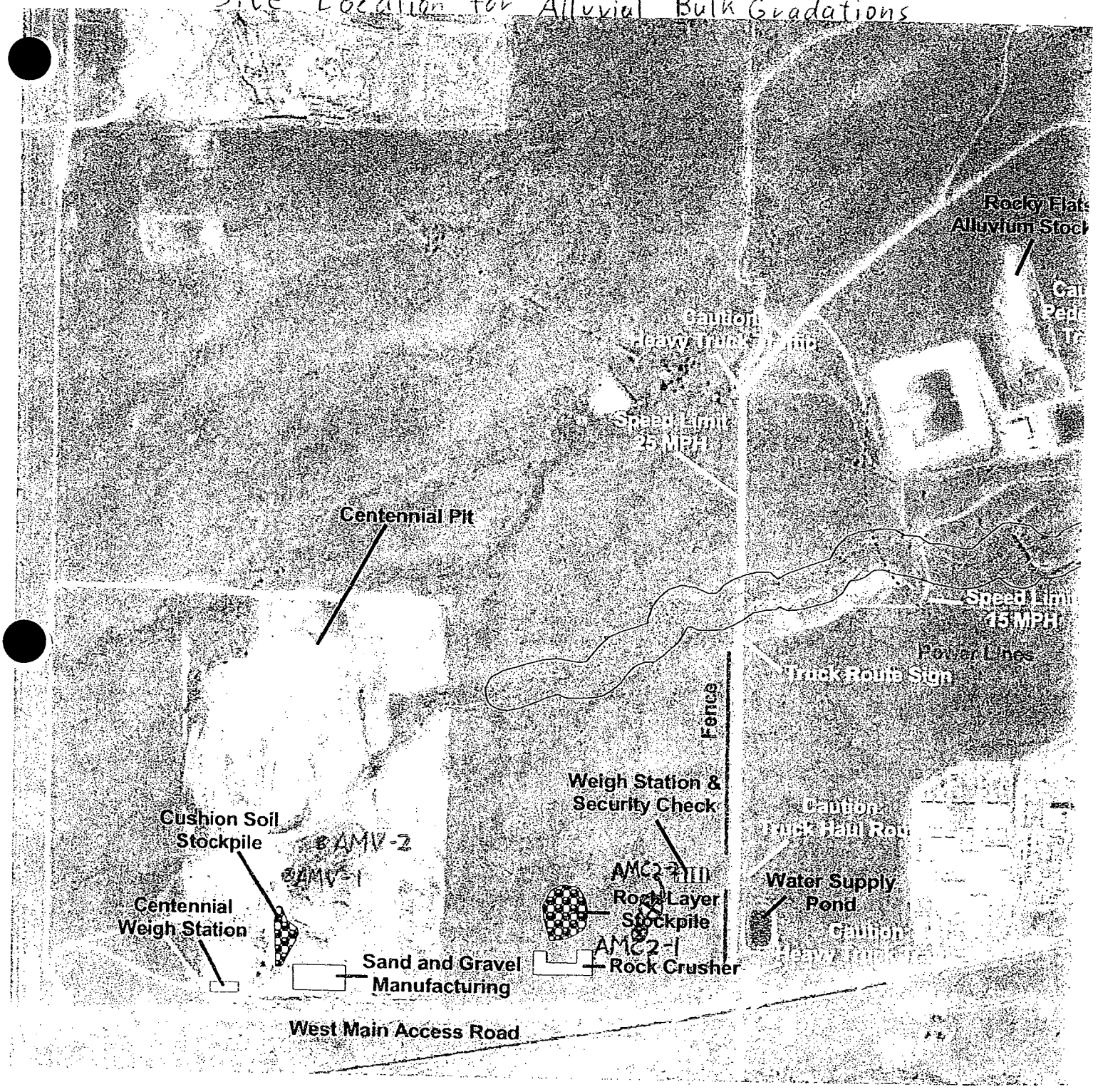
ATTERBERG LIMITS

M,	LL	PL	PI	SpG (assumed)
9.4	42	16	26	2.70

DESCRIPTION: Moderate yellowish brown (10 YR 5/4) clayey gravel with sand
USCS: GC

TECH: AGE
DATE: 04/28/2005
REVIEW: MB

Centennial
Site Location for Alluvial Bulk Gradations



resent Landfill
celerated Action

N

8 Sample Location for Bulk gradation

Explanation:

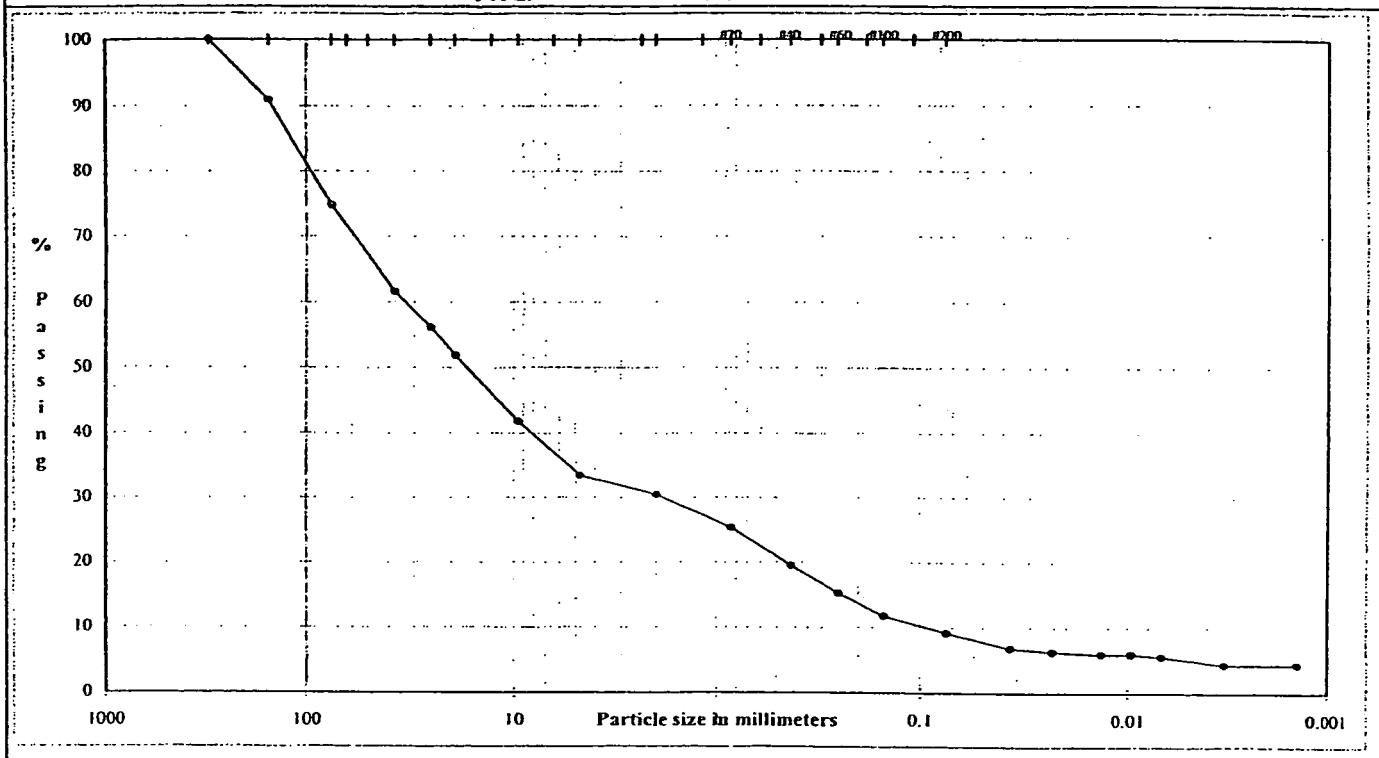
Traffic Control Signs
Haul Route
Power Lines
Preble's Protection Area

March-05 043-2246-0002

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318, D5519

PROJECT NAME: **Rocky Flats/Field & Lab Testing/CO**
SAMPLE ID: **AMV-1** Depth:
TYPE: **Pail**



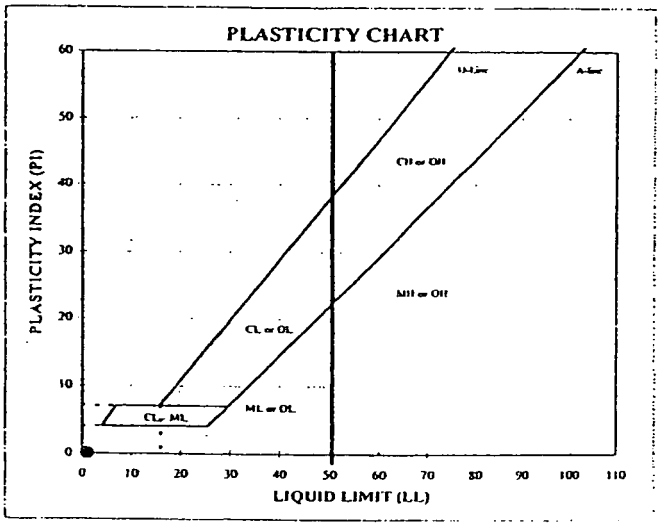
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
12.0"	304.8	100.0	Cobbles	25.31
12.0"	304.8	100.0		
6.0"	154.2	90.9		
3.0"	75.0	74.7		
1.5"	37.5	61.6		
1.0"	25.0	56.1	Coarse Gravel	22.93
0.75"	19.0	51.8		
0.375"	9.5	41.8		
#4	4.8	33.4	Fine Gravel	18.37
#10	2.00	30.4	Coarse Sand	3.00
#20	0.85	25.3		
#40	0.43	19.5	Medium Sand	10.91
#60	0.25	15.3		
#100	0.15	11.8		
#200	0.075	9.1	Fine Sand	10.33

Hydrometer Analysis

(mm)	%Finer		
0.037	6.8		
0.023	6.3		
0.014	5.9	Fines	
0.0096	5.9	Silt or Clay	9.14
0.0068	5.6		
0.0033	4.4		
0.0014	4.4		



ATTERBERG LIMITS

M_c	LL	PL	PI	SpG (assumed)
–	–	–	–	2.70

DESCRIPTION: Moderate yellowish brown (10 YR 5/4)

USCS: –

TECH: MKS
DATE: 3/18/2005
REVIEW: NG

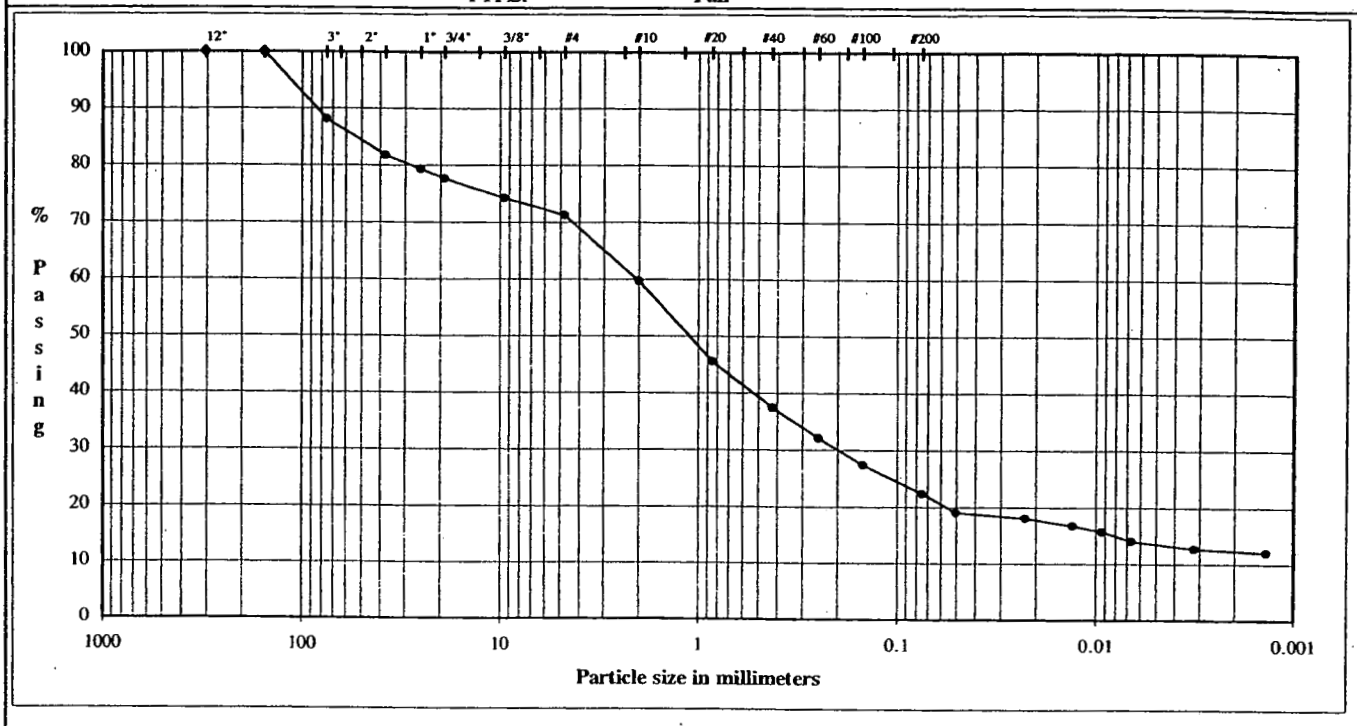
May-05

043-2246-0002

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318, D5519

PROJECT NAME: Rocky Flats/Field & Lab Testing/CO
SAMPLE ID: AMC 2-1 Depth: –
TYPE: Pail



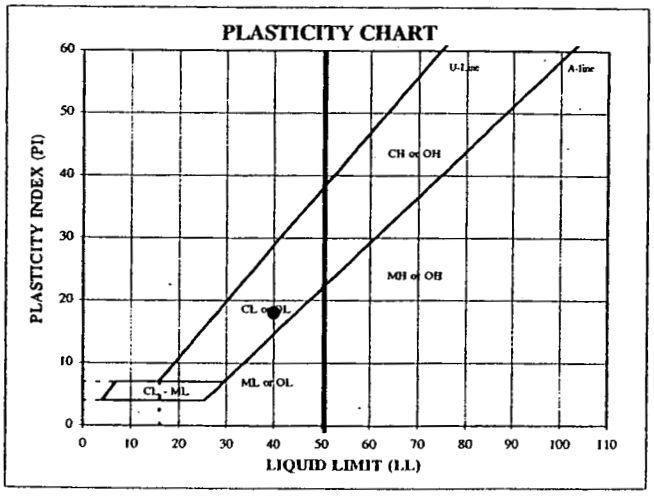
COBBLES	Coarse GRAVEL	Fine GRAVEL	Coarse SAND	Medium SAND	Fine SAND	Silt or Clay FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Particle Size Percentage
12.0"	304.8	100.0		
12.0"	304.8	100.0	Cobbles	11.82
12.0"	304.8	100.0		
6.0"	154.2	100.0		
3.0"	75.0	88.2		
1.5"	37.5	81.8		
1.0"	25.0	79.3	Coarse Gravel	10.54
0.75"	19.0	77.6		
0.375"	9.5	74.2		
#4	4.8	71.2	Fine Gravel	6.45
#10	2.00	59.6	Coarse Sand	11.63
#20	0.85	45.5		
#40	0.43	37.4	Medium Sand	22.14
#60	0.25	32.1		
#100	0.15	27.4		
#200	0.075	22.4	Fine Sand	15.08

Hydrometer Analysis

(mm)	%Finer		
0.050	19.1		
0.023	18.1		
0.013	16.7	Fines	
0.0093	15.7	Silt or Clay	22.35
0.0067	14.1		
0.0032	12.7		
0.0014	12.0		



ATTERBERG LIMITS

M_c	LL	PL	PI	SpG (assumed)
9.2	40	22	18	2.70

DESCRIPTION: Reddish brown (5 YR 4/4) clayey grave with sand

USCS: SC

TECH: JR
DATE: 05/05/2005
REVIEW: MB

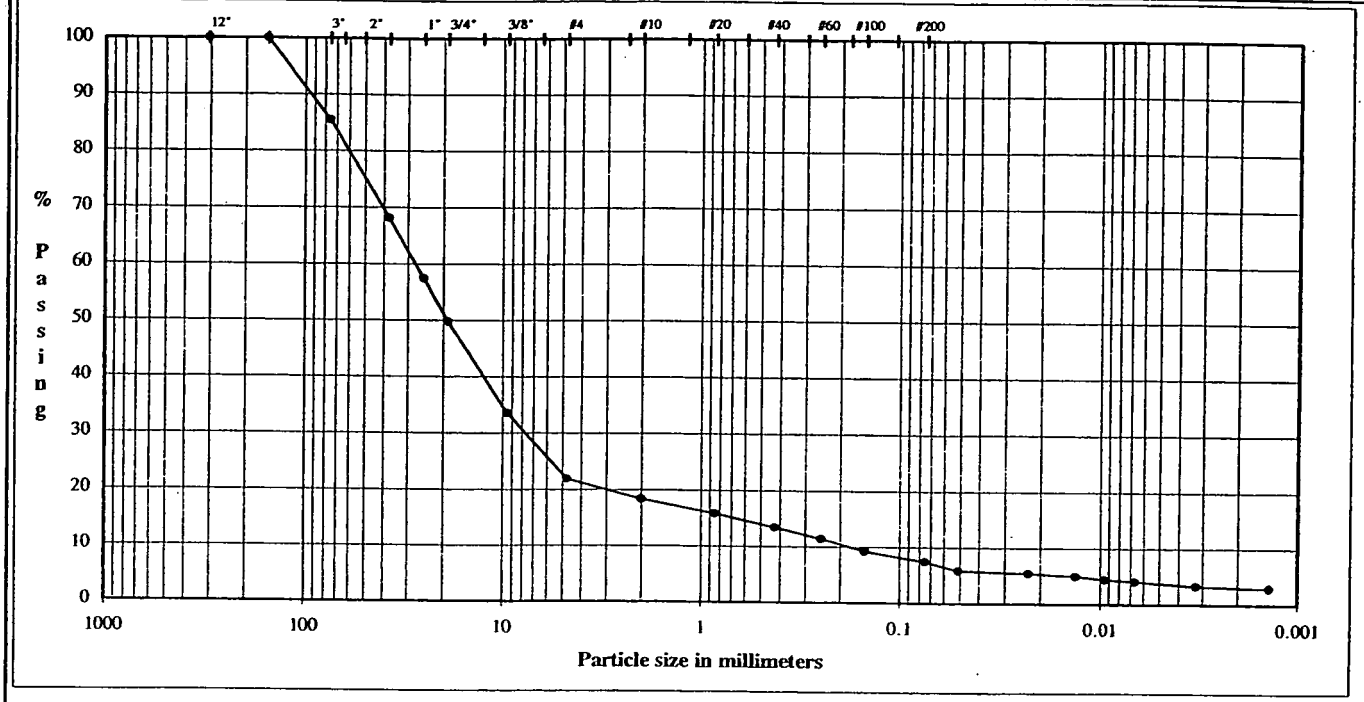
May-05

043-2246-0002

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318, D5519

PROJECT NAME: Rocky Flats/Field & Lab Testing/CO
SAMPLE ID: AMC 2-2 Depth: --
TYPE: Pail



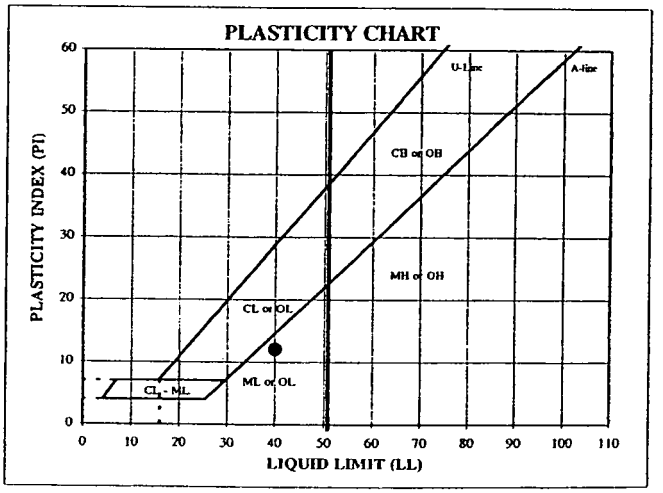
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
12.0"	304.8	100.0	Cobbles	14.52
12.0"	304.8	100.0		
6.0"	154.2	100.0		
3.0"	75.0	85.5		
1.5"	37.5	68.1		
1.0"	25.0	57.4	Coarse Gravel	35.72
0.75"	19.0	49.8		
0.375"	9.5	33.5		
#4	4.8	21.8	Fine Gravel	27.97
#10	2.00	18.3	Coarse Sand	3.45
#20	0.85	15.8		
#40	0.43	13.4	Medium Sand	4.91
#60	0.25	11.4		
#100	0.15	9.3		
#200	0.075	7.5	Fine Sand	5.96

Hydrometer Analysis

(mm)	%Finer		
0.051	5.8		
0.023	5.5		
0.013	5.0	Fines	
0.0094	4.4	Silt or Clay	7.47
0.0066	4.1		
0.0032	3.3		
0.0014	2.9		



ATTERBERG LIMITS

M_c	LL	PL	PI	SpG (assumed)
6.7	40	28	12	2.70

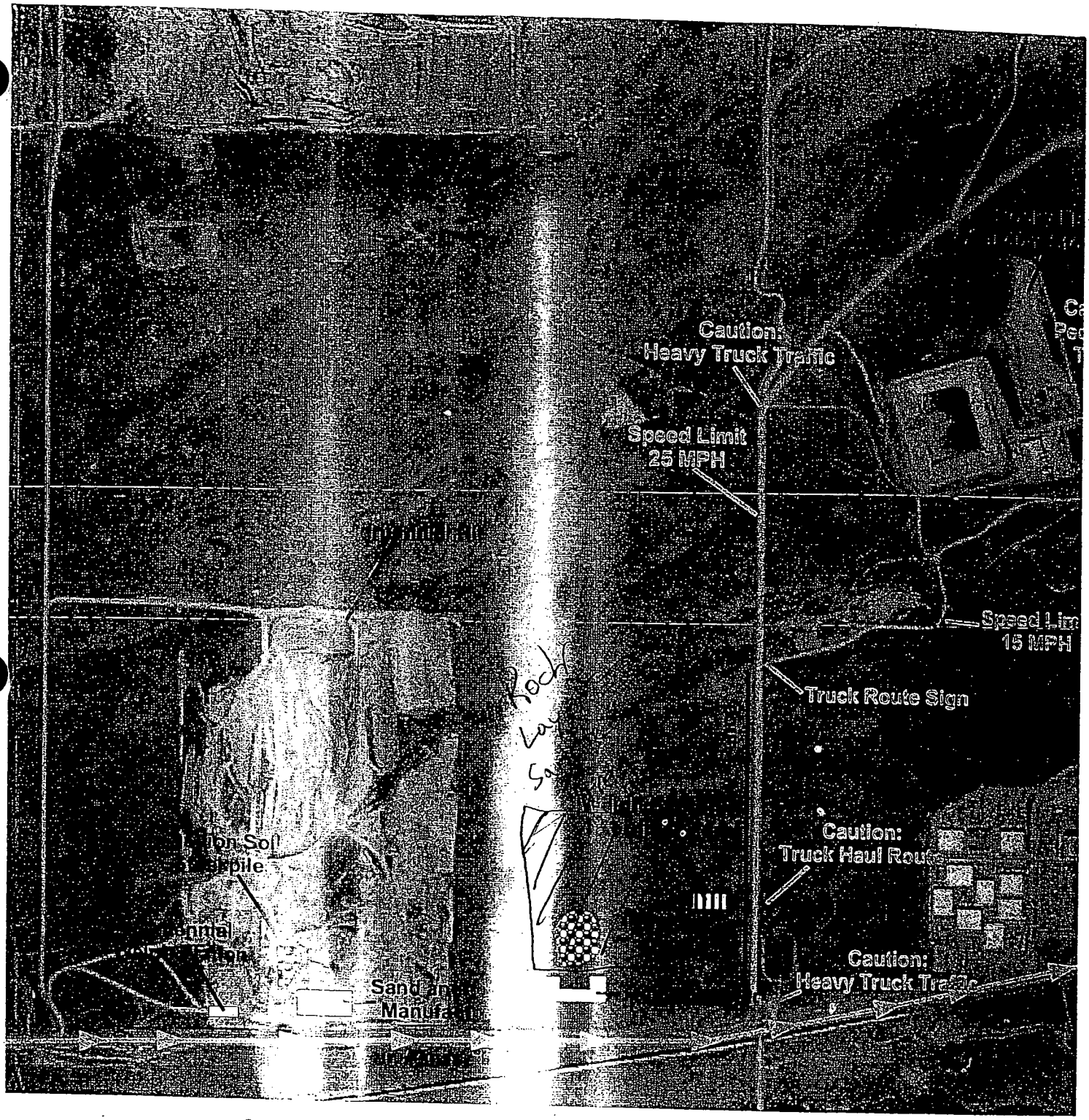
DESCRIPTION: Reddish brown (5 YR2.5/2) poorly graded gravel with silt and sand

USCS: GP-GM

TECH: JR
DATE: 05/05/2005
REVIEW: MB

ROCK LAYER TESTING

All Rock Layer samples has grain size and uniaxial compressive strength tests performed on them. See the Rock Layer Sample Location Map for sample locations.



Present Landfill
Accelerated Action

N

Rock layer Sample Location Map.

Explanation:

Traffic Control Signs
Haul Route
Power Lines
Preble's Protection Area

BULK GRADATION

DATE	October 5, 2004
PROJECT NAME	Rocky Flats
PROJECT NUMBI	043-2246
SAMPLE ID:	RF-1 Depth (ft)
MATERIAL	Rock Layer

Total Weight of Sample
2506260

Ratio (3"-:total 3"-)	21.01

	Wt Retained	Cumulative Wt. Reatined	Percent Retained	Percent Passing	Spec for % Passing
10.0"	0.00	0.0	0.00	100.00	0
6.0"	721763.59	721763.6	28.80	71.20	50-67
3.0"	553343.01	1275106.6	50.88	49.12	30-55
Total Passing 3"	1231153.04	2506259.6			-
2"	103842	1493329.4	59.58	40.42	-
1.5"	62120	1623878.1	64.79	35.21	-
1.0"	83165.0	1798648.4	71.77	28.23	15-35
.75"	49279.0	1902207.7	75.90	24.10	-
.378"	86100.0	2083164.8	83.12	16.88	5-15
#4	51485.0	2191351.5	87.44	12.56	-
pan	14985.00	2506259.6	100.00	0.00	-

Tech	MSP
Reviewed by	PRH

BULK GRADATION

DATE	October 11, 2004
PROJECT NAME	Rocky Flats
PROJECT NUMBI	043-2246
SAMPLE ID:	RL-1R Depth (ft)
MATERIAL	Rock Layer

Total Weight of Sample
2571733.2

Ratio (3"-:total 3"-)	20.06

	Wt Retained	Cumulative Wt. Reatined	Percent Retained	Percent Passing	Spec for % Passing
10.0"	0.00	0.0	0.00	100.00	0
6.0"	850531.10	850531.1	33.07	66.93	50-67
3.0"	632443.80	1482974.9	57.66	42.34	30-55
Total Passing 3"	1088757.80	2571732.7			-
2"	8585.4	1655166.2	64.36	35.64	-
1.5"	4254.80	1740501.7	67.68	32.32	-
1.0"	6790.60	1876696.0	72.97	27.03	15-35
.75"	5025.70	1977492.9	76.89	23.11	-
.378"	10456.30	2187207.5	85.05	14.95	5-15
#4	8668.10	2361057.4	91.81	8.19	-
Total Passing #4	10504.20	2571732.7	100.00	0.00	-

Tech	MSP
Reviewed by	PRH

BULK GRADATION

DATE	January 12, 2005
PROJECT NAME	Rocky Flats
PROJECT NUMBI	043-2246
SAMPLE ID:	RF-3 Depth (ft) NA
MATERIAL	Rock Layer

Total Weight of Sample
1,195,191 g

Ratio (3"-:total 3"-)	11.10

	Wt Retained		Cumulative Wt. Reatined		Percent Retained	Percent Passing	Spec for % Passing
10.0"	0.0	g	0.00	g	0.00	100.00	100
6.0"	420,508.2	g	420,508.20	g	35.18	64.82	50-67
3.0"	302,087.1	g	722,595.30	g	60.46	39.54	30-55
Total Passing 3"	472,595.3	g	1,195,190.60	g			-

Split Sieve

1.0"	311,939.9	g	855,110.30	g	71.55	28.45	15-35
.75"	39,526.5	g	894,249.17	g	74.82	25.18	-
.378"	121,982.0	g	1,016,132.92	g	85.02	14.98	5-15
Total Passing .378"	16,133.5	g	1,195,190.60	g	100.00	0.00	-

Tech	MSP
Reviewed by	PRH

BULK GRADATION

DATE	January 18, 2005
PROJECT NAME	Rocky Flats
PROJECT NUMB	043-2246
SAMPLE ID:	RI-4 Depth (ft) NA
MATERIAL	Rock Layer (Pit Run 6" Rock 1-[illegible]

Total Weight of Sample
4,107,033 g

Ratio (3"-:total 3"-)	34.15

	Wt Retained		Cumulative Wt. Reatined		Percent Retained	Percent Passing	Spec for % Passing
10.0"	0.0	g	0.00	g	0.00	100.00	100
6.0"	1,656,011.8	g	1,656,011.80	g	40.32	59.68	50-67
3.0"	883,961.0	g	2,539,972.80	g	61.84	38.16	30-55
Total Passing 3"	1,567,059.9	g	4,107,032.70	g			-

Split Sieve

1.0"	16,914.5	g	3,117,536.92	g	75.91	24.09	15-35
.75"	3,801.7	g	3,247,350.13	g	79.07	20.93	-
.378"	7,553.1	g	3,505,259.00	g	85.35	14.65	5-15
Total Passing .378"	17,623.5	g	4,107,032.70	g	100.00	0.00	-

Tech	MSP
Reviewed by	PRH

BULK GRADATION

DATE	February 22, 2005
PROJECT NAME	Rocky Flats
PROJECT NUMB	043-2246
SAMPLE ID:	RL-5 Depth (ft) NA
MATERIAL	Rock Layer (Pit Run 6 Rock Pile)

Total Weight of Sample
2,147,954 g

Ratio (3"-:total 3"-)	18.47

	Wt Retained		Cumulative Wt. Reatined		Percent Retained	Percent Passing	Spec for % Passing
10.0"	0.0	g	0.00	g	0.00	100.00	100
6.0"	860,681.0	g	860,681.00	g	40.07	59.93	50-67
3.0"	433,227.3	g	1,293,908.27	g	60.24	39.76	30-55
Total Passing 3"	854,045.5	g	2,147,953.72	g			-

Split Sieve

1.0"	320,172.59	g	1,614,080.86	g	75.15	24.85	15-35
.75"	63,203.21	g	1,678,877.65	g	78.16	21.84	-
.378"	155,253.28	g	1,834,130.93	g	85.39	14.61	5-15
Total Passing .378"	16,986.5	g	2,147,953.72	g	100.00	0.00	-

Tech	MSP
Reviewed by	MGC

BULK GRADATION

DATE	February 22, 2005
PROJECT NAME	Rocky Flats
PROJECT NUMB	043-2246
SAMPLE ID:	RF-6 Depth (ft) NA
MATERIAL	Rock Layer (Pit Run 6" Rock 1" I)

Total Weight of Sample
2,027,274 g

Ratio (3"-:total 3"-)	18.05

	Wt Retained		Cumulative Wt. Reatined		Percent Retained	Percent Passing	Spec for % Passing
10.0"	0.0	g	0.00	g	0.00	100.00	100
6.0"	682305.12	g	682,305.12	g	33.66	66.34	50-67
3.0"	528444	g	1,210,749.12	g	59.72	40.28	30-55
Total Passing 3"	816525.36	g	2,027,274.48	g			-

Split Sieve

1.0"	19,844.2	g	1,569,007.11	g	77.39	22.61	15-35
.75"	2,755.9	g	1,618,760.86	g	79.85	20.15	-
.378"	7,058.5	g	1,746,191.74	g	86.13	13.87	5-15
Total Passing .378"	15,569.4	g	2,027,274.48	g	100.00	0.00	-

Tech	MSP
Reviewed by	MGC

BULK GRADATION

DATE	February 22, 2005
PROJECT NAME	Rocky Flats
PROJECT NUMBI	043-2246
SAMPLE ID:	RF-7 Depth (ft) NA
MATERIAL	Rock Layer (Pit Run 6" Rock 1-1)

Total Weight of Sample
1,833,016 g

Ratio (3"-:total 3"-)	15.14

	Wt Retained		Cumulative Wt. Reatined		Percent Retained	Percent Passing	Spec for % Passing
10.0"	0.0	g	0.00	g	0.00	100.00	100
6.0"	672,335.6	g	672,335.60	g	36.68	63.32	50-67
3.0"	471,610.0	g	1,143,945.58	g	62.41	37.59	30-55
Total Passing 3"	689,070.3	g	1,833,015.88	g			-

Split Sieve

1.0"	19,193.3	g	1,434,626.22	g	78.27	21.73	15-35
.75"	3,012.2	g	1,480,245.69	g	80.75	19.25	-
.378"	6,832.2	g	1,583,718.69	g	86.40	13.60	5-15
Total Passing .378"	16,460.8	g	1,833,015.88	g	100.00	0.00	-

Tech	MSP
Reviewed by	MGC

Post-it® Fax Note 7671	Date 11, 12/04	# of pages ▶ 1
To Mark	From Hamid Nazari	
Co./Dept. Golder Assoc	Co.	
Phone #	Phone #	
Fax # 303-935-2080	Fax #	

ASTM D 2938

CLIENT: Golder Associates

JOB NO.: 2003-94

LOCATION: Rock Flat, CO.

DATE TESTED: 11/08/04 HN

PROJECT: RFETS Project

Specimen ID Boring, Sample	Diameter (In.)	Length (In.)	Mass (gms)	Wet Density (pcf)	Failure Load (lb)	Failure Types **	Compressive Strength (psi)
RL-1R	2.001	2.852	384.50	163.3	40,359	C	*12240

Notes and Comments:

* Indicates L/D < 2.0. Correction Factor from ASTM D 2938 used.
C=Ca/[0.88+0.24b/h]
Ca = Failure Load / Surface Area
b = Sample Diameter
h = Sample Length

** Failure Types:
S: Shear Failure, M: Matrix Failure, F/V: Fracture, Bedding/Void Failure, C: Combination

Data Entered By: HN Date: 11/08/2004
Data Checked By: [illegible] Date: 11/8/04
Filename: GOUCSR11

ADVANCED TERRA TESTING, Inc.

UNCONFINED COMPRESSIVE STRENGTH
ASTM D 2938

LIENT: Golder Associates, Inc. JOB NO.: 2003-96

OCATION: DATE TESTED: 2/7/05 HN

ROJECT: Rocky Flat, #043-2246

Boring	Specimen ID	Diameter (in.)	Length (in.)	Mass (gms)	Wet Density (pcf)	Failure Load (lb)	Failure Types *	Compressive Strength (psi)
RL-3		1.995	4.297	571.90	162.2	28,253	F	9,040
RL-4		1.995	4.418	608.80	167.9	36,846	S/F	11,790

otes and Comments: * Failure Types:
S: Shear Failure, M: Matrix Failure, F/V: Fracture, Bedding/Void Failure, C: Combination

ata Entered By: HN Date: 02/07/2005
ata Checked By: CJ Date: 02/07/05
ename: GOUCSR12

ADVANCED TERRA TESTING, Inc.

UNCONFINED COMPRESSIVE STRENGTH
ASTM D 2938

CLIENT: Golder Associates JOB NO.: 2003-97

LOCATION: Rocky Flat Project Site DATE TESTED: 3/12/05 HN

PROJECT: # 043-2246

Specimen ID / Boring	Diameter (in.)	Length (in.)	Mass (gms)	Wet Density (pcf)	Failure Load (lb)	Failure Types **	Compressive Strength (psi)
RL-2	1.987	3.718	511.50	169.0	79,285	S	*25360
RL-5	2.003	3.872	609.80	190.4	57,300	C	*18110

Notes and Comments:

* Indicates L/D < 2.0. Correction Factor from ASTM D 2938 used.
C=Ca/[0.88+0.24b/h]
Ca = Failure Load / Surface Area
b = Sample Diameter
h = Sample Length

** Failure Types:
S: Shear Failure, M: Matrix Failure, F/V: Fracture, Bedding/Void Failure, C: Combination

Data Entered By: HN Date: 03/15/2005
Data Checked By: CJ Date: 03/15/05
Filename: GOUCSR13

ADVANCED TERRA TESTING, Inc.

UNCONFINED COMPRESSIVE STRENGTH
ASTM D 2938

CLIENT: Golder Associates JOB NO.: 2003-99

LOCATION: Rocky Flat Project Site, CO. DATE TESTED: 4/18/05 HN

PROJECT: # 043-2246

Specimen ID / Boring	Diameter (in.)	Length (in.)	Mass (gms)	Wet Density (pcf)	Failure Load (lb)	Failure Types *	Compressive Strength (psi)
RL-6	1.998	4.199	648.40	187.6	46,635	F/S	14,870
RL-7	1.989	3.994	554.10	170.1	89,785	C	28,900

Notes and Comments: * Failure Types:
S: Shear Failure, M: Matrix Failure, F/V: Fracture, Bedding/Void Failure, C: Combination

Data Entered By: HN Date: 04/18/2005
Data Checked By: CJ Date: 04/18/05
Filename: GOUCSR14

ADVANCED TERRA TESTING, Inc.

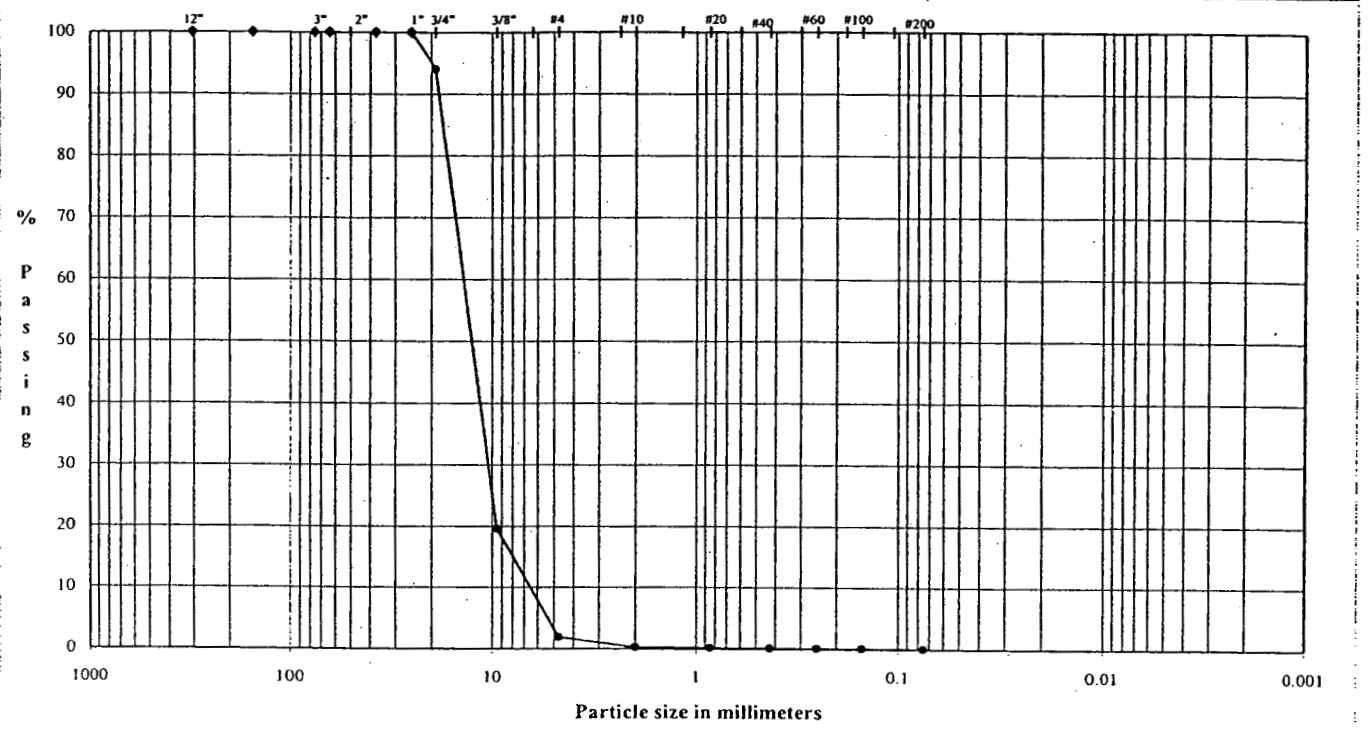
GRAVELS TESTING

All gravel materials were subjected to off-site laboratory grain size analysis only. Gravels were used as bedding materials for both the gas vent trenches and the culverts.

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

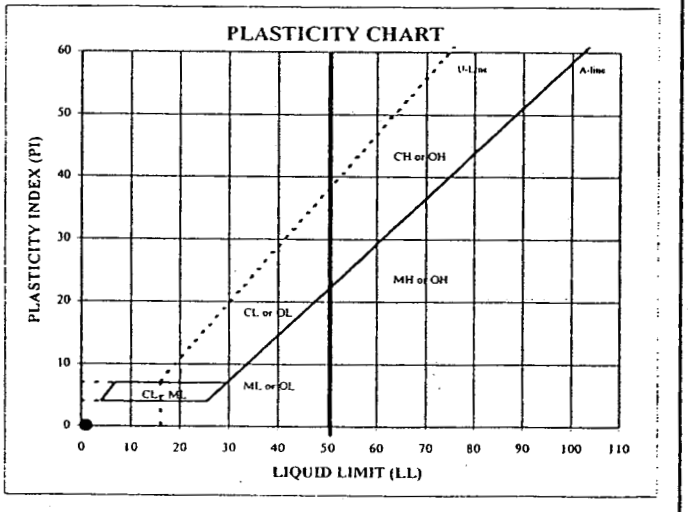
PROJECT NAME: Rocky Flats/Field & Laboratory Testing/CO
SAMPLE ID: GVG-1 Depth (ft): --
TYPE: Bulk



COBBLES	GRAVEL		SAND			FINES
	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	0.00
3.0"	75.0	100.0		
2.5"	63.5	100.0		
1.5"	37.5	100.0		
1.0"	25.0	100.0		
0.75"	19.0	94.0	Coarse Gravel	5.99
0.375"	9.5	19.6		
#4	4.8	1.9	Fine Gravel	92.16
#10	2.0	0.3	Coarse Sand	1.59
#20	0.9	0.2		
#40	0.4	0.1	Medium Sand	0.14
#60	0.3	0.1		
#100	0.2	0.1		
#200	0.1	0.1	Fine Sand	0.06
			Fines	0.07



ATTERBERG LIMITS

M_c	LL	PL	PI	SG
--	--	--	--	--

DESCRIPTION: Medium gray poorly graded gravel

USCS: GP

TECH	NG
DATE	2/14/05
REVIEW	MB

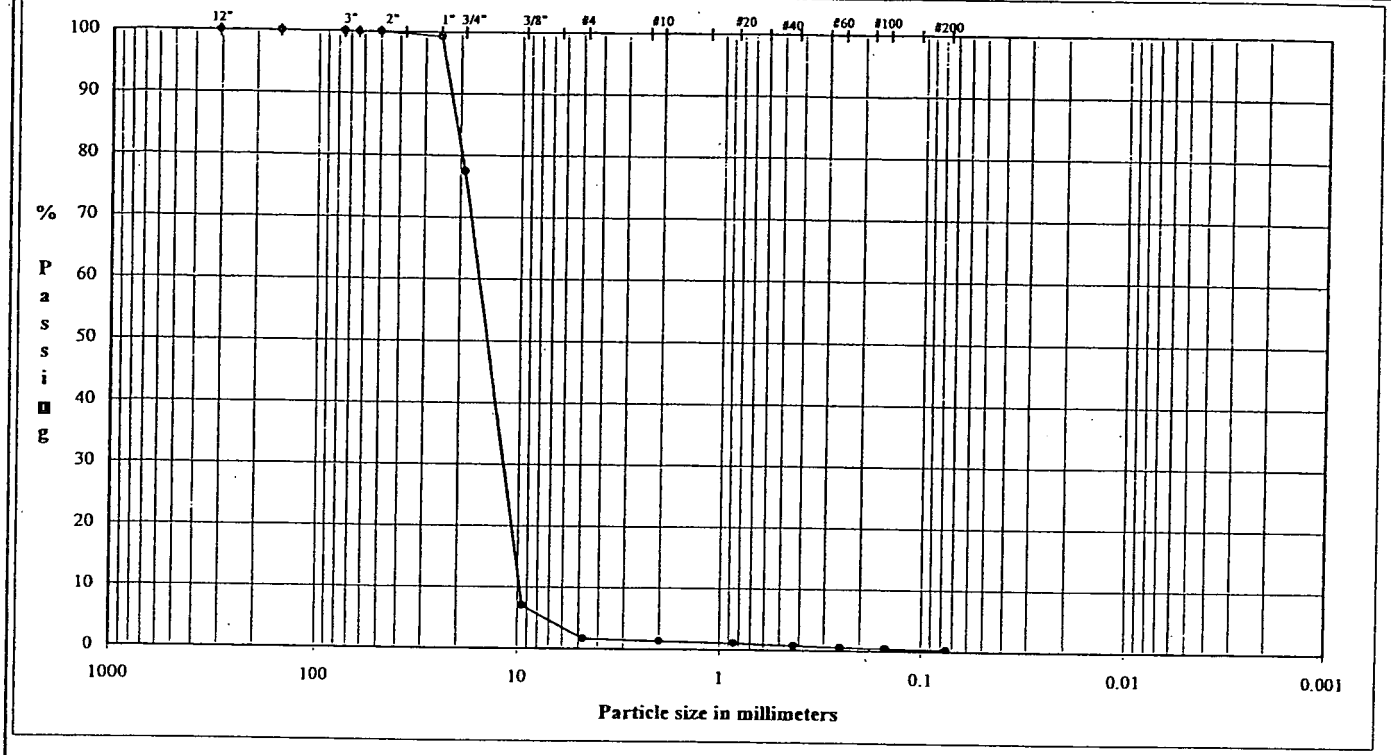
November-04

043-2246-0002

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

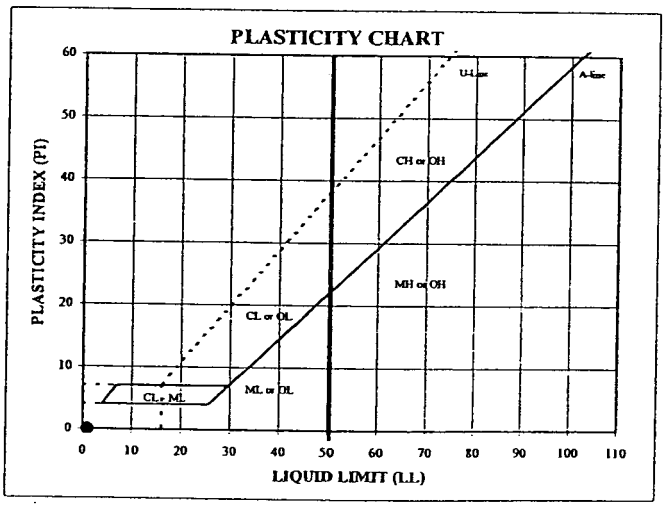
PROJECT NAME: Rocky Flats/Field & Laboratory Testing/CO
SAMPLE ID: GV-1 Depth (ft): –
TYPE: Bulk



COBBLES	GRAVEL: Coarse	GRAVEL: Fine	SAND: Coarse	SAND: Medium	SAND: Fine	FINES: Silt or Clay

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0	Cobbles	0.00
3.0"	75.0	100.0		
2.5"	63.5	100.0		
2.0"	50.0	100.0		
1.0"	25.0	99.3		
0.75"	19.0	77.5	Coarse Gravel	22.53
0.375"	9.5	7.1		
#4	4.8	1.7	Fine Gravel	75.81
#10	2.0	1.4	Coarse Sand	0.30
#20	0.9	1.1		
#40	0.4	0.8	Medium Sand	0.58
#60	0.3	0.6		
#100	0.2	0.5		
#200	0.1	0.3	Fine Sand	0.44
			Fines	0.33



ATTERBERG LIMITS

M_c	LL	PL	PI	SG
1.0	–	–	–	–

DESCRIPTION: Grayish orange pink (5 YR 7/2) poorly graded gravel

USCS: GP

TECH	MKS
DATE	11/8/04
REVIEW	MB

ASTM GRAIN SIZE ANALYSIS
ASTM D 421, D 2217, D 1140, C 117, D 422, C 136

PROJECT TITLE	Rocky Flats/Field and Lab Testing/CO	**SAMPLE ID**	PDG-1
PROJECT NO.	043-2246-0002	**SAMPLE TYPE**	Bulk
REMARKS		**SAMPLE DEPTH (ft)**	NR

WATER CONTENT (Delivered Moisture)

Wt Wet Soil & Tare (gm)	(w1)	
Wt Dry Soil & Tare (gm)	(w2)	
Weight of Tare (gm)	(w3)	
Weight of Water (gm)	(w4=w1-w2)	
Weight of Dry Soil (gm)	(w5=w2-w3)	
Moisture Content (%)	(w4/w5)*100	0.00

Hygroscopic Moisture For Sieve Sample

Wet Soil & Tare (gm)	318.33
Dry Soil & Tare (gm)	314.70
Tare Weight (gm)	33.34
Moisture Content (%)	1.3

Total Weight Of Sample Used For Sieve Corrected For Hygroscopic Moisture

	Weight Of Sample (gm)	1197.30
	Tare Weight (gm)	100.48
(W6)	Total Dry Weight (gm)	1082.85

SIEVE ANALYSIS

Tare Weight: 0.00

	Wt Ret +Tare	(Wt-Tare)	Cumulative (%Retained) ((wt ret/w6)*100)	% PASS (100-%ret)	SIEVE	
12.0"	0.00	0.00	0.00	100.00	12.0"	cobbles
6.0"	0.00	0.00	0.00	100.00	6.0"	cobbles
3.0"	0.00	0.00	0.00	100.00	3.0"	coarse gravel
2.5"	0.00	0.00	0.00	100.00	2.5"	coarse gravel
2.0"	0.00	0.00	0.00	100.00	2.0"	coarse gravel
1.5"	0.00	0.00	0.00	100.00	1.5"	coarse gravel
1.0"	0.00	0.00	0.00	100.00	1.0"	coarse gravel
0.75"	0.00	0.00	0.00	100.00	0.75"	fine gravel
0.375"	54.93	54.93	5.07	94.93	0.375"	fine gravel
#4	821.20	821.20	75.84	24.16	#4	coarse sand
#8	960.10	960.10	88.66	11.34	#8	coarse sand
#16	1006.00	1006.00	92.90	7.10	#16	medium sand
#30	1029.30	1029.30	95.05	4.95	#30	medium sand
#50	1042.90	1042.90	96.31	3.69	#50	fine sand
#100	1053.00	1053.00	97.24	2.76	#100	fine sand
#200	1060.50	1060.50	97.94	2.06	#200	fines
PAN	1061.80	1061.80			PAN	

% COBBLES	0.00
% C GRAVEL	0.00
% F GRAVEL	75.84
% C SAND	13.84
% M SAND	6.00
% F SAND	2.26
% FINES	2.06
% TOTAL	100.00

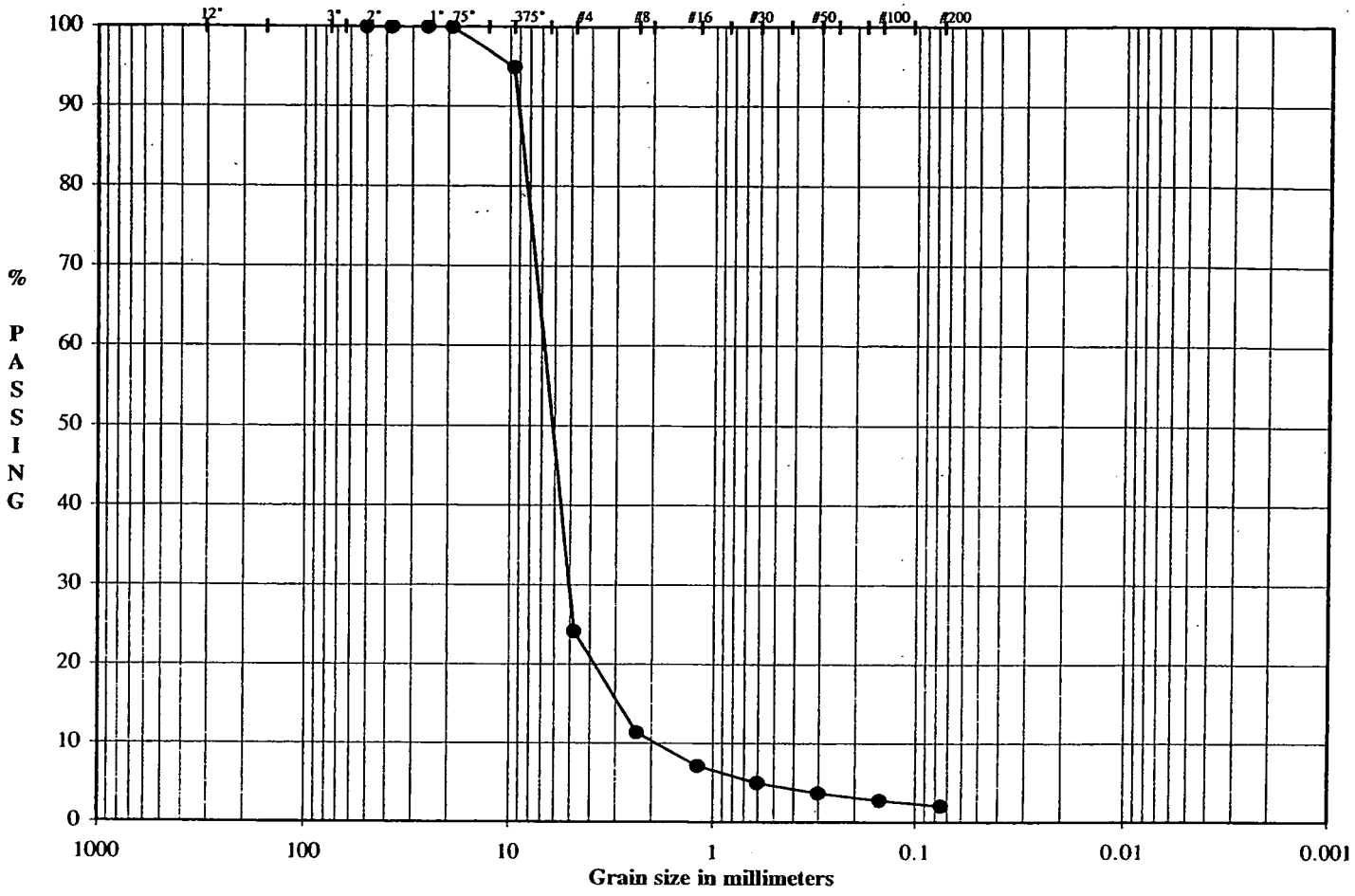
LL	-
PL	-
PI	-
Gs	-

DESCRIPTION: Pink

USCS: --

TECH	PRH
DATE	4/27/2005
REVIEW	MB

PARTICLE SIZE DISTRIBUTION
US STANDARD SIEVE OPENING SIZES



Boulders	Cobbles	Gravel		SAND			FINES
		Coarse	Fine	Cor	Med	Fine	SILT OR CLAY

SAMPLE ID	PDG-1
SAMPLE TYPE	Bulk
SAMPLE DEPTH (ft)	NR

LL	-
PL	-
PI	-

DESCRIPTION	Pink
USCS	--

Rocky Flats/Field and Lab Testing/CO
043-2246-0002

TECH	PRH
DATE	04/27/2005
REVIEW	MB

RIP RAP

Rip Rap was subject to gradation testing utilizing ASTM D-5519 Method B.

BULK GRADATION D-5519B

DATE February 22, 2005
PROJECT NAME Rocky Flats
PROJECT NUMBER: 043-2246
SAMPLE ID: 12" Rip Rap Depth (ft) NA
MATERIAL

Total Weight of Sample
6,672,727 g

	Wt Retained		Cumulative Wt. Reatined		Percent Retained	Percent Passing	Spec for % Passing
21"	0.0	g	0.00	g	0.0%	100.0%	70-100
18"	625000.0	g	625,000.00	g	9.4%	90.6%	50-70
12"	2972454.5	g	3,597,454.50	g	53.9%	46.1%	35-50
4"	2913181.8	g	6,510,636.30	g	97.6%	2.4%	2-10
Total Passing 4"	162090.9	g	6,672,727.20	g	100.0%	0.0%	-

Partical Size	# of Particals Retained		Average Wt of Partical		Cum. Wt
21"	0		440.0	lb	0
18"	5		275.0	lb	1375
12"	84		77.9	lb	6539
4"	377		17.0	lb	6409

* For the 21" and 18" Earth Techs estimates of Typical Stone Weights were used from Table SPEC-2245-0950-2 of the general project specificaitons.
* For the 12" and 4" material, samples of each size rock were weighed and averaged to come up with an average partical weight.
* For the material Passing the 4" the total weight of material determined by weighing the Cat 980 that carried the sample to the testing area, when it was loaded and unloaded, and subtracting the total weight of all the material greater than 4".

12" Rock Wt	4" Rock Wt
83.4 lb	29.9 lb
80.1 lb	13.3 lb
65.8 lb	55.5 lb
82.1 lb	35 lb
	17.7 lb
	12.7 lb
	12.3 lb
	37.9 lb
	4.5 lb
	6.6 lb
	7.5 lb
	3.9 lb
	5.9 lb
	13 lb
	10.3 lb
	6.2 lb
12" Average	4" Average
77.9 lb	17.0 lb

Tech	MSP
Reviewed by	MGC

CONCRETE

Concrete placed for the new seep capture treatment system was tested for air content, slump and uniaxial compressive strength.

Golder Associates Inc.
12860 West Cedar Drive
Suite 206
Lakewood, CO 80228
Ph: 303-969-9270
Fx: 303-969-0468

CONCRETE CYLINDER DATA RECORD

ASTM C39, C1231

PROJECT NAME: Rocky Flats
PROJECT NUMBER: 043-2246-0002

SAMPLE ID: SVS
TYPE: Cylinder

Sample Location: Base of Aeration Structure

Sample Date: 04/08/05
Sample Time: 12:15 PM
Number of Specimens: 5
Cylinder Sample Size: 6X12
Curing Method/Notes: 5 - 1 day field cure then lab

Design Strength (psi): 4000 psi
Slump Specifiactions (in): <4"
Air Content Specifications: 6% +/-1%

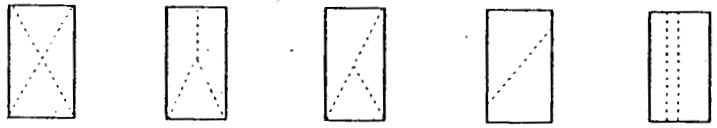
Supplier: Central Ready Mix
Ticket Number: 149495
Truck Number: 320
Concrete Mix Design:
Batch Time: 8:56 AM
Slump: 2.5"
Concrete Temperature (F): 72
Admixtures: 0
Placement Method:

Batch Size (yds): 9
Total Yds. Placed: 9

Air Content (%): 5.5%
Air Temperature (F): 65
Water Added (gal): None

Client's Sample Number	Golder Lab No.	Load lbs.	Area (in^2)	Age Tested	Curing*	Type of Fracture*	Strength (psi)
SVS-1	1	94,750	28.21	4/11/05	L	A	3,360
SVS-2	2	125,790	28.21	4/15/05	L	A	4,460
SVS-3	3	120,640	28.21	4/15/05	L	A	4,280
SVS-4	4	146,560	28.21	5/6/05	L	C	5,200
SVS-5	5	148,630	28.21	5/6/05	L	B	5,270

*Types of Fracture



Cone (a) | Cone and Split (b) | Cone and Shear (c) | Shear (d) | Columnar (e)

*Curing
"L" - Lab Cured
"F" - Field Cured

Golder Associates Inc.
12860 West Cedar Drive
Suite 206
Lakewood, CO 80228
Ph: 303-969-9270
Fx: 303-969-0468

CONCRETE CYLINDER DATA RECORD

ASTM C39, C1231

PROJECT NAME: Rocky Flats
PROJECT NUMBER: 043-2246-0002

SAMPLE ID: RF4/16
TYPE: Cylinder

Sample Location: Sidewall of Aeration Structure

Sample Date: 04/16/05
Sample Time: 8:45 AM
Number of Specimens: 5
Cylinder Sample Size: 6 X 12"
Curing Method/Notes: 1 day field cure then lab

Design Strength (psi): 4000 psi
Slump Specifiactions (in): <4"
Air Content Specifications: 6% +/-1%

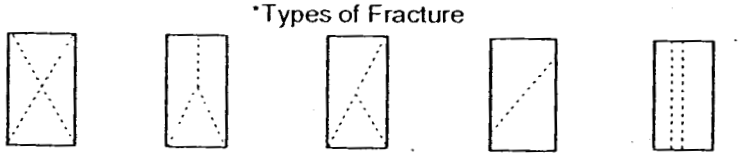
Supplier: Central Ready Mix
Ticket Number: 149677
Truck Number: 317
Concrete Mix Design:
Batch Time: 7:04 AM
Slump: 5
Concrete Temperature (F): 68
Admixtures: 0
Placement Method: Pump Truck

Batch Size (yds): 9 3/4
Total Yds. Placed: 9 3/4

Air Content (%): 10.0%
Air Temperature (F): 55
Water Added (gal): none

Client's Sample Number	Golder Lab No.	Load lbs.	Area (in^2)	Age Tested	Curing*	Type of Fracture*	Strength (psi)
RF4/16A	1	46,370	28.21	4/19/05	L	d	1,640
RF4/16B	2	61,790	28.21	4/23/05	L	d	2,190
RF4/16C	3	59,330	28.21	4/23/05	L	d	2,100
RF4/16D	4	89,960	28.21	5/14/05	L	d	3,190
RF4/16E	5	81,640	28.21	5/14/05	L	d	2,890

*Types of Fracture



Cone (a) | Cone and Split (b) | Cone and Shear (c) | Shear (d) | Columnar (e)

*Curing
"L" - Lab Cured
"F" - Field Cured

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Lakewood, CO 80228
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CONCRETE CYLINDER DATA RECORD

ASTM C39, C1231

PROJECT NAME: Rocky Flats
PROJECT NUMBER: 043-2246-0002

SAMPLE ID: RF4/20
TYPE: Cylinder

Sample Location: Steps on Aeration Structure

Sample Date: 04/20/05
Sample Time: 12:30 PM
Number of Specimens: 6
Cylinder Sample Size: 4 X 8"
Curing Method/Notes: 1 day field cure then lab

Design Strength (psi): 4000
Slump Specifiactions (in):
Air Content Specifications: 6% +/-1%

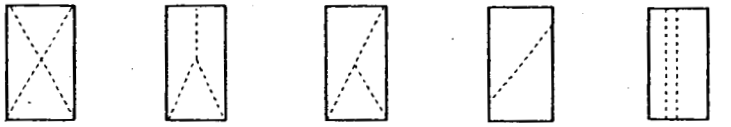
Supplier: Central Ready Mix
Ticket Number:
Truck Number: 319
Concrete Mix Design:
Batch Time: 10:39 AM
Slump: 4
Concrete Temperature (F): 68
Admixtures: 0
Placement Method:

Batch Size (yds): 9 1/4
Total Yds. Placed: 9 1/4

Air Content (%): 6.2%
Air Temperature (F): 48
Water Added (gal): 0

Client's Sample Number	Golder Lab No.	Load lbs.	Area (in^2)	Age Tested	Curing*	Type of Fracture*	Strength (psi)
RF4/20A	RF4/20A	38,790	12.46	4/23/05	L	e	3,110
RF4/20B	RF4/20B	36,890	12.46	4/23/05	L	d	2,960
RF4/20C	RF4/20C	54,010	12.46	4/27/05	L	d	4,330
RF4/20D	RF4/20D	50,180	12.46	4/27/05	L	c	4,030
RF4/20E	RF4/20E	66,460	12.46	5/20/05	L	c	5,330
RF4/20F	RF4/20F	67,250	12.46	5/20/05	L	c	5,400

*Types of Fracture



Cone (a) | Cone and Split (b) | Cone and Shear (c) | Shear (d) | Columnar (e)

*Curing
"L" - Lab Cured
"F" - Field Cured

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CONCRETE CYLINDER DATA RECORD

ASTM C39, C1231

PROJECT NAME: Rocky Flats
PROJECT NUMBER: 043-2246-0002

SAMPLE ID: RF4/22
TYPE: Cylinder

Sample Location: East Wall of Aeration System

Sample Date: 04/22/05
Sample Time: 7:30 AM
Number of Specimens: 6
Cylinder Sample Size: 4 X 8"
Curing Method/Notes: 1 day field cure then lab

Design Strength (psi): 4000
Slump Specifiactions (in):
Air Content Specifications: 6% +/-1%

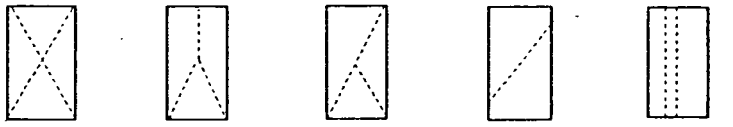
Supplier: Central Ready Mix
Ticket Number:
Truck Number: 327
Concrete Mix Design:
Batch Time: 5:37 AM
Slump: 4
Concrete Temperature (F): 57
Admixtures: 0
Placement Method:

Batch Size (yds): 2 1/2
Total Yds. Placed: 1 1/2

Air Content (%): 5.2%
Air Temperature (F): 45
Water Added (gal): 4

Client's Sample Number	Golder Lab No.	Load lbs.	Area (in^2)	Age Tested	Curing*	Type of Fracture*	Strength (psi)
RF4/22A	RF4/22A	36,480	12.46	4/23/05	L	e	2,930
RF4/22B	RF4/22B	35,430	12.46	4/23/05	L	d	2,840
RF4/22C	RF4/22C	46,520	12.46	5/3/05	L	c	3,730
RF4/22D	RF4/22D	22,480	12.46	5/3/05	L	b	1,804
RF4/22E	RF4/22E	66,460	12.46	5/20/05	L	c	5,330
RF4/22F	RF4/22F	67,250	12.46	5/20/05	L	c	5,400

*Types of Fracture



Cone (a) | Cone and Split (b) | Cone and Shear (c) | Shear (d) | Columnar (e)

*Curing
"L" - Lab Cured
"F" - Field Cured

APPENDIX F-2.2: GEOSYNTHETICS

LINER DATA TABLE OF CONTENTS

Liner Abbreviations Summary:

GCL: Geosynthetic Clay Liner

- GCL Deployment Logs
- GCL Defect Logs
- GCL Repair Logs

FML: Flexible Membrane Liner, 60 mil LLDPE

- Fusion Trial Seam Logs
- Extrusion Trial Seam Logs
- Destructive Seam Test Logs
- FML Deployment Logs
- Fusion Seaming Logs
- FML Defect Logs
- FML Repair Logs
- Pressure Testing Logs
- Vacuum Testing Logs

GDN: Geosynthetic Drainage Net

- GDN Deployment Logs
- GDN Defect Logs
- GDN Repair Logs

Liner Abbreviations:

Locations Abbreviations

P#	Primary Liner Panel or FML
S#	Secondary Liner Panel or GCL
T#	Tertiary Liner Panel or GDN
NEOS	North end of Seam
SEOS	South end of Seam
EEOS	East end of Seam
WEOS	West end of Seam
SNEOS	South of North end of Seam
NSEOS	North of South end of Seam
EWEOS	East of West end of Seam
WEEOS	West of East end of Seam
NEOP	North end of Panel
SEOP	South end of Panel
EEOP	East end of Panel
WEOP	West end of Panel
SNEOP	South of North end of Panel
NSEOP	North of South end of Panel
EWEOP	East of West end of Panel
WEEOP	West of East end of Panel
@INT	At the Panel Intersection
AT	Anchor Trench

Defect Abbreviations:

DP-#letter	Defect on Primary Liner FML
DS-#letter	Defect on Secondary liner GCL
DT-#letter	Defect on Tertiary liner GDN
DS	Destructive
PT	Pressure Test
D	Damage
BO	Burn Out
T	Three Panel Intersection
4T	Four Panel Intersection
EXT	Extension
SI	Surface Irregularity
WR	Wrinkle
EE	Earth Work Equipment Damage
MD	Manufacturer / Delivery Defect.
IO	Insufficient Overlap
WS	Welder Restart
VL	Vacuum Test Leak
AD	Animal Damage
BS/BOOT	Boot / Skirt for FML Penetration
FM	Fish Mouth
FS	Failed Seam Length
HT	Heat Tack Burn

Repair Abbreviations

P	Patch
C	Cap
GNW	Grind and Weld
RS	Reconstructed Seam
EXT	Extension
BOOT	Boot for gas vent trench

Other Abbreviations:

NA	Not Applicable (Defect does not need Repairs) Usually Rock Removed from under the Liner without cutting the Liner
BY SURVEY	Unable to find panel location of defect since repair of the defect required cutting a whole in both the FML and GCL so the defect repair location is only reportable by Northing Easting and Elevations given by Paragon.
EXT TO AT	Extends into Anchor Trench.

Golder QC Monitor Initials:

MSP	Michael Place
MGC	Matt Cashimer
PRH	Patrick Harrell
DJE	Doug Eagleton
GDH	Greg Henrikson

Colorado Lining Technician Initials:

BC	Brian Cunningham
RD	Raymond Dyba
GK	Guy Krone
JS	Josh Scanlon
FP	Frank Peringher
JH	Jessie H.

GCL

Geosynthetic Clay Liner

GCL REPAIR LOG

PROJECT NUMBER:	043-2246	**PROJECT TITLE:**	Rocky Flats, Present Landfill
LINER INSTALLER:	Colorado Lining	**CONTRACTOR:**	S.M. Stoller
LOCATION:	Rocky Flats	**SITE MANAGER:**	Kaiser Hill Company LLC

GCL

REPAIR TYPE: P - PATCH, C - CAP, RS - RECONSTRUCTED SEAM, G&W - GRIND WELD

DEFECT CODE	REPAIR DATE	BENTONITE PLUG (Y/N)	APPROX. TIME	REPAIR TYPE	APPROX. DIMENSIONS	REPAIR TECH	MONITOR	REMARKS
DS1 A	10/28/04	Y	1610	P	3 x3	JB	MGC	
DS1 B	10/30/04	Y	1200	P	5X5	JB	MGC	
DS1 C	10/30/04	Y	1350	P	2X2	JB	MGC	
DS1 D	11/3/04	Y	1320	P	3X6	GK	MGC	
DS1 E	11/4/04	Y	935	P	2X15	BC	PRH	
DS1 F	11/4/04	Y	1455	P	2X2	BC	PRH	
DS1 G	11/5/04	Y	800	P	2X4	BC	MGC	
DS1 H	11/5/04	Y	900	P	6X15	BC	MGC	
DS1 I	11/5/04	Y	1200	P	2X2	BC	MGC	
DS1 J	11/6/04	Y	1115	P	2X2	BC	MGC	
DS1 K	11/8/04	Y	945	P	3X5	BC	PRH	
DS1 M	11/8/04	Y	1115	P	4X6	BC	PRH	
DS1 N	11/8/04	Y	1150	P	8X50 triangle	BC	PRH	
DS1 P	11/9/04	Y	1530	P	2X2	RD	PRH	
DS1 Q	11/9/04	Y	1630	P	2X2	RD	PRH	
DS1 R	11/12/04	Y	1635	P	2X2	RD	MGC	
DS1 S	11/12/04	Y	1640	P	2X2	RD	MGC	
DS1 T	11/15/04	Y	1610	P	5X40	BC	MGC	
DS1 W	11/16/04	Y	1000	C	15X65	RD	PRH	
DS1 X	11/16/04	Y	1305	P	2X2	RD	PRH	
DS2 A	11/19/04	Y	0840	P	2x30	BC	PRH	
DS2 B	11/19/04	Y	0845	P	2x30	BC	PRH	
DS2 C	11/19/04	Y	0940	P	5x15	BC	PRH	
DS2 D	12/7/04	Y	0915	P	2X4	BC	PRH	
DS2 E	12/8/04	Y	0750	P	2X15	JP	MGC	
DS2 F	12/9/04	Y	1335	EXT	3X15	BC	MGC	
DS2 G	12/12/04	Y	0815	P	2X2	RD	PRH	
DS2 H	12/12/04	Y	0840	P	5X8	BC	PRH	
DS2 I	12/12/04	Y	0842	P	5X8	BC	PRH	
DS2 J	12/14/04	Y	1114	EXT	4X40	RD	PRH	Triangle
DS2 K	12/14/04	Y	1120	EXT	2X40	RD	PRH	Triangle
DS2 M	12/15/04	Y	1100	EXT	6X15	JS	PRH	
DS2 N	1/17/05	Y	1050	BOOT	5X5	RB	MSP	
DS2 P	1/17/05	Y	1500	BOOT	2X2	RB	MSP	
DS2 Q	1/18/05	Y	1008	BOOT	2X2	RB	PRH	
DS2 R	2/11/05	Y	1300	P	5X15	BC	MGC	
DS2 S	2/11/05	Y	1305	P	3X7	BC	MGC	
DS2 T	2/11/05	Y	1310	P	20X8	BC	MGC	
DS2 W	2/17/05	Y	1128	P	4X4	RD	PRH	
DS2 X	2/17/05	Y	1133	P	10X10	RD	PRH	
DS3 A	3/22/05	Y	0925	P	6X14	BC	MGC	Triangle
DS3 B	3/22/05	Y	0928	P	2X2	BC	MGC	
DS3 C	3/23/05	Y	0817	EXT	8X20	BC	MGC	Triangle

DEFECT CODE	DEFECT LOCATION		DEFECT TYPE	LOG DATE	MON.	REMARKS	** REPAIR DATE
	SEAM, PANEL OR REPAIR NO.	DEFECT LOCATION DESCRIPTION					
DS3 D	S508	@EEOP	EXT	3/23/05	MGC	EXT TO AT	3/23/2005
DS3 E	S529	7' NSEOP/4' WEEOP	BS	3/24/05	MGC	3 Patches 3 pipes	3/24/2005
DS3 F	S533	7' NSEOP/ 15' WEEOP	BS	3/24/05	MGC	1 pipe	3/24/2005
DS3 G	S537	@EEOP	EXT	3/29/05	MGC		3/29/2005
DS3 H	S535	@EEOP	EXT	3/29/05	MGC		3/29/2005
DS3 I	S548	@NEOP	EXT	3/30/05	MGC		3/30/2005
DS3 J	S551	@NEOP	EXT	3/30/05	MGC		3/30/2005
DS3 K	S559	@NEOP	EXT	3/30/05	MGC		3/30/2005
DS3 M	S562	@NEOP	EXT	3/30/05	MGC		3/30/2005
DS3 N	S565	@NEOP	EXT	3/30/05	MGC		3/30/2005
DS3 P	S573	3'NSEOP/ 3'W EEOP	EE	4/1/05	MGC		4/1/2005
DS3 Q	S581	@NWEOP	EXT	4/1/05	MGC		4/1/2005
DS3 R	S581	@EEOP	EXT	4/1/05	MGC		4/1/2005
DS3 S	S590	@EEOP	EXT	4/1/05	MGC		4/1/2005
DS3 T	S620	@NEOP	EXT	4/3/05	MGC		4/3/2005
DS3 W	S627	@NEOP	EXT	4/3/05	MGC		4/3/2005
DS3 X	S628	@SEOP	EXT	4/3/05	MGC		4/3/2005
DS4 A	S633	@WEOS	EXT	4/3/05	MGC		4/3/2005
DS4 B	S639	@WEOS	EXT	4/3/05	MGC		4/3/2005
DS4 C	S639	@WEOS	EXT	4/3/05	MGC		4/3/2005
DS4 D	S639	@EEOS	EXT	4/3/05	MGC		4/3/2005
DS4 E	S645	@NEOS	EXT	4/3/05	MGC		4/3/2005
DS4 F	S657	@SEOS	EXT	4/4/05	MGC		4/4/2005
DS4 G	S664	@EEOS	EXT	4/4/05	MGC		4/4/2005

GCL DEFECT LOG

PROJECT NUMBER:	**043-2246**	**PROJECT TITLE:**	**Rocky Flats, Present Landfill**
LINER INSTALLER:	**Colorado Lining**	**CONTRACTOR:**	**S.M. Stoller**
LOCATION:	**Rocky Flats**	**SITE MANAGER:**	**Kaiser Hill Company LLC**

DEFECT CODE	DEFECT LOCATION		DEFECT TYPE	LOG DATE	MON.	REMARKS	REPAIR DATE
	SEAM, PANEL OR REPAIR NO.	DEFECT LOCATION DESCRIPTION					
DS1 A	S1	5'S NEOP/ 2'E WEOP	D	10/28/04	MGC		10/28/2004
DS1 B	S7/S9	@ NEOS	EXT	10/30/04	MGC	EXT TO AT	10/30/2004
DS1 C	S11	6'S NEOP/ 2'W EEOP	SI	10/30/04	MGC		10/30/2004
DS1 D	S2	10' S NEOP/ 3' W EEOP	SI	11/3/04	MGC		11/3/2004
DS1 E	S-17	2' S NEOP/ Whole width	MD	11/4/04	PRH		11/4/2004
DS1 F	S-27	2'NSEOP/3' EWEOP	D	11/4/04	PRH		11/4/2004
DS1 G	S-38	25'NSEOP/2'EWEOP	D	11/5/04	MGC		11/5/2004
DS1 H	S-42/S-43	NEOS	EXT	11/5/04	MGC		11/5/2004
DS1 I	BY SURVEY	BY SURVEY	D	11/5/04	MGC		11/5/2004
DS1 J	BY SURVEY	BY SURVEY	SI	11/6/04	MGC		11/6/2004
DS1 K	S43/S48	50' S NEOS	MD	11/8/04	PRH		11/8/2004
DS1 M	S52/S56	NEOS	EXT	11/8/04	PRH		11/8/2004
DS1 N	S54/S58	SEOS	EXT	11/8/04	PRH		11/8/2004
DS1 P	BY SURVEY	BY SURVEY	SI	11/9/04	PRH		11/9/2004
DS1 Q	BY SURVEY	BY SURVEY	SI	11/9/04	PRH		11/9/2004
DS1 R	BY SURVEY	BY SURVEY	SI	11/12/04	MGC		11/12/2004
DS1 S	BY SURVEY	BY SURVEY	SI	11/12/04	MGC		11/12/2004
DS1 T	P86/P87	@SEAM	SI	11/15/04	MGC		11/15/2004
DS1 W	BY SURVEY	BY SURVEY	IO/EXT	11/16/04	PRH		11/16/2004
DS1 X	S111	30' NSEOP 1'WEEOP	MD	11/16/04	PRH		11/16/2004
DS2 A	BY SURVEY	BY SURVEY	EXT	11/19/04	PRH	EXT TO AT	11/19/2004
DS2 B	BY SURVEY	BY SURVEY	EXT	11/19/04	PRH	EXT TO AT	11/19/2004
DS2 C	BY SURVEY	BY SURVEY	EXT	11/19/04	PRH	EXT TO AT	11/19/2004
DS2 D	S167	60' SNEOP/7' WEEOP	EE	12/7/04	PRH		12/7/2004
DS2 E	S190/S196	SEOS to 15' SNEOS	MD	12/8/04	MGC		12/8/2004
DS2 F	S245	@SEOP	EXT	12/9/04	MGC		12/9/2004
DS2 G	BY SURVEY	BY SURVEY	SI	12/12/04	PRH		12/12/2004
DS2 H	S263	50' SNEOP/4' WEEOP	SI	12/12/04	PRH		12/12/2004
DS2 I	S263	55' SNEOP/4' WEEOP	SI	12/12/04	PRH		12/12/2004
DS2 J	BY SURVEY	BY SURVEY	EXT	12/14/04	PRH		12/14/2004
DS2 K	BY SURVEY	BY SURVEY	EXT	12/14/04	PRH		12/14/2004
DS2 M	S316/S317	Entire Seam	EXT	12/15/04	PRH		12/15/2004
DS2 N	BY SURVEY	BY SURVEY	BOOT	1/17/05	MSP		1/17/2005
DS2 P	BY SURVEY	BY SURVEY	BOOT	1/17/05	MSP		1/17/2005
DS2 Q	BY SURVEY	BY SURVEY	BOOT	1/18/05	PRH		1/18/2005
DS2 R	S398	75' SNEOP, 7' WEEOP	H	2/11/05	MGC		2/11/2005
DS2 S	S398	70' NSEOP, 7' WEEOOP	H	2/11/05	MGC		2/11/2005
DS2 T	S398	50' NSEOP, 7' WEEOP	H	2/11/05	MGC		2/11/2005
DS2 W	BY SURVEY	BY SURVEY	D	2/17/05	PRH		2/17/2005
DS2 X	BY SURVEY	BY SURVEY	D	2/17/05	PRH		2/17/2005
DS3 A	S477/S479	@AT	EXT	3/22/05	MGC	EXT TO AT	3/22/2005
DS3 B	S477	3' SNEOP/1' EWEOP	D	3/22/05	MGC		3/22/2005
DS3 C	S506/S507	@NEOS	EXT	3/23/05	MGC	EXT TO AT	3/23/2005

DEFECT CODE	REPAIR DATE	BENTONITE PLUG (Y/N)	APPROX. TIME	REPAIR TYPE	APPROX. DIMENSIONS	REPAIR TECH	MONITOR	REMARKS
DS3 D	3/23/05	Y	0829	EXT	10X20	BC	MGC	Triangle
DS3 E	3/24/05	Y	0812-0816	P	4X4 (X3)	BC	MGC	3 Pipes
DS3 F	3/24/05	Y	0936	P	4X4	BC	MGC	
DS3 G	3/29/05	Y	0756	P	4X15 /2	BC	MGC	Triangle
DS3 H	3/29/05	Y	0802	P	2X1 /2	BC	MGC	
DS3 I	3/30/05	Y	1105	P	8X12 /2	RD	MGC	Triangle
DS3 J	3/30/05	Y	1350	P	22X15 /2	RD	MGC	Triangle
DS3 K	3/30/05	Y	1400	P	19X14.5 /2	RD	MGC	Triangle
DS3 M	3/30/05	Y	1410	P	20X14.5/2	RD	MGC	Triangle
DS3 N	3/30/05	Y	1422	P	13X14.5/2	RD	MGC	Triangle
DS3 P	4/1/05	Y	800	P	3X3	RB	MGC	
DS3 Q	4/1/05	Y	820	P	4X4/2	RB	MGC	Triangle
DS3 R	4/1/05	Y	849	P	3X6	RB	MGC	
DS3 S	4/1/05	Y	853	P	8X14.5/2	RB	MGC	Triangle
DS3 T	4/3/05	Y	822	P	8X15/2	RB	MGC	Triangle
DS3 W	4/3/05	Y	840	P	5X14.5	RB	MGC	
DS3 X	4/3/05	Y	849	P	4X14.5	RB	MGC	
DS4 A	4/3/05	Y	906	P	3X3	RB	MGC	
DS4 B	4/3/05	Y	931	P	3X3	RB	MGC	
DS4 C	4/3/05	Y	932	P	3X3	RB	MGC	
DS4 D	4/3/05	Y	1005	P	3X3	RB	MGC	
DS4 E	4/3/05	Y	1300	P	3X15/2	RB	MGC	Triangle
DS4 F	4/4/05	Y	924	P	4X25/2	RB	MGC	Triangle
DS4 G	4/4/05	Y	926	P	14X24/2	RB	MGC	Triangle

PANEL DEPLOYMENT LOG

PROJECT NUMBER: 043-2246 MATERIAL TYPE: GCL PROJECT TITLE: Rocky Flats, Present Landfill

LINER INSTALLER: Colorado Lining CONTRACTOR: S. M. Stoller

LOCATION: Rocky Flats SITE MANAGER: Kaiser Hill Company LLC

PANEL NUMBER	ROLL NUMBER	DEPLOY DATE	QC MON.	OBSERVED OVERLAP	VISUAL PANEL CONDITION	PANEL DIMENSIONS (FT)		PANEL AREA	TOTAL AREA PLACED	NOTES
						LENGTH	WIDTH			
S-1	10787	10/28/04	MGC	6"	good	75	14.5	1088	1088	
S-2	10788	10/28/04	MGC	6"	good	75	14.5	1088	2175	
S-3	10788	10/28/04	MGC	6"	good	59.5	14.5	863	3038	
S-4	10791	10/28/04	MGC	6"	good	132.5	14.5	1921	4959	
S-5	10782	10/30/04	MGC	6"	good	131	14.5	1900	6859	
S-6	10785	10/30/04	MGC	6"	good	35	14.5	508	7366	
S-7	10785	10/30/04	MGC	6"	good	87	14.5	1262	8628	
S-8	10793	10/30/04	MGC	6"	good	47	14.5	682	9309	
S-9	10793	10/30/04	MGC	6"	good	76.5	14.5	1109	10418	
S-10	10781	10/30/04	MGC	6"	good	22	14.5	319	10737	
S-11	10781	10/30/04	MGC	6"	good	ellipse		395	11132	
S-12	10781	11/03/04	PRH	6"	good	27	14.5	392	11524	
S-13	10786	11/03/04	PRH	6"	good	32	14.5	464	11988	
S-14	10786	11/04/04	PRH	6"	good	112	13	1456	13444	
S-15	10766	11/04/04	PRH	6"	good	114.5	13	1489	14932	
S-16	10766	11/04/04	PRH	6"	good	22	14.5	319	15251	
S-17	10784	11/04/04	PRH	6"	good	147	14.5	2132	17383	
S-18	10636	11/04/04	PRH	6"	good	72.5	14.5	1051	18434	
S-19	10636	11/04/04	PRH	6"	good	62	14.5	899	19333	
S-20	10789	11/04/04	PRH	6"	good	145.5	14.5	2110	21443	
S-21	10635	11/04/04	PRH	6"	good	48	14.5	696	22139	
S-22	10635	11/04/04	PRH	6"	good	93	14.5	1349	23487	
S-23	10804	11/04/04	PRH	6"	good	144	14.5	2088	25575	
S-24	10637	11/04/04	PRH	6"	good	27	14.5	392	25967	
S-25	10637	11/04/04	PRH	6"	good	113.5	14.5	1646	27613	
S-26	10810	11/04/04	PRH	6"	good	144	14.5	2088	29701	
S-27	10805	11/04/04	PRH	6"	good	18	14.5	261	29962	
S-28	10795	11/04/04	PRH	6"	good	119.5	14.5	1733	31694	
S-29	10806	11/04/04	PRH	6"	good	144.5	14.5	2095	33790	
S-30	10792	11/04/04	PRH	6"	good	23	14.5	334	34123	
S-31	10792	11/04/04	PRH	6"	good	113.5	14.5	1646	35769	
S-32	10807	11/04/04	PRH	6"	good	142	14.5	2059	37828	
S-33	10808	11/04/04	PRH	6"	good	38	14.5	551	38379	
S-34	10808	11/04/04	PRH	6"	good	94.5	14.5	1370	39749	

PANEL NUMBER	ROLL NUMBER	DEPLOY DATE	QC MON.	OBSERVED OVERLAP	VISUAL PANEL CONDITION	PANEL DIMENSIONS (FT)		PANEL AREA	TOTAL AREA PLACED	NOTES
						LENGTH	WIDTH			
S-35	10798	11/04/04	PRH	6"	good	144	14.5	2088	41837	
S-36	10802	11/04/04	PRH	6"	good	63	14.5	914	42751	
S-37	10802	11/05/04	MGC	6"	good	75	14.5	1088	43838	
S-38	10803	11/05/04	MGC	6"	good	146	14.5	2117	45955	
S-39	09785	11/05/04	MGC	6"	good	99	14.5	1436	47391	
S-40	09785	11/05/04	MGC	6"	good	36	14.5	522	47913	
S-41	10801	11/05/04	MGC	6"	good	144	14.5	2088	50001	
S-42	10799	11/05/04	MGC	6"	good	146	14.5	2117	52118	
S-43	09786	11/05/04	MGC	6"	good	130.5	14.5	1892	54010	
S-44	09792	11/05/04	MGC	6"	good	144	14.5	2088	56098	
S-45	09784	11/05/04	MGC	6"	good	69	14.5	1001	57098	
S-46	09784	11/08/04	PRH	6"	good	69.5	14.5	1008	58106	
S-47	09793	11/08/04	PRH	6"	good	148	14.5	2146	60252	
S-48	09789	11/08/04	PRH	6"	good	137.5	14.5	1994	62246	
S-49	09686	11/08/04	PRH	6"	good	137.5	14.5	1994	64240	
S-50	09794	11/08/04	PRH	6"	good	143.5	14.5	2081	66320	
S-51	09788	11/08/04	PRH	6"	good	86	14.5	1247	67567	
S-52	09788	11/08/04	PRH	6"	good	47.5	14.5	689	68256	
S-53	09787	11/08/04	PRH	6"	good	143	14.5	2074	70330	
S-54	09767	11/08/04	PRH	6"	good	146	14.5	2117	72447	
S-55	09777	11/08/04	PRH	6"	good	43	14.5	624	73070	
S-56	09777	11/08/04	PRH	6" to 36"	good	90.5	13.5	1222	74292	
S-57	09751	11/08/04	PRH	36"	good	144	12	1728	76020	
S-58	09781	11/08/04	PRH	6" to 36"	good	146.5	13.5	1978	77998	
S-59	09782	11/08/04	PRH	36"	good	19	12	228	78226	
S-60	09782	11/08/04	PRH	6"	good	116	14.5	1682	79908	
S-61	09791	11/08/04	PRH	6" to 18"	good	137	13.75	1884	81791	
S-62	09715	11/08/04	PRH	6" to 12"	good	143.5	14.25	2045	83836	
S-63	09790	11/08/04	PRH	12"	good	21	14	294	84130	
S-64	09790	11/09/04	MGC	6"	good	111.5	14.5	1617	85747	
S-65	09758	11/09/04	MGC	6"	good	145	14.5	2103	87849	
S-66	09725	11/09/04	MGC	6"	good	138.5	14.5	2008	89858	
S-67	09697	11/09/04	MGC	6"	good	40	14.5	580	90438	
S-68	09697	11/09/04	MGC	6"	good	99.5	14.5	1443	91880	
S-69	09679	11/09/04	MGC	6"	good	145	14.5	2103	93983	
S-70	09755	11/09/04	MGC	6"	good	138	14.5	2001	95984	
S-71	09734	11/09/04	MGC	6"	good	62	14.5	899	96883	
S-72	09734	11/09/04	MGC	6"	good	72	14.5	1044	97927	

PANEL NUMBER	ROLL NUMBER	DEPLOY DATE	QC MON.	OBSERVED OVERLAP	VISUAL PANEL CONDITION	PANEL DIMENSIONS (FT)		PANEL AREA	TOTAL AREA PLACED	NOTES
						LENGTH	WIDTH			
S-73	09689	11/09/04	MGC	6"	good	145	14.5	2103	100029	
S-74	09750	11/09/04	MGC	6"	good	140.5	14.5	2037	102067	
S-75	09763	11/09/04	MGC	6"	good	104	14.5	1508	103575	
S-76	09763	11/09/04	MGC	6"	good	33.5	14.5	486	104060	
S-77	09723	11/09/04	MGC	6"	good	144	14.5	2088	106148	
S-78	09741	11/09/04	MGC	6"	good	148	14.5	2146	108294	
S-79	09783	11/09/04	MGC	6"	good	138.5	14.5	2008	110303	
S-80	09753	11/09/04	MGC	6"	good	14	14.5	203	110506	
S-81	09753	11/09/04	MGC	6"	good	121.5	14.5	1762	112267	
S-82	09757	11/09/04	MGC	6"	good	142	14.5	2059	114326	
S-83	09752	11/09/04	MGC	6"	good	142	14.5	2059	116385	
S-84	09735	11/09/04	MGC	6"	good	87	14.5	1262	117647	
S-85	09735	11/09/04	MGC	6"	good	52	14.5	754	118401	
S-86	10494	11/09/04	MGC	6"	good	146	14.5	2117	120518	
S-87	10510	11/09/04	MGC	6"	good	150	14.5	2175	122693	
S-88	10499	11/09/04	MGC	6"	good	141.5	14.5	2052	124745	
S-89	10491	11/09/04	MGC	6"	good	16	14.5	232	124977	
S-90	10491	11/16/04	MGC	6"	good	90.5	14.5	1312	126289	
S-91	09702	11/16/04	MGC	6"	good	142	14.5	2059	128348	
S-92	10498	11/16/04	MGC	6"	good	149	14.5	2161	130508	
S-93	10496	11/16/04	MGC	6"	good	131.5	14.5	1907	132415	
S-94	10495	11/16/04	MGC	6"	good	141	14.5	2045	134460	
S-95	09699	11/16/04	MGC	6"	good	146	14.5	2117	136577	
S-96	10487	11/16/04	MGC	6"	good	140	14.5	2030	138607	
S-97	10488	11/16/04	MGC	6"	good	100	14.5	1450	140057	
S-98	10488	11/16/04	MGC	6"	good	39	14.5	566	140622	
S-99	10493	11/16/04	MGC	6"	good	145	14.5	2103	142725	
S-100	10762	11/16/04	MGC	6"	good	146	14.5	2117	144842	
S-101	10486	11/16/04	MGC	6"	good	145	14.5	2103	146944	
S-102	10733	11/16/04	MGC	6"	good	63	14.5	914	147858	
S-103	10733	11/17/04	PRH	6"	good	73	14.5	1059	148916	
S-104	10489	11/17/04	PRH	6"	good	145	14.5	2103	151019	
S-105	9795	11/17/04	PRH	6"	good	144	14.5	2088	153107	
S-106	10497	11/17/04	PRH	6"	good	141	14.5	2045	155151	
S-107	10720	11/17/04	PRH	6"	good	45	14.5	653	155804	
S-108	10720	11/17/04	PRH	6"	good	98	14.5	1421	157225	
S-109	10745	11/17/04	PRH	6"	good	148	14.5	2146	159371	
S-110	10485	11/17/04	PRH	6"	good	145	14.5	2103	161473	

PANEL NUMBER	ROLL NUMBER	DEPLOY DATE	QC MON.	OBSERVED OVERLAP	VISUAL PANEL CONDITION	PANEL DIMENSIONS (FT)		PANEL AREA	TOTAL AREA PLACED	NOTES
						LENGTH	WIDTH			
S-111	10688	11/17/04	PRH	6"	good	140	14.75	2065	163538	
S-112	10755	11/17/04	PRH	6"	good	28	14.5	406	163944	
S-113	10755	11/17/04	PRH	6"	good	40.5	14.5	587	164531	
S-114	10687	11/17/04	PRH	6"	good	146	14.5	2117	166648	
S-115	10796	11/17/04	PRH	6"	good	145	14.5	2103	168751	
S-116	10783	11/17/04	PRH	6"	good	148	14.5	2146	170897	
S-117	10797	11/17/04	PRH	6"	good	90	14.5	1305	172202	
S-118	10797	11/17/04	PRH	6"	good	43.5	14.5	631	172833	
S-119	9760	11/17/04	PRH	6"	good	145	14.5	2103	174935	
S-120	9754	11/17/04	PRH	6"	good	144	14.5	2088	177023	
S-121	10752	11/17/04	PRH	6"	good	148	14.5	2146	179169	
S-122	9680	11/17/04	PRH	6"	good	103	14.5	1494	180663	
S-123	9680	11/18/04	MGC	6"	good	28.5	14.5	413	181076	
S-124	9756	11/18/04	MGC	6"	good	144	14.5	2088	183164	
S-125	10794	11/18/04	MGC	6"	good	146	14.5	2117	185281	
S-126	9732	11/18/04	MGC	6"	good	148	14.5	2146	187427	
S-127	9724	11/18/04	MGC	6"	good	127	14.5	1842	189268	
S-128	9724	11/18/04	MGC	6"	good	12	14.5	174	189442	
S-129	10790	11/18/04	MGC	6"	good	142.5	14.5	2066	191509	
S-130	9730	11/18/04	MGC	6"	good	146	14.5	2117	193626	
S-131	9733	11/18/04	MGC	6"	good	148	14.5	2146	195772	
S-132	10813	11/18/04	MGC	6"	good	148	14.5	2146	197918	
S-133	9713	11/18/04	MGC	6"	good	7	14.5	102	198019	
S-134	9713	11/18/04	MGC	6"	good	134	14.5	1943	199962	
S-135	9708	11/18/04	MGC	6"	good	146	14.5	2117	202079	
S-136	10812	11/18/04	MGC	6"	good	149	14.5	2161	204240	
S-137	9716	11/18/04	MGC	6"	good	144	14.5	2088	206328	
S-138	9706	11/18/04	MGC	6"	good	40	14.5	580	206908	
S-139	9706	11/18/04	MGC	6"	good	98	14.5	1421	208329	
S-140	10809	11/18/04	MGC	6"	good	146	14.5	2117	210446	
S-141	9687	11/18/04	MGC	6"	good	146	14.5	2117	212563	
S-142	9718	11/18/04	MGC	6"	good	144	14.5	2088	214651	
S-143	10811	11/18/04	MGC	6"	good	88	14.5	1276	215927	
S-144	10811	11/18/04	MGC	6"	good	56	14.5	812	216739	
S-145	9711	11/18/04	MGC	6"	good	138	14.5	2001	218740	
S-146	9722	11/18/04	MGC	6"	good	145	14.5	2103	220842	
S-147	10800	11/18/04	MGC	6"	good	148	14.5	2146	222988	
S-148	9700	11/18/04	MGC	6"	good	142	14.5	2059	225047	

PANEL NUMBER	ROLL NUMBER	DEPLOY DATE	QC MON.	OBSERVED OVERLAP	VISUAL PANEL CONDITION	PANEL DIMENSIONS (FT)		PANEL AREA	TOTAL AREA PLACED	NOTES
						LENGTH	WIDTH			
S-149	10504	11/19/04	PRH	6"	good	135	14.5	1992	227039	
S-150	10502	11/19/04	PRH	6"	good	103	14.5	1494	228533	
S-151	10503	11/19/04	PRH	6"	good	146	14.5	2117	230650	
S-152	10512	11/19/04	PRH	6"	good	149	14.5	2161	232810	
S-153	10492	11/19/04	PRH	6"	good	109	14.5	1608	234418	
S-154	10492	11/19/04	PRH	6"	good	24	14.5	348	234766	
S-155	10505	11/19/04	PRH	6"	good	146	14.5	2117	236883	
S-156	10511	11/19/04	PRH	6"	good	146	14.5	2117	239000	
S-157	9677	11/19/04	PRH	6"	good	149	14.5	2161	241161	
S-158	10507	11/19/04	PRH	6"	good	147	14.5	2132	243292	
S-159	10506	11/19/04	PRH	6"	good	40	14.5	580	243872	
S-160	10506	11/19/04	PRH	6"	good	76	14.5	1102	244974	
S-161	10516	11/19/04	PRH	6"	good	148	14.5	2146	247120	
S-162	10490	11/19/04	PRH	6"	good	144	14.5	2088	249208	
S-163	10500	11/19/04	PRH	6"	good	149	14.5	2161	251369	
S-164	10667	11/19/04	PRH	6"	good	144	14.5	2088	253457	
S-165	10508	12/07/04	PRH	6"	good	141.5	14.5	2052	255508	
S-166	10514	12/07/04	PRH	6"	good	147	14.5	2132	257640	
S-167	10638	12/07/04	PRH	6"	good	147	14.5	2132	259771	
S-168	10513	12/07/04	PRH	6"-12"	good	147	14.25	2095	261866	
S-169	10666	12/07/04	PRH	12"	good	87	14	1218	263084	
S-170	10666	12/07/04	PRH	6"	good	19	14.5	276	263360	
S-171	10515	12/07/04	PRH	6"	good	146	14.5	2117	265477	
S-172	10748	12/07/04	PRH	6"	good	147	14.5	2132	267608	
S-173	10750	12/07/04	PRH	6"	good	147	14.5	2132	269740	
S-174	10756	12/07/04	PRH	6"	good	149	14.5	2161	271900	
S-175	10763	12/07/04	PRH	6"	good	74	14.5	1073	272973	
S-176	10763	12/07/04	PRH	6"	good	61	14.5	885	273858	
S-177	10761	12/07/04	PRH	6"	good	146	14.5	2117	275975	
S-178	10758	12/07/04	PRH	6"	good	147	14.5	2132	278106	
S-179	10764	12/07/04	PRH	6"	good	149	14.5	2161	280267	
S-180	10647	12/07/04	PRH	6"	good	147	14.5	2132	282398	
S-181	10760	12/07/04	PRH	6"	good	41	14.5	595	282993	
S-182	10760	12/07/04	PRH	6"	good	103	14.5	1494	284486	
S-183	10744	12/07/04	PRH	6"	good	147	14.5	2132	286618	
S-184	10743	12/07/04	PRH	6"	good	150	14.5	2175	288793	
S-185	10621	12/07/04	PRH	6"	good	147	14.5	2132	290924	
S-186	10728	12/07/04	PRH	6"	good	144.5	14.5	2095	293019	

PANEL NUMBER	ROLL NUMBER	DEPLOY DATE	QC MON.	OBSERVED OVERLAP	VISUAL PANEL CONDITION	PANEL DIMENSIONS (FT)		PANEL AREA	TOTAL AREA PLACED	NOTES
						LENGTH	WIDTH			
S-187	10731	12/07/04	PRH	6"	good	9	14.5	131	293150	
S-188	10731	12/07/04	PRH	6"	good	130.5	14.5	1892	295042	
S-189	10730	12/07/04	PRH	6"	good	147	14.5	2132	297174	
S-190	10703	12/07/04	PRH	6"	good	149	14.5	2161	299334	
S-191	10718	12/07/04	PRH	6"	good	148	14.5	2146	301480	
S-192	10717	12/07/04	PRH	6"	good	132	14.5	1914	303394	
S-193	10717	12/08/04	MGC	6"	good	9	14.5	131	303525	
S-194	10701	12/08/04	MGC	6"	good	147	14.5	2132	305656	
S-195	10702	12/08/04	MGC	6"	good	148	14.5	2146	307802	
S-196	10716	12/08/04	MGC	6"	good	148	14.5	2146	309948	
S-197	10683	12/08/04	MGC	6"	good	149	14.5	2161	312109	
S-198	10685	12/08/04	MGC	6"	good	115	14.5	1668	313776	
S-199	10685	12/08/04	MGC	6"	good	29	14.5	421	314197	
S-200	10684	12/08/04	MGC	6"	good	148	14.5	2146	316343	
S-201	9690	12/08/04	MGC	6"	good	147	14.5	2132	318474	
S-202	10662	12/08/04	MGC	6"	good	148	14.5	2146	320620	
S-203	10663	12/08/04	MGC	6"	good	147	14.5	2132	322752	
S-204	9685	12/08/04	MGC	6"	good	105	14.5	1523	324274	
S-205	9685	12/08/04	MGC	6"	good	28	14.5	406	324680	
S-206	9693	12/08/04	MGC	6"	good	146	14.5	2117	326797	
S-207	9694	12/08/04	MGC	6"	good	147	14.5	2132	328929	
S-208	9684	12/08/04	MGC	6"	good	148	14.5	2146	331075	
S-209	9692	12/08/04	MGC	6"	good	146	14.5	2117	333192	
S-210	9696	12/08/04	MGC	6"	good	114	14.5	1653	334845	
S-211	9696	12/08/04	MGC	6"	good	27	14.5	392	335236	
S-212	10719	12/08/04	MGC	6"	good	143	14.5	2074	337310	
S-213	9683	12/08/04	MGC	6"	good	147	14.5	2132	339441	
S-214	9691	12/08/04	MGC	6"	good	148	14.5	2146	341587	
S-215	10686	12/08/04	MGC	6"	good	148	14.5	2146	343733	
S-216	9681	12/08/04	MGC	6"	good	125	14.5	1813	345546	
S-217	9681	12/08/04	MGC	6"	good	20	14.5	290	345836	
S-218	9688	12/08/04	MGC	6"	good	140	14.5	2030	347866	
S-219	10665	12/08/04	MGC	6"	good	146	14.5	2117	349983	
S-220	10704	12/08/04	MGC	6"	good	150	14.5	2175	352158	
S-221	9682	12/08/04	MGC	6"	good	147	14.5	2132	354289	
S-222	9703	12/08/04	MGC	6"	good	142	14.5	2059	356348	
S-223	9701	12/09/04	PRH	6"	good	140	14.5	2030	358378	
S-224	10732	12/09/04	PRH	6"	good	147	14.5	2132	360510	

PANEL NUMBER	ROLL NUMBER	DEPLOY DATE	QC MON.	OBSERVED OVERLAP	VISUAL PANEL CONDITION	PANEL DIMENSIONS (FT)		PANEL AREA	TOTAL AREA PLACED	NOTES
						LENGTH	WIDTH			
S-225	9707	12/09/04	PRH	6"	good	148	14.5	2146	362656	
S-226	9704	12/09/04	PRH	6"	good	146	14.5	2117	364773	
S-227	9695	12/09/04	PRH	6"	good	144	14.5	2088	366861	
S-228	9714	12/09/04	PRH	6"	good	25	14.5	363	367223	
S-229	9714	12/09/04	PRH	6"	good	116	14.5	1682	368905	
S-230	9709	12/09/04	PRH	6"	good	143.5	14.5	2081	370986	
S-231	9698	12/09/04	PRH	6"	good	146	14.5	2117	373103	
S-232	9720	12/09/04	PRH	6"	good	148	14.5	2146	375249	
S-233	9710	12/09/04	PRH	6"	good	146	14.5	2117	377366	
S-234	9705	12/09/04	PRH	6"	good	58	14.5	841	378207	
S-235	9705	12/09/04	PRH	6"	good	85	14.5	1233	379439	
S-236	9721	12/09/04	PRH	6"	good	142.5	14.5	2066	381506	
S-237	9719	12/09/04	PRH	6"	good	146	14.5	2117	383623	
S-238	9712	12/09/04	PRH	6"	good	149	14.5	2161	385783	
S-239	9727	12/09/04	PRH	6"	good	146	14.5	2117	387900	
S-240	9726	12/09/04	PRH	6"	good	100	14.5	1450	389350	
S-241	9717	12/09/04	PRH	6"	good	139.5	14.5	2023	391373	
S-242	9764	12/09/04	PRH	6"	good	146	14.5	2117	393490	
S-243	9768	12/09/04	PRH	6"	good	148	14.5	2146	395636	
S-244	9773	12/09/04	PRH	6"	good	148	14.5	2146	397782	
S-245	9765	12/09/04	PRH	6"	good	146	14.5	2117	399899	
S-246	9726	12/09/04	PRH	6"	good	47	14.5	682	400580	
S-247	9748	12/11/04	MGC	6"	good	136	14.5	1972	402552	
S-248	9775	12/11/04	MGC	6"	good	147	14.5	2132	404684	
S-249	9746	12/11/04	MGC	6"	good	149	14.5	2161	406844	
S-250	9744	12/11/04	MGC	6"	good	146	14.5	2117	408961	
S-251	9737	12/11/04	MGC	6"	good	146	14.5	2117	411078	
S-252	9728	12/11/04	MGC	6"	good	54	14.5	783	411861	
S-253	9728	12/11/04	MGC	6"	good	87	14.5	1262	413123	
S-254	9747	12/11/04	MGC	6"	good	140	14.5	2030	415153	
S-255	9771	12/11/04	MGC	6"	good	146	14.5	2117	417270	
S-256	9731	12/11/04	MGC	6"	good	149	14.5	2161	419430	
S-257	9745	12/11/04	MGC	6"	good	146	14.5	2117	421547	
S-258	9766	12/11/04	MGC	6"	good	116	14.5	1682	423229	
S-259	9766	12/12/04	PRH	6"	good	22	14.5	319	423548	
S-260	9774	12/12/04	PRH	6"	good	146	14.5	2117	425665	
S-261	9778	12/12/04	PRH	6"	good	146	14.5	2117	427782	
S-262	9736	12/12/04	PRH	6"	good	148	14.5	2146	429928	

PANEL NUMBER	ROLL NUMBER	DEPLOY DATE	QC MON.	OBSERVED OVERLAP	VISUAL PANEL CONDITION	PANEL DIMENSIONS (FT)		PANEL AREA	TOTAL AREA PLACED	NOTES
						LENGTH	WIDTH			
S-263	9769	12/12/04	PRH	6"	good	147	14.5	2132	432060	
S-264	9779	12/12/04	PRH	6"	good	146	14.5	2117	434177	
S-265	9729	12/12/04	PRH	6"	good	37	14.5	537	434713	
S-266	9729	12/12/04	PRH	6"	good	105	14.5	1523	436236	
S-267	9762	12/12/04	PRH	6"	good	141.5	14.5	2052	438288	
S-268	9772	12/12/04	PRH	6"	good	146	14.5	2117	440405	
S-269	9780	12/12/04	PRH	6"	good	146	14.5	2117	442522	
S-270	9742	12/12/04	PRH	6"	good	148	14.5	2146	444668	
S-271	9770	12/12/04	PRH	6"	good	110	14.5	1595	446263	
S-272	9770	12/12/04	PRH	6"	good	27	14.5	392	446654	
S-273	9776	12/12/04	PRH	6"	good	146	14.5	2117	448771	
S-274	9739	12/12/04	PRH	6"	good	146	14.5	2117	450888	
S-275	9749	12/12/04	PRH	6"	good	149	14.5	2161	453049	
S-276	9761	12/12/04	PRH	6"	good	146	14.5	2117	455166	
S-277	10778	12/12/04	PRH	6"	good	143	14.5	2074	457239	
S-278	9740	12/12/04	PRH	6"	good	48	14.5	696	457935	
S-279	9740	12/14/04	PRH	6"	good	95.5	14.5	1385	459320	
S-280	9759	12/14/04	PRH	6"	good	146	14.5	2117	461437	
S-281	10774	12/14/04	PRH	6"	good	147	14.5	2132	463568	
S-282	10779	12/14/04	PRH	6"	good	149	14.5	2161	465729	
S-283	9743	12/14/04	PRH	6"	good	146	14.5	2117	467846	
S-284	10777	12/14/04	PRH	6"	good	126	14.5	1827	469673	
S-285	10777	12/14/04	PRH	6"	good	16.5	14.5	239	469912	
S-286	10707	12/14/04	PRH	6"	good	144	14.5	2088	472000	
S-287	9738	12/14/04	PRH	6"	good	147	14.5	2132	474132	
S-288	10767	12/14/04	PRH	6"	good	147	14.5	2132	476263	
S-289	10776	12/14/04	PRH	6"	good	149	14.5	2161	478424	
S-290	10780	12/14/04	PRH	6"	good	147	14.5	2132	480555	
S-291	10765	12/14/04	PRH	6"	good	66	14.5	957	481512	
S-292	10765	12/14/04	PRH	6"	good	73	14.5	1059	482571	
S-293	10772	12/14/04	PRH	0-6"	good	141	14.5	2045	484615	
S-294	10775	12/14/04	PRH	6"	good	147	14.5	2132	486747	
S-295	10768	12/14/04	PRH	6"	good	147	14.5	2132	488878	
S-296	10771	12/14/04	PRH	6"	good	149	14.5	2161	491039	
S-297	10773	12/14/04	PRH	6"	good	147	14.5	2132	493170	
S-298	10769	12/14/04	PRH	6"	good	17	14.5	247	493417	
S-299	10684	12/15/04	PRH	6"	good	142	14.5	2059	495476	
S-300	10757	12/15/04	PRH	6"	good	146	14.5	2117	497593	

PANEL NUMBER	ROLL NUMBER	DEPLOY DATE	QC MON.	OBSERVED OVERLAP	VISUAL PANEL CONDITION	PANEL DIMENSIONS (FT)		PANEL AREA	TOTAL AREA PLACED	NOTES
						LENGTH	WIDTH			
S-301	10642	12/15/04	PRH	6"	good	147	14.5	2132	499724	
S-302	10641	12/15/04	PRH	6"	good	149	14.5	2161	501885	
S-303	10646	12/15/04	PRH	6"	good	147	14.5	2132	504016	
S-304	10651	12/15/04	PRH	6"	good	91	14.5	1320	505336	
S-305	10651	12/15/04	PRH	6"	good	48.5	14.5	703	506039	
S-306	10652	12/15/04	PRH	6"	good	145	14.5	2103	508141	
S-307	10653	12/15/04	PRH	6"	good	147	14.5	2132	510273	
S-308	10634	12/15/04	PRH	6"	good	147	14.5	2132	512404	
S-309	10645	12/15/04	PRH	6"	good	149	14.5	2161	514565	
S-310	10649	12/15/04	PRH	6"	good	147	14.5	2132	516696	
S-311	10682	12/15/04	PRH	6"	good	45	14.5	653	517349	
S-312	10682	12/15/04	PRH	6"	good	99	14.5	1436	518784	
S-313	10639	12/15/04	PRH	6"	good	147	14.5	2132	520916	
S-314	10650	12/15/04	PRH	6"	good	147	14.5	2132	523047	
S-315	10680	12/15/04	PRH	6"	good	149	14.5	2161	525208	
S-316	10633	12/15/04	PRH	6"	good	147	14.5	2132	527339	
S-317	10679	12/15/04	PRH	6"	good	141.5	14.5	2052	529391	
S-318	10574	12/15/04	PRH	6"	good	144	14.5	2088	531479	
S-319	10661	12/15/04	PRH	6"	good	143	14.5	2074	533553	
S-320	10632	12/15/04	PRH	6"	good	148	14.5	2146	535699	
S-321	10678	12/15/04	PRH	6"	good	147	14.5	2132	537830	
S-322	10696	12/15/04	PRH	6"	good	147	14.5	2132	539962	
S-323	10660	12/15/04	PRH	6"	good	116	14.5	1682	541644	
S-324	10660	12/17/04	PRH	6"	good	26	14.5	377	542021	
S-325	10769	12/17/04	PRH	6"	good	68	14.5	986	543007	
S-326	10692	12/17/04	PRH	6"	good	147	14.5	2132	545138	
S-327	10695	12/17/04	PRH	6"	good	146	14.5	2117	547255	
S-328	10681	12/17/04	PRH	6"	good	147	14.5	2132	549387	
S-329	10675	12/17/04	PRH	6"	good	149	14.5	2161	551547	
S-330	10694	12/17/04	PRH	6"	good	141.5	14.5	2052	553599	
S-331	10697	12/17/04	PRH	6"	good	144.5	14.5	2095	555694	
S-332	10674	12/17/04	PRH	6"	good	147	14.5	2132	557826	
S-333	10676	12/17/04	PRH	6"	good	147	14.5	2132	559957	
S-334	10677	12/17/04	PRH	6"	good	147	14.5	2132	562089	
S-335	10671	12/17/04	PRH	6"	good	132	14.5	1914	564003	
S-336	10671	12/17/04	PRH	6"	good	8	14.5	116	564119	
S-337	10690	12/17/04	PRH	6"	good	123.5	14.5	1791	565909	
S-338	10690	12/17/04	PRH	6"	good	17.5	14.5	254	566163	

PANEL NUMBER	ROLL NUMBER	DEPLOY DATE	QC MON.	OBSERVED OVERLAP	VISUAL PANEL CONDITION	PANEL DIMENSIONS (FT)		PANEL AREA	TOTAL AREA PLACED	NOTES
						LENGTH	WIDTH			
S-339	10693	12/17/04	PRH	6"	good	143.5	14.5	2081	568244	
S-340	10670	12/17/04	PRH	6"	good	147	14.5	2132	570375	
S-341	10672	12/17/04	PRH	6"	good	146	14.5	2117	572492	
S-342	10689	12/17/04	PRH	6"	good	147	14.5	2132	574624	
S-343	10644	12/17/04	PRH	6"	good	149	14.5	2161	576784	
S-344	10668	12/17/04	PRH	6"	good	87	14.5	1262	578046	
S-345	10668	12/19/04	GDH	6"	good	55.5	14.5	805	578851	
S-346	10691	12/19/04	GDH	6"	good	146	14.5	2117	580968	
S-347	10659	12/19/04	GDH	6"	good	145	14.5	2103	583070	
S-348	10648	12/19/04	GDH	6"	good	146	14.5	2117	585187	
S-349	10669	12/19/04	GDH	6"	good	144	14.5	2088	587275	
S-350	10656	12/19/04	GDH	6"	good	146.5	14.5	2124	589399	
S-351	10658	12/19/04	GDH	6"	good	45	14.5	653	590052	
S-352	10658	12/19/04	GDH	6"	good	94	14.5	1363	591415	
S-353	10630	12/19/04	GDH	6"	good	142	14.5	2059	593474	
S-354	10654	12/19/04	GDH	6"	good	148	14.5	2146	595620	
S-355	10657	12/19/04	GDH	6"	good	142	14.5	2059	597679	
S-356	10643	12/19/04	GDH	6"	good	144	14.5	2088	599767	
S-357	10699	12/19/04	GDH	6"	good	43	14.5	624	600390	
S-358	10722	12/19/04	GDH	6"	good	8	14.5	116	600506	
S-359	10722	12/19/04	GDH	6"	good	134	14.5	1943	602449	
S-360	10673	12/19/04	GDH	6"	good	144	14.5	2088	604537	
S-361	10710	12/19/04	GDH	6"	good	147	14.5	2132	606669	
S-362	10715	12/19/04	GDH	6"	good	146	14.5	2117	608786	
S-363	10721	12/19/04	GDH	6"	good	148	14.5	2146	610932	
S-364	10708	12/19/04	GDH	6"	good	102.5	14.5	1486	612418	
S-365	10708	12/19/04	GDH	6"	good	40	14.5	580	612998	
S-366	10713	12/19/04	GDH	6"	good	146	14.5	2117	615115	
S-367	10714	12/19/04	GDH	6"	good	146	14.5	2117	617232	
S-368	10700	12/19/04	GDH	6"	good	145	14.5	2103	619335	
S-369	10709	12/19/04	GDH	6"	good	146	14.5	2117	621452	
S-370	10712	12/19/04	GDH	6"	good	148	14.5	2146	623598	
S-371	10746	12/19/04	GDH	6"	good	47.5	14.5	689	624286	
S-372	10746	12/19/04	GDH	6"	good	89.5	14.5	1298	625584	
S-373	10706	12/19/04	GDH	6"	good	146.5	14.5	2124	627708	
S-374	10711	12/19/04	GDH	6"	good	143	14.5	2074	629782	
S-375	10655	12/19/04	GDH	6"	good	143	14.5	2074	631855	
S-376	10698	12/19/04	GDH	6"	good	145	14.5	2103	633958	

PANEL NUMBER	ROLL NUMBER	DEPLOY DATE	QC MON.	OBSERVED OVERLAP	VISUAL PANEL CONDITION	PANEL DIMENSIONS (FT)		PANEL AREA	TOTAL AREA PLACED	NOTES
						LENGTH	WIDTH			
S-377	10705	12/19/04	GDH	6"	good	142	14.5	2059	636017	
S-378	10736	12/21/04	MGC	6"	good	145	14.5	2103	638119	
S-379	10747	12/21/04	MGC	6"	good	148	14.5	2146	640265	
S-380	10640	12/21/04	MGC	6"	good	146	14.5	2117	642382	
S-381	10735	12/21/04	MGC	6"	good	147	14.5	2132	644514	
S-382	10742	12/21/04	MGC	6"	good	150	14.5	2175	646689	
S-383	10738	12/21/04	MGC	6"	good	81.5	14.5	1182	647871	
S-384	10738	12/21/04	MGC	6"	good	56	14.5	812	648683	
S-385	10726	12/21/04	MGC	6"	good	148	14.5	2146	650829	
S-386	10734	12/21/04	MGC	6"	good	147	14.5	2132	652960	
S-387	10741	12/21/04	MGC	6"	good	146	14.5	2117	655077	
S-388	10724	12/21/04	MGC	6"	good	149	14.5	2161	657238	
S-389	10727	12/21/04	MGC	6"	good	149	14.5	2161	659398	
S-390	10737	12/21/04	MGC	6"	good	19	14.5	276	659674	
S-391	10737	12/21/04	MGC	6"	good	120	14.5	1740	661414	
S-392	10723	12/21/04	MGC	6"	good	147	14.5	2132	663545	
S-393	10725	12/21/04	MGC	6"	good	147	14.5	2132	665677	
S-394	10729	12/21/04	MGC	6"	good	146	14.5	2117	667794	
S-395	10740	12/21/04	MGC	6"	good	150	14.5	2175	669969	
S-396	10603	12/21/04	MGC	6"	good	97	14.5	1407	671375	
S-397	10522	2/11/05	MGC	3'	good	145	12	1740	673115	
S-398	10525	2/11/05	MGC	3'	good	147	12	1764	674879	
S-399	10527	2/11/05	MGC	3'	good	148	12	1776	676655	
S-400	10523	2/11/05	MGC	3'	good	147	12	1764	678419	
S-401	10526	2/11/05	MGC	3'	good	149	12	1788	680207	
S-402	10509	2/11/05	MGC	3'	good	68.5	12	822	681029	
S-403	10509	2/11/05	MGC	6"	good	69.5	14.5	1008	682037	
S-404	10517	2/11/05	MGC	6"	good	147	14.5	2132	684168	
S-405	10519	2/11/05	MGC	6"	good	147	14.5	2132	686300	
S-406	10528	2/11/05	MGC	6"	good	147	14.5	2132	688431	
S-407	10521	2/11/05	MGC	6"	good	146	14.5	2117	690548	
S-408	10518	2/11/05	MGC	6"	good	110	14.5	1595	692143	
S-409	10520	2/11/05	MGC	6"	good	131	14.5	1900	694043	
S-410	10529	2/11/05	MGC	6"	good	147	14.5	2132	696174	
S-411	10535	2/11/05	MGC	6"	good	146	14.5	2117	698291	
S-412	10530	2/11/05	MGC	6"	good	146	14.5	2117	700408	
S-413	10556	2/11/05	MGC	6"	good	147	14.5	2132	702540	
S-414	10560	2/11/05	MGC	6"	good	78.5	14.5	1138	703678	

PANEL NUMBER	ROLL NUMBER	DEPLOY DATE	QC MON.	OBSERVED OVERLAP	VISUAL PANEL CONDITION	PANEL DIMENSIONS (FT)		PANEL AREA	TOTAL AREA PLACED	NOTES
						LENGTH	WIDTH			
S-415	10560	2/12/05	MGC	6"	good	65	14.5	943	704621	
S-416	10531	2/12/05	MGC	6"	good	147	14.5	2132	706752	
S-417	10546	2/12/05	MGC	6"	good	147	14.5	2132	708884	
S-418	10544	2/12/05	MGC	6"	good	147	14.5	2132	711015	
S-419	10570	2/12/05	MGC	6"	good	139	14.5	2016	713031	
S-420	10533	2/12/05	MGC	6"	good	146	14.5	2117	715148	
S-421	10536	2/12/05	MGC	6"	good	144	14.5	2088	717236	
S-422	10545	2/12/05	MGC	6"	good	147	14.5	2132	719367	
S-423	10562	2/12/05	MGC	6"	good	147	14.5	2132	721499	
S-424	10532	2/12/05	MGC	6"	good	146	14.5	2117	723616	
S-425	10555	2/12/05	MGC	6"	good	147	14.5	2132	725747	
S-426	10557	2/12/05	MGC	6"	good	52	14.5	754	726501	
S-427	10557	2/12/05	MGC	6"	good	90.5	14.5	1312	727813	
S-428	10558	2/12/05	MGC	6"	good	146	14.5	2117	729930	
S-429	10552	2/12/05	MGC	6"	good	147	14.5	2132	732062	
S-430	10602	2/12/05	MGC	6"	good	152	14.5	2204	734266	
S-431	10573	2/12/05	MGC	6"	good	147	14.5	2132	736397	
S-432	10559	2/12/05	MGC	6"	good	95	14.5	1378	737775	
S-433	10559	2/12/05	MGC	6"	good	46.5	14.5	674	738449	
S-434	10598	2/12/05	MGC	6"	good	147	14.5	2132	740581	
S-435	10610	2/12/05	MGC	6"	good	146	14.5	2117	742698	
S-436	10572	2/12/05	MGC	6"	good	146	14.5	2117	744815	
S-437	10566	2/12/05	MGC	6"	good	146	14.5	2117	746932	
S-438	10583	2/12/05	MGC	6"	good	138	14.5	2001	748933	
S-439	10585	2/12/05	MGC	6"	good	145	14.5	2103	751035	
S-440	10594	2/12/05	MGC	6"	good	150	14.5	2175	753210	
S-441	10575	2/12/05	MGC	6"	good	147	14.5	2132	755342	
S-442	10584	2/12/05	MGC	6"	good	148	14.5	2146	757488	
S-443	10611	2/12/05	MGC	6"	good	149	14.5	2161	759648	
S-444	10587	2/12/05	MGC	6"	good	27	14.5	392	760040	
S-445	10587	2/12/05	MGC	6"	good	114	14.5	1653	761693	
S-446	10576	2/12/05	MGC	6"	good	148	14.5	2146	763839	
S-447	10616	2/12/05	MGC	6"	good	148	14.5	2146	765985	
S-448	10623	2/12/05	MGC	6"	good	148	14.5	2146	768131	
S-449	10601	2/12/05	MGC	6"	good	150	14.5	2175	770306	
S-450	10606	2/12/05	MGC	6"	good	54	14.5	783	771089	
S-451	10606	2/14/05	MGC	6"	good	92	14.5	1334	772423	
S-452	10614	2/14/05	MGC	6"	good	147	14.5	2132	774554	

PANEL NUMBER	ROLL NUMBER	DEPLOY DATE	QC MON.	OBSERVED OVERLAP	VISUAL PANEL CONDITION	PANEL DIMENSIONS (FT)		PANEL AREA	TOTAL AREA PLACED	NOTES
						LENGTH	WIDTH			
S-453	10607	2/14/05	MGC	6"	good	148	14.5	2146	776700	
S-454	10578	2/14/05	MGC	6"	good	146	14.5	2117	778817	
S-455	10590	2/14/05	MGC	6"	good	147	14.5	2132	780949	
S-456	10599	2/14/05	MGC	6"	good	79	14.5	1146	782094	
S-457	10599	2/14/05	MGC	6"	good	66	14.5	957	783051	
S-458	10579	2/14/05	MGC	6"	good	147	14.5	2132	785183	
S-459	10580	2/14/05	MGC	6"	good	147	14.5	2132	787314	
S-460	10597	2/14/05	MGC	6"	good	150	14.5	2175	789489	
S-461	10548	2/14/05	MGC	6"	good	147	14.5	2132	791621	
S-462	10550	2/14/05	MGC	6"	good	100	14.5	1450	793071	
S-463	DN-0021	3/21/05	MGC	6"	good	150	14.5	2175	795246	
S-464	DN-0009	3/22/05	MGC	6"	good	143	14.5	2074	797319	
S-465	DN-0023	3/22/05	MGC	6"	good	21.5	14.5	312	797631	
S-466	DN-0023	3/22/05	MGC	6"	good	115.5	14.5	1675	799306	
S-467	DN-0034	3/22/05	MGC	6"	good	48.5	14.5	703	800009	
S-468	DN-0034	3/22/05	MGC	6"	good	95	14.5	1378	801386	
S-469	DN-0022	3/22/05	MGC	6"	good	89	14.5	1291	802677	
S-470	DN-0022	3/22/05	MGC	6"	good	66	14.5	957	803634	
S-471	DN-0025	3/22/05	MGC	6"	good	79.5	14.5	1153	804787	
S-472	DN-0025	3/22/05	MGC	6"	good	52.5	14.5	761	805548	
S-473	DN-0020	3/22/05	MGC	6"	good	72	14.5	1044	806592	
S-474	DN-0020	3/22/05	MGC	6"	good	67.5	14.5	979	807571	
S-475	DN-0024	3/22/05	MGC	6"	good	71	14.5	1030	808600	
S-476	DN-0024	3/22/05	MGC	6"	good	27	14.5	392	808992	
S-477	DN-0024	3/22/05	MGC	6"	good	15	14.5	218	809209	
S-478	DN-0033	3/22/05	MGC	6"	good	33	14.5	479	809688	
S-479	DN-0033	3/22/05	MGC	6"	good	22	14.5	319	810007	
S-480	DN-0033	3/22/05	MGC	6"	good	71.5	14.5	1037	811043	
S-481	DN-0037	3/22/05	MGC	6"	good	100	14.5	1450	812493	
S-482	DN-0037	3/22/05	MGC	6"	good	34	14.5	493	812986	
S-483	DN-0019	3/22/05	MGC	6"	good	116	14.5	1682	814668	
S-484	DN-0019	3/22/05	MGC	6"	good	17	14.5	247	814915	
S-485	DN-0036	3/22/05	MGC	6"	good	107	14.5	1552	816466	
S-486	DN-0036	3/22/05	MGC	6"	good	25.5	14.5	370	816836	
S-487	DN-0032	3/22/05	MGC	6"	good	73.5	14.5	1066	817902	
S-488	DN-0032	3/22/05	MGC	6"	good	47.5	14.5	689	818591	
S-489	DN-0038	3/22/05	MGC	6"	good	53.5	14.5	776	819366	
S-490	DN-0028	3/22/05	MGC	6"	good	Triangle	Triangle	238	819604	

PANEL NUMBER	ROLL NUMBER	DEPLOY DATE	QC MON.	OBSERVED OVERLAP	VISUAL PANEL CONDITION	PANEL DIMENSIONS (FT)		PANEL AREA	TOTAL AREA PLACED	NOTES
						LENGTH	WIDTH			
S-491	DN-0028	3/22/05	MGC	6"	good	42.5	14.5	616	820221	
S-492	DN-0039	3/22/05	MGC	6"	good	136.5	14.5	1979	822200	
S-493	DN-0065	3/22/05	MGC	6"	good	146.5	14.5	2124	824324	
S-494	DN-0066	3/22/05	MGC	6"	good	25	14.5	363	824687	
S-495	DN-0066	3/22/05	MGC	6"	good	106	14.5	1537	826224	
S-496	DN-0072	3/22/05	MGC	6"	good	62.5	14.5	906	827130	
S-497	DN-0072	3/22/05	MGC	6"	good	76	14.5	1102	828232	
S-498	DN-0073	3/22/05	MGC	6"	good	85	14.5	1233	829464	
S-499	DN-0073	3/22/05	MGC	6"	good	48	14.5	696	830160	
S-500	DN-0040	3/22/05	MGC	6"	good	98	14.5	1421	831581	
S-501	DN-0040	3/22/05	MGC	6"	good	33	14.5	479	832060	
S-502	DN-0035	3/22/05	MGC	6"	good	96.5	14.5	1399	833459	
S-503	DN-0038	3/22/05	MGC	6"	good	33	14.5	479	833938	
S-504	DN-0064	3/22/05	MGC	6"	good	83.5	14.5	1211	835148	
S-505	DN-0064	3/23/05	MGC	6"	good	58	14.5	841	835989	
S-506	DN-0050	3/23/05	MGC	6"	good	41	14.5	595	836584	
S-507	DN-0050	3/23/05	MGC	6"	good	66	14.5	957	837541	
S-508	DN-0050	3/23/05	MGC	6"	good	16	14.25	228	837769	
S-509	DN-0055	3/23/05	MGC	6"	good	Triangle	Triangle	231	838000	
S-510	DN-0055	3/23/05	MGC	6"	good	116	14.5	1682	839682	
S-511	DN-0059	3/23/05	MGC	6"	good	149.5	14.5	2168	841850	
S-512	DN-0057	3/23/05	MGC	6"	good	150	14.5	2175	844025	
S-513	DN-0058	3/23/05	MGC	6"	good	37.5	14.5	544	844568	
S-514	DN-0058	3/23/05	MGC	6"	good	11	14.5	160	844728	
S-515	DN-0058	3/23/05	MGC	6"	good	17	14.5	247	844974	
S-516	DN-0058	3/23/05	MGC	6"	good	66.5	14.5	964	845939	
S-517	DN-0067	3/23/05	MGC	6"	good	104.5	14.5	1515	847454	
S-518	DN-067	3/23/05	MGC	6"	good	36.5	14.5	529	847983	
S-519	DN-0046	3/23/05	MGC	6"	good	140.5	14.5	2037	850020	
S-520	DN-0047	3/23/05	MGC	6"	good	146.5	14.5	2124	852145	
S-521	DN-0056	3/23/05	MGC	6"	good	37.5	14.5	544	852688	
S-522	DN-0056	3/24/05	MGC	6"	good	103	14.5	1494	854182	
S-523	DN-0080	3/24/05	MGC	6"	good	86	14.5	1247	855429	
S-524	DN-0049	3/24/05	MGC	6"	good	150	14.5	2175	857604	
S-525	DN-0080	3/24/05	MGC	6"	good	46	14.5	667	858271	
S-526	DN-0010	3/24/05	MGC	6"	good	148	14.5	2146	860417	
S-527	DN-0068	3/24/05	MGC	6"	good	52	14.5	754	861171	
S-528	DN-0068	3/24/05	MGC	6"	good	84	14.5	1218	862389	

PANEL NUMBER	ROLL NUMBER	DEPLOY DATE	QC MON.	OBSERVED OVERLAP	VISUAL PANEL CONDITION	PANEL DIMENSIONS (FT)		PANEL AREA	TOTAL AREA PLACED	NOTES
						LENGTH	WIDTH			
S-529	DN-0071	3/24/05	MGC	6"	good	82	14.5	1189	863578	
S-530	DN-0071	3/24/05	MGC	6"	good	36	14.5	522	864100	
S-531	DN-0071	3/24/05	MGC	6"	good	12	14.5	174	864274	
S-532	DN-0070	3/24/05	MGC	6"	good	148	14.5	2146	866420	
S-533	DN-0048	3/24/05	MGC	6"	good	43	14.5	624	867043	
S-534	DN-0053	03/29/05	MGC	6"	good	128.5	14.5	1863	868907	
S-535	DN-0048	03/29/05	MGC	6"	good	102	14.5	1479	870386	
S-536	DN-0088	03/29/05	MGC	6"	good	PENTAGON		1196	871582	
S-537	DN-0088	03/29/05	MGC	6"	good	TRIANGLE		293	871874	
S-538	DN-0063	03/29/05	MGC	6"	good	105.5	14.5	1530	873404	
S-539	DN-0088	03/29/05	MGC	6"	good	31	5	155	873559	
S-540	1730	03/30/05	MGC	6"	good	138	14.5	2001	875560	
S-541	1731	03/30/05	MGC	6"	good	143	14.5	2074	877634	
S-542	10550	03/30/05	MGC	6"	good	36	14.5	522	878156	
S-543	10567	03/30/05	MGC	6"	good	86	14.5	1247	879403	
S-544	10567	03/30/05	MGC	6"	good	55	14.5	798	880200	
S-545	1732	03/30/05	MGC	6"	good	146	14.5	2117	882317	
S-546	1729	03/30/05	MGC	6"	good	135	14.5	1958	884275	
S-547	10613	03/30/05	MGC	6"	good	45	14.5	653	884927	
S-548	10613	03/30/05	MGC	6"	good	98.5	14.5	1428	886355	
S-549	10538	03/30/05	MGC	6"	good	147	14.5	2132	888487	
S-550	10565	03/30/05	MGC	6"	good	102.5	14.5	1486	889973	
S-551	10565	03/30/05	MGC	6"	good	41	14.5	595	890568	
S-552	10539	03/30/05	MGC	6"	good	147	14.5	2132	892699	
S-553	1726	03/30/05	MGC	6"	good	132.5	14.5	1921	894620	
S-554	1726	03/30/05	MGC	6"	good	9.5	14.5	138	894758	
S-555	1725	03/30/05	MGC	6"	good	146	14.5	2117	896875	
S-556	1727	03/30/05	MGC	6"	good	134	14.5	1943	898818	
S-557	1728	03/30/05	MGC	6"	good	14	14.5	203	899021	
S-558	1728	03/30/05	MGC	6"	good	119	14.5	1726	900747	
S-559	1733	03/30/05	MGC	6"	good	148	14.5	2146	902893	
S-560	1734	03/30/05	MGC	6"	good	137.5	14.5	1994	904886	
S-561	10595	03/30/05	MGC	6"	good	115.5	14.5	1675	906561	
S-562	10595	03/30/05	MGC	6"	good	29	14.5	421	906982	
S-563	10568	03/30/05	MGC	6"	good	142.5	14.5	2066	909048	
S-564	10589	03/30/05	MGC	6"	good	52	14.5	754	909802	
S-565	10589	03/30/05	MGC	6"	good	89	14.5	1291	911092	
S-566	10611	03/30/05	MGC	6"	good	112.5	14.5	1631	912724	

PANEL NUMBER	ROLL NUMBER	DEPLOY DATE	QC MON.	OBSERVED OVERLAP	VISUAL PANEL CONDITION	PANEL DIMENSIONS (FT)		PANEL AREA	TOTAL AREA PLACED	NOTES
						LENGTH	WIDTH			
S-567	10611	4/1/05	MGC	6"	good	18.5	14.5	268	912992	
S-568	10605	4/1/05	MGC	6"	good	146	14.5	2117	915109	
S-569	10603	4/1/05	MGC	6"	good	13	14.5	189	915297	
S-570	10603	4/1/05	MGC	6"	good	131.5	14.5	1907	917204	
S-571	10564	4/1/05	MGC	6"	good	15	14.5	218	917422	
S-572	10611	4/1/05	MGC	6"	good	TRIANGLE		145	917567	
S-573	10564	4/1/05	MGC	6"	good	120	14.5	1740	919307	
S-574	10563	4/1/05	MGC	6"	good	14	14.5	203	919510	
S-575	10563	4/1/05	MGC	6"	good	98.5	14.5	1428	920938	
S-576	10564	4/1/05	MGC	6"	good	TRIANGLE		145	921083	
S-577	10563	4/1/05	MGC	6"	good	18.5	14.5	268	921351	
S-578	10574	4/1/05	MGC	6"	good	67.5	14.5	979	922330	
S-579	10574	4/1/05	MGC	6"	good	51	14.5	740	923069	
S-580	10563	4/1/05	MGC	6"	good	TRIANGLE		145	923214	
S-581	10574	4/1/05	MGC	6"	good	11	27	297	923511	
S-582	10586	4/1/05	MGC	6"	good	33	14.5	479	923990	
S-583	10586	4/1/05	MGC	6"	good	29	14.5	421	924410	
S-584	10586	4/1/05	MGC	6"	good	33.5	14.5	486	924896	
S-585	10586	4/1/05	MGC	6"	good	28.5	14.5	413	925309	
S-586	10627	4/1/05	MGC	6"	good	24	14.5	348	925657	
S-587	10627	4/1/05	MGC	6"	good	19.5	14.5	283	925940	
S-588	10627	4/1/05	MGC	6"	good	15.5	14.5	225	926165	
S-589	10627	4/1/05	MGC	6"	good	12	14.5	174	926339	
S-590	10627	4/1/05	MGC	6"	good	9	14.5	131	926469	
S-591	DN-0054	4/2/05	MGC	6"	good	151	14.5	2190	928659	
S-592	DN-0051	4/2/05	MGC	6"	good	149	14.5	2161	930819	
S-593	DN-0061	4/2/05	MGC	6"	good	147	14.5	2132	932951	
S-594	DN-0041	4/2/05	MGC	6"	good	147.5	14.5	2139	935090	
S-595	DN-0042	4/2/05	MGC	6"	good	43	14.5	624	935713	
S-596	DN-0042	4/2/05	MGC	6"	good	39	14.5	566	936279	
S-597	DN-0042	4/2/05	MGC	6"	good	36	14.5	522	936801	
S-598	DN-0042	4/2/05	MGC	6"	good	14	14.5	203	937004	
S-599	DN-0045	4/2/05	MGC	6"	good	18	14.5	261	937265	
S-600	DN-0045	4/2/05	MGC	6"	good	122	14.5	1769	939034	
S-601	DN-0043	4/2/05	MGC	6"	good	149	14.5	2161	941194	
S-602	DN-0030	4/2/05	MGC	6"	good	51	14.5	740	941934	
S-603	DN-0030	4/2/05	MGC	6"	good	18	14.5	261	942195	
S-604	DN-0030	4/2/05	MGC	6"	good	67.5	14.5	979	943173	

PANEL NUMBER	ROLL NUMBER	DEPLOY DATE	QC MON.	OBSERVED OVERLAP	VISUAL PANEL CONDITION	PANEL DIMENSIONS (FT)		PANEL AREA	TOTAL AREA PLACED	NOTES
						LENGTH	WIDTH			
S-605	DN-0092	4/2/05	MGC	6"	good	94	14.5	1363	944536	
S-606	DN-0092	4/2/05	MGC	6"	good	47.5	14.5	689	945225	
S-607	DN-0029	4/2/05	MGC	6"	good	111.5	14.5	1617	946842	
S-608	DN-0029	04/03/05	MGC	6"	good	28.5	14.5	413	947255	
S-609	DN-0090	04/03/05	MGC	6"	good	100	14.5	1450	948705	
S-610	DN-0090	04/03/05	MGC	6"	good	36	14.5	522	949227	
S-611	DN-0091	04/03/05	MGC	6"	good	73.5	14.5	1066	950293	
S-612	DN-0091	04/03/05	MGC	6"	good	65.4	14.5	949	951242	
S-613	DN-0090	04/03/05	MGC	6"	good	TRIANGLE		88	951330	
S-614	DN-0084	04/03/05	MGC	6"	good	19.5	14.5	283	951612	
S-615	DN-0084	04/03/05	MGC	6"	good	73	14.5	1059	952671	
S-616	DN-0084	04/03/05	MGC	6"	good	40.8	14.5	592	953263	
S-617	DN-0084	04/03/05	MGC	6"	good	TRIANGLE		75	953338	
S-618	DN-0085	04/03/05	MGC	6"	good	11	14.5	160	953497	
S-619	DN-0085	04/03/05	MGC	6"	good	36.5	14.5	529	954027	
S-620	DN-0085	04/03/05	MGC	6"	good	-	14.5	215	954242	
S-621	DN-0085	04/03/05	MGC	6"	good	TRIANGLE		75	954317	
S-622	DN-0031	04/03/05	MGC	6"	good	101	14.5	1465	955781	
S-623	DN-0031	04/03/05	MGC	6"	good	36	14.5	522	956303	
S-624	DN-0081	04/03/05	MGC	6"	good	62.5	14.5	906	957209	
S-625	DN-0081	04/03/05	MGC	6"	good	70	14.5	1015	958224	
S-626	DN-0085	04/03/05	MGC	6"	good	62	14.5	899	959123	
S-627	DN-0081	04/03/05	MGC	6"	good	10.5	14.5	152	959276	
S-628	DN-0087	04/03/05	MGC	6"	good	54.5	14.5	790	960066	
S-629	DN-0087	04/03/05	MGC	6"	good	34.5	14.5	500	960566	
S-630	DN-0087	04/03/05	MGC	6"	good	7.5	14.5	109	960675	
S-631	DN-0087	04/03/05	MGC	6"	good	18.5	14.5	268	960943	
S-632	DN-0087	04/03/05	MGC	6"	good	6	14.5	87	961030	
S-633	DN-0089	04/03/05	MGC	6"	good	9	14.5	131	961161	
S-634	DN-0089	04/03/05	MGC	6"	good	104	14.5	1508	962669	
S-635	10627	04/03/05	MGC	6"	good	43	14.5	624	963292	
S-636	10537	04/03/05	MGC	6"	good	149	14.5	2161	965453	
S-637	10534	04/03/05	MGC	6"	good	139.5	14.5	2023	967475	
S-638	10577	04/03/05	MGC	6"	good	136.5	14.5	1979	969455	
S-639	10543	04/03/05	MGC	6"	good	105.6	14.5	1531	970985	
S-640	10590	04/03/05	MGC	6"	good	152	14.5	2204	973189	
S-641	10626	04/03/05	MGC	6"	good	45	14.5	653	973842	
S-642	10626	04/03/05	MGC	6"	good	89.5	14.5	1298	975139	

PANEL NUMBER	ROLL NUMBER	DEPLOY DATE	QC MON.	OBSERVED OVERLAP	VISUAL PANEL CONDITION	PANEL DIMENSIONS (FT)		PANEL AREA	TOTAL AREA PLACED	NOTES
						LENGTH	WIDTH			
S-643	10628	04/03/05	MGC	6"	good	53	14.5	769	975908	
S-644	10628	04/03/05	MGC	6"	good	88.5	14.5	1283	977191	
S-645	DN-0086	04/03/05	MGC	6"	good	104.5	14.5	1515	978706	
S-646	DN-0086	04/03/05	MGC	6"	good	37	14.5	537	979243	
S-647	DN-0082	04/03/05	MGC	6"	good	43	14.5	624	979866	
S-648	DN-0082	04/03/05	MGC	6"	good	98	14.5	1421	981287	
S-649	DN-0083	04/03/05	MGC	6"	good	92	14.5	1334	982621	
S-650	DN-0083	04/03/05	MGC	6"	good	23.5	14.5	341	982962	
S-651	DN-0083	04/03/05	MGC	6"	good	28	14.5	406	983368	
S-652	DN-0079	04/03/05	MGC	6"	good	61	14.5	885	984253	
S-653	DN-0079	04/03/05	MGC	6"	good	81.5	14.5	1182	985434	
S-654	DN-0093	04/03/05	MGC	6"	good	56	14.5	812	986246	
S-655	DN-0093	04/03/05	MGC	6"	good	10	14.5	145	986391	
S-656	DN-0093	04/03/05	MGC	6"	good	27	7	189	986580	
S-657	10619	04/04/05	MGC	6"	good	115	14.5	1668	988248	
S-658	10593	04/04/05	MGC	6"	good	124	14.5	1798	990046	
S-659	10593	04/04/05	MGC	6"	good	TRIANGLE		63	990109	
S-660	10581	04/04/05	MGC	6"	good	PENTAGON		1917	992026	
S-661	10571	04/04/05	MGC	6"	good	HEXIGON		1237	993263	
S-662	10571	04/04/05	MGC	6"	good	28	14.5	406	993669	
S-663	10553	04/04/05	MGC	6"	good	54	14.5	783	994452	
S-664	10553	04/04/05	MGC	6"	good	TRIANGLE		145	994597	
S-665	10553	04/04/05	MGC	6"	good	25	14.5	363	994959	

FML

Flexible Membrane Liner

FUSION TRIAL SEAM TEST

PROJECT NUMBER:	043-2246	PROJECT TITLE:	Rocky Flats, Present Landfill	Specificaitons	
LINER INSTALLER:	Colorado Lining	CONTRACTOR:	S.M. Stoller	Shear	90 lb/in
LOCATION:	Rocky Flats	SITE MANAGER:	Kaiser Hill Company LLC	Peal	75 lb/in

	SHEAR (ppi)			PEEL-Top (ppi)			PEEL-Bottom (ppi)			Tested					Pass	
Specimen #	S1	S2	S3	P1T	P2T	P3T	P1B	P2B	P3B	by	Date Tested	Temp	Speed	Tech	Fail	Comments
TF-001	110	110	111	95	96	95	92	89	99	MGC	10/30/04	800	8.6 fpm	BC	Pass	mach #0004
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 60°F
TF-002	101	104	97	95	99	98	101	101	99	MSP	11/4/04	800	7.0 fpm	BC	Pass	mach #0004
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 35°F
TF-003	108	103	111	93	96	96	92	97	94	MSP	11/4/04	800	8.0 fpm	BC	Pass	mach #0004
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 35°F
TF-004	102	111	111	84	95	92	92	95	95	PRH	11/4/04	800	8.5 fpm	BC	Pass	mach #0004
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 45°F
TF-005	99	98	98	83	84	88	84	88	89	MSP	11/5/04	800	8.0 fpm	BC	Pass	mach #0004
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 60°F
TF-006	93	91	90	81	84	79	84	80	88	MSP	11/5/04	800	8.5 fpm	BC	Pass	mach #0004
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 60°F
TF-007	96	96	96	85	82	86	86	86	83	PRH	11/8/04	800	8.0 fpm	BC	Pass	mach #0004
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 70°F
TF-008	101	105	105	89	89	92	90	90	92	PRH	11/8/04	800	9.0 fpm	BC	Pass	mach #0004
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 70°F
TF-009	91	97	97	84	85	85	84	86	86	MSP	11/8/04	800	9.5 fpm	BC	Pass	mach #0004
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 65°F
TF-010	97	102	103	92	90	90	90	91	92	MSP	11/9/04	750	9.0 fpm	RD	Pass	mach #0019
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 60°F
TF-011	103	103	103	91	93	94	92	95	92	MSP	11/9/04	800	8.5 fpm	BC	Pass	mach #0004
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 55°F
TF-012	93	93	94	88	88	87	88	87	88	MGC	11/9/04	800	8.5 fpm	BC	Pass	mach #0004
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 60°F
TF-013	100	102	102	94	97	97	94	97	97	PRH	11/9/04	800	9.0 fpm	JS	Pass	mach #0019
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 50°F
TF-014	95	91	97	86	88	87	87	82	83	PRH	11/16/04	800	9.5 fpm	JS	Pass	mach #0004
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 50°F
TF-015	110	108	99	95	94	99	94	91	99	MSP	11/17/04	800	9.0 fpm	BC	Pass	mach #0004
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 50°F

Specimen #	SHEAR (ppi)			PEEL-Top (ppi)			PEEL-Bottom (ppi)			Tested by	Date Tested	Temp	Speed	Tech	Pass Fail	Comments
	S1	S2	S3	P1T	P2T	P3T	P1B	P2B	P3B							
TF-016	103	102	101	98	97	99	99	94	96	MSP	11/17/04	800	9.0 fpm	JS	Pass	mach #0019
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp50
TF-017	103	103	101	100	97	91	93	97	92	MGC	11/17/04	800	8.5 fpm	JS	Pass	mach #0019
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 50°F
TF-018	98	97	105	93	92	92	91	93	90	MSP	11/17/04	800	9.0 fpm	BC	Pass	mach #0004
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 50°F
TF-019	113	113	110	97	99	95	95	99	94	PRH	11/18/04	800	9.0 fpm	BC	Pass	mach #0004
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 45°F
TF-020	101	111	113	98	99	102	96	99	100	PRH	11/18/04	800	9.0 fpm	JS	Pass	mach #0019
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 45°F
TF-021	114	106	109	113	103	104	99	100	99	MGC	11/18/04	800	8.8 fpm	JS	Pass	mach #0019
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 50°F
TF-022	103	103	105	96	98	100	97	92	95	MGC	11/18/04	800	9.0 fpm	BC	Pass	mach #0004
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 50°F
TF-023	120	122	114	100	102	104	110	110	110	MGC	11/19/04	800	8.5 fpm	BC	Pass	mach #0004
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 45°F
TF-024	116	123	117	108	103	103	103	111	102	MGC	11/19/04	800	8.5 fpm	JS	Pass	mach #0019
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 45°F
TF-025	105	104	100	90	97	92	87	90	91	PRH	11/19/04	800	9.0 fpm	BC	Pass	mach #0004
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 45°F
TF-026	94	96	96	90	91	94	92	92	94	PRH	11/19/04	800	8.5 fpm	JS	Pass	mach #0019
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 45°F
TF-027	104	113	113	102	109	101	104	105	101	MGC	12/7/04	800	9.0 fpm	JS	Pass	mach #0019
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 50°F
TF-028	100	100	99	88	89	86	91	92	86	PRH	12/7/04	800	9.5 fpm	BC	Pass	mach #0004
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 50°F
TF-029	97	99	94	88	89	86	91	93	85	PRH	12/7/04	800	9.5 fpm	JS	Pass	mach #0019
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 50°F
TF-030	116	114	115	96	102	101	99	103	103	PRH	12/7/04	800	9.5 fpm	JS	Pass	mach #0019
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 45°F
TF-031	109	110	109	90	90	93	92	95	97	PRH	12/8/04	800	9.5 fpm	BC	Pass	mach #0035
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 50°F
TF-032	99	104	101	94	97	94	93	97	93	MSP	12/8/04	800	9.5 fpm	JS	Pass	mach #0019
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 50°F

Specimen #	SHEAR (ppi)			PEEL-Top (ppi)			PEEL-Bottom (ppi)			Tested by	Date Tested	Temp	Speed	Tech	Pass Fail	Comments
	S1	S2	S3	P1T	P2T	P3T	P1B	P2B	P3B							
TF-033	101	98	99	89	87	89	89	89	92	MSP	12/8/04	800	9.5 fpm	BC	Pass	mach #0004
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 45°F
TF-034	118	121	119	99	103	102	112	106	101	MGC	12/9/04	800	9.5 fpm	BC	Pass	mach #0004
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 40°F
TF-035	117	121	118	108	101	99	113	101	99	MGC	12/9/04	800	9.5 fpm	JS	Pass	mach #0019
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 40°F
TF-036	101	104	103	97	94	95	97	94	92	MGC	12/9/04	800	9.5 fpm	JS	Pass	mach #0019
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 40°F
TF-037	91	93	99	91	89	86	82	85	88	MGC	12/9/04	800	9.5 fpm	BC	Pass	mach #0004
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 40°F
TF-038	109	102	109	95	94	96	94	97	97	PRH	12/11/04	800	10.0 fpm	BC	Pass	mach #0004
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 50°F
TF-039	119	115	119	100	97	97	94	97	97	PRH	12/11/04	800	10.0 fpm	BC	Pass	mach #0004
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 40°F
TF-040	104	102	102	89	87	96	92	92	90	PRH	12/12/04	800	10.0 fpm	BC	Pass	mach # 0004
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 40°F
TF-041	122	122	122	109	115	110	102	102	106	MSP	12/14/04	800	10.0 fpm	BC	Pass	mach # 0004
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 45°F
TF-042	102	102	103	95	94	95	89	95	93	MSP	12/14/04	800	10.0 fpm	RB	Pass	mach # 0019
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 45°F
TF-043	98	105	101	95	91	93	91	91	92	MSP	12/14/04	800	10.0 fpm	BC	Pass	mach # 0004
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 50°F
TF-044	117	110	113	101	99	108	99	97	107	MSP	12/15/04	800	10.0 fpm	BC	Pass	mach # 0004
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 40°F
TF-045	113	113	114	93	102	96	96	96	95	MSP	12/15/04	800	10.0 fpm	JS	Pass	mach # 0019
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 40°F
TF-046	109	109	101	97	95	91	99	94	95	MSP	12/15/04	800	10.0 fpm	BC	Pass	mach # 0004
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 40°F
TF-047	99	94	104	95	92	97	91	91	90	MSP	12/15/04	800	10.0 fpm	JS	Pass	mach # 0019
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 40°F
TF-048	118	116	111	108	99	101	102	98	105	PRH	12/17/04	800	10.0 fpm	JS	Pass	mach # 0019
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 50°F
TF-049	111	111	112	93	98	95	94	92	93	PRH	12/17/04	800	10.0 fpm	BC	Pass	mach # 0004
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 50°F

Specimen #	SHEAR (ppi)			PEEL-Top (ppi)			PEEL-Bottom (ppi)			Tested by	Date Tested	Temp	Speed	Tech	Pass Fail	Comments
	S1	S2	S3	P1T	P2T	P3T	P1B	P2B	P3B							
TF-050	108	102	109	99	93	94	89	90	96	MSP	12/17/04	800	10.0 fpm	BC	Pass	mach # 0004
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 40°F
TF-051	118	129	119	112	101	102	113	104	109	MSP	12/19/04	800	10.0 fpm	BC	Pass	mach # 0004
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 55°F
TF-052	114	113	118	107	108	103	103	108	108	MSP	12/19/04	800	10.0 fpm	JS	Pass	mach # 0019
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 55°F
TF-053	100	99	99	92	93	90	90	92	87	MSP	12/19/04	800	10.0 fpm	JS	Pass	mach # 0019
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 55°F
TF-054	102	100	98	88	91	88	88	92	95	PRH	12/19/04	800	10.0 fpm	BC	Pass	mach # 0004
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 55°F
TF-055	109	103	110	96	89	92	96	96	96	MSP	12/21/04	800	10.0 fpm	BC	Pass	mach # 0004
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 35°F
TF-056	110	108	110	97	100	99	93	95	97	MSP	12/21/04	800	10.0 fpm	JS	Pass	mach # 0019
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 35°F
TF-057	-	-	-	89	-	-	69	-	-	MSP	12/21/04	800	10.0 fpm	BC	Pass	mach # 0004
				SE-1			AD-BRK									Air Temp 35°F
TF-057A	116	111	113	103	97	93	96	100	100	MSP	12/21/04	800	10.0 fpm	BC	Pass	mach #0004
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 35°F
TF-058	98	101	97	90	94	92	89	96	93	MSP	12/21/04	800	10.0 fpm	BC	Pass	mach # 0019
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 35°F
TF-059	113	117	118	99	101	110	94	97	109	MSP	2/11/05	800	10.0 fpm	GK	Pass	mach #0053
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 60°F
TF-060	115	115	114	96	107	103	98	100	103	MSP	2/11/05	800	10.0 fpm	BC	Pass	mach #0004
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 60°F
TF-061	104	103	108	97	95	91	97	95	94	MSP	2/11/05	800	10.0 fpm	GK	Pass	mach #0053
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 50°F
TF-062	100	104	105	99	98	100	97	99	98	MSP	2/11/05	800	10.0 fpm	BC	Pass	mach #0004
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 50°F
TF-063	114	117	112	106	103	108	99	108	102	PRH	2/12/05	800	10.0 fpm	GK	Pass	mach #0053
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 45°F
TF-064	113	108	109	93	98	93	89	91	91	PRH	2/12/05	800	9.5 fpm	BC	Pass	mach #0004
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 45°F
TF-065	94	97	94	94	93	91	92	91	91	PRH	2/12/05	800	10.0 fpm	GK	Pass	mach #0053
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 50°F

Specimen #	SHEAR (ppi)			PEEL-Top (ppi)			PEEL-Bottom (ppi)			Tested by	Date Tested	Temp	Speed	Tech	Pass Fail	Comments
	S1	S2	S3	P1T	P2T	P3T	P1B	P2B	P3B							
TF-066	96	97	100	86	92	91	86	87	91	PRH	2/12/05	800	10.0 fpm	BC	Pass	mach #0004
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 50°F
TF-067	112	113	116	94	101	94	96	96	93	PRH	2/13/05	800	10.0 fpm	BC	Pass	mach #0004
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 55°F
TF-068	123	123	123	104	111	113	109	102	111	MSP	2/14/05	800	10.0 fpm	BC	Pass	mach #0004
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 55°F
TF-069	101	105	101	93	93	94	92	94	93	MSP	2/14/05	800	10.0 fpm	BC	Pass	mach #0004
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 55°F
TF-070	120	124	121	109	118	115	113	116	114	MGC	3/21/05	800	8.5 fpm	BC	Pass	mach #0053
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1						tex/tex	Air Temp 55°F
TF-071	129	131	126	118	118	111	119	114	114	MSP	3/22/05	800	8.0 fpm	BC	Pass	mach #0035
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1						tex/tex	Air Temp 55°F
TF-072	119	113	127	110	103	104	110	103	100	MSP	3/22/05	800	8.0 fpm	GK	Pass	mach #0035
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1						tex/tex	Air Temp 55°F
TF-073	103	113	110	100	92	101	97	93	101	MSP	3/22/05	800	8.0 fpm	GK	Pass	mach #0035
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1						tex/tex	Air Temp 50°F
TF-074	110	107	104	97	97	96	97	96	99	MSP	3/22/05	800	8.5 fpm	BC	Pass	mach #0053
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1						tex/tex	Air Temp 50°F
TF-075	130	125	125	116	125	114	124	122	112	MSP	3/23/05	800	8.0 fpm	BC	Pass	mach #0053
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1						tex/tex	Air Temp 32°F
TF-076	131	132	129	123	121	121	112	109	115	MSP	3/23/05	800	7.5 fpm	GK	Pass	mach #0035
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1						tex/tex	Air Temp 32°F
TF-077	121	119	121	103	109	111	109	114	107	MGC	3/23/05	800	8.3 fpm	BC	Pass	mach #0053
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1						tex/tex	Air Temp 40°F
TF-078	110	114	117	113	108	108	112	111	103	MSP	3/23/05	800	8.0 fpm	GK	Pass	mach #0035
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1						tex/tex	Air Temp 40°F
TF-079	139	132	129	121	122	119	124	127	121	MSP	3/24/05	800	8.0 fpm	GK	Pass	mach #0035
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1						tex/tex	Air Temp 30°F
TF-080	131	126	128	120	115	120	120	115	117	MSP	3/24/05	800	8.3 fpm	BC	Pass	mach #0053
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	BRK						tex/tex	Air Temp 30°F
TF-081	128	133	128	119	125	115	122	121	118	MSP	3/24/05	800	7.5 fpm	BC	Pass	mach #0053
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1						tex/tex	Air Temp 30°F
TF-082	116	120	119	104	112	110	103	110	111	MSP	3/29/05	800	8.3 fpm	BC	Pass	mach #0053
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1						tex/tex	Air Temp 45°F

Specimen #	SHEAR (ppi)			PEEL-Top (ppi)			PEEL-Bottom (ppi)			Tested by	Date Tested	Temp	Speed	Tech	Pass Fail	Comments
	S1	S2	S3	P1T	P2T	P3T	P1B	P2B	P3B							
TF-083	96	97	98	93	90	92	91	92	89	MGC	3/30/05	800	9.4 fpm	RB	Pass	mach #0035
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 50°F
TF-084	96	102	102	89	92	88	91	92	89	MGC	3/30/05	800	8.5 fpm	BC	Pass	mach #0053
	BRK	BRK	BRK	SE-1	SE-1	SE-1	BRK	BRK	BRK							Air Temp 50°F
TF-085	102	98	98	95	92	92	97	98	90	MSP	4/1/05	800	8.5 fpm	GK	Pass	mach #0035
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	BRK							Air Temp 55°F
TF-086	101	100	112	92	97	94	96	96	94	MSP	4/1/05	800	8.5 fpm	BC	Pass	mach #0053
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 55°F
TF-087	109	108	109	101	99	97	97	97	101	MGC	4/2/05	800	9.0 fpm	BC	Pass	mach #0053
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1						tex/tex	Air Temp 65°F
TF-088	101	102	102	100	101	99	102	103	100	MGC	4/2/05	800	9.0 fpm	GK	Pass	mach #0035
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1						tex/tex	Air Temp 65°F
TF-089	143	137	136	137	134	130	132	131	131	MGC	4/3/05	800	9.0 fpm	GK	Pass	mach #0035
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1						tex/tex	Air Temp 55°F
TF-090	133	135	129	126	116	118	120	120	120	MGC	4/3/05	800	8.8 fpm	BC	Pass	mach #0053
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1						tex/tex	Air Temp 55°F
TF-091	94	99	99	97	93	92	92	93	96	MGC	4/3/05	800	9.0 fpm	BC	Pass	mach #0053
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1						tex/tex	Air Temp 65°F
TF-092	100	112	105	97	101	103	99	98	101	MGC	4/3/05	800	9.0 fpm	GK	Pass	mach #0035
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1						tex/tex	Air Temp 65°F
TF-093	103	107	107	96	99	101	99	97	101	MSP	4/4/05	800	9.0 fpm	BC	Pass	mach #0053
	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1							Air Temp 60°F

EXTRUSION TRIAL SEAM TEST

PROJECT NUMBER: 043-2246
LINER INSTALLER: Colorado Lining
LOCATION: Rocky Flats

PROJECT TITLE: Rocky Flats, Present Landfill
CONTRACTOR: S.M. Stoller
SITE MANAGER: Kaiser Hill Company LLC

Specificaitons
Shear 90 lb/in
Peal 72 lb/in

Specimen #	SHEAR (ppi)			PEEL-Top (ppi)			Tested by	Date Tested	PASS/FAIL	Liester	Temp	Tech	Comments
	S1	S2	S3	P1T	P2T	P3T							
TX-001	103	108	103	95	104	100	MGC	11/2/2004	PASS	500	525	BC	Mach # 0124
	BRK2	BRK1	BRK1	SE-3	SE-3	SE-3							Air Temp 50°F
TX-002	100	99	103	95	90	90	MSP	11/4/2004	PASS	525	550	BC	Mach # 0124
	BRK1	BRK2	BRK1	SE-3	SE-3	SE-3							Air Temp 50°F
TX-003	90	91	91	81	79	81	MSP	11/5/2004	PASS	525	550	BC	Mach # 0124
	BRK1	BRK1	BRK1	SE-3	SE-3	SE-3							Air Temp 45°F
TX-004	98	92	105	81	84	86	PRH	11/5/2004	PASS	525	550	GK	Mach # 0124
	BRK1	BRK2	BRK1	SE-3	SE-3	SE-3							Air Temp 40°F
TX-005	102	101	102	97	87	93	MSP	11/6/2004	PASS	525	550	BC	Mach # 0124
	BRK2	BRK1	BRK1	SE-3	SE-3	SE-3							Air Temp 40°F
TX-006	94	99	97	90	84	87	MGC	11/8/2004	PASS	525	550	RD	Mach # 0124
	BRK1	BRK1	BRK1	SE-3	SE-3	SE-3							Air Temp 45°F
TX-007	115	112	110	94	92	92	MSP	11/9/2004	PASS	525	550	RD	Mach # 0124
	BRK2	BRK2	BRK2	SE-3	SE-3	SE-3							Air Temp 40°F
TX-008	91	95	93	82	85	85	MSP	11/9/2004	PASS	485	500	RD	Mach # 0124
	BRK1	BRK1	BRK1	SE-3	SE-3	SE-3							Air Temp 55°F
TX-009	122	120	123	110	104	91	MGC	11/12/2004	PASS	485	500	RD	Mach # 0124
	BRK1	BRK1	BRK2	SE-3	SE-3	SE-3							Air Temp 50°F
TX-010	98	99	99	86	86	79	PRH	11/15/2004	PASS	450	500	RD	Mach # 0124
	BRK1	BRK1	BRK1	SE-3	SE-3	SE-3							Air Temp 55°F
TX-011	96	99	100	87	93	91	MGC	11/17/2004	PASS	450	500	RD	Mach # 0124
	BRK1	BRK2	BRK1	SE-3	SE-3	SE-3							Air Temp 55°F
TX-012	98	98	94	88	88	92	MGC	11/19/2004	PASS	475	500	RD	Mach # 0124
	BRK1	BRK1	BRK2	SE-3	SE-3	SE-3							Air Temp 50°F
TX-013	96	96	95	92	92	92	MGC	11/22/2004	PASS	490	525	JS	Mach # 0124
	BRK2	BRK1	BRK1	SE-3	SE-3	SE-3							Air Temp 50°F
TX-014	110	107	110	99	101	101	MGC	11/23/2004	PASS	495	525	JS	Mach # 0124
	BRK1	BRK1	BRK1	SE-3	SE-3	SE-3							Air Temp 35°F
TX-015	97	103	97	95	80	77	MSP	12/3/2004	PASS	475	525	RD	Mach #124
	BRK1	BRK1	BRK2	SE-3	SE-3	SE-3							Air Temp 35°F

Specimen #	SHEAR (ppi)			PEEL-Top (ppi)			Tested by	Date Tested	PASS/FAIL	Liester	Temp	Tech	Comments
	S1	S2	S3	P1T	P2T	P3T							
TX-016				95			PRH	12/4/2004	FAIL	475	525	RD	Mach #124
				SE-3	AD-BRK								Air Temp 40°F
TX-016A	101	101	99	88	91	91	PRH	12/4/2004	PASS	475	525	RD	Mach #124
	BRK1	BRK1	BRK2	SE-3	SE-3	SE-3							Air Temp 40°F
TX-017	102	108	111	90	81	93	MSP	12/5/2004	PASS	475	525	RD	Mach #124
	BRK1	BRK1	BRK2	SE-3	SE-3	SE-3							Air Temp 40°F
TX-018				81	87		PRH	12/8/2004	PASS	485	525	RD	Mach #124
				SE-3	AD-BRK								Air Temp 45°F
TX-018A	101	102	102	91	92	94	PRH	12/8/2004	PASS	535	575	RD	Mach #124
	BRK1	BRK1	BRK1	SE-3	SE-3	SE-3							Air Temp 45°F
TX-019	100	104	101	81	81	92	PRH	12/11/2004	PASS	575	575	RD	Mach #124
	BRK1	BRK1	BRK1	SE-1	SE-3	SE-3							Air Temp 35°F
TX-020	115	115	116	111	108	84	PRH	12/12/2004	PASS	550	575	RD	Mach #124
	BRK2	BRK1	BRK1	SE-1	SE-3	SE-3							Air Temp 35°F
TX-021	110	107	14	98	99	97	PRH	12/12/2004	PASS	550	575	RD	Mach #124
	BRK2	BRK2	BRK1	SE-1	SE-3	SE-3							Air Temp 40°F
TX-022	194	194	196	95	96	84	MSP	12/14/2004	PASS	515	550	RD	Mach #124
	BRK1	BRK1	BRK1	SE-1	SE-3	SE-3							Air Temp 40°F
TX-023	98	106	107	95	91	95	MSP	12/15/2004	PASS	515	550	RD	Mach #124
	BRK1	BRK1	BRK1	SE-3	SE-3	SE-3							Air Temp 50°F
TX-024	108	106	107	95	91	95	MSP	12/15/2004	PASS	515	550	RD	Mach #124
	BRK1	BRK1	BRK1	SE-3	SE-1	SE-3							Air Temp 35°F
TX-025	98	100	95	90	91	91	PRH	12/16/2004	PASS	515	550	RD	Mach #124
	BRK1	BRK1	BRK1	SE-3	SE-3	SE-3							Air Temp 50°F
TX-026	104	109	108	102	100	101	PRH	12/17/2004	PASS	465	550	RD	Mach #124
	BRK2	BRK1	BRK1	SE-3	SE-3	SE-3							Air Temp 40°F
TX-027	99	90	100	96	89	90	MSP	12/17/2004	PASS	500	515	RD	Mach #124
	BRK1	BRK1	BRK1	SE-3	SE-3	SE-3							Air Temp 45°F
TX-028	101	98	102	100	98	101	MSP	1/3/2005	PASS	500	550	RD	Mach #124
	BRK2	BRK2	BRK1	SE-3	SE-3	BRK1							Air Temp 40°F
TX-029	99	100	102	85	91	87	MSP	1/3/2005	PASS	475	535	RD	Mach #124
	BRK1	BRK1	BRK1	SE-3	SE-2	SE-3							Air Temp 50°F
TX-030	93	98	98	87	89	92	MSP	1/6/2005	PASS	500	550	RD	Mach #124
	BRK1	BRK2	BRK1	SE-3	SE-3	SE-3							Air Temp 40°F

Specimen #	SHEAR (ppi)			PEEL-Top (ppi)			Tested by	Date Tested	PASS/FAIL	Liester	Temp	Tech	Comments
	S1	S2	S3	P1T	P2T	P3T							
TX-031	98	98	102	102	98	78	MSP	1/7/2005	PASS	500	550	RD	Mach #124
	BRK1	BRK2	BRK1	SE-3	SE-3	SE-3							Air Temp 35°F
TX-032	90	100	101	83	88	86	MSP	1/7/2005	PASS	525	525	RD	Mach #124
	BRK1	BRK2	BRK1	SE-3	SE-3	SE-3							Air Temp 40°F
TX-033	106	106	106	98	100	98	MSP	1/8/2005	PASS	525	525	RD	Mach #124
	BRK1	BRK1	BRK1	SE-3	SE-3	SE-3							Air Temp 40°F
TX-034	97	100	104	89	92	89	MSP	1/8/2005	PASS	525	565	RD	Mach #124
	BRK1	BRK1	BRK1	SE-3	SE-3	SE-3							Air Temp 40°F
TX-035	101	99	101	83	88	93	MSP	1/9/2005	PASS	550	575	CB	Mach #0010
	BRK1	BRK2	BRK2	SE-3	SE-3	SE-3							Air Temp 35°F
TX-036	99	101	99	90	85	87	MSP	1/9/2005	PASS	550	575	RD	Mach #124
	BRK2	BRK2	BRK2	SE-3	SE-3	SE-3							Air Temp 40°F
TX-037	99	102	97	83	85	84	MSP	1/9/2005	PASS	550	565	RD	Mach #124
	BRK1	BRK1	BRK2	SE-3	SE-3	SE-3							Air Temp 50°F
TX-038	103	100	100	93	88	92	MSP	1/10/2005	PASS	515	550	RD	Mach #124
	BRK1	BRK2	BRK2	SE-3	SE-3	SE-3							Air Temp 40°F
TX-039	96	97	98	85	85	86	MSP	1/17/2005	PASS	500	550	RB	Mach #12
	BRK1	BRK1	BRK1	SE-3	SE-3	SE-3							Air Temp 35°F
TX-040	105	115	115	95	98	93	PRH	1/18/2005	PASS	400	500	RB	Mach #12
	BRK2	BRK1	BRK1	SE-3	SE-3	SE-3							Air Temp 35°F
TX-040.1	101	116	110	95	93	94	PRH	1/18/2005	PASS	350	500	RB	Mach #12
	BRK1	BRK1	BRK1	SE-3	SE-3	SE-3							Air Temp 35°F
TX-041	111	108	112	88	95	92	PRH	1/19/2005	PASS	450	500	RB	Mach #12
	BRK1	BRK1	BRK1	SE-3	SE-3	SE-3							Air Temp 35°F
TX-042	93	92	95	80	83	81	PRH	1/20/2005	PASS	450	490	RB	Mach #12
	BRK1	BRK1	BRK1	SE-3	SE-3	SE-3							Air Temp 50°F
TX-043	102	102	103	90	90	89	PRH	1/21/2005	PASS	450	500	RB	Mach #12
	BRK1	BRK2	BRK1	SE-3	SE-3	SE-3							Air Temp 45°F
TX-044	104	105	101	100	101	101	PRH	2/13/2005	PASS	525	515	RD	Mach #2
	BRK1	BRK2	BRK1	SE-3	SE-3	SE-3							Air Temp 45°F
TX-045	110	102	104	80	78	75	PRH	2/14/2005	PASS	520	515	RD	Mach #124
	BRK1	BRK2	BRK1	SE-3	SE-3	SE-3							Air Temp 50°F
TX-046	109	100	102	86	79	94	MSP	2/14/2005	PASS	520	500	RD	Mach #124
	BRK1	BRK2	BRK1	SE-3	SE-3	SE-3							Air Temp 50°F

Specimen #	SHEAR (ppi)			PEEL-Top (ppi)			Tested by	Date Tested	PASS/FAIL	Liester	Temp	Tech	Comments
	S1	S2	S3	P1T	P2T	P3T							
TX-047	119	121	122	110	111	109	MSP	2/15/2005	PASS	535	500	RD	Mach #124
	BRK1	BRK2	BRK1	SE-3	SE-3	SE-3							Air Temp 35°F
TX-048	103	103	104	96	95	93	MGC	2/17/2005	PASS	530	525	RD	Mach #10
	BRK1	BRK2	BRK1	SE-3	SE-3	SE-3							Air Temp 40°F
TX-049	100	98	98	88	93	92	MSP	2/17/2005	PASS	500	500	RD	Mach #10
	BRK1	BRK2	BRK1	SE-3	SE-3	SE-3							Air Temp 40°F
TX-050	112	111	109	108	107	103	MGC	2/22/2005	PASS	400	490	RD	Mach #10
	BRK1	BRK2	BRK1	SE-3	SE-3	SE-3							Air Temp 40°F
TX-051	101	101	99	96	94	95	MGC	2/22/2005	PASS	250	490	RD	Mach #10
	BRK1	BRK1	BRK1	SE-3	SE-3	SE-3							Air Temp 50°F
TX-052	112	118	116	88	96	86	MSP	3/28/2005	PASS	435	550	RD	Mach #124
	BRK1	BRK1	BRK1	SE-3	SE-3	SE-3						tex/tex	Air Temp 40°F
TX-053	94	97	98	78	83	84	MSP	3/28/2005	PASS	380	525	RD	Mach #124
	BRK1	BRK2	BRK1	SE-3	SE-3	SE-3						tex/tex	Air Temp 50°F
TX-054	90	91	91	83	80	83	MGC	3/28/2005	PASS	300	525	RD	Mach #124
	BRK1	BRK1	BRK1	SE-3	SE-3	SE-3							Air Temp 50°F
TX-055	95	92	94	89	90	90	MGC	3/28/2005	PASS	300	525	RD	Mach #124
	BRK1	BRK1	BRK1	SE-3	SE-3	SE-3						tex/sm	Air Temp 50°F
TX-056	103	98	96	83	87	76	MGC	3/31/2005	PASS	500	550	RD	Mach #124
	BRK2	BRK2	BRK1	SE-3	SE-3	SE-3							Air Temp 45°F
TX-057	103	113	111	85	95	96	MSP	3/31/2005	PASS	475	525	RD	Mach #124
	BRK1	BRK2	BRK1	SE-3	SE-3	SE-3							Air Temp 45°F
TX-058	93	92	95	88	87	85	MSP	4/1/2005	PASS	420	525	RD	Mach # 124
	BRK1	BRK1	BRK1	SE-3	SE-3	SE-3							Air Temp 45°F
TX-059	112	114	119	99	102	89	MSP	4/4/2005	PASS	300	500	RD	Mach #124
	BRK2	BRK1	BRK1	SE-3	SE-3	SE-3						tex/tex	Air Temp 45°F
TX-060	92	94	93	87	83	85	MSP	4/4/2005	PASS	300	500	RD	Mach #124
	BRK1	BRK2	BRK1	SE-3	SE-3	SE-3							Air Temp 60°F
TX-061	108	103	105	90	97	96	MSP	4/4/2005	PASS	300	500	RD	Mach #124
	BRK2	BRK2	BRK1	SE-3	SE-3	SE-3						tex/tex	Air Temp 60°F
TX-062	92	92	94	90	88	84	MGC	4/7/2005	PASS	275	500	RD	Mach #124
	BRK1	BRK1	BRK1	SE-3	SE-3	SE-3							Air Temp 60°F

FUSION SEAM DESTRUCTIVE TEST

PROJECT NUMBER: 043-2246
PROJECT TITLE: Rocky Flats, Present Landfill
LINER INSTALLER: Colorado Lining
CONTRACTOR: S.M. Stoller
LOCATION: Rocky Flats
SITE MANAGER: Kaiser Hill Company LLC

	SHEAR (ppi)					PEEL-Top (ppi)					PEEL-Bottom (ppi)					Tested	Date	Mach	Defect	SEAM, LOCATION TECH,
Specimen #	S1	S2	S3	S4	S5	P1T	P2T	P3T	P4T	P5T	P1B	P2B	P3B	P4B	P5B	by	Tested	#	Code	TEMP/SPEED
DFp-001	103	106	108	108	108	93	95	96	90	91	93	96	87	91	90	MGC	10/30/04	0004	DP-1A	P1/P2, 35' N SEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/9.0
DFp-002	98	99	98	100	100	89	86	88	92	93	94	86	93	93	92	MSP	11/06/04	0004	DP-1H	P1/P5, 50'S NEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/8.0
DFp-003	93	94	94	102	95	78	79	83	77	81	82	83	82	83	82	MSP	11/06/04	0004	DP-1S	P7/P8, 10' S NEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/8.5
DFp-004	90	94	98	98	94	83	82	84	83	86	83	85	80	86	85	MSP	11/06/04	0004	DP-2D	P8/P9, 10' S NEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/7.7
DFp-005	92	93	98	99	98	81	86	82	82	84	83	80	81	82	86	MSP	11/08/04	0004	DP-2H	P11/P13, 183' S NEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/8.2
DFp-006	116	116	116	117	122	104	94	97	100	100	103	98	96	96	100	PRH	11/10/04	0004	DP-2S	P15/P16, 9'N SEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/9.0
DFp-007	112	113	111	110	102	96	95	91	96	103	102	99	99	98	103	PRH	11/10/04	0004	DP-2X	P16/P18, 135' S NEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/9.0
DFp-008	111	113	110	110	110	96	96	100	98	97	96	100	100	98	97	MGC	11/10/04	0004	DP-3C	P18/P19, 34' S NEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/9.5
DFp-009	113	109	113	113	112	93	91	96	97	97	87	96	96	88	97	PRH	11/15/04	0004	DP-3N	P19/P21, 92' S NEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/9.0
DFp-010	101	111	108	109	98	103	100	107	112	106	96	101	99	96	94	MGC	11/16/04	0004	DP-3R	P21/P22, 40' S NEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/9.0
DFp-011	100	103	104	105	105	105	109	105	109	105	97	103	105	101	102	MGC	11/16/04	0004	DP-3P	P23/P24, 100' S NEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC 800/9.0
DFp-012	100	100	102	95	105	97	100	88	104	97	98	102	97	99	101	MGC	11/16/04	0004	DP-3S	P24/P26. 50' N SEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					JS, 800/9.0
DFp-013	99	98	98	97	95	92	90	89	91	92	88	90	92	92	93	MGC	11/22/04	0004	DP-4I	P26/P28, 350' N SEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					JS, 800/9.5
DFp-014	95	96	94	95	95	95	89	89	88	89	89	89	89	89	90	MGC	11/22/04	0004	DP-4N	P28/P30, 300' N SEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					JS, 800/8.8
DFp-015	93	91	93	93	92	83	86	87	85	84	83	86	87	86	86	MGC	11/22/04	0019	DP-4P	P30/P32, 240' N SEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/9.0

Specimen #	SHEAR (ppi)					PEEL-Top (ppi)					PEEL-Bottom (ppi)					Tested by	Date Tested	Mach #	Defect Code	SEAM, LOCATION TECH, TEMP/SPEED
	S1	S2	S3	S4	S5	P1T	P2T	P3T	P4T	P5T	P1B	P2B	P3B	P4B	P5B					
DFp-016	110	115	116	106	112	100	101	96	100	100	99	98	99	97	99	MSP	11/23/04	0019	DP-6D	P32/P34, 30' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/8.5
DFp-017	94	94	98	104	113	95	98	94	94	92	98	96	92	97	93	MSP	11/23/04	0019	DP-5E	P31/P33, 31' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					JS, 800/8.5
DFp-018	107	115	112	115	113	96	94	97	92	100	89	94	94	93	95	MSP	11/23/04	0004	DP-5F	P34/P36150' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/9.0
DFp-019	103	106	103	102	113	93	90	94	97	97	86	92	97	94	95	MSP	11/23/04	0019	DP-5M	P36/P38, 150' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					JS, 800/9.0
DFp-020	116	115	102	111	111	90	94	93	92	92	93	94	91	94	90	MSP	11/23/04	0004	DP-5N	P38/P40, 130' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/9.0
DFp-021	98	112	112	108	110	92	92	100	97	97	91	95	94	95	92	MSP	11/23/04	0019	DP-6A	P40/P43, 100' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					JS800/8.8
DFp-022	115	114	114	114	113	103	99	99	95	99	91	100	101	101	101	MSP	11/23/04	0004	DP-6B	P40/P42, 100' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/9.0
DFp-023	108	104	104	108	109	96	97	96	97	97	91	94	90	93	95	MSP	11/23/04	0019	DP-6D	P42/P45, 30' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					JS, 800/8.5
DFp-024	115	114	103	109	103	93	95	96	96	95	90	92	92	92	94	MSP	11/23/04	0004	DP-6H	P44/P47, 26' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/9.0
DFp-025	100	96	98	98	98	85	92	94	92	93	90	91	93	91	91	MSP	12/14/04	0019	DP-7D	P46/P49, 14' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					JS 800/9.0
DFp-026	100	99	103	101	109	100	101	101	93	93	95	99	93	93	96	MSP	12/14/04	0019	DP-7G	P47/P48, 50' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					JS, 800/9.0
DFp-027	103	110	104	110	109	97	98	97	98	99	94	95	97	96	95	MSP	12/14/04	0019	DP-7J	P48/P50 14' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					JS, 800/9.5
DFp-028	110	110	105	109	101	93	93	92	92	92	96	91	91	95	93	MSP	12/14/04	0004	DP-7Q	P51/P53, 107' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/9.5
DFp-029	101	103	104	104	108	91	96	94	96	91	90	88	93	91	88	MSP	12/14/04	0019	DP-7R	P50/P53, 53' NEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					JS, 800/9.0
DFp-030	98	97	92	97	93	93	91	90	91	90	93	88	92	95	90	MSP	12/14/04	0019	DP-7W	P53/P54, 150' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					JS, 800/9.0
DFp-031	98	95	100	97	101	90	92	93	92	90	90	91	92	87	91	MSP	12/14/04	0019	DP-8C	P54/57, 50' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					JS, 800/9.0
DFp-032	96	103	105	106	97	91	90	89	89	92	89	90	90	90	90	MSP	12/14/04	0019	DP-8F	P57/P58, 11' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					JS, 800/9.5

Specimen #	SHEAR (ppi)					PEEL-Top (ppi)					PEEL-Bottom (ppi)					Tested by	Date Tested	Mach #	Defect Code	SEAM, LOCATION TECH, TEMP/SPEED
	S1	S2	S3	S4	S5	P1T	P2T	P3T	P4T	P5T	P1B	P2B	P3B	P4B	P5B					
DFp-033	94	97	97	100	101	89	87	90	91	93	92	92	89	87	87	MSP	12/14/04	0004	DP-8G	P56/P59, 25' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/9.5
DFp-034	99	101	101	102	98	91	90	89	89	89	85	88	92	90	88	MSP	12/14/04	0019	DP-8J	P59/P61, 200' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					JS, 800/9.5
DFp-035	100	101	99	100	100	98	96	97	93	93	93	92	95	94	90	MSP	12/14/04	0004	DP-8M	P61/P62, 11' EWEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/9.5
DFp-036	98	99	96	98	101	93	90	92	93	94	91	89	89	89	90	MSP	12/14/04	0019	DP-8T	P58/P62, 150' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					JS, 800/9.5
DFp-037	99	99	97	94	100	94	95	92	92	91	93	93	91	89	91	MSP	12/14/04	0019	DP-9B	P61/P63, 57' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					JS, 800/9.5
DFp-038	101	108	95	105	113	89	95	97	94	94	87	88	85	87	89	MSP	12/14/04	0035	DP-9C	P54/P56, 10' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 750/9.5
DFp-039	107	107	101	101	103	97	96	95	87	96	89	91	97	96	86	MSP	12/14/04	0004	DP-9G	P64/P66, 30' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/9.5
DFp-040	100	97	97	102	101	94	91	91	95	90	90	92	94	91	92	MSP	12/14/04	0019	DP-9H	P64/P65, 135' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					JS, 800/9.5
DFp-041	111	104	109	113	97	98	96	95	93	94	84	97	95	93	92	MSP	12/17/04	0004	DP-9J	P65/P68, 130' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/10.0
DFp-042	111	108	109	108	111	102	99	96	97	96	93	96	94	96	95	MSP	12/17/04	0004	DP-9Q	P67/P97, 100' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/10.0
DFp-043	109	110	106	105	111	94	93	94	85	89	97	95	96	95	94	MSP	12/17/04	0004	DP-9X	P68/P70, 50' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/10.0
DFp-044	112	105	109	110	113	99	99	97	102	100	101	97	93	99	101	MSP	12/17/04	0004	DP-10D	P69/P73 290' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/10.0
DFp-045	96	104	101	102	102	94	86	91	96	89	93	93	92	93	91	MSP	12/17/04	0004	DP-10J	P72/P74, 11' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/10.0
DFp-046	114	111	111	112	112	96	91	93	95	92	95	97	95	94	97	PRH	12/20/04	0004	DP-10R	P74/P76, 8' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/10.0
DFp-047	108	105	111	104	109	95	95	94	98	92	90	90	93	93	95	PRH	12/20/04	0004	DP-11B	P75/P78, 120' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/10.0
DFp-048	109	114	114	114	109	98	99	101	98	98	99	101	100	97	99	MSP	01/06/05	0004	DP-11F	P76/P79, 74' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC 800/10.0
DFp-049	103	103	100	104	104	90	91	91	93	90	93	89	88	83	90	PRH	12/20/04	0004	DP-11P	P78/P81, 175' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/10.0

Specimen #	SHEAR (ppi)					PEEL-Top (ppi)					PEEL-Bottom (ppi)					Tested by	Date Tested	Mach #	Defect Code	SEAM, LOCATION TECH, TEMP/SPEED
	S1	S2	S3	S4	S5	P1T	P2T	P3T	P4T	P5T	P1B	P2B	P3B	P4B	P5B					
DFp-050	104	102	114	112	112	97	94	97	96	97	92	97	96	98	99	MSP	12/17/04	0004	DP-11R	P79/P80, 41' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/10.0
DFp-051	102	97	102	109	102	94	94	93	87	89	94	92	91	92	94	MSP	01/06/05	0004	DP-11X	P81/P84, 30' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/10.0
DFp-052	103	101	101	103	102	93	95	90	93	92	91	94	94	93	93	MSP	01/06/05	0004	DP-12A	P84/P86, 100' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/10.0
DFp-053	105	101	109	108	105	95	93	95	95	95	93	95	93	93	95	MSP	01/06/05	0019	DP-12B	P83/P86, 130' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					JS, 800/10.0
DFp-054	101	98	97	99	100	92	93	91	89	79	89	88	88	93	78	MSP	01/03/05	0004	DP-12K	P86/P88, 100' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/10.0
DFp-055	111	105	105	106	105	93	99	97	98	100	96	96	97	98	97	MSP	01/07/05	0019	DP-12N	P86/P89, 74' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					JS, 800/10.0
DFp-056	103	102	105	103	103	92	94	95	94	95	95	93	96	93	94	MSP	01/06/05	0004	DP-12Q	P90/P92, 10' WEEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/10.0
DFp-057	112	103	104	109	105	96	96	96	100	97	91	93	95	97	97	MSP	01/06/05	0004	DP-13C	P92/P93, 100' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/10.0
DFp-058	108	98				94	95	78	100	98	97	98	94	101	101	MSP	01/06/05	0019	DP-13D	P93/P95, 110' SNEOS
	BRK	BRK				SE-1	SE-1	AD-BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					JS, 800/10.0
DFp-058						89	80	79			101	99	99			MSP	01/06/05	0019		P93/P95, 95' SNEOS
+15'N						AD-BRK	AD-BRK	AD-BRK			SE-1	SE-1	SE-1							JS, 800/10.0
DFp-058						83	87	93			98	96	93			MSP	01/06/05	0019		P93/P95, 125' SNEOS
15'S						AD-BRK	AD-BRK	AD-BRK			SE-1	SE-1	SE-1							JS, 800/10.0
DFp-058						100	98	98								MSP	01/06/05	0019		P93/P95, 160' SNEOS
+50'S						AD-BRK	AD-BRK	AD-BRK												JS, 800/10.0
DFp-058						90	94	86								MSP	01/06/05	0019		P93/P95, 60' SNEOS
+50'N						AD-BRK	AD-BRK	AD-BRK												JS, 800/10.0
DFp-058U	94	99	95	95	106	93	89	93	98	97	95	89	91	92	93	MSP	01/07/05	0019	DP-15F	P95/P96, 10' WEEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					JS, 800/10.0
DFp-058D						85	93				97	88	84				01/07/05	0019	DP-15G	P94/P95, 8' SNEOS
						SE-1	SE-1				AD-BRK	SE-1	AD-BRK							JS, 800/10.0 failed to DF
DRp-059						56	66				93					MSP	01/09/05	0004	DP-13J	P90/P94, 240' SNEOS
						AD-BRK	AD-BRK				SE-1									BC, 800/10.0

Fusion destruct

GOLDER ASSOCIATES

Specimen #	SHEAR (ppi)					PEEL-Top (ppi)					PEEL-Bottom (ppi)					Tested by	Date Tested	Mach #	Defect Code	SEAM, LOCATION TECH, TEMP/SPEED
	S1	S2	S3	S4	S5	P1T	P2T	P3T	P4T	P5T	P1B	P2B	P3B	P4B	P5B					
DFp-059U	106	106	111	114	111	94	94	94	93	95	90	91	90	93	91	MSP	01/09/05	0004	DP-17A	P90/P94, 150' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/10.0
DFp-059D	99	98	94	97	96	93	91	92	90	88	89	90	91	91	93	MSP	01/09/05	0004	DP-16S	P90/P94, 35' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/10.0
DFp-060	99	98	99	105	100	94	93	95	93	96	91	96	98	96	95	MSP	01/07/05	0019	DP-13M	P94/P96, 60' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					JS, 800/10.0
DFp-061	109	108	110	109	110	96	98	96	96	95	98	97	98	97	93	MSP	01/10/05	0004	DP-13N	P95/P98, 250' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/10.0
DFp-062	109	109	103	103	103	98	95	97	98	94	99	95	100	95	97	MSP	01/10/05	0019	DP-13P	P96/P97, 43' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					JS, 800/10.0
DFp-063	108	107	109	108	109	93	96	96	94	99	102	96	98	95	100	MSP	01/10/05	0019	DP-14E	P98/P100, 81' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					JS, 800/ 10.0
DFp-064	110	108	103	108	110	93	92	92	88	96	99	94	93	94	98	MSP	01/10/05	0019	DP-14F	P100/P103, 130' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/10.0
DFp-065	108	110	107	108	113	93	91	92	94	93	95	94	93	92	95	MSP	01/10/05	0004	DP-14G	P101/P102, 75' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/10.0
DFp-066						70	53				109					MSP	02/15/05	0004	DP-18C	P103/P106 20' NSEOS
						AD-BRK	AD-BRK				SE-1									BC 9.5/800
DFp-066U	117	116	114	132	132	116	114	115	91	121	114	113	116	110	111	MSP	02/15/05	0004	DP-19R	P103/P106 60' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC 9.5/800
DFp-066D	122	123	129	119	122	108	101	111	111	111	109	104	104	111	108	MSP	02/15/05	0004	DP-19X	P107/P108 11' WEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC 9.5/800
DFp-067	131	130	135	126	133	114	112	110	117	117	108	115	115	114	111	PRH	02/15/05	0053	DP-18B	P102/P105 8'SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					GK 10.0/800
DFp-068	130	137	136	134	133	120	113	111	114	117	115	114	114	105	110	PRH	02/15/05	0053	DP-18G	P105/P108 250' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					GK 10.0/800
DFp-069	135	138	134	137	134	98	121	120	120	115	102	119	114	121	108	MSP	02/15/05	0004	DP-18J	P107/P110 100' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC 9.5/800
DFp-070	130	135	132	133	132	116	111	113	116	119	116	110	113	115	115	MSP	02/15/05	0053	DP-18K	P108/111 20' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					GK 10.0/800
DFp-071	122	120	122	124	124	111	102	108	108	113	114	111	104	114	100	MSP	02/15/05	0004	DP-18Q	P110/P112 80' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC 9.5/800
DFp-072	117	120	120	119	117	103	100	113	101	99	100	101	101	101	100	MGC	02/15/05	0004	DP-18W	P112/P114 80' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC 9.5/800

Specimen #	SHEAR (ppi)					PEEL-Top (ppi)					PEEL-Bottom (ppi)					Tested by	Date Tested	Mach #	Defect Code	SEAM, LOCATION TECH, TEMP/SPEED
	S1	S2	S3	S4	S5	P1T	P2T	P3T	P4T	P5T	P1B	P2B	P3B	P4B	P5B					
DFp-073	122	122	121	122	121	104	108	104	108	109	108	109	108	112	107	MGC	02/15/05	0053	DP-18X	P113/115 110' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					GK 10.0/800
DFp-074	118	118	117	118	117	108	100	108	104	103	101	111	109	110	104	MGC	02/15/05	0004	DP-19D	P114/117 4' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC 10.0/800
DFp-075	118	120	118	116	118	109	101	103	102	98	112	104	109	110	107	MGC	02/15/05	0053	DP-19G	P115/116 10' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					GK 10.0/800
DFp-076	111	107	109	108	109	102	101	102	101	101	96	97	97	96	96	MSP	02/18/05	0004	DP-19I	P117/119 30' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC 10.0/800
DFp-077	110	110	111	109	104	104	101	99	99	100	97	102	96	98	97	MSP	02/18/05	0004	DP-19Q	P116/118 75' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC 10.0/800
DFp-078	107	103	108	100	102	96	93	100	97	98	96	96	96	99	97	MSP	03/28/05	0053	DP-20F	P121/P122, 35' EWEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/8.3
DFp-079	107	107	107	100	102	97	98	98	98	98	98	99	99	98	97	MSP	03/28/05	0035	DP-20G	P122/P124, 25' EWEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					GK, 800/8.0
DFp-080	98	104	108	104	103	97	98	95	97	95	96	96	92	98	95	MSP	03/28/05	0053	DP-20N	P127/P128, 52' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/8.5
DFp-081	107	103	104	104	102	93	92	96	98	95	95	89	95	95	95	MSP	03/28/05	0053	DP-20S	P127/P131, 20' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/8.3
DFp-082	112	103	104	102	108	96	94	94	96	91	92	93	98	93	97	MSP	03/28/05	0035	DP-21A	P134/P135, 18' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					GK, 800/8.0
DFp-083	101	110	100	109	103	93	95	97	96	96	97	100	100	100	97	MSP	03/28/05	0053	DP-21E	P120/P140, 30' EWEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/8.3
DFp-084	121	117	119	122	118	110	107	108	112	113	107	107	103	113	109	MSP	03/29/05	0053	DP-21H	P144/P146, 4' EWEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	BRK	SE-1					BC, 800/ 7.5
DFp-085	114	114	120	118	119	107	113	101	107	103	110	102	109	103	101	MSP	03/29/05	0053	DP-21I	P146/P147, 60' EWEOS
	BRK	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	BRK	BRK	SE-1	SE-1	SE-1					BC, 800/7.5
DFp-086	118	114	120	121	119	102	108	108	112	108	109	102	102	110	109	MSP	03/29/05	0053	DP-21J	P147/P149, 10' EWEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/7.5
DFp-087	120	126	124	119	126	113	108	107	113	113	113	110	114	114	112	MSP	04/01/05	0053	DP-22I	P149/P153, 24' EWEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/8.5
DFp-088	117	113	112	115	114	100	101	101	100	101	100	103	99	97	101	MSP	03/31/05	0035	DP-22Q	P154/P156, 150'NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					RB, 800/9.4
DFp-089	120	116	114	116	116	109	105	103	99	103	101	101	103	104	99	MSP	03/31/05	0053	DP-22R	P118/P155, 10' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/8.5

Specimen #	SHEAR (ppi)					PEEL-Top (ppi)					PEEL-Bottom (ppi)					Tested by	Date Tested	Mach #	Defect Code	SEAM, LOCATION TECH, TEMP/SPEED
	S1	S2	S3	S4	S5	P1T	P2T	P3T	P4T	P5T	P1B	P2B	P3B	P4B	P5B					
DFp-090	115	116	116	117	114	105	103	101	102	108	104	110	108	104	105	MSP	03/31/05	0035	DP-22X	P156/P158, 89' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					RB, 800/9.5
DFp-091	109	99	113	104	102	101	103	102	100	96	101	100	104	100	100	MSP	04/01/05	0053	DP-23B	P161/P162, 50' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800, 8.0
DFp-092	112	115	115	114	113	108	101	101	101	101	103	100	101	101	103	MSP	03/31/05	0035	DP-23C	P159/P161, 50' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					RB, 800/7.0
DFp-093	98	97	95	97	97	90	90	87	87	89	90	92	88	88	89	MSP	04/01/05	0053	DP-23P	P164/P165. 10' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/9.0
DFp-094	101	97	92	98	91	95	91	88	94	94	92	91	90	93	94	MSP	04/01/05	0035	DP-23Q	P167/P170, 10' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					GK 800, 8.9
DFp-095	125	120	121	126	125	117	110	113	115	116	114	113	113	112	110	MSP	04/05/05	0053	DP-24E	P174/P175, 23' EWEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/9.0
DFp-096	131	131	132	129	123	120	126	124	117	125	127	128	120	121	117	MSP	04/05/05	0035	DP-24F	P176/P177, 10' EWEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					GK 800/9.0
DFp-097	121	117	118	117	119	115	113	107	113	114	112	110	112	107	115	MSP	04/05/05	0053	DP-24M	P185/P187, 46' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/9.0
DFp-098	124	121	118	121	122	116	113	111	114	113	114	112	111	116	111	MSP	04/05/05	0035	DP-24Q	P189/P190, 68' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	BRK	SE-1	SE-1	SE-1	SE-1	BRK	SE-1					GK, 800/9.0
DFp-099	122	117	120	121	121	111	114	112	111	112	107	106	107	108	113	MSP	04/05/05	0053	DP-25D	P191/P192, 10' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					GK, 800/9.0
DFp-100	104	106	104	106	105	101	98	99	99	90	103	90	101	89	99	MSP	04/05/05	0053	DP-25K	P119/P198, 100'NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/9.0

PANEL DEPLOYMENT LOG

PROJECT NUMBER: 043-2246
LINER INSTALLER: Colorado Lining
LOCATION: Rocky Flats

MATERIAL TYPE: 60 mil LLDPE

PROJECT TITLE: Rocky Flats, Present Landfill
CONTRACTOR: S.M. Stoller
SITE MANAGER: Kaiser Hill Company LLC

PANEL NUMBER	ROLL NUMBER	DEPLOYMENT DATE	QC MON.	OBSERVED OVERLAP	VISUAL PANEL CONDITION	PANEL DIMENSIONS (FT)		PANEL AREA	TOTAL AREA PLACED	PANEL THICKNESS						NOTES
						LENGTH	WIDTH			T1	T2	T3	T4	T5	AVERAGE	
P-1	0562	10/28/04	MGC	6"	good	207	22	4,554	4,554	59	60	60	61	60	60	
P-2	0562	10/30/4	MGC	6"	good	171.5	22	3,773	8,327	60	60	60	60	61	60	
P-3	0562	10/30/04	MGC	6"	good	122.5	22	2,695	11,022	60	60	60	59	61	60	
P-4	0570	10/30/04	MGC	6"	good	ELLIPSE		970	11,992	60	60	60	65	58	61	
P-5	0570	11/4/04	MGC	6"	good	230.5	22	5,071	17,063	62	62	62	61	61	62	
P-6	0570	11/4/04	MGC	6"	good	185.5	22	4,081	21,144	61	62	61	62	62	62	
P-7	0575	11/4/04	MGC	6"	good	66	22	1,452	22,596	60	64	66	67	68	65	
P-8	0575	11/4/04	MGC	6"	good	269	22	5,918	28,514	65	66	67	68	66	66	
P-9	0575	11/4/04	MGC	6"	good	181.5	22	3,993	32,507	65	68	60	66	60	64	
P-10	0576	11/4/04	MGC	6"	good	106.5	22	2,343	34,850	70	63	57	63	60	63	
P-11	0576	11/4/04	MGC	6"	good	304	22	6,688	41,538	70	63	57	63	60	63	
P-12	0576	11/05/04	PRH	6"	good	111	22	2,442	43,980	60	60	61	61	60	60	
P-13	0574	11/05/04	PRH	6"	good	215	22	4,730	48,710	61	60	65	58	60	61	
P-14	0574	11/05/04	PRH	6"	good	312	22	6,864	55,574	60	66	57	61	60	61	
P-15	3307	11/05/04	PRH	6"	good	29.5	22	649	56,223	57	66	60	62	61	61	
P-16	3307	11/8/04	MGC	6"	good	357.5	22	7,865	64,088	78	73	59	60	61	66	
P-17	3307	11/8/04	MGC	6"	good	113	22	2,486	66,574	60	61	59	60	60	60	
P-18	3308	11/8/04	MGC	6"	good	271	22	5,962	72,536	60	60	61	62	63	61	
P-19	3308	11/8/04	MGC	6"	good	261.5	22	5,753	78,289	60	60	62	63	61	61	
P-20	3251	11/8/04	MGC	6"	good	149	22	3,278	81,567	60	60	60	60	60	60	
P-21	23251	11/9/04	MGC	6"	good	369	22	8,118	89,685	59	59	60	61	66	61	
P-22	23247	11/9/04	MGC	6"	good	64	22	1,408	91,093	60	60	64	60	60	61	
P-23	23247	11/9/04	MGC	6"	good	455.5	22	10,021	101,114	60	64	60	60	60	61	
P-24	23240	11/9/04	MGC	6"	good	479.5	22	10,549	111,663	60	62	62	68	72	65	
P-25	23240	11/9/04	MGC	6"	good	45.5	22	1,001	112,664	62	72	60	62	60	63	

PANEL NUMBER	ROLL NUMBER	DEPLOYMENT DATE	QC MON.	OBSERVED OVERLAP	VISUAL PANEL CONDITION	PANEL DIMENSIONS (FT)		PANEL AREA	TOTAL AREA PLACED	PANEL THICKNESS						NOTES
						LENGTH	WIDTH			T1	T2	T3	T4	T5	AVERAGE	
P-26	23235	11/9/04	MGC	6"	good	455	22	10,010	122,674	58	63	66	68	60	63	
P-27	3235	11/16/04	PRH	6"	good	70.5	22	1,551	124,225	58	63	66	68	60	63	
P-28	3234	11/16/04	PRH	6"	good	448	22	9,856	134,081	60	61	60	62	61	61	
P-29	3234	11/16/04	MGC	6"	good	91	22	2,002	136,083	62	60	63	61	61	61	
P-30	3233	11/16/04	MGC	6"	good	447	22	9,834	145,917	59	60	63	64	67	63	
P-31	3233	11/17/04	MGC	6"	good	86	22	1,892	147,809	67	60	61	65	62	63	
P-32	3289	11/17/04	MGC	6"	good	467.5	22	10,285	158,094	59	60	61	60	60	60	
P-33	3289	11/17/04	MGC	6"	good	67	22	1,474	159,568	60	61	60	60	61	60	
P-34	3290	11/17/04	PRH	6"	good	503	22	11,066	170,634	61	65	65	64	67	64	
P-35	3290	11/17/04	PRH	6"	good	31	22	682	171,316	61	65	65	64	67	64	
P-36	3740	11/17/04	PRH	6"	good	540	22	11,880	183,196	63	63	65	64	64	64	
P-37	3252	11/17/04	PRH	6"	good	16	22	352	183,548	64	64	64	67	63	64	
P-38	3252	11/18/04	PRH	6"	good	517.5	22	11,385	194,933	64	64	64	67	63	64	
P-39	3288	11/18/04	PRH	6"	good	89	22	1,958	196,891	61	67	61	64	64	63	
P-40	3288	11/18/04	PRH	6"	good	445	22	9,790	206,681	61	67	61	64	64	63	
P-41	3287	11/18/04	PRH	6"	good	174	22	3,828	210,509	61	68	61	62	64	63	
P-42	3287	11/18/04	PRH	6"	good	354.5	22	7,799	218,308	61	68	61	62	64	63	
P-43	3299	11/18/04	PRH	6"	good	283	22	6,226	224,534	63	65	65	60	61	63	
P-44	3299	11/19/04	MGC	6"	good	256	22	5,632	230,166	60	62	62	65	65	63	
P-45	3306	11/19/04	MGC	6"	good	396	22	8,712	238,878	60	61	60	60	60	60	
P-46	3306	11/19/04	MGC	6"	good	133.5	22	2,937	241,815	61	60	60	60	60	60	
P-47	3298	11/19/04	MGC	6"	good	531	22	11,682	253,497	59	61	60	60	60	60	
P-48	3644	12/7/04	MGC	6"	good	461	22	10,142	263,639	61	63	62	61	62	62	
P-49	3304	12/7/04	MGC	6"	good	218	22	4,796	268,435	61	61	60	61	61	61	
P-50	3304	12/7/04	MGC	6"	good	306	22	6,732	275,167	61	61	60	61	61	61	
P-51	3301	12/7/04	MGC	6"	good	385	22	8,470	283,637	62	62	61	62	61	62	
P-52	3301	12/7/04	MGC	6"	good	160	22	3,520	287,157	62	62	61	62	61	62	
P-53	2300	12/7/04	MGC	6"	good	539	22	11,858	299,015	60	60	61	60	60	60	
P-54	3303	12/8/04	MGC	6"	good	552	22	12,144	311,159	61	60	61	62	61	61	

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						LENGTH	WIDTH			T1	T2	T3	T4	T5	AVERAGE	
P-55	3231	12/8/04	MGC	6"	good	168	22	3,696	314,855	59	61	60	60	60	60	
P-56	3231	12/8/04	MGC	6"	good	359	22	7,898	322,753	60	60	60	59	61	60	
P-57	3242	12/8/04	MGC	6"	good	372	22	8,184	330,937	61	60	61	60	61	61	
P-58	3242	12/8/04	MGC	6"	good	175	22	3,850	334,787	61	60	61	60	61	61	
P-59	3254	12/8/04	MGC	6"	good	540	22	11,880	346,667	60	60	61	60	60	60	
P-60	3255	12/8/04	MGC	6"	good	25	22	550	347,217	62	64	62	62	61	62	
P-61	3255	12/9/04	PRH	6"	good	509	22	11,198	358,415	61	66	62	65	62	63	
P-62	3260	12/9/04	PRH	6"	good	244.5	22	5,379	363,794	61	67	64	63	61	63	
P-63	3260	12/9/04	PRH	6"	good	295.5	22	6,501	370,295	61	67	64	63	61	63	
P-64	3264	12/9/04	PRH	6"	good	475	22	10,450	380,745	62	62	66	61	65	63	
P-65	3276	12/9/04	PRH	6"	good	545.5	22	12,001	392,746	61	61	65	66	65	64	
P-66	3275	12/9/04	PRH	6"	good	229	22	5,038	397,784	61	61	62	61	64	62	
P-67	3275	12/11/04	MGC	6"	good	314	22	6,908	404,692	62	61	62	62	61	62	
P-68	3277	12/11/04	MGC	6"	good	468.5	22	10,307	414,999	64	64	65	64	63	64	
P-69	3273	12/12/04	PRH	6"	good	551.5	22	12,133	427,132	63	63	61	61	61	62	
P-70	3272	12/12/04	PRH	6"	good	72	22	1,584	428,716	64	66	62	62	64	64	
P-71	9770	12/12/04	PRH	6"	good	76	22	1,672	430,388	62	62	66	64	62	63	
P-72	3249	12/12/04	PRH	6"	good	94.5	22	2,079	432,467	64	64	65	62	62	63	
P-73	3249	12/12/04	PRH	6"	good	449.5	22	9,889	442,356	64	66	62	61	63	63	
P-74	3268	12/12/04	PRH	6"	good	358	22	7,876	450,232	63	63	62	64	64	63	
P-75	3268	12/14/04	PRH	6"	good	180.5	22	3,971	454,203	68	63	61	63	67	64	
P-76	3244	12/14/04	PRH	6"	good	557	22	12,254	466,457	61	61	63	61	62	62	
P-77	3269	12/14/04	PRH	6"	good	82	22	1,804	468,261	62	62	61	63	62	62	
P-78	3270	12/14/04	PRH	6"	good	542.5	22	11,935	480,196	62	66	67	63	63	64	
P-79	3269	12/14/04	PRH	6"	good	279	22	6,138	486,334	62	63	63	61	64	63	
P-80	3269	12/15/04	PRH	6"	good	168.5	22	3,707	490,041	62	63	63	61	64	63	
P-81	3263	12/15/04	PRH	6"	good	538	22	11,836	501,877	63	61	61	63	63	62	
P-82	3259	12/15/04	PRH	6"	good	121	22	2,662	504,539	62	64	64	66	61	63	
P-83	3259	12/15/04	PRH	6"	good	419	22	9,218	513,757	62	64	64	66	61	63	

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						LENGTH	WIDTH			T1	T2	T3	T4	T5	AVERAGE	
P-84	3253	12/15/04	PRH	6"	good	413.5	22	9,097	522,854	64	60	60	61	61	61	
P-85	3253	12/15/04	PRH	6"	good	117.5	22	2,585	525,439	64	60	60	61	61	61	
P-86	3257	12/15/04	PRH	6"	good	552	22	12,144	537,583	61	60	60	64	61	61	
P-87	3266	12/15/04	PRH	6"	good	169	22	3,718	541,301	63	60	63	63	63	62	
P-88	3266	12/17/04	PRH	6"	good	370.5	22	8,151	549,452	61	61	64	65	61	62	
P-89	3274	12/17/04	PRH	6"	good	470.5	22	10,351	559,803	64	61	66	61	62	63	
P-90	3256	12/17/04	PRH	6"	good	542	22	11,924	571,727	62	64	61	63	60	62	
P-91	3274	12/17/04	PRH	6"	good	66.5	22	1,463	573,190	64	61	66	61	62	63	
P-92	3271	12/17/04	PRH	6"	good	236	22	5,192	578,382	64	64	62	62	63	63	
P-93	3271	12/19/04	PRH	6"	good	308	22	6,776	585,158	63	64	64	63	65	64	
P-94	3237	12/19/04	PRH	6"	good	533.5	22	11,737	596,895	63	61	60	61	62	61	
P-95	3246	12/19/04	PRH	6"	good	547	22	12,034	608,929	63	63	62	62	61	62	
P-96	3258	12/19/04	PRH	6"	good	284.5	22	6,259	615,188	62	64	64	61	61	62	
P-97	3258	12/19/04	PRH	6"	good	249.5	22	5,489	620,677	62	64	64	61	61	62	
P-98	3229	12/19/04	PRH	6"	good	549	22	12,078	632,755	61	63	61	61	63	62	
P-99	3297	12/19/04	PRH	6"	good	26	22	572	633,327	62	64	64	63	60	63	
P100	3297	12/21/04	MGC	6"	good	518	21	10,878	644,205	64	63	64	64	63	64	
P-101	3302	12/21/04	MGC	6"	good	298	21	6,258	650,463	60	61	61	61	60	61	
P-102	3302	12/21/04	MGC	6"	good	239	22	5,258	655,721	61	61	61	60	60	61	
P-103	3293	12/21/04	MGC	6"	good	553	22	12,166	667,887	61	60	61	61	61	61	
P-104	3294	12/21/04	MGC	6"	good	21	22	462	668,349	62	61	62	63	62	62	
P-105	3294	2/11/05	MGC	6"	good	460	22	10,120	678,469	59	60	60	61	63	61	
P-106	3286	2/11/05	MGC	6"	good	343	22	7,546	686,015	62	61	61	60	61	61	
P-107	3286	2/11/05	MGC	6"	good	197	22	4,334	690,349	61	61	62	61	60	61	
P-108	3291	2/11/05	MGC	6"	good	544	22	11,968	702,317	62	61	62	62	62	62	
P-109	3239	2/11/05	MGC	6"	good	51	22	1,122	703,439	59	61	60	60	60	60	
P-110	3239	2/12/05	MGC	6"	good	489	22	10,758	714,197	61	60	61	60	61	61	
P-111	3295	2/12/05	MGC	6"	good	297	22	6,534	720,731	59	61	61	62	61	61	
P-112	3295	2/12/05	MGC	6"	good	242	22	5,324	726,055	61	62	61	61	60	61	

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						LENGTH	WIDTH			T1	T2	T3	T4	T5	AVERAGE	
P-113	3280	2/12/05	MGC	6"	good	538.5	22	11,847	737,902	63	61	61	61	61	61	
P-114	3282	2/12/05	MGC	6"	good	551	22	12,122	750,024	59	61	60	61	60	60	
P-115	3267	2/12/05	MGC	6"	good	217	22	4,774	754,798	62	61	61	61	63	62	
P-116	3267	2/12/05	MGC	6"	good	314	22	6,908	761,706	62	62	62	63	61	62	
P-117	3285	2/12/05	MGC	6"	good	444	22	9,768	771,474	60	61	61	61	62	61	
P-118	3283	2/14/05	MGC	6"	good	547	22	12,034	783,508	62	61	62	62	62	62	
P-119	3296	2/14/05	MGC	6"	good	210	22	4,620	788,128	62	62	62	63	63	62	
P-120	TT-4723	3/21/05	MGC	6"	good	148.5	22	3,267	791,395	60	62	61	65	65	63	TEXTURED
P-121	TT-4723	3/22/05	MGC	6"	good	165	22	3,630	795,025	65	60	62	64	61	62	TEXTURED
P-122	TT-4723	3/22/05	MGC	6"	good	Pentagon	Pentagon	3,586	798,611	60	65	65	60	64	63	TEXTURED
P-123	TT-4722	3/22/05	MGC	6"	good	124	22	2,728	801,339	62	62	63	63	64	63	TEXTURED
P-124	TT-4722	3/22/05	MGC	6"	good	85	22	1,870	803,209	61	63	63	63	63	63	TEXTURED
P-125	TT-4722	3/22/05	MGC	6"	good	45.5	22	1,001	804,210	63	63	63	63	62	63	TEXTURED
P-126	TT-4722	3/22/05	MGC	6"	good	11	14	154	804,364	63	62	63	63	62	63	TEXTURED
P-127	TT-4722	3/22/05	MGC	6"	good	167.5	22	3,685	808,049	60	61	60	62	61	61	TEXTURED
P-128	TT-4733	3/22/05	MGC	6"	good	132.5	22	2,915	810,964	63	62	63	63	63	63	TEXTURED
P-129	TT-4733	3/22/05	MGC	6"	good	93	22	2,046	813,010	63	64	65	62	63	63	TEXTURED
P-130	TT-4733	3/22/05	MGC	6"	good	Pentagon	Pentagon	996	814,006	64	63	63	63	62	63	TEXTURED
P-131	TT-4733	3/22/05	MGC	6"	good	152.5	22	3,355	817,361	63	63	63	63	63	63	TEXTURED
P-132	TT-4732	3/22/05	MGC	6"	good	27	22	594	817,955	62	61	62	62	62	62	TEXTURED
P-133	TT-4732	3/22/05	MGC	6"	good	161.5	22	3,553	821,508	62	62	62	61	63	62	TEXTURED
P-134	TT-4732	3/22/05	MGC	6"	good	156	22	3,432	824,940	63	61	62	62	62	62	TEXTURED
P-135	TT-4732	3/22/05	MGC	6"	good	105	22	2,310	827,250	62	62	61	62	61	62	TEXTURED
P-136	TT2977	3/22/05	MGC	6"	good	27.5	22	605	827,855	63	63	62	63	63	63	TEXTURED
P-137	TT-2977	3/23/05	MGC	6"	good	108.5	22	2,387	830,242	62	61	62	62	61	62	TEXTURED
P-138	TT-2977	3/23/05	MGC	6"	good	69	22	1,518	831,760	61	61	62	62	63	62	TEXTURED
P-139	TT-2977	3/23/05	MGC	6"	good	Triangle	Triangle	315	832,075	61	61	62	63	62	62	TEXTURED
P-140	TT-2977	3/23/05	MGC	6"	good	155	22	3,410	835,485	62	62	63	62	61	62	TEXTURED
P-141	TT-2977	3/23/05	MGC	6"	good	66	22	1,452	836,937	63	62	62	62	62	62	TEXTURED

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						LENGTH	WIDTH			T1	T2	T3	T4	T5	AVERAGE	
P-142	TT-4727	3/23/05	MGC	6"	good	99.5	22	2,189	839,126	60	60	60	59	61	60	TEXTURED
P-143	TT-4727	3/23/05	MGC	6"	good	176	22	3,872	842,998	61	60	60	60	60	60	TEXTURED
P-144	TT-4727	3/23/05	MGC	6"	good	184	22	4,048	847,046	61	60	60	61	60	60	TEXTURED
P-145	TT-4727	3/24/05	MGC	6"	good	14.5	22	319	847,365	60	60	61	60	60	60	TEXTURED
P-146	TT-4731	3/24/05	MGC	6"	good	181	22	3,982	851,347	61	61	61	61	60	61	TEXTURED
P-147	TT-4731	3/24/05	MGC	6"	good	198	22	4,356	855,703	61	61	60	61	60	61	TEXTURED
P-148	TT-4731	3/24/05	MGC	6"	good	90.5	22	1,991	857,694	61	61	60	61	61	61	TEXTURED
P-149	TT-4730	3/24/05	MGC	6"	good	113.5	22	2,497	860,191	62	63	63	60	62	62	TEXTURED
P-150	TT4730	3/29/05	MGC	6"	good	PENTAGON		3,996	864,187	60	60	60	60	61	60	TEXTURED
P-151	TT4730	3/29/05	MGC	6"	good	TRIANGLE		168	864,355	61	60	60	60	60	60	TEXTURED
P-152	TT4730	3/29/05	MGC	6"	good	HEXAGON		1,969	866,324	60	60	61	60	60	60	TEXTURED
P-153	TT430	3/29/05	MGC	6"	good	TRIANGLE		312	866,636	60	60	60	61	60	60	TEXTURED
P-154	3296	3/30/05	MGC	6"	good	313.5	22	6,897	873,533	61	60	61	60	61	61	
P-155	3284	3/30/05	MGC	6"	good	88.5	22	1,947	875,480	60	62	61	62	62	61	
P-156	3284	3/30/05	MGC	6"	good	365.5	22	8,041	883,521	61	62	61	61	62	61	
P-157	3284	3/30/05	MGC	6"	good	57.5	22	1,265	884,786	61	61	62	61	60	61	
P-158	3278	3/30/05	MGC	6"	good	264.5	22	5,819	890,605	62	62	62	62	63	62	
P-159	3278	3/30/05	MGC	6"	good	147.5	22	3,245	893,850	61	61	61	61	60	61	
P-160	3277	3/30/05	MGC	6"	good	35	22	770	894,620	61	61	61	61	61	61	
P-161	3277	3/30/05	MGC	6"	good	246	22	5,412	900,032	60	61	60	61	60	60	
P-162	3277	3/30/05	MGC	6"	good	206	22	4,532	904,564	60	60	60	61	61	60	
P-163	3279	4/1/05	MGC	6"	good	171.5	22	3,773	908,337	60	61	61	60	61	61	
P-164	3279	4/1/05	MGC	6"	good	135	22	2,970	911,307	60	61	61	60	61	61	
P-165	3279	4/1/05	MGC	6"	good	99	22	2,178	913,485	60	61	61	60	61	61	
P-166	3279	4/1/05	MGC	6"	good	55.5	22	1,221	914,706	61	60	61	61	61	61	
P-167	3232	4/1/05	MGC	6"	good	40.5	22	891	915,597	59	60	62	60	61	60	
P-168	3285	4/1/05	MGC	6"	good	33	22	726	916,323	61	61	61	60	61	61	
P-169	3232	4/1/05	MGC	6"	good	25.5	22	561	916,884	61	60	60	61	62	61	
P-170	323	4/1/05	MGC	6"	good	19	22	418	917,302	61	61	62	61	61	61	

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						LENGTH	WIDTH			T1	T2	T3	T4	T5	AVERAGE	
P-171	3232	4/1/05	MGC	6"	good	TRIANGLE		384	917,686	60	61	61	61	61	61	
P-172	3232	4/1/05	MGC	6"	good	10	22	220	917,906	60	61	61	62	61	61	
P-173	4724	4/2/05	MGC	6"	good	191.5	22	4,213	922,119	60	61	60	61	60	60	TEXTURED
P-174	4724	4/2/05	MGC	6"	good	183.5	22	4,037	926,156	60	60	60	60	61	60	TEXTURED
P-175	4725	4/2/05	MGC	6"	good	107	22	2,354	928,510	61	61	60	61	61	61	TEXTURED
P-176	3038	4/2/05	MGC	6"	good	68.5	22	1,507	930,017	63	63	62	61	63	62	TEXTURED
P-177	3038	4/2/05	MGC	6"	good	166	22	3,652	933,669	63	62	63	63	63	63	TEXTURED
P-178	3038	4/2/05	MGC	6"	good	151.5	22	3,333	937,002	63	63	63	62	63	63	TEXTURED
P-179	3038	4/3/05	MGC	6"	good	37	22	814	937,816	62	63	62	62	61	62	TEXTURED
P-180	4728	4/3/05	MGC	6"	good	87.5	22	1,925	939,741	63	63	62	63	63	63	TEXTURED
P-181	4728	4/3/05	MGC	6"	good	96	22	2,112	941,853	63	63	62	63	63	63	TEXTURED
P-182	4728	4/3/05	MGC	6"	good	67.5	22	1,485	943,338	63	63	63	63	63	63	TEXTURED
P-183	4728	4/3/05	MGC	6"	good	39.5	22	869	944,207	63	63	62	62	63	63	TEXTURED
P-184	4728	4/3/05	MGC	6"	good	TRIANGLE	TRIANGLE	213	944,420	63	63	62	63	63	63	TEXTURED
P184A	4726	4/3/05	MGC	6"	good	2.9	22	63	944,483	61	61	60	60	60	60	TEXTURED
P-185	4728	4/3/05	MGC	6"	good	132	22	2,904	947,387	63	63	62	63	63	63	TEXTURED
P-186	4726	4/3/05	MGC	6"	good	42	22	924	948,311	60	61	60	60	60	60	TEXTURED
P-187	4726	4/3/05	MGC	6"	good	164.5	22	3,619	951,930	60	61	60	60	60	60	TEXTURED
P-188	4726	4/3/05	MGC	6"	good	144.5	22	3,179	955,109	60	61	60	60	60	60	TEXTURED
P-189	4726	4/3/05	MGC	6"	good	107.5	22	2,365	957,474	61	61	60	60	60	60	TEXTURED
P-190	4729	4/3/05	MGC	6"	good	57.5	22	1,265	958,739	60	61	60	60	60	60	TEXTURED
P190A	4729	4/3/05	MGC	6"	good	TRIANGLE	TRIANGLE	135	958,874	60	61	60	60	60	60	TEXTURED
P-191	4729	4/3/05	MGC	6"	good	170	22	3,740	962,614	61	61	60	61	61	61	TEXTURED
P-192	4729	4/3/05	MGC	6"	good	162	22	3,564	966,178	61	61	60	60	60	60	TEXTURED
P-193	4729	4/3/05	MGC	6"	good	67	22	1,474	967,652	59	60	60	60	60	60	TEXTURED
P-194	4725	4/3/05	MGC	6"	good	86	22	1,892	969,544	61	61	61	60	60	61	TEXTURED
P-195	4725	4/3/05	MGC	6"	good	139.75	22	3,075	972,618	61	61	61	61	60	61	TEXTURED
P-196	4725	4/3/05	MGC	6"	good	93.5	22	2,057	974,675	61	61	61	61	60	61	TEXTURED
P-197	4725	4/3/05	MGC	6"	good	44.5	22	979	975,654	61	61	61	61	60	61	TEXTURED

PANEL NUMBER	ROLL NUMBER	DEPLOYMENT DATE	QC MON.	OBSERVED OVERLAP	VISUAL PANEL CONDITION	PANEL DIMENSIONS (FT)		PANEL AREA	TOTAL AREA PLACED	PANEL THICKNESS						NOTES
						LENGTH	WIDTH			T1	T2	T3	T4	T5	AVERAGE	
P197A	4725	4/3/05	MGC	6"	good	4.5	22	99	975,753	61	61	61	60	60	61	TEXTURED
P-198	3232	4/4/05	MGC	6"	good	229	22	5,038	980,791	61	60	60	60	60	60	
P-199	3232	4/4/05	MGC	6"	good	TRIANGLE		248	981,039	60	60	60	61	60	60	
P-200	3238	4/4/05	MGC	6"	good	HEXAGON		1,908	982,947	63	63	64	63	62	63	
P-201	3238	4/4/05	MGC	6"	good	44	22	968	983,915	63	63	63	62	63	63	
P-202	3238	4/4/05	MGC	6"	good	TRIANGLE		308	984,223	63	63	62	63	63	63	

FUSION SEAM DESTRUCTIVE TEST

PROJECT NUMBER: 043-2246
LINER INSTALLER: Colorado Lining
LOCATION: Rocky Flats

PROJECT TITLE: Rocky Flats, Present Landfill
CONTRACTOR: S.M. Stoller
SITE MANAGER: Kaiser Hill Company LLC

	SHEAR (ppi)					PEEL-Top (ppi)					PEEL-Bottom (ppi)									
Specimen #	S1	S2	S3	S4	S5	P1T	P2T	P3T	P4T	P5T	P1B	P2B	P3B	P4B	P5B	Tested by	Date Tested	Mach #	Defect Code	SEAM, LOCATION TECH, TEMP/SPEED
DFp-001	103	106	108	108	108	93	95	96	90	91	93	96	87	91	90	MGC	10/30/04	0004	DP-1A	P1/P2, 35' N SEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/9.0
DFp-002	98	99	98	100	100	89	86	88	92	93	94	86	93	93	92	MSP	11/06/04	0004	DP-1H	P1/P5, 50'S NEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/8.0
DFp-003	93	94	94	102	95	78	79	83	77	81	82	83	82	83	82	MSP	11/06/04	0004	DP-1S	P7/P8, 10' S NEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/8.5
DFp-004	90	94	98	98	94	83	82	84	83	86	83	85	80	86	85	MSP	11/06/04	0004	DP-2D	P8/P9, 10' S NEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/7.7
DFp-005	92	93	98	99	98	81	86	82	82	84	83	80	81	82	86	MSP	11/08/04	0004	DP-2H	P11/P13, 183' S NEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/8.2
DFp-006	116	116	116	117	122	104	94	97	100	100	103	98	96	96	100	PRH	11/10/04	0004	DP-2S	P15/P16, 9'N SEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/9.0
DFp-007	112	113	111	110	102	96	95	91	96	103	102	99	99	98	103	PRH	11/10/04	0004	DP-2X	P16/P18, 135' S NEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/9.0
DFp-008	111	113	110	110	110	96	96	100	98	97	96	100	100	98	97	MGC	11/10/04	0004	DP-3C	P18/P19, 34' S NEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/9.5
DFp-009	113	109	113	113	112	93	91	96	97	97	87	96	96	88	97	PRH	11/15/04	0004	DP-3N	P19/P21, 92' S NEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/9.0
DFp-010	101	111	108	109	98	103	100	107	112	106	96	101	99	96	94	MGC	11/16/04	0004	DP-3R	P21/P22, 40' S NEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/9.0
DFp-011	100	103	104	105	105	105	109	105	109	105	97	103	105	101	102	MGC	11/16/04	0004	DP-3P	P23/P24, 100' S NEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC 800/9.0
DFp-012	100	100	102	95	105	97	100	88	104	97	98	102	97	99	101	MGC	11/16/04	0004	DP-3S	P24/P26. 50' N SEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					JS, 800/9.0
DFp-013	99	98	98	97	95	92	90	89	91	92	88	90	92	92	93	MGC	11/22/04	0004	DP-4I	P26/P28, 350' N SEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					JS, 800/9.5
DFp-014	95	96	94	95	95	95	89	89	88	89	89	89	89	89	90	MGC	11/22/04	0004	DP-4N	P28/P30, 300' N SEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					JS, 800/8.8
DFp-015	93	91	93	93	92	83	86	87	85	84	83	86	87	86	86	MGC	11/22/04	0019	DP-4P	P30/P32, 240' N SEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/9.0

Specimen #	SHEAR (ppi)					PEEL-Top (ppi)					PEEL-Bottom (ppi)					Tested by	Date Tested	Mach #	Defect Code	SEAM, LOCATION TECH, TEMP/SPEED
	S1	S2	S3	S4	S5	P1T	P2T	P3T	P4T	P5T	P1B	P2B	P3B	P4B	P5B					
DFp-016	110	115	116	106	112	100	101	96	100	100	99	98	99	97	99	MSP	11/23/04	0019	DP-6D	P32/P34, 30' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/8.5
DFp-017	94	94	98	104	113	95	98	94	94	92	98	96	92	97	93	MSP	11/23/04	0019	DP-5E	P31/P33, 31' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					JS, 800/8.5
DFp-018	107	115	112	115	113	96	94	97	92	100	89	94	94	93	95	MSP	11/23/04	0004	DP-5F	P34/P36150' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/9.0
DFp-019	103	106	103	102	113	93	90	94	97	97	86	92	97	94	95	MSP	11/23/04	0019	DP-5M	P36/P38, 150' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					JS, 800/9.0
DFp-020	116	115	102	111	111	90	94	93	92	92	93	94	91	94	90	MSP	11/23/04	0004	DP-5N	P38/P40, 130' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/9.0
DFp-021	98	112	112	108	110	92	92	100	97	97	91	95	94	95	92	MSP	11/23/04	0019	DP-6A	P40/P43, 100' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					JS800/8.8
DFp-022	115	114	114	114	113	103	99	99	95	99	91	100	101	101	101	MSP	11/23/04	0004	DP-6B	P40/P42, 100' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/9.0
DFp-023	108	104	104	108	109	96	97	96	97	97	91	94	90	93	95	MSP	11/23/04	0019	DP-6D	P42/P45, 30' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					JS, 800/8.5
DFp-024	115	114	103	109	103	93	95	96	96	95	90	92	92	92	94	MSP	11/23/04	0004	DP-6H	P44/P47, 26' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/9.0
DFp-025	100	96	98	98	98	85	92	94	92	93	90	91	93	91	91	MSP	12/14/04	0019	DP-7D	P46/P49, 14' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					JS 800/9.0
DFp-026	100	99	103	101	109	100	101	101	93	93	95	99	93	93	96	MSP	12/14/04	0019	DP-7G	P47/P48, 50' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					JS, 800/9.0
DFp-027	103	110	104	110	109	97	98	97	98	99	94	95	97	96	95	MSP	12/14/04	0019	DP-7J	P48/P50 14' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					JS, 800/9.5
DFp-028	110	110	105	109	101	93	93	92	92	92	96	91	91	95	93	MSP	12/14/04	0004	DP-7Q	P51/P53, 107' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/9.5
DFp-029	101	103	104	104	108	91	96	94	96	91	90	88	93	91	88	MSP	12/14/04	0019	DP-7R	P50/P53, 53' NEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					JS, 800/9.0
DFp-030	98	97	92	97	93	93	91	90	91	90	93	88	92	95	90	MSP	12/14/04	0019	DP-7W	P53/P54, 150' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					JS, 800/9.0
DFp-031	98	95	100	97	101	90	92	93	92	90	90	91	92	87	91	MSP	12/14/04	0019	DP-8C	P54/57, 50' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					JS, 800/9.0
DFp-032	96	103	105	106	97	91	90	89	89	92	89	90	90	90	90	MSP	12/14/04	0019	DP-8F	P57/P58, 11' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					JS, 800/9.5

Specimen #	SHEAR (ppi)					PEEL-Top (ppi)					PEEL-Bottom (ppi)					Tested by	Date Tested	Mach #	Defect Code	SEAM, LOCATION TECH, TEMP/SPEED
	S1	S2	S3	S4	S5	P1T	P2T	P3T	P4T	P5T	P1B	P2B	P3B	P4B	P5B					
DFp-033	94	97	97	100	101	89	87	90	91	93	92	92	89	87	87	MSP	12/14/04	0004	DP-8G	P56/P59, 25' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/9.5
DFp-034	99	101	101	102	98	91	90	89	89	89	85	88	92	90	88	MSP	12/14/04	0019	DP-8J	P59/P61, 200' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					JS, 800/9.5
DFp-035	100	101	99	100	100	98	96	97	93	93	93	92	95	94	90	MSP	12/14/04	0004	DP-8M	P61/P62, 11' EWEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/9.5
DFp-036	98	99	96	98	101	93	90	92	93	94	91	89	89	89	90	MSP	12/14/04	0019	DP-8T	P58/P62, 150' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					JS, 800/9.5
DFp-037	99	99	97	94	100	94	95	92	92	91	93	93	91	89	91	MSP	12/14/04	0019	DP-9B	P61/P63, 57' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					JS, 800/9.5
DFp-038	101	108	95	105	113	89	95	97	94	94	87	88	85	87	89	MSP	12/14/04	0035	DP-9C	P54/P56, 10' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 750/9.5
DFp-039	107	107	101	101	103	97	96	95	87	96	89	91	97	96	86	MSP	12/14/04	0004	DP-9G	P64/P66, 30' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/9.5
DFp-040	100	97	97	102	101	94	91	91	95	90	90	92	94	91	92	MSP	12/14/04	0019	DP-9H	P64/P65, 135' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					JS, 800/9.5
DFp-041	111	104	109	113	97	98	96	95	93	94	84	97	95	93	92	MSP	12/17/04	0004	DP-9J	P65/P68, 130' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/10.0
DFp-042	111	108	109	108	111	102	99	96	97	96	93	96	94	96	95	MSP	12/17/04	0004	DP-9Q	P67/P97, 100' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/10.0
DFp-043	109	110	106	105	111	94	93	94	85	89	97	95	96	95	94	MSP	12/17/04	0004	DP-9X	P68/P70, 50' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/10.0
DFp-044	112	105	109	110	113	99	99	97	102	100	101	97	93	99	101	MSP	12/17/04	0004	DP-10D	P69/P73 290' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/10.0
DFp-045	96	104	101	102	102	94	86	91	96	89	93	93	92	93	91	MSP	12/17/04	0004	DP-10J	P72/P74, 11' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/10.0
DFp-046	114	111	111	112	112	96	91	93	95	92	95	97	95	94	97	PRH	12/20/04	0004	DP-10R	P74/P76, 8' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/10.0
DFp-047	108	105	111	104	109	95	95	94	98	92	90	90	93	93	95	PRH	12/20/04	0004	DP-11B	P75/P78, 120' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/10.0
DFp-048	109	114	114	114	109	98	99	101	98	98	99	101	100	97	99	MSP	01/06/05	0004	DP-11F	P76/P79, 74' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC 800/10.0
DFp-049	103	103	100	104	104	90	91	91	93	90	93	89	88	83	90	PRH	12/20/04	0004	DP-11P	P78/P81, 175' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/10.0

Specimen #	SHEAR (ppi)					PEEL-Top (ppi)					PEEL-Bottom (ppi)					Tested by	Date Tested	Mach #	Defect Code	SEAM, LOCATION TECH, TEMP/SPEED
	S1	S2	S3	S4	S5	P1T	P2T	P3T	P4T	P5T	P1B	P2B	P3B	P4B	P5B					
DFp-050	104	102	114	112	112	97	94	97	96	97	92	97	96	98	99	MSP	12/17/04	0004	DP-11R	P79/P80, 41' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/10.0
DFp-051	102	97	102	109	102	94	94	93	87	89	94	92	91	92	94	MSP	01/06/05	0004	DP-11X	P81/P84, 30' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/10.0
DFp-052	103	101	101	103	102	93	95	90	93	92	91	94	94	93	93	MSP	01/06/05	0004	DP-12A	P84/P86, 100' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/10.0
DFp-053	105	101	109	108	105	95	93	95	95	95	93	95	93	93	95	MSP	01/06/05	0019	DP-12B	P83/P86, 130' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					JS, 800/10.0
DFp-054	101	98	97	99	100	92	93	91	89	79	89	88	88	93	78	MSP	01/03/05	0004	DP-12K	P86/P88, 100' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/10.0
DFp-055	111	105	105	106	105	93	99	97	98	100	96	96	97	98	97	MSP	01/07/05	0019	DP-12N	P86/P89, 74' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					JS, 800/10.0
DFp-056	103	102	105	103	103	92	94	95	94	95	95	93	96	93	94	MSP	01/06/05	0004	DP-12Q	P90/P92, 10' WEEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/10.0
DFp-057	112	103	104	109	105	96	96	96	100	97	91	93	95	97	97	MSP	01/06/05	0004	DP-13C	P92/P93, 100' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/10.0
DFp-058	108	98				94	95	78	100	98	97	98	94	101	101	MSP	01/06/05	0019	DP-13D	P93/P95, 110' SNEOS
	BRK	BRK				SE-1	SE-1	AD-BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					JS, 800/10.0
DFp-058						89	80	79			101	99	99			MSP	01/06/05	0019		P93/P95, 95' SNEOS
+15'N						AD-BRK	AD-BRK	AD-BRK			SE-1	SE-1	SE-1							JS, 800/10.0
DFp-058						83	87	93			98	96	93			MSP	01/06/05	0019		P93/P95, 125' SNEOS
15'S						AD-BRK	AD-BRK	AD-BRK			SE-1	SE-1	SE-1							JS, 800/10.0
DFp-058						100	98	98								MSP	01/06/05	0019		P93/P95, 160' SNEOS
+50'S						AD-BRK	AD-BRK	AD-BRK												JS, 800/10.0
DFp-058						90	94	86								MSP	01/06/05	0019		P93/P95, 60' SNEOS
+50'N						AD-BRK	AD-BRK	AD-BRK												JS, 800/10.0
DFp-058U	94	99	95	95	106	93	89	93	98	97	95	89	91	92	93	MSP	01/07/05	0019	DP-15F	P95/P96, 10' WEEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					JS, 800/10.0
DFp-058D						85	93				97	88	84				01/07/05	0019	DP-15G	P94/P95, 8' SNEOS
						SE-1	SE-1				AD-BRK	SE-1	AD-BRK							JS, 800/10.0 failed to DF
DRp-059						56	66				93					MSP	01/09/05	0004	DP-13J	P90/P94, 240' SNEOS
						AD-BRK	AD-BRK				SE-1									BC, 800/10.0

Specimen #	SHEAR (ppi)					PEEL-Top (ppi)					PEEL-Bottom (ppi)					Tested by	Date Tested	Mach #	Defect Code	SEAM, LOCATION TECH, TEMP/SPEED
	S1	S2	S3	S4	S5	P1T	P2T	P3T	P4T	P5T	P1B	P2B	P3B	P4B	P5B					
DFp-059U	106	106	111	114	111	94	94	94	93	95	90	91	90	93	91	MSP	01/09/05	0004	DP-17A	P90/P94, 150' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/10.0
DFp-059D	99	98	94	97	96	93	91	92	90	88	89	90	91	91	93	MSP	01/09/05	0004	DP-16S	P90/P94, 35' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/10.0
DFp-060	99	98	99	105	100	94	93	95	93	96	91	96	98	96	95	MSP	01/07/05	0019	DP-13M	P94/P96, 60' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					JS, 800/10.0
DFp-061	109	108	110	109	110	96	98	96	96	95	98	97	98	97	93	MSP	01/10/05	0004	DP-13N	P95/P98, 250' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/10.0
DFp-062	109	109	103	103	103	98	95	97	98	94	99	95	100	95	97	MSP	01/10/05	0019	DP-13P	P96/P97, 43' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					JS, 800/10.0
DFp-063	108	107	109	108	109	93	96	96	94	99	102	96	98	95	100	MSP	01/10/05	0019	DP-14E	P98/P100, 81' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					JS, 800/ 10.0
DFp-064	110	108	103	108	110	93	92	92	88	96	99	94	93	94	98	MSP	01/10/05	0019	DP-14F	P100/P103, 130' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/10.0
DFp-065	108	110	107	108	113	93	91	92	94	93	95	94	93	92	95	MSP	01/10/05	0004	DP-14G	P101/P102, 75' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/10.0
DFp-066						70	53				109					MSP	02/15/05	0004	DP-18C	P103/P106 20' NSEOS
						AD-BRK	AD-BRK				SE-1									BC 9.5/800
DFp-066U	117	116	114	132	132	116	114	115	91	121	114	113	116	110	111	MSP	02/15/05	0004	DP-19R	P103/P106 60' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC 9.5/800
DFp-066D	122	123	129	119	122	108	101	111	111	111	109	104	104	111	108	MSP	02/15/05	0004	DP-19X	P107/P108 11' WEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC 9.5/800
DFp-067	131	130	135	126	133	114	112	110	117	117	108	115	115	114	111	PRH	02/15/05	0053	DP-18B	P102/P105 8'SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					GK 10.0/800
DFp-068	130	137	136	134	133	120	113	111	114	117	115	114	114	105	110	PRH	02/15/05	0053	DP-18G	P105/P108 250' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					GK 10.0/800
DFp-069	135	138	134	137	134	98	121	120	120	115	102	119	114	121	108	MSP	02/15/05	0004	DP-18J	P107/P110 100' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC 9.5/800
DFp-070	130	135	132	133	132	116	111	113	116	119	116	110	113	115	115	MSP	02/15/05	0053	DP-18K	P108/111 20' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					GK 10.0/800
DFp-071	122	120	122	124	124	111	102	108	108	113	114	111	104	114	100	MSP	02/15/05	0004	DP-18Q	P110/P112 80' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC 9.5/800
DFp-072	117	120	120	119	117	103	100	113	101	99	100	101	101	101	100	MGC	02/15/05	0004	DP-18W	P112/P114 80' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC 9.5/800

Specimen #	SHEAR (ppi)					PEEL-Top (ppi)					PEEL-Bottom (ppi)					Tested by	Date Tested	Mach #	Defect Code	SEAM, LOCATION TECH, TEMP/SPEED
	S1	S2	S3	S4	S5	P1T	P2T	P3T	P4T	P5T	P1B	P2B	P3B	P4B	P5B					
DFp-073	122	122	121	122	121	104	108	104	108	109	108	109	108	112	107	MGC	02/15/05	0053	DP-18X	P113/115 110' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					GK 10.0/800
DFp-074	118	118	117	118	117	108	100	108	104	103	101	111	109	110	104	MGC	02/15/05	0004	DP-19D	P114/117 4' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC 10.0/800
DFp-075	118	120	118	116	118	109	101	103	102	98	112	104	109	110	107	MGC	02/15/05	0053	DP-19G	P115/116 10' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					GK 10.0/800
DFp-076	111	107	109	108	109	102	101	102	101	101	96	97	97	96	96	MSP	02/18/05	0004	DP-19I	P117/119 30' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC 10.0/800
DFp-077	110	110	111	109	104	104	101	99	99	100	97	102	96	98	97	MSP	02/18/05	0004	DP-19Q	P116/118 75' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC 10.0/800
DFp-078	107	103	108	100	102	96	93	100	97	98	96	96	96	99	97	MSP	03/28/05	0053	DP-20F	P121/P122, 35' EWEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/8.3
DFp-079	107	107	107	100	102	97	98	98	98	98	98	99	99	98	97	MSP	03/28/05	0035	DP-20G	P122/P124, 25' EWEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					GK, 800/8.0
DFp-080	98	104	108	104	103	97	98	95	97	95	96	96	92	98	95	MSP	03/28/05	0053	DP-20N	P127/P128, 52' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/8.5
DFp-081	107	103	104	104	102	93	92	96	98	95	95	89	95	95	95	MSP	03/28/05	0053	DP-20S	P127/P131, 20' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/8.3
DFp-082	112	103	104	102	108	96	94	94	96	91	92	93	98	93	97	MSP	03/28/05	0035	DP-21A	P134/P135, 18' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					GK, 800/8.0
DFp-083	101	110	100	109	103	93	95	97	96	96	97	100	100	100	97	MSP	03/28/05	0053	DP-21E	P120/P140, 30' EWEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/8.3
DFp-084	121	117	119	122	118	110	107	108	112	113	107	107	103	113	109	MSP	03/29/05	0053	DP-21H	P144/P146, 4' EWEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	BRK	SE-1					BC, 800/ 7.5
DFp-085	114	114	120	118	119	107	113	101	107	103	110	102	109	103	101	MSP	03/29/05	0053	DP-21I	P146/P147, 60' EWEOS
	BRK	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	BRK	BRK	SE-1	SE-1	SE-1					BC, 800/7.5
DFp-086	118	114	120	121	119	102	108	108	112	108	109	102	102	110	109	MSP	03/29/05	0053	DP-21J	P147/P149, 10' EWEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/7.5
DFp-087	120	126	124	119	126	113	108	107	113	113	113	110	114	114	112	MSP	04/01/05	0053	DP-22I	P149/P153, 24' EWEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/8.5
DFp-088	117	113	112	115	114	100	101	101	100	101	100	103	99	97	101	MSP	03/31/05	0035	DP-22Q	P154/P156, 150'NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					RB, 800/9.4
DFp-089	120	116	114	116	116	109	105	103	99	103	101	101	103	104	99	MSP	03/31/05	0053	DP-22R	P118/P155, 10' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/8.5

Specimen #	SHEAR (ppi)					PEEL-Top (ppi)					PEEL-Bottom (ppi)					Tested by	Date Tested	Mach #	Defect Code	SEAM, LOCATION TECH, TEMP/SPEED
	S1	S2	S3	S4	S5	P1T	P2T	P3T	P4T	P5T	P1B	P2B	P3B	P4B	P5B					
DFp-090	115	116	116	117	114	105	103	101	102	108	104	110	108	104	105	MSP	03/31/05	0035	DP-22X	P156/P158, 89' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					RB, 800/9.5
DFp-091	109	99	113	104	102	101	103	102	100	96	101	100	104	100	100	MSP	04/01/05	0053	DP-23B	P161/P162, 50' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800, 8.0
DFp-092	112	115	115	114	113	108	101	101	101	101	103	100	101	101	103	MSP	03/31/05	0035	DP-23C	P159/P161, 50' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					RB, 800/7.0
DFp-093	98	97	95	97	97	90	90	87	87	89	90	92	88	88	89	MSP	04/01/05	0053	DP-23P	P164/P165. 10' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/9.0
DFp-094	101	97	92	98	91	95	91	88	94	94	92	91	90	93	94	MSP	04/01/05	0035	DP-23Q	P167/P170, 10' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					GK 800, 8.9
DFp-095	125	120	121	126	125	117	110	113	115	116	114	113	113	112	110	MSP	04/05/05	0053	DP-24E	P174/P175, 23' EWEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/9.0
DFp-096	131	131	132	129	123	120	126	124	117	125	127	128	120	121	117	MSP	04/05/05	0035	DP-24F	P176/P177, 10' EWEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					GK 800/9.0
DFp-097	121	117	118	117	119	115	113	107	113	114	112	110	112	107	115	MSP	04/05/05	0053	DP-24M	P185/P187, 46' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/9.0
DFp-098	124	121	118	121	122	116	113	111	114	113	114	112	111	116	111	MSP	04/05/05	0035	DP-24Q	P189/P190, 68' SNEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	BRK	SE-1	SE-1	SE-1	SE-1	BRK	SE-1					GK, 800/9.0
DFp-099	122	117	120	121	121	111	114	112	111	112	107	106	107	108	113	MSP	04/05/05	0053	DP-25D	P191/P192, 10' NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					GK, 800/9.0
DFp-100	104	106	104	106	105	101	98	99	99	90	103	90	101	89	99	MSP	04/05/05	0053	DP-25K	P119/P198, 100'NSEOS
	BRK	BRK	BRK	BRK	BRK	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1	SE-1					BC, 800/9.0

FUSION SEAMING LOG

PROJECT NUMBER: 043-2246
LINER INSTALLER: Colorado Lining
LOCATION: Rocky Flats

PROJECT TITLE: Rocky Flats Present Landfill
CONTRACTOR: S..M. Stoller
SITE MANAGER: Kaiser Hill LLC

MACHINE NUMBER 0004

DATE	SEAM NUMBER	SEAM SECTION START POINT	SEAM SECTION FINISH POINT	APPROX. START TIME	AMB. AIR TEMP	WELD TECH	PRE-HEAT MACH. SPEED	MACHINE TEMPERATURES DIGITAL SET WEDGE OR BARREL NOZZLE	MACHINE TEMPERATURES INDICATOR WEDGE OR BARREL NOZZLE	APPROX. LENGTH WELDED	DESTR. NUMBER	MON.	REMARKS
10/30	P1 / P2	NEOS	SEOS	1347	60	BC	9	800 -	800 -	195	DFp-001	MGC	DP 1A
10/30	P2 / P3	NEOS	SEOS	1420	60	BC	9	800 -	800 -	148		MGC	
10/30	P3 / P4	NEOS	SEOS	1446	60	BC	9	800 -	798 -	97		MGC	
11/4	P1 / P5	SEOS	NEOS	1132	40	BC	8	800 -	796 -	219	DFp-002	MGC	DP 1H
11/4	P6 / P7	WEOS	EEOS	1322	50	BC	8.5	800 -	782 -	22		MGC	
11/4	P5 / P7	SEOS	NEOS	1435	50	BC	8.5	800 -	799 -	62		MGC	
11/4	P5 / P6	SEOS	NEOS	1345	50	BC	8.5	800 -	802 -	180		MGC	
11/4	P7 / P8	SEOS	NEOS	1520	50	BC	8.5	800 -	798 -	70	DFp-003	MGC	DP 1S
11/4	P6 / P8	SEOS	NEOS	1530	50	BC	8.5	800 -	800 -	191		MGC	
11/4	P9 / P10	EEOS	WEOS	1600	45	BC	7.7	800 -	791 -	22		PRH	
11/4	P8 / P10	SEOS	NEOS	1610	45	BC	7.7	800 -	790 -	103		PRH	
11/4	P8 / P9	SEOS	NEOS	1620	40	BC	7.7	800 -	799 -	175	DFp-004	PRH	DP 2D
11/4	P10 / P11	SEOS	NEOS	1650	34	BC	7.7	800 -	801 -	110		PRH	
11/4	P9 / P11	SEOS	NEOS	1705	32	BC	7.7	800 -	799 -	175		PRH	
11/5	P12 / P13	WEOS	EEOS	1535	65	BC	8.2	800 -	798 -	22		MGC	
11/5	P11 / P13	NEOS	SEOS	1540	65	BC	8.2	800 -	794 -	210	DFp-005	MGC	DP 2H
11/5	P11 / P12	NEOS	SEOS	1610	65	BC	8.2	800 -	800 -	109		MGC	
11/5	P14 / P15	WEOS	EEOS	1635	65	BC	8.2	800 -	799 -	22		MGC	
11/5	P13 / P14	NEOS	SEOS	1640	55	BC	8.2	800 -	800 -	220		MGC	
11/5	P12 / P14	NEOS	SEOS	1710	55	BC	8.2	800 -	800 -	87		MGC	
11/5	P12 / P15	NEOS	SEOS	1725	55	BC	8.2	800 -	800 -	26		MGC	
11/8	P15 / P16	SEOS	NEOS	1005	70	BC	9	800 -	799 -	34	DFp-006	PRH	DP 2S
11/8	P14 / P16	SEOS	NEOS	1010	70	BC	9	800 -	800 -	321		PRH	
11/8	P17 / P18	WEOS	EEOS	1050	70	BC	9	800 -	800 -	22		MGC	
11/8	P16 / P18	SEOS	NEOS	1055	70	BC	9	800 -	801 -	267	DFp-007	MGC	DP 2X
11/8	P16 / P17	SEOS	NEOS	1135	65	BC	9	800 -	800 -	102		MGC	
11/8	P19 / P20	EEOS	WEOS	1500	65	BC	9.3	800 -	788 -	22		PRH	
11/8	P18 / P20	SEOS	NEOS	1515	65	BC	9.5	800 -	794 -	145		MGC	

DATE	SEAM NUMBER	SEAM SECTION START POINT	SEAM SECTION FINISH POINT	APPROX. START TIME	AMB. AIR TEMP	WELD TECH	PRE-HEAT MACH. SPEED	MACHINE TEMPERATURES DIGITAL SET WEDGE OR BARREL	MACHINE TEMPERATURES DIGITAL SET NOZZLE	MACHINE TEMPERATURES INDICATOR WEDGE OR BARREL	MACHINE TEMPERATURES INDICATOR NOZZLE	APPROX. LENGTH WELDED	DESTR. NUMBER	MON.	REMARKS
11/8	P18 / P19	SEOS	NEOS	1530	65	BC	9.5	800	-	799	-	130	DFp-008	MGC	DP 3C
11/8	P17 / P19	SEOS	NEOS	1545	65	BC	9.5	800	-	800	-	121		MGC	
11/9	P21 / P22	EEOS	WEOS	1045	55	BC	9	800	-	798	-	22		PRH	
11/9	P20 / P22	SEOS	NEOS	1052	55	BC	9	800	-	797	-	60		PRH	
11/9	P20 / P21	SEOS	NEOS	1100	55	BC	9	800	-	800	-	91		PRH	
11/9	P19 / P21	SEOS	NEOS	1113	55	BC	9	800	-	798	-	272	DFp-009	PRH	DP 3N
11/9	P22 / P23	SEOS	NEOS	1145	60	BC	9	800	-	798	-	68		PRH	
11/9	P21 / P23	SEOS	NEOS	1157	60	BC	9	800	-	797	-	375	DFp-010	PRH	DP 3P
11/9	P23 / P24	SEOS	NEOS	1500	50	BC	9	800	-	800	-	468	DFp-011	PRH	DP 3C
11/9	P25 / P26	EEOS	WEOS	1620	45	BC	9	800	-	799	-	22		PRH	
11/16	P27 / P28	WEOS	EEOS	1500	50	JS	9.5	800	-	797	-	22		PRH	
11/16	P26 / P28	SEOS	NEOS	1520	50	JS	9.5	800	-	796	-	447	DFp-013	PRH	DP 4I
11/16	P26 / P27	SEOS	NEOS	1605	50	JS	9.5	800	-	799	-	12		PRH	
11/16	P25 / P27	SEOS	NEOS	1607	50	JS	9.5	800	-	797	-	52		PRH	
11/16	P29 / P30	WEOS	EEOS	1618	50	JS	9.5	800	-	797	-	22		PRH	
11/16	P28 / P30	SEOS	NEOS	1628	45	JS	9.5	800	-	799	-	447	DFp-014	PRH	DP 4N
11/16	P28 / P29	SEOS	NEOS	1718	40	JS	8.8	800	-	798	-	5		PRH	
11/16	P27 / P29	SEOS	NEOS	1719	40	JS	8.8	800	-	799	-	83		PRH	
11/17	P31 / P32	WEOS	EEOS	1035	55	BC	9	800	-	799	-	22		MGC	
11/17	P30 / P32	SEOS	NEOS	1055	55	BC	9	800	-	794	-	446	DFp-015	MGC	DP 4P
11/17	P29 / P32	SEOS	NEOS	1045	55	BC	9	800	-	800	-	19		MGC	
11/17	P29 / P31	SEOS	NEOS	1047	55	BC	9	800	-	799	-	79		MGC	
11/17	P36 / P37	EEOS	WEOS	1623	45	BC	9	800	-	796	-	22		PRH	
11/17	P34 / P37	SEOS	NEOS	1626	45	BC	9	800	-	798	-	15		PRH	
11/17	P34 / P36	SEOS	NEOS	1628	45	BC	9	800	-	796	-	400	DFp-018	PRH	DP 5F
11/18	P40 / P41	WEOS	EEOS	1356	45	BC	9	800	-	799	-	22		PRH	
11/18	P39 / P40	SEOS	NEOS	1410	50	BC	9	800	-	799	-	89		MGC	
11/18	P38 / P40	SEOS	NEOS	1420	50	BC	9	800	-	800	-	357	DPp-020	MGC	DP-5N +QA Sample
11/18	P38 / P41	SEOS	NEOS	1502	50	BC	9	800	-	800	-	167		MGC	
11/18	P40 / P42	SEOS	NEOS	1540	50	BC	9	800	-	800	-	166	DFp-022	MGC	DP 6B
11/18	P41 / P42	SEOS	NEOS	1550	50	BC	9	800	-	799	-	181		MGC	
11/19	P44 / P45	EEOS	WEOS	1300	45	BC	9	800	-	798	-	22		PRH	
11/19	P44 / P47	SEOS	NEOS	1340	45	BC	9	800	-	799	-	256	DFp-024	PRH	DP-6H
11/19	P45 / P47	SEOS	NEOS	1410	45	BC	9	800	-	795	-	275		PRH	

DATE	SEAM NUMBER	SEAM SECTION START POINT	SEAM SECTION FINISH POINT	APPROX. START TIME	AMB. AIR TEMP	WELD TECH	PRE-HEAT MACH. SPEED	MACHINE TEMPERATURES DIGITAL SET WEDGE OR BARREL NOZZLE	MACHINE TEMPERATURES INDICATOR WEDGE OR BARREL NOZZLE	APPROX. LENGTH WELDED	DESTR. NUMBER	MON.	REMARKS
11/19	P45 / P46	SEOS	NEOS	1445	45	BC	9	800 -	800 -	128		PRH	
12/7	P50 / P51	WEOS	EEOS	1340	50	BC	9.5	800 -	788 -	22		MGC	
12/7	P52 / P53	WEOS	EEOS	1510	50	BC	9.5	800 -	782 -	22		MGC	
12/7	P51 / P53	DP-7P	SEOS	1530	50	BC	9.5	800 -	798 -	137	DFp-028	MGC	DP-7Q
12/7	P51 / P52	NEOS	SEOS	1545	50	BC	9.5	800 -	800 -	161		MGC	
12/8	P59 / P60	WEOS	EEOS	1640	45	BC	9.5	800 -	799 -	22		MGC	
12/8	P56 / P60	NEOS	SEOS	1645	45	BC	9.5	800 -	800 -	17		MGC	
12/8	P56 / P59	NEOS	DP-8E	1647	45	BC	9.5	800 -	800 -	510	DFp-033	MGC	DP-8G
12/9	P61 / P62	EEOS	WEOS	0905	40	BC	9.5	800 -	786 -	22	DFp-035	MGC	DP-8M
12/9	P63 / P64	EEOS	WEOS	1120	40	BC	9.5	800 -	781 -	22		MGC	
12/9	P61 / P64	NEOS	SEOS	1125	40	BC	9.5	800 -	775 -	232		MGC	
12/9	P65 / P66	EEOS	WEOS	1435	40	BC	9.5	800 -	799 -	22		PRH	
12/9	P64 / P66	NEOS	SEOS	1442	40	BC	9.5	800 -	798 -	230	DFp-039	PRH	DP-9G
12/11	P65 / P67	NEOS	SEOS	0902	50	BC	10	800 -	800 -	90		MGC	
12/11	P66 / P67	NEOS	SEOS	0911	50	BC	10	800 -	799 -	225		MGC	
12/11	P67 / P68	EEOS	WEOS	1016	50	BC	10	800 -	801 -	22		MGC	
12/11	P65 / P68	NEOS	SEOS	1035	50	BC	10	800 -	800 -	462	DFp-041	MGC	DP-9J
12/12	P69 / P70	EEOS	WEOS	0910	40	BC	10	800 -	801 -	22		PRH	
12/12	P70 / P71	EEOS	WEOS	0920	40	BC	10	800 -	795 -	22		PRH	
12/12	P71 / P72	EEOS	WEOS	0926	40	BC	10	800 -	792 -	22		PRH	
12/12	P67 / P69	SEOS	NEOS	0950	40	BC	10	800 -	791 -	315	DFp-042	PRH	DP-9Q
12/12	P68 / P69	SEOS	NEOS	1020	40	BC	10	800 -	800 -	230		PRH	
12/12	P68 / P70	SEOS	NEOS	1048	40	BC	10	800 -	800 -	72	DFp-043	PRH	DP-9W
12/12	P68 / P71	SEOS	NEOS	1055	40	BC	10	800 -	801 -	76		PRH	
12/12	P68 / P72	SEOS	NEOS	1104	40	BC	10	800 -	799 -	88		PRH	
12/12	P73 / P74	EEOS	WEOS	1142	40	BC	10	800 -	798 -	22		PRH	
12/12	P69 / P73	SEOS	NEOS	1400	40	BC	10	800 -	801 -	451	DFp-044	PRH	DP-10D
12/12	P69 / P74	SEOS	NEOS	1450	40	BC	10	800 -	800 -	100		PRH	
12/12	P70 / P74	SEOS	NEOS	1459	40	BC	10	800 -	799 -	72		PRH	
12/12	P71 / P74	SEOS	NEOS	1508	40	BC	10	800 -	799 -	76		PRH	
12/12	P72 / P74	SEOS	NEOS	1514	40	BC	10	800 -	799 -	101	DFp-045	PRH	DP-10J
12/14	P75 / P76	WEOS	EEOS	1034	45	BC	10	800 -	792 -	22		PRH	
12/14	P76 / P77	EEOS	WEOS	1120	45	BC	10	800 -	799 -	22		PRH	
12/14	P73 / P77	SEOS	NEOS	1130	45	BC	10	800 -	799 -	81		PRH	

DATE	SEAM NUMBER	SEAM SECTION START POINT	SEAM SECTION FINISH POINT	APPROX. START TIME	AMB. AIR TEMP	WELD TECH	PRE-HEAT MACH. SPEED	MACHINE TEMPERATURES DIGITAL SET WEDGE OR BARREL	MACHINE TEMPERATURES DIGITAL SET NOZZLE	MACHINE TEMPERATURES INDICATOR WEDGE OR BARREL	MACHINE TEMPERATURES INDICATOR NOZZLE	APPROX. LENGTH WELDED	DESTR. NUMBER	MON.	REMARKS
12/14	P73 / P76	SEOS	NEOS	1136	45	BC	10	800	-	800	-	367		PRH	
12/14	P74 / P76	SEOS	NEOS	1210	50	BC	10	800	-	798	-	190	DFp-046	PRH	DP-10R
12/14	P74 / P75	SEOS	NEOS	1229	50	BC	10	800	-	801	-	174		PRH	
12/14	P78 / P79	EEOS	WEOS	1350	45	BC	10	800	-	799	-	22		PRH	
12/14	P75 / P78	NEOS	SEOS	1406	45	BC	10	800	-	801	-	186	DFp-047	PRH	DP-11B
12/14	P76 / P78	NEOS	SEOS	1424	45	BC	10	800	-	800	-	350		PRH	
12/14	P76 / P79	NEOS	SEOS	1500	45	BC	10	800	-	799	-	204	DFp-048	PRH	DP-11F
12/14	P77 / P79	NEOS	SEOS	1521	45	BC	10	800	-	800	-	77		PRH	
12/15	P78 / P82	NEOS	SEOS	1028	40	BC	10	800	-	800	-	115		PRH	
12/15	P78 / P81	NEOS	SEOS	1041	40	BC	10	800	-	799	-	434	DFp-049	PRH	DP-11P
12/15	P79 / P81	NEOS	SEOS	1130	40	BC	10	800	-	800	-	104		PRH	
12/15	P79 / P80	NEOS	SEOS	1140	40	BC	10	800	-	798	-	171	DFp-050	PRH	DP-11R
12/15	P80 / P83	SEOS	NEOS	1315	40	BC	10	800	-	799	-	164		PRH	
12/15	P81 / P83	SEOS	NEOS	1339	40	BC	10	800	-	800	-	257		PRH	
12/15	P81 / P84	SEOS	NEOS	1410	40	BC	10	800	-	799	-	282	DFp-051	PRH	DP-11X
12/15	P82 / P84	SEOS	NEOS	1435	40	BC	10	800	-	799	-	126		PRH	
12/15	P85 / P86	EEOS	WEOS	1509	35	BC	10	800	-	800	-	22		PRH	
12/15	P84 / P86	SEOS	NEOS	1520	35	BC	10	800	-	800	-	306	DFp-052	PRH	DP-12A
12/15	P84 / P85	SEOS	NEOS	1553	35	BC	10	800	-	800	-	113		PRH	
12/17	P88 / P89	EEOS	WEOS	1028	50	BC	10	800	-	800	-	22		PRH	
12/17	P86 / P88	SEOS	NEOS	1040	50	BC	10	800	-	798	-	252	DFp-054	PRH	DP-12K
12/17	P85 / P88	SEOS	NEOS	1100	50	BC	10	800	-	799	-	123		PRH	
12/17	P88 / P92	NEOS	SEOS	1125	40	BC	10	800	-	790	-	233		PRH	
12/17	P90 / P92	WEOS	EEOS	1151	40	BC	10	800	-	796	-	22	DFp-056	PRH	DP-12Q
12/17	P88 / P90	NEOS	SEOS	1156	40	BC	10	800	-	799	-	149		PRH	
12/17	P89 / P90	NEOS	DP-12R	1320	40	BC	10	800	-	800	-	217		PRH	
12/19	P93 / P94	WEOS	EEOS	1016	55	BC	10	800	-	800	-	22		PRH	
12/19	P92 / P93	NEOS	SEOS	1030	55	BC	10	800	-	799	-	243	DFp-057	PRH	DP-13C
12/19	P90 / P93	NEOS	SEOS	1055	55	BC	10	800	-	799	-	62		PRH	
12/19	P90 / P94	NEOS	SEOS	1101	55	BC	10	800	-	799	-	476	DFp-059	PRH	DP-13J
12/19	P91 / P94	NEOS	SEOS	1153	55	BC	10	800	-	800	-	61		PRH	
12/19	P95 / P98	NEOS	SEOS	1405	55	BC	10	800	-	788	-	548	DFp-061	PRH	DP-13N
12/21	P100 / P101	EEOS	WEOS	1118	35	BC	10	800	-	789	-	22		PRH	
12/21	P102 / P103	EEOS	WEOS	1152	35	BC	10	800	-	796	-	22		PRH	

DATE	SEAM NUMBER	SEAM SECTION START POINT	SEAM SECTION FINISH POINT	APPROX. START TIME	AMB. AIR TEMP	WELD TECH	PRE-HEAT MACH. SPEED	MACHINE TEMPERATURES DIGITAL SET WEDGE OR BARREL	MACHINE TEMPERATURES DIGITAL SET NOZZLE	MACHINE TEMPERATURES INDICATOR WEDGE OR BARREL	MACHINE TEMPERATURES INDICATOR NOZZLE	APPROX. LENGTH WELDED	DESTR. NUMBER	MON.	REMARKS
12/21	P100 / P104	NEOS	SEOS	1354	35	BC	10	800	-	800	-	21		PRH	
12/21	P100 / P103	NEOS	SEOS	1357	35	BC	10	800	-	799	-	504	DFp-064	PRH	DP-14F
12/21	P101 / P103	NEOS	SEOS	1446	35	BC	10	800	-	800	-	49		PRH	
12/21	P101 / P102	NEOS	SEOS	1451	35	BC	10	800	-	799	-	243	DFp-065	PRH	DP-14G
2/11	P104 / P106	NEOS	SEOS	1500	60	BC	9.5	800	-	799	-	22		PRH	
2/11	P103 / P106	NEOS	SEOS	1503	60	BC	9.4	800	-	800	-	320	DFp-066	PRH	DP-18C
2/11	P107 / P108	EEOS	WEOS	1615	50	BC	9.5	800	-	799	-	22		PRH	
2/11	P106 / P107	NEOS	SEOS	1621	50	BC	9.5	800	-	800	-	197		PRH	
2/11	P106 / P108	NEOS	SEOS	1653	50	BC	9.5	800	-	797	-	150		PRH	
2/12	P107 / P110	NEOS	SEOS	840	45	BC	9.5	800	-	794	-	199	DFp-069	PRH	DP-18J
2/12	P108 / P110	NEOS	SEOS	902	45	BC	9.5	800	-	800	-	290		PRH	
2/12	P112 / P113	EEOS	WEOS	1046	50	BC	9.5	800	-	788	-	22		PRH	
2/12	P110 / P112	NEOS	SEOS	1056	50	BC	9.5	800	-	795	-	242	DFp-071	PRH	DP-18Q
2/12	P110 / P113	NEOS	SEOS	1122	55	BC	9.5	800	-	800	-	252		PRH	
2/12	P112 / P114	NEOS	SEOS	1448	50	BC	9.5	800	-	797	-	245	DFp-072	PRH	DP-18W
2/12	P113 / P114	NEOS	SEOS	1515	50	BC	9.5	800	-	799	-	306		PRH	
2/12	P116 / P117	WEOS	EEOS	1547	50	BC	9.5	800	-	800	-	22		PRH	
2/12	P114 / P117	NEOS	SEOS	1608	50	BC	9.5	800	-	800	-	444	DFp-074	PRH	DP-19D
2/14	P118 / P119	EEOS	WEOS	1308	55	BC	10	800	-	800	-	22		PRH	
2/14	P117 / P119	NEOS	SEOS	1327	55	BC	10	800	-	797	-	210	DFp-076	PRH	DP-19I
2/14	P117 / P118	NEOS	SEOS	1348	55	BC	10	800	-	801	-	238		PRH	
2/14	P116 / P118	NEOS	SEOS	1421	55	BC	10	800	-	799	-	312	DFp-077	PRH	DP-19Q

FUSION SEAMING LOG

PROJECT NUMBER:	043-2246	PROJECT TITLE:	Rocky Flats, Present Landfill
LINER INSTALLER:	Colorado Lining	CONTRACTOR:	S.M. Stoller
LOCATION:	Rocky Flats	SITE MANAGER:	Kaiser Hill Company LLC

MACHINE NUMBER 0019

DATE	SEAM NUMBER	SEAM SECTION START POINT	SEAM SECTION FINISH POINT	APPROX. START TIME	AMB. AIR TEMP	WELD TECH	PRE-HEAT MACH. SPEED	MACHINE TEMPERATURES DIGITAL SET WEDGE OR BARREL	MACHINE TEMPERATURES DIGITAL SET NOZZLE	MACHINE TEMPERATURES INDICATOR WEDGE OR BARREL	MACHINE TEMPERATURES INDICATOR NOZZLE	APPROX. LENGTH WELDED	DESTR. NUMBER	MON.	REMARKS
11/9	P24 / P26	SEOS	NEOS	1605	50	JS	9	800	-	792	-	452	DFp-012	MGC	DP-3S
11/9	P24 / P25	SEOS	NEOS	1700	50	JS	9	800	-	800	-	39		MGC	
11/17	P33 / P34	EEOS	WEOS	1520	50	JS	8.5	800	-	777	-	22		MGC	
11/17	P32 / P34	SEOS	NEOS	1530	50	JS	8.5	800	-	800	-	471	DTp-016	MGC	DP-5D
11/17	P31 / P34	SEOS	NEOS	1630	50	JS	8.5	800	-	799	-	32		MGC	
11/17	P31 / P33	SEOS	NEOS	1634	50	JS	8.5	800	-	796	-	58	DFp-017	MGC	DP-5E
11/17	P35 / P36	EEOS	WEOS	1645	45	JS	8.5	800	-	789	-	22		MGC	
11/17	P34 / P36	DP-5G	NEOS	1655	45	JS	8.5	800	-	796	-	93		MGC	
11/17	P33 / P36	SEOS	NEOS	1705	45	JS	8.5	800	-	799	-	49		MGC	
11/17	P33 / P35	SEOS	NEOS	1710	45	JS	8.5	800	-	799	-	25		MGC	
11/18	P38 / P39	EEOS	WEOS	1337	50	JS	8.8	800	-	800	-	22		MGC	
11/18	P37 / P39	SEOS	NEOS	1343	50	JS	8.8	800	-	800	-	17		MGC	
11/18	P36 / P39	SEOS	NEOS	1345	50	JS	8.8	800	-	798	-	72		MGC	
11/18	P36 / P38	SEOS	NEOS	1355	50	JS	8.8	800	-	799	-	469	DPp-019	MGC	DP-5M
11/18	P35 / P38	SEOS	NEOS	1452	50	JS	8.8	800	-	778	-	41		MGC	
11/18	P42 / P43	EEOS	WEOS	1418	50	JS	8.8	800	-	781	-	22		MGC	
11/18	P40 / P43	SEOS	NEOS	1515	50	JS	8.8	800	-	798	-	283	DFp-021	MGC	DP-6A
11/19	P43 / P44	SEOS	NEOS	1255	45	JS	8.5	800	-	801	-	256		PRH	
11/19	P43 / P45	SEOS	NEOS	1323	45	JS	8.5	800	-	799	-	30		PRH	
11/19	P42 / P45	SEOS	NEOS	1328	45	JS	8.5	800	-	799	-	359	DFp-023	PRH	DP-6D
11/19	P46 / P47	EEOS	WEOS	1412	45	JS	8.5	800	-	798	-	22		PRH	
12/7	P48 / P49	WEOS	EEOS	1030	50	JS	9	800	-	784	-	22		MGC	
12/7	P46 / P49	NEOS	SEOS	1100	50	JS	9	800	-	800	-	141	DFp-025	MGC	DP-7D
12/7	P47 / P49	NEOS	SEOS	1055	50	JS	9	800	-	801	-	20		MGC	
12/7	P47 / P48	NEOS	SEOS	1104	50	JS	9	800	-	799	-	461	DFp-026	MGC	DP-7G
12/7	P48 / P51	SEOS	NEOS	1340	50	JS	9.5	800	-	800	-	385		MGC	
12/7	P48 / P50	SEOS	NEOS	1420	50	JS	9.5	800	-	800	-	74	DFp-027	MGC	DP-7J
12/7	P49 / P50	SEOS	NEOS	1430	50	JS	9.5	800	-	800	-	225		MGC	

DATE	SEAM NUMBER	SEAM SECTION START POINT	SEAM SECTION FINISH POINT	APPROX. START TIME	AMB. AIR TEMP	WELD TECH	PRE-HEAT MACH. SPEED	MACHINE TEMPERATURES DIGITAL SET WEDGE OR BARREL	MACHINE TEMPERATURES DIGITAL SET NOZZLE	MACHINE TEMPERATURES INDICATOR WEDGE OR BARREL	MACHINE TEMPERATURES INDICATOR NOZZLE	APPROX. LENGTH WELDED	DESTR. NUMBER	MON.	REMARKS
12/7	P50 / P53	NEOS	SEOS	1515	50	JS	9.5	800	-	800	-	313	DFp-029	MGC	DP-7R
12/7	P51 / P53	NEOS	DP-7P	1550	50	JS	9.5	800	-	800	-	87		MGC	
12/8	P54 / P55	WEOS	EEOS	0928	45	JS	9	800	-	797	-	22		PRH	
12/8	P53 / P55	NEOS	SEOS	0937	45	JS	9	800	-	797	-	161		PRH	
12/8	P53 / P54	NEOS	SEOS	0956	45	JS	9	800	-	800	-	392	DFp-030	MGC	DP-7W
12/8	P52 / P54	NEOS	SEOS	1037	45	JS	9	800	-	797	-	161		PRH	
12/8	P56 / P57	WEOS	EEOS	1105	50	JS	9	800	-	799	-	22		PRH	
12/8	P54 / P57	NEOS	SEOS	1115	50	JS	9	800	-	799	-	374	DFp-031	PRH	DP-8C
12/8	P57 / P58	SEOS	NEOS	1620	40	JS	9.5	800	-	795	-	177	DFp-032	MGC	DP-8F
12/8	P58 / P59	EEOS	WEOS	1635	40	JS	9.5	800	-	800	-	22		MGC	
12/8	P56 / P59	DP-8E	SEOS	1650	40	JS	9.5	800	-	800	-	30		MGC	
12/8	P57 / P59	NEOS	SEOS	1653	40	JS	9.5	800	-	800	-	193		MGC	
12/9	P60 / P61	NEOS	SEOS	0845	40	JS	9.5	800	-	799	-	33		MGC	
12/9	P59 / P61	NEOS	SEOS	0847	40	JS	9.5	800	-	801	-	472	DFp-034	MGC	DP-8J
12/9	P59 / P62	NEOS	SEOS	0940	40	JS	9.5	800	-	800	-	70		MGC	
12/9	P58 / P62	NEOS	SEOS	0949	40	JS	9.5	800	-	800	-	176	DFp-036	MGC	DP-8T
12/9	P62 / P64	SEOS	DP-9A	1115	40	JS	9.5	800	-	799	-	175		MGC	
12/9	P62 / P64	NEOS	DP-9A	1135	40	JS	9.5	800	-	800	-	68		MGC	
12/9	P61 / P63	NEOS	SEOS	1140	40	JS	9.5	800	-	800	-	288	DFp-037	MGC	DP-9B
12/9	P63 / P65	NEOS	SEOS	1407	40	JS	9.5	800	-	801	-	303		MGC	
12/9	P64 / P65	NEOS	SEOS	1450	40	JS	9.5	800	-	797	-	237	DFp-040	MGC	DP-9H
12/15	P80 / P81	EEOS	WEOS	1010	40	JS	10	800	-	791	-	22		PRH	
12/15	P81 / P82	WEOS	EEOS	1025	40	JS	10	800	-	793	-	22		PRH	
12/15	P83 / P84	WEOS	EEOS	1215	40	JS	10	800	-	799	-	22		PRH	
12/15	P86 / P87	WEOS	EEOS	1519	35	JS	10	800	-	797	-	22		PRH	
12/15	P83 / P87	SEOS	NEOS	1528	35	JS	10	800	-	801	-	171		PRH	
12/15	P83 / P86	SEOS	NEOS	1545	35	JS	10	800	-	803	-	246	DFp-053	PRH	DP-12B
12/17	P90 / P91	EEOS	WEOS	1050	50	JS	10	800	-	798	-	22		PRH	
12/17	P87 / P89	SEOS	DP-12M	1100	50	JS	10	800	-	800	-	115		PRH	
12/17	P86 / P89	NEOS	SEOS	1120	40	JS	10	800	-	795	-	314	DFp-055	PRH	DP-12N
12/17	P87 / P89	NEOS	DP-12M	1155	40	JS	10	800	-	798	-	45		PRH	
12/17	P89 / P90	DP-12R	SEOS	1200	40	JS	10	800	-	799	-	175		PRH	
12/17	P89 / P91	NEOS	SEOS	1219	40	JS	10	800	-	800	-	71		PRH	
12/19	P95 / P96	WEOS	WEOS	1044	55	JS	10	800	-	799	-	22		PRH	

DATE	SEAM NUMBER	SEAM SECTION START POINT	SEAM SECTION FINISH POINT	APPROX. START TIME	AMB. AIR TEMP	WELD TECH	PRE-HEAT MACH. SPEED	MACHINE TEMPERATURES DIGITAL SET WEDGE OR BARREL	MACHINE TEMPERATURES DIGITAL SET NOZZLE	MACHINE TEMPERATURES INDICATOR WEDGE OR BARREL	MACHINE TEMPERATURES INDICATOR NOZZLE	APPROX. LENGTH WELDED	DESTR. NUMBER	MON.	REMARKS
12/19	P93 / P95	NEOS	EEOS	1102	55	JS	10	800	-	799	-	306	DFp-058	PRH	DP-13D
12/19	P94 / P95	NEOS	SEOS	1135	55	JS	10	800	-	800	-	240		PRH	
12/19	P94 / P95	NEOS	SEOS	1158	55	JS	10	800	-	800	-	288	DFp-060	PRH	DP-13M
12/19	P97 / P99	EEOS	WEOS	1405	55	JS	10	800	-	798	-	22		GDH	
12/19	P98 / P99	WEOS	EEOS	1415	55	JS	10	800	-	790	-	22		GDH	
12/19	P95 / P99	NEOS	SEOS	1418	55	JS	10	800	-	799	-	3		GDH	Capped by DP-13S
12/19	P96 / P99	NEOS	SEOS	1420	55	JS	10	800	-	789	-	23		GDH	
12/19	P96 / P97	NEOS	SEOS	1439	55	JS	10	800	-	797	-	243	DFp-062	GDH	DP-12P
12/21	P103 / P104	EEOS	WEOS	1202	35	JS	10	800	-	800	-	22		PRH	
12/21	P98 / P100	NEOS	SEOS	1319	35	JS	10	800	-	801	-	516	DFp-063	PRH	DP-14E
12/21	P98 / P101	NEOS	SEOS	1407	35	JS	10	800	-	799	-	31		PRH	
12/21	P99 / P101	NEOS	SEOS	1410	35	JS	10	800	-	800	-	25		PRH	
12/21	P97 / P101	NEOS	SEOS	1413	35	JS	10	800	-	801	-	304		PRH	

FUSION SEAMING LOG

PROJECT NUMBER:	**043-2246**	**PROJECT TITLE:**	**Rocky Flats, Present Landfill**
LINER INSTALLER:	**Colorado Lining**	**CONTRACTOR:**	**S.M. Stoller**
LOCATION:	**Rocky Flats**	**SITE MANAGER:**	**Kaiser Hill Company LLC**

MACHINE NUMBER 0035

DATE	SEAM NUMBER	SEAM SECTION START POINT	SEAM SECTION FINISH POINT	APPROX. START TIME	AMB. AIR TEMP	WELD TECH	PRE-HEAT MACH. SPEED	MACHINE TEMPERATURES DIGITAL SET WEDGE OR BARREL NOZZLE	MACHINE TEMPERATURES INDICATOR WEDGE OR BARREL NOZZLE	APPROX. LENGTH WELDED	DESTR. NUMBER	MON.	REMARKS
12/8	P55 / P56	NEOS	SEOS	1100	50	BC	9.5	750 -	750 -	176		PRH	
12/8	P54 / P56	NEOS	SOES	1125	50	BC	9.5	750 -	749 -	178	DFp-038	PRH	DP-9C
3/22	P123 / P124	EEOS	WEOS	1036	55	GK	8	800 -	793 -	105	DFp-079	MGC	DP-20G
3/22	P125 / P126	EEOS	WEOS	1055	55	GK	8	800 -	800 -	26		MGC	
3/22	P128 / P129	NEOS	SEOS	1430	50	GK	8	800 -	800 -	113		MGC	
3/22	P132 / P133	SEOS	NEOS	1702	50	GK	8	800 -	799 -	29		MGC	
3/22	P131 / P133	SEOS	NEOS	1707	50	GK	8	800 -	800 -	147		MGC	
3/22	P134 / P136	SEOS	NEOS	1807	40	GK	8	800 -	800 -	28		MGC	
3/22	P134 / P135	SEOS	NEOS	1811	40	GK	8	800 -	800 -	118	DFp-082	MGC	DP-21A
3/23	P136 / P137	SEOS	NEOS	900	32	GK	7.5	800 -	799 -	27		MGC	
3/23	P135 / P137	SEOS	NEOS	905	32	GK	7.5	800 -	800 -	94		MGC	
3/23	P141 / P143	EEOS	WEOS	1543	40	GK	8	800 -	789 -	59		MSP	
3/23	P142 / P143	EEOS	WEOS	1553	40	GK	8	800 -	799 -	112		MSP	
3/30	P154 / P156	NEOS	SEOS	1320	50	RB	9.4	800 -	800 -	300	DFp0-088	MGC	DP-22Q
3/30	P155 / P156	NEOS	SEOS	1356	45	RB	8	800 -	800 -	84		MGC	
3/30	P156 / P157	NEOS	SEOS	1433	45	RB	9.5	800 -	799 -	73		MGC	
3/30	P156 / P158	NEOS	SEOS	1443	45	RB	9.5	800 -	800 -	269	DFp-090	MGC	DP-22X
3/30	P159 / P160	WEOS	EEOS	1518	45	RB	9.5	800 -	798 -	22		MGC	
3/30	P160 / P161	SEOS	NEOS	1556	35	RB	7	800 -	800 -	31		MGC	
3/30	P159 / P161	SEOS	NEOS	1600	35	RB	7	800 -	800 -	233	DFp-092	MGC	DP-23C
4/1	P162 / P163	NEOS	SEOS	0925	55	GK	8.5	800 -	800 -	189		MGC	
4/1	P166 / P172	WEOS	EEOS	1007	60	GK	8.7	800 -	792 -	22		MGC	
4/1	P165 / P166	NEOS	SEOS	1018	60	GK	8.7	800 -	799 -	67		MGC	
4/1	P165 / P172	NEOS	SEOS	1024	60	GK	8.7	800 -	800 -	13		MGC	
4/1	P169 / P170	NEOS	SEOS	1040	60	GK	8.8	800 -	794 -	22	DFp-094	MGC	DP-23Q
4/2	P174 / P175	EEOS	WEOS	1520	65	GK	9	800 -	800 -	96		MGC	
4/2	P174 / P176	EEOS	WEOS	1533	65	GK	9	800 -	800 -	84		MGC	
4/2	P175 / P177	EEOS	WEOS	1544	60	GK	9	800 -	800 -	118		MGC	

4/2	P176 / P177	EEOS - WEOS	1557	60	GK	9	800 -	800 -	53	DFp-096	MGC	DP-24F
4/3	P178 / P179	EEOS - WEOS	1010	55	GK	9	800 -	799 -	37		MGC	
4/3	P178 / P180	EEOS - WEOS	1014	55	GK	9	800 -	799 -	101		MGC	
4/3	P181 / P182	EEOS - WEOS	1033	55	GK	9	800 -	799 -	81		MGC	
4/3	P183 / P184	EEOS - WEOS	1101	55	GK	9	800 -	780 -	25		MGC	
4/3	P185 / P186	EEOS - WEOS	1112	55	GK	9	800 -	798 -	22		MGC	
4/3	P187 / P188	SEOS - NEOS	1122	55	GK	9	800 -	794 -	156		MGC	
4/3	P189 / P190	NEOS - SEOS	1144	60	GK	9	800 -	799 -	82	DFp-098	MGC	DP-24Q
4/3	P186 / P191	SEOS - NEOS	1351	65	GK	9	800 -	794 -	133		MGC	
4/3	P193 / P194	EEOS - WEOS	1420	65	GK	9	800 -	799 -	22		MGC	
4/3	P193 / P195	SEOS - NEOS	1430	65	GK	9	800 -	800 -	64		MGC	
4/3	P194 / P195	SEOS - NEOS	1438	65	GK	9	800 -	800 -	83		MGC	
4/3	P196 / P197	SEOS - NEOS	1454	65	GK	9	800 -	799 -	67		MGC	
4/3	P197 / P197A	SEOS - NEOS	1502	70	GK	9	800 -	797 -	22		MGC	

FUSION SEAMING LOG

PROJECT NUMBER:	043-2246	PROJECT TITLE:	Rocky Flats, Present Landfill
LINER INSTALLER:	Colorado Lining	CONTRACTOR:	S.M. Stoller
LOCATION:	Rocky Flats	SITE MANAGER:	Kaiser Hill Company LLC

MACHINE NUMBER 53

DATE	SEAM NUMBER	SEAM SECTION START POINT	SEAM SECTION FINISH POINT	APPROX. START TIME	AMB. AIR TEMP	WELD TECH	PRE-HEAT MACH. SPEED	MACHINE TEMPERATURES DIGITAL SET WEDGE OR BARREL NOZZLE	MACHINE TEMPERATURES INDICATOR WEDGE OR BARREL NOZZLE	APPROX. LENGTH WELDED	DESTR. NUMBER	MON.	REMARKS
2/11	P105 / P106	EEOS	WEOS	1502	60	GK	10	800 -	790 -	23		PRH	
2/11	P103 / P105	NEOS	SEOS	1507	60	GK	10	800 -	800 -	229		PRH	
2/11	P102 / P105	NEOS	SEOS	1535	55	GK	10	800 -	797 -	236	DFp-67	PRH	DP-18B
2/11	P108 / P109	EEOS	WEOS	1627	50	GK	10	800 -	790 -	22		PRH	
2/11	P105 / P108	NEOS	SEOS	1636	50	GK	10	800 -	787 -	394	DFp-68	PRH	DP-18G
2/11	P105 / P109	NEOS	SEOS	1718	50	GK	10	800 -	797 -	95		PRH	
2/12	P110 / P111	WEOS	EEOS	900	45	GK	10	800 -	799 -	22		PRH	
2/12	P108 / P111	NEOS	SEOS	910	45	GK	10	800 -	800 -	258	DFp-70	PRH	DP-18K
2/12	P109 / P111	NEOS	SEOS	939	45	GK	10	800 -	798 -	45		PRH	
2/12	P111 / P113	NEOS	SEOS	1105	55	GK	10	800 -	800 -	294		PRH	
2/12	P114 / P115	EEOS	WEOS	1502	50	GK	10	800 -	799 -	22		PRH	
2/12	P113 / P115	NEOS	SEOS	1518	50	GK	10	800 -	799 -	223	DFp-73	PRH	DP-18X
2/12	P114 / P116	NEOS	SEOS	1555	50	GK	10	800 -	800 -	107		PRH	
2/12	P115 / P116	NEOS	SEOS	1607	50	GK	10	800 -	800 -	211	DFp-75	PRH	DP-19G
3/22	P121 / P122	EEOS	WEOS	1010	55	BC	8.3	800 -	800 -	165	DFp-078	MGC	DP-20F
3/22	P122 / P123	EEOS	WEOS	1030	55	BC	8.3	800 -	800 -	143		MGC	
3/22	P124 / P125	EEOS	WEOS	1052	55	BC	8.3	800 -	800 -	65		MGC	
3/22	P120 / P126	WEOS	EEOS	1117	50	BC	8.3	800 -	796 -	22		MGC	
3/22	P120 / P125	WEOS	EEOS	1119	50	BC	8.3	800 -	801 -	36		MGC	
3/22	P120 / P124	WEOS	EEOS	1123	50	BC	8.3	800 -	800 -	36		MGC	
3/22	P120 / P123	WEOS	EEOS	1127	50	BC	8.3	800 -	800 -	36		MGC	
3/22	P120 / P122	WEOS	EEOS	1132	50	BC	8.3	800 -	800 -	21		MGC	
3/22	P127 / P128	NEOS	SEOS	1411	50	BC	8.5	800 -	796 -	152	DFp-080	MGC	Dp-20N
3/22	P129 / P130	NEOS	SEOS	1434	50	BC	8.5	800 -	799 -	73		MGC	
3/22	P121 / P127	EEOS	WEOS	1449	50	BC	8.5	800 -	800 -	36		MSP	
3/22	P121 / P128	EEOS	WEOS	1455	50	BC	8.5	800 -	801 -	43		MSP	
3/22	P121 / P129	EEOS	WEOS	1500	50	BC	8.5	800 -	798 -	42		MSP	
3/22	P121 / P130	EEOS	WEOS	1505	50	BC	8.5	800 -	800 -	41		MSP	

DATE	SEAM NUMBER	SEAM SECTION START POINT	SEAM SECTION FINISH POINT	APPROX. START TIME	AMB. AIR TEMP	WELD TECH	PRE-HEAT MACH. SPEED	MACHINE TEMPERATURES DIGITAL SET WEDGE OR BARREL	MACHINE TEMPERATURES DIGITAL SET NOZZLE	MACHINE TEMPERATURES INDICATOR WEDGE OR BARREL	MACHINE TEMPERATURES INDICATOR NOZZLE	APPROX. LENGTH WELDED	DESTR. NUMBER	MON.	REMARKS
3/22	P131 / P132	WEOS	EEOS	1649	50	BC	8	800	-	793	-	22		MGC	
3/22	P127 / P132	SEOS	NEOS	1654	50	BC	8.3	800	-	799	-	25		MGC	
3/22	P127 / P131	SEOS	NEOS	1657	50	BC	8.3	800	-	800	-	158	DFp-081	MGC	DP-20S
3/22	P133 / P134	SEOS	NEOS	1726	45	BC	8.3	800	-	782	-	167		MGC	
3/22	P135 / P136	EEOS	WEOS	1802	40	BC	8	800	-	786	-	22		MGC	
3/23	P137 / P138	SEOS	NEOS	0905	32	BC	8	800	-	791	-	96		MGC	
3/23	P138 / P139	SEOS	NEOS	0930	32	BC	8	800	-	800	-	42		MGC	
3/23	P120 / P140	EEOS	WEOS	1418	40	BC	8.3	800	-	799	-	150	DFp-083	MGC	DP-21E
3/23	P141 / P142	NEOS	SEOS	1535	40	BC	8.3	800	-	783	-	31		MSP	
3/23	P140 / P141	EEOS	WEOS	1541	40	BC	8.3	800	-	784	-	73		MSP	
3/23	P140 / P142	EEOS	WEOS	1553	40	BC	8.3	800	-	800	-	87		MSP	
3/23	P143 / P144	EEOS	WEOS	1613	32	BC	7.8	800	-	800	-	181		MSP	
3/24	P145 / P146	NEOS	SEOS	952	30	BC	7.5	800	-	790	-	22		MSP	
3/24	P144 / P145	WEOS	EEOS	958	30	BC	7.5	800	-	789	-	13		MSP	
3/24	P144 / P146	WEOS	EEOS	1000	30	BC	7.5	800	-	800	-	180	DFp-084	MSP	DP-21H
3/24	P146 / P147	EEOS	WEOS	1026	30	BC	7.5	800	-	801	-	182	DFp-085	MSP	DP-21I
3/24	P145 / P147	EEOS	WEOS	1050	30	BC	7.5	800	-	779	-	16		MSP	
3/24	P148 / P149	NEOS	SEOS	1056	30	BC	7.5	800	-	789	-	31		MSP	
3/24	P147 / P148	EEOS	WEOS	1115	30	BC	7.5	800	-	776	-	80		MSP	
3/24	P147 / P149	EEOS	WEOS	1159	30	BC	7.5	800	-	801	-	123	DFp-086	MSP	DP-21J
3/29	P151 / P152	NEOS	SEOS	0850	45	BC	8	800	-	794	-	10		MGC	
3/29	P152 / P153	WEOS	EEOS	0858	45	BC	8	800	-	800	-	51		MGC	
3/29	P150 / P151	EEOS	WEOS	0910	45	BC	8	800	-	793	-	42		MGC	
3/29	P150 / P152	EEOS	WEOS	0915	45	BC	8	800	-	785	-	116		MGC	
3/29	P148 / P150	EEOS	WEOS	1038	45	BC	8	800	-	800	-	52		MGC	
3/29	P148 / P151	EEOS	WEOS	1045	50	BC	8.5	800	-	799	-	37		MGC	
3/29	P148 / P152	EEOS	WEOS	1049	50	BC	8.5	800	-	801	-	13		MGC	
3/29	P149 / P152	EEOS	WEOS	1051	50	BC	8.5	800	-	799	-	58		MGC	
3/29	P149 / P153	EEOS	WEOS	1058	50	BC	8.5	800	-	796	-	48	DFp-087	MGC	DP-22I
3/30	P154 / P155	EEOS	WEOS	1305	50	BC	8.5	800	-	794	-	22		MGC	
3/30	P118 / P154	NEOS	SEOS	1322	50	BC	8.5	800	-	794	-	327		MGC	
3/30	P118 / P155	NEOS	SEOS	1400	45	BC	8.5	800	-	800	-	93	DFp-089	MGC	DP-22R
3/30	P157 / P158	WEOS	EEOS	1420	45	BC	8.5	800	-	800	-	22		MGC	
3/30	P157 / P159	NEOS	SEOS	1300	40	BC	8.5	800	-	800	-	42		MGC	

DATE	SEAM NUMBER	SEAM SECTION START POINT	SEAM SECTION FINISH POINT	APPROX. START TIME	AMB. AIR TEMP	WELD TECH	PRE-HEAT MACH. SPEED	MACHINE TEMPERATURES DIGITAL SET WEDGE OR BARREL NOZZLE	MACHINE TEMPERATURES INDICATOR WEDGE OR BARREL NOZZLE	APPROX. LENGTH WELDED	DESTR. NUMBER	MON.	REMARKS
3/30	P158 / P159	NEOS	SEOS	1310	40	BC	8.5	800 -	800 -	220		MGC	
3/30	P158 / P160	NEOS	SEOS	1537	40	BC	8.5	800 -	800 -	40		MGC	
3/30	P161 / P162	NEOS	SEOS	1556	35	BC	8	800 -	797 -	228	DFp-091	MGC	DP-23B
4/1	P163 / P164	NEOS	SEOS	0924	55	BC	8.5	800 -	800 -	154		MGC	
4/1	P164 / P165	NEOS	SEOS	0945	55	BC	9	800 -	800 -	116	DFp-093	MGC	DP-23P
4/1	P166 / P167	NEOS	SEOS	1011	60	BC	9.2	800 -	790 -	44		MGC	
4/1	P167 / P172	NEOS	SEOS	1014	60	BC	9.2	800 -	798 -	5		MGC	
4/1	P167 / P168	NEOS	SEOS	1020	60	BC	8.9	800 -	798 -	37		MGC	
4/1	P168 / P169	NEOS	SEOS	1028	60	BC	8.9	800 -	791 -	29		MGC	
4/1	P170 / P171	NEOS	SEOS	1040	60	BC	8.9	800 -	800 -	14		MGC	
4/2	P150 / P173	WEOS	EEOS	1440	65	BC	9	800 -	800 -	196		MGC	
4/2	P173 / P174	EEOS	WEOS	1500	65	BC	9	800 -	800 -	187	DFp-095	MGC	DP-24E
4/2	P175 / P176	NEOS	SEOS	1525	65	BC	9	800 -	800 -	31		MGC	
4/2	P177 / P178	EEOS	WEOS	1607	60	BC	8.8	800 -	800 -	163		MGC	
4/3	P179 / P180	NEOS	SEOS	1008	55	BC	9	800 -	793 -	31		MGC	
4/3	P179 / P181	EEOS	WEOS	1014	55	BC	9	800 -	797 -	37		MGC	
4/3	P180 / P181	EEOS	WEOS	1018	55	BC	9	800 -	800 -	74		MGC	
4/3	P182 / P183	EEOS	WEOS	1033	55	BC	9	800 -	796 -	54		MGC	
4/3	P186 / P187	SEOS	NEOS	1110	55	BC	9	800 -	799 -	131	DFp-097	MGC	DP-24M
4/3	P185 / P187	SEOS	NEOS	1127	55	BC	9	800 -	799 -	42		MGC	
4/3	P188 / P189	NEOS	SEOS	1133	55	BC	9.2	800 -	797 -	133		MGC	
4/3	P184A / P190A	WEOS	EEOS	1152	55	BC	8.5	800 -	793 -	18		MGC	
4/3	P190 / P190A	NEOS	SEOS	1200	55	BC	8.5	800 -	793 -	25		MGC	
4/3	P190 / P184A	NEOS	SEOS	1202	60	BC	8.5	800 -	799 -	9		MGC	
4/3	P178 / P186	EEOS	WEOS	1310	60	BC	9	800 -	799 -	11		MGC	
4/3	P178 / P187	EEOS	WEOS	1311	65	BC	9	800 -	800 -	11		MGC	
4/3	P179 / P187	EEOS	WEOS	1312	65	BC	9	800 -	800 -	21		MGC	
4/3	P179 / P188	EEOS	WEOS	1315	65	BC	9	800 -	799 -	10		MGC	
4/3	P181 / P188	EEOS	WEOS	1316	65	BC	9	800 -	799 -	22		MGC	
4/3	P181 / P189	EEOS	WEOS	1319	65	BC	9	800 -	800 -	7		MGC	
4/3	P182 / P189	EEOS	WEOS	1320	65	BC	9	800 -	800 -	25		MGC	
4/3	P182 / P190	EEOS	WEOS	1323	65	BC	9	800 -	799 -	5		MGC	
4/3	P183 / P190	EEOS	WEOS	1324	65	BC	9	800 -	799 -	29		MGC	
4/3	P184 / P184A	EEOS	WEOS	1328	65	BC	9	800 -	800 -	25		MGC	

DATE	SEAM NUMBER	SEAM SECTION START POINT	SEAM SECTION FINISH POINT	APPROX. START TIME	AMB. AIR TEMP	WELD TECH	PRE-HEAT MACH. SPEED	MACHINE TEMPERATURES DIGITAL SET WEDGE OR BARREL NOZZLE	MACHINE TEMPERATURES INDICATOR WEDGE OR BARREL NOZZLE	APPROX. LENGTH WELDED	DESTR. NUMBER	MON.	REMARKS
4/3	P191 / P192	SEOS -	NEOS	1400	65	BC	9	800 -	800 -	165	DFp-099	MGC	DP-25D
4/3	P192 / P193	SEOS -	NEOS	1425	65	BC	9	800 -	799 -	70		MGC	
4/3	P192 / P194	SEOS -	NEOS	1432	70	BC	9	800 -	800 -	89		MGC	
4/3	P195 / P196	SEOS -	NEOS	1451	70	BC	9	800 -	797 -	120		MGC	
4/4	P119 / P198	NEOS -	SEOS	945	60	BC	9	800 -	800 -	210	DFp-100	MGC	DP-25K
4/4	P118 / P198	NEOS -	SEOS	1011	60	BC	9	800 -	797 -	90		MGC	
4/4	P199 / P200	WEOS -	EEOS	1028	60	BC	9	800 -	800 -	8		MGC	
4/4	P198 / P200	NEOS -	SEOS	1035	60	BC	9	800 -	799 -	96		MGC	
4/4	P198 / P199	NEOS -	SEOS	1040	60	BC	9	800 -	800 -	62		MGC	
4/4	P200 / P201	NEOS -	SEOS	1051	60	BC	9.2	800 -	797 -	60		MGC	
4/4	P201 / P202	NEOS -	SEOS	1100	60	BC	9.2	800 -	793 -	28		MGC	

GEOMEMBRANE DEFECT LOG

PROJECT NUMBER: 043-2246 **PROJECT TITLE:** Rocky Flats, Present Landfill
LINER INSTALLER: Colorado Lining **CONTRACTOR:** S.M. Stoller
LOCATION: Rocky Flats **SITE MANAGER:** Kaiser Hill Company LLC

	DEFECT LOCATION						**	PASS
DEFECT CODE	SEAM, PANEL OR REPAIR NO.	DEFECT LOCATION DESCRIPTION	DEFECT TYPE	LOG DATE	MON.	REMARKS	REPAIR DATE	VACUUM TEST
DP1 A	P1/P2	35' SNEOS	DS	10/30/04	MGC	DFp-001	11/02/04	Y
DP1 B	P1/P2	25' SNEOS	PT	11/02/04	PRH		11/02/04	Y
DP1 C	P3/P4	3' SNEOS	PT	11/02/04	PRH		11/02/04	Y
DP1 D	P1	15' SNEOP/ 10' WEEOP	D	11/02/04	PRH		11/02/04	Y
DP1 E	P1	25' SNEOP/ 10' WEEOP	D	11/02/04	PRH		11/02/04	Y
DP1 F	P1/P2	2' NSEOS	BO	11/02/04	PRH		11/02/04	Y
DP1 G	P1/P5	@SEOS	EXT	11/04/04	MGC		11/05/04	Y
DP1 H	P1/P5	50' NSEOS	DS	11/04/04	MGC	DFp-002	11/05/04	Y
DP1 I	P1/P5	93' NSEOS	D	11/04/04	MGC		11/05/04	Y
DP1 J	P5/P6/P7	@INT	T	11/04/04	MGC		11/05/04	Y
DP1 K	P5/P7	@SEOS	EXT	11/04/04	MGC		11/05/04	Y
DP1 M	P5/P7	30' NSEOS	BO	11/04/04	MGC		11/05/04	Y
DP1 N	P5/P6	120' SNEOS	BO	11/04/04	MGC		11/05/04	Y
DP1 P	P5/P6	75' SNEOS	BO	11/04/04	MGC		11/05/04	Y
DP1 Q	P5/P6	100' NSEOS	BO	11/04/04	MGC		11/05/04	Y
DP1 R	P6/P7/P8	@INT	T	11/04/04	MGC		11/05/04	Y
DP1 S	P7/P8	10' SNEOS	DS	11/04/04	MGC	DFp-003	11/05/04	Y
DP1 T	P8/P9/P10	@INT	T	11/04/04	MGC		11/05/04	Y
DP1 W	P9/P10/P11	@INT	T	11/04/04	MGC		11/05/04	Y
DP1 X	P7/P8	@SEOS	EXT	11/04/04	MGC		11/05/04	Y
DP2 A	P8/P10	@SEOS	EXT	11/04/04	MGC		11/05/04	Y
DP2 B	P1/P5	73' SNEOS	PT	11/04/04	MGC		11/05/04	Y
DP2 C	P1/P5	40' SNEOS	PT	11/04/04	MGC		11/05/04	Y
DP2 D	P8/P9	10' SNEOS	DS	11/04/04	PRH	DFp-004	11/05/04	Y
DP2 E	P5	3' NSEOP/ 6' WEEOP	SI	11/05/04	PRH		11/05/04	Y
DP2 F	P10/P11	@SEOS	EXT	11/05/04	PRH		11/05/04	Y
DP2 G	P11/P12/P13	@INT	T	11/05/04	MGC		11/06/04	Y
DP2 H	P11/P13	183' SNEOS	DS	11/05/04	MGC	DFp-005	11/06/04	Y
DP2 I	N/A	N/A	N/A	N/A	N/A	N/A	NA	N/A
DP2 J	P13/P14	25' SNEOS	PT	11/06/04	PRH		11/06/04	Y
DP2 K	P12/P14/P15	@INT	T	11/06/04	PRH		11/06/04	Y
DP2 M	P12/P13/P14	@INT	T	11/06/04	PRH		11/06/04	Y
DP2 N	P14/P15	15' WEEOS	PT	11/06/04	PRH		11/06/04	Y
DP2 P	P5	5' NSEOP/ 3' EWEOP	SI	11/06/04	MGC		11/06/04	Y
DP2 Q	P11/P13	@SEOS	EXT	11/06/04	MGC		11/06/04	Y
DP2 R	P14/P15/P16	INT/ 2' SNEOP/ 3' WEEOP	T/WR	11/08/04	MGC		11/09/04	Y
DP2 S	P15/P16	9' NSEOS	DS	11/08/04	PRH	DFp-006	11/09/04	Y
DP2 T	P14/P16	50' SNEOS	BO	11/08/04	MGC		11/09/04	Y
DP2 W	P16/P17/P18	@INT	T	11/08/04	MGC		11/09/04	Y
DP2 X	P16/P18	135' SNEOS	DS	11/08/04	MGC	DFp-007	11/09/04	Y
DP3 A	P18/P19/P20	@INT	T	11/08/04	MGC		11/09/04	Y
DP3 B	P18/P20	@SEOS	BO/EXT	11/08/04	MGC		11/09/04	Y
DP3 C	P18/P19	34' SNEOS	DS	11/08/04	MGC	DFp-008	11/09/04	Y

	DEFECT LOCATION							
DEFECT CODE	SEAM, PANEL OR REPAIR NO.	DEFECT LOCATION DESCRIPTION	DEFECT TYPE	LOG DATE	MON.	REMARKS	** REPAIR DATE	PASS VACUUM TEST
DP3 D	P17/P18/P19	@INT	T	11/08/04	MGC		11/09/04	Y
DP3 E	P16/P18	@SEOS	EXT	11/08/04	MGC		11/09/04	Y
DP3 F	P15/P16	@SEOS	EXT	11/08/04	MGC		11/09/04	Y
DP3 G	P17/P19	100' SNEOS	PT	11/09/04	PRH		11/09/04	Y
DP3 H	P16	115' SNEOP/ 4' WEEOP	SI	11/09/04	PRH		11/09/04	Y
DP3 I	P19	75' SNEOP/ 4' EWEOP	SI	11/09/04	PRH		11/09/04	Y
DP3 J	P20/P22	25' SNEOS	BO	11/09/04	PRH		11/12/04	Y
DP3 K	P20/P21/P22	@INT	T	11/09/04	PRH		11/12/04	Y
DP3 M	P19/P20/P21	@INT	T	11/09/04	PRH		11/12/04	Y
DP3 N	P19/P21	92' SNEOS	DS	11/09/04	PRH	DFp-009	11/12/04	Y
DP3 P	P21/P23	40' SNEOS	DS	11/09/04	PRH	DFp-010	11/12/04	Y
DP3 Q	P23/P24	200' SNEOS	WS	11/09/04	PRH		11/12/04	Y
DP3 R	P23/P24	100' SNEOS	DS	11/09/04	PRH	DFp-011	11/12/04	Y
DP3 S	P24/P26	50' NSEOS	DS	11/09/04	PRH	DFp-012	11/12/04	Y
DP3 T	P24/P25/P26	@INT	T	11/09/04	PRH		11/12/04	Y
DP3 W	P23/P24	215' NSEOS	WS	11/09/04	PRH		11/12/04	Y
DP3 X	P21/P22/P23	@INT	T	11/12/04	MGC		11/12/04	Y
DP4 A	P24	100' SNEOP/ 8' WEEOP	SI	11/12/04	MGC		11/12/04	Y
DP4 B	P24	225' NSEOP/ 8' WEEOP	SI	11/12/04	MGC	2 patches	11/12/04	Y
DP4 C	P20	@ SEOP/ 6' WEEOP	EE	11/15/04	MGC	in AT	11/15/04	Y
DP4 D	P19	NEOP/ 3' WEEOP TO EEOP	WR	11/15/04	MGC		11/15/04	Y
DP4 E	P21	NEOP/ WEEOP TO EEOP	WR	11/15/04	MGC		11/15/04	Y
DP4 F	P23	NEOP/ WEEOP TO EEOP	WR	11/15/04	MGC		11/15/04	Y
DP4 G	P24	NEOP/ WEEOP TO EEOP	WR	11/15/04	MGC		11/15/04	Y
DP4 H	P25	EOP/ WEEOP TO 3' EWEOP	WR	11/15/04	MGC		11/15/04	Y
DP4 I	P26/P28	350' NSEOS	DS	11/16/04	MGC	DFp-013	11/17/04	Y
DP4 J	P26/P27/P28	@INT	T	11/16/04	MGC		11/17/04	Y
DP4 K	P25/P26/P27	@INT	T	11/16/04	MGC		11/17/04	Y
DP4 M	P27/P28/P29	@INT	T	11/16/04	MGC		11/17/04	Y
DP4 N	P28/P30	300' NSEOS	DS	11/16/04	PRH	DFp-014	11/17/04	Y
DP4 P	P30/P32	240' NSEOS	DS	11/17/04	PRH	DFp-015	11/17/04	Y
DP4 Q	P29/P30/P32	@INT	T	11/17/04	PRH		11/17/04	Y
DP4 R	P29/P31/P32	@INT	T	11/17/04	PRH		11/17/04	Y
DP4 S	P29/P31	20' SNEOS TO AT	IO	11/17/04	PRH		11/17/04	Y
DP4 T	P30/P32	300' NSEOS	BO	11/17/04	PRH		11/17/04	Y
DP4 W	P32	300' NSEOP/ 10'EWEOP	SI	11/17/04	MGC		11/17/04	Y
DP4 X	P28/P29/P30	@INT	T	11/17/04	MGC		11/17/04	Y
DP5 A	P34	4' SNEOP/ 11' WEEOP	D	11/17/04	MGC		11/19/04	Y
DP5 B	P31/P33/P34	@INT	T	11/17/04	MGC		11/19/04	Y
DP5 C	P31/P32/P34	@INT	T	11/17/04	MGC		11/19/04	Y
DP5 D	P32/P34	30' NSEOS	DS	11/17/04	MGC	DFp-016	11/19/04	Y
DP5 E	P31/P33	31' SNEOS	DS	11/17/04	MGC	DFp-017	11/19/04	Y
DP5 F	P34/P36	150' NSEOS	DS	11/17/04	PRH	DFp-018	11/19/04	Y
DP5 G	P34/P36	93' SNEOS	WS	11/17/04	PRH		11/19/04	Y
DP5 H	P33/P34/P36	@INT	T	11/18/04	PRH		11/19/04	Y
DP5 I	P33/P35/P36	@INT	T	11/18/04	PRH		11/19/04	Y
DP5 J	P34/P36/P37	@INT	T	11/18/04	PRH		11/19/04	Y
DP5 K	P31/P33	4' SNEOS	MD	11/18/04	PRH		11/23/04	Y
DP5 M	P36/P38	150' NSEOS	DS	11/18/04	PRH	DFp-019	11/19/04	Y
DP5 N	P38/40	130' NSEOS	DS	11/18/04	PRH	DFp-020	11/22/04	Y

	DEFECT LOCATION						**	PASS
DEFECT CODE	SEAM, PANEL OR REPAIR NO.	DEFECT LOCATION DESCRIPTION	DEFECT TYPE	LOG DATE	MON.	REMARKS	REPAIR DATE	VACUUM TEST
DP5 P	P36/P37/P39	@INT	T	11/18/04	PRH		11/19/04	Y
DP5 Q	P38/P39/P40	@INT	T	11/18/04	PRH		11/19/04	Y
DP5 R	P36/P38/P39	@INT	T	11/18/04	PRH		11/22/04	Y
DP5 S	P40/P42/P43	@INT	T	11/18/04	PRH		11/22/04	Y
DP5 T	P38/P40/P41	@INT	T	11/18/04	PRH		11/19/04	Y
DP5 W	P40/P41/P42	@INT	T	11/18/04	PRH		11/19/04	Y
DP5 X	P35/P36/P38	@INT	T	11/18/04	PRH		11/19/04	Y
DP6 A	P40/P43	100' NSEOS	DS	11/18/04	MGC	DFp-021	11/22/04	Y
DP6 B	P40/P42	100' NSEOS	DS	11/18/04	MGC	DFp-022	11/22/04	Y
DP6 C	P40/P41	6' EWEOS	PT	11/19/04	MGC		11/19/04	Y
DP6 D	P42/P45	30' NSEOS	DS	11/19/04	MGC	DFp-023	11/23/04	Y
DP6 E	P43/P44/P45	@INT	T	11/19/04	MGC		11/22/04	Y
DP6 F	P44/P45/P47	@INT	T	11/19/04	MGC		11/22/04	Y
DP6 G	P42/P43/P45	@INT	T	11/19/04	MGC		11/23/04	Y
DP6 H	P44/P47	26' SNEOS	DS	11/19/04	MGC	DFp-024	11/22/04	Y
DP6 I	P45/P46/P47	@INT	T	11/19/04	MGC		11/23/04	Y
DP6 J	P32	150' NSEOP/ 3' WEEOP	SI	11/23/04	MGC		11/23/04	Y
DP6 K	P35	10' SNEOP/ 4' EWEOP	SI	11/23/04	MGC		11/23/04	Y
DP6 M	P20	15' NSEOP/ 6' WEEOP	D	11/23/04	MGC		11/23/04	Y
DP6 N	P34	20' NSEOP/ 2' WEEOP	EE	11/23/04	MGC		12/3/04	Y
DP6 P	P37	4' SNEOP/ 4' EWEOP	EE	11/23/04	MGC		12/3/04	Y
DP6 Q	P39	15' SNEOP/ 5' EWEOP	EE	12/04/04	MGC		12/4/04	Y
DP6 R	P40	75'-100' NSEOP/ 10' EWEOP	EE	12/04/04	MGC		12/4/04	Y
DP6 S	P40	120' NSEOP/ 10' WEEOP	EE	12/04/04	PRH		12/4/04	Y
DP6 T	P40	25'-50' NSEOP/ 10'EWEOP	EE	12/04/04	PRH		12/4/04	Y
DP6 W	P40	65' NSEOP/ 15' WEEOP	EE	12/04/04	PRH		12/4/04	Y
DP6 X	P43	@SEOP/ 10' WEEOP	D	12/04/04	MGC		12/5/04	Y
DP7 A	P43/P44	@SEOS	EXT	12/05/04	MGC		12/5/04	Y
DP7 B	P44/P47	@SEOS	EXT	12/05/04	MGC		12/5/04	Y
DP7 C	P46	3' SNEOP/ 5' EWEOP	D	12/05/04	MGC		12/5/04	Y
DP7 D	P46/P49	14' NSEOS	DS	12/07/04	MGC	DFp-025	12/12/04	Y
DP7 E	P46/P47/P49	@INT	T	12/07/04	MGC		12/12/04	Y
DP7 F	P47/P48/P49	@INT	T	12/07/04	MGC		12/12/04	Y
DP7 G	P47/P48	50' NSEOS	DS	12/07/04	MGC	DFp-026	12/8/04	Y
DP7 H	P48/P50/P51	@INT	T	12/07/04	MGC		12/11/04	Y
DP7 I	P48/P49/P50	@INT	T	12/07/04	MGC		12/12/04	Y
DP7 J	P48/P50	14' SNEOS	DS	12/07/04	MGC	DFp-027	12/12/04	Y
DP7 K	P51/P52/P53	@INT	T	12/07/04	MGC		12/8/04	Y
DP7 M	P52/P53	12' EWEOS	BO	12/07/04	MGC		12/8/04	Y
DP7 N	P50/P51/P53	@INT	T	12/07/04	MGC		12/11/04	Y
DP7 P	P51/P53	87' SNEOS	WS	12/07/04	MGC		12/11/04	Y
DP7 Q	P51/P53	107' SNEOS	DS	12/07/04	MGC	DFp-028	12/11/04	Y
DP7 R	P50/P53	53' NSEOS	DS	12/07/04	MGC	DFp-029	12/12/04	Y
DP7 S	P49	6' NSEOP/ 10'WEEOP	SI	12/08/04	PRH		12/12/04	Y
DP7 T	P53/P54/P55	@INT	T	12/08/04	PRH		12/12/04	Y
DP7 W	P53/P54	150' SNEOS	DS	12/08/04	PRH	DFp-030	12/12/04	Y
DP7 X	P52/P53/P54	@INT	T	12/08/04	PRH		12/12/04	Y
DP8 A	P52/P54	10' SNEOS	BO	12/08/04	PRH		12/12/04	Y
DP8 B	P54/P56/P57	@INT	T	12/08/04	PRH		12/12/04	Y
DP8 C	P54/P57	50' SNEOS	DS	12/08/04	PRH	DFp-031	12/12/04	Y

	DEFECT LOCATION						**	PASS
DEFECT CODE	SEAM, PANEL OR REPAIR NO.	DEFECT LOCATION DESCRIPTION	DEFECT TYPE	LOG DATE	MON.	REMARKS	REPAIR DATE	VACUUM TEST
DP8 D	P54/P55/P56	@INT	T	12/08/04	PRH		12/12/04	Y
DP8 E	P56/P59	30' NSEOS	WS	12/08/04	MGC		12/12/04	Y
DP8 F	P57/P58	11' SNEOS	DS	12/08/04	MGC	DFp-032 Covered by 9E	12/12/04	Y
DP8 G	P56/P59	25' SNEOS	DS	12/08/04	MGC	DFp-033	12/12/04	Y
DP8 H	P56/P59/P60	@INT	T	12/09/04	MGC		12/12/04	Y
DP8 I	P59/P60/P61	@INT	T	12/09/04	MGC		12/12/04	Y
DP8 J	P59/P61	200' SNEOS	DS	12/09/04	MGC	DFp-034	12/14/04	Y
DP8 K	P60/P61	@NEOS	EXT	12/09/04	MGC	EXT TO AT	12/14/04	Y
DP8 M	P61/P62	11' EWEOS	DS	12/09/04	MGC	DFp-035	12/12/04	Y
DP8 N	P56/P57/P59	@INT	T	12/09/04	MGC		12/12/04	Y
DP8 P	P59/P61/P62	@INT	T	12/09/04	MGC		12/12/04	Y
DP8 Q	P57/P58/P59	@INT	T	12/09/04	MGC		12/12/04	Y
DP8 R	P58/P59/P62	@INT	T	12/09/04	MGC		12/12/04	Y
DP8 S	P55/P56	110' SNEOS	PT	12/09/04	MGC		12/12/04	Y
DP8 T	P58/P62	150' SNEOS	DS	12/09/04	MGC	DFp-036	12/12/04	Y
DP8 W	P61/P63/P64	@INT	T	12/09/04	MGC		12/12/04	Y
DP8 X	P61/P62/P64	@INT	T	12/09/04	MGC		12/12/04	Y
DP9 A	P62/P64	175' NSEOS	BO	12/09/04	MGC		12/12/04	Y
DP9 B	P61/P63	57' NSEOS	DS	12/09/04	MGC	DFp-037	12/12/04	Y
DP9 C	P54/P56	10' NSEOS	DS	12/09/04	PRH	DFp-038	12/12/04	Y
DP9 D	P63/P64/P65	@INT	T	12/09/04	MGC		12/12/04	Y
DP9 E	P57/P58	15' SNEOS	PT	12/09/04	MGC	covers DP-8F	12/14/04	Y
DP9 F	P64/P65/P66	@INT	T	12/09/04	MGC		12/12/04	Y
DP9 G	P64/P66	30' NSEOS	DS	12/09/04	PRH	DFp-039	12/12/04	Y
DP9 H	P64/P65	135' SNEOS	DS	12/09/04	PRH	DFp-040	12/12/04	Y
DP9 I	P61/P64	140' SNEOS	BO	12/09/04	MGC		12/12/04	Y
DP9 J	P65/P68	130' SNEOS	DS	12/11/04	MGC	DFp-041	12/14/04	Y
DP9 K	P50	80' NSEOP/ 4' EWEOP	SI	12/12/04	PRH		12/12/04	Y
DP9 M	P65/P67/P68	@INT	T	12/12/04	PRH		12/15/04	Y
DP9 N	P65/P66/P67	@INT	T	12/12/04	PRH		12/15/04	Y
DP9 P	P67	1' SNEOP/ 8' EWEOP	D	12/12/04	PRH		12/15/04	Y
DP9 Q	P67/P69	100' NSEOS	DS	12/12/04	PRH	DFp-042	12/15/04	Y
DP9 R	P67/P68/P69	@INT	T	12/12/04	PRH		12/15/04	Y
DP9 S	P68/P69/P70	@INT	T	12/12/04	PRH		12/15/04	Y
DP9 T	P68/P70/P71	@INT	T	12/12/04	PRH		12/14/04	Y
DP9 W	P68/P71/P72	@INT	T	12/12/04	PRH		12/14/04	Y
DP9 X	P68/P70	50' NSEOS	DS	12/12/04	PRH	DFp-043	12/16/04	Y
DP10 A	P59	350' SNEOP/ 6' EWEOP	SI	12/12/04	PRH		12/12/04	Y
DP10 B	P59	450' SNEOP/ 6' WEEOP	SI	12/12/04	PRH		12/14/04	Y
DP10 C	P59	410' SNEOP/ 11' EWEOP	SI	12/12/04	PRH		12/12/04	Y
DP10 D	P69/P73	290' NSEOS	DS	12/12/04	PRH	DFp-044	12/16/04	Y
DP10 E	P69/P73/P74	@INT	T	12/12/04	PRH		12/15/04	Y
DP10 F	P69/P70/P74	@INT	T	12/12/04	PRH		12/15/04	Y
DP10 G	P69	5' SNEOP/ 1' WEEOP	D	12/12/04	PRH		12/15/04	Y
DP10 H	P70/P71/P74	@INT	T	12/12/04	PRH		12/14/04	Y
DP10 I	P71/P72/P74	@INT	T	12/12/04	PRH		12/14/04	Y
DP10 J	P72/P74	11' SNEOS	DS	12/12/04	PRH	DFp-045	12/14/04	Y
DP10 K	P63/P65	@NEOS	PT	12/12/04	PRH		12/12/04	Y
DP10 M	P58	10' NSEOP/ 8' WEEOP	SI	12/14/04	PRH		12/14/04	Y

	DEFECT LOCATION							
DEFECT CODE	SEAM, PANEL OR REPAIR NO.	DEFECT LOCATION DESCRIPTION	DEFECT TYPE	LOG DATE	MON.	REMARKS	** REPAIR DATE	PASS VACUUM TEST
DP10 N	P73/P76/P77	@INT	T	12/14/04	PRH		12/16/04	Y
DP10 P	P76/P78/P79	@INT	T	12/14/04	PRH		1/3/05	Y
DP10 Q	P73/P74/P76	@INT	T	12/14/04	PRH		12/17/04	Y
DP10 R	P74/P76	8' NSEOS	DS	12/14/04	PRH	DFp-046	12/17/04	Y
DP10 S	P76	1' SNEOP/ 5' EWEOP	D	12/14/04	PRH		12/17/04	Y
DP10 T	P76	1' SNEOP/ 10' EWEOP	D	12/14/04	PRH		12/17/04	Y
DP10 W	P74/P75/P76	@INT	T	12/14/04	PRH		12/17/04	Y
DP10 X	P75/P76/P78	@INT	T	12/14/04	PRH		12/17/04	Y
DP11 A	P66/P67	60' NSEOS	BO	12/14/04	PRH		12/15/04	Y
DP11 B	P75/P78	120' SNEOS	DS	12/14/04	PRH	DFp-047	12/17/04	Y
DP11 C	P65/P68	@NEOS	PT	12/14/04	PRH		12/14/04	Y
DP11 D	P75/P78	@NEOS	PT	12/14/04	PRH		12/17/04	Y
DP11 E	P73/P76	110' SNEOS	PT	12/14/04	PRH		1/3/05	Y
DP11 F	P76/P79	75' SNEOS	DS	12/14/04	PRH	DFp-048	1/3/04	Y
DP11 G	P70	69' SNEOP/ 5' WEEOP	SI	12/14/04	PRH		12/15/04	Y
DP11 H	P68	63' NSEOP/ 9' WEEOP	SI	12/15/04	PRH		12/15/04	Y
DP11 I	P66/P67	@SEOS	PT	12/15/04	PRH		12/15/04	Y
DP11 J	P67/P69	@SEOS	PT	12/15/04	PRH		12/15/04	Y
DP11 K	P69/P73	@SEOS	PT	12/15/04	PRH		12/15/04	Y
DP11 M	P79/P80/P81	@INT	T	12/15/04	PRH		1/3/05	Y
DP11 N	P78/P79/P81	@INT	T	12/15/04	PRH		1/3/05	Y
DP11 P	P78/P81	175' SNEOS	DS	12/15/04	PRH	DFp-049	12/17/04	Y
DP11 Q	P78/P81	10' SNEOS	BO	12/15/04	PRH		12/17/04	Y
DP11 R	P79/P80	41' NSEOS	DS	12/15/04	PRH	DFp-050	12/16/04	Y
DP11 S	P81/P82/P84	@INT	T	12/15/04	PRH		1/3/05	Y
DP11 T	P78/P81/P82	@INT	T	12/15/04	PRH		12/17/04	Y
DP11 W	P80/P81/P83	@INT	T	12/15/04	PRH		1/3/05	Y
DP11 X	P81/P84	30' NSEOS	DS	12/15/04	PRH	DFp-051	1/3/05	Y
DP12 A	P84/P86	100' NSEOS	DS	12/15/04	PRH	DFp-052	1/3/05	Y
DP12 B	P83/P86	130' NSEOS	DS	12/15/04	PRH	DFp-053	1/3/05	Y
DP12 C	P84/P85/P86	@INT	T	12/15/04	PRH		1/3/05	Y
DP12 D	P83/P84/P86	@INT	T	12/16/04	PRH		1/3/05	Y
DP12 E	P81/P83/P84	@INT	T	12/16/04	PRH		1/3/05	Y
DP12 F	P83/P86/P87	@INT	T	12/16/04	PRH		1/3/05	Y
DP12 G	P76/P77/P79	@INT	T	12/16/04	PRH		12/16/04	Y
DP12 H	P78/P82	@NEOS	PT/EXT	12/17/04	GDH	EXT TO AT	12/17/04	Y
DP12 I	P78	@NEOP/ 12' EWEOP	D	12/17/04	GDH	EXT TO AT	12/17/04	Y
DP12 J	P78	207' SNEOP/ 3' EWEOP	SI	12/17/04	PRH		12/17/04	Y
DP12 K	P86/P88	100' SNEOS	DS	12/17/04	PRH	DFp-054	1/3/05	Y
DP12 M	P87/P89	45' SNEOS	CO	12/17/04	PRH		1/3/05	Y
DP12 N	P86/P89	74' NSEOS	DS	12/17/04	PRH	DFp-055	1/7/05	Y
DP12 P	P76	93' SNEOP/ 2' WEEOP	SI	12/17/04	PRH		12/17/04	Y
DP12 Q	P90/P92	10' WEEOS	DS	12/17/04	PRH	DFp-056	1/3/05	Y
DP12 R	P89/P90	175' NSEOS	WS	12/17/04	PRH		1/7/05	Y
DP12 S	P76	125' SNEOP/ 7' EWEOP	SI	12/17/04	PRH		12/17/04	Y
DP12 T	P76	140' SNEOP/ 1' EWEOP	SI	12/17/04	PRH		12/17/04	Y
DP12 W	P73	40' SNEOP/ 4' WEEOP	SI	12/17/04	PRH		12/17/04	Y
DP12 X	P78	110' NSEOP/ 5' WEEOP	SI	12/17/04	PRH		12/17/04	Y
DP13 A	P78	110' NSEOP/ 2' EWEOP	SI	12/17/04	PRH		12/17/04	Y
DP13 B	P81	200' NSEOP/ 8' EWEOP	SI	12/17/04	PRH		12/17/04	Y

	DEFECT LOCATION							
DEFECT CODE	SEAM, PANEL OR REPAIR NO.	DEFECT LOCATION DESCRIPTION	DEFECT TYPE	LOG DATE	MON.	REMARKS	REPAIR DATE	VACUUM TEST
DP13 C	P92/P93	100' SNEOS	DS	12/19/04	PRH	DFp-057	1/3/05	Y
DP13 D	P93/P95	110' SNEOS	DS	12/19/04	PRH	DFp-058	1/3/05	Y
DP13 E	P90/P91/P94	@INT	T	12/19/04	PRH		1/7/05	Y
DP13 F	P94/P95/P96	@INT	T	12/19/04	PRH		1/7/05	Y
DP13 G	P90/P93/P94	@INT	T	12/19/04	PRH		1/7/05	Y
DP13 H	P93/P94/P95	@INT	T	12/19/04	PRH		1/7/05	Y
DP13 I	P90/P92/P93	@INT	T	12/19/04	PRH		1/7/05	Y
DP13 J	P90/P94	290' SNEOS	DS	12/19/04	PRH	DFp-059	1/7/05	Y
DP13 K	P90/P94	80' NSEOS	WS	12/19/04	PRH		1/7/05	Y
DP13 M	P94/P96	60' SNEOS	DS	12/19/04	PRH	DFp-060	1/7/05	Y
DP13 N	P95/P98	250' SNEOS	DS	12/19/04	PRH	DFp-061	1/9/05	Y
DP13 P	P96/P97	43' NSEOS	DS	12/19/04	PRH	DFp-062	1/9/05	Y
DP13 Q	P96/P97	15' SNEOS	BO	12/19/04	PRH		1/9/05	Y
DP13 R	P96/P97/P99	@INT	T	12/19/04	PRH		1/9/05	Y
DP13 S	P95/P96/P98/P99	@INT	4T	12/19/04	PRH	Caps P95/P99	1/9/05	Y
DP13 T	P96/P99	6' NSEOS	WS	12/19/04	PRH		1/9/05	Y
DP13 W	P98/P100/P101	@INT	T	12/21/04	PRH		1/9/05	Y
DP13 X	P98/P99/P101	@INT	T	12/21/04	PRH		1/9/05	Y
DP14 A	P97/P99/P101	@INT	T	12/21/04	PRH		1/9/05	Y
DP14 B	P101/P102/P103	@INT	T	12/21/04	PRH		1/9/05	Y
DP14 C	P100/P101/P103	@INT	T	12/21/04	PRH		1/9/05	Y
DP14 D	P100/P103/P104	@INT	T	12/21/04	PRH		1/9/05	Y
DP14 E	P98/P100	81' NSEOS	DS	12/21/04	PRH	DFp-063	1/9/05	Y
DP14 F	P100/P103	130' SNEOS	DS	12/21/04	PRH	DFp-064	1/9/05	Y
DP14 G	P101/P102	75' SNEOS	DS	12/21/04	PRH	DFp-065	1/9/05	Y
DP14 H	P86/P87/P89	@INT	T	01/03/05	MGC		1/3/05	Y
DP14 I	P89/P90/P91	@INT	T	01/03/05	MGC		1/7/05	Y
DP14 J	P83/P87	@SEOS	PT/EXT	01/03/05	MGC	EXT TO AT	1/3/05	Y
DP14 K	P87/P89	@SEOS	PT/EXT	01/03/05	MGC	EXT TO AT	1/3/05	Y
DP14 M	P89/P91	@SEOS	PT/EXT	01/03/05	MGC	EXT TO AT	1/3/05	Y
DP14 N	P86/P88/P89	@INT	T	01/03/05	MGC		1/7/05	Y
DP14 P	P88/P89/P90	@INT	T	01/03/05	MGC		1/7/05	Y
DP14 Q	P8/P90/P92	@INT	T	01/03/05	MGC		1/3/05	Y
DP14 R	P85/P86/P88	@INT	T	01/03/05	MGC		1/3/05	Y
DP14 S	P85/P88	75' NSEOS	PT	01/03/05	MGC	Covered by DP-14T	NA	Y
DP14 T	P85/P88	66' NSEOS - NEOS	FS/PT	01/03/05	MGC	Covers DP-14S caps to neos	1/3/05	Y
DP14 W	P88/P92	@NEOS	PT/EXT	01/03/05	MGC	EXT TO AT	1/3/05	Y
DP14 X	P92/P93	@NEOS	PT/EXT	01/03/05	MGC	EXT TO AT	1/3/05	Y
DP15 A	P93/P95	@NEOS	PT/EXT	01/03/05	MGC	EXT TO AT	1/3/05	Y
DP15 B	P95/P98	@NEOS	PT/EXT	01/03/05	MGC	EXT TO AT	1/9/05	Y
DP15 C	P98/P100	@NEOS	PT/EXT	01/03/05	MGC	EXT TO AT	1/9/05	Y
DP15 D	P100/P104	@NEOS	PT/EXT	01/03/05	MGC	EXT TO AT	1/9/05	Y
DP15 E	DP-11W	on patch weld	VL	01/06/05	PRH		1/6/05	Y
DP15 F	P95/P96	10' WEEOS	DS	01/07/05	PRH	DFp-058U	1/7/05	Y
DP15 G	P94/P95	8' SNEOS	FTS	01/07/05	PRH	caps to DFp-060	1/9/05	Y
DP15 H	P94/P96	10' NSEOS	PT	01/07/05	PRH		1/7/05	Y

	DEFECT LOCATION							
DEFECT CODE	SEAM, PANEL OR REPAIR NO.	DEFECT LOCATION DESCRIPTION	DEFECT TYPE	LOG DATE	MON.	REMARKS	** REPAIR DATE	PASS VACUUM TEST
DP15 I	P94/P95	100' NSEOS	FTS	01/07/05	PRH		1/8/05	Y
DP15 J	N/A	N/A	N/A	N/A	N/A	N/A	NA	N/A
DP15 K	P96/P97	3' NSEOS	PT	01/07/05	PRH		1/9/05	Y
DP15 M	P94/P96	1' NSEOS	PT	01/07/05	PRH		1/7/05	Y
DP15 N	P94/P96	NEOS TO DP-13M	FS	01/07/05	PRH		1/7/05	Y
DP15 P	P95/P96	WEOS TO DP-15F	FS	01/07/05	PRH		1/7/05	Y
DP15 Q	P94/P95	DP-15I TO SEOS	FS	01/07/05	PRH		1/8/05	Y
DP15 R	P94/P95	DP-15G TO DP-15I	FS	01/07/05	PRH		1/9/05	Y
DP15 S	P98/P100	130' SNEOS	PT	01/07/05	PRH		1/9/05	Y
DP15 T	P100/P103	210' SNEOS	PT	01/07/05	PRH		1/9/05	Y
DP15 W	P100/P103	230' SNEOS	PT	01/07/05	PRH		1/9/05	Y
DP15 X	P94/P95	DP-15G TO NEOS	FS	01/07/05	PRH		1/9/05	Y
DP16 A	P93/P95	100' NSEOS	FTS	01/09/05	PRH		1/9/05	Y
DP16 B	P93/P95	155' NSEOS	FTS	01/09/05	PRH		1/9/05	Y
DP16 C	P93/P95	140' SNEOS	FTS	01/09/05	PRH		1/9/05	Y
DP16 D	P93/P95	125' SNEOS	FTS	01/09/05	PRH		1/9/05	Y
DP16 E	P93/P95	95' SNEOS	FTS	01/09/05	PRH		1/9/05	Y
DP16 F	P93/P95	80' SNEOS	FTS	01/09/05	PRH		1/9/05	Y
DP16 G	P93/P95	65' SNEOS	FTS	01/09/05	PRH		1/9/05	Y
DP16 H	P93/P95	SEOS TO DP-16A	FS	01/09/05	PRH		1/9/05	Y
DP16 I	P93/P95	DP-16A TO DP-16B	FS	01/09/05	PRH		1/9/05	Y
DP16 J	P93/P95	DP-16B TO DP-16C	FS	01/09/05	PRH		1/9/05	Y
DP16 K	P93/P95	DP-16C TO DP-16D	FS	01/09/05	PRH		1/9/05	Y
DP16 M	P93/P95	DP-16DA TO DP-13D	FS	01/09/05	PRH		1/9/05	Y
DP16 N	P93/P95	DP-13D TO DP-16E	FS	01/09/05	PRH		1/9/05	Y
DP16 P	P93/P95	DP-16E TO DP-16F	FS	01/09/05	PRH		1/9/05	Y
DP16 Q	P93/P95	DP-16F TO DP-16G	FS	01/09/05	PRH		1/9/05	Y
DP16 R	P93/P95	DP-16G TO NEOS	FS	01/09/05	PRH		1/9/05	Y
DP16 S	P90/P94	35' NSEOS	DS	01/09/05	PRH	DFp-059D	1/9/05	Y
DP16 T	P90/P94	320' SNEOS	FTS	01/09/05	PRH		1/9/05	Y
DP16 W	P90/P94	260' SNEOS	FTS	01/09/05	PRH		1/9/05	Y
DP16 X	P90/P94	210' SNEOS	FTS	01/09/05	PRH		1/9/05	Y
DP17 A	P90/P94	150' SNEOS	DS	01/09/05	PRH	DFp-059U	1/9/05	Y
DP17 B	P90/P94	DP-17A TO DP-16X	FS	01/09/05	PRH		1/9/05	Y
DP17 C	P90/P94	DP-16X TO DP-16W	FS	01/09/05	PRH		1/9/05	Y
DP17 D	P90/P94	DP-16W TO DP-13J	FS	01/09/05	PRH		1/9/05	Y
DP17 E	P90/P94	DP-13J TO DP-16T	FS	01/09/05	PRH		1/9/05	Y
DP17 F	P90/P94	DP-16T TO DP-17G	FS	01/09/05	PRH		1/9/05	Y
DP17 G	P90/P94	350' SNEOS	FTS	01/09/05	PRH		1/9/05	Y
DP17 H	P90/P94	DP-17G TO DP-13K	FS	01/09/05	PRH		1/9/05	Y
DP17 I	P90/P94	DP-13K TO DP-16S	FS	01/09/05	PRH		1/9/05	Y
DP17 J	By Survey	By Survey	BS	01/17/05	MSP	WEST VENT PIPE	1/17/05	Y
DP17 K	By Survey	By Survey	BS	01/17/05	MSP	WEST VENT PIPE	1/17/05	Y
DP17 M	By Survey	By Survey	BS	01/18/05	PRH	WEST VENT PIPE	1/18/05	Y
DP17 N	By Survey	By Survey	BS	01/18/05	MSP	CENTRAL VENT PIPE	1/18/05	Y
DP17 P	By Survey	By Survey	BS	01/18/05	MSP	CENTRAL VENT PIPE	1/18/05	Y
DP17 Q	By Survey	By Survey	BS	01/19/05	PRH	CENTRAL VENT PIPE	1/19/05	Y
DP17 R	By Survey	By Survey	BS	01/20/05	PRH	EAST VENT PIPE	1/20/05	Y
DP17 S	By Survey	By Survey	BS	01/21/05	PRH	EAST VENT PIPE	1/21/05	Y
DP17 T	By Survey	By Survey	BS	01/21/05	PRH	EAST VENT PIPE	1/21/05	Y

	DEFECT LOCATION						**	PASS
DEFECT CODE	SEAM, PANEL OR REPAIR NO.	DEFECT LOCATION DESCRIPTION	DEFECT TYPE	LOG DATE	MON.	REMARKS	REPAIR DATE	VACUUM TEST
DP17 W	P102/P103/P105	@INT	T	02/11/05	PRH		2/14/05	Y
DP17 X	P103/P105/P106	@INT	T	02/11/05	PRH		2/14/05	Y
DP18 A	P103/P104/P106	@INT	T	02/11/05	PRH		2/14/05	Y
DP18 B	P102/P105	8' S NEOS	DS	02/11/05	PRH	DFp-067	2/14/05	Y
DP18 C	P103/P106	20' N SEOS	DS	02/11/05	PRH	DFp-066	2/14/05	Y
DP18 D	P105/P106/P108	@INT	T	02/11/05	PRH		2/14/05	Y
DP18 E	P106/P107/P108	@INT	T	02/11/05	PRH		2/14/05	Y
DP18 F	P106/P107	120' SNEOS	WS	02/11/05	PRH		2/14/05	Y
DP18 G	P105/P108	250' SNEOS	DS	02/11/05	PRH	DFp-068	2/13/05	Y
DP18 H	P105/P108/P109	@INT	T	02/11/05	PRH		2/13/05	Y
DP18 I	P107/P108/P110	@INT	T	02/12/05	PRH		2/14/05	Y
DP18 J	P107/P110	100' SNEOS	DS	02/12/05	PRH	DFp-069	2/14/05	Y
DP18 K	P108/P111	28' N SEOS	DS	02/12/05	PRH	DFp-070	2/13/05	Y
DP18 M	P108/P109/P111	@INT	T	02/12/05	PRH		2/13/05	Y
DP18 N	P108/P110/P111	@INT	T	02/12/05	PRH		2/14/05	Y
DP18 P	P106	4' N SEOP/ 2'E WEOP	D	02/12/05	PRH		2/14/05	Y
DP18 Q	P110/P112	80' S NEOS	DS	02/12/05	PRH	DFp-071	2/14/05	Y
DP18 R	P110/P112/P113	@INT	T	02/12/05	PRH		2/14/05	Y
DP18 S	P110/P111/P113	@INT	T	02/12/05	PRH		2/14/05	Y
DP18 T	P112/P113/P114	@INT	T	02/12/05	PRH		2/14/05	Y
DP18 W	P112/P114	80' S NEOS	DS	02/12/05	PRH	DFp-072	2/14/05	Y
DP18 X	P113/P115	110' S NEOS	DS	02/12/05	PRH	DFp-073	2/17/05	Y
DP19 A	P113/P114/P115	@INT	T	02/12/05	PRH		2/17/05	Y
DP19 B	P114/P115/P116	@INT	T	02/12/05	PRH		2/17/05	Y
DP19 C	P114/P116/P117	@INT	T	02/12/05	PRH		2/17/05	Y
DP19 D	P114/P117	4' SNEOS	DS	02/12/05	PRH	DFp-074	2/14/05	Y
DP19 E	P113/P114	15' SNEOS	PT	02/12/05	PRH		2/14/05	Y
DP19 F	P105	250' NSEOP/6' WEEOP	D	02/14/05	PRH		2/14/05	Y
DP19 G	P115/P116	10' NSEOS	DS	02/14/05	PRH	DFp-075	2/17/05	Y
DP19 H	P117/P118/P119	@INT	T	02/14/05	PRH		2/17/05	Y
DP19 I	P117/P119	30' SNEOS	DS	02/14/05	PRH	DFp-076	2/17/05	Y
DP19 J	P114/P117	@NEOS	PT	02/14/05	PRH		2/14/05	Y
DP19 K	P106	4' NSEOP/3' WEEOP	MD	02/14/05	PRH		2/14/05	Y
DP19 M	P106	8' NSEOP/3' WEEOP	MD	02/14/05	PRH		2/14/05	Y
DP19 N	P116/P117/P118	@INT	T	02/14/05	PRH		2/17/05	Y
DP19 P	P117/P118	210' SNEOS	WS	02/14/05	PRH		2/17/05	Y
DP19 Q	P116/P118	75' SNEOS	DS	02/14/05	PRH	DFp-077	2/17/05	Y
DP19 R	P103/P106	60' SNEOS	DS	02/15/05	PRH	DFp-066U	2/17/05	Y
DP19 S	P103/P106	240' TO 300' SNEOS	FS	02/15/05	MGC		2/17/05	Y
DP19 T	P103/P106	0' TO 30' NSEOS	FS	02/15/05	MGC		2/17/05	Y
DP19 W	P107/P108	0' TO 11' WEEOS	FS	02/15/05	MGC		2/17/05	Y
DP19 X	P107/P108	11' WEEOS	DS	02/15/05	MGC	DFp-066D	2/17/05	Y
DP20 A	P113	150' NSEOP/4' EWEOP	D	02/17/05	PRH		2/17/05	Y
DP20 B	P116	100' NSEOP/5' WEEOP	D	02/17/05	PRH		2/17/05	Y
DP20 C	P116	80' NSEOP/3' WEEOP	D	02/17/05	PRH		2/17/05	Y
DP20 D	By Survey	By Survey	BS	02/22/05	MGC	North Vent Riser	2/22/05	Y
DP20 E	By Survey	By Survey	BS	02/22/05	MGC	Center Vent Riser	2/22/05	Y
DP20 F	P121/P122	35' EWEOS	DS	03/22/05	MGC	DFp-078	3/28/05	Y
DP20 G	P124/P128	25' EWEOS	DS	03/22/05	MGC	DFp-079	3/28/05	Y
DP20 H	P120/P125/P126	@INT	T	03/22/05	MGC		3/28/05	Y

	DEFECT LOCATION						**	PASS
DEFECT CODE	SEAM, PANEL OR REPAIR NO.	DEFECT LOCATION DESCRIPTION	DEFECT TYPE	LOG DATE	MON.	REMARKS	REPAIR DATE	VACUUM TEST
DP20 I	P120/P124/P125	@INT	T	03/22/05	MGC		3/28/05	Y
DP20 J	P120/P123/P124	@INT	T	03/22/05	MGC		3/28/05	Y
DP20 K	P120/P122/P123	@INT	T	03/22/05	MGC		3/28/05	Y
DP20 M	P121/0130	@NEOS	EXT	03/22/05	MGC	EXT to AT	3/28/05	Y
DP20 N	P127/P128	52' NSEOS	DS	03/22/05	MGC	DFp-080	3/28/05	Y
DP20 P	P121/P129/P130	@INT	T	03/22/05	MGC		3/28/05	Y
DP20 Q	P121/P128/P129	@INT	T	03/22/05	MGC		3/28/05	Y
DP20 R	P121/P127/P128	@INT	T	03/22/05	MGC		3/28/05	Y
DP20 S	P127/P131	20' SNEOS	DS	03/22/05	MGC	DFp-081	3/28/05	Y
DP20 T	P127/P131/P132	@INT	T	03/22/05	MGC		3/28/05	Y
DP20 W	P131/P132/P133	@INT	T	03/22/05	MGC		3/28/05	Y
DP20 X	P133/P134	80' NSEOS	BO	03/22/05	MGC		3/28/05	Y
DP21 A	P134/P135	18' SNEOS	DS	03/22/05	MGC	DFp-082	3/28/05	Y
DP21 B	P134/P135/P136	@INT	T	03/22/05	MGC		3/28/05	Y
DP21 C	P135/P136/P137	@INT	T	03/23/05	MGC		3/28/05	Y
DP21 D	P121/P127	@EEOS	PT/EXT	03/23/05	MGC	EXT to AT	3/28/05	Y
DP21 E	P120/P140	10' EWEOS	DS	03/23/05	MGC	DFp-083	3/28/05	Y
DP21 F	P140/P141/P142	@INT	T	03/23/05	MGC		3/28/05	Y
DP21 G	P141/P142/P143	@INT	T	03/23/05	MGC		3/28/05	Y
DP21 H	P144/P146	4' EWEOS	DS	03/24/05	MSP	DFp-084	Covered By	DP-21Q
DP21 I	P146/P147	60' EWEOS	DS	03/24/05	MSP	DFp-085	3/28/05	Y
DP21 J	P147/P149	10' EWEOS	DS	03/24/05	MSP	DFp-086	3/28/05	Y
DP21 K	P138/P139	@SEOS	PT	03/28/05	MSP		3/28/05	Y
DP21 M	P137/P138	@SEOS	PT	03/28/05	MSP		3/28/05	Y
DP21 N	P138/P139	@NEOS	PT	03/28/05	MSP		3/28/05	Y
DP21 P	P137/P138	@SEOS	PT	03/28/05	MSP		3/28/05	Y
DP21 Q	P144/P145/P146	@INT	T	03/28/05	MSP	covers DP-21H	3/28/05	Y
DP21 R	P145/P146/P147	@INT	T	03/28/05	MSP		3/28/05	Y
DP21 S	P147/P148/P149	@INT	T	03/28/05	MSP		3/28/05	Y
DP21 T	P147/P148	45' WEEOS	BS	03/28/05	MSP		3/28/05	Y
DP21 W	P147/P148	25' WEEOS	BO	03/28/05	MSP		3/28/05	Y
DP21 X	P148	38' WEEOP, 3' NSEOP	BS	03/28/05	MSP	Covered by	DP-22A	NA
DP22 A	P148	41' WEEOP, 5' NSEOP	BS	03/28/05	MGC	covers DP-21X	3/28/05	Y
DP22 B	P136/P137	@SEOS	PT	03/28/05	MGC		3/28/05	Y
DP22 C	P135/P137	@NEOS	PT	03/28/05	MGC		3/28/05	Y
DP22 D	P127/P132	@SEOS	PT/EXT	03/28/05	MGC	EXT to AT	3/28/05	Y
DP22 E	P129/P130	@SEOS	PT/EXT	03/28/05	MGC	EXT to AT	3/28/05	Y
DP22 F	P144/P146	@EEOS	PT/EXT	03/28/05	MGC	EXT to AT	3/28/05	Y
DP22 G	P148	4' NSEOP/15' WEEOP	D	03/28/05	MGC	2 patches	3/28/05	Y
DP22 H	P148	8' SNEOP/30' WEEOP	BS	03/28/05	MGC		3/28/05	Y
DP22 I	P149/P153	24' EWEOS	DS	03/29/05	MGC	DFp-087	3/31/05	Y
DP22 J	P149/P152/P153	@INT	T	03/29/05	MGC		3/31/05	Y
DP22 K	P148/P149/P152	@INT	T	03/29/05	MGC		3/31/05	Y
DP22 M	P150/P151/P152	@INT	T	03/29/05	MGC		3/31/05	Y
DP22 N	P148/P151/P152	@INT	T	03/29/05	MGC		3/31/05	Y
DP22 P	P148/P150/P151	@INT	T	03/29/05	MGC		3/31/05	Y
DP22 Q	P154/P156	150' NSEOS	DS	03/30/05	MGC	DFp-088	3/31/05	Y
DP22 R	P118/P155	10' NSEOS	DS	03/30/05	MGC	DFp-089	3/31/05	Y
DP22 S	P118/P154/P155	@INT	T	03/30/05	MGC		3/31/05	Y
DP22 T	P154/P155/P156	@INT	T	03/30/05	MGC		3/31/05	Y

	DEFECT LOCATION						**	PASS
DEFECT CODE	SEAM, PANEL OR REPAIR NO.	DEFECT LOCATION DESCRIPTION	DEFECT TYPE	LOG DATE	MON.	REMARKS	REPAIR DATE	VACUUM TEST
DP22 W	P156/P157/P158	@INT	T	03/30/05	MGC		3/31/05	Y
DP22 X	P156/P158	89' NSEOS	DS	03/30/05	MGC	DFp-090	3/31/05	Y
DP23 A	P157/P158/P159	@INT	T	03/30/05	MGC		3/31/05	Y
DP23 B	P161/P162	50' SNEOS	DS	03/30/05	MGC	DFp-091	3/31/05	Y
DP23 C	P159/P162	50' NSEOS	DS	03/30/05	MGC	DFp-092	3/31/05	Y
DP23 D	P158/P159/P160	@INT	T	03/30/05	MGC		3/31/05	Y
DP23 E	P159/P160/P161	@INT	T	03/30/05	MGC		3/31/05	Y
DP23 F	P118/P154	@NEOS	EXT	03/31/05	MSP	EXT to AT	3/31/05	Y
DP23 G	P160/P161	@SEOS	PT	03/31/05	MSP		3/31/05	Y
DP23 H	P150/P152	30' EWEOS	PT	03/31/05	MSP		3/31/05	Y
DP23 I	P161/P162	@NEOS	PT	03/31/05	MSP		3/31/05	Y
DP23 J	P118	125' SNEOP @Crest AT	EXT	03/31/05	MSP		3/31/05	Y
DP23 K	P149/150	@EEOS	EXT	03/31/05	MGC	EXT to AT	3/31/05	Y
DP23 M	P165/P166/P172	@INT	T	04/01/05	MGC		4/1/05	Y
DP23 N	P165/P167/P172	@INT	T	04/01/05	MGC		4/1/05	Y
DP23 P	P164/P165	10' NSEOS	DS	04/01/05	MGC	DFp-093	4/1/05	Y
DP23 Q	P169/P170	10' NSEOS	DS	04/01/05	MGC	DFp-094	4/1/05	Y
DP23 R	P162/P163	40' NSEOS	PT	04/01/05	MGC		4/1/05	Y
DP23 S	P165/P172	@SEOS	PT/EXT	04/01/05	MGC	EXT to AT	4/1/05	Y
DP23 T	P168/P169	@NEOS	PT/EXT	04/01/05	MGC	EXT to AT	4/1/05	Y
DP23 W	P166/P167	@NEOS	PT/EXT	04/01/05	MGC	EXT to AT	4/1/05	Y
DP23 X	P165/P166	@NEOS	PT/EXT	04/01/05	MGC	EXT to AT	4/1/05	Y
DP24 A	P164/P165	@NEOS	PT/EXT	04/01/05	MGC	EXT to AT	4/1/05	Y
DP24 B	P163/P164	@NEOS	PT/EXT	04/01/05	MGC	EXT to AT	4/1/05	Y
DP24 C	P162/P163	@NEOS	PT/EXT	04/01/05	MGC	EXT to AT	4/1/05	Y
DP24 D	P169/P170	@NEOS	PT/EXT	04/01/05	MGC	EXT to AT	4/1/05	Y
DP24 E	P173/P174	23' EWEOS	DS	04/02/05	MGC	DFp-095	4/4/05	Y
DP24 F	P176/P177	10' EWEOS	DS	04/02/05	MGC	DFp-096	4/4/05	Y
DP24 G	P174/P175/P176	@INT	T	04/02/05	MGC		4/4/05	Y
DP24 H	P175/P176/P177	@INT	T	04/02/05	MGC		4/4/05	Y
DP24 I	P178/P179/P180	@INT	T	04/03/05	MGC		4/4/05	Y
DP24 J	P179/P180/P181	@INT	T	04/03/05	MGC		4/4/05	Y
DP24 K	P185/P186/P187	@INT	T	04/03/05	MGC		4/4/05	Y
DP24 M	P186/P187	46' SNEOS	DS	04/03/05	MGC	DFp-097	4/4/05	Y
DP24 N	NA	NA	NA	NA	NA	NA	NA	NA
DP24 P	NA	NA	NA	NA	NA	NA	NA	NA
DP24 Q	P189/P190	68' SNEOS	DS	04/03/05	MGC	DFp-098	4/4/05	Y
DP24 R	P178/P186/P187	@INT	T	04/03/05	MGC		4/4/05	Y
DP24 S	P178/P179/P187	@INT	T	04/03/05	MGC		4/4/05	Y
DP24 T	P179/P187/P188	@INT	T	04/03/05	MGC		4/4/05	Y
DP24 W	P171/P181/P188	@INT	T	04/03/05	MGC		4/4/05	Y
DP24 X	P181/P188/P189	@INT	T	04/03/05	MGC		4/4/05	Y
DP25 A	P181/P182/P189	@INT	T	04/03/05	MGC		4/4/05	Y
DP25 B	P182/P183/P189/P190	@INT	4T	04/03/05	MGC	caps 182/190	4/4/05	Y
DP25 C	P183/P184/P184A/P190	@INT	4T	04/03/05	MGC		4/4/05	Y
DP25 D	P191/P192	60' NSEOS	DS	04/03/05	MGC	DFp-099	4/4/05	Y
DP25 E	P185/P186/P191	@INT	T	04/03/05	MGC		4/4/05	Y
DP25 F	NA	NA	NA	NA	NA	NA	NA	NA
DP25 G	P193/P194/P195	@INT	T	04/03/05	MGC		4/4/05	Y
DP25 H	P192/P193/P194	@INT	T	04/03/05	MGC		4/4/05	Y

	DEFECT LOCATION						**	PASS
DEFECT CODE	SEAM, PANEL OR REPAIR NO.	DEFECT LOCATION DESCRIPTION	DEFECT TYPE	LOG DATE	MON.	REMARKS	REPAIR DATE	VACUUM TEST
DP25 I	P195/P196	@SEOS	PT/EXT	04/04/05	MGC		4/4/05	Y
DP25 J	P189/P190	@NEOS	PT	04/04/05	MGC		4/4/05	Y
DP25 K	P119/P198	100' NSEOS	DS	04/04/05	MGC	DFp-100	4/4/05	Y
DP25 M	P118/P119/P198	@INT	T	04/04/05	MGC		4/4/05	Y
DP25 N	P198/P199/P200	@INT	T	04/04/05	MGC		4/4/05	Y
DP25 P	P193/P195	@SEOS	PT/EXT	04/04/05	MGC	EXT to AT	4/4/05	Y
DP25 Q	P192/P193	@SEOS	PT/EXT	04/04/05	MGC	EXT to AT	4/4/05	Y
DP25 R	P186/P191	@SEOS	PT/EXT	04/04/05	MGC	EXT to AT	4/4/05	Y
DP25 S	P178/P186	@EEOS	PT/EXT	04/04/05	MGC	EXT to AT	4/4/05	Y
DP25 T	P200/P201	@NEOS	PT/EXT	04/04/05	MGC	EXT to AT	4/4/05	Y
DP25 W	P184/P184A	@WEOS	PT/EXT	04/04/05	MGC	EXT to AT	4/4/05	Y
DP25 X	P184A/P190/P190A	@INT	T	04/04/05	MGC	EXT to AT	4/4/05	Y
DP26 A	DP-25G	on patch weld	VT	04/04/05	MGC		4/4/05	Y
DP26 B	DP-25E	on patch weld	VT	04/04/05	MGC		4/4/05	Y
DP26 C	P190/P190A	@NEOS	PT/EXT	04/04/05	MGC		4/4/05	Y
DP26 D	P200/P201	@SEOS	PT/EXT	04/04/05	MGC		4/4/05	Y
DP26 E	P119/P198	75' NSEOS	IO	04/04/05	MGC		4/4/05	Y
DP26 F	P198P199	@SEOS	PT/EXT	04/04/05	MGC		4/4/05	Y
DP26 G	P150/P173	@WEOS	PT/EXT	04/04/05	MGC		4/4/05	Y
DP26 H	By Survey	By Survey	BS	04/07/05	MGC	south vent pipe	4/7/05	Y

GEOMEMBRANE REPAIR LOG

PROJECT NUMBER: 043-2246
LINER INSTALLER: Colorado Lining
LOCATION: Rocky Flats
PROJECT TITLE: Rocky Flats, Present Landfill
CONTRACTOR: S.M. Stoller
SITE MANAGER: Kaiser Hill Company LLC

REPAIR TYPE: P - PATCH, C - CAP, RS - RECONSTRUCTED SEAM, G&W - GRIND WELD

DEFECT CODE	REPAIR DATE	MACHINE NUMBER	APPROX. TIME	REPAIR TYPE	APPROX. DIMENSIONS	WELD TECH	MONITOR	REMARKS
DP1 A	11/02/04	124	1025	P	2X5	BC	PRH	DFp-001
DP1 B	11/02/04	124	1045	P	1X5	BC	PRH	
DP1 C	11/02/04	124	1320	P	1X2	BC	PRH	
DP1 D	11/02/04	124	1100	P	1X1	BC	PRH	
DP1 E	11/02/04	124	1110	P	1X1	BC	PRH	
DP1 F	11/02/04	124	1135	P	1X1	BC	PRH	
DP1 G	11/05/04	124	1435	P	3X4	BC	MGC	
DP1 H	11/05/04	124	1125	P	3X5	BC	PRH	DFp-002
DP1 I	11/05/04	124	1100	P	3X12	BC	PRH	
DP1 J	11/05/04	124	1115	P	2X5	BC	PRH	
DP1 K	11/05/04	124	1315	P	2X5	BC	MGC	
DP1 M	11/05/04	124	1145	P	2X3	BC	PRH	
DP1 N	11/05/04	124	1050	P	1X3	BC	PRH	
DP1 P	11/05/04	124	1046	P	1X3	BC	PRH	
DP1 Q	11/05/04	124	1057	P	1X1	BC	PRH	
DP1 R	11/05/04	124	1133	P	2X4	BC	PRH	
DP1 S	11/05/04	124	1138	P	3X5	BC	PRH	DFp-003
DP1 T	11/05/04	124	1410	P	1X1	BC	MGC	
DP1 W	11/05/04	124	1425	P	2X3	BC	MGC	
DP1 X	11/05/04	124	1350	P	2X5	BC	MGC	
DP2 A	11/05/04	124	1355	P	2X5	BC	MGC	
DP2 B	11/05/04	124	1054	P	1X1	BC	PRH	
DP2 C	11/05/04	124	1044	P	1X1	BC	PRH	
DP2 D	11/05/04	124	1815	P	3X6	GK	MGC	DFp-004
DP2 E	11/05/04	124	1325	P	1X3	BC	MGC	
DP2 F	11/05/04	124	1440	P	3X4	BC	MGC	
DP2 G	11/06/04	124	1000	P	1X2	BC	PRH	
DP2 H	11/06/04	124	953	P	3X5	BC	PRH	DFp-005
DP2 I	NA	NA	NA	NA	NA	NA	NA	ROCK REMOVED
DP2 J	11/06/04	124	950	P	1X1	BC	PRH	
DP2 K	11/06/04	124	1007	P	2X3	BC	PRH	
DP2 M	11/06/04	124	1003	P	1X2	BC	PRH	
DP2 N	11/06/04	124	1012	P	1X2	BC	PRH	
DP2 P	11/06/04	124	1140	P	2x4	BC	PRH	
DP2 Q	11/06/04	124	1145	P	2x6	BC	PRH	
DP2 R	11/09/04	124	1040	P	3X9	RD	PRH	
DP2 S	11/09/04	124	0834	P	3X5	RD	PRH	
DP2 T	11/09/04	124	1640	P	3X5	RD	PRH	

DEFECT CODE	REPAIR DATE	MACHINE NUMBER	APPROX. TIME	REPAIR TYPE	APPROX. DIMENSIONS	WELD TECH	MONITOR	REMARKS
DP2 W	11/09/04	124	1525	P	2X3	RD	PRH	
DP2 X	11/09/04	124	1337	P	4X5	RD	PRH	DFp-007
DP3 A	11/09/04	124	1340	P	2X2	RD	PRH	
DP3 B	11/09/04	124	0900	P	3X3	RD	PRH	into AT
DP3 C	11/09/04	124	1405	P	4X5	RD	PRH	DFp-008
DP3 D	11/09/04	124	1520	P	3X5	RD	PRH	
DP3 E	11/09/04	124	0848	P	3X3	RD	PRH	into AT
DP3 F	11/09/04	124	0840	P	2X3	RD	PRH	into AT
DP3 G	11/09/04	124	1632	P	3X4	RD	PRH	
DP3 H	11/09/04	124	1529	P	3X3	RD	PRH	
DP3 I	11/09/04	124	1636	P	3X3	RD	PRH	
DP3 J	11/12/04	124	1400	P	2x3	RD	MGC	
DP3 K	11/12/04	124	1405	P	2x3	RD	MGC	
DP3 M	11/12/04	124	1410	P	2x3	RD	MGC	
DP3 N	11/12/04	124	1500	P	2x5	RD	MGC	DFp-009
DP3 P	11/12/04	124	1515	P	2x5	RD	MGC	DFp-010
DP3 Q	11/12/04	124	1425	P	2x2	RD	MGC	
DP3 R	11/12/04	124	1510	P	2x5	RD	MGC	DFp-011
DP3 S	11/12/04	124	1550	P	2x5	RD	MGC	DFp-012
DP3 T	11/12/04	124	1530	P	2X2	RD	MGC	
DP3 W	11/12/04	124	1430	P	2x4	RD	MGC	
DP3 X	11/12/04	124	1410	P	2x3	RD	MGC	
DP4 A	11/12/04	124	1700	P	3X8	RD	MGC	
DP4 B	11/12/04	124	1635	P	3X3	RD	MGC	
DP4 C	11/15/04	124	1355	P	2X2	RD	MGC	
DP4 D	11/15/04	124	1605	P	2X4	RD	PRH	
DP4 E	11/15/04	124	1600	C	3X25	RD	PRH	
DP4 F	11/15/04	124	1520	C	3X25	RD	PRH	
DP4 G	11/15/04	124	1500	GW	0X22	RD	PRH	
DP4 H	11/15/04	124	1445	P	2X6	RD	PRH	
DP4 I	11/17/04	124	1515	P	2X5	RD	MGC	DFp-013
DP4 J	11/17/04	124	1448	P	2X3	RD	MGC	
DP4 K	11/17/04	124	1505	P	2X3	RD	MGC	
DP4 M	11/17/04	124	1440	P	2X2	RD	MGC	
DP4 N	11/17/04	124	1525	P	2X5	RD	MGC	DFp-014
DP4 P	11/17/04	124	1610	P	2X5	RD	MGC	DFp-015
DP4 Q	11/17/04	124	1435	P	2X2	RD	MGC	
DP4 R	11/17/04	124	1430	P	2X3	RD	MGC	
DP4 S	11/17/04	124	1410	C	2X14	RD	MGC	
DP4 T	11/17/04	124	1530	P	1X2	RD	MGC	
DP4 W	11/17/04	124	1535	P	1x1	RD	MGC	
DP4 X	11/17/04	124	1445	P	2X2	RD	MGC	
DP5 A	11/19/04	124	1535	P	2X2	RD	MGC	
DP5 B	11/19/04	124	1525	P	2X2	RD	MGC	
DP5 C	11/19/04	124	1507	P	2X2	RD	MGC	

DEFECT CODE	REPAIR DATE	MACHINE NUMBER	APPROX. TIME	REPAIR TYPE	APPROX. DIMENSIONS	WELD TECH	MONITOR	REMARKS
DP5 D	11/19/04	124	1430	P	2X5	RD	MGC	DFp-016
DP5 E	11/19/04	124	1540	P	2X5	RD	MGC	DFp-017
DP5 F	11/19/04	124	1455	P	2X5	RD	MGC	DFp-018
DP5 G	11/19/04	124	1505	P	2X2	RD	MGC	
DP5 H	11/19/04	124	1510	P	2X2	RD	MGC	
DP5 I	11/19/04	124	1545	P	2X2	RD	MGC	
DP5 J	11/19/04	124	1415	P	2X3	RD	MGC	
DP5 K	11/23/04	124	900	GW	6"	JS	PRH	
DP5 M	11/19/04	124	1500	P	2X5	RD	MGC	DFp-019
DP5 N	11/22/04	124	1450	P	2x8	JS	MGC	DFp-020
DP5 P	11/19/04	124	1410	P	2X2	RD	MGC	
DP5 Q	11/19/04	124	1435	P	2X2	RD	MGC	
DP5 R	11/22/04	124	1500	P	2X3	JS	MGC	
DP5 S	11/22/04	124	1352	P	3X3	JS	MGC	
DP5 T	11/19/04	124	1554	P	2X2	RD	MGC	
DP5 W	11/19/04	124	1605	P	2X2	RD	MGC	
DP5 X	11/19/04	124	1548	P	2X2	RD	MGC	
DP6 A	11/22/04	124	1520	P	2X5	JS	MGC	DFp-021
DP6 B	11/22/04	124	1345	P	2X5	JS	MGC	DFp-022
DP6 C	11/19/04	124	1557	P	2X3	RD	MGC	
DP6 D	11/23/04	124	1000	P	2X5	JS	MGC	DFp-023
DP6 E	11/22/04	124	1630	P	2X2	JS	MGC	
DP6 F	11/22/04	124	1610	P	3X3	JS	MGC	
DP6 G	11/23/04	124	1005	P	2X2	JS	MGC	
DP6 H	11/22/04	124	1605	P	2X5	JS	MGC	DFp-024
DP6 I	11/23/04	124	930	P	2X3	JS	MGC	
DP6 J	11/23/04	124	850	P	2X2	JS	PRH	
DP6 K	11/23/04	124	915	P	2X2	JS	MGC	
DP6 M	11/23/04	124	1030	P	2X2	JS	MGC	
DP6 N	12/3/04	124	0935	P	1X1	RD	MGC	
DP6 P	12/3/04	124	0940	P	1X1	RD	MGC	
DP6 Q	12/4/04	124	1340	GW	3'	RD	PRH	
DP6 R	12/4/04	124	1100	P	3X25	RD	PRH	
DP6 S	12/4/04	124	1050	P	1X1	RD	PRH	
DP6 T	12/4/04	124	1345	P	2X25	RD	PRH	
DP6 W	12/4/04	124	1140	P	1X1	RD	PRH	
DP6 X	12/5/04	124	0900	P	1X1	RD	MGC	
DP7 A	12/5/04	124	0910	P	2X4	RD	MGC	
DP7 B	12/5/04	124	0920	P	2X4	RD	MGC	
DP7 C	12/5/04	124	1000	P	2X2	RD	MGC	
DP7 D	12/12/04	124	0832	P	4X2	RD	MGC	
DP7 E	12/12/04	124	0823	P	3X2	RD	GDH	
DP7 F	12/12/04	124	0803	P	2X1	RD	GDH	
DP7 G	12/8/04	124	1140	P	3X6	RD	PRH	DFp-026
DP7 H	12/11/04	124	1125	P	2X3	RD	MGC	

DEFECT CODE	REPAIR DATE	MACHINE NUMBER	APPROX. TIME	REPAIR TYPE	APPROX. DIMENSIONS	WELD TECH	MONITOR	REMARKS
DP7 I	12/12/04	124	0751	P	2X2	RD	GDH	
DP7 J	12/12/04	124	0745	P	4X2	RD	GDH	
DP7 K	12/8/04	124	1155	P	2X2	RD	PRH	
DP7 M	12/8/04	124	1150	P	2X2	RD	PRH	
DP7 N	12/11/04	124	1120	P	2X3	RD	MGC	
DP7 P	12/11/04	124	1115	P	3X4	RD	MGC	
DP7 Q	12/11/04	124	1110	P	3X5	RD	MGC	DFp-028
DP7 R	12/12/04	124	0849	P	4X2	RD	GDH	
DP7 S	12/12/04	124	0822	P	1X1	RD	GDH	DS-26 covers DFp-025
DP7 T	12/12/04	124	0858	P	2X2	RD	GDH	
DP7 W	12/12/04	124	1045	P	4X2	RD	GDH	
DP7 X	12/12/04	124	1142	P	3X2	RD	GDH	
DP8 A	12/12/04	124	1144	P	3X2	RD	GDH	
DP8 B	12/12/04	124	1010	P	2X1	RD	GDH	
DP8 C	12/12/04	124	1033	P	4X2	RD	GDH	
DP8 D	12/12/04	124	0900	P	2X2	RD	GDH	
DP8 E	12/12/04	124	0949	P	3X2	RD	GDH	
DP8 F	12/12/04	124	1125	P	7X2	RD	GDH	
DP8 G	12/12/04	124	0926	P	5X2	RD	GDH	
DP8 H	12/12/04	124	0912	P	1X1	RD	GDH	
DP8 I	12/12/04	124	0913	P	1X1	RD	GDH	
DP8 J	12/14/04	124	0857	P	5X2	RD	GDH	
DP8 K	12/14/04	124	0917	P	2X2	RD	GDH	
DP8 M	12/12/04	124	1407	P	4X2	RD	GDH	
DP8 N	12/12/04	124	0955	P	2X1	RD	GDH	
DP8 P	12/12/04	124	1351	P	2X2	RD	GDH	
DP8 Q	12/12/04	124	1120	P	2X2	RD	GDH	
DP8 R	12/12/04	124	1329	P	3X3	RD	GDH	
DP8 S	12/12/04	124	0930	P	1X1	RD	GDH	
DP8 T	12/12/04	124	1313	P	4X2	RD	GDH	
DP8 W	12/12/04	124	1548	P	2X2	RD	GDH	
DP8 X	12/12/04	124	1410	P	3X2	RD	GDH	
DP9 A	12/12/04	124	1335	P	3X2	RD	GDH	
DP9 B	12/12/04	124	1556	P	5X2	RD	GDH	
DP9 C	12/12/04	124	1015	P	4X2	RD	GDH	
DP9 D	12/12/04	124	1539	P	2X2	RD	GDH	
DP9 E	12/14/04	124	NA	P	9X2	RD	GDH	Covers DP-8F
DP9 F	12/12/04	124	1412	P	3X2	RD	GDH	
DP9 G	12/12/04	124	1326	P	4X2	RD	GDH	
DP9 H	12/12/04	124	1449	P	7X3	RD	GDH	
DP9 I	12/12/04	124	1432	P	2X2	RD	GDH	
DP9 J	12/14/04	124	1551	P	5X2	RD	GDH	
DP9 K	12/12/04	124	0830	P	3X2	RD	GDH	
DP9 M	12/15/04	124	0945	P	4X3	RD	GDH	
DP9 N	12/15/04	124	0956	P	4X3	RD	GDH	

DEFECT CODE	REPAIR DATE	MACHINE NUMBER	APPROX. TIME	REPAIR TYPE	APPROX. DIMENSIONS	WELD TECH	MONITOR	REMARKS
DP9 P	12/15/04	124	0935	P	9X4	RD	GDH	
DP9 Q	12/15/04	124	1053	P	4X3	RD	GDH	
DP9 R	12/15/04	124	0932	P	3X2	RD	GDH	
DP9 S	12/15/04	124	0809	P	4X3	RD	GDH	
DP9 T	12/14/04	124	1554	P	3X3	RD	GDH	
DP9 W	12/14/04	124	1516	P	2X2	RD	GDH	
DP9 X	12/16/04	124	1415	P	3X6	RD	PRH	DFp-043
DP10 A	12/12/04	124	1118	P	2X1	RD	GDH	
DP10 B	12/14/04	124	0757	P	2X1	RD	GDH	
DP10 C	12/12/04	124	1430	P	2X1	RD	GDH	
DP10 D	12/16/04	124	1456	P	3X6	RD	PRH	DFp-044
DP10 E	12/15/04	124	0826	P	3X3	RD	GDH	
DP10 F	12/15/04	124	0807	P	3X2	RD	GDH	
DP10 G	12/15/04	124	1123	P	2X2	RD	GDH	
DP10 H	12/14/04	124	1556	P	2X2	RD	GDH	
DP10 I	12/14/04	124	1519	P	3X3	RD	GDH	
DP10 J	12/14/04	124	1503	P	5X3	RD	GDH	
DP10 K	12/12/04	124	1609	P	1X1	RD	GDH	
DP10 M	12/14/04	124	0805	P	10'	RD	GDH	
DP10 N	12/16/04	124	1627	P	2X2	RD	PRH	
DP10 P	1/3/05	124	0855	P	2X6	RD	MGC	
DP10 Q	12/17/04	124	1414	P	2X2	RD	PRH	
DP10 R	12/17/04	124	1410	P	3X6	RD	PRH	DFp-046
DP10 S	12/17/04	124	1049	P	3X3	RD	GDH	
DP10 T	12/17/04	124	1046	P	2X3	RD	GDH	
DP10 W	12/17/04	124	1054	P	3X3	RD	GDH	
DP10 X	12/17/04	124	1044	P	2X2	RD	GDH	
DP11 A	12/15/04	124	1056	P	2X2	RD	GDH	
DP11 B	12/17/04	124	0928	P	6X3	RD	GDH	
DP11 C	12/14/04	124	1345	P	2X2	RD	GDH	
DP11 D	12/17/04	124	0831	P	5X3	RD	GDH	Partly in AT
DP11 E	1/3/05	124	0820	P	2X4	RD	MGC	
DP11 F	1/3/04	124	0915	P	2X5	RD	MGC	
DP11 G	12/15/04	124	0805	P	4X3	RD	GDH	
DP11 H	12/15/04	124	0834	P	3X3	RD	GDH	
DP11 I	12/15/04	124	1057	P	2X2	RD	GDH	
DP11 J	12/15/04	124	1100	P	1X1	RD	GDH	
DP11 K	12/15/04	124	1101	P	1X1	RD	GDH	
DP11 M	1/3/05	124	0925	P	2X2	RD	MGC	
DP11 N	1/3/05	124	0905	P	2X7	RD	MGC	
DP11 P	12/17/04	124	1148	P	5X2	RD	GDH	
DP11 Q	12/17/04	124	0925	P	4X3	RD	GDH	
DP11 R	12/16/04	124	1545	P	3X6	RD	PRH	DFp-050
DP11 S	1/3/05	124	1325	P	2X2	RD	MGC	
DP11 T	12/17/04	124	0923	P	2X2	RD	GDH	

DEFECT CODE	REPAIR DATE	MACHINE NUMBER	APPROX. TIME	REPAIR TYPE	APPROX. DIMENSIONS	WELD TECH	MONITOR	REMARKS
DP11 W	1/3/05	124	0930	P	2X2	RD	MGC	
DP11 X	1/3/05	124	1120	P	3X5	RD	MGC	
DP12 A	1/3/05	124	1125	P	2X5	RD	MGC	
DP12 B	1/3/05	124	1110	P	2X6	RD	MGC	
DP12 C	1/3/05	124	1430	P	2X7	RD	MGC	
DP12 D	1/3/05	124	1130	P	2X3	RD	MGC	
DP12 E	1/3/05	124	1135	P	2X3	RD	MGC	
DP12 F	1/3/05	124	1055	P	2X2	RD	MGC	
DP12 G	12/16/04	124	1613	P	2X2	RD	PRH	
DP12 H	12/17/04	124	0807	P	5X3	RD	GDH	
DP12 I	12/17/04	124	0827	P	2X2	RD	GDH	
DP12 J	12/17/04	124	1039	P	4X3	RD	GDH	
DP12 K	1/3/05	124	1320	P	2X6	RD	MGC	
DP12 M	1/3/05	124	1050	P	2X5	RD	MGC	
DP12 N	1/7/05	124	0858	P	3X6	RD	PRH	DFp-055
DP12 P	12/17/04	124	1145	P	4X4	RD	GDH	
DP12 Q	1/3/05	124	1705	P	3X5	RD	MGC	
DP12 R	1/7/05	124	1347	P	2X3	RD	PRH	
DP12 S	12/17/04	124	1351	P	2X2	RD	PRH	
DP12 T	12/17/04	124	1412	P	2X2	RD	PRH	
DP12 W	12/17/04	124	1443	P	2X2	RD	PRH	
DP12 X	12/17/04	124	1450	P	3X6	RD	PRH	
DP13 A	12/17/04	124	1445	P	3X6	RD	PRH	
DP13 B	12/17/04	124	1456	P	2X2	RD	PRH	
DP13 C	1/3/05	124	1630	P	2X5	RD	MGC	
DP13 D	1/3/05	124	1635	P	2X5	RD	MGC	
DP13 E	1/7/05	124	1426	P	2X2	RD	PRH	
DP13 F	1/7/05	124	1640	P	2X2	RD	PRH	
DP13 G	1/7/05	124	1146	P	2X2	RD	PRH	
DP13 H	1/7/05	124	1331	P	2X2	RD	PRH	
DP13 I	1/7/05	124	1130	P	2X3	RD	PRH	
DP13 J	1/7/05	124	1356	P	3X6	RD	PRH	
DP13 K	1/7/05	124	1409	P	2X3	RD	PRH	
DP13 M	1/7/05	124	1607	P	2X2	RD	PRH	
DP13 N	1/9/05	124	1346	P	4X6	RD	PRH	
DP13 P	1/9/05	124	1500	P	3X6	RD	PRH	
DP13 Q	1/9/05	124	1444	P	2X2	RD	PRH	
DP13 R	1/9/05	124	1440	P	2X2	RD	PRH	
DP13 S	1/9/05	124	1420	P	1X2	RD	PRH	
DP13 T	1/9/05	124	1433	P	1X3	RD	PRH	
DP13 W	1/9/05	124	1400	P	1X2	RD	PRH	
DP13 X	1/9/05	124	1420	P	1X2	RD	PRH	
DP14 A	1/9/05	124	1430	P	2X2	RD	PRH	
DP14 B	1/9/05	124	1425	P	2X3	RD	PRH	
DP14 C	1/9/05	124	1415	P	1X2	RD	PRH	

DEFECT CODE	REPAIR DATE	MACHINE NUMBER	APPROX. TIME	REPAIR TYPE	APPROX. DIMENSIONS	WELD TECH	MONITOR	REMARKS
DP14 D	1/9/05	124	1331	P	2X2	RD	PRH	
DP14 E	1/9/05	124	1506	P	2X5	RD	PRH	
DP14 F	1/9/05	124	1337	P	3X7	RD	PRH	
DP14 G	1/9/05	124	1448	P	2X5	RD	PRH	
DP14 H	1/3/05	124	1100	P	2X2	RD	MGC	
DP14 I	1/7/05	124	1435	P	2X2	RD	PRH	
DP14 J	1/3/05	124	1000	P	2X2	RD	MGC	
DP14 K	1/3/05	124	1010	P	2X2	RD	MGC	
DP14 M	1/3/05	124	1015	P	2X2	RD	MGC	
DP14 N	1/7/05	124	1653	P	2X2	RD	PRH	
DP14 P	1/7/05	124	1152	P	3X3	RD	PRH	
DP14 Q	1/3/05	124	1705	P	3X5	RD	MGC	
DP14 R	1/3/05	124	1430	P	2X2	RD	MGC	
DP14 S	NA	NA	NA	NA	NA	NA	NA	DP-14T Covers
DP14 T	1/3/05	124	1500	C	2X10	RD	MGC	Covers DP-14S
DP14 W	1/3/05	124	1600	P	2X2	RD	MGC	
DP14 X	1/3/05	124	1605	P	2X2	RD	MGC	
DP15 A	1/3/05	124	1610	P	2X2	RD	MGC	
DP15 B	1/9/05	124	1320	P	1X1	RD	PRH	
DP15 C	1/9/05	124	1323	P	2X4	RD	PRH	
DP15 D	1/9/05	124	1328	P	1X2	RD	PRH	
DP15 E	1/6/05	124	1415	GW	6"	RD	MGC	
DP15 F	1/7/05	124	1650	P	3X6	RD	PRH	
DP15 G	1/9/05	10	0838	P	3X6	CB	PRH	
DP15 H	1/7/05	124	1604	P	2X4	RD	PRH	
DP15 I	1/8/05	124	0829	P	3X6	RD	PRH	DFp-058-2D
DP15 J	NA	NA	NA	NA	NA	NA	NA	No Repari Needed
DP15 K	1/9/05	124	1503	P	1X1	RD	PRH	
DP15 M	1/7/05	124	1607	P	2X2	RD	PRH	
DP15 N	1/7/05	124	1628	P	3X10	RD	PRH	
DP15 P	1/7/05	124	1642	P	2X2	RD	PRH	
DP15 Q	1/8/05	124	0800	P	100'	RD	PRH	
DP15 R	1/9/05	10	0817	RS	125'	CB	PRH	
DP15 S	1/9/05	124	1334	P	2X5	RD	PRH	
DP15 T	1/9/05	124	1349	P	4X6	RD	PRH	
DP15 W	1/9/05	124	1351	P	2X2	RD	PRH	
DP15 X	1/9/05	10	0841	RS	8'	CB	PRH	
DP16 A	1/9/05	124	0819	P	3X3	RD	PRH	
DP16 B	1/9/05	124	0820	P	2X3	RD	PRH	
DP16 C	1/9/05	124	0826	P	10'	RD	PRH	
DP16 D	1/9/05	124	0833	P	2X3	RD	PRH	
DP16 E	1/9/05	124	0837	P	2X2	RD	PRH	
DP16 F	1/9/05	10	0912	RS	2X2	CB	PRH	
DP16 G	1/9/05	10	1117	RS	10'	CB	PRH	
DP16 H	1/9/05	10	0843	RS	75'	CB	PRH	

DEFECT CODE	REPAIR DATE	MACHINE NUMBER	APPROX. TIME	REPAIR TYPE	APPROX. DIMENSIONS	WELD TECH	MONITOR	REMARKS
DP16 I	1/9/05	10	0855	RS	75'	CB	PRH	
DP16 J	1/9/05	124	0826	RS	10'	RD	PRH	
DP16 K	1/9/05	124	0831	RS	10'	RD	PRH	
DP16 M	1/9/05	124	0835	RS	10'	RD	PRH	
DP16 N	1/9/05	10	0908	RS	10'	CB	PRH	
DP16 P	1/9/05	10	0912	RS	10'	CB	PRH	
DP16 Q	1/9/05	10	0919	RS	10'	CB	PRH	
DP16 R	1/9/05	10	1117	RS	10'	CB	PRH	
DP16 S	1/9/05	10	1020	P	2X6	CB	PRH	
DP16 T	1/9/05	124	0953	P	2X2	RD	PRH	
DP16 W	1/9/05	124	0940	P	2X2	RD	PRH	
DP16 X	1/9/05	124	0926	P	1X2	RD	PRH	
DP17 A	1/9/05	124	1029	P	3X6	RD	PRH	
DP17 B	1/9/05	124	0902	RS	60'	RD	PRH	
DP17 C	1/9/05	124	0928	RS	60'	RD	PRH	
DP17 D	1/9/05	124	0943	RS	25'	RD	PRH	
DP17 E	1/9/05	124	0950	RS	25'	RD	PRH	
DP17 F	1/9/05	124	0955	RS	25'	RD	PRH	
DP17 G	1/9/05	124	1001	P	1X2	RD	PRH	
DP17 H	1/9/05	124	1003	RS	30'	RD	PRH	
DP17 I	1/9/05	10	1003	RS	35'	CB	PRH	
DP17 J	1/17/05	12	1110	BOOT	6X6	RB	MSP	West vent pipe North trench
DP17 K	1/17/05	12	1530	BOOT	3X3	RB	MSP	West vent pipe South trench
DP17 M	1/18/05	12	1030	BOOT	3X3	RB	PRH	West vent pipe Center trench
DP17 N	1/18/05	12	1345	BOOT	3X3	RB	MSP	Center vent pipe North trench
DP17 P	1/18/05	12	1530	BOOT	3X3	RB	MSP	Center vent pipe Center trench
DP17 Q	1/19/05	12	0845	BOOT	3X3	RB	PRH	Center vent pipe South trench
DP17 R	1/20/05	12	1440	BOOT	3X3	RB	PRH	East vent pipe North trench
DP17 S	1/21/05	12	0840	BOOT	3X3	RB	PRH	East vent pipe Center trench
DP17 T	1/21/05	12	0925	BOOT	3X3	RB	PRH	East vent pipe South trench
DP17 W	2/14/05	2	1320	P	2X2	RD	MGC	
DP17 X	2/14/05	2	1340	P	3X3	RD	MGC	
DP18 A	2/14/05	2	1512	P	2X2	RD	MGC	
DP18 B	2/14/05	2	1318	P	2X5	RD	MGC	DFp-067
DP18 C	2/14/05	2	1409	P	2X5	RD	MGC	DFp-066
DP18 D	2/14/05	2	1356	P	2X3	RD	MGC	
DP18 E	2/14/05	2	1433	P	2x2	RD	MGC	
DP18 F	2/14/05	2	1447	P	2X2	RD	MGC	
DP18 G	2/13/05	2	0858	P	3X6	RD	PRH	
DP18 H	2/13/05	2	0827	P	2X2	RD	PRH	
DP18 I	2/14/05	2	1435	P	2X2	RD	MGC	
DP18 J	2/14/05	2	1508	P	2X5	RD	MGC	DFp-069
DP18 K	2/13/05	2	0838	P	3X6	RD	PRH	DFp-070
DP18 M	2/13/05	2	0830	P	2X2	RD	PRH	DFp-068
DP18 N	2/14/05	2	1333	P	2X3	RD	MGC	

DEFECT CODE	REPAIR DATE	MACHINE NUMBER	APPROX. TIME	REPAIR TYPE	APPROX. DIMENSIONS	WELD TECH	MONITOR	REMARKS
DP18 P	2/14/05	2	1346	P	2X2	RD	MGC	
DP18 Q	2/14/05	2	1550	P	2X5	RD	MGC	DFp-071
DP18 R	2/14/05	2	1641	P	2X2	RD	MGC	
DP18 S	2/14/05	2	1653	P	2X3	RD	MGC	
DP18 T	2/14/05	2	1643	P	2X2	RD	MGC	
DP18 W	2/14/05	2	1638	P	2X5	RD	MGC	DFp-072
DP18 X	2/17/05	10	1147	P	3X7	RD	PRH	DFp-073
DP19 A	2/17/05	10	1055	P	2X3	RD	PRH	
DP19 B	2/17/05	10	1057	P	2X3	RD	PRH	
DP19 C	2/17/05	10	1013	P	2X5	RD	PRH	
DP19 D	2/14/05	2	1532	P	2X5	RD	MGC	DFp-074
DP19 E	2/14/05	2	1646	P	2X3	RD	MGC	
DP19 F	2/14/05	2	1325	P	2X2	RD	MGC	
DP19 G	2/17/05	10	1425	P	3X6	RD	PRH	DFp-075
DP19 H	2/17/05	10	1629	P	3X3	RD	PRH	
DP19 I	2/17/05	10	1640	P	3X7	RD	PRH	DFp-076
DP19 J	2/14/05	2	1530	P	1X1	RD	MGC	
DP19 K	2/14/05	2	1348	P	1X1	RD	MGC	
DP19 M	2/14/05	2	1402	P	1X1	RD	MGC	
DP19 N	2/17/05	10	1601	P	2X2	RD	PRH	
DP19 P	2/17/05	10	1603	P	2X3	RD	PRH	
DP19 Q	2/17/05	10	1537	P	3X7	RD	PRH	DFp-077
DP19 R	2/17/05	10	0854	P	3X6	RD	PRH	DFp-066U
DP19 S	2/17/05	10	0847	RS	35'	RD	PRH	
DP19 T	2/17/05	10	0844	RS	20'	RD	PRH	
DP19 W	2/17/05	10	0913	RS	8'	RD	PRH	
DP19 X	2/17/05	10	0910	P	3X6	RD	PRH	DFp-066D
DP20 A	2/17/05	10	1053	P	2X2	RD	PRH	
DP20 B	2/17/05	10	1448	P	5X6	RD	PRH	
DP20 C	2/17/05	10	1357	P	10X10	RD	PRH	
DP20 D	2/22/05	10	1206	BOOT	3X3	RD	MGC	North Vent Riser
DP20 E	2/22/05	10	1445	BOOT	3X3	RD	MGC	Central Vent Riser
DP20 F	3/28/05	124	1319	P	2X8	RD	MGC	DFp-078
DP20 G	3/28/05	124	1341	P	2X2	RD	MGC	
DP20 H	3/28/05	124	1337	P	2X2	RD	MGC	
DP20 I	3/28/05	124	1334	P	2X3	RD	MGC	
DP20 J	3/28/05	124	1332	P	2X3	RD	MGC	
DP20 K	3/28/05	124	1323	P	3X3	RD	MGC	
DP20 M	3/28/05	124	1150	P	6X10	RD	MGC	EXT to AT
DP20 N	3/28/05	124	1113	P	2X8	RD	MGC	DFp-080
DP20 P	3/28/05	124	1118	P	2X2	RD	MGC	
DP20 Q	3/28/05	124	1049	P	2X3	RD	MGC	
DP20 R	3/28/05	124	1045	P	2X3	RD	MGC	
DP20 S	3/28/05	124	1015	P	2X5	RD	MGC	DFp-081
DP20 T	3/28/05	124	1002	P	2X2	RD	MGC	

DEFECT CODE	REPAIR DATE	MACHINE NUMBER	APPROX. TIME	REPAIR TYPE	APPROX. DIMENSIONS	WELD TECH	MONITOR	REMARKS
DP20 W	3/28/05	124	1000	P	2X2	RD	MGC	
DP20 X	3/28/05	124	0958	P	2X3	RD	MGC	
DP21 A	3/28/05	124	0955	P	2X5	RD	MGC	DFp-082
DP21 B	3/28/05	124	0915	P	2X2	RD	MSP	
DP21 C	3/28/05	124	0905	P	2X2	RD	MSP	
DP21 D	3/28/05	124	1037	P	4X5	RD	MGC	EXT to AT
DP21 E	3/28/05	124	1346	P	2X5	RD	MGC	
DP21 F	3/28/05	124	1351	P	3X3	RD	MGC	
DP21 G	3/28/05	124	1358	P	2X3	RD	MGC	
DP21 H	NA	NA	NA	NA	NA	NA	NA	COVERED BY DP-21Q
DP21 I	3/28/05	124	1446	P	2X5	RD	MGC	
DP21 J	3/28/05	124	1617	P	2X4	RD	MGC	
DP21 K	3/28/05	124	0818	P	1X1	RD	MSP	
DP21 M	3/28/05	124	0840	P	1X1	RD	MSP	
DP21 N	3/28/05	124	0830	P	1X1	RD	MSP	
DP21 P	3/28/05	124	0840	P	1X1	RD	MSP	
DP21 Q	3/28/05	124	1455	P	2X8	RD	MGC	COVERS DP-21H
DP21 R	3/28/05	124	1500	P	2X2	RD	MGC	
DP21 S	3/28/05	124	1440	P	2X2	RD	MGC	
DP21 T	3/28/05	124	1622	BS	3X5	RD	MGC	
DP21 W	3/28/05	124	1434	P	2X2	RD	MGC	
DP21 X	NA	NA	NA	NA	NA	NA	NA	COVERED BY DP-21A
DP22 A	3/28/05	124	1622	BS	7X10	RD	MGC	COVERS DP-21X
DP22 B	3/28/05	124	0915	P	1X1	RD	MSP	
DP22 C	3/28/05	124	0953	P	2X5	RD	MGC	
DP22 D	3/28/05	124	1004	P	2X4	RD	MGC	EXT to AT
DP22 E	3/28/05	124	1124	P	2X6	RD	MGC	EXT to AT
DP22 F	3/28/05	124	1402	P	2X3	RD	MGC	EXT to AT
DP22 G	3/28/05	124	1436/1438	2 P	2X2 & 2X2	RD	MGC	2 PATCHES
DP22 H	3/28/05	124	1628	BS	4X7	RD	MGC	
DP22 I	3/31/05	124	1532	P	2X2	RD	MGC	
DP22 J	3/31/05	124	1554	P	2X3	RD	MGC	
DP22 K	3/31/05	124	1609	P	2X2	RD	MGC	
DP22 M	3/31/05	124	1622	P	2X2	RD	MGC	
DP22 N	3/31/05	124	1615	P	2X2	RD	MGC	
DP22 P	3/31/05	124	1630	P	2X4	RD	MGC	
DP22 Q	3/31/05	124	1115	P	3X5	RD	MSP	
DP22 R	3/31/05	124	1137	P	6X2	RD	MSP	
DP22 S	3/31/05	124	1120	P	2X2	RD	MSP	
DP22 T	3/31/05	124	1130	P	3X3	RD	MSP	
DP22 W	3/31/05	124	1355	P	3X2	RD	MSP	
DP22 X	3/31/05	124	1205	P	2X5	RD	MSP	
DP23 A	3/31/05	124	1348	P	2X4	RD	MSP	
DP23 B	3/31/05	124	1312	P	2X5	RD	MSP	
DP23 C	3/31/05	124	1305	P	2X5	RD	MSP	

DEFECT CODE	REPAIR DATE	MACHINE NUMBER	APPROX. TIME	REPAIR TYPE	APPROX. DIMENSIONS	WELD TECH	MONITOR	REMARKS
DP23 D	3/31/05	124	1151	P	3X3	RD	MSP	
DP23 E	3/31/05	124	1154	P	2X2	RD	MSP	
DP23 F	3/31/05	124	1045	P	7X6	RD	MSP	
DP23 G	3/31/05	124	1145	P	6X2	RD	MSP	
DP23 H	3/31/05	124	1532	P	2X2	RD	MGC	
DP23 I	3/31/05	124	1348	P	2X4	RD	MSP	
DP23 J	3/31/05	124	1431	P	5X6	RD	MSP	
DP23 K	3/31/05	124	1640	P	3X3	RD	MGC	
DP23 M	4/1/05	124	1341	P	2X2	RD	MGC	
DP23 N	4/1/05	124	1349	P	2X2	RD	MGC	
DP23 P	4/1/05	124	1332	P	2X5	RD	MGC	
DP23 Q	4/1/05	124	1407	P	3X5	RD	MGC	
DP23 R	4/1/05	124	1338	P	2X3	RD	MGC	
DP23 S	4/1/05	124	1346	P	6X7	RD	MGC	
DP23 T	4/1/05	124	1401	P	3X6	RD	MGC	
DP23 W	4/1/05	124	1355	P	6X8	RD	MGC	
DP23 X	4/1/05	124	1351	P	6X7	RD	MGC	
DP24 A	4/1/05	124	1327	P	4X5	RD	MGC	
DP24 B	4/1/05	124	1322	P	8X6	RD	MGC	
DP24 C	4/1/05	124	1317	P	8X6	RD	MGC	
DP24 D	4/1/05	124	1417	P	3X5	RD	MGC	
DP24 E	4/4/05	124	1538	P	2X5	RD	MGC	
DP24 F	4/4/05	124	1530	P	2X5	RD	MGC	
DP24 G	4/4/05	124	1544	P	2X2	RD	MGC	
DP24 H	4/4/05	124	1534	P	2X2	RD	MGC	
DP24 I	4/4/05	124	1326	P	2X2	RD	MGC	
DP24 J	4/4/05	124	1331	P	2X2	RD	MGC	
DP24 K	4/4/05	124	1008	P	2X2	RD	MSP	
DP24 M	4/4/05	124	1014	P	2X5	RD	MSP	
DP24 N	NA	NA	NA	NA	NA	NA	NA	
DP24 P	NA	NA	NA	NA	NA	NA	NA	
DP24 Q	4/4/05	124	1346	P	2X5	RD	MGC	
DP24 R	4/4/05	124	1146	P	6X8	RD	MGC	
DP24 S	4/4/05	124	1149	P	2X2	RD	MGC	
DP24 T	4/4/05	124	1153	P	2X2	RD	MGC	
DP24 W	4/4/05	124	1321	P	2X2	RD	MGC	
DP24 X	4/4/05	124	1336	P	2X3	RD	MGC	
DP25 A	4/4/05	124	1341	P	2X3	RD	MGC	
DP25 B	4/4/05	124	1344	P/C	2X7	RD	MGC	
DP25 C	4/4/05	124	1348	P	3X3	RD	MGC	
DP25 D	4/4/05	124	1032	P	2X5	RD	MSP	
DP25 E	4/4/05	124	1010	P	3X3	RD	MSP	
DP25 F	NA	NA	NA	NA	NA	NA	NA	
DP25 G	4/4/05	124	1036	P	2X2	RD	MSP	
DP25 H	4/4/05	124	1034	P	2X2	RD	MSP	

DEFECT CODE	REPAIR DATE	MACHINE NUMBER	APPROX. TIME	REPAIR TYPE	APPROX. DIMENSIONS	WELD TECH	MONITOR	REMARKS
DP25 I	4/4/05	124	1041	P	3X4	RD	MSP	
DP25 J	4/4/05	124	1400	P	10X7	RD	MGC	
DP25 K	4/4/05	124	1450	P	2X5	RD	MGC	
DP25 M	4/4/05	124	1503	P	2X3	RD	MGC	
DP25 N	4/4/05	124	1447	P	2X2	RD	MGC	
DP25 P	4/4/05	124	1119	P	3X4	RD	MGC	
DP25 Q	4/4/05	124	1121	P	3X4	RD	MGC	
DP25 R	4/4/05	124	1127	P	2X4	RD	MGC	
DP25 S	4/4/05	124	1137	P	2X4	RD	MGC	
DP25 T	4/4/05	124	1440	P	2X3	RD	MGC	
DP25 W	4/4/05	124	1355	P	3X4	RD	MGC	
DP25 X	4/4/05	124	1352	P	2X3	RD	MGC	
DP26 A	4/4/05	124	1422	G&W	6"	RD	MGC	
DP26 B	4/4/05	124	1420	G&W	6"	RD	MGC	
DP26 C	4/4/05	124	1356	P	2X3	RD	MGC	
DP26 D	4/4/05	124	1443	P	3X3	RD	MGC	
DP26 E	4/4/05	124	1456	P	2X3	RD	MGC	
DP26 F	4/4/05	124	1458	P	4X3	RD	MGC	
DP26 G	4/4/05	124	1532	P	3X4	RD	MGC	
DP26 H	4/7/05	124	1103	P	3X3	RD	MGC	SOUTH VENT PIPE

PRES E TEST LOG

PROJECT NUMBER: 043-2246
LINER INSTALLER: Colorado Lining
LOCATION: Rocky Flats

PROJECT TITLE: Rocky Flats, Present Landfill
CONTRACTOR: S.M. Stoller
SITE MANAGER: Kaiser Hill Company LLC

DATE	SEAM NUMBER	SEAM SECTION* FROM	SEAM SECTION* TO	GAUGE NUMBER	TECH ID	TIME START	TIME FINISH	PRESSURE INITIAL	PRESSURE FINISH	OBS. TEST	RESULTS PASS / FAIL	SEAM COMPLETE NO	SEAM COMPLETE YES	MON.	REMARKS
11/2/04	P1 / P2	NEOS	DP1B	1	GMK	918	923	35	35	Y	PASS	X		PRH	
11/2/04	P1 / P2	DP1B	SEOS	2	GMK	919	924	35	34	Y	PASS		X	PRH	
11/2/04	P2 / P3	NEOS	SEOS	1	GMK	948	953	35	34	Y	PASS		X	PRH	
11/2/04	P3 / P4	NEOS	SEOS	2	GMK	949	954	35	33	Y	PASS		X	PRH	
11/4/04	P1 / P5	SEOS	DP-1I	1	GMK	1341	1346	35	33	Y	PASS	X		PRH	
11/4/04	P1 / P5	DP-2B	DP-2C	2	GMK	1618	1625	34	32	Y	PASS	X		MGC	
11/4/04	P1 / P5	DP-1I	DP-2B	1	GMK	1630	1635	35	34	Y	PASS	X		MGC	
11/5/04	P1 / P5	DP-2C	NEOS	2	GMK	735	740	35	33	Y	PASS		X	PRH	
11/5/04	P5 / P6	NEOS	DP-1P	2	GMK	758	803	35	34	Y	PASS	X		PRH	
11/5/04	P5 / P6	DP-1P	DP-1N	5	GMK	759	804	35	32	Y	PASS	X		PRH	
11/5/04	P5 / P6	DP-1N	DP-1Q	3	GMK	800	805	35	34	Y	PASS	X		PRH	
11/5/04	P5 / P6	DP-1Q	SEOS	4	GK	801	806	35	34	Y	PASS		X	PRH	
11/5/04	P5 / P7	SEOS	DP-1M	4	GK	839	844	35	33	Y	PASS	X		PRH	
11/5/04	P5 / P7	DP-1M	NEOS	3	GK	840	845	35	34	Y	PASS		X	PRH	
11/5/04	P7 / P8	NEOS	SEOS	2	GK	842	847	35	33	Y	PASS		X	PRH	
11/5/04	P6 / P8	SEOS	NEOS	5	GK	843	848	35	34	Y	PASS		X	PRH	
11/5/04	P6 / P7	EEOS	WEOS	4	GK	849	854	35	34	Y	PASS		X	PRH	
11/5/04	P9 / P10	EEOS	WEOS	2	GK	914	919	35	33	Y	PASS		X	PRH	
11/5/04	P8 / P10	NEOS	SEOS	4	GK	914	919	35	32	Y	PASS		X	PRH	
11/5/04	P8 / P9	NEOS	SEOS	3	GK	914	919	35	33	Y	PASS		X	PRH	
11/5/04	P10 / P11	NEOS	SEOS	5	GK	916	921	35	32	Y	PASS		X	PRH	
11/5/04	P9 / P11	SEOS	NEOS	5	GK	927	932	35	33	Y	PASS		X	PRH	
11/6/04	P13 / P14	NEOS	DP-2J	5	GK	820	825	35	34	Y	PASS	X		PRH	
11/6/04	P12 / P13	WEOS	EEOS	2	GK	823	828	35	34	Y	PASS		X	PRH	
11/6/04	P11 / P12	NEOS	SEOS	4	GK	823	828	35	33	Y	PASS		X	PRH	
11/6/04	P11 / P13	SEOS	NEOS	3	GK	823	828	35	34	Y	PASS		X	PRH	
11/6/04	P13 / P14	DP-2J	SEOS	5	GK	829	834	35	34	Y	PASS		X	PRH	

DATE	SEAM NUMBER	SEAM SECTION* FROM	TO	GAUGE NUMBER	TECH ID	TIME START	TIME FINISH	PRESSURE INITIAL	PRESSURE FINISH	OBS. TEST	RESULTS PASS / FAIL	SEAM COMPLETE NO	SEAM COMPLETE YES	MON.	REMARKS
11/6/04	P12 / P14	NEOS -	SEOS	5	GK	838 :	843	35 :	34	Y	PASS		X	PRH	
11/6/04	P12 / P15	NEOS -	SEOS	3	GK	842 :	847	35 :	33	Y	PASS		X	PRH	
11/6/04	P14 / P15	WEOS -	DP-2N	4	GK	857 :	902	35 :	34	Y	PASS	X		PRH	
11/6/04	P14 / P15	DP-2N -	EEOS	3	GK	858 :	903	35 :	34	Y	PASS		X	PRH	
11/8/04	P15 / P16	SEOS -	NEOS	2	GK	1509 :	1514	35 :	34	Y	PASS		X	PRH	
11/8/04	P16 / P18	SEOS -	NEOS	4	GK	1526 :	1531	35 :	33	Y	PASS		X	PRH	
11/8/04	P14 / P16	SEOS -	DP-2T	3	GK	1513 :	1518	35 :	34	Y	PASS	X		PRH	
11/8/04	P16 / P17	SEOS -	NEOS	3	GK	1526 :	1531	35 :	33	Y	PASS		X	PRH	
11/8/04	P17 / P18	WEOS -	EEOS	5	GK	1538 :	1543	35 :	34	Y	PASS		X	PRH	
11/8/04	P14 / P16	DP-2T -	NEOS	2	GK	1528 :	1533	35 :	34	Y	PASS		X	PRH	
11/8/04	P18 / P19	SEOS -	NEOS	2	GK	1606 :	1611	35 :	34	Y	PASS		X	PRH	
11/8/04	P18 / P20	NEOS -	SEOS	5	GK	1630 :	1635	35 :	34	Y	PASS		X	PRH	
11/8/04	P19 / P20	WEOS -	EEOS	4	GK	1630 :	1635	35 :	34	Y	PASS		X	PRH	
11/9/04	P17 / P19	SEOS -	DP-3G	2	GK	0716 :	0721	35 :	35	Y	PASS	X		PRH	
11/9/04	P17 / P19	DP-3G -	NEOS	2	GK	0723 :	0728	35 :	35	Y	PASS		X	PRH	
11/12/04	P20 / P22	NEOS -	DP-3J	2	RD	1109 :	1114	34 :	33	Y	PASS	X		MGC	
11/12/04	P21 / P22	WEOS -	EEOS	1	RD	1110 :	1115	34 :	33	Y	PASS		X	MGC	
11/12/04	P22 / P23	NEOS -	SEOS	4	RD	1111 :	1116	34 :	33	Y	PASS		X	MGC	
11/12/04	P20 / P22	DP-3J -	SEOS	3	RD	1111 :	1116	34 :	33	Y	PASS		X	MGC	
11/12/04	P21 / P23	SEOS -	NEOS	4	RD	1120 :	1125	34 :	34	Y	PASS		X	MGC	
11/12/04	P20 / P21	SEOS -	NEOS	1	RD	1122 :	1127	34 :	34	Y	PASS		X	MGC	
11/12/04	P19 / P21	SEOS -	NEOS	2	RD	1123 :	1128	34 :	34	Y	PASS		X	MGC	
11/12/04	P23 / P24	DP-3Q -	SEOS	3	RD	1124 :	1129	34 :	33	Y	PASS	X		MGC	
11/12/04	P23 / P24	DP-3W -	DP-3Q	1	RD	1129 :	1134	34 :	32	Y	PASS	X		MGC	
11/12/04	P24 / P26	NEOS -	SEOS	1	RD	1138 :	1143	34 :	34	Y	PASS		X	MGC	
11/12/04	P24 / P25	SEOS -	NEOS	2	RD	1137 :	1142	34 :	34	Y	PASS		X	MGC	
11/12/04	P23 / P24	DP-3W -	NEOS	4	RD	1140 :	1145	34 :	33	Y	PASS		X	MGC	
11/12/04	P25 / P26	WEOS -	EEOS	3	RD	1150 :	1155	34 :	32	Y	PASS		X	MGC	
11/17/04	P27 / P28	WEOS -	EEOS	2	GK	1128 :	1133	35 :	33	Y	PASS		X	PRH	
11/17/04	P26 / P27	NEOS -	SEOS	1	GK	1126 :	1131	35 :	34	Y	PASS		X	PRH	
11/17/04	P25 / P27	SEOS -	NEOS	1	GK	1136 :	1141	35 :	32	Y	PASS		X	PRH	

DATE	SEAM NUMBER	SEAM SECTION* FROM	TO	GAUGE NUMBER	TECH ID	TIME START	TIME FINISH	PRESSURE INITIAL	PRESSURE FINISH	OBS. TEST	RESULTS PASS / FAIL	SEAM COMPLETE NO	SEAM COMPLETE YES	MON.	REMARKS
11/17/04	P27 / P29	SEOS -	NEOS	3	GK	1137 :	1142	35 :	33	Y	PASS		X	PRH	
11/17/04	P28 / P29	SEOS -	NEOS	4	GK	1139 :	1144	35 :	35	Y	PASS		X	PRH	
11/17/04	P29 / P30	WEOS -	EEOS	2	GK	1140 :	1145	35 :	33	Y	PASS		X	PRH	
11/17/04	P28 / P30	NEOS -	SEOS	2	GK	1147 :	1152	35 :	33	Y	PASS		X	PRH	
11/17/04	P26 / P28	NEOS -	SEOS	1	GK	1148 :	1153	35 :	32	Y	PASS		X	PRH	
11/17/04	P31 / P32	WEOS -	EEOS	2	GK	1304 :	1309	35 :	33	Y	PASS		X	PRH	
11/17/04	P29 / P31	SEOS -	DP-4S	1	GK	1304 :	1309	35 :	34	Y	PASS		X	PRH	DP-4S into AT
11/17/04	P29 / P32	SEOS -	NEOS	3	GK	1307 :	1312	35 :	33	Y	PASS		X	MGC	
11/17/04	P30 / P32	NEOS -	DP-4T	4	GK	1308 :	1313	35 :	33	Y	PASS	X		MGC	
11/17/04	P30 / P32	DP-4T -	SEOS	2	GK	1313 :	1318	35 :	34	Y	PASS		X	MGC	
11/18/04	P32 / P34	NEOS -	SEOS	2	GK	0945 :	0954	35 :	33	Y	PASS		X	PRH	
11/18/04	P33 / P34	WEOS -	EEOS	4	GK	1040 :	1045	35 :	34	Y	PASS		X	PRH	
11/18/04	P31 / P34	NEOS -	SEOS	1	GK	1025 :	1030	35 :	34	Y	PASS		X	PRH	
11/18/04	P31 / P33	SEOS -	NEOS	3	GK	1040 :	1045	35 :	34	Y	PASS		X	PRH	
11/18/04	P33 / P36	SEOS -	NEOS	4	GK	1027 :	1032	35 :	32	Y	PASS		X	PRH	
11/18/04	P35 / P36	WEOS -	EEOS	2	GK	1043 :	1048	35 :	33	Y	PASS		X	PRH	
11/18/04	P33 / P35	SEOS -	NEOS	1	GK	1043 :	1048	35 :	32	Y	PASS		X	PRH	
11/18/04	P34 / P36	DP-5G -	NEOS	1	GK	1057 :	1102	35 :	34	Y	PASS	X		PRH	
11/18/04	P34 / P36	DP-5G -	SEOS	1	GK	1127 :	1132	35 :	34	Y	PASS		X	PRH	
11/18/04	P36 / P37	WEOS -	EEOS	2	GK	1127 :	1132	35 :	33	Y	PASS		X	PRH	
11/18/04	P34 / P37	NEOS -	SEOS	3	GK	1128 :	1133	35 :	32	Y	PASS		X	PRH	
11/19/04	P35 / P38	SEOS -	NEOS	1	GK	0913 :	0918	35 :	34	Y	PASS		X	MGC	
11/19/04	P36 / P38	NEOS -	SEOS	2	GK	0913 :	0918	35 :	34	Y	PASS		X	MGC	
11/19/04	P40 / P41	WEOS -	DP-6C	4	GK	0915 :	0920	35 :	33	Y	PASS	X		MGC	
11/19/04	P38 / P41	SEOS -	SEOS	3	GK	0915 :	0920	35 :	34	Y	PASS		X	MGC	
11/19/04	P40 / P41	DP-6C -	EEOS	3	GK	0931 :	0936	34 :	33	Y	PASS		X	MGC	
11/19/04	P41 / P42	SEOS -	NEOS	1	GK	0932 :	0937	35 :	34	Y	PASS		X	MGC	
11/19/04	P40 / P42	NEOS -	SEOS	2	GK	0932 :	0937	34 :	33	Y	PASS		X	MGC	
11/19/04	P42 / P43	WEOS -	EEOS	4	GK	0934 :	0939	35 :	33	Y	PASS		X	MGC	
11/19/04	P38 / P40	NEOS -	SEOS	3	GK	0940 :	0945	35 :	34	Y	PASS		X	MGC	
11/19/04	P40 / P43	NEOS -	SEOS	4	GK	0943 :	0948	35 :	33	Y	PASS		X	MGC	

DATE	SEAM NUMBER	SEAM SECTION* FROM	TO	GAUGE NUMBER	TECH ID	TIME START	TIME FINISH	PRESSURE INITIAL	PRESSURE FINISH	OBS. TEST	RESULTS PASS / FAIL	SEAM COMPLETE NO	SEAM COMPLETE YES	MON.	REMARKS
11/19/04	P38 / P39	EEOS -	WEOS	1	GK	0954 :	0959	35 :	33	Y	PASS		X	MGC	
11/19/04	P36 / P39	NEOS -	SEOS	3	GK	0955 :	1000	35 :	32	Y	PASS		X	MGC	
11/19/04	P39 / P40	NEOS -	SEOS	2	GK	1002 :	1007	35 :	34	Y	PASS		X	MGC	
11/19/04	P37 / P39	NEOS -	SEOS	1	GK	1004 :	1009	35 :	32	Y	PASS		X	MGC	
11/22/04	P44 / P47	NEOS -	SEOS	1	GK	1516 :	1521	35 :	35	Y	PASS		X	MGC	
11/22/04	P44 / P45	EEOS -	WEOS	2	GK	1516 :	1521	35 :	34	Y	PASS		X	MGC	
11/22/04	P43 / P45	NEOS -	SEOS	4	GK	1525 :	1530	35 :	34	Y	PASS		X	MGC	
11/22/04	P43 / P44	NEOS -	SEOS	3	GK	1542 :	1547	35 :	33	Y	PASS		X	MGC	
11/22/04	P45 / P47	SEOS -	NEOS	2	GK	1554 :	1559	35 :	35	Y	PASS		X	MGC	
11/22/04	P42 / P45	SEOS -	NEOS	4	GK	1558 :	1603	35 :	34	Y	PASS		X	MGC	
11/22/04	P45 / P46	SEOS -	NEOS	1	GK	1609 :	1614	35 :	34	Y	PASS		X	MGC	
11/22/04	P46 / P47	WEOS -	EEOS	2	GK	1612 :	1617	35 :	34	Y	PASS		X	MGC	
12/8/04	P47 / P49	NEOS -	SEOS	2	GK	0746 :	751	35 :	34	Y	PASS		X	PRH	
12/8/04	P46 / P49	SEOS -	NEOS	1	GK	0811 :	0816	35 :	34	Y	PASS		X	PRH	
12/8/04	P48 / P50	NEOS -	SEOS	3	GK	0813 :	0818	35 :	34	Y	PASS		X	PRH	
12/8/04	P48 / P49	EEOS -	WEOS	2	GK	0813 :	0818	35 :	33	Y	PASS		X	PRH	
12/8/04	P49 / P50	SEOS -	NEOS	4	GK	0814 :	0819	35 :	34	Y	PASS		X	PRH	
12/8/04	P50 / P53	SEOS -	NEOS	2	GK	0826 :	0831	35 :	34	Y	PASS		X	PRH	
12/8/04	P50 / P51	EESO -	WEOS	3	GK	0826 :	0831	35 :	34	Y	PASS		X	PRH	
12/8/04	P51 / P53	NEOS -	DP-7P	4	GK	0827 :	0832	35 :	33	Y	PASS	X		PRH	
12/8/04	P47 / P48	NEOS -	SEOS	1	GK	0853 :	0858	35 :	34	Y	PASS		X	PRH	
12/8/04	P48 / P51	NEOS -	SEOS	2	GK	0855 :	0900	35 :	34	Y	PASS		X	PRH	
12/8/04	P51 / P53	SDP-7P -	SEOS	3	GK	0856 :	0901	35 :	34	Y	PASS		X	PRH	
12/8/04	P52 / P53	WEOS -	DP-7M	2	GK	0910 :	0915	35 :	34	Y	PASS	X		PRH	
12/8/04	P52 / P53	DP-7M -	EEOS	3	GK	0910 :	0915	35 :	33	Y	PASS		X	PRH	
12/8/04	P51 / P52	NEOS -	SEOS	1	GK	0910 :	0915	35 :	34	Y	PASS		X	PRH	
12/9/04	P53 / P55	SEOS -	NEOS	1	GK	0919 :	0924	35 :	33	Y	PASS		X	MGC	
12/9/04	P54 / P55	WEOS -	EEOS	2	GK	0919 :	0924	35 :	34	Y	PASS		X	MGC	
12/9/04	P54 / P56	NEOS -	SEOS	4	GK	0921 :	0926	35 :	33	Y	PASS		X	MGC	
12/9/04	P55 / P56	SEOS -	DP-8S	3	GK	0940 :	0945	34 :	32	Y	PASS	X		MGC	
12/9/04	P55 / P56	DP-8S -	NEOS	1	GK	0947 :	0952	35 :	34	Y	PASS		X	MGC	

DATE	SEAM NUMBER	SEAM SECTION* FROM	TO	GAUGE NUMBER	TECH ID	TIME START	TIME FINISH	PRESSURE INITIAL	PRESSURE FINISH	OBS. TEST	RESULTS PASS / FAIL	SEAM COMPLETE NO	SEAM COMPLETE YES	MON.	REMARKS
12/9/04	P56 / P59	DP-8E	NEOS	3	GK	0952	0957	35	32	Y	PASS	X		MGC	
12/9/04	P56 / P59	DP-8E	SEOS	4	GK	0952	0957	35	33	Y	PASS		X	MGC	
12/9/04	P56 / P60	SEOS	NEOS	1	GK	1007	1012	35	34	Y	PASS		X	MGC	
12/9/04	P59 / P60	WEOS	EEOS	4	GK	1007	1012	34	33	Y	PASS		X	MGC	
12/9/04	P56 / P57	WEOS	EEOS	3	GK	1048	1053	35	33	Y	PASS		X	MGC	
12/9/04	P53 / P54	NEOS	SEOS	2	GK	1114	1119	35	33	Y	PASS		X	MGC	
12/9/04	P54 / P57	NEOS	SEOS	1	GK	1332	1337	35	34	Y	PASS		X	MGC	
12/9/04	P57 / P59	NEOS	SEOS	2	GK	1333	1338	35	33	Y	PASS		X	MGC	
12/9/04	P58 / P59	WEOS	EEOS	4	GK	1337	1342	34	32	Y	PASS		X	MGC	
12/9/04	P57 / P58	NEOS	DP-9E	3	GK	1422	1427	35	33	Y	PASS	X		MGC	
12/9/04	P57 / P58	DP-9E	SEOS	1	GK	1426	1431	35	32	Y	PASS		X	MGC	
12/9/04	P52 / P54	NEOS	DP-8A	4	GK	1327	1332	35	33	Y	PASS	X		MGC	
12/9/04	P52 / P54	DP-8A	SEOS	2	GK	1429	1434	35	34	Y	PASS		X	MGC	
12/9/04	P58 / P62	NEOS	SEOS	1	GK	1511	1516	35	34	Y	PASS		X	MGC	
12/9/04	P59 / P62	SEOS	NEOS	3	GK	1511	1516	35	32	Y	PASS		X	MGC	
12/9/04	P62 / P64	DP-9A	SEOS	2	GK	1513	1518	35	34	Y	PASS	X		MGC	
12/9/04	P62 / P64	DP-9A	NEOS	4	GK	1513	1518	35	33	Y	PASS		X	MGC	
12/9/04	P64 / P66	NEOS	SEOS	1	GK	1537	1542	35	34	Y	PASS		X	MGC	
12/9/04	P65 / P66	WEOS	EEOS	3	GK	1537	1542	34	33	Y	PASS		X	MGC	
12/9/04	P61 / P62	EEOS	WEOS	2	GK	1536	1541	35	33	Y	PASS		X	MGC	
12/9/04	P59 / P61	SEOS	NEOS	4	GK	1542	1547	35	34	Y	PASS		X	MGC	
12/11/04	P61 / P64	SEOS	DP-9I	1	GK	1039	1044	35	34	Y	PASS	X		PRH	
12/11/04	P64 / P65	SEOS	NEOS	2	GK	1049	1054	35	33	Y	PASS		X	PRH	
12/11/04	P63 / P64	WEOS	EEOS	2	GK	1108	1113	35	34	Y	PASS		X	PRH	
12/11/04	P61 / P64	NEOS	DP-9I	3	GK	1109	1114	35	33	Y	PASS		X	PRH	
12/11/04	P61 / P63	SEOS	NEOS	1	GK	1109	1114	35	33	Y	PASS		X	PRH	
12/11/04	P63 / P65	SEOS	NEOS	4	GK	1150	1155	35	33	Y	PASS		X	PRH	
12/11/04	P60 / P61	SEOS	NEOS	1	GK	1152	1157	35	33	Y	PASS		X	PRH	
12/14/04	P71 / P72	WEOS	EEOS	NA	GK	1050	1055	35	33	Y	PASS		X	GDH	
12/14/04	P68 / P72	SEOS	NEOS	NA	GK	1050	1055	35	33	Y	PASS		X	GDH	
12/14/04	P68 / P71	NEOS	SEOS	NA	GK	1050	1055	35	33	Y	PASS		X	GDH	

DATE	SEAM NUMBER	SEAM SECTION* FROM	TO	GAUGE NUMBER	TECH ID	TIME START	TIME FINISH	PRESSURE INITIAL	PRESSURE FINISH	OBS. TEST	RESULTS PASS / FAIL	SEAM COMPLETE NO	SEAM COMPLETE YES	MON.	REMARKS
12/14/04	P72 / P74	SEOS -	NEOS	NA	GK	1051 :	1056	35 :	34	Y	PASS		X	GDH	
12/14/04	P65 / P68	NEOS -	SEOS	NA	GK	1100 :	1105	35 :	34	Y	PASS		X	GDH	
12/14/04	P70 / P71	WEOS -	EEOS	NA	GK	1104 :	1109	35 :	33	Y	PASS		X	GDH	
12/14/04	P68 / P70	NEOS -	SEOS	NA	GK	1104 :	1109	35 :	33	Y	PASS		X	GDH	
12/14/04	P71 / P74	NEOS -	SEOS	NA	GK	1102 :	1107	35 :	32	Y	PASS		X	GDH	
12/14/04	P69 / P70	WEOS -	EEOS	NA	GK	1118 :	1123	35 :	32	Y	PASS		X	GDH	
12/14/04	P68 / P69	NEOS -	EEOS	NA	GK	1119 :	1124	35 :	34	Y	PASS		X	GDH	
12/14/04	P70 / P74	SEOS -	NEOS	NA	GK	1117 :	1122	35 :	34	Y	PASS		X	GDH	
12/14/04	P69 / P74	NEOS -	SEOS	NA	GK	1117 :	1122	35 :	33	Y	PASS		X	GDH	
12/14/04	P73 / P74	WEOS -	EEOS	NA	GK	1133 :	1138	35 :	33	Y	PASS		X	GDH	
12/14/04	P69 / P73	NEOS -	SEOS	NA	GK	1338 :	1143	35 :	34	Y	PASS		X	GDH	
12/14/04	P67 / P69	NEOS -	SEOS	NA	GK	1341 :	1346	35 :	33	Y	PASS		X	GDH	
12/14/04	P67 / P68	EEOS -	WEOS	NA	GK	1341 :	1346	35 :	34	Y	PASS		X	GDH	
12/14/04	P65 / P67	NEOS -	SEOS	NA	GK	1342 :	1348	35 :	33	Y	PASS		X	GDH	
12/14/04	P66 / P67	DP-11A -	NEOS	NA	GK	1355 :	1401	35 :	34	Y	PASS	X		GDH	
12/14/04	P66 / P67	DP-11A -	SEOS	NA	GK	1355 :	1401	35 :	34	Y	PASS		X	GDH	
12/15/04	P73 / P76	SEOS -	DP-11E	1	GK	1108 :	1113	35 :	33	Y	PASS	X		GDH	
12/15/04	P73 / P77	NEOS -	SEOS	2	GK	1108 :	1113	34 :	33	Y	PASS		X	GDH	
12/15/04	P76 / P77	EEOS -	WEOS	3	GK	1109 :	1114	34 :	33	Y	PASS		X	GDH	
12/15/04	P77 / P79	NEOS -	SEOS	4	GK	1109 :	1114	35 :	32	Y	PASS		X	GDH	
12/15/04	P76 / P79	SEOS -	NEOS	4	GK	1119 :	1114	35 :	33	Y	PASS		X	GDH	
12/15/04	P79 / P80	NEOS -	SEOS	3	GK	1344 :	1349	35 :	35	Y	PASS		X	GDH	
12/15/04	P80 / P81	WEOS -	EEOS	4	GK	1345 :	1359	35 :	33	Y	PASS		X	GDH	
12/15/04	P79 / P81	SEOS -	NEOS	2	GK	1345 :	1359	34 :	33	Y	PASS		X	GDH	
12/15/04	P80 / P83	NEOS -	SEOS	1	GK	1346 :	1351	35 :	33	Y	PASS		X	GDH	
12/15/04	P76 / P78	SEOS -	NEOS	1	GK	1402 :	1407	35 :	34	Y	PASS		X	GDH	
12/15/04	P78 / P79	WEOS -	EEOS	2	GK	1402 :	1407	35 :	33	Y	PASS		X	GDH	
12/15/04	P73 / P76	DP-11E -	NEOS	3	GK	1403 :	1408	35 :	34	Y	PASS		X	GDH	
12/15/04	P74 / P76	SEOS -	NEOS	1	GK	1419 :	1424	35 :	34	Y	PASS		X	GDH	
12/15/04	P74 / P75	SEOS -	NEOS	2	GK	1421 :	1426	35 :	34	Y	PASS		X	GDH	
12/15/04	P75 / P76	WEOS -	EEOS	3	GK	1422 :	1427	34 :	32	Y	PASS		X	GDH	

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12/15/04	P75 / P78	SEOS -	NEOS	4	GK	1403 :	1408	35 :	34	Y	PASS		X	GDH	
12/15/04	P81 / P82	WEOS -	EEOS	3	GK	1503 :	1508	34 :	32	Y	PASS		X	GDH	
12/15/04	P78 / P82	SEOS -	NEOS	1	GK	1503 :	1508	35 :	32	Y	PASS		X	GDH	
12/15/04	P78 / P81	DP-11Q -	NEOS	4	GK	1505 :	1510	35 :	34	Y	PASS	X		GDH	
12/15/04	P78 / P81	DP-11Q -	SEOS	2	GK	1505 :	1510	35 :	35	Y	PASS		X	GDH	
12/15/04	P81 / P84	NEOS -	SEOS	1	GK	1524 :	1529	35 :	34	Y	PASS		X	GDH	
12/15/04	P82 / P84	SEOS -	NEOS	3	GK	1524 :	1529	35 :	34	Y	PASS		X	GDH	
12/15/04	P83 / P84	WEOS -	EEOS	2	GK	1537 :	1542	35 :	33	Y	PASS		X	GDH	
12/15/04	P81 / P83	NEOS -	SEOS	1	GK	1537 :	1542	35 :	35	Y	PASS		X	GDH	
1/3/05	P85 / P88	SEOS -	DP-14T	4	GK	1325 :	1330	35 :	34	Y	PASS		X	MGC	DP-14T Caps to NEOS
1/3/05	P92 / P93	SEOS -	NEOS	2	GK	1433 :	1438	34 :	31	Y	PASS		X	MGC	
1/3/05	P90 / P93	NEOS -	SEOS	4	GK	1433 :	1438	35 :	33	Y	PASS		X	MGC	
1/3/05	P93 / P94	EEOS -	WEOS	1	GK	1437 :	1442	35 :	34	Y	PASS		X	MGC	
1/3/05	P93 / P95	SEOS -	NEOS	3	GK	1437 :	1442	35 :	32	Y	PASS		X	MGC	
1/3/05	P94 / P95	NEOS -	SEOS	1	GK	1523 :	1528	35 :	33	Y	PASS		X	MGC	
1/3/05	P90 / P94	NEOS -	DP-13K	4	GK	1524 :	1529	35 :	33	Y	PASS	X		MGC	
1/3/05	P95 / P98	SEOS -	NEOS	3	GK	1531 :	1536	35 :	35	Y	PASS		X	MGC	
1/3/05	P95 / P96	EEOS -	WEOS	4	GK	1606 :	1611	34 :	33	Y	PASS		X	MGC	
1/3/05	P96 / P99	NEOS -	DP-13T	1	GK	1606 :	1611	35 :	34	Y	PASS		X	MGC	DP-13T Cups to SEOS
1/3/05	P98 / P99	WEOS -	EEOS	3	GK	1612 :	1617	35 :	34	Y	PASS		X	MGC	
1/3/05	P83 / P87	NEOS -	SEOS	1	GK	0942 :	0947	34 :	31	Y	PASS		X	MGC	
1/3/05	P87 / P89	NEOS -	DP-12M	2	GK	0943 :	0948	35 :	33	Y	PASS	X		MGC	
1/3/05	P89 / P91	NEOS -	SEOS	4	GK	0946 :	0951	35 :	33	Y	PASS		X	MGC	
1/3/05	P87 / P89	DP-12M -	SEOS	3	GK	0949 :	0954	35 :	34	Y	PASS		X	MGC	
1/3/05	P90 / P91	WEOS -	EEOS	4	GK	1003 :	1008	35 :	34	Y	PASS		X	MGC	
1/3/05	P86 / P89	SEOS -	NEOS	3	GK	1006 :	1011	34 :	32	Y	PASS		X	MGC	
1/3/05	P86 / P87	EEOS -	WEOS	2	GK	1006 :	1011	34 :	32	Y	PASS		X	MGC	
1/3/05	P83 / P86	SEOS -	NEOS	1	GK	1022 :	1027	35 :	33	Y	PASS		X	MGC	
1/3/05	P89 / P90	SEOS -	DP-12R	4	GK	1032 :	1037	35 :	33	Y	PASS	X		MGC	
1/3/05	P84 / P86	SEOS -	NEOS	1	GK	1053 :	1058	35 :	34	Y	PASS		X	MGC	
1/3/05	P86 / P88	SEOS -	NEOS	2	GK	1103 :	1108	35 :	32	Y	PASS		X	MGC	

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1/3/05	P88 / P89	WEOS -	EEOS	3	GK	1054 :	1059	34 :	32	Y	PASS		X	MGC	
1/3/05	P88 / P90	SEOS -	NEOS	4	GK	1114 :	1119	35 :	34	Y	PASS		X	MGC	
1/3/05	P90 / P92	WEOS -	EEOS	1	GK	1117 :	1122	34 :	33	Y	PASS		X	MGC	
1/3/05	P88 / P92	SEOS -	NEOS	2	GK	1117 :	1122	35 :	34	Y	PASS		X	MGC	
1/3/05	P85 / P86	WEOS -	EEOS	3	GK	1119 :	1124	35 :	32	Y	PASS		X	MGC	
1/3/05	P89 / P90	NEOS -	DP-12R	4	GK	1056 :	1101	35 :	33	Y	PASS		X	MGC	
1/3/05	P84 / P85	SEOS -	NEOS	1	GK	1128 :	1133	35 :	33	Y	PASS		X	MGC	
1/7/05	P90 / P94	SEOS -	DP-13K	2	CB	1331 :	1336	35 :	34	Y	PASS		X	MGC	
1/7/05	P91 / P94	NEOS -	SEOS	1	CB	1331 :	1336	35 :	34	Y	PASS		X	MGC	
1/7/05	P94 / P96	DP-15H -	SEOS	2	CB	1400 :	1405	35 :	34	Y	PASS	X		MGC	
1/7/05	P94 / P96	DP-15H -	NEOS	1	CB	1403 :	1408	35 :	35	Y	PASS		X	MGC	
1/7/05	P96 / P97	SEOS -	DP-13Q	2	CB	1414 :	1419	35 :	35	Y	PASS	X		MGC	
1/7/05	P96 / P97	NEOS -	DP-13Q	1	CB	1426 :	1431	35 :	34	Y	PASS		X	MGC	
1/7/05	P97 / P99	WEOS -	EEOS	2	CB	1426 :	1431	35 :	33	Y	PASS		X	MGC	
1/7/05	P97 / P101	NEOS -	SEOS	1	CB	1436 :	1441	35 :	34	Y	PASS		X	MGC	
1/7/05	P99 / P101	SEOS -	NEOS	2	CB	1436 :	1441	35 :	33	Y	PASS		X	MGC	
1/7/05	P98 / P101	NEOS -	SEOS	2	CB	1508 :	1513	35 :	33	Y	PASS		X	MGC	
1/7/05	P100 / P101	WEOS -	EEOS	1	CB	1515 :	1520	35 :	34	Y	PASS		X	MGC	
1/7/05	P101 / P102	NEOS -	SEOS	4	CB	1600 :	1605	35 :	35	Y	PASS		X	MGC	
1/7/05	P102 / P103	WEOS -	EEOS	2	CB	1637 :	1642	35 :	34	Y	PASS		X	MGC	
1/7/05	P95 / P99	NEOS -	SEOS	NA	NA	NA :	NA	NA :	NA	NA	NA	NA	NA	NA	Capped by DP-13S
1/8/05	P101 / P103	SEOS -	NEOS	3	CB	0734 :	0739	35 :	33	Y	PASS		X	PRH	
1/8/05	P98 / P100	SEOS -	DP-15S	3	CB	0748 :	0753	35 :	35	Y	PASS	X		PRH	
1/8/05	P100 / P103	SEOS -	DP-15W	1	CB	0802 :	0807	35 :	35	Y	PASS	X		PRH	
1/8/05	P100 / P103	DP-15W -	DP-15T	3	CB	0804 :	0809	35 :	32	Y	PASS	X		PRH	
1/8/05	P100 / P103	DP15T -	NEOS	2	CB	0805 :	0810	35 :	35	Y	PASS		X	PRH	
1/8/05	P98 / P100	DP-15S -	NEOS	2	CB	0820 :	0825	35 :	35	Y	PASS		X	PRH	
1/8/05	P103 / P104	WEOS -	EEOS	3	CB	0826 :	0831	35 :	35	Y	PASS		X	PRH	
1/8/05	P100 / P104	SEOS -	NEOS	1	CB	0830 :	0835	35 :	35	Y	PASS		X	PRH	
2/12/05	P106 / P107	NEOS -	DP-18F	2	JH	0846 :	0851	35 :	33	Y	PASS	X		PRH	
2/12/05	P106 / P107	DP-18F -	SEOS	3	JH	0848 :	0853	35 :	35	Y	PASS		X	PRH	

DATE	SEAM NUMBER	SEAM SECTION* FROM	TO	GAUGE NUMBER	TECH ID	TIME START	TIME FINISH	PRESSURE INITIAL	PRESSURE FINISH	OBS. TEST	RESULTS PASS / FAIL	SEAM COMPLETE NO	SEAM COMPLETE YES	MON.	REMARKS
2/12/05	P107 / P108	WEOS -	EEOS	4	JH	0849	0854	35	33	Y	PASS		X	PRH	
2/12/05	P106 / P108	NEOS -	SEOS	1	JH	0850	0855	35	34	Y	PASS		X	PRH	
2/12/05	P104 / P106	SEOS -	NEOS	1	JH	0907	0912	35	34	Y	PASS		X	PRH	
2/12/05	P103 / P106	NEOS -	SEOS	4	JH	0909	0914	35	33	Y	PASS		X	PRH	
2/12/05	P105 / P106	WEOS -	EEOS	3	JH	0947	0952	35	34	Y	PASS		X	PRH	
2/12/05	P105 / P108	NEOS -	SEOS	1	JH	0948	0953	35	34	Y	PASS		X	PRH	
2/12/05	P103 / P105	NEOS -	SEOS	2	JH	0949	0954	35	34	Y	PASS		X	PRH	
2/12/05	P102 / P105	SEOS -	NEOS	3	JH	1003	1008	36	35	Y	PASS		X	PRH	
2/12/05	P108 / P109	WEOS -	EEOS	2	JH	1005	1010	35	35	Y	PASS		X	PRH	
2/12/05	P105 / P109	NEOS -	SEOS	4	JH	1005	1010	36	34	Y	PASS		X	PRH	
2/12/05	P108 / P111	SEOS -	NEOS	2	JH	1122	1127	35	32	Y	PASS		X	MGC	
2/12/05	P109 / P111	NEOS -	SEOS	1	JH	1126	1131	36	34	Y	PASS		X	MGC	
2/12/05	P110 / P111	WEOS -	EEOS	2	JH	1136	1141	35	32	Y	PASS		X	MGC	
2/12/05	P108 / P110	SEOS -	NEOS	1	JH	1148	1153	36	34	Y	PASS		X	MGC	
2/12/05	P107 / P110	SEOS -	NEOS	4	JH	1153	1158	35	34	Y	PASS		X	MGC	
2/12/05	P111 / P113	NEOS -	SEOS	1	JH	1418	1423	36	34	Y	PASS		X	PRH	
2/12/05	P110 / P113	SEOS -	NEOS	1	JH	1352	1357	35	35	Y	PASS		X	PRH	
2/12/05	P112 / P113	WEOS -	EEOS	4	JH	1351	1356	35	35	Y	PASS		X	PRH	
2/12/05	P110 / P112	SEOS -	NEOS	2	JH	1352	1357	35	35	Y	PASS		X	PRH	
2/12/05	P113 / P114	SEOS -	DP-19E	2	JH	1603	1608	35	35	Y	PASS	X		MGC	
2/12/05	P113 / P115	NEOS -	SEOS	1	JH	1605	1610	36	35	Y	PASS		X	MGC	
2/12/05	P114 / P115	WEOS -	EEOS	4	JH	1606	1611	35	33	Y	PASS		X	MGC	
2/12/05	P113 / P114	NEOS -	DP-19E	2	JH	1617	1622	36	35	Y	PASS		X	MGC	
2/12/05	P112 / P114	SEOS -	NEOS	1	JH	1617	1622	35	34	Y	PASS		X	MGC	
2/14/05	P114 / P117	SEOS -	NEOS	1	JH	1103	1108	35	34	Y	PASS		X	MGC	
2/14/05	P116 / P117	WEOS -	EEOS	2	JH	1104	1109	36	34	Y	PASS		X	MGC	
2/14/05	P114 / P116	NEOS -	SEOS	3	JH	1120	1125	35	33	Y	PASS		X	MGC	
2/14/05	P115 / P116	NEOS -	SEOS	1	JH	1320	1325	35	34	Y	PASS		X	PRH	
2/14/05	P118 / P119	WEOS -	EEOS	2	JH	1442	1447	36	35	Y	PASS		X	MGC	
2/14/05	P117 / P119	SEOS -	NEOS	1	JH	1442	1447	35	34	Y	PASS		X	MGC	
2/14/05	P117 / P118	NEOS -	DP-19P	1	JH	1456	1501	36	33	Y	PASS	X		MGC	

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2/14/05	P117 / P118	DP-19P	SEOS	1	JH	1514	1519	35	35	Y	PASS		X	PRH	
2/14/05	P116 / P118	NEOS	SEOS	2	JH	1516	1521	35	33	Y	PASS		X	PRH	
3/28/05	P137 / P138	SEOS	NEOS	9	JH	0804	0809	36	35	Y	PASS		X	MSP	
3/28/05	P135 / P137	SEOS	NEOS	10	JH	0758	0803	36	36	Y	PASS		X	MSP	
3/28/05	P136 / P137	SEOS	NEOS	11	JH	0800	0805	35	34	Y	PASS		X	MSP	
3/28/05	P135 / P136	EEOS	WEOS	10	JH	0808	0813	35	34	Y	PASS		X	MSP	
3/28/05	P134 / P136	NEOS	SEOS	11	JH	0809	0814	35	34	Y	PASS		X	MSP	
3/28/05	P134 / P135	SEOS	NEOS	9	JH	0811	0816	35	34	Y	PASS		X	MSP	
3/28/05	P131 / P133	SEOS	NEOS	10	JH	0823	0828	35	34	Y	PASS		X	MSP	
3/28/05	P132 / P133	SEOS	NEOS	9	JH	0823	0828	36	35	Y	PASS		X	MSP	
3/28/05	P131 / P132	EEOS	WEOS	10	JH	0832	0837	36	35	Y	PASS		X	MSP	
3/28/05	P133 / P134	SEOS	DP-20X	11	JH	0834	0839	35	33	Y	PASS	X		MSP	
3/28/05	P133 / P134	DP-20X	NEOS	9	JH	0836	0841	36	35	Y	PASS		X	MSP	
3/28/05	P127 / P131	SEOS	NEOS	11	JH	0841	0846	35	33	Y	PASS		X	MSP	
3/28/05	P121 / P127	SEOS	NEOS	10	JH	0910	0915	35	34	Y	PASS		X	MSP	
3/28/05	P121 / P128	EEOS	WEOS	11	JH	0911	0916	36	34	Y	PASS		X	MSP	
3/28/05	P127 / P128	NEOS	SEOS	9	JH	0914	0919	36	35	Y	PASS		X	MSP	
3/28/05	P121 / P129	NEOS	SEOS	11	JH	0923	0928	35	33	Y	PASS		X	MSP	
3/28/05	P128 / P129	NEOS	SEOS	9	JH	0922	0927	35	34	Y	PASS		X	MSP	
3/28/05	P129 / P130	NEOS	SEOS	11	JH	0924	0829	35	34	Y	PASS		X	MSP	
3/28/05	P121 / P130	NEOS	SEOS	11	JH	0932	0937	35	33	Y	PASS		X	MSP	
3/28/05	P121 / P122	WEOS	EEOS	10	JH	0934	0939	36	35	Y	PASS		X	MSP	
3/28/05	P120 / P122	EEOS	WEOS	9	JH	0944	0949	35	34	Y	PASS		X	MSP	
3/28/05	P122 / P123	NEOS	SEOS	11	JH	0943	0948	35	34	Y	PASS		X	MSP	
3/28/05	P120 / P123	EEOS	WEOS	10	JH	0943	0948	35	34	Y	PASS		X	MSP	
3/28/05	P120 / P124	EEOS	WEOS	10	JH	0951	0956	35	35	Y	PASS		X	MSP	
3/28/05	P123 / P124	NEOS	SEOS	9	JH	0951	0956	36	35	Y	PASS		X	MSP	
3/28/05	P124 / P125	NEOS	SEOS	11	JH	0954	0959	35	34	Y	PASS		X	MSP	
3/28/05	P120 / P125	EEOS	WEOS	10	JH	0958	1003	35	33	Y	PASS		X	MSP	
3/28/05	P120 / P126	EEOS	WEOS	9	JH	1001	1006	35	34	Y	PASS		X	MSP	
3/28/05	P125 / P126	NEOS	SEOS	11	JH	1006	1011	35	33	Y	PASS		X	MSP	

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3/28/05	P120 / P140	WEOS -	EEOS	10	JH	1005 :	1010	35 :	34	Y	PASS		X	MSP	
3/28/05	P140 / P142	EEOS -	WEOS	11	JH	1013 :	1018	36 :	34	Y	PASS		X	MSP	
3/28/05	P141 / P142	SEOS -	NEOS	9	JH	1014 :	1019	35 :	34	Y	PASS		X	MSP	
3/28/05	P140 / P141	WEOS -	EEOS	10	JH	1015 :	1020	35 :	35	Y	PASS		X	MSP	
3/28/05	P142 / P143	EEOS -	WEOS	10	JH	1022 :	1027	36 :	35	Y	PASS		X	MSP	
3/28/05	P141 / P143	WEOS -	EEOS	11	JH	1023 :	1028	35 :	34	Y	PASS		X	MSP	
3/28/05	P144 / P145	EEOS -	WEOS	11	JH	1039 :	1044	35 :	33	Y	PASS		X	MSP	
3/28/05	P145 / P146	SEOS -	NEOS	9	JH	1040 :	1045	35 :	34	Y	PASS		X	MSP	
3/28/05	P143 / P144	WEOS -	EEOS	10	JH	1038 :	1043	35 :	33	Y	PASS		X	MSP	
3/28/05	P145 / P147	EEOS -	WEOS	10	JH	1049 :	1054	35 :	33	Y	PASS		X	MSP	
3/28/05	P146 / P147	WEOS -	EEOS	9	JH	1050 :	1055	36 :	34	Y	PASS		X	MSP	
3/28/05	P144 / P146	WEOS -	EEOS	11	JH	1055 :	1100	35 :	33	Y	PASS		X	MSP	
3/28/05	P147 / P149	EEOS -	WEOS	11	JH	1104 :	1109	35 :	33	Y	PASS		X	MSP	
3/28/05	P148 / P149	SEOS -	NEOS	10	JH	1105 :	1110	35 :	34	Y	PASS		X	MSP	
3/28/05	P147 / P148	WEOS -	DP-21T	9	JH	1108 :	1113	36 :	34	Y	PASS	X		MSP	
3/28/05	P147 / P148	DP-21W -	DP-21T	11	JH	1116 :	1121	35 :	33	Y	PASS	X		MSP	
3/28/05	P147 / P148	DP-21W -	EEOS	10	JH	1117 :	1122	35 :	34	Y	PASS		X	MSP	
3/28/05	P138 / P139	NEOS -	SEOS	10	JH	0752 :	0757	35 :	34	Y	PASS		X	MSP	
3/28/05	P127 / P132	NEOS -	SEOS	9	JH	0907 :	0912	36 :	35	Y	PASS		X	MSP	
3/31/05	P118 / P154	SEOS -	NEOS	1	JH	1026 :	1031	36 :	34	Y	PASS		X	MSP	
3/31/05	P118 / P155	NEOS -	SEOS	3	JH	1027 :	1032	36 :	34	Y	PASS		X	MSP	
3/31/05	P154 / P155	WEOS -	EEOS	7	JH	1028 :	1033	35 :	33	Y	PASS		X	MSP	
3/31/05	P155 / P156	NEOS -	SEOS	1	JH	1035 :	1040	35 :	33	Y	PASS		X	MSP	
3/31/05	P154 / P156	SEOS -	NEOS	7	JH	1036 :	1041	35 :	33	Y	PASS		X	MSP	
3/31/05	P156 / P157	SEOS -	NEOS	2	JH	1043 :	1048	36 :	35	Y	PASS		X	MSP	
3/31/05	P156 / P158	NEOS -	SEOS	4	JH	1044 :	1049	36 :	35	Y	PASS		X	MSP	
3/31/05	P157 / P158	WEOS -	EEOS	3	JH	1045 :	1050	35 :	35	Y	PASS		X	MSP	
3/31/05	P157 / P159	SEOS -	NEOS	5	JH	1046 :	1051	35 :	35	Y	PASS		X	MSP	
3/31/05	P158 / P159	NEOS -	SEOS	7	JH	1046 :	1051	36 :	35	Y	PASS		X	MSP	
3/31/05	P158 / P160	NEOS -	SEOS	7	JH	1100 :	1105	36 :	34	Y	PASS		X	MSP	
3/31/05	P159 / P160	WEOS -	EEOS	4	JH	1101 :	1106	36 :	34	Y	PASS		X	MSP	

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3/31/05	P159 / P161	SEOS -	NEOS	3	JH	1102 :	1107	36 :	34	Y	PASS		X	MSP	
3/31/05	P160 / P161	NEOS -	SEOS	1	JH	1103 :	1108	36 :	34	Y	PASS		X	MSP	
3/31/05	P161 / P162	SEOS -	NEOS	7	JH	1122 :	1127	35 :	33	Y	PASS		X	MSP	
3/31/05	P149 / P153	EEOS -	WEOS	4	JH	1401 :	1406	36 :	36	Y	PASS		X	MSP	
3/31/05	P152 / P153	EEOS -	WEOS	3	JH	1401 :	1406	35 :	35	Y	PASS		X	MSP	
3/31/05	P149 / P152	WEOS -	EEOS	7	JH	1402 :	1407	36 :	36	Y	PASS		X	MSP	
3/31/05	P150 / P152	DP-23H -	EEOS	3	JH	1409 :	1414	36 :	36	Y	PASS	X		MSP	
3/31/05	P150 / P152	DP-23H -	WEOS	4	JH	1410 :	1415	35 :	35	Y	PASS		X	MSP	
3/31/05	P148 / P152	WEOS -	EEOS	7	JH	1416 :	1421	36 :	33	Y	PASS		X	MSP	
3/31/05	P148 / P151	WEOS -	EEOS	4	JH	1418 :	1423	35 :	34	Y	PASS		X	MSP	
3/31/05	P151 / P152	SEOS -	NEOS	3	JH	1419 :	1424	35 :	35	Y	PASS		X	MSP	
3/31/05	P148 / P150	WEOS -	EEOS	4	JH	1426 :	1431	36 :	34	Y	PASS		X	MSP	
3/31/05	P150 / P151	EEOS -	WEOS	4	JH	1453 :	1458	35 :	35	Y	PASS		X	MSP	
4/1/05	P162 / P163	DP-23R -	SEOS	2	JH	1006 :	1011	36 :	35	Y	PASS	X		MGC	
4/1/05	P162 / P163	DP-23R -	NEOS	1	JH	1007 :	1012	36 :	33	Y	PASS		X	MGC	
4/1/05	P163 / P164	SEOS -	NEOS	1	JH	1015 :	1020	36 :	34	Y	PASS		X	MGC	
4/1/05	P164 / P165	SEOS -	NEOS	2	JH	1017 :	1022	35 :	32	Y	PASS		X	MGC	
4/1/05	P165 / P166	SEOS -	NEOS	1	JH	1055 :	1100	35 :	33	Y	PASS		X	MGC	
4/1/05	P165 / P172	NEOS -	SEOS	2	JH	1056 :	1101	36 :	34	Y	PASS		X	MGC	
4/1/05	P166 / P172	WEOS -	EEOS	3	JH	1103 :	1108	36 :	35	Y	PASS		X	MGC	
4/1/05	P167 / P172	NEOS -	SEOS	2	JH	1105 :	1110	36 :	34	Y	PASS		X	MGC	
4/1/05	P166 / P167	SEOS -	NEOS	1	JH	1105 :	1110	36 :	33	Y	PASS		X	MGC	
4/1/05	P168 / P169	SEOS -	NEOS	2	JH	1115 :	1120	35 :	33	Y	PASS		X	MGC	
4/1/05	P167 / P168	SEOS -	NEOS	1	JH	1116 :	1121	36 :	35	Y	PASS		X	MGC	
4/1/05	P169 / P170	SEOS -	NEOS	1	JH	1123 :	1128	35 :	33	Y	PASS		X	MGC	
4/1/05	P170 / P171	SEOS -	NEOS	3	JH	1125 :	1130	36 :	33	Y	PASS		X	MGC	
4/4/05	P197 / P197A	NEOS -	SEOS	2	JH	0727 :	732	36 :	36	Y	PASS		X	MGC	
4/4/05	P196 / P197	NEOS -	SEOS	1	JH	0729 :	0734	36 :	36	Y	PASS		X	MGC	
4/4/05	P194 / P195	NEOS -	SEOS	1	JH	0742 :	0747	36 :	35	Y	PASS		X	MGC	
4/4/05	P192 / P194	NEOS -	SEOS	2	JH	0747 :	0752	36 :	35	Y	PASS		X	MGC	
4/4/05	P195 / P196	NEOS -	SEOS	7	JH	0748 :	0753	35 :	34	Y	PASS		X	MGC	

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4/4/05	P191 / P192	NEOS	SEOS	7	JH	0755	800	36	33	Y	PASS		X	MGC	
4/4/05	P186 / P187	SEOS	NEOS	2	JH	0759	804	36	35	Y	PASS		X	MGC	
4/4/05	P186 / P191	SEOS	NEOS	1	JH	0800	805	36	35	Y	PASS		X	MGC	
4/4/05	P187 / P188	NEOS	SEOS	7	JH	0801	0806	35	34	Y	PASS		X	MGC	
4/4/05	P192 / P193	NEOS	SEOS	1	JH	0812	0817	36	35	Y	PASS		X	MGC	
4/4/05	P193 / P194	WEOS	EEOS	2	JH	0814	0819	36	36	Y	PASS		X	MGC	
4/4/05	P193 / P195	NEOS	SEOS	7	JH	0817	0822	35	34	Y	PASS		X	MGC	
4/4/05	P185 / P187	NEOS	SEOS	2	JH	0832	0837	36	35	Y	PASS		X	MGC	
4/4/05	P185 / P191	NEOS	SEOS	3	JH	0825	0830	36	35	Y	PASS		X	MSP	
4/4/05	P178 / P186	EEOS	WEOS	3	JH	0852	0857	36	35	Y	PASS		X	MSP	
4/4/05	P178 / P187	EEOS	WEOS	2	JH	0855	0900	35	34	Y	PASS		X	MSP	
4/4/05	P179 / P187	EEOS	WEOS	4	JH	0856	0901	35	32	Y	PASS		X	MSP	
4/4/05	P178 / P179	EEOS	WEOS	1	JH	0856	0901	35	35	Y	PASS		X	MSP	
4/4/05	P179 / P188	EEOS	WEOS	3	JH	0857	0904	35	34	Y	PASS		X	MSP	
4/4/05	P179 / P181	EEOS	WEOS	1	JH	0905	0910	36	34	Y	PASS		X	MSP	
4/4/05	P181 / P188	EEOS	WEOS	2	JH	0906	0911	36	35	Y	PASS		X	MSP	
4/4/05	P188 / P189	SEOS	NEOS	1	JH	0917	0922	35	34	Y	PASS		X	MSP	
4/4/05	P181 / P189	EEOS	WEOS	2	JH	0919	0924	35	34	Y	PASS		X	MSP	
4/4/05	P182 / P189	EEOS	WEOS	4	JH	0947	0952	35	34	Y	PASS		X	MSP	
4/4/05	P183 / P190	EEOS	WEOS	3	JH	0944	0949	36	34	Y	PASS		X	MSP	
4/4/05	P184 / P190	SEOS	NEOS	1	JH	0954	0959	35	35	Y	PASS		X	MSP	
4/4/05	P183 / P184	NEOS	SEOS	4	JH	0958	1003	35	34	Y	PASS		X	MSP	
4/4/05	P184 / P184A	NEOS	SEOS	7	JH	0959	1004	35	34	Y	PASS		X	MSP	
4/4/05	P184A / P190	NEOS	SEOS	2	JH	1000	1005	35	34	Y	PASS		X	MSP	
4/4/05	P184A / P190A	EEOS	WEOS	3	JH	1012	1017	35	34	Y	PASS		X	MSP	
4/4/05	P190 / P190A	SEOS	NEOS	2	JH	1012	1017	36	34	Y	PASS		X	MSP	
4/4/05	P179 / P180	NEOS	SEOS	3	JH	0908	0913	36	34	Y	PASS		X	MSP	
4/4/05	P180 / P181	EEOS	WEOS	1	JH	1045	1050	36	35	Y	PASS		X	MSP	
4/4/05	P178 / P180	EEOS	WEOS	4	JH	1047	1052	36	34	Y	PASS		X	MSP	
4/4/05	P177 / P178	WEOS	EEOS	1	JH	1055	1100	36	36	Y	PASS		X	MSP	
4/4/05	P176 / P177	EEOS	WEOS	4	JH	1057	1102	36	33	Y	PASS		X	MSP	

DATE	SEAM NUMBER	SEAM SECTION* FROM	TO	GAUGE NUMBER	TECH ID	TIME START	TIME FINISH	PRESSURE INITIAL	PRESSURE FINISH	OBS. TEST	RESULTS PASS / FAIL	SEAM COMPLETE NO	SEAM COMPLETE YES	MON.	REMARKS
4/4/05	P175 / P177	WEOS	EEOS	1	JH	1103	1108	35	33	Y	PASS		X	MSP	
4/4/05	P175 / P176	NEOS	SEOS	4	JH	1105	1110	35	32	Y	PASS		X	MSP	
4/4/05	P182 / P183	EEOS	WEOS	4	JH	1114	1119	36	34	Y	PASS		X	MSP	
4/4/05	P181 / P182	EEOS	WEOS	1	JH	1115	1120	36	34	Y	PASS		X	MSP	
4/4/05	P174 / P176	EEOS	WEOS	4	JH	1123	1128	35	34	Y	PASS		X	MSP	
4/4/05	P175 / P174	WEOS	EEOS	1	JH	1124	1129	36	34	Y	PASS		X	MSP	
4/4/05	P173 / P174	WEOS	EEOS	1	JH	1132	1137	36	34	Y	PASS		X	MSP	
4/4/05	P150 / P173	WEOS	EEOS	4	JH	1133	1138	36	35	Y	PASS		X	MSP	
4/4/05	P201 / P202	NEOS	SEOS	4	JH	1149	1154	35	33	Y	PASS		X	MSP	
4/4/05	P200 / P201	NEOS	SEOS	1	JH	1150	1155	35	33	Y	PASS		X	MSP	
4/4/05	P199 / P200	WEOS	EEOS	4	JH	1314	1319	36	34	Y	PASS		X	MSP	
4/4/05	P198 / P199	NEOS	SEOS	1	JH	1316	1321	35	32	Y	PASS		X	MSP	
4/4/05	P198 / P198	NEOS	SEOS	1	JH	1323	1328	35	34	Y	PASS		X	MSP	
4/4/05	P119 / P198	NEOS	SEOS	4	JH	1325	1330	35	34	Y	PASS		X	MSP	
4/4/05	P118 / P198	NEOS	SEOS	1	JH	1329	1334	35	34	Y	PASS		X	MSP	
4/4/05	P182 / P190	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A			N/A	CAPPED BY DP-25B
4/4/05	P185 / P186	WEOS	EEOS	1	JH	835	840	36	35	Y	PASS		X	MGC	

VACUUM TEST LOG

PROJECT NUMBER:	**043-2246**	**PROJECT TITLE:**	**Rocky Flats, Present Landfill**
LINER INSTALLER:	**Colorado Lining**	**CONTRACTOR:**	**S.M. Stoller**
LOCATION:	**Rocky Flats**	**SITE MANAGER:**	**Kaiser Hill Company LLC**

DEFECT CODE	TEST DATE	TECH ID	DEFECTS	OBS. TEST	MON.	REMARKS
DP1 A	11/2/04	GK	none	Y	MGC	DFp-001
DP1 B	11/2/04	GK	none	Y	MGC	
DP1 C	11/2/04	GK	none	Y	PRH	
DP1 D	11/2/04	GK	none	Y	MGC	
DP1 E	11/2/04	GK	none	Y	MGC	
DP1 F	11/2/04	GK	none	Y	MGC	
DP1 G	11/6/04	GK	none	Y	PRH	
DP1 H	11/6/04	GK	none	Y	PRH	DFp-002
DP1 I	11/6/04	GK	none	Y	PRH	
DP1 J	11/6/04	GK	none	Y	PRH	
DP1 K	11/6/04	GK	none	Y	PRH	
DP1 M	11/6/04	GK	none	Y	PRH	
DP1 N	11/6/04	GK	none	Y	PRH	
DP1 P	11/6/04	GK	none	Y	PRH	
DP1 Q	11/6/04	GK	none	Y	PRH	
DP1 R	11/6/04	GK	none	Y	PRH	
DP1 S	11/6/04	GK	none	Y	PRH	DFp-003
DP1 T	11/6/04	GK	none	Y	PRH	
DP1 W	11/6/04	GK	none	Y	PRH	
DP1 X	11/6/04	GK	none	Y	PRH	
DP2 A	11/6/04	GK	none	Y	PRH	
DP2 B	11/6/04	GK	none	Y	PRH	
DP2 C	11/6/04	GK	none	Y	PRH	
DP2 D	11/6/04	GK	none	Y	PRH	DFp-004
DP2 E	11/6/04	GK	none	Y	PRH	
DP2 F	11/6/04	GK	none	Y	PRH	
DP2 G	11/6/04	GK	none	Y	PRH	
DP2 H	11/6/04	GK	none	Y	PRH	DFp-005
DP2 I	NA	NA	NA	NA	NA	Rocky Pulled no patch
DP2 J	11/6/04	GK	none	Y	PRH	
DP2 K	11/6/04	GK	none	Y	PRH	
DP2 M	11/6/04	GK	none	Y	PRH	
DP2 N	11/6/04	GK	none	Y	PRH	
DP2 P	11/6/04	GK	none	Y	PRH	
DP2 Q	11/6/04	GK	none	Y	PRH	
DP2 R	11/12/04	RD	none	Y	MGC	
DP2 S	11/12/04	RD	none	Y	MGC	DFp-006
DP2 T	11/12/04	RD	none	Y	MGC	
DP2 W	11/12/04	RD	none	Y	MGC	
DP2 X	11/12/04	RD	none	Y	MGC	DFp-007
DP3 A	11/12/04	RD	none	Y	MGC	
DP3 B	11/12/04	RD	none	Y	MGC	
DP3 C	11/12/04	RD	none	Y	MGC	DFp-008
DP3 D	11/12/04	RD	none	Y	MGC	
DP3 E	11/12/04	RD	none	Y	MGC	

DEFECT CODE	TEST DATE	TECH ID	DEFECTS	OBS. TEST	MON.	REMARKS
DP3 F	11/12/04	RD	none	Y	MGC	
DP3 G	11/12/04	RD	none	Y	MGC	
DP3 H	11/12/04	RD	none	Y	MGC	
DP3 I	11/12/04	RD	none	Y	MGC	
DP3 J	11/15/04	RD	none	Y	PRH	
DP3 K	11/15/04	RD	none	Y	PRH	
DP3 M	11/15/04	RD	none	Y	PRH	
DP3 N	11/15/04	RD	none	Y	PRH	DFp-009
DP3 P	11/15/04	RD	none	Y	PRH	DFp-010
DP3 Q	11/15/04	RD	none	Y	PRH	
DP3 R	11/15/04	RD	none	Y	PRH	DFp-011
DP3 S	11/15/04	RD	none	Y	PRH	DFp-012
DP3 T	11/15/04	RD	none	Y	PRH	
DP3 W	11/15/04	RD	none	Y	PRH	
DP3 X	11/15/04	RD	none	Y	PRH	
DP4 A	11/15/04	RD	none	Y	PRH	
DP4 B	11/15/04	RD	none	Y	PRH	
DP4 C	N/A	N/A	N/A	N/A	N/A	In Anchor Trench no VT
DP4 D	11/16/04	RD	none	Y	PRH	
DP4 E	11/16/04	RD	none	Y	PRH	
DP4 F	11/16/04	RD	none	Y	PRH	
DP4 G	11/16/04	RD	none	Y	PRH	
DP4 H	11/16/04	RD	none	Y	PRH	
DP4 I	11/22/04	GK	none	Y	MGC	DFp-013
DP4 J	11/22/04	GK	none	Y	MGC	
DP4 K	11/22/04	GK	none	Y	MGC	
DP4 M	11/22/04	GK	none	Y	MGC	
DP4 N	11/22/04	GK	none	Y	MGC	DFp-014
DP4 P	11/22/04	GK	none	Y	MGC	DFp-015
DP4 Q	11/22/04	GK	none	Y	MGC	
DP4 R	11/22/04	GK	none	Y	MGC	
DP4 S	11/23/04	RB	none	y	PRH	
DP4 T	11/22/04	GK	none	Y	MGC	
DP4 W	11/22/04	GK	none	Y	MGC	
DP4 X	11/22/04	GK	none	Y	MGC	
DP5 A	11/22/04	GK	none	Y	MGC	
DP5 B	11/22/04	GK	none	Y	MGC	
DP5 C	11/22/04	GK	none	Y	MGC	
DP5 D	11/22/04	GK	none	Y	MGC	DFp-016
DP5 E	11/22/04	GK	none	Y	MGC	DFp-017
DP5 F	11/22/04	GK	none	Y	MGC	DFp-018
DP5 G	11/22/04	GK	none	Y	MGC	
DP5 H	11/22/04	GK	none	Y	MGC	
DP5 I	11/22/04	GK	none	Y	MGC	
DP5 J	11/22/04	GK	none	Y	MGC	
DP5 K	11/23/04	RB	none	Y	PRH	
DP5 M	11/22/04	GK	none	Y	MGC	
DP5 N	11/23/04	JS	none	Y	MGC	DFp-019
DP5 P	11/22/04	GK	none	Y	MGC	DFp-020
DP5 Q	11/22/04	GK	none	Y	MGC	

DEFECT CODE	TEST DATE	TECH ID	DEFECTS	OBS. TEST	MON.	REMARKS
DP5 R	11/23/04	JS	none	Y	MGC	
DP5 S	11/22/04	GK	none	Y	MGC	
DP5 T	11/22/04	GK	none	Y	MGC	
DP5 W	11/22/04	GK	none	Y	MGC	
DP5 X	11/22/04	GK	none	Y	MGC	
DP6 A	11/23/04	JS	none	Y	MGC	DFp-021
DP6 B	11/22/04	GK	none	Y	MGC	DFp-022
DP6 C	11/22/04	GK	none	Y	MGC	
DP6 D	11/23/04	JS	none	Y	MGC	DFp-023
DP6 E	11/23/04	JS	none	Y	MGC	
DP6 F	11/23/04	JS	none	Y	MGC	
DP6 G	11/23/04	JS	none	Y	MGC	
DP6 H	11/23/04	JS	none	Y	MGC	DFp-024
DP6 I	11/23/04	RB	none	Y	MGC	
DP6 J	11/23/04	RB	none	Y	PRH	
DP6 K	11/23/04	RB	none	Y	MGC	
DP6 M	11/23/04	JS	none	Y	MGC	
DP6 N	12/3/04	RD	none	Y	MGC	
DP6 P	12/3/04	RD	none	Y	MGC	
DP6 Q	12/4/04	RD	none	Y	MSP	
DP6 R	12/4/04	RD	none	Y	MSP	
DP6 S	12/4/04	RD	none	Y	MSP	
DP6 T	12/4/04	RD	none	Y	MSP	
DP6 W	12/4/04	RD	none	Y	MSP	
DP6 X	12/5/04	RD	none	Y	MGC	
DP7 A	12/5/04	RD	none	Y	MGC	
DP7 B	12/5/04	RD	none	Y	MGC	
DP7 C	12/5/04	RD	none	Y	MGC	
DP7 D	12/12/04	JS	none	Y	GDH	
DP7 E	12/12/04	JS	none	Y	GDH	
DP7 F	12/12/04	JS	none	Y	GDH	
DP7 G	12/12/04	JS	none	Y	GDH	
DP7 H	12/12/04	JS	none	Y	GDH	
DP7 I	12/12/04	JS	none	Y	GDH	
DP7 J	12/12/04	JS	none	Y	GDH	
DP7 K	12/12/04	JS	none	Y	GDH	
DP7 M	12/12/04	JS	none	Y	GDH	
DP7 N	12/12/04	JS	none	Y	GDH	
DP7 P	12/12/04	JS	none	Y	GDH	
DP7 Q	12/12/04	JS	none	Y	GDH	DFp-028
DP7 R	12/12/04	JS	none	Y	GDH	
DP7 S	12/12/04	JS	none	Y	GDH	
DP7 T	12/12/04	JS	none	Y	GDH	
DP7 W	12/12/04	JS	none	Y	GDH	
DP7 X	12/12/04	JS	none	Y	GDH	
DP8 A	12/12/04	JS	none	Y	GDH	
DP8 B	12/12/04	JS	none	Y	GDH	
DP8 C	12/12/04	JS	none	Y	GDH	
DP8 D	12/12/04	JS	none	Y	GDH	
DP8 E	12/12/04	JS	none	Y	GDH	

DEFECT CODE	TEST DATE	TECH ID	DEFECTS	OBS. TEST	MON.	REMARKS
DP8 F	N/A	N/A	N/A	N/A	N/A	Covered by 9E
DP8 G	12/12/04	JS	none	Y	GDH	
DP8 H	12/12/04	JS	none	Y	GDH	
DP8 I	12/12/04	JS	none	Y	GDH	
DP8 J	12/14/04	GK	none	Y	GDH	
DP8 K	12/14/04	GK	none	Y	GDH	
DP8 M	12/14/04	GK	none	Y	GDH	
DP8 N	12/12/04	JS	none	Y	GDH	
DP8 P	12/14/04	GK	none	Y	GDH	
DP8 Q	12/12/04	JS	none	Y	GDH	
DP8 R	12/12/04	JS	none	Y	GDH	
DP8 S	12/12/04	JS	none	Y	GDH	
DP8 T	12/12/04	JS	none	Y	GDH	
DP8 W	12/14/04	GK	none	Y	GDH	
DP8 X	12/14/04	GK	none	Y	GDH	
DP9 A	12/12/04	JS	none	Y	GDH	
DP9 B	12/14/04	GK	none	Y	GDH	
DP9 C	12/12/04	JS	none	Y	GDH	
DP9 D	12/14/04	GK	none	Y	GDH	
DP9 E	12/12/04	JS	none	Y	GDH	Covers by 8F
DP9 F	12/14/04	GK	none	Y	GDH	
DP9 G	12/12/04	JS	none	Y	GDH	
DP9 H	12/14/04	GK	none	Y	GDH	
DP9 I	12/14/04	GK	none	Y	GDH	
DP9 J	12/15/04	RD	none	Y	MSP	
DP9 K	12/12/04	JS	none	Y	GDH	
DP9 M	12/15/04	RD	none	Y	MSP	
DP9 N	12/15/04	RD	none	Y	GDH	
DP9 P	12/15/04	RD	none	Y	MSP	
DP9 Q	12/15/04	RD	none	Y	GDH	
DP9 R	12/15/04	RD	none	Y	MSP	
DP9 S	12/15/04	RD	none	Y	MSP	
DP9 T	12/15/04	RD	none	Y	MSP	
DP9 W	12/15/04	RD	none	Y	MSP	
DP9 X	12/16/04	GK	none	Y	PRH	
DP10 A	12/12/04	JS	none	Y	GDH	
DP10 B	12/14/04	GK	none	Y	GDH	
DP10 C	12/14/04	GK	none	Y	GDH	
DP10 D	12/16/04	GK	none	Y	PRH	
DP10 E	12/15/04	RD	none	Y	MSP	
DP10 F	12/15/04	RD	none	Y	MSP	
DP10 G	12/15/04	RD	none	Y	MSP	
DP10 H	12/15/04	RD	none	Y	MSP	
DP10 I	12/15/04	RD	none	Y	MSP	
DP10 J	12/15/04	RD	none	Y	MSP	
DP10 K	12/14/04	GK	none	Y	GDH	
DP10 M	12/14/04	GK	none	Y	GDH	
DP10 N	1/6/05	GK	none	Y	MGC	
DP10 P	1/6/05	GK	none	Y	MGC	
DP10 Q	1/6/05	GK	none	Y	MGC	

DEFECT CODE	TEST DATE	TECH ID	DEFECTS	OBS. TEST	MON.	REMARKS
DP10 R	1/6/05	GK	none	Y	MGC	
DP10 S	1/6/05	GK	none	Y	MGC	
DP10 T	1/6/05	GK	none	Y	MGC	
DP10 W	1/6/05	GK	none	Y	MGC	
DP10 X	1/6/05	GK	none	Y	MGC	
DP11 A	12/15/04	RD	none	Y	GDH	
DP11 B	1/6/05	GK	none	Y	MGC	
DP11 C	12/15/04	RD	none	Y	MSP	
DP11 D	1/4/05	GK	none	Y	PRH	
DP11 E	1/6/05	GK	none	Y	MGC	
DP11 F	1/6/05	GK	none	Y	MGC	
DP11 G	12/15/04	RD	none	Y	MSP	
DP11 H	12/15/04	RD	none	Y	MSP	
DP11 I	12/15/04	RD	none	Y	GDH	
DP11 J	12/15/04	RD	none	Y	GDH	
DP11 K	12/15/04	RD	none	Y	GDH	
DP11 M	1/6/05	GK	none	Y	MGC	
DP11 N	1/6/05	GK	none	Y	MGC	
DP11 P	1/6/05	GK	none	Y	MGC	
DP11 Q	1/6/05	GK	none	Y	MGC	
DP11 R	1/6/05	GK	none	Y	MGC	
DP11 S	1/6/05	GK	none	Y	MGC	
DP11 T	1/6/05	GK	none	Y	MGC	
DP11 W	1/6/05	GK	1 hole	Y	MGC	Hole defect 15E
DP11 X	1/6/05	GK	none	Y	MGC	
DP12 A	1/7/05	GK	none	Y	PRH	
DP12 B	1/7/05	GK	none	Y	PRH	
DP12 C	1/7/05	GK	none	Y	PRH	
DP12 D	1/7/05	GK	none	Y	PRH	
DP12 E	1/6/05	GK	none	Y	MGC	
DP12 F	1/7/05	GK	none	Y	PRH	
DP12 G	1/6/05	GK	none	Y	MGC	
DP12 H	1/6/05	GK	none	Y	MGC	
DP12 I	1/4/05	GK	none	Y	PRH	
DP12 J	1/6/05	GK	none	Y	MGC	
DP12 K	1/7/05	GK	none	Y	PRH	
DP12 M	1/7/05	GK	none	Y	PRH	
DP12 N	1/7/05	GK	none	Y	PRH	
DP12 P	1/6/05	GK	none	Y	MGC	
DP12 Q	1/7/05	GK	none	Y	PRH	
DP12 R	1/7/05	GK	none	Y	PRH	
DP12 S	1/6/05	GK	none	Y	MGC	
DP12 T	1/6/05	GK	none	Y	MGC	
DP12 W	1/6/05	GK	none	Y	MGC	
DP12 X	1/6/05	GK	none	Y	MGC	
DP13 A	1/6/05	GK	none	Y	MGC	
DP13 B	1/6/05	GK	none	Y	MGC	
DP13 C	1/7/05	GK	none	Y	PRH	
DP13 D	1/7/05	GK	none	Y	PRH	
DP13 E	1/7/05	GK	none	Y	PRH	

DEFECT CODE	TEST DATE	TECH ID	DEFECTS	OBS. TEST	MON.	REMARKS
DP13 F	1/8/05	CB	none	Y	PRH	
DP13 G	1/7/05	GK	none	Y	PRH	
DP13 H	1/7/05	GK	none	Y	PRH	
DP13 I	1/7/05	GK	none	Y	PRH	
DP13 J	1/7/05	GK	none	Y	PRH	
DP13 K	1/7/05	GK	none	Y	PRH	
DP13 M	1/9/05	GK	none	Y	PRH	
DP13 N	1/9/05	GK	none	Y	PRH	
DP13 P	1/9/05	GK	none	Y	PRH	
DP13 Q	1/9/05	GK	none	Y	PRH	
DP13 R	1/9/05	GK	none	Y	PRH	
DP13 S	1/9/05	GK	none	Y	PRH	
DP13 T	1/9/05	GK	none	Y	PRH	
DP13 W	1/9/05	GK	none	Y	PRH	
DP13 X	1/9/05	GK	none	Y	PRH	
DP14 A	1/9/05	GK	none	Y	PRH	
DP14 B	1/9/05	GK	none	Y	PRH	
DP14 C	1/9/05	GK	none	Y	PRH	
DP14 D	1/9/05	GK	none	Y	PRH	
DP14 E	1/9/05	GK	none	Y	PRH	
DP14 F	1/9/05	GK	none	Y	PRH	
DP14 G	1/9/05	GK	none	Y	PRH	
DP14 H	1/7/05	GK	none	Y	PRH	
DP14 I	1/7/05	GK	none	Y	PRH	
DP14 J	1/7/05	GK	none	Y	PRH	
DP14 K	1/7/05	GK	none	Y	PRH	
DP14 M	1/7/05	GK	none	Y	PRH	
DP14 N	1/7/05	GK	none	Y	PRH	
DP14 P	1/7/05	GK	none	Y	PRH	
DP14 Q	1/7/05	GK	none	Y	PRH	
DP14 R	1/7/05	GK	none	Y	PRH	
DP14 S	NA	NA	NA	NA	NA	Covered by DP-14T
DP14 T	1/6/05	GK	none	Y	MGC	Covers DP-14S
DP14 W	1/7/05	GK	none	Y	PRH	
DP14 X	1/7/05	GK	none	Y	PRH	
DP15 A	1/7/05	GK	none	Y	PRH	
DP15 B	1/9/05	GK	none	Y	PRH	
DP15 C	1/9/05	GK	none	Y	PRH	
DP15 D	1/9/05	GK	none	Y	PRH	
DP15 E	1/6/05	GK	none	Y	MGC	
DP15 F	1/8/05	CB	none	Y	PRH	
DP15 G	1/9/05	GK	none	Y	PRH	
DP15 H	1/8/05	CB	none	Y	PRH	
DP15 I	1/8/05	CB	none	Y	PRH	
DP15 J	NA	NA	NA	NA	NA	no Defect
DP15 K	1/9/05	GK	none	Y	PRH	
DP15 M	1/8/05	CB	none	Y	PRH	
DP15 N	1/8/05	CB	none	Y	PRH	
DP15 P	1/8/05	CB	none	Y	PRH	
DP15 Q	1/8/05	CB	none	Y	PRH	

DEFECT CODE	TEST DATE	TECH ID	DEFECTS	OBS. TEST	MON.	REMARKS
DP15 R	1/9/05	GK	none	Y	PRH	
DP15 S	1/9/05	GK	none	Y	PRH	
DP15 T	1/9/05	GK	none	Y	PRH	
DP15 W	1/9/05	GK	none	Y	PRH	
DP15 X	1/9/05	GK	none	Y	PRH	
DP16 A	1/9/05	GK	none	Y	PRH	
DP16 B	1/9/05	GK	none	Y	PRH	
DP16 C	1/9/05	GK	none	Y	PRH	
DP16 D	1/9/05	GK	none	Y	PRH	
DP16 E	1/9/05	GK	none	Y	PRH	
DP16 F	1/9/05	GK	none	Y	PRH	
DP16 G	1/9/05	GK	none	Y	PRH	
DP16 H	1/9/05	GK	none	Y	PRH	
DP16 I	1/9/05	GK	none	Y	PRH	
DP16 J	1/9/05	GK	none	Y	PRH	
DP16 K	1/9/05	GK	none	Y	PRH	
DP16 M	1/9/05	GK	none	Y	PRH	
DP16 N	1/9/05	GK	none	Y	PRH	
DP16 P	1/9/05	GK	none	Y	PRH	
DP16 Q	1/9/05	GK	none	Y	PRH	
DP16 R	1/9/05	GK	none	Y	PRH	
DP16 S	1/9/05	GK	none	Y	PRH	
DP16 T	1/9/05	GK	none	Y	PRH	
DP16 W	1/9/05	GK	none	Y	PRH	
DP16 X	1/9/05	GK	none	Y	PRH	
DP17 A	1/9/05	GK	none	Y	PRH	
DP17 B	1/9/05	GK	none	Y	PRH	
DP17 C	1/9/05	GK	none	Y	PRH	
DP17 D	1/9/05	GK	none	Y	PRH	
DP17 E	1/9/05	GK	none	Y	PRH	
DP17 F	1/9/05	GK	none	Y	PRH	
DP17 G	1/9/05	GK	none	Y	PRH	
DP17 H	1/9/05	GK	none	Y	PRH	
DP17 I	1/9/05	GK	none	Y	PRH	
DP17 J	1/17/05	RB	none	Y	MSP	
DP17 K	1/17/05	RB	none	Y	MSP	
DP17 M	1/18/05	RB	none	Y	PRH	
DP17 N	1/18/05	RB	none	Y	MSP	
DP17 P	1/18/05	RB	none	Y	MSP	
DP17 Q	1/19/05	RB	none	Y	PRH	
DP17 R	1/20/05	RB	none	Y	PRH	
DP17 S	1/21/05	RB	none	Y	PRH	
DP17 T	1/21/05	RB	none	Y	PRH	
DP17 W	2/14/05	JH	none	Y	PRH	
DP17 X	2/14/05	JH	none	Y	PRH	
DP18 A	2/14/05	JH	none	Y	PRH	
DP18 B	2/14/05	JH	none	Y	PRH	
DP18 C	2/14/05	JH	none	Y	PRH	
DP18 D	2/14/05	JH	none	Y	PRH	
DP18 E	2/14/05	JH	none	Y	PRH	

DEFECT CODE	TEST DATE	TECH ID	DEFECTS	OBS. TEST	MON.	REMARKS
DP18 F	2/14/05	JH	none	Y	PRH	
DP18 G	2/14/05	JH	none	Y	PRH	
DP18 H	2/14/05	JH	none	Y	PRH	
DP18 I	2/14/05	JH	none	Y	PRH	
DP18 J	2/14/05	JH	none	Y	PRH	
DP18 K	2/14/05	JH	none	Y	PRH	
DP18 M	2/14/05	JH	none	Y	PRH	
DP18 N	2/14/05	JH	none	Y	PRH	
DP18 P	2/14/05	JH	none	Y	PRH	
DP18 Q	2/14/05	JH	none	Y	PRH	
DP18 R	2/14/05	JH	none	Y	PRH	
DP18 S	2/18/05	JH	none	Y	PRH	
DP18 T	2/14/05	JH	none	Y	PRH	
DP18 W	2/14/05	JH	none	Y	PRH	
DP18 X	2/18/05	JH	none	Y	PRH	
DP19 A	2/18/05	JH	none	Y	PRH	
DP19 B	2/18/05	JH	none	Y	PRH	
DP19 C	2/18/05	JH	none	Y	PRH	
DP19 D	2/18/05	JH	none	Y	PRH	
DP19 E	2/14/05	JH	none	Y	PRH	
DP19 F	2/14/05	JH	none	Y	PRH	
DP19 G	2/18/05	JH	none	Y	PRH	
DP19 H	2/18/05	JH	none	Y	PRH	
DP19 I	2/18/05	JH	none	Y	PRH	
DP19 J	2/18/05	JH	none	Y	PRH	
DP19 K	2/14/05	JH	none	Y	PRH	
DP19 M	2/14/05	JH	none	Y	PRH	
DP19 N	2/18/05	JH	none	Y	PRH	
DP19 P	2/18/05	JH	none	Y	PRH	
DP19 Q	2/18/05	JH	none	Y	PRH	
DP19 R	2/17/05	GK	none	Y	PRH	
DP19 S	2/17/05	GK	none	Y	PRH	
DP19 T	2/17/05	GK	none	Y	PRH	
DP19 W	2/17/05	GK	none	Y	PRH	
DP19 X	2/17/05	GK	none	Y	PRH	
DP20 A	2/18/05	JH	none	Y	PRH	
DP20 B	2/18/05	JH	none	Y	PRH	
DP20 C	2/18/05	JH	none	Y	PRH	
DP20 D	2/22/05	RB	none	Y	MGC	
DP20 E	2/22/05	RB	none	Y	MGC	
DP20 F	3/28/05	CB	none	Y	MGC	
DP20 G	3/28/05	CB	none	Y	MGC	
DP20 H	3/28/05	CB	none	Y	MGC	
DP20 I	3/28/05	CB	none	Y	MGC	
DP20 J	3/28/05	CB	none	Y	MGC	
DP20 K	3/28/05	CB	none	Y	MGC	
DP20 M	3/28/05	CB	none	Y	MGC	
DP20 N	3/28/05	CB	none	Y	MGC	
DP20 P	3/28/05	CB	none	Y	MGC	
DP20 Q	3/28/05	CB	none	Y	MGC	

DEFECT CODE	TEST DATE	TECH ID	DEFECTS	OBS. TEST	MON.	REMARKS
DP20 R	3/28/05	CB	none	Y	MGC	
DP20 S	3/28/05	CB	none	Y	MGC	
DP20 T	3/28/05	CB	none	Y	MGC	
DP20 W	3/28/05	CB	none	Y	MGC	
DP20 X	3/28/05	CB	none	Y	MGC	
DP21 A	3/28/05	CB	none	Y	MGC	
DP21 B	3/28/05	CB	none	Y	MGC	
DP21 C	3/28/05	CB	none	Y	MGC	
DP21 D	3/28/05	CB	none	Y	MGC	
DP21 E	3/28/05	CB	none	Y	MGC	
DP21 F	3/28/05	CB	none	Y	MGC	
DP21 G	3/28/05	CB	none	Y	MGC	
DP21 H	N/A	N/A	N/A	N/A	N/A	COVERED BY DP-21Q
DP21 I	3/28/05	CB	none	Y	MGC	
DP21 J	3/28/05	CB	none	Y	MGC	
DP21 K	3/28/05	CB	none	Y	MGC	
DP21 M	3/28/05	CB	none	Y	MGC	
DP21 N	3/28/05	CB	none	Y	MGC	
DP21 P	3/28/05	CB	none	Y	MGC	
DP21 Q	3/28/05	CB	none	Y	MGC	COVERS DP-21H
DP21 R	3/28/05	CB	none	Y	MGC	
DP21 S	3/28/05	CB	none	Y	MGC	
DP21 T	3/28/05	CB	none	Y	MGC	
DP21 W	3/28/05	CB	none	Y	MGC	
DP21 X	N/A	N/A	N/A	N/A	N/A	COVERED BY DP-22A
DP22 A	3/28/05	CB	none	Y	MGC	COVERS SP-21X
DP22 B	3/28/05	CB	none	Y	MGC	
DP22 C	3/28/05	CB	none	Y	MGC	
DP22 D	3/28/05	CB	none	Y	MGC	
DP22 E	3/28/05	CB	none	Y	MGC	
DP22 F	3/28/05	CB	none	Y	MGC	
DP22 G	3/28/05	CB	none	Y	MGC	
DP22 H	3/28/05	CB	none	Y	MGC	
DP22 I	3/31/05	JH	none	Y	MGC	
DP22 J	3/31/05	JH	none	Y	MGC	
DP22 K	3/31/05	JH	none	Y	MGC	
DP22 M	3/31/05	JH	none	Y	MGC	
DP22 N	3/31/05	JH	none	Y	MGC	
DP22 P	3/31/05	JH	none	Y	MGC	
DP22 Q	3/31/05	DH	none	Y	MGC	
DP22 R	3/31/05	DH	none	Y	MGC	
DP22 S	3/31/05	CB	none	Y	MGC	
DP22 T	3/31/05	DH	none	Y	MGC	
DP22 W	3/31/05	CB	none	Y	MGC	
DP22 X	3/31/05	CB	none	Y	MGC	
DP23 A	3/31/05	CB	none	Y	MGC	
DP23 B	3/31/05	CB	none	Y	MGC	
DP23 C	3/31/05	CB	none	Y	MGC	
DP23 D	3/31/05	CB	none	Y	MGC	
DP23 E	3/31/05	CB	none	Y	MGC	

DEFECT CODE	TEST DATE	TECH ID	DEFECTS	OBS. TEST	MON.	REMARKS
DP23 F	3/31/05	DH	none	Y	MGC	
DP23 G	3/31/05	DH	none	Y	MGC	
DP23 H	3/31/05	JH	none	Y	MGC	
DP23 I	3/31/05	CB	none	Y	MGC	
DP23 J	3/31/05	CB	none	Y	MGC	
DP23 K	3/31/05	JH	none	Y	MGC	
DP23 M	4/1/05	GK	none	Y	MSP	
DP23 N	4/1/05	GK	none	Y	MSP	
DP23 P	4/1/05	GK	none	Y	MSP	
DP23 Q	4/1/05	GK	none	Y	MSP	
DP23 R	4/1/05	GK	none	Y	MSP	
DP23 S	4/1/05	GK	none	Y	MSP	
DP23 T	4/1/05	GK	none	Y	MSP	
DP23 W	4/1/05	GK	none	Y	MSP	
DP23 X	4/1/05	GK	none	Y	MSP	
DP24 A	4/1/05	GK	none	Y	MSP	
DP24 B	4/1/05	GK	none	Y	MSP	
DP24 C	4/1/05	GK	none	Y	MSP	
DP24 D	4/1/05	GK	none	Y	MSP	
DP24 E	4/4/05	JH	none	Y	MGC	
DP24 F	4/4/05	JH	none	Y	MGC	
DP24 G	4/4/05	JH	none	Y	MGC	
DP24 H	4/4/05	JH	none	Y	MGC	
DP24 I	4/4/05	JH	none	Y	MGC	
DP24 J	4/4/05	JH	none	Y	MGC	
DP24 K	4/4/05	JH	none	Y	MGC	
DP24 M	4/4/05	JH	1 Hole	Y	MGC	
DP24 N	NA	NA	none	NA	NA	
DP24 P	NA	NA	none	NA	NA	
DP24 Q	4/4/05	JH	none	Y	MGC	
DP24 R	4/4/05	JH	none	Y	MGC	
DP24 S	4/4/05	JH	none	Y	MGC	
DP24 T	4/4/05	JH	none	Y	MGC	
DP24 W	4/4/05	JH	none	Y	MGC	
DP24 X	4/4/05	JH	none	Y	MGC	
DP25 A	4/4/05	JH	none	Y	MGC	
DP25 B	4/4/05	JH	none	Y	MGC	
DP25 C	4/4/05	JH	none	Y	MGC	
DP25 D	4/4/05	JH	none	Y	MGC	
DP25 E	4/4/05	JH	none	Y	MGC	DP-26B
DP25 F	NA	NA	NA	NA	NA	
DP25 G	4/4/05	JH	1 hole	Y	MGC	DP-26A
DP25 H	4/4/05	JH	none	Y	MGC	
DP25 I	4/4/05	JH	none	Y	MGC	
DP25 J	4/4/05	JH	none	Y	MGC	
DP25 K	4/4/05	JH	none	Y	MGC	
DP25 M	4/4/05	JH	none	Y	MGC	
DP25 N	4/4/05	JH	none	Y	MGC	
DP25 P	4/4/05	JH	none	Y	MGC	
DP25 Q	4/4/05	JH	none	Y	MGC	

DEFECT CODE	TEST DATE	TECH ID	DEFECTS	OBS. TEST	MON.	REMARKS
DP25 R	4/4/05	JH	none	Y	MGC	
DP25 S	4/4/05	JH	none	Y	MGC	
DP25 T	4/4/05	JH	none	Y	MGC	
DP25 W	4/4/05	JH	none	Y	MGC	
DP25 X	4/4/05	JH	none	Y	MGC	
DP26 A	4/4/05	JH	none	Y	MGC	
DP26 B	4/4/05	JH	none	Y	MGC	
DP26 C	4/4/05	JH	none	Y	MGC	
DP26 D	4/4/05	JH	none	Y	MGC	
DP26 E	4/4/05	JH	none	Y	MGC	
DP26 F	4/4/05	JH	none	Y	MGC	
DP26 G	4/4/05	JH	none	Y	MGC	
DP26 H	4/7/05	RB	none	Y	MGC	

GDN

Geosythetic Drainage Net

PANEL DEPLOYMENT LOG

PROJECT NUMBER: 043-2246 MATERIAL TYPE: GDN PROJECT TITLE: Rocky Flats, Present Landfill

LINER INSTALLER: Colorado Lining CONTRACTOR: S. M. Stoller

LOCATION: Rocky Flats SITE MANAGER: Kaiser Hill Company LLC

PANEL NUMBER	ROLL NUMBER	DEPLOYMENT DATE	QC MON.	OBSERVED OVERLAP	VISUAL PANEL CONDITION	PANEL DIMENSIONS (FT)		PANEL AREA	TOTAL AREA PLACED	ZIP TIED or LEISTER
						LENGTH	WIDTH			
T-1	2229	11/12/04	PRH	6"	Good	192.5	14	2695	2695	Y
T-2	2239	11/12/04	PRH	6"	Good	64.5	14	903	3598	Y
T-3	2239	11/12/04	PRH	6"	Good	129.5	14	1813	5411	Y
T-4	2238	11/12/04	PRH	6"	Good	113.5	14	1589	7000	Y
T-5	2238	11/12/04	PRH	6"	Good	75.5	14	1057	8057	Y
T-6	2220	11/12/04	PRH	6"	Good	148.5	14	2079	10136	Y
T-7	2220	11/12/04	PRH	6"	Good	30.5	14	427	10563	Y
T-8	2230	11/12/04	PRH	6"	Good	172	14	2408	12971	Y
T-9	2237	11/12/04	PRH	6"	Good	177.5	14	2485	15456	Y
T-10	2237	11/12/04	PRH	6"	Good	11.5	14	161	15617	Y
T-11	2228	11/12/04	PRH	6"	Good	135	14	1890	17507	Y
T-12	2228	11/12/04	PRH	6"	Good	58.5	14	819	18326	Y
T-13	2219	11/12/04	PRH	6"	Good	52.5	14	735	19061	Y
T-14	2219	11/12/04	PRH	6"	Good	6.5	6	39	19100	Y
T-15	2219	11/12/04	PRH	6"	Good	7	13	91	19191	Y
T-16	2219	11/12/04	PRH	6"	Good	7	13	91	19282	Y
T-17	2219	11/12/04	PRH	6"	Good	8	13	104	19386	Y
T-18	2219	11/12/04	PRH	6"	Good	8	13	104	19490	Y
T-19	2219	11/12/04	PRH	6"	Good	3.5	13	45.5	19535.5	Y
T-20	2219	11/12/04	PRH	6"	Good	57.5	14	805	20340.5	Y
T-21	2227	11/12/04	PRH	6"	Good	196	14	2744	23084.5	Y
T-22	2217	11/12/04	PRH	6"	Good	16	14	224	23308.5	Y
T-23	2217	11/12/04	PRH	6"	Good	178	14	2492	25800.5	Y
T-24	2236	11/12/04	PRH	6"	Good	104	14	1456	27256.5	Y
T-25	2236	11/12/04	PRH	6"	Good	87.5	14	1225	28481.5	Y
T-26	2233	11/12/04	PRH	6"	Good	200	14	2800	31281.5	Y
T-27	2231	11/12/04	PRH	6"	Good	191.5	14	2681	33962.5	Y
T-28	2224	11/12/04	PRH	6"	Good	115.5	14	1617	35579.5	Y
T-29	2224	11/12/04	PRH	6"	Good	81	14	1134	36713.5	Y
T-30	2235	11/12/04	PRH	6"	Good	203	14	2842	39555.5	Y
T-31	2215	11/12/04	PRH	6"	Good	37.5	14	525	40080.5	Y
T-32	2215	11/15/04	MGC	6"	Good	160	13	2080	42160.5	Y
T-33	2232	11/15/04	MGC	6"	Good	166	13	2158	44318.5	Y
T-34	2232	11/15/04	MGC	6"	Good	19.5	13	253.5	44572	Y
T-35	2207	11/15/04	MGC	6"	Good	197	13	2561	47133	Y
T-36	2208	11/15/04	MGC	6"	Good	118.5	13	1540.5	48673.5	Y
T-37	2208	11/15/04	MGC	6"	Good	77	13	1001	49674.5	Y
T-38	2234	11/15/04	MGC	6"	Good	200	13	2600	52274.5	Y
T-39	2218	11/15/04	MGC	6"	Good	71	13	923	53197.5	Y
T-40	2218	11/15/04	MGC	6"	Good	127	13	1651	54848.5	Y
T-41	2210	11/15/04	MGC	6"	Good	163	13	2119	56967.5	Y
T-42	2214	11/15/04	MGC	6"	Good	43.5	13	565.5	57533	Y
T-43	2214	11/16/04	PRH	6"	Good	141	13	1833	59366	Y
T-44	2216	11/16/04	PRH	6"	Good	198.5	13	2580.5	61946.5	Y
T-45	2257	11/16/04	PRH	6"	Good	36	13	468	62414.5	Y

PANEL NUMBER	ROLL NUMBER	DEPLOYMENT DATE	QC MON.	OBSERVED OVERLAP	VISUAL PANEL CONDITION	PANEL DIMENSIONS (FT)		PANEL AREA	TOTAL AREA PLACED	ZIP TIED or LEISTER
						LENGTH	WIDTH			
T-46	2257	11/16/04	PRH	6"	Good	142	13	1846	64260.5	Y
T-47	2248	11/16/04	PRH	6"	Good	196	13	2548	66808.5	Y
T-48	2203	11/16/04	PRH	6"	Good	181	13	2353	69161.5	Y
T-49	2260	11/16/04	PRH	6"	Good	45.5	13	591.5	69753	Y
T-50	2260	11/16/04	PRH	6"	Good	156	13	2028	71781	Y
T-51	2256	11/16/04	PRH	6"	Good	215.5	13	2801.5	74582.5	Y
T-52	2206	11/16/04	PRH	6"	Good	59	13	767	75349.5	Y
T-53	2206	11/16/04	PRH	6"	Good	128	13	1664	77013.5	Y
T-54	2249	11/16/04	PRH	6"	Good	200.5	13	2606.5	79620	Y
T-55	2243	11/16/04	PRH	6"	Good	64.5	13	838.5	80458.5	Y
T-56	2243	11/16/04	PRH	6"	Good	134	13	1742	82200.5	Y
T-57	2252	11/16/04	PRH	6"	Good	91.5	13	1189.5	83390	Y
T-58	2252	11/16/04	PRH	6"	Good	94	13	1222	84612	Y
T-59	2251	11/16/04	PRH	6"	Good	197	13	2561	87173	Y
T-60	2250	11/16/04	PRH	6"	Good	150.5	13	1956.5	89129.5	Y
T-61	2242	11/23/04	MGC	6"	Good	196	13	2548	91677.5	Y
T-62	2250	11/23/04	PRH	6"	Good	43	13	559	92236.5	Y
T-63	2262	11/23/04	PRH	6"	Good	198	13	2574	94810.5	Y
T-64	2240	11/23/04	PRH	6"	Good	19	13	247	95057.5	Y
T-65	2240	11/23/04	PRH	6"	Good	169	13	2197	97254.5	Y
T-66	2241	11/23/04	PRH	6"	Good	197	13	2561	99815.5	Y
T-67	2259	11/23/04	PRH	6"	Good	198	13	2574	102389.5	Y
T-68	2253	11/23/04	PRH	6"	Good	219	13	2847	105236.5	Y
T-69	2247	11/23/04	PRH	6"	Good	101.5	13	1319.5	106556	Y
T-70	2247	11/23/04	PRH	6"	Good	98	13	1274	107830	Y
T-71	2245	11/23/04	PRH	6"	Good	194.5	13	2528.5	110358.5	Y
T-72	2132	11/23/04	PRH	6"	Good	188.5	13	2450.5	112809	Y
T-73	2258	11/23/04	PRH	6"	Good	197	13	2561	115370	Y
T-74	2254	11/23/04	PRH	6"	Good	204	13	2652	118022	Y
T-75	2241	11/23/04	PRH	6"	Good	197.5	13	2567.5	120589.5	Y
T-76	2123	11/23/04	PRH	6"	Good	72	13	936	121525.5	Y
T-77	2123	11/23/04	PRH	6"	Good	122	13	1586	123111.5	Y
T-78	2289	11/23/04	PRH	6"	Good	196.5	13	2554.5	125666	Y
T-79	2092	11/23/04	PRH	6"	Good	195.5	13	2541.5	128207.5	Y
T-80	2003	11/23/04	PRH	6"	Good	211	13	2743	130950.5	Y
T-81	2244	11/23/04	PRH	6"	Good	117	13	1521	132471.5	Y
T-82	2244	11/23/04	PRH	6"	Good	75	13	975	133446.5	Y
T-83	2096	11/23/04	PRH	6"	Good	189	13	2457	135903.5	Y
T-84	2074	11/23/04	PRH	6"	Good	76.5	13	994.5	136898	Y
T-85	2074	11/23/04	PRH	6"	Good	117	13	1521	138419	Y
T-86	2077	11/23/04	PRH	6"	Good	210	13	2730	141149	Y
T-87	2075	11/23/04	PRH	6"	Good	30	13	390	141539	Y
T-88	2075	11/23/04	PRH	6"	Good	155	13	2015	143554	Y
T-89	2089	11/23/04	PRH	6"	Good	203	13	2639	146193	Y
T-90	2078	11/23/04	PRH	6"	Good	203	13	2639	148832	Y
T-91	2066	11/23/04	PRH	6"	Good	195	13	2535	151367	Y
T-92	2255	11/23/04	PRH	6"	Good	69	13	897	152264	Y
T-93	2276	11/23/04	PRH	6"	Good	180	13	2340	154604	Y
T-94	2081	11/23/04	PRH	6"	Good	202	13	2626	157230	Y
T-95	2288	11/23/04	PRH	6"	Good	67	13	871	158101	Y

PANEL NUMBER	ROLL NUMBER	DEPLOYMENT DATE	QC MON.	OBSERVED OVERLAP	VISUAL PANEL CONDITION	PANEL DIMENSIONS (FT)		PANEL AREA	TOTAL AREA PLACED	ZIP TIED or LEISTER
						LENGTH	WIDTH			
T-96	2255	11/23/04	PRH	6"	Good	62	13	806	158907	Y
T-97	2288	11/23/04	PRH	6"	Good	132	13	1716	160623	Y
T-98	2246	11/23/04	PRH	6"	Good	206	13	2678	163301	Y
T-99	2084	11/23/04	PRH	6"	Good	195	13	2535	165836	Y
T-100	2285	11/23/04	PRH	6"	Good	45.5	13	591.5	166427.5	Y
T-101	2285	11/23/04	PRH	6"	Good	144	13	1872	168299.5	Y
T-102	2271	11/23/04	PRH	6"	Good	211	13	2743	171042.5	Y
T-103	2284	11/23/04	PRH	6"	Good	42.5	13	552.5	171595	Y
T-104	2072	12/03/04	MGC	6"	Good	202.5	13	2632.5	174227.5	Y
T-105	2082	12/03/04	MGC	6"	Good	197.5	13	2567.5	176795	Y
T-106	2063	12/03/04	MGC	6"	Good	193.5	13	2515.5	179310.5	Y
T-107	2076	12/03/04	MGC	6"	Good	198.5	13	2580.5	181891	Y
T-108	2086	12/03/04	MGC	6"	Good	196	13	2548	184439	Y
T-109	2070	12/03/04	MGC	6"	Good	201	13	2613	187052	Y
T-110	2085	12/03/04	MGC	6"	Good	197	13	2561	189613	Y
T-111	2080	12/03/04	MGC	6"	Good	196	13	2548	192161	Y
T-112	2073	12/03/04	MGC	6"	Good	197	13	2561	194722	Y
T-113	2061	12/03/04	MGC	6"	Good	200	13	2600	197322	Y
T-114	2069	12/03/04	MGC	6"	Good	184	13	2392	199714	Y
T-115	2056	12/03/04	MGC	6"	Good	201	13	2613	202327	Y
T-116	2079	12/03/04	MGC	6"	Good	196	13	2548	204875	Y
T-117	2058	12/03/04	MGC	6"	Good	197	13	2561	207436	Y
T-118	2046	12/03/04	MGC	6"	Good	199	13	2587	210023	Y
T-119	2060	12/03/04	MGC	6"	Good	202	13	2626	212649	Y
T-120	2045	12/03/04	MGC	6"	Good	202	13	2626	215275	Y
T-121	2044	12/03/04	MGC	6"	Good	198	13	2574	217849	Y
T-122	2065	12/05/04	MGC	6"	Good	202	13	2626	220475	Y
T-123	2047	12/05/04	MGC	6"	Good	197	13	2561	223036	Y
T-124	2050	12/05/04	MGC	6"	Good	200	13	2600	225636	Y
T-125	2062	12/05/04	MGC	6"	Good	195	13	2535	228171	Y
T-126	2054	12/05/04	MGC	6"	Good	200	13	2600	230771	Y
T-127	2064	12/05/04	MGC	6"	Good	204	13	2652	233423	Y
T-128	2043	12/05/04	MGC	6"	Good	199	13	2587	236010	Y
T-129	2053	12/05/04	MGC	6"	Good	199	13	2587	238597	Y
T-130	2071	12/05/04	MGC	6"	Good	198	13	2574	241171	Y
T-131	2284	12/06/04	PRH	6"	Good	43	13	559	241730	Y
T-132	2284	12/06/04	PRH	6"	Good	37	13	481	242211	Y
T-133	2284	12/06/04	PRH	6"	Good	55	13	715	242926	Y
T-134	2268	12/06/04	PRH	6"	Good	59	13	767	243693	Y
T-135	2268	12/06/04	PRH	6"	Good	60	13	780	244473	Y
T-136	2268	12/06/04	PRH	6"	Good	55	13	715	245188	Y
T-137	2267	12/06/04	PRH	6"	Good	67	13	871	246059	Y
T-138	2267	12/06/04	PRH	6"	Good	22	13	286	246345	Y
T-139	2267	12/06/04	PRH	6"	Good	69	13	897	247242	Y
T-140	2275	12/06/04	PRH	6"	Good	34	13	442	247684	Y
T-141	2275	12/06/04	PRH	6"	Good	140	13	1820	249504	Y
T-142	2261	12/06/04	PRH	6"	Good	204	13	2652	252156	Y
T-143	2057	12/06/04	PRH	6"	Good	204	13	2652	254808	Y
T-144	2052	12/06/04	PRH	6"	Good	197	13	2561	257369	Y
T-145	2059	12/06/04	PRH	6"	Good	158	13	2054	259423	Y

PANEL NUMBER	ROLL NUMBER	DEPLOYMENT DATE	QC MON.	OBSERVED OVERLAP	VISUAL PANEL CONDITION	PANEL DIMENSIONS (FT)		PANEL AREA	TOTAL AREA PLACED	ZIP TIED or LEISTER
						LENGTH	WIDTH			
T-146	2059	12/06/04	PRH	6"	Good	26	13	338	259761	Y
T-147	2067	12/06/04	PRH	6"	Good	206	13	2678	262439	Y
T-148	2055	12/06/04	PRH	6"	Good	200	13	2600	265039	Y
T-149	2068	12/06/04	PRH	6"	Good	81	13	1053	266092	Y
T-150	2165	12/12/04	GDH	6"	Good	187	13	2431	268523	Y
T-151	2051	12/12/04	GDH	6"	Good	181	13	2353	270876	Y
T-152	2048	12/12/04	GDH	6"	Good	203	13	2639	273515	Y
T-153	2049	12/12/04	GDH	6"	Good	201	13	2613	276128	Y
T-154	2163	12/12/04	GDH	6"	Good	190	13	2470	278598	Y
T-155	2161	12/12/04	GDH	6"	Good	202	13	2626	281224	Y
T-156	2151	12/12/04	GDH	6"	Good	202	13	2626	283850	Y
T-157	2129	12/12/04	GDH	6"	Good	194	13	2522	286372	Y
T-158	2150	12/12/04	GDH	6"	Good	207	13	2691	289063	Y
T-159	2148	12/12/04	GDH	6"	Good	196	13	2548	291611	Y
T-160	2149	12/12/04	GDH	6"	Good	205	13	2665	294276	Y
T-161	2155	12/12/04	GDH	6"	Good	200	13	2600	296876	Y
T-162	2157	12/12/04	GDH	6"	Good	207	13	2691	299567	Y
T-163	2158	12/12/04	GDH	6"	Good	204	13	2652	302219	Y
T-164	2124	12/12/04	GDH	6"	Good	201	13	2613	304832	Y
T-165	2153	12/12/04	GDH	6"	Good	199.5	13	2593.5	307425.5	Y
T-166	2127	12/12/04	GDH	6"	Good	199	13	2587	310012.5	Y
T-167	2154	12/12/04	GDH	6"	Good	195	13	2535	312547.5	Y
T-168	2133	12/12/04	GDH	6"	Good	191	13	2483	315030.5	Y
T-169	2156	12/12/04	GDH	6"	Good	198	13	2574	317604.5	Y
T-170	2146	12/12/04	GDH	6"	Good	206	13	2678	320282.5	Y
T-171	2131	12/12/04	GDH	6"	Good	201.5	13	2619.5	322902	Y
T-172	2181	12/12/04	GDH	6"	Good	190	13	2470	325372	Y
T-173	2171	12/12/04	GDH	6"	Good	201	13	2613	327985	Y
T-174	2152	12/14/04	PRH	6"	Good	148	13	1924	329909	Y
T-175	2088	12/14/04	PRH	6"	Good	137	13	1781	331690	Y
T-176	2088	12/14/04	PRH	6"	Good	39	13	507	332197	Y
T-177	2174	12/14/04	PRH	6"	Good	89	13	1157	333354	Y
T-178	2174	12/14/04	PRH	6"	Good	104	13	1352	334706	Y
T-179	2152	12/14/04	PRH	6"	Good	38.5	13	500.5	335206.5	Y
T-180	2172	12/14/04	PRH	6"	Good	146.5	13	1904.5	337111	Y
T-181	2172	12/14/04	PRH	6"	Good	56	13	728	337839	Y
T-182	2180	12/14/04	PRH	6"	Good	110	13	1430	339269	Y
T-183	2180	12/14/04	PRH	6"	Good	84	13	1092	340361	Y
T-184	2093	12/14/04	PRH	6"	Good	92	13	1196	341557	Y
T-185	2093	12/14/04	PRH	6"	Good	92	13	1196	342753	Y
T-186	2224	12/14/04	PRH	6"	Good	91	13	1183	343936	Y
T-187	2185	12/16/04	GDH	6"	Good	191.5	13	2489.5	346425.5	Y
T-188	2166	12/16/04	GDH	6"	Good	199	13	2587	349012.5	Y
T-189	2147	12/16/04	GDH	6"	Good	202	13	2626	351638.5	Y
T-190	2182	12/16/04	GDH	6"	Good	202	13	2626	354264.5	Y
T-191	2168	12/16/04	GDH	6"	Good	192	13	2496	356760.5	Y
T-192	2160	12/16/04	GDH	6"	Good	185	13	2405	359165.5	Y
T-193	2120	12/16/04	GDH	6"	Good	21	13	273	359438.5	Y
T-194	2170	12/16/04	GDH	6"	Good	168.5	13	2190.5	361629	Y
T-195	2178	12/16/04	GDH	6"	Good	184	13	2392	364021	Y

PANEL NUMBER	ROLL NUMBER	DEPLOYMENT DATE	QC MON.	OBSERVED OVERLAP	VISUAL PANEL CONDITION	PANEL DIMENSIONS (FT)		PANEL AREA	TOTAL AREA PLACED	ZIP TIED or LEISTER
						LENGTH	WIDTH			
T-196	2179	12/16/04	GDH	6"	Good	204	13	2652	366673	Y
T-197	2183	12/16/04	GDH	6"	Good	192.5	13	2502.5	369175.5	Y
T-198	2184	12/16/04	GDH	6"	Good	201	13	2613	371788.5	Y
T-199	2175	12/16/04	GDH	6"	Good	204	13	2652	374440.5	Y
T-200	2176	12/16/04	GDH	6"	Good	202.5	13	2632.5	377073	Y
T-201	2164	12/16/04	GDH	6"	Good	185	13	2405	379478	Y
T-202	2173	12/16/04	GDH	6"	Good	207	13	2691	382169	Y
T-203	2188	12/16/04	GDH	6"	Good	193	13	2509	384678	Y
T-204	2177	12/16/04	GDH	6"	Good	198	13	2574	387252	Y
T-205	2167	12/16/04	GDH	6"	Good	197	13	2561	389813	Y
T-206	2222	12/17/04	GDH	6"	Good	200.5	13	2606.5	392419.5	Y
T-207	2226	12/17/04	GDH	6"	Good	197.5	13	2567.5	394987	Y
~~T-208~~	~~2212~~	installed 12/17/04, removed 1/3/05	~~GDH~~	~~6"~~	~~Good~~	~~200~~	~~13~~	~~2600~~	NA	~~Y~~
T-209	2192	12/17/04	GDH	6"	Good	53.5	13	695.5	395682.5	Y
T-210	2192	12/17/04	GDH	6"	Good	143	13	1859	397541.5	Y
T-211	2194	12/17/04	GDH	6"	Good	70.5	13	916.5	398458	Y
T-212	2194	12/17/04	GDH	6"	Good	116	13	1508	399966	Y
T-213	2225	12/17/04	GDH	6"	Good	115.5	13	1501.5	401467.5	Y
T-214	2225	12/17/04	GDH	6"	Good	84	13	1092	402559.5	Y
T-215	2223	12/17/04	GDH	6"	Good	166	13	2158	404717.5	Y
T-216	2200	01/04/05	MGC	6"	Good	193	13	2509	407226.5	Y
T-217	2202	01/04/05	MGC	6"	Good	195	13	2535	409761.5	Y
T-218	2209	01/04/05	MGC	6"	Good	197	13	2561	412322.5	Y
T-219	2204	01/04/05	MGC	6"	Good	199	13	2587	414909.5	Y
T-220	2199	01/04/05	MGC	6"	Good	59	13	767	415676.5	Y
T-221	2199	01/04/05	MGC	6"	Good	136	13	1768	417444.5	Y
T-222	2191	01/03/05	MGC	6"	Good	75	13	975	418419.5	Y
T-223	2211	01/03/05	MGC	6"	Good	43	13	559	418978.5	Y
T-224	2211	01/03/05	MGC	6"	Good	38	13	494	419472.5	Y
T-225	2211	01/03/05	MGC	6"	Good	28	13	364	419836.5	Y
T-226	2211	01/03/05	MGC	6"	Good	49	13	637	420473.5	Y
T-227	2205	01/04/05	MGC	6"	Good	210	13	2730	423203.5	Y
T-228	2190	01/04/05	MGC	6"	Good	198	13	2574	425777.5	Y
T-229	2195	01/04/05	MGC	6"	Good	194	13	2522	428299.5	Y
T-230	2193	01/04/05	MGC	6"	Good	115	13	1495	429794.5	Y
T-231	2213	01/06/05	PRH	6"	Good	185	13	2405	432199.5	Y
T-232	2193	01/06/05	PRH	6"	Good	145	13	1885	434084.5	Y
T-233	2197	01/06/05	PRH	6"	Good	187	13	2431	436515.5	Y
T-234	2113	01/06/05	PRH	6"	Good	196	13	2548	439063.5	Y
T-235	2068	01/06/05	PRH	6"	Good	112	13	1456	440519.5	Y
T-236	2196	01/06/05	PRH	6"	Good	30	13	390	440909.5	Y
T-237	2196	01/06/05	PRH	6"	Good	137	13	1781	442690.5	Y
T-238	2187	01/06/05	PRH	6"	Good	192	13	2496	445186.5	Y
T-239	2221	01/06/05	PRH	6"	Good	194	13	2522	447708.5	Y
T-240	2189	01/06/05	PRH	6"	Good	196	13	2548	450256.5	Y
T-241	1916	01/06/05	PRH	6"	Good	134	13	1742	451998.5	Y
T-242	1916	01/06/05	PRH	6"	Good	52	13	676	452674.5	Y
T-243	1955	01/06/05	PRH	6"	Good	191	13	2483	455157.5	Y
T-244	1957	01/06/05	PRH	6"	Good	204	13	2652	457809.5	Y
T-245	1961	01/06/05	PRH	6"	Good	188	13	2444	460253.5	Y

PANEL NUMBER	ROLL NUMBER	DEPLOYMENT DATE	QC MON.	OBSERVED OVERLAP	VISUAL PANEL CONDITION	PANEL DIMENSIONS (FT)		PANEL AREA	TOTAL AREA PLACED	ZIP TIED or LEISTER
						LENGTH	WIDTH			
T-246	1956	01/06/05	PRH	6"	Good	196	13	2548	462801.5	Y
T-247	1991	01/06/05	PRH	6"	Good	37	13	481	463282.5	Y
T-248	1991	01/06/05	PRH	6"	Good	156	13	2028	465310.5	Y
T-249	1954	01/06/05	PRH	6"	Good	197	13	2561	467871.5	Y
T-250	1964	01/06/05	PRH	6"	Good	194	13	2522	470393.5	Y
T-251	1992	01/06/05	PRH	6"	Good	195	13	2535	472928.5	Y
T-252	2116	01/06/05	PRH	6"	Good	131	13	1703	474631.5	Y
T-253	2116	01/06/05	PRH	6"	Good	58	13	754	475385.5	Y
T-254	1967	01/06/05	PRH	6"	Good	197	13	2561	477946.5	Y
T-255	1930	01/06/05	PRH	6"	Good	198	13	2574	480520.5	Y
T-256	1943	01/06/05	PRH	6"	Good	202	13	2626	483146.5	Y
T-257	1950	01/06/05	PRH	6"	Good	196	13	2548	485694.5	Y
T-258	1933	01/06/05	PRH	6"	Good	33	13	429	486123.5	Y
T-259	1933	01/06/05	PRH	6"	Good	154	13	2002	488125.5	Y
T-260	1952	01/06/05	PRH	6"	Good	201	13	2613	490738.5	Y
T-261	1944	01/06/05	PRH	6"	Good	198	13	2574	493312.5	Y
T-262	1939	01/06/05	PRH	6"	Good	198	13	2574	495886.5	Y
T-263	1918	01/06/05	PRH	6"	Good	146	13	1898	497784.5	Y
T-264	1822	01/07/05	MGC	6"	Good	181	13	2353	500137.5	Y
T-265	1821	01/07/05	MGC	6"	Good	198	13	2574	502711.5	Y
T-266	1823	01/07/05	MGC	6"	Good	198	13	2574	505285.5	Y
T-267	1812	01/07/05	MGC	6"	Good	194	13	2522	507807.5	Y
T-268	1809	01/07/05	MGC	6"	Good	131	13	1703	509510.5	Y
T-269	1996	01/07/05	MGC	6"	Good	200	13	2600	512110.5	Y
T-270	1808	01/07/05	MGC	6"	Good	196	13	2548	514658.5	Y
T-271	1824	01/07/05	MGC	6"	Good	196	13	2548	517206.5	Y
T-272	1820	01/07/05	MGC	6"	Good	195	13	2535	519741.5	Y
T-273	1827	01/07/05	MGC	6"	Good	125	13	1625	521366.5	Y
T-274	1827	01/07/05	MGC	6"	Good	70	13	910	522276.5	Y
T-275	1819	01/07/05	MGC	6"	Good	200	13	2600	524876.5	Y
T-276	1825	01/07/05	MGC	6"	Good	195	13	2535	527411.5	Y
T-277	1838	01/07/05	MGC	6"	Good	200	13	2600	530011.5	Y
T-278	1815	01/07/05	MGC	6"	Good	192	13	2496	532507.5	Y
T-279	1809	01/07/05	MGC	6"	Good	50	13	650	533157.5	Y
T-280	1836	01/07/05	MGC	6"	Good	197	13	2561	535718.5	Y
T-281	1813	01/07/05	MGC	6"	Good	198	13	2574	538292.5	Y
T-282	1826	01/07/05	MGC	6"	Good	197	13	2561	540853.5	Y
T-283	1844	01/07/05	MGC	6"	Good	203	13	2639	543492.5	Y
T-284	1835	01/07/05	MGC	6"	Good	129	13	1677	545169.5	Y
T-285	1835	01/07/05	MGC	6"	Good	51	13	663	545832.5	Y
T-286	1843	01/07/05	MGC	6"	Good	196	13	2548	548380.5	Y
T-287	1925	01/07/05	MGC	6"	Good	198	13	2574	550954.5	Y
T-288	1923	01/07/05	MGC	6"	Good	200	13	2600	553554.5	Y
T-289	1831	01/07/05	MGC	6"	Good	180	13	2340	555894.5	Y
T-290	1852	01/07/05	MGC	6"	Good	112	13	1456	557350.5	Y
T-291	1852	01/07/05	MGC	6"	Good	70	13	910	558260.5	Y
T-292	1850	01/07/05	MGC	6"	Good	195	13	2535	560795.5	Y
T-293	2021	01/07/05	MGC	6"	Good	196	13	2548	563343.5	Y
T-294	1921	01/07/05	MGC	6"	Good	197	13	2561	565904.5	Y
T-295	1851	01/07/05	MGC	6"	Good	194	13	2522	568426.5	Y

PANEL NUMBER	ROLL NUMBER	DEPLOYMENT DATE	QC MON.	OBSERVED OVERLAP	VISUAL PANEL CONDITION	PANEL DIMENSIONS (FT)		PANEL AREA	TOTAL AREA PLACED	ZIP TIED or LEISTER
						LENGTH	WIDTH			
T-296	1938	01/07/05	MGC	6"	Good	92	13	1196	569622.5	Y
T-297	1938	01/07/05	MGC	6"	Good	93	13	1209	570831.5	Y
T-298	1847	01/07/05	MGC	6"	Good	196	13	2548	573379.5	Y
T-299	1928	01/07/05	MGC	6"	Good	210	13	2730	576109.5	Y
T-300	1937	01/07/05	MGC	6"	Good	194	13	2522	578631.5	Y
T-301	1966	01/07/05	MGC	6"	Good	203	13	2639	581270.5	Y
T-302	1914	01/07/05	MGC	6"	Good	46	13	598	581868.5	Y
T-303	1913	01/08/05	MGC	6"	Good	187	13	2431	584299.5	Y
T-304	1910	01/08/05	MGC	6"	Good	204	13	2652	586951.5	Y
T-305	1908	01/08/05	MGC	6"	Good	192	13	2496	589447.5	Y
T-306	1934	01/08/05	MGC	6"	Good	196	13	2548	591995.5	Y
T-307	1924	01/08/05	MGC	6"	Good	151	13	1963	593958.5	Y
T-308	1924	01/08/05	MGC	6"	Good	35	13	455	594413.5	Y
T-309	1926	01/08/05	MGC	6"	Good	195	13	2535	596948.5	Y
T-310	1917	01/08/05	MGC	6"	Good	195	13	2535	599483.5	Y
T-311	1915	01/10/05	MGC	6"	Good	169	13	2197	601680.5	Y
T-312	1912	01/10/05	MGC	6"	Good	203	13	2639	604319.5	Y
T-313	1911	01/10/05	MGC	6"	Good	140	13	1820	606139.5	Y
T-314	1911	01/10/05	MGC	6"	Good	60	13	780	606919.5	Y
T-315	1940	01/10/05	MGC	6"	Good	195	13	2535	609454.5	Y
T-316	1951	01/10/05	MGC	6"	Good	198	13	2574	612028.5	Y
T-317	1946	01/10/05	MGC	6"	Good	198	13	2574	614602.5	Y
T-318	1909	01/10/05	MGC	6"	Good	191	13	2483	617085.5	Y
T-319	1949	01/10/05	MGC	6"	Good	86	13	1118	618203.5	Y
T-320	1949	01/10/05	MGC	6"	Good	86	13	1118	619321.5	Y
T-321	1920	01/10/05	MGC	6"	Good	199	13	2587	621908.5	Y
T-322	1947	01/10/05	MGC	6"	Good	190	13	2470	624378.5	Y
T-323	1919	01/10/05	MGC	6"	Good	194	13	2522	626900.5	Y
T-324	1935	01/10/05	MGC	6"	Good	198	13	2574	629474.5	Y
T-325	1922	01/10/05	MGC	6"	Good	53	13	689	630163.5	Y
T-326	1922	01/10/05	MGC	6"	Good	126	13	1638	631801.5	Y
T-327	1927	01/10/05	MGC	6"	Good	193	13	2509	634310.5	Y
T-328	1953	01/10/05	MGC	6"	Good	201	13	2613	636923.5	Y
T-329	1945	01/10/05	MGC	6"	Good	191	13	2483	639406.5	Y
T-330	1948	01/10/05	MGC	6"	Good	196	13	2548	641954.5	Y
T-331	1936	01/11/05	MGC	6"	Good	193	13	2509	644463.5	Y
T-332	1932	01/11/05	MGC	6"	Good	189	13	2457	646920.5	Y
T-333	1942	01/11/05	MGC	6"	Good	197	13	2561	649481.5	Y
T-334	1959	01/11/05	MGC	6"	Good	200	13	2600	652081.5	Y
T-335	2109	01/11/05	MGC	6"	Good	143	13	1859	653940.5	Y
T-336	2109	01/11/05	MGC	6"	Good	21	13	273	654213.5	Y
T-337	1958	01/11/05	MGC	6"	Good	187	13	2431	656644.5	Y
T-338	2274	01/11/05	MGC	6"	Good	195	13	2535	659179.5	Y
T-339	1965	01/11/05	MGC	6"	Good	194	13	2522	661701.5	Y
T-340	1963	01/11/05	MGC	6"	Good	199	13	2587	664288.5	Y
T-341	1994	01/11/05	MGC	6"	Good	134	13	1742	666030.5	Y
T-342	1994	01/11/05	MGC	6"	Good	49	13	637	666667.5	Y
T-343	1960	01/11/05	MGC	6"	Good	98	13	1274	667941.5	Y
T-344	1914	01/11/05	MGC	6"	Good	144	13	1872	669813.5	Y
T-345	2201	01/11/05	MGC	6"	Good	35	13	455	670268.5	Y

PANEL NUMBER	ROLL NUMBER	DEPLOYMENT DATE	QC MON.	OBSERVED OVERLAP	VISUAL PANEL CONDITION	PANEL DIMENSIONS (FT)		PANEL AREA	TOTAL AREA PLACED	ZIP TIED or LEISTER
						LENGTH	WIDTH			
T-346	2201	01/11/05	MGC	6"	Good	47	13	611	670879.5	Y
T-347	1941	01/11/05	MGC	6"	Good	189	13	2457	673336.5	Y
T-348	1931	01/11/05	MGC	6"	Good	204	13	2652	675988.5	Y
T-349	2118	01/11/05	MGC	6"	Good	143	13	1859	677847.5	Y
T-350	2118	01/11/05	MGC	6"	Good	51	13	663	678510.5	Y
T-351	1962	01/11/05	MGC	6"	Good	186	13	2418	680928.5	Y
T-352	1817	01/11/05	MGC	6"	Good	198	13	2574	683502.5	Y
T-353	1828	01/11/05	MGC	6"	Good	194	13	2522	686024.5	Y
T-354	1830	01/11/05	MGC	6"	Good	195	13	2535	688559.5	Y
T-355	1833	01/11/05	MGC	6"	Good	83	13	1079	689638.5	Y
T-356	1833	01/11/05	MGC	6"	Good	103.5	11	1138.5	690777	Y
T-357	1816	01/11/05	MGC	6"	Good	208	7 to 11	1872	692649	Y
T-358	1814	01/11/05	MGC	6"	Good	193	6 to 11	1445.5	694094.5	Y
T-359	1818	01/11/05	MGC	6"	Good	199	11 to 13	2547	696641.5	Y
T-360	1810	01/11/05	MGC	6"	Good	192	13	2496	699137.5	Y
T-361	2109	01/11/05	MGC	6"	Good	17	13	221	699358.5	Y
T-362	1811	01/11/05	MGC	6"	Good	198	0 to 8	792	700150.5	Y
T-363	1929	01/11/05	MGC	6"	Good	175	8 to 13	2112.5	702263	Y
T-364	1918	01/11/05	MGC	6"	Good	51	9 to 13	561	702824	Y
T-365	1811	01/11/05	MGC	6"	Good	116	0 to 9	522	703346	Y
T-366	1841	01/11/05	MGC	6"	Good	196	13	2548	705894	Y
T-367	1839	01/11/05	MGC	6"	Good	201	13	2613	708507	Y
T-368	2278	01/11/05	MGC	6"	Good	195	13	2535	711042	Y
T-369	1834	01/11/05	MGC	6"	Good	194	13	2522	713564	Y
T-370	1829	01/11/05	MGC	6"	Good	23	13	299	713863	Y
T-371	2308	02/17/05	MGC	6"	Good	50	13	650	714513	Y
T-372	2308	02/17/05	MGC	6"	Good	54.5	13	708.5	715221.5	Y
T-373	2308	02/17/05	MGC	6"	Good	80.5	13	1046.5	716268	Y
T-374	2282	02/17/05	MGC	6"	Good	191	13	2483	718751	Y
T-375	2281	02/17/05	MGC	6"	Good	194	13	2522	721273	Y
T-376	2264	02/17/05	MGC	6"	Good	197	13	2561	723834	Y
T-377	2307	02/17/05	MGC	6"	Good	206	13	2678	726512	Y
T-378	1816	02/17/05	MGC	6"	Good	35	13	455	726967	Y
T-379	1816	02/17/05	MGC	6"	Good	150.5	13	1956.5	728923.5	Y
T-380	2198	02/17/05	MGC	6"	Good	194	13	2522	731445.5	Y
T-381	2283	02/17/05	MGC	6"	Good	192	13	2496	733941.5	Y
T-382	2300	02/17/05	MGC	6"	Good	195	13	2535	736476.5	Y
T-383	1829	02/17/05	MGC	6"	Good	165	13	2145	738621.5	Y
T-384	2304	02/17/05	MGC	6"	Good	187.5	13	2437.5	741059	Y
T-385	2269	02/17/05	MGC	6"	Good	195	13	2535	743594	Y
T-386	2303	02/17/05	MGC	6"	Good	196	13	2548	746142	Y
T-387	2305	02/17/05	MGC	6"	Good	200	13	2600	748742	Y
T-388	2301	02/17/05	MGC	6"	Good	115	13	1495	750237	Y
T-389	2301	02/18/05	MGC	6"	Good	65.5	13	851.5	751088.5	Y
T-390	2295	02/18/05	MGC	6"	Good	192	13	2496	753584.5	Y
T-391	2297	02/18/05	MGC	6"	Good	196	13	2548	756132.5	Y
T-392	2277	02/18/05	MGC	6"	Good	197	13	2561	758693.5	Y
T-393	2298	02/18/05	MGC	6"	Good	194	13	2522	761215.5	Y
T-394	2296	02/18/05	MGC	6"	Good	47	13	611	761826.5	Y
T-395	2296	02/18/05	MGC	6"	Good	140.5	13	1826.5	763653	Y

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						LENGTH	WIDTH			
T-396	2263	02/18/05	MGC	6"	Good	204	13	2652	766305	Y
T-397	2299	02/18/05	MGC	6"	Good	187	13	2431	768736	Y
T-398	2290	02/18/05	MGC	6"	Good	193	13	2509	771245	Y
T-399	2306	02/18/05	MGC	6"	Good	164	13	2132	773377	Y
T-400	2287	02/18/05	MGC	6"	Good	190.5	13	2476.5	775853.5	Y
T-401	2273	02/18/05	MGC	6"	Good	190	13	2470	778323.5	Y
T-402	2265	02/18/05	MGC	6"	Good	190	13	2470	780793.5	Y
T-403	2294	02/18/05	MGC	6"	Good	199	13	2587	783380.5	Y
T-404	2306	02/18/05	MGC	6"	Good	35	13	455	783835.5	Y
T-405	2302	02/18/05	MGC	6"	Good	79	13	1027	784862.5	Y
T-406	2302	02/18/05	MGC	6"	Good	100.5	13	1306.5	786169	Y
T-407	2293	02/18/05	MGC	6"	Good	203	13	2639	788808	Y
T-408	2309	02/18/05	MGC	6"	Good	195	13	2535	791343	Y
T-409	2292	02/18/05	MGC	6"	Good	193	13	2509	793852	Y
T-410	2291	02/18/05	MGC	6"	Good	192	13	2496	796348	Y
T-411	2279	02/18/05	MGC	6"	Good	191	13	2483	798831	Y
T-412	2280	02/18/05	MGC	6"	Good	196	13	2548	801379	Y
T-413	2272	02/18/05	MGC	6"	Good	195	13	2535	803914	Y
T-414	2286	02/18/05	MGC	6"	Good	196	13	2548	806462	Y
T-415	2270	02/18/05	MGC	6"	Good	98.5	13	1280.5	807742.5	Y
T-416	2270	02/18/05	MGC	6"	Good	83	13	1079	808821.5	Y
T-417	1993	02/18/05	MGC	6"	Good	194	13	2522	811343.5	Y
T-418	2004	02/18/05	MGC	6"	Good	203	13	2639	813982.5	Y
T-419	2014	02/18/05	MGC	6"	Good	197	13	2561	816543.5	Y
T-420	1997	02/18/05	MGC	6"	Good	199	13	2587	819130.5	Y
T-421	2011	02/18/05	MGC	6"	Good	191	13	2483	821613.5	Y
T-422	1998	02/18/05	MGC	6"	Good	202	13	2626	824239.5	Y
T-423	2266	02/18/05	MGC	6"	Good	197	13	2561	826800.5	Y
T-424	1995	02/18/05	MGC	6"	Good	200	13	2600	829400.5	Y
T-425	2013	02/18/05	MGC	6"	Good	80	13	1040	830440.5	Y
T-426	2000	02/21/05	PRH	6"	Good	186	13	2418	832858.5	Y
T-427	2007	02/21/05	PRH	6"	Good	200	13	2600	835458.5	Y
T-428	2008	02/21/05	PRH	6"	Good	198	13	2574	838032.5	Y
T-429	2005	02/21/05	PRH	6"	Good	197	13	2561	840593.5	Y
T-430	2013	02/21/05	PRH	6"	Good	92	13	1196	841789.5	Y
T-431	0011	03/29/05	MGC	6"	Good	180.5	13	2346.5	844136	Y
T-432	0071	03/29/05	MGC	6"	Good	167.5	13	2177.5	846313.5	Y
T-433	0071	03/29/05	MGC	6"	Good	23	13	299	846612.5	Y
T-434	0074	03/29/05	MGC	6"	Good	129.5	13	1683.5	848296	Y
T-435	0074	03/29/05	MGC	6"	Good	46.5	13	604.5	848900.5	Y
T-436	0015	03/29/05	MGC	6"	Good	85.5	13	1111.5	850012	Y
T-437	0015	03/29/05	MGC	6"	Good	109.5	13	1423.5	851435.5	Y
T-438	0023	03/29/05	MGC	6"	Good	74	13	962	852397.5	Y
T-439	0023	03/29/05	MGC	6"	Good	35.5	10	355	852752.5	Y
T-440	0023	03/29/05	MGC	6"	Good	36	13	468	853220.5	Y
T-441	0025	03/29/05	MGC	6"	Good	139	13	1807	855027.5	Y
T-442	0025	03/29/05	MGC	6"	Good	46	13	598	855625.5	Y
T-443	0030	03/29/05	MGC	6"	Good	141	13	1833	857458.5	Y
T-444	0030	03/29/05	MGC	6"	Good	51	13	663	858121.5	Y
T-445	0031	03/29/05	MGC	6"	Good	139	13	1807	859928.5	Y

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						LENGTH	WIDTH			
T-446	0031	03/29/05	MGC	6"	Good	56	13	728	860656.5	Y
T-447	0027	03/29/05	MGC	6"	Good	143	13	1859	862515.5	Y
T-448	0027	03/29/05	MGC	6"	Good	53.5	13	695.5	863211	Y
T-449	0021	03/29/05	MGC	6"	Good	149	13	1937	865148	Y
T-450	0021	03/29/05	MGC	6"	Good	37.5	13	487.5	865635.5	Y
T-451	0022	03/29/05	MGC	6"	Good	142	13	1846	867481.5	Y
T-452	0022	03/29/05	MGC	6"	Good	43	13	559	868040.5	Y
T-453	0036	03/29/05	MGC	6"	Good	122	13	1586	869626.5	Y
T-454	0036	03/29/05	MGC	6"	Good	66	13	858	870484.5	Y
T-455	0035	03/29/05	MGC	6"	Good	74	13	962	871446.5	Y
T-456	0035	03/29/05	MGC	6"	Good	116	13	1508	872954.5	Y
T-457	0018	03/29/05	MGC	6"	Good	90.5	13	1176.5	874131	Y
T-458	0018	03/29/05	MGC	6"	Good	61.5	13	799.5	874930.5	Y
T-459	0018	03/29/05	MGC	6"	Good	11	13	143	875073.5	Y
T-460	0050	03/29/05	MGC	6"	Good	187	13	2431	877504.5	Y
T-461	0050	03/29/05	MGC	6"	Good	9	10	90	877594.5	Y
T-462	0052	03/29/05	MGC	6"	Good	186	13	2418	880012.5	Y
T-463	0042	03/29/05	MGC	6"	Good	164	13	2132	882144.5	Y
T-464	0042	03/29/05	MGC	6"	Good	16.5	13	214.5	882359	Y
T-465	0028	03/29/05	MGC	6"	Good	123.5	13	1605.5	883964.5	Y
T-466	0028	03/29/05	MGC	6"	Good	61.5	13	799.5	884764	Y
T-467	0032	03/29/05	MGC	6"	Good	54	13	702	885466	Y
T-468	0032	03/29/05	MGC	6"	Good	93	13	1209	886675	Y
T-469	0032	03/29/05	MGC	6"	Good	40	13	520	887195	Y
T-470	0024	03/29/05	MGC	6"	Good	26.5	13	344.5	887539.5	Y
T-471	0024	03/29/05	MGC	6"	Good	44	13	572	888111.5	Y
T-472	0024	03/29/05	MGC	6"	Good	TRIANGLE		200	888311.5	Y
T-473	0024	03/29/05	MGC	6"	Good	97	13	1261	889572.5	Y
T-474	0043	03/29/05	MGC	6"	Good	66	13	858	890430.5	Y
T-475	0043	03/30/05	MGC	6"	Good	102	13	1326	891756.5	Y
T-476	0026	03/30/05	MGC	6"	Good	64.5	13	838.5	892595	Y
T-477	0026	03/30/05	MGC	6"	Good	129.5	13	1683.5	894278.5	Y
T-478	0044	03/30/05	MGC	6"	Good	40.5	13	526.5	894805	Y
T-479	0044	03/30/05	MGC	6"	Good	160.5	13	2086.5	896891.5	Y
T-480	0038	03/30/05	MGC	6"	Good	15	13	195	897086.5	Y
T-481	0038	03/30/05	MGC	6"	Good	183	13	2379	899465.5	Y
T-482	0051	03/30/05	MGC	6"	Good	190.5	13	2476.5	901942	Y
T-483	0049	03/30/05	MGC	6"	Good	185	13	2405	904347	Y
T-484	0051	03/30/05	MGC	6"	Good	11	13	143	904490	Y
T-485	0049	03/30/05	MGC	6"	Good	17	13	221	904711	Y
T-486	0046	03/30/05	MGC	6"	Good	186	13	2418	907129	Y
T-487	0063	03/30/05	MGC	6"	Good	15	13	195	907324	Y
T-488	0041	03/30/05	MGC	6"	Good	191	13	2483	909807	Y
T-489	0063	03/30/05	MGC	6"	Good	17	13	221	910028	Y
T-490	0020	03/30/05	MGC	6"	Good	193.5	13	2515.5	912543.5	Y
T-491	0029	03/30/05	MGC	6"	Good	214	13	2782	915325.5	Y
T-492	0039	4/1/05	MGC	6"	Good	188	13	2444	917769.5	Y
T-493	0073	4/1/05	MGC	6"	Good	208	13	2704	920473.5	Y
T-494	0037	4/1/05	MGC	6"	Good	85.5	13	1111.5	921585	Y
T-495	0037	4/1/05	MGC	6"	Good	103	13	1339	922924	Y

PANEL NUMBER	ROLL NUMBER	DEPLOYMENT DATE	QC MON.	OBSERVED OVERLAP	VISUAL PANEL CONDITION	PANEL DIMENSIONS (FT)		PANEL AREA	TOTAL AREA PLACED	ZIP TIED or LEISTER
						LENGTH	WIDTH			
T-496	0045	4/1/05	MGC	6"	Good	196	13	2548	925472	Y
T-497	0047	4/1/05	MGC	6"	Good	160	13	2080	927552	Y
T-498	0047	4/1/05	MGC	6"	Good	16	13	208	927760	Y
T-499	0016	4/1/05	MGC	6"	Good	201	13	2613	930373	Y
T-500	0061	4/1/05	MGC	6"	Good	204	13	2652	933025	Y
T-501	0061	4/1/05	MGC	6"	Good	12	13	156	933181	Y
T-502	0056	4/1/05	MGC	6"	Good	175	13	2275	935456	Y
T-503	0040	4/1/05	MGC	6"	Good	186	13	2418	937874	Y
T-504	0014	4/1/05	MGC	6"	Good	46	13	598	938472	Y
T-505	0014	4/1/05	MGC	6"	Good	122.5	13	1592.5	940064.5	Y
T-506	0068	4/1/05	MGC	6"	Good	194	13	2522	942586.5	Y
T-507	0072	4/1/05	MGC	6"	Good	66	13	858	943444.5	Y
T-508	0072	4/1/05	MGC	6"	Good	102.5	13	1332.5	944777	Y
T-509	0070	4/1/05	MGC	6"	Good	200	13	2600	947377	Y
T-510	0060	4/1/05	MGC	6"	Good	57	13	741	948118	Y
T-511	0060	4/1/05	MGC	6"	Good	114.5	13	1488.5	949606.5	Y
T-512	0055	4/1/05	MGC	6"	Good	197	13	2561	952167.5	Y
T-513	0064	4/1/05	MGC	6"	Good	27	13	351	952518.5	Y
T-514	0064	4/1/05	MGC	6"	Good	159	13	2067	954585.5	Y
T-515	0062	4/1/05	MGC	6"	Good	155	13	2015	956600.5	Y
T-516	0062	4/1/05	MGC	6"	Good	32.5	13	422.5	957023	Y
T-517	0054	4/1/05	MGC	6"	Good	207	13	2691	959714	Y
T-518	0066	4/1/05	MGC	6"	Good	47	13	611	960325	Y
T-519	0066	4/2/05	MGC	6"	Good	133	13	1729	962054	Y
T-520	0033	4/2/05	MGC	6"	Good	132.5	13	1722.5	963776.5	Y
T-521	0033	4/2/05	MGC	6"	Good	44	13	572	964348.5	Y
T-522	0065	4/2/05	MGC	6"	Good	197	13	2561	966909.5	Y
T-523	0058	4/2/05	MGC	6"	Good	193.5	13	2515.5	969425	Y
T-524	0069	4/2/05	MGC	6"	Good	28	13	364	969789	Y
T-525	0069	4/2/05	MGC	6"	Good	155	13	2015	971804	Y
T-526	0057	4/2/05	MGC	6"	Good	43	13	559	972363	Y
T-527	0057	4/2/05	MGC	6"	Good	136.5	13	1774.5	974137.5	Y
T-528	0065	4/2/05	MGC	6"	Good	33.5	13	435.5	974573	Y
T-529	0065	4/2/05	MGC	6"	Good	127.5	13	1657.5	976230.5	Y
T-530	0053	4/2/05	MGC	6"	Good	22.5	13	292.5	976523	Y
T-531	0053	4/2/05	MGC	6"	Good	128.5	13	1670.5	978193.5	Y
T-532	0053	4/2/05	MGC	6"	Good	23	13	299	978492.5	Y
T-533	0059	4/2/05	MGC	6"	Good	84.5	13	1098.5	979591	Y
T-534	0059	4/2/05	MGC	6"	Good	PENTAGON		1084	980675	Y
T-535	0059	4/2/05	MGC	6"	Good	19	13	247	980922	Y
T-536	0048	4/2/05	MGC	6"	Good	56	13	728	981650	Y
T-537	0048	4/2/05	MGC	6"	Good	70	13	910	982560	Y
T-538	0048	4/2/05	MGC	6"	Good	110	13	1430	983990	Y
T-539	0067	4/2/05	MGC	6"	Good	25	13	325	984315	Y
T-540	0067	4/2/05	MGC	6"	Good	68.5	13	890.5	985205.5	Y
T-541	0067	4/2/05	MGC	6"	Good	53.5	13	695.5	985901	Y
T-542	0067	4/2/05	MGC	6"	Good	48.5	13	630.5	986531.5	Y
T-543	1848	4/2/05	MGC	6"	Good	44	13	572	987103.5	Y
T-544	1848	4/2/05	MGC	6"	Good	38.5	13	500.5	987604	Y
T-545	1848	4/2/05	MGC	6"	Good	32.5	13	422.5	988026.5	Y

PANEL NUMBER	ROLL NUMBER	DEPLOYMENT DATE	QC MON.	OBSERVED OVERLAP	VISUAL PANEL CONDITION	PANEL DIMENSIONS (FT)		PANEL AREA	TOTAL AREA PLACED	ZIP TIED or LEISTER
						LENGTH	WIDTH			
T-546	1848	4/2/05	MGC	6"	Good	27	13	351	988377.5	Y
T-547	1848	4/6/05	MGC	6"	Good	21	13	273	988650.5	Y
T-548	1837	4/6/05	MGC	6"	Good	136.5	13	1774.5	990425	Y
T-549	1837	4/6/05	MGC	6"	Good	54	13	702	991127	Y
T-550	2091	4/6/05	MGC	6"	Good	106.5	13	1384.5	992511.5	Y
T-551	2091	4/6/05	MGC	6"	Good	93	13	1209	993720.5	Y
T-552	2122	4/6/05	MGC	6"	Good	132	13	1716	995436.5	Y
T-553	2122	4/6/05	MGC	6"	Good	TRIANGLE		358	995794.5	Y
T-554	1842	4/6/05	MGC	6"	Good	154	13	2002	997796.5	Y
T-555	1842	4/6/05	MGC	6"	Good	TRIANGLE		96	997892.5	Y
T-556	1832	4/6/05	MGC	6"	Good	PENTAGON		1402	999294.5	Y
T-557	1832	4/6/05	MGC	6"	Good	44	13	572	999866.5	Y
T-558	1845	4/6/05	MGC	6"	Good	195	13	2535	1002402	Y
T-559	2097	4/6/05	MGC	6"	Good	194	13	2522	1004924	Y
T-560	1846	4/6/05	MGC	6"	Good	187	13	2431	1007355	Y
T-561	0013	4/6/05	MGC	6"	Good	178	13	2314	1009669	Y
T-562	2090	4/6/05	MGC	6"	Good	31	13	403	1010072	Y
T-563	2090	4/6/05	MGC	6"	Good	33	13	429	1010501	Y
T-564	2090	4/6/05	MGC	6"	Good	32	13	416	1010917	Y
T-565	2090	4/6/05	MGC	6"	Good	36	13	468	1011385	Y
T-566	2090	4/6/05	MGC	6"	Good	45	13	585	1011970	Y
T-567	2083	4/6/05	MGC	6"	Good	164	13	2132	1014102	Y
T-568	0034	4/6/05	MGC	6"	Good	183	13	2379	1016481	Y
T-569	2083	4/6/05	MGC	6"	Good	28	13	364	1016845	Y
T-570	0034	4/6/05	MGC	6"	Good	17	13	221	1017066	Y
T-571	2108	4/6/05	MGC	6"	Good	193	13	2509	1019575	Y
T-572	2098	4/6/05	MGC	6"	Good	181.5	13	2359.5	1021934	Y
T-573	2087	4/6/05	MGC	6"	Good	166.5	13	2164.5	1024099	Y
T-574	2887	4/6/05	MGC	6"	Good	155.5	13	2021.5	1026120	Y
T-575	2125	4/6/05	MGC	6"	Good	137	13	1781	1027901	Y
T-576	2125	4/6/05	MGC	6"	Good	52	13	676	1028577	Y
T-577	2111	4/6/05	MGC	6"	Good	79	13	1027	1029604	Y
T-578	2111	4/6/05	MGC	6"	Good	109.5	13	1423.5	1031028	Y
T-579	2083	4/6/05	MGC	6"	Good	11.5	13	149.5	1031177	Y
T-580	2105	4/6/05	MGC	6"	Good	103.5	13	1345.5	1032523	Y
T-581	2105	4/6/05	MGC	6"	Good	86.5	13	1124.5	1033647	Y
T-582	2101	4/6/05	MGC	6"	Good	73	13	949	1034596	Y
T-583	2101	4/6/05	MGC	6"	Good	62	13	806	1035402	Y
T-584	2095	4/6/05	MGC	6"	Good	160	13	2080	1037482	Y
T-585	2101	4/6/05	MGC	6"	Good	40	13	520	1038002	Y
T-586	2095	4/6/05	MGC	6"	Good	34	13	442	1038444	Y
T-587	2106	4/6/05	MGC	6"	Good	149	13	1937	1040381	Y
T-588	2099	4/6/05	MGC	6"	Good	138	13	1794	1042175	Y
T-589	2106	4/6/05	MGC	6"	Good	36	13	468	1042643	Y
T-590	2099	4/6/05	MGC	6"	Good	53.5	13	695.5	1043339	Y
T-591	2100	4/6/05	MGC	6"	Good	126	13	1638	1044977	Y
T-592	2100	4/6/05	MGC	6"	Good	73.5	13	955.5	1045932	Y
T-593	2126	4/6/05	MGC	6"	Good	98	13	1274	1047206	Y
T-594	2126	4/6/05	MGC	6"	Good	87	13	1131	1048337	Y
T-595	2130	4/6/05	MGC	6"	Good	73	13	949	1049286	Y

PANEL NUMBER	ROLL NUMBER	DEPLOYMENT DATE	QC MON.	OBSERVED OVERLAP	VISUAL PANEL CONDITION	PANEL DIMENSIONS (FT)		PANEL AREA	TOTAL AREA PLACED	ZIP TIED or LEISTER
						LENGTH	WIDTH			
T-596	2130	4/6/05	MGC	6"	Good	109.5	13	1423.5	1050710	Y
T-597	2120	4/6/05	MGC	6"	Good	40	13	520	1051230	Y
T-598	2128	4/6/05	MGC	6"	Good	145.5	13	1891.5	1053121	Y
T-599	2102	4/6/05	MGC	6"	Good	136	13	1768	1054889	Y
T-600	2102	4/6/05	MGC	6"	Good	58	13	754	1055643	Y
T-601	2104	4/6/05	MGC	6"	Good	73	13	949	1056592	Y
T-602	2104	4/6/05	MGC	6"	Good	122	13	1586	1058178	Y
T-603	2103	4/6/05	MGC	6"	Good	19	13	247	1058425	Y
T-604	2103	4/6/05	MGC	6"	Good	141	13	1833	1060258	Y
T-605	2103	4/6/05	MGC	6"	Good	PENTAGON		414	1060672	Y
T-606	2107	4/6/05	MGC	6"	Good	62	7.5	465	1061137	Y
T-607	2036	4/7/05	MGC	6"	Good	202	13	2626	1063763	Y
T-608	2107	4/7/05	MGC	6"	Good	137	13	1781	1065544	Y
T-609	2041	4/7/05	MGC	6"	Good	58	13	754	1066298	Y
T-610	2041	4/7/05	MGC	6"	Good	133.5	13	1735.5	1068034	Y
T-611	2194	4/7/05	MGC	6"	Good	59	13	767	1068801	Y
T-612	2094	4/7/05	MGC	6"	Good	131	13	1703	1070504	Y
T-613	2037	4/7/05	MGC	6"	Good	58	13	754	1071258	Y
T-614	2027	4/7/05	MGC	6"	Good	138	13	1794	1073052	Y
T-615	2169	4/7/05	MGC	6"	Good	45	13	585	1073637	Y
T-616	2169	4/7/05	MGC	6"	Good	56	13	728	1074365	Y
T-617	2040	4/7/05	MGC	6"	Good	120	13	1560	1075925	Y
T-618	2040	4/7/05	MGC	6"	Good	68	13	884	1076809	Y
T-619	2038	4/7/05	MGC	6"	Good	97	13	1261	1078070	Y
T-620	2038	4/7/05	MGC	6"	Good	87	13	1131	1079201	Y
T-621	2015	4/7/05	MGC	6"	Good	59	13	767	1079968	Y
T-622	2015	4/7/05	MGC	6"	Good	111.5	13	1449.5	1081417	Y
T-623	2026	4/7/05	MGC	6"	Good	80	13	1040	1082457	Y
T-624	2026	4/7/05	MGC	6"	Good	55	13	715	1083172	Y
T-625	2026	4/7/05	MGC	6"	Good	29	13	377	1083549	Y
T-626	2023	4/7/05	MGC	6"	Good	60	13	780	1084329	Y
T-627	2023	4/7/05	MGC	6"	Good	70	13	910	1085239	Y

GDN DEFECT LOG

PROJECT NUMBER:	**043-2246**	**PROJECT TITLE:**	**Rocky Flats, Present Landfi**
LINER INSTALLER:	**Colorado Lining**	**CONTRACTOR:**	**S.M. Stoller**
LOCATION:	**Rocky Flats**	**SITE MANAGER:**	**Kaiser Hill Company LLC**

DEFECT LOCATION							
DEFECT CODE	SEAM, PANEL OR REPAIR NO.	DEFECT LOCATION DESCRIPTION	DEFECT TYPE	LOG DATE	MON.	REMARKS	** REPAIR DATE
DT1 A	T26	@SEOP	EXT	11/12/04	PRH		11/12/04
DT1 B	T35	114' SNEOP/7'WEEOP	MD	11/15/04	MGC		11/15/04
DT1 C	T29	25'NSEOP/EEOP-5'WEEOP	MD	11/15/04	MGC		11/15/04
DT1 D	NA	NA	NA	NA	NA	rock pulled	NA
DT1 E	T51	100' NSEOP/6' EWEOP	MD	11/18/04	MGC		11/19/04
DT1 F	T66	75' NSEOP/Entire width	MD	11/23/04	PRH		11/23/04
DT1 G	T68	5' SNEOP/6' EWEOP	MD	11/23/04	PRH		11/23/04
DT1 H	T68	15' SNEOP/6' EWEOP	MD	11/23/04	PRH		11/23/04
DT1 I	T68	20' SNEOP/6' EWEOP	MD	11/23/04	PRH		11/23/04
DT1 J	T114	52'NSEOP/6'EWEOP	MD	12/3/04	MGC		12/04/04
DT1 K	T114	45'NSEOP/6'EWEOP	MD	12/3/04	MGC		12/04/04
DT1 M	T115	130'NSEOP/6'EWEOP	MD	12/3/04	MGC		12/04/04
DT1 N	T112	30'SNEOP/6'EWEOP	D	12/3/04	MGC		12/04/04
DT1 P	T104	100'SNEOP/6'EWEOP	MD	12/3/04	MGC		12/04/04
DT1 Q	T115	50' NSEOP/6'EWEOP	MD	12/4/04	MGC		12/04/04
DT1 R	T57	20' SNEOP/6' WEEOP	EE	12/4/04	MGC		12/06/04
DT1 S	T40	10' NSEOP/2' WEEOP	EE	12/4/04	MGC		12/05/04
DT1 T	T63	50' SNEOP/5' WEEOP	EE	12/4/04	MGC		12/05/04
DT1 W	T63	45' SNEOP/3' WEEOP	EE	12/4/04	MGC		12/05/04
DT1 X	T79	60' NSEOP/4' WEEOP	MD	12/4/04	MGC		12/04/04
DT2 A	T61	100' NSEOP/ 6'WEEOP	EE	12/4/04	MGC		12/05/04
DT2 B	T27	10' NSEOP/ 6' WEEOP	EE	12/5/04	MGC		12/05/04
DT2 C	T37	20' NSEOP/6' WEEOP	EE	12/5/04	MGC	3 Patches	12/05/04
DT2 D	T51	15' NSEOP/6' WEEOP	EE	12/5/04	MGC		12/05/04
DT2 E	T62	15' NSEOP/4' WEEOP	EE	12/5/04	MGC	3 Patches	12/05/04
DT2 F	T65	10' NSEOP/ 6'WEEOP	EE	12/5/04	MGC		12/05/04
DT2 G	T65	20' NSEOP/3' EWEOP	EE	12/5/04	MGC		12/05/04
DT2 H	T65	25' NSEOP/5' EWEOP	EE	12/5/04	MGC		12/05/04
DT2 I	T65	30' NSEOP/2' EWEOP	EE	12/5/04	MGC		12/05/04
DT2 J	T55	10' SNEOP/4'WEEOP	EE	12/5/04	MGC		12/06/04
DT2 K	T61	15' SNEOP/6' WEEOP	EE	12/5/04	MGC		12/06/04
DT2 M	T58	40' NSEOP/1' WEEOP	D	12/5/04	MGC		12/06/04
DT2 N	T61	75' SNEOP.1' WEEOP	EE	12/5/04	MGC		12/05/04
DT2 P	T61	80' SNEOP/6' WEEOP	EE	12/5/04	MGC		12/05/04
DT2 Q	T61/T67	50' NSEOS	EE	12/5/04	MGC		12/05/04
DT2 R	T61	25' NSEOP/2' WEEOP	EE	12/5/04	MGC		12/05/04
DT2 S	T61	15' NSEOP/2'EWEOP	EE	12/5/04	MGC		12/05/04
DT2 T	T63	20' SNEOP/6' WEEOP	EE	12/5/04	MGC		12/05/04
DT2 W	T65	75' SNEOP/1' EWEOP	EE	12/5/04	MGC		12/06/04
DT2 X	T67	10' SNEOP/1' EWEOP	EE	12/5/04	MGC		12/05/04
DT3 A	T69	20' NSEOP/5'EWEOP	EE	12/5/04	MGC		12/05/04
DT3 B	T80	25' SNEOP/5' WEEOP	EE	12/5/04	MGC		12/05/04
DT3 C	T80	70' SNEOP/2' WEEOP	EE	12/5/04	MGC		12/05/04

DEFECT LOCATION			DEFECT TYPE	LOG DATE	MON.	REMARKS	REPAIR DATE
DEFECT CODE	SEAM, PANEL OR REPAIR NO.	DEFECT LOCATION DESCRIPTION					
DT3 D	T73	80' SNEOP/5' WEEOP	EE	12/5/04	MGC		12/06/04
DT3 E	T75	40' SNEOP/6' WEEOP	EE	12/5/04	MGC		12/06/04
DT3 F	T73/T75	10' SNEOS	EE	12/5/04	MGC		12/06/04
DT3 G	T82	10' NSEOP/6' WEEOP	EE	12/5/04	MGC		12/06/04
DT3 H	T82	5' SNEOP/1' EWEOP	EE	12/5/04	MGC		12/05/04
DT3 I	T83	50' NSEOP/2' WEEOP	EE	12/5/04	MGC		12/06/04
DT3 J	T83	75' NSEOP/2'EWEOP	EE	12/5/04	MGC		12/05/04
DT3 K	T71	10' NSEOP/6' WEEOP	EE	12/5/04	MGC		12/06/04
DT3 M	T73	10' NSEOP/3' EWEOP	EE	12/5/04	MGC		12/06/04
DT3 N	T115	75' NSEOP/1' WEEOP	EE	12/5/04	MGC		12/06/04
DT3 P	T87	5' NSEOP/1' WEEOP	EE	12/5/04	MGC		12/06/04
DT3 Q	T68	5' NSEOP/6'WEEOP	EE	12/6/04	MGC		12/06/04
DT3 R	T93	10' NSEOP/1' EWEOP	EE	12/6/04	PRH		12/06/04
DT3 S	T90	10' NSEOP/4' EWEOP	EE	12/6/04	PRH		12/06/04
DT3 T	T78	8' NSEOP/6' EWEOP	EE	12/6/04	PRH		12/06/04
DT3 W	T115	60' NSEOP/1' WEEOP	MD	12/6/04	PRH		12/06/04
DT3 X	T105	30' SNEOP/6' WEEOP	MD	12/6/04	PRH		12/06/04
DT4 A	T122	SEOP	EXT	12/6/04	PRH		12/06/04
DT4 B	T144	100' SNEOP/6' WEEOP	MD	12/6/04	PRH		12/06/04
DT4 C	T130	100' SNEOP/2' WEEOP	MD	12/6/04	PRH		12/08/04
DT4 D	T147	20' SNEOP/6' WEEOP	MD	12/6/04	PRH		12/08/04
DT4 E	T111/T112	3' NSEOS	MD	12/7/04	MGC		12/08/04
DT4 F	T82	70' NSEOP/2' WEEOP	EE	12/11/04	PRH		12/11/04
DT4 G	T85	2' NSEOP/2' WEEOP	D	12/11/04	PRH		12/11/04
DT4 H	T154	80' SNEOP/4' WEEOP	MD	12/14/04	PRH		12/15/04
DT4 I	T154	85' SNEOP/4' WEEOP	MD	12/14/04	PRH		12/15/04
DT4 J	T154	90' SNEOP/4' WEEOP	MD	12/14/04	PRH		12/15/04
DT4 K	NA	NA	NA	NA	NA	rock pulled	NA
DT4 M	T171	1' NSEOP/7' WEEOP	D	12/14/04	GDH		12/15/04
DT4 N	T173	57' SNEOP/6' WEEOP	MD	12/14/04	GDH		12/15/04
DT4 P	T170	75' SNEOP/1' EWEOP	D	12/14/04	GDH		12/15/04
DT4 Q	T163	84' SNEOP/6'WEEOP	MD	12/14/04	GDH		12/15/04
DT4 R	T187	66' NEOP/6' WEEOP	MD	12/16/04	GDH		01/08/05
DT4 S	T189	60 NSEOP/5' WEEOP	MD	12/16/04	GDH		01/08/05
DT4 T	T190	60' NSEOP/5 'WEEOP	MD	12/16/04	GDH		01/08/05
DT4 W	T197	84' SNEOP/2' WEEOP	SI	12/16/04	GDH		12/21/04
DT4 X	T207	3' EWEOP/27' SNEOP	MD	12/17/04	GDH		12/21/04
DT5 A	T207	SEOS	EXT	12/21/04	PRH		12/21/04
DT5 B	T150	10' NSEOP/3'EWEOP	D	12/21/04	MGC		12/21/04
DT5 C	T192	50' NSEOP/5' EWEOP	D	12/21/04	MGC		12/21/04
DT5 D	T210	2' NSEOP/3' EWEOP	WD	12/21/04	MGC		12/21/04
DT5 E	T210/T212	@EEOS	WD	12/21/04	MGC		01/08/05
DT5 F	T189	100' SNEOP/3' EWEOP	D	12/21/04	MGC		01/03/05
DT5 G	T148	10' NSEOP/5' WEEOP	D	1/3/05	MGC		01/03/05
DT5 H	T151	10' SNEOP/5' WEEOP	D	1/3/05	MGC		01/03/05
DT5 I	T154	15' SNEOP/8' WEEOP	D	1/3/05	MGC		01/03/05
DT5 J	T183	25' NSEOP/3' WEEOP	D	1/3/05	MGC		01/06/05
DT5 K	T173	50' NSEOP/EEOP-WEEOP	D	1/3/05	MGC		01/06/05
DT5 M	T189	150' SNEOP/EEOP-WEEOP	D	1/3/05	MGC		01/04/04
DT5 N	T152	50' NSEOP/5' WEEOP	D	1/3/05	MGC		01/06/05

DEFECT LOCATION			DEFECT TYPE	LOG DATE	MON.	REMARKS	REPAIR DATE
DEFECT CODE	SEAM, PANEL OR REPAIR NO.	DEFECT LOCATION DESCRIPTION					
DT5 P	T199	75' NSEOP/6' WEEOP	D	1/3/05	MGC		01/08/05
DT5 Q	T167	10' NSEOP/ 3'EWEOP	D	1/3/05	MGC		01/03/05
DT5 R	T166	10' NSEOP/4 'EWEOP	D	1/3/05	MGC		01/03/05
DT5 S	T167/T170	NEOS to 50' SNEOS	D	1/3/05	MGC		01/03/05
DT5 T	T294	80' SNEOP/4' WEEOP	MD	1/7/05	PRH		01/10/05
DT5 W	T316	70' SNEOP/4' WEEOP	MD	1/10/05	MGC		01/11/05
DT5 X	T345	5' NSEOP/6' WEEOP	D	1/11/05	MGC	3 Patches	01/11/05
DT6 A	T363	75' SNEOP/6'WEEOP	MD	1/11/05	MGC		01/11/05
DT6 B	T367	75' SNEOP/6' WEEOP	MD	1/11/05	MGC		01/11/05
DT6 C	BY SURVEY	BY SURVEY	BS	1/17/05	MSP		01/17/05
DT6 D	BY SURVEY	BY SURVEY	BS	1/17/05	MSP		01/17/05
DT6 E	BY SURVEY	BY SURVEY	BS	1/18/05	PRH		01/18/05
DT6 F	BY SURVEY	BY SURVEY	BS	1/18/05	MSP		01/18/05
DT6 G	BY SURVEY	BY SURVEY	BS	1/18/05	MSP		01/18/05
DT6 H	BY SURVEY	BY SURVEY	BS	1/19/05	PRH		01/19/05
DT6 I	BY SURVEY	BY SURVEY	BS	1/20/05	PRH		01/20/05
DT6 J	BY SURVEY	BY SURVEY	BS	1/21/05	PRH		01/21/05
DT6 K	BY SURVEY	BY SURVEY	BS	1/21/05	PRH		01/21/05
DT6 M	T369	100' SNEOP/7'WEEOP	D	2/17/05	MGC		02/17/05
DT6 N	T369	50' NSEOP/7'WEEOP	D	2/17/05	MGC		02/17/05
DT6 P	T368	75' NSEOP/7'WEEOP	D	2/17/05	MGC		02/17/05
DT6 Q	T368	50' NSEOP/7' WEEOP	D	2/17/05	MGC		02/17/05
DT6 R	T368	25' NSEOP/7'WEEOP	D	2/17/05	MGC		02/17/05
DT6 S	T367	10' SNEOP/7' WEEOP	D	2/17/05	MGC		02/17/05
DT6 T	T367	40' SNEOP/7' WEEOP	D	2/17/05	MGC		02/17/05
DT6 W	T367	100' SNEOP/7' WEEOP	D	2/17/05	MGC		02/17/05
DT6 X	T387	110' SNEOP/7' WEEOP	D	2/17/05	MGC		02/17/05
DT7 A	T367	50' NSEOP/7' WEEOP	D	2/17/05	MGC		02/17/05
DT7 B	T367	20' NSEOP/7' WEEOP	D	2/17/05	MGC		02/17/05
DT7 C	T366	20' SNEOP/7'WEEOP	D	2/17/05	MGC		02/17/05
DT7 D	T366	50' NSEOP/7' WEEOP	D	2/17/05	MGC		02/17/05
DT7 E	T394	10', 15', 20' NSEOP/5' EWEOP	D	2/18/05	MGC	3 Patches	02/18/05
DT7 F	T394	10', 15' NSEOP/3' WEEOP	D	2/18/05	MGC	2 Patches	02/18/05
DT7 G	T410	50' SNEOP/2' WEEOP	MD	2/18/05	MGC		02/18/05
DT7 H	BY SURVEY	BY SURVEY	BS	2/22/05	MGC	North Vent Riser	02/22/05
DT7 I	BY SURVEY	BY SURVEY	BS	2/22/05	MGC	Center Vent Riser	02/22/05
DT7 J	T492	50'N SEOP/ 7'E WEOP	D	4/1/05	MGC		04/02/05
DT7 K	T450	@NEOP	EXT	3/29/05	MGC		03/30/05
DT7 M	T461	@NEOP	EXT	3/29/05	MGC		03/30/05
DT7 N	T495	45' N SEOP/ 7' EWEOP	D	4/1/05	MGC		04/02/05
DT7 P	T502	30' N SEOP/ 7' EWEOP	D	4/1/05	MGC		04/02/05
DT7 Q	T505	28' N SEOP/ 7' EWEOP	D	4/1/05	MGC		04/02/05
DT7 R	T508	28' N SEOP/ 7' EWEOP	D	4/1/05	MGC		04/02/05
DT7 S	T525	10' N SEOP/ 7' EWEOP	D	4/2/05	MGC		04/02/05
DT7 T	T529	5' N SEOP/ 7' EWEOP	D	4/2/05	MGC		04/02/05
DT7 W	T544	5' N SEOP/ 7' EWEOP	MD	4/2/05	MGC		04/02/05
DT7 X	T552	@WEOP/@AT	EXT	4/6/05	MGC	EXT TO AT	04/06/05
DT8 A	T605	@SEOP	EXT	4/6/05	MGC		04/07/05
DT8 B	T606	@NEOP	EXT	4/6/05	MGC		04/06/05
DT8 C	T593	30' SNEOP/ 3' EWEOP	D	4/6/05	MGC		04/07/05

DEFECT LOCATION			DEFECT TYPE	LOG DATE	MON.	REMARKS	** REPAIR DATE
DEFECT CODE	SEAM, PANEL OR REPAIR NO.	DEFECT LOCATION DESCRIPTION					
DT8 D	T429	15' NSEOP/ 5' WEEOP	WR	4/6/05	MGC		04/07/05
DT8 E	T429	25' to 175' SNEOP/ 6' WEEOP	WR	4/7/05	MGC		04/07/05
DT8 F	T429	EOP to 125' NSEOP/ 6' WEEOP	WR	4/7/05	MGC		04/07/05
DT8 G	BY SURVEY	BY SURVEY	BS	4/7/05	MGC		04/07/05
DT8 H	T627	@WEOP / 2' SNEOP	BS	4/7/05	MGC		04/07/05
DT8 I	T627	@WEOP / 3' SNEOP	BS	4/7/05	MGC		04/07/05
DT8 J	T627	@WEOP / 3' NSEOP	BS	4/7/05	MGC		04/07/05
DT8 K	T626	4' EWEOP / 6' NSEOP	BS	4/7/05	MGC		04/07/05

GDN REPAIR LOG

PROJECT NUMBER:	043-2246	PROJECT TITLE:	Rocky Flats, Present Landfill
LINER INSTALLER:	Colorado Lining	CONTRACTOR:	S.M. Stoller
LOCATION:	Rocky Flats	SITE MANAGER:	Kaiser Hill Company LLC

REPAIR TYPE: P - PATCH, C - CAP, RS - RECONSTRUCTED SEAM, G&W - GRIND WELD

DEFECT CODE	REPAIR DATE	LEISTERED or SEWN	APPROX. TIME	REPAIR TYPE	APPROX. DIMENSIONS	REPAIR TECH	MONITOR	REMARKS
DT1 A	11/12/04	Y	1600	EXT	10X14	GK	PRH	-
DT1 B	11/15/04	Y	1625	P	2X6	GK	MGC	-
DT1 C	11/15/04	Y	1630	P	2X7	GK	MGC	-
DT1 D	NA	NA	NA	NA	NA	NA	NA	ROCK PULLED
DT1 E	11/19/04	Y	0830	P	4X6	GK	PRH	-
DT1 F	11/23/04	Y	1547	P	2X12	GK	PRH	-
DT1 G	11/23/04	Y	1602	P	2X2	GK	PRH	-
DT1 H	11/23/04	Y	1604	P	2X2	GK	PRH	-
DT1 I	11/23/04	Y	1607	P	2X2	GK	PRH	-
DT1 J	12/04/04	Y	0947	P	2X5	JP	MGC	-
DT1 K	12/04/04	Y	0949	P	2X5	JP	MGC	-
DT1 M	12/04/04	Y	0940	P	2X5	JP	MGC	-
DT1 N	12/04/04	Y	1005	P	2X7	JP	MGC	-
DT1 P	12/04/04	Y	1000	P	2X4	JP	MGC	-
DT1 Q	12/04/04	Y	0945	P	2X5	JP	MGC	-
DT1 R	12/06/04	Y	0747	P	2X2	RD	MGC	-
DT1 S	12/05/04	Y	0945	P	2x4	GK	MGC	-
DT1 T	12/05/04	Y	1055	P	4X4	JP	MGC	-
DT1 W	12/05/04	Y	1050	P	2X2	JP	MGC	-
DT1 X	12/04/04	Y	0850	P	2X7	JP	MGC	-
DT2 A	12/05/04	Y	0945	P	3X6	JP	MGC	-
DT2 B	12/05/04	Y	0930	P	4X4	GK	MGC	-
DT2 C	12/05/04	Y	0949	P	10X5, 3X3	GK	MGC	2 Patches
DT2 D	12/05/04	Y	0950	P	3X3	GK	MGC	-
DT2 E	12/05/04	Y	1000	P	2X2 All	GK	MGC	3 Patches
DT2 F	12/05/04	Y	1110	P	3X3	GK	MGC	-
DT2 G	12/05/04	Y	1105	P	3X3	GK	MGC	-
DT2 H	12/05/04	Y	1100	P	3X4	GK	MGC	-
DT2 I	12/05/04	Y	1005	P	2X3	GK	MGC	-
DT2 J	12/06/04	Y	0745	P	2X2	RD	MGC	-
DT2 K	12/06/04	Y	0749	P	2X2	RD	MGC	-
DT2 M	12/06/04	Y	0748	P	3X3, 2x2	RD	MGC	2 Patches
DT2 N	12/05/04	Y	0935	P	3X5	JP	MGC	-
DT2 P	12/05/04	Y	0940	P	3X3	JP	MGC	-
DT2 Q	12/05/04	Y	0955	P	2X5	JP	MGC	-
DT2 R	12/05/04	Y	1000	P	2X2	JP	MGC	-
DT2 S	12/05/04	Y	1005	P	2X2	JP	MGC	-
DT2 T	12/05/04	Y	1045	P	2X2	JP	MGC	-
DT2 W	12/06/04	Y	0735	P	2X3	JS	PRH	-
DT2 X	12/05/04	Y	0950	P	2X2	JP	MGC	-
DT3 A	12/05/04	Y	0957	P	2X2	JP	MGC	-
DT3 B	12/05/04	Y	0952	P	2X2	JP	MGC	-
DT3 C	12/05/04	Y	0943	P	2X2	JP	MGC	-
DT3 D	12/06/04	Y	0738	P	2X3, 3X6	JS	PRH	2 Patches

DEFECT CODE	REPAIR DATE	LEISTERED or SEWN	APPROX. TIME	REPAIR TYPE	APPROX. DIMENSIONS	REPAIR TECH	MONITOR	REMARKS
DT3 E	12/06/04	Y	0741	P	3X3	JS	PRH	-
DT3 F	12/06/04	Y	0758	P	4x4, 2x2	JS	PRH	2 Patches
DT3 G	12/06/04	Y	0746	P	3X3	JS	PRH	-
DT3 H	12/05/04	Y	1100	P	2X3	JP	MGC	-
DT3 I	12/06/04	Y	0752	P	3X3	JS	PRH	-
DT3 J	12/05/04	Y	0937	P	2X3	JP	MGC	-
DT3 K	12/06/04	Y	0759	P	2X2	RD	PRH	-
DT3 M	12/06/04	Y	0802	P	4X5	RD	PRH	-
DT3 N	12/06/04	Y	0820	P	2X2	JS	PRH	-
DT3 P	12/06/04	Y	0810	P	2X2	RD	PRH	-
DT3 Q	12/06/04	Y	0757	P	3X3	RD	MGC	-
DT3 R	12/06/04	Y	0840	P	2X2	RD	PRH	-
DT3 S	12/06/04	Y	0843	P	2X2	RD	PRH	-
DT3 T	12/06/04	Y	0846	P	3X3	RD	PRH	-
DT3 W	12/06/04	Y	0856	P	3X3	RD	PRH	-
DT3 X	12/06/04	Y	0906	P	2X2	RD	PRH	-
DT4 A	12/06/04	Y	1040	EXT	13X15	RD	PRH	-
DT4 B	12/06/04	Y	1100	P	3X3	RD	PRH	-
DT4 C	12/08/04	Y	1100	P	2X3	GK	MGC	-
DT4 D	12/08/04	Y	1330	P	3X3	GK	MGC	-
DT4 E	12/08/04	Y	1310	P	2X4	GK	MGC	-
DT4 F	12/11/04	Y	0840	P	3X3	GK	PRH	-
DT4 G	12/11/04	Y	0845	P	2X6	GK	PRH	Leistered Overlap
DT4 H	12/15/04	Y	1423	P	4X1	JS	GDH	-
DT4 I	12/15/04	Y	1446	P	2X2	JS	GDH	-
DT4 J	12/15/04	Y	1430	P	2X2	JS	GDH	-
DT4 K	NA	NA	NA	NA	NA	NA	NA	ROCK PULLED
DT4 M	12/15/04	Y	1414	P	2X1	JS	GDH	-
DT4 N	12/15/04	Y	1415	P	4X2	JS	GDH	-
DT4 P	12/15/04	Y	1417	P	2X2	JS	GDH	-
DT4 Q	12/15/04	Y	1420	P	2X1	JS	GDH	-
DT4 R	01/08/05	Y	1405	P	2X4	BC	MGC	-
DT4 S	01/08/05	Y	1415	P	2X4	BC	MGC	-
DT4 T	01/08/05	Y	1430	P	2X4	BC	MGC	-
DT4 W	12/21/04	NA	NA	NA	NA	NA	NA	ROCK PULLED
DT4 X	12/21/04	Y	1600	P	2X3	JS	MGC	-
DT5 A	12/21/04	Y	1007	EXT	13X20	JS	PRH	-
DT5 B	12/21/04	Y	1325	P	2X2	JS	MGC	-
DT5 C	12/21/04	Y	1350	P	2X3	RD	MGC	-
DT5 D	12/21/04	Y	1610	P	2X2	JP	MGC	-
DT5 E	01/08/05	Y	1515	P	2X4	BC	MGC	-
DT5 F	01/03/05	Y	1510	P	2X2	JS	MGC	-
DT5 G	01/03/05	Y	0830	P	2X10	JS	MGC	-
DT5 H	01/03/05	Y	0835	P	2X15	JS	MGC	-
DT5 I	01/03/05	Y	0840	P	2X10, 2X30	JS	MGC	2 Patches
DT5 J	01/06/05	Y	1015	P	2X2	BC	MGC	-
DT5 K	01/06/05	Y	1030	P	4X13	BC	MGC	-
DT5 M	01/04/04	Y	1007	P	2X2	GK	PRH	-
DT5 N	01/06/05	Y	1045	P	2X2	BC	MGC	-
DT5 P	01/08/05	Y	1515	P	2X4	BC	MGC	-
DT5 Q	01/03/05	Y	1455	P	2X10	JS	MGC	-

DEFECT CODE	REPAIR DATE	LEISTERED or SEWN	APPROX. TIME	REPAIR TYPE	APPROX. DIMENSIONS	REPAIR TECH	MONITOR	REMARKS
DT5 R	01/03/05	Y	1500	P	2X20	JS	MGC	-
DT5 S	01/03/05	Y	1630	P	2X50	JS	MGC	-
DT5 T	01/10/05	Y	0800	P	2X4	JS	MGC	-
DT5 W	01/11/05	Y	0900	P	2X4	JS	MGC	-
DT5 X	01/11/05	Y	1330	P	3 patches 2X2	JS	MGC	3 Patches
DT6 A	01/11/05	Y	1345	P	2X3	JS	MGC	-
DT6 B	01/11/05	Y	1400	P	3X8	JS	MGC	-
DT6 C	01/17/05	Y	1145	BOOT	8X8	RB	MSP	-
DT6 D	01/17/05	Y	1600	BOOT	4X4	RB	MSP	-
DT6 E	01/18/05	Y	1040	BOOT	4X4	RB	PRH	-
DT6 F	01/18/05	Y	1425	BOOT	4X4	RB	MSP	-
DT6 G	01/18/05	Y	1555	BOOT	4X4	RB	MSP	-
DT6 H	01/19/05	Y	0920	BOOT	4X4	RB	PRH	-
DT6 I	01/20/05	Y	1500	BOOT	4X4	RB	PRH	-
DT6 J	01/21/05	Y	0849	BOOT	4X4	RB	PRH	-
DT6 K	01/21/05	Y	0932	BOOT	4X4	RB	PRH	-
DT6 M	02/17/05	Y	1500	P	2X3	FP	MGC	-
DT6 N	02/17/05	Y	1505	P	2X5	FP	MGC	-
DT6 P	02/17/05	Y	1519	P	2X3	FP	MGC	-
DT6 Q	02/17/05	Y	1525	P	2X3	FP	MGC	-
DT6 R	02/17/05	Y	1535	P	2X3	FP	MGC	-
DT6 S	02/17/05	Y	1545	P	2X3	FP	MGC	-
DT6 T	02/17/05	Y	1555	P	1X4	FP	MGC	-
DT6 W	02/17/05	Y	1557	P	2X3	FP	MGC	-
DT6 X	02/17/05	Y	1600	P	2X4	FP	MGC	-
DT7 A	02/17/05	Y	1605	P	2X2	FP	MGC	-
DT7 B	02/17/05	Y	1610	P	2X5	FP	MGC	-
DT7 C	02/17/05	Y	1612	P	2X5	FP	MGC	-
DT7 D	02/17/05	Y	1616	P	2X3	FP	MGC	-
DT7 E	02/18/05	Y	1615	P	2X3, 2X2, 2X2	JH	MGC	3 Patches
DT7 F	02/18/05	Y	1620	P	2X2, 2X2	JH	MGC	2 Patches
DT7 G	02/18/05	Y	1625	P	2X10	JH	MGC	-
DT7 H	02/22/05	Y	1345	BS	5X5	RD	MGC	North Vent Riser
DT7 I	02/22/05	Y	1500	BS	5X5	RD	MGC	Center Vent Riser
DT7 J	04/02/05	Y	902	P	3X4	GK	MGC	-
DT7 K	03/30/05	Y	0942	P	5X5/2	GK	MGC	TRIANGLE
DT7 M	03/30/05	Y	0927	P	8X20	GK	MGC	-
DT7 N	04/02/05	Y	0905	P	3X3	GK	MGC	-
DT7 P	04/02/05	Y	0923	P	3x3	GK	MGC	-
DT7 Q	04/02/05	Y	0931	P	3X3	GK	MGC	-
DT7 R	04/02/05	Y	0944	P	2X3	GK	MGC	-
DT7 S	04/02/05	Y	1137	P	2X3	GK	MGC	-
DT7 T	04/02/05	Y	1311	P	2X3	GK	MGC	-
DT7 W	04/02/05	Y	1403	P	2X3	GK	MGC	-
DT7 X	04/06/05	Y	1049	P	2X10/2	GK	MGC	TRIANGLE
DT8 A	04/07/05	Y	0715	P	6X10/2	RB	MGC	TRIANGLE
DT8 B	04/06/05	Y	1601	P	5X20/2	RB	MGC	TRIANGLE
DT8 C	04/07/05	Y	0718	P	2X6	RB	MGC	-
DT8 D	04/07/05	Y	0721	P	2X5	RB	MGC	-
DT8 E	04/07/05	Y	1040	P	2X50	RB	MGC	-
DT8 F	04/07/05	Y	1030	P	2X125	GK	MGC	-

DEFECT CODE	REPAIR DATE	LEISTERED or SEWN	APPROX. TIME	REPAIR TYPE	APPROX. DIMENSIONS	REPAIR TECH	MONITOR	REMARKS
DT8 G	04/07/05	Y	1140	P	3X3(X3)	GK	MGC	3 Patches
DT8 H	04/07/05	Y	1531	P	2X3	RB	MGC	-
DT8 I	04/07/05	Y	1532	P	2X3	RB	MGC	-
DT8 J	04/07/05	Y	1533	P	2X3	RB	MGC	-
DT8 K	04/07/05	Y	1534	P	2X3	RB	MGC	-

APPENDIX G

CONSTRUCTION QUALITY ASSURANCE DOCUMENTATION

APPENDIX G-1: DAILY QA REPORTS

Quality Assurance

OBSERVATION REPORT NO. 1

TETRA TECH RMC

TO: _____

Project No. 19-9886.001.00	Date 8-23-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Nielsons Skanska / Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: —	
Temp. 58 ° at 9:00 a.m.	
Temp. 84 ° at 5:00 p.m.	
Observation Period: 9:00am - 5:30pm	

Equipment: (1) Cat 825G, (2) Cat 14G grader, (1) Cat 950B loader, (1) Cat CS-583C smooth drum, (1) Cat 633D scraper, (2) watertrucks.

- The construction trailes were completed and I moved into our site office. The contractor was continuing to dewater the pond just East of the landfill. The contractor was also placing gravel on the haul road just North of the gate to stabilize some soft areas. The watertruck was being used for dust control on the haul roads. No work was being done on the landfill at this time.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

Quality Assurance

OBSERVATION REPORT NO. 2

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 8-24-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreite	
Weather Conditions: —	
Temp. 57 ° at 6:30 a.m.	
Temp. 86 ° at 3:00 p.m.	
Observation Period: 6:30 am -	

Equipment: (1) Cat 825G, (2) Cat 14G graders, (1) Cat 950B loader, (1) Cat CS-583C smooth Drum, (1) Cat 613D scraper, (2) water trucks

- The contractor continued to work on the haul road cutting and stabilizing soft areas with gravel. De watering was also being continued on the pond. I was also given the work package for the subgrade prep. of the landfill to review. I wrote one comment to Bob Davis about the 95% density spec in the package. The spec. had been discused at the meeting on 8-20 to change it to a strictly performance spec. The management team including myself and the operators on site did a "walk down" to adress any safety issues or concerns for the subgrade package.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

Quality Assurance

OBSERVATION REPORT NO. 3

TETRA TECH RMC

TO: _____

Project No.	19-9886.001.00 Date 8-25-04
Project:	Rocky Flats RCRA Landfill Cover
Owner:	DOE
Contractor:	Kaiser Hill
Contractor Superintendent:	Bob Davis
Subcontractor:	Stoller
Subcontractor Superintendent:	Paul Kreitz
Weather Conditions:	—
Temp.	61 ° at 7:30 a.m.
Temp.	60 ° at 12:00 p.m.
Observation Period:	7:20 am – 12:00 pm

Equipment: (1) Cat 825G, (2) Cat 14G graders (1) Cat 950B loader (1) Cat CS-583C smooth drum, (1) Cat 633D scraper, (2) water trucks

- The contractor continued working on the haul road including grading as well as installing signage. The pond was still being dewatered. The surveyors were continuing to stake the landfill with grade stakes for the cut and fill operations.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

Quality Assurance

OBSERVATION REPORT NO. 4

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 8-26-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: ~~Stoller~~ Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: T Temp. 53 ° at 6:45 a.m. Temp. 76 ° at 4:45 p.m.	
Observation Period: 6:45 am - 5:00 pm	

Equipment: (1) Cat 825G, (2) Cat 14G graders, (1) Cat 950B loader, (2) water trucks (1) Cat CS-583C smooth drum, (1) Cat 633D scraper (1) Cat D6N dozer.

- The contractor continued to grade the haul road, and de water the pond. Concrete barriers around the gas vents and the monitoring wells to protect them during grading operations on the landfill. The weekly meeting was held on site but was very short due to time constraints.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

Quality Assurance

OBSERVATION REPORT NO. 5

TETRA TECH RMC

TO: _____

Project No.	19-9886.001.00 Date 8-27-04
Project:	Rocky Flats RCRA Landfill Cover
Owner:	DOE
Contractor:	Kaiser Hill
Contractor Superintendent:	Bob Davis
Subcontractor:	Stoller
Subcontractor Superintendent:	Paul Kreitz
Weather Conditions:	—
Temp.	51 ° at 6:45 a.m.
Temp.	54 ° at 9:30 p.m.
Observation Period:	6:45 a.m. – 9:45 pm

Equipment: (1) Cat 825G, (2) Cat 14G graders, (1) Cat 950B loader, (2) water trucks (1) Cat CS-583C smooth drum, (1) Cat 633D scraper, (1) Cat D6N dozer

– The contractor continued grading the haul roads and dewater the pond. The surveyors also continued to stake the cut/fills for overlot grading. The job was shutdown at 9:30 due to rainy wet conditions.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

Quality Assurance

OBSERVATION REPORT NO. 6

TETRA TECH RMC

TO: _____

Project No.	19-4886.001.00 Date 8-30-04
Project:	Rocky Flats RCRA Landfill Cover
Owner:	DOE
Contractor:	Kaiser Hill
Contractor Superintendent:	Bob Davis
Subcontractor:	Stoller
Subcontractor Superintendent:	Paul Breite
Weather Conditions:	—
Temp.	56 ° at 6:45 a.m.
Temp.	81 ° at 5:10 p.m.
Observation Period:	6:40am - 5:30pm

Equipment: (1) Cat 825G, (2) Cat 14G, (1) Cat 950B, (2) water trucks (1) Cat CS-583C, (1) Cat 633D, (1) Cat D6N LGP.

- The contractor continued grading the haulroad, as well as placing ~~base~~ SPJ 8-30 roadbase around the trailers and parking areas. The areas for the test bores on the east slope were discussed, mainly how the drill rig will access the area & how to build the roadway.

Copies to: John. Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

Quality Assurance

OBSERVATION REPORT NO. 7

TETRA TECH RMC

TO: _____

Project No.	19-4886.001.00 Date 8-31-04
Project:	Rocky Flats RCRA Landfill Cover
Owner:	DOE
Contractor:	Kaiser Hill
Contractor Superintendent:	Bob Davis
Subcontractor:	Stoller
Subcontractor Superintendent:	Paul Kreitz
Weather Conditions:	—
Temp.	56 ° at 6:45 a.m.
Temp.	88 ° at 4:00 p.m.
Observation Period:	6:40 am - 5:00 pm

Equipment: (1) Cat 825G, (2) Cat 14G, (1) Cat 950B, (2) water trucks (1) Cat CS-583C, (1) Cat 633D, (1) Cat D6N LGP

Continued 8-31 and 9-1

The contractor ~~finished~~ grading the haul road, ~~but~~ continued around the trailers. The weigh scale was delivered and set in place near the gate. The contractor also started to build the equipment wash pad. Golder was on site doing the gradation on the 10" minus rock layer.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

Quality Assurance

OBSERVATION REPORT NO. 8

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 9-1-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: —	
Temp. 57 ° at 6:30 a.m.	
Temp. 86 ° at 4:30 p.m.	
Observation Period: 6:30am - 4:30pm	

Equipment: (1) Cat 825G, (2) Cat 14G, (1) Cat 950B, (2) water trucks
(1) Cat CS-583C, (2) Cat 633D, (1) Cat D6N LGP

- The contractor placed the erosion control logs and staked them in place. Then they started the clear and grub process on the landfill cap. The graders were being used to cut and windrow the vegetation for the scrapers to remove it. The Dozer was being used to clear & grub the drainage channel. Waste was encountered during this process and the job was shut down for evaluation of the waste. I spent the afternoon on a tour of the Rocky Mountain Arsenal with Kaiser Hill, EPA, and EarthTech to observe their landfill construction.

Copies to: John. Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

Quality Assurance

OBSERVATION REPORT NO. 9

TETRA TECH RMC

TO: _____

Project No.	19-4886.001.00 Date 9-2-04
Project:	Rocky Flats RCRA Landfill Cover
Owner:	DOE
Contractor:	Kaiser Hill
Contractor Superintendent:	Bob Davis
Subcontractor:	Stoller
Subcontractor Superintendent:	Paul Kreitz
Weather Conditions:	—
Temp.	62 ° at 6:45 a.m.
Temp.	90 ° at 3:30 p.m.
Observation Period:	6:45 am – 4:15

Equipment: (1) Cat 825G, (2) Cat 14G, (1) Cat 950B, (2) watertrucks (1) Cat CS-583C, (2) Cat 633D, (1) Cat D6N LGP

– The contractor continued to clear and grub the landfill area using the graders to windrow and the scrapers to haul and stockpile. Waste was being staked for analysis, the job is not being shut down for every hit, only unusual trash. Golder was on site redoing the seive anylsis on a different pile for the rock layer. There was an incident @ the end of the day with the watertruck and the grader and the job was shut down.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

Quality Assorance

OBSERVATION REPORT NO. 10

JRV 9-7-04

TETRA TECH RMC

TO: _____

Project No. 19-48866.001.00	Date 9-3-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: PARTLY CLOUDY TO CLEAR, ~57°F-80°F, NO PRECIP.	
Temp. 60 ° at 7:00 a.m.	
Temp. 86 ° at 4:00 p.m.	
Observation Period: 6:50 am – 5:30 pm	

Equipment: (1) Cat 825G, (2) Cat 14G, (1) Cat 950B, (2) water trucks (1) Cat CS-583C, (2) Cat 633D, (1) Cat DeN 4GP

- The job was shut down all day due to the Incident on Thursday 9-2. The day was spent doing safety meetings and training mainly between Kaiser Hill, Stoller, and Neilson Skanska. Work may resume on Wednesday 9-8.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

Quality Assurance

OBSERVATION REPORT NO. 11

TETRA TECH RMC

TO: _____

Project No.	19-4886.001.00 Date 9-8-04
Project:	Rocky Flats RCRA Landfill Cover
Owner:	DOE
Contractor:	~~Stoller~~ JAV 9-8-04 Kaiser Hill
Contractor Superintendent:	Bob Davis
Subcontractor:	Stoller
Subcontractor Superintendent:	Paul Kreitz
Weather Conditions:	CLEAR TO PARTLY CLOUDY, ~60-82°F, NO PRECIPITATION
Temp.	62 ° at 6:45 a.m.
Temp.	82 ° at 5:40 p.m.
Observation Period:	6:45 a.m. - 5:45 pm

Equipment: (1) Cat 825G, (2) Cat 14G, (1) Cat 950B, (2) Water trucks (1) Cat CS-583C, (2) Cat 633D, (1) Cat D6N LGP

- The contractor re started the clear and grub operations, and hope to start proof rolling on 9-8-04. The drill rig was on site for the test bores, but no drilling was done today.

Copies to: ~~P~~ John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

Quality Assurance

OBSERVATION REPORT NO. 12

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 9-9-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: PARTLY CLOUDY, ≈58°-82°F, NO PRECIP.	
Temp. 56 ° at 6:45 a.m.	
Temp. 89 ° at 3:45 p.m.	
Observation Period: 6:45 am - 4:00pm	

Equipment: (1) Cat 825G, (2) Cat 14G, (1) Cat 950B, (2) (1) water trucks JRV 9-9-04
(1) Cat CS-583C, (2) Cat 633D, (1) Cat D6N LGP

The contractor continued to clear and grub the landfill using the grader to windrow the vegetation, and the scraper to remove and stockpile. The drill rig was drilling test bores around trash locations to identify the cover thickness. The contractor also did some work on the scales for the trucks. JRV 9-9-04 The day was cut short due to a Rocky Flats site wide meeting.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

Quality Assurance

OBSERVATION REPORT NO. 13

TETRA TECH RMC

TO: _____

Project No.	19-4886.001.00 Date 9-13-04
Project:	Rocky Flats RCRA Landfill Cover
Owner:	DOE
Contractor:	Kaiser Hill
Contractor Superintendent:	Bob Davis
Subcontractor:	Stoller
Subcontractor Superintendent:	Paul Kreitz
Weather Conditions:	—
Temp.	63 ° at 7:00 a.m.
Temp.	79 ° at 4:00 p.m.
Observation Period:	6:45am – 5:00pm

Equipment: (1) Cat 825G, (2) Cat 14G, (1) Cat 950B, (2) water trucks (1) Cat CS-583C, (2) Cat 6330, (1) Cat D6N LGP

- The contractor continued to clear and grub the remaining areas on the west section of the cap. Ryan from Earth Tech finished drilling the test holes on top of the landfill cap to check the depth of cover material. Earth Tech and the drillers spent the rest of the day drilling and sampeling the first test bore (#5) on the east slope. There was only drilling done on the cap on 9-10-04, Stoller took the day off.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

Quality Assurance

OBSERVATION REPORT NO. 14

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 9-14-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: PARTLY CLOUDY, ≈52°F-78°F NO PRECIP.	
Temp. 53 ° at 6:45 a.m.	
Temp. 78 ° at 3:00 p.m.	
Observation Period: 6:45am - 5:30pm	

MM 3/14/05

Equipment: (1) Cat 825G, (2) Cat 14G, (1) Cat 950B, (2) water trucks (1) Cat CS-583C., (2) Cat 633D, (1) Cat D6N LGP, (1) Bobcat mower, (1) cat backhoe

- The contractor started the proofroll on the landfill cap. A loaded scraper was used with Stoller QC, Kaiser Hill, EarthTech and QA reps walking behind. The 1st pass was completed on the South half of the landfill, and the second pass West of the stockpile. All soft areas as well as alignment marks were painted during the proofroll. The final areas will be painted and flagged after the second pass for the final survey. The contractor also started to cut the vegetation around the pond. The second borehole was drilled on the East face, and samples were taken. The job was shut down @ 4:30 due to rain and lightning.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

Quality Assurance

OBSERVATION REPORT NO. 15

TETRA TECH RMC

TO: _____

Project No. 19-48686.001.00 Date 9-15-04	
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: PARTLY CLOUDY, ≈49°F - 72°F NO PRECIP. MAM 3/14/05	
Temp. 52 ° at 7:00 a.m.	
Temp. 78 ° at 5:00 p.m.	
Observation Period: 6:45am - 6:45 pm	

Equipment: (1) Cat 825G, (2) Cat 14G, (1) Cat 950B, (2) water trucks (1) Cat CS-583E, (2) Cat 633D, (1) Cat D6N LGP, (1) Bobcat mower, (1) Cat Backhoe

- The contractor continued doing the proofroll with the loaded scraper with reps from QA, QC, Kaiser Hill & Earth Tech following. The first pass was completed on the North half up to the S.E. entrance. The second scraper was also used for the proofroll after lunch with a second crew of reps. The second pass was completed from the west ledge to approx. 2/3rds of the way to the S.E. entrance. The soft areas were marked with paint and flags to be surveyed. The drilling crew was doing test bores in the center of the soft areas on the South side to determine why they are soft. The mowing operations were shut down in the morning due to hitting an asbestos bag on the east face.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

OBSERVATION REPORT NO. ~~X~~ 15A MAN 3/14/05

TETRA TECH RMC

TO: File

Project No. 19-4886.001.00	Date 9-15-04 MAN 3/14/05
Project: Present Landfill Rocky FLCD	
Owner: RFETS	
Contractor: Stoller	
Contractor Superintendent: BOB DAVIS	
Subcontractor: Skanson Nielson	
Subcontractor Superintendent: PAUL KREITZ	
Weather Conditions: PARTLY CLOUDY, ≈49°F - 72°F NO PRECIP.	
Temp. 70 ° at 10:00 a.m.	
Temp. 80 ° at 5:30 p.m.	
Observation Period: 11:30am — 1720	

10:00 GL at Bldg 60. Viewed video obtained visitor badge and vehicle pass. Met Jub Valentine who will be my escort.

11:30 At trailer did Health Safety w. Stoller and Preev with Skanson.

Starting at 1300 performed proofrolling initially 1 scraper on north side of landfill cover then 2 scrapers. Followed scrapers marked areas of deflection with Golder and Earth Tech. Later proofrolled in N-S pattern w. two scrapers. Found ~~three~~ areas of deflection on west side & on north slope and 1 on crest. Scraper crews consisted of operator and 2 spotters. Stopped proofrolling at 5:20. Flagged areas of deflection with Stoller

Copies to: JOHN RAHE

Observer: Gary Linden

Reviewing Engineer: JOHN RAHE

Quality Assurance

OBSERVATION REPORT NO. 16

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 9-16-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: PARTLY CLOUDY, ≈ 54°F - 82°F NO PRECIP. MMM 3/14/05	
Temp. 57 ° at 6:45 a.m.	
Temp. 81 ° at 5:00 p.m.	
Observation Period: 6:45 AM - 5:30	

Equipment: (1) Cat 825G, (2) Cat 14G, (1) Cat 950B, (2) Water trucks (2) Cat 6330 (1) Cat CS-583C, (1) Cat D6N LGP, (1) Bobcat mower, (1) Cat Backhoe

- The second pass of the proof roll was completed from the west end of the cap to the southeast entrance. The loaded scraper was being used with reps from QA, QC, Kaiser Hill and EarthTech observing the proofroll. The soft areas were marked with paint and pin flags for survey. The contractor started to build the top ramps for drilling on the east face using Rocky Flats Alluvium, moisture conditioned then compacted using the 825. The contractor also started to place the first 1' lift of RF Alluvium on the test fill area. The weekly meeting was held @ 1:30 along with the QA, QC meeting and a tour with the EPA.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

OBSERVATION REPORT NO. 2 16A MM 3/14/05

TETRA TECH RMC

TO: File

Project No. 19-4886.001.00 Date 9/16/04	
Project: Present Landfill	
Owner: RFETS	
Contractor: Stoller	
Contractor Superintendent:	
Subcontractor: Vic Isom	
Subcontractor Superintendent:	
Weather Conditions: PARTLY CLOUDY, ~54°F-82°F NO PRECIP.	
Temp. 65 ° at 0700 a.m.	
Temp. 80 ° at 1430 p.m.	
Observation Period: 0700 - 1430	

0700 GC on-site for Pre-ev meeting.
Before noon proofrolled north slope of crest east of yesterday's proof roll. Also finish interior of west proofroll circle from yesterday and "pie" shaped area to north. Also caught thin swath between yesterday's two scraper proofroll. There was a spring in a soft-spot previously from previous proof roll on north side of landfill. We informed Stoller Health and Safety. Spring roped off in afternoon.
After lunch we proofrolled south slope east of yesterday's proofroll. The proof roll ended on the east because Contractor is concerned about rebar in that east area. They only had one scraper walked behind with Golder and EarthTech. Only one new soft spot identified. It was on the south side very near to previously identified soft spot at base of hill.

Copies to: JOHN RAHE

Observer: - GARY LINDEN

Reviewing Engineer: JOHN RAHE

Quality Assurance

OBSERVATION REPORT NO. 17

TETRA TECH RMC

TO: _____

Project No.	19-4886.001.00 Date 9-17-04
Project:	Rocky Flats RCRA Landfill Cover
Owner:	DOE
Contractor:	Kaiser Hill
Contractor Superintendent:	Bob Davis
Subcontractor:	Stoller
Subcontractor Superintendent:	Paul Kreitz
Weather Conditions:	—
Temp.	57 ° at 6:45 a.m.
Temp.	87 ° at 2:30 p.m.
Observation Period:	6:45 am - 2:45 pm

Equipment: (1) Cat 825G, (2) Cat 14G, (2) Cat 623D, (1) Cat 950B, (1) Cat D6N LGP (1) Cat CS-583C, (1) Cat Backhoe, (1) bobcat mower, (2) water trucks

- The contractor continued to build the upper pads on the east face for the test bores, the south pad was completed and drilling is scheduled for 9-15-04. The contractor also finished placing the 1' loose lift of RF Alluvium on the test pad, but no processing has been done. The contractor continued stockpiling the cushion material for the test area.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

Quality Assurance

OBSERVATION REPORT NO. 18

TETRA TECH RMC

TO: _____

Project No.	19-4886.001.00 Date 9-20-04
Project:	Rocky Flats RCRA Landfill Cover
Owner:	DOE
Contractor:	Kaiser Hill
Contractor Superintendent:	Bob Davis
Subcontractor:	Stoller
Subcontractor Superintendent:	Paul Kreitz
Weather Conditions:	—
Temp.	53 ° at 7:00 a.m.
Temp.	81 ° at 3:00 p.m.
Observation Period:	6:50am – 5:30pm

Equipment: (1) Cat 825G, (2) Cat 14G, (1) Cat 950B, (2) Cat 633D, (1) Cat D6N LGP (1) Cat CS-583C, (1) Cat backhoe, (2) water trucks (1) Bobcat mower (1) Cat Forklift

- The contractor continued building the third and final ramp for the test bores on the east face. The drill rig was broken, so no drilling was done today. The first lift of Rocky Flats Alluvium was mixed and moisture conditioned in preparation for compaction on 9-21-04. Cushion material is being delivered and stockpiled for the test fill. The contractor is also continuing to ~~mow~~ SRW 9-20 cut the vegetation around the pond.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

Quality Assurance

OBSERVATION REPORT NO. 19

TETRA TECH RMC

TO: _____

Project No.	19-4886.001.00 Date 9-21-04
Project:	Rocky Flats RCRA Landfill Cover
Owner:	DOE
Contractor:	Kaiser Hill
Contractor Superintendent:	Bob Davis
Subcontractor:	Stoller
Subcontractor Superintendent:	Paul Kreitz
Weather Conditions:	—
Temp.	43 ° at 6:45 a.m.
Temp.	47 ° at 8:00 p.m.
Observation Period:	6:45am – 9:00am

Equipment - (1) Cat 825G, (2) Cat 14G, (2) Cat 633D, (1) Cat 950B, (1) Cat 06N LGP (1) Cat Backhoe, (1) Cates-583c, (2) watertrucks, (1) Cat Forklift, (1) Bobcat mower

- The contractor shut down the job first thing in the morning due to rain.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

Quality Assurance

OBSERVATION REPORT NO. 20

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 9-22-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: —	
Temp. 43 ° at 6:45 a.m.	
Temp. 57 ° at 2:00 p.m.	
Observation Period: 6:45am – 2:00pm	

- Equipment = (1) Cat 825G, (2) Cat 14G, (2) Cat 633D, (1) Cat 950B, (1) Cat D10N LGP (1) cat Backhoe, (1) cat CS-583E, (2) water trucks, (1) Bobcat mower, (1) Cat Forklift (1) Cat 325 Backhoe

- The contractor held a safety meeting with all personnel on site, and was planning to work on the cap by late morning. The cap was evaluated including the test fill area, and was too wet and muddy to work so everyone was sent home.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

Quality Assurance

OBSERVATION REPORT NO. 21

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 9-23-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: PARTLY CLOUDY, NO PRECIP.	
Temp. 46 ° at 7:30 a.m.	
Temp. 65 ° at 4:30 p.m.	
Observation Period: 6:45am - 5:15	

Equipment: (1) Cat 825G, (2) Cat 14G, (2) Cat 1633D, (1) Cat 950B, (1) Cat D6N LGP (1) cat Backhoe, (1) Cat Forklift, (1) Cat CS-583E, (2) Watertrucks, (1) Bobcat Mower

- The contractor scarified the test fill in the morning to aid in drying the material. The test fill was compacted using the 825G, 4 passes with the EPA present. The Rocky Flats Alluvium was too wet to compact and failed the visual inspection. The contractor plans to dry the material and retry compaction on Mon. 9-27 with the EPA present. The contractor continued to cut the vegetation around the pond and asbestos areas. Drilling was also continued on the east face.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

Quality Assurance

OBSERVATION REPORT NO. 22

TETRA TECH RMC

TO: _____

Project No. 19-1886.001.00	Date 9-24-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: ~~Stoller~~ Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: PARTLY CLOUDY	
Temp. 53 ° at 7:30 a.m.	
Temp. 69 ° at 12:00 p.m.	
Observation Period: 6:45am – 1:30pm	

- Equipment: (1) Cat 825G, (2) Cat 14G, (2) Cat 6330, (1) Cat 950B, (1) Cat D6N LGP (1) Cat Backhoe, (1) Cat C55 83C, (1) Cat Forklift, (2) water trucks (1) Bobcat Mower

- The contractor started to build the first staging area for the geosynthetics just north west of the cap. The area was stripped, compacted, cut/fill to grade for drainage and plan to place the filter fabric and some gravel. The drillers are continuing to drill the test bores on the east face taking samples as needed by Earth Tech. The contractor is also continuing to cut vegetation around the pond and asbestos areas.

Copies to: John. Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 23

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 9-27-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 49 ° at 6:45 a.m. Temp. 70 ° at 3:00 p.m.	
Observation Period: 6:45am - 6:15pm	

EQUIPMENT: (1) Cat 825G, (2) Cal 14G, (1) Cat 950B, (1) Cat D6N LGP, (2) Cat 633D (1) Cat Backhoe, (1) Cat 325, (1) Cat Forklift, (1) Cat CS-583c, (2) watertrucks (1) Bobcat mower

- The contractor continued working on the north west and the southwest geosynthetic staging areas. The drilling crew was continuing to drill and sample the east face. The vegetation was being cut and cleared from the pond area. The EPA ~~was~~ JPJ 9-27 reps. were on-site to witness the first 2 layers of the test fill. The first lift of Rocky Flats Alluvium was scarified, compacted (4 passes with the 825G) then proofrolled using a loaded scraper. The proofroll passed and the second lift of R.F. Alluvium was placed, mixed then compacted at existing moisture with the 825G, and the CS583C smooth drum to help seal it from the rain.

9-27-04
#23

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Soft areas from 1st proofroll.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES: None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 24

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 9-28-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 52 ° at 7:30 a.m. Temp. — ° at — p.m.	
Observation Period: 6:45am – ~~5:45pm~~ 12:30pm	

EQUIPMENT: (1) cat 825G, (2) cat 14G, (1) cat 950B, (2) cat 6330, (1) cat DeNLGP, (1) cat 825L (1) cat CS-583E, (1) cat Backhoe, (1) Cat Forklift (2) water trucks (1) Bobcat Mower

- The EPA reps. were on site to observe the test pits in the test fill on the Rocky Flats Alluvium. Three random test pits were excavated down to native soil to observe any voids and to visuall inspect compaction. There were no voids found, and compaction was satisfactory to QA, QC, EPA and the contractor. The test pits will be surveyed and mapped with the rest of the test fill data. The drilling crew is continuing to drill and sample on the east face. No other work was being done on site due to muddy, wet conditions due to rain the previous night.

9-28-04

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Soft areas from 1st proofroll.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES: None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 25

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 9-29-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 48 ° at 7:00 a.m. Temp. 74 ° at 3:45 p.m.	
Observation Period: 6:45am - 5:45pm	

EQUIPMENT: (1) Cat 825G, (2) Cat 14G, (1) Cat 950B, (1) Cat CS-583E, (2) Cat 633D, (1) Cat D6N LGP, (1) Cat 325L, (1) Cat Backhoe, (1) Cat Forklift, (2) water trucks, (1) Bobcat mower-

- The contractor finished compacting the east edge of the 2nd lift of R.F. Alluvium on the test fill. The test fill is still too wet to start placing cushion material. The test bores were completed on the east face. The contractor continued cutting the vegetation around the pond and loading it into the roll-offs. Much of the concrete and debris from ~~the~~ 9/29 the east side was loaded in to the roll-offs. The contractor also continued to build the geosynthetic staging/storage area on the north side.

9-29-04

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Soft areas from 1st proofroll.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES: None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 26

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 9-30-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 49 ° at 7:00 a.m. Temp. 60 ° at 4:30 p.m.	
Observation Period: 7:00am – NA	

EQUIPMENT: (1) Cat 825G, (2) Cat 14G, (2) Cat 633D, (1) Cat 950B, (1) Cat D6NLGP, (1) Cat 325L, (1) Cat CS-583E, (1) Cat Backhoe, (2) water trucks, (1) Cat Forklift, (1) Bobcat mower

- The contractor finished building the geosynthetic staging area on the north side and started stock piling gravel for the south staging area. The geo-probe was on site to check the remaining soft areas. The contractor started to cut the cap on the north side of the ridge using the dozer and grader. The material was cut and pushed into a stockpile at the edge of the fill area, very little trash was encountered.

9-30-04

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Soft areas from 1st proofroll.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES: None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 27

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 10-1-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 45 ° at 7:00 a.m. Temp. 45 ° at 8:00 p.m.	
Observation Period: 6:45am 8:15am	

EQUIPMENT: (1) Cat 825G, (2) Cat 14G, (1) Cat 950B, (1) Cat 325L, (2) Cat 633D, (1) Cat D6NLGP (1) Cat Backhoe, (1) Cat Forklift, (2) watertrucks, (1) Cat CS-583E, (1) Bobcat mower

- The job was shut down due to rain, no work was done.

10-1-04

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Soft areas from 1st proof roll.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES: None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 28

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 10-4-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 47 ° at 7:00 a.m. Temp. 58 ° at 6:00 p.m.	
Observation Period: 6:45 am – 6:45 pm	

EQUIPMENT: (1) Cat 825G, (2) Cat 14G, (1) Cat 950B, (1) Cat 325L, (1) Cat D6NLGP, (2) Cat 633D (1) Cat Backhoe, (1) Cat CS-583C, (1) Cat Forklift, (2) water trucks, (1) bobcat mower

– The contractor continued to cut from the top of the cap and place the material as fill on the southwest corner. The material was being placed in 6"± lifts to aid in drying then compacted with 4 passes of the 825G. There was some trash encountered near the west end in the cut areas. The trash was removed and piled using the backhoe awaiting a roll-off container.

The contractor placed the 6" lay cushion layer on the test fill, and spent much of the day drying it out. The lift was surveyed and brought of final grade then compacted 2 passes using the vibrating smooth drum. The area was re surveyed and 5 nuclear and 1 sandcone test was preformed. The nuclear tests were all above 95% and within ±2% on moisture.

Soft spot # 3 was excavated and water was encountered at 3'. The excavation was stopped and reevaluated by Earth Tech. Due to the water it is to be treated as a seep by placing

the geosynthetic, geogrid then 2' of rock material followed by Rocky Flats Alluvium. The area was left open due to lack of rock material.

Earth Tech finished investigating the soft areas with the geo probe.

20 SRV rolls of the 60 mil LLDPE were delivered, unloaded and stored on ~~the~~ SRV staging area #1. The rolls were inspected and logged by QA and QC personell. The rolls will be covered on 10-6-04 to prevent UV damage.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Soft areas from 1st proof roll.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES: None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 29

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 10-5-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 47 ° at 7:00 a.m. Temp. 60 ° at 5:00 p.m.	
Observation Period: 6:45am - 6:30pm	

EQUIPMENT: (1) 825G, (1) Cat 950B, (2) Cat 633D, (1) Cat CS-563C, (1) Cat D6LGP, (1) Cat 325L (1) Cat Backhoe, (1) Cat Forklift, (2) watertrucks (2) Cat 14G, (1) Bobcat mower

The contractor continued to cut on top of the cap and place the material as fill on the south and west sides. The trash encountered is being stockpiled for removal or relocation. The fill is being placed in 1'- lifts and compacted with 4 passes of the 825G. The material is being compacted at existing moisture which has been acceptable.

The 10" layers of cushion material was placed on the test fill. The layer was graded, compacted with 3 passes of the CS-583C, surveyed and tested. The five nuclear density tests taken were within spec. for moisture and density (95% ±2%M). One sand cone test was taken for correlation.

The contractor placed geosynthetic and geogrid material on soft spots #1, 2, and 3. Very little backfilling was done on these areas due to a lack of suitable material. Soft Spot #18 was excavated, and a large amount of

trash appears to be the cause. This area is being evaluated for a suitable repair.

The contractor delivered and unloaded 24 rolls of LLDPE in staging areas #1 & 2. The rolls and roll # were inspected by QA.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK: (1) Soft areas from 1st proofroll.
(2) 4± loads of cushion material for test fill (topsoil & 3/4" minus).
(3) 4± loads of rock layer for wet soft spot repair (too many fines).

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES: (1) In process
(2) Rejected & removed from testfill
(3) Rejected & not used for wet spot repair.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 30

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 10-6-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor:- Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 46 ° at 7:15 a.m. Temp. 52 ° at 3:30 p.m.	
Observation Period: 6:45 am – 4:15 pm	

EQUIPMENT: (1) Cat 825G, (2) Cat 14G, (1) Cat 950B, (1) Cat 325L, (1) Cat CS-583E, (2) Cat 633D (1) Cat PlorLGP, (1) Cat Backhoe (1) Cat forklift, (2) water trucks, (1) Bobcat, (1) Volvo truck

- The contractor completed the last staging area for the geosynthetics (#3) on the south side. 24 rolls of the FML, 60mil LDPE were delivered and unloaded onto the staging areas. The rolls were inspected and documented by QA only. The contractor pumped out any standing water in the perimeter channel. No work was done on the cap due to rain and very wet muddy conditions.

10-6-04

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Soft areas from 1st proofroll.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES: Soft area repair in progress.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 31

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 10-7-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 57 ° at 8:00 a.m. Temp. 68 ° at 5:20 p.m.	
Observation Period: 7:05am - 5:45pm	

EQUIPMENT: (1) Cat 825G, (2) Cat 14G, (1) Cat 950B, (1) Cat 325L, (1) Cat CS-583C, (1) Cat 120K LGP (2) Cat 6330, (1) Cat Backhoe, (1) Cat Forklift, (1) Volvo truck, (2) water trucks (1) Bobcat

The contractor spent the morning clearing mud and water from the west side, and drying material. The perimeter channel was being cut around the sath west edge pushing the cuttings onto the cap in thin lifts to aid in drying.

Soft spot #17 was cut to the level of waiste (18"±) and covered with geosynthetic and geogrid per the manufacturers specs. A small amount of rock material was placed on top to hold the geogrid in place. Soft spot #16 was also cut and rolled with the smooth drum but no geosynthetics have been placed at this time.

The contractor continued to haul rock layer material to backfill the soft areas, but much of it is too wet to use at this time.

10-7-04

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Soft areas from 1st proofroll, repair in progress

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES: None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 32

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 10-8-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 61 ° at 7:30 a.m. Temp. 69 ° at 4:30 p.m.	
Observation Period: 7:00am - 5:30pm	

EQUIPMENT: (1) Cat 825B, (2) Cat 14G, (1) Cat 950B, (2) Cat 633D, (1) Cat CS-583D, (1) Cat D6R LGP (1) Cat 325L, (1) Cat Backhoe, (1) Cat Forklift, (2) water trucks, (1) Volvo Truck, (1) Bobcat

The contractor continued cut and fill operations on the west end including the new alignment of the perimeter channel. The fill is being placed in 1' of less lifts and compacted with a min. of 4 passes with the 825.

The contractor also continued to work on the soft spots. The Geosynthetic and the geogrid were placed on soft spots # 17, 16, 15, 14, 13, 4. Rock material was placed on soft spot # 17 and 16, but none were completed.

The surveyors continued to stake cut/fill, anchor trench and perimeter channel.

10-8-04

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK: NONE

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES: NONE

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 33

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 10-9-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 51 ° at 8:00 a.m. Temp. 73 ° at 4:30 p.m.	
Observation Period: 7:00am - 4:45pm	

EQUIPMENT (1) Cat 825G, (2) Cat 816, (2) Cat 633D, (1) Cat D6R LGP, (1) Cat 950B, (1) Cat CS-583C (1) Cat 325L, (1) Cat Backhoe, (1) Cat Forklift, (2) Volvo Truck, (1) Bobcat, (2) watertrucks

- The contractor continued to cut and fill the cap as well as the perimeter channel on the west side. The fill was being placed in 12"- lifts at existing moisture and compacted with 4+ passes of the 825.

The contractor also moved all of the exposed trash to the east side trash/fill area. The trash was placed in a 12"± lift, covered with a thin layer (8"±) of Rocky Flats Alluvium. The area is scheduled for compaction on 10-11-04.

The contractor continued cutting and removing vegetation from the pond area.

10-9-04
#33

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK: Soft areas from 1st proof roll, rework in progress.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 34

TETRA TECH RMC

TO:

Project No. 19-4886.001.00	Date 10-11-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 46 ° at 7:45 a.m. Temp. 56 ° at 5:00 p.m.	
Observation Period: 6:45am – 6:00pm	

EQUIPMENT: (1) Cat 825G, (2) Cat 14G, (1) Cat 950B, (2) Cat 633D, (1) Cat D6RLGP, (1) Cat 325L, (1) Cat CS-583C, (1) Cat Backhoe, (1) Cat Forklift, (2) Volvo trucks, (2) watertrucks, (1) Bobcat

– The contractor continued to cut and fill on the west face, and some on the North face. The cut material is being placed as fill at existing moisture in 1'- lifts and compacted with a min. of 4 passes of the 825. The perimeter channel is also being cut on the north, west and south sides.

The contractor placed fill on soft spots #16, 4 and 6. Soft spot #4 was backfilled with rock material, #'s 16 and 6 were filled with Rocky Flats Aluvium. Soft spots #6, 7 and 8 were combined into one area, the area was bladed smooth and rolled with the CS-583C smooth drum. The entire area was covered with geotextile and geogrid per the manufacturers specs. The east and north edges of Soft Spot #8 will be left exposed in case the area grows after the proofroll on the east side.

A QA/QC meeting was held onsite with Stoller, Earth Tech, Golder, TetraTech (John Rahe) and Kaiser Hill.

10-11-04

The meeting went over QA/QC responsibilities and included a tour and design changes to regrade of the Cap.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Soft areas of 1st proof roll. Rework in progress.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES: None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 35

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 10-12-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 48 ° at 8:00 a.m. Temp. 67 ° at 3:00 p.m.	
Observation Period: 7:00am - 6:15	

EQUIPMENT: (1) Cat 825G, (2) Cat 14G, (1) Cat 950B, (2) Cat 4330, (1) Cat D6R LGP, (1) Cat 325L (1) Cat CS-583E, (1) Cat Backhoe, (1) Cat Forklift (2) Volvo Trucks, (2) water trucks (1) Bobcat

The contractor continued to cut and fill on the cap. The majority of the cut is comming from the perimeter channel on the north and south sides. The fill is being placed on the north and south sides of the cap in 1'-lifts and compacted with a min. of 4 passes with the 825. The material is being placed at existing moisture and dryed as needed before compaction.

Golder (QC) removed 4 samples of Rocky Flats Alluvium from the permeter channel for seive analisys to confirm the material.

10-12-04

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Soft areas from 1st proof roll, repair in progress.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 36

TETRA TECH RMC

TO:

Project No. 19-4886.001.00	Date 10-13-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 38 ° at 7:00 a.m. Temp. 54 ° at 3:45 p.m.	
Observation Period: 6:45am - 4:15pm	

EQUIPMENT: (1) Cat 825G, (1) Cat CS-583C, (2) Cat 74G, (2) Cat 633D, (1) Cat D6R LGP, (1) Cat 325L, (1) Cat Backhoe (1) Cat Forklift, (2) Volvo Trucks, (2) water trucks, (1) Bobcat

- The contractor spent the day clearing water from the perimeter channel from the overnight rains. No work was done on the cap due to wet, muddy conditions. One trash area was excavated on the west perimeter channel to find its edge and depth limits. All trash from this area was replaced at the end of the day, and is awaiting a decision to be ~~remove~~ JK/10-13 relocated.

The contractor recieved and offloaded 17 rolls of Geosynthetic Clay Liner (GCL) onto the staging area. All rolls were inspected and documented by QC and QA personnel. Any damaged plastic covering was repaired and all rolls were covered with a large tarp.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Soft areas from 1st proofroll, repair is in progress.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 37

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 10-14-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 52 ° at 7:30 a.m. Temp. 66 ° at 3:00 p.m.	
Observation Period: 7:30am - 6:00pm	

EQUIPMENT: (1) Cat 825G, (1) Cat CS-583C, (2) Cat 14G, (3) Cat Ca33D, (1) Cat 325L (2) Cat D6R LGP (1) Cat Backhoe, (1) Cat Forklift, (2) watertrucks (1) Cat 950B (1) Bobcat, (2) Volvo C35A

- The contractor continued placing fill on the south side of the cap. The fill material is being hauled with the Cat 633D scrapers from the stock pile west of the site. The fill is being placed, thinned out with a dozer to aid in drying before compaction. The fill has not been compacted at this time, compaction is scheduled for 10-15-04.

- The contractor recieved and offloaded 38 rolls of GCL onto staging area #3. The rolls were inspected, logged by QA & QC, and any holes in the covering patched. The GCL in the staging area was covered with a tarp at the end of the day.

10-14-04

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Soft areas from 1st proofroll, repair in progress.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES: None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 38

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 10-15-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 45 ° at 7:30 a.m. Temp. 41 ° at 4:00 p.m.	
Observation Period: 7:00am – 4:15pm	

EQUIPMENT: (1)Cat 825G, (2)Cat 816, (1)Cat CS-583C, (2)Cat D6R LGP, (3)Cat 6330, (1) Cat 950B, (1)Cat 325L (1)Cat Backhoe, (1)Cat Forklift, (2)Volvo C35A, (2) water trucks (1) Bobcat

The contractor continued to place fill on the south side from the borrow area west of the landfill. The fill was being placed in thin lifts <1' and allowing them to dry. The fill placed on 10-14 was compacted with a min. of 4 passes with the 825.

The contractor offloaded GDN and GCL onto staging area #3, all rolls were inspected and logged. The GCL plastic covering was patched as needed and the rolls tarped at the end of the day. The GCL is rolled backwards for deployment per the specs. The issue was discussed with Stoller, Bob Davis, CO Linings and Earth Tech, and no decision has been made at this time.

10-15-04

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK: NONE

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES: NONE

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 39

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 10-18-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 46 ° at 7:30 a.m. Temp. 57 ° at 5:30 p.m.	
Observation Period: 6:45am - 6:15pm	

EQUIPMENT: (1)Cat 825G (1)Cat CS-583c, (2)Cat 14G, (2)Cat D6RLGP, (3)Cat 6330, (1)Cat 950B, (1)Cat 325L (1)Cat Backhoe, (1)Cat Forklift, (2) Volvo C35A, (1)Bobcat, (2) water trucks

The contractor continued to place fill from the borrow pile west of the PLF on the south side of the cap. The material was being placed at existing moisture, spread to a 1' lift and compacted with a min of 4 passes of the 825.

The west end was cut to final grade and a few known soft areas were reworked before the second proof roll. The second proofroll was done on the south west quadrant, 2 passes with a loaded scraper. The passes were done east/west then north/south. Several alignment marks were made to ensure no areas were missed, Stoller, Earth Tech, Golder, Tetratech and EPA all had reps. observing the proof roll. The soft areas found were marked and scarified for drying overnight. The areas will be surveyed and re-inspected on 10-19-04.

The contractor also off loaded GDN and GCL onto staging area #3, all rolls were inspected,

documented and covered with tarps at the end of the day.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Soft areas from ~~proof~~ proof roll #1 and #2, repairs in progress.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES: None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 40

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 10-19-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 45 ° at 7:30 a.m. Temp. 62 ° at 4:00 p.m.	
Observation Period: 6:45am – 5:45	

EQUIPMENT: (1)Cat 825G, (1)Cat CS-583E, (2)Cat 14G, (1)Cat D6RLGP, (3)Cat 633D, (1)Cat 950B (1)Cat 325L, (1)Cat Backhoe, (1)Cat Forklift, (1)Bobcat, (1)Volvo c55A, (2)water trucks

The second proof roll was completed on the subgrade on the north west corner of the cap. The area was rolled 2 complete passes with ~~the~~ JAV a loaded scraper (633D). The passes were marked several times with paint to ensure that no areas were missed, the first pass was done east/west and the second north/south. The soft areas were marked and scarified to dry the material. The soft areas on the south west end were recompacted, inspected and approved. Cushion material is being delivered and spread on the south west corner of the cap. The material is very wet so no compaction has been done at this time.

The contractor is also continuing to place fill on the north end of the cap. The fill material is being hauled from the borrow pit west of the cap. The material is being placed in 1' lifts, dryed as needed and compacted with a min of 4 passes with the 825.

10-19-04

The carbon area was backfilled and the new alignment for the perimeter channel was started.

I was notified by Earth Tech that the GCL can be placed as it is rolled with the woven side up on all areas except the east face near the pond.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Soft areas from the 1st & 2nd proof rolls, repair in progress.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

Soft area approved for the 2nd proof roll on the southwest end.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 41

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 10-20-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 46 ° at 7:30 a.m. Temp. 58 ° at 4:00 p.m.	
Observation Period: 7:30am - 5:45	

EQUIPMENT: (1)Cat 825G, (1)Cat CS583C, (2)Cat 14G, (1)Cat 950B, (2) Cat D6RLGP, (5)Cat 330 (1)Cat 325L, (1)Cat Backhoe, (1)Cat Forklift, (2) Volvo C35H, (1) Bobcat, (2) water trucks

The contractor continued to place fill on the north side of the cap. The fill is being hauled from the stockpile west of the PLF. The material is being placed in 1'- lifts and compacted with a min. of 4 passes of the 825.

QA/QC personnel did a preliminary proofroll on the very top of the cap to check for any large soft spots. Soft spot #16 as well as 3 other areas were marked and surveyed. Soft spot #16 was used as a test fill for a new repair method using geocell material. The soft spot was excavated to 1', a woven geotextile was placed in the bottom, then a geocell material staked on top. The area will be backfilled with crusher fines on 10-21-04. The other 3 soft spots were excavated to 18"-24" and backfilled with rock layer material, none have been reinspected at this time.

Stoller also continued to haul and place cushion material on the west end of the PLF, no compaction has been done at this time.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Soft spots from 1st & 2nd proofroll, repair in progress.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

Soft area repair approved on pregrade on N.W. corner.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 42

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 10-21-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 48 ° at 7:30 a.m. Temp. 54 ° at 2:00 p.m.	
Observation Period: 6:30am – 5:45pm	

EQUIPMENT: (1) Cat 825G, (1) Cat CS-583C, (2) Cat 14G, (1) Cat 950B, (3) Cat 633D, (2) Cat D6R LGP (1) Cat 325L, (1) Cat Backhoe, (1) Cat Forklift (2) Volvo C35A, (1) Bobcat, (2) water trucks

The contractor continued to place fill on the north central side of the cap. The fill material was being delivered from the stockpile of RF Alluvium west of site. The material is being placed ~~in~~ and in 1'- lifts and compacted with a min. of 4 passes of the 825. The contractor is also continuing to cut and fill in the graphite area for the re designed section. Cushion soil placement was also continuing on the western 300' of the ~~cap~~ and cap. The material is being placed and rough graded at existing moisture-, no compaction has been done at this time.

The second proof roll was completed on the south central side of the cap. The proofroll was done with 2 passes of a loaded 633D scraper, several alignment marks were made to ensure no areas were missed. Soft spots were marked for repair at a later date. The soft spots that were repaired on 10-20-04 were

reinspected and all passed except #18 (the test area).
GCL and GDN were delivered and off loaded onto staging areas #2 and #3, all GCL was covered with a tarp to protect ~~them~~ it from weather.
The weekly meeting was held, EPA, CDPHE, John Rahe, QA, QC, and Earth Tech attended, a site tour was done afterwards.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Soft spots from 1st & 2nd proof roll, repair in progress.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

3 new soft areas on top of the cap were approved.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 43

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 10-22-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 40 ° at 7:30 a.m. Temp. 54 ° at 2:30 p.m.	
Observation Period: 6:45am - 5:30	

EQUIPMENT: (1) Cat 825G, (2) Cat 16G, (3) Cat 6330, (2) Cat D6R LGP, (1) Cat 950B, (1) Cat 325L (1) Cat Backhoe, (2) Cat Forklift, (2) Volvo C35A, (2) Bobcat T300 (2) watertrucks

The contractor continued to fill on the South east corner of the cap. The fill is being delivered from the stockpile west of the site. The material (RF Alluvium) is being placed in 12"- lifts and compacted with a min of 4 passes of the 825. The cushion soil is also being delivered and rough graded on the West 300' of the cap, no compaction has been done at this time.

QA and QC personnel did a 2 pass proof roll using a loaded 633 D scraper on the graphite area and a section approx 75' x 200' ea. just east of the trash placement area. Alignment marks were made to ensure no areas were missed, and all soft areas were marked for repair. The soft spots were marked and scarified for drying.

10-22-04

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Soft areas from 1st & 2nd proofrolls, repair in progress.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

SS # 1, 2, 3, 4, 5, 6, 7, 9, 17 are approved.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 44

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 10-23-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 43 ° at 7:30 a.m. Temp. 58 ° at 2:00 p.m.	
Observation Period: 6:45 am – 5:00 pm	

EQUIPMENT: (1) Cat 825G, (1) Cat CS-583C, (2) Cat 14G, (1) Cat 950B, (2) Cat D6LGP, (1) Cat 325L (1) Cat Backhoe (2) Cat Forklifts, (2) Water trucks (2) Volvo C30A, (3) Bobcat T300 (3) Cat 633D

The contractor continued to place fill on the southwest corner of the cap. The material was hauled from the R.F. Alluvium pit west of site, placed in 1'– 1½ lifts and compacted with a min. of 4 passes with the 825.

QA and QC did a second proofroll on the north central area, approx. 250' against the approved west area. The area was rolled with 2 passes of a loaded 633D with several alignment marks to make sure no areas were missed. Soft spots were marked to be fixed at a later date.

The graphite area was proofrolled after the first repair and still had 2 5' diameter soft areas. The soft areas were excavated 2'± and left open to aid in drying.

10-23-04

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Soft areas from 1st & 2nd proofrolls, repairs in progress.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 465

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 10-25-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 33 ° at 7:30 a.m. Temp. 50 ° at 5:00 p.m.	
Observation Period: 7:15 – 5:45 pm	

EQUIPMENT: (1) cat 825G (1) Cat CS-583E, (2) Cat 14G, (1) Cat 950B, (3) Cat 633D (1) Cat 325L (2) Cat D6 LGP, (2) watertrucks, (2) Cat Forklift, (1) Cat Backhoe, (2) Volvo C35A, (3) Bobcat T300

The contractor continued to place fill on the southeast corner of the cap. The fill material is being hauled from the R.F. Alluvium pile west of the cap, placed in 1' lifts and compacted with 4 passes of the 825.

QA, QC, Kaiser Hill and EPA performed a 1st proofroll on the rebar area as well as the trash placement area. The trash area was rolled 2 passes with a loaded 633D scraper, and the rebar area with 2 passes of the 825. The areas were marked with several alignment marks to ensure no areas were missed. Soft areas were marked for rework. One soft area was marked in the rebar area, that will be left to dry and rechecked @ a later date.

10-25-04

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Soft areas from 1st & 2nd proof roll, repair in progress.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

Graphite soft area approved.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 46

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 10-26-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 39 ° at 7:45 a.m. Temp. 55 ° at 5:30 p.m.	
Observation Period: 6:45pm - 5:45	

EQUIPMENT: (1)Cat 825G, (1)Cat CS-583C, (2)Cat 14G, (3)Cat 633D, (2)Cat D6 LGP, (1)Cat 325L, (1)Cat 950B (1)Cat Backhoe, (2)Cat Forklift, (2)Volvo C35A, (2) Watertrucks, (3)Bobcat T300

The contractor continued to place fill on the east side of the cap. The material is being hauled from the 280 stock pile west of site. The material is being placed in 1' lifts then compacted with a min. of 4 passes with 825.

QA/QC did another 2nd proofroll on the next 200±' section on the north central side of the cap. The area was rolled 2 complete passes with a loaded 633D scraper, alignment marks were made every pass to ensure no areas were missed. Soft areas were marked for repair at a later date.

Soft spot #10, 11, 12 (Geocell area) was excavated 18"-24", compacted with the 825 and the CS-583C to smooth out the surface. Then the non woven geotextile and the geogrid were placed and the area backfilled with R.F. Alluvium.

10-26-04

The contractor continued to place and finish grade the cushion soil on the west 300'. The area is being surveyed for final grading before the record survey. The area is also being compacted with a min. of 2 passes with the CS-583C.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Soft area from the 1st & 2nd proofrolls, repair in progress.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

SS# 16, 15, 13 released.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 47

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 10-27-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 42 ° at 7:00 a.m. Temp. 54 ° at 5:30 p.m.	
Observation Period: 6:45am - 6:00pm	

EQUIPMENT: (1)Cat 825G, (1)Cat CS-583E, (2)Cat 14G, (3)Cat 633D, (1)Cat 950B, (1)Cat 325L (2)Cat Forklift, (1)Cat Backhoe, (2)Volvo C55A, (2) watertrucks, (3)Bobcat T300 (2) Cat D6LGP

The contractor continued placing fill on the south and east sides of the cap. The fill material (RF Alluvium) is being hauled from the 280 stockpile west of the cap. The material is being placed in 1' lifts then compacted w/a min of 4 passes with the 825.

The contractor also continued to finish grade and compact the west 300' of the cap. The record survey has been completed on the north half of the cushion area, so all the wooden hubs have been removed on that half. The entire cushion area has also been inspected for any rocks over ½", all rocks over ½" are being removed. The area is also being inspected for soft areas and excessive roll marks.

The contractor excavated the pit and placed the liner

10-27-04

for the soap capture system. The soap is flowing into the capture pond, but no pump or tank has been installed

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Soft areas from 1st & 2nd prodrolls, repair in progress

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 48

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 10-28-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 39 ° at 7:45 a.m. Temp. 65 ° at 2:30 p.m.	
Observation Period: 6:45am – 6:00 pm	

EQUIPMENT: (1) Cat 825B, (1) Cat CS-583C, (2) Cat 14G, (1) Cat 325L, (2) Cat D6LGP (1) Cat 950B, (3) Cat 633D, (2) Volvo C35A, (2) Cat Forklift, (3) ~~Cat~~ URV Bobcat T300, (1) Cat Backhoe (2) watertrucks

The contractor is continuing to place fill on the east and south sides of the cap. The material was hauled from the 280 stockpile, placed in 1' lifts and compacted with a min of 4 passes of the 825.

The contractor also continued to finish grade the west 300' of the cushion soil. The area was inspected for any rocks over ½" and any roll marks over ½", all areas found were repaired. The west 100' was released for liner placement.

The anchor trench was excavated on the west 100', much of it still has to be cleaned before liner is placed in it. 4 panels of GCL were placed, and all were inspected and documented by QC. One patch was placed on the GCL on an area damaged by the Bobcat.

10-28-04

1 panned of FML was also placed, inspected and documented. The edge of the FML was damaged during deployment and will have to be repaired.

The weekly meeting was held, ~~and Th~~ 3rd EPA, CDPHE, Bob Davis and John Rahe were all present for the meeting and liner placement.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Soft areas from 1st & 2nd proof rolls, rework in progress.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 49

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 10-29-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 41 ° at 8:30 a.m. Temp. 43 ° at 9:45 p.m.	
Observation Period: 6:45am – 10:00am	

EQUIPMENT: (1) Cat 825G, (1) Cat CS-583C, (2) Cat 14G, (3) Cat 633D, (1) Cat 950B, (1) Cat 325L (2) Cat D6LGP, (1) Cat Backhoe, (2) Cat Forklift (2) Volvo A35C, (3) Bobcat T300 (2) water trucks

The job was shutdown due to wind. The FML is still in place but wrinkled due to the wind. Many of the tarps on the geosynthetics have blown loose, but cannot be repaired until the wind speed drops.

10-29-04

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Soft areas from 1st and 2nd proofrolls, repair in progress.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 50

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 10-30-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 43 ° at 7:45 a.m. Temp. 51 ° at 4:00 p.m.	
Observation Period: 6:45am – 4:15	

EQUIPMENT: (1)Cat 8256, (1)Cat CS-583E, (1)Cat 325L, (2)Cat 14G, (3)Cat 633D, (2)Cat D6LGP (1)Cat 950B, (2)Cat Forklift, (2)Volvo C35A, (3)BobcaT T300, (1)Cat Backhoe, (2)watertrucks

The contractor fixed all of the tarps covering the GCL in the staging areas.

The liner crew finished placing GCL and LLDPE on the 80' west section. The GCL was overlaped 6"+ on the sides and 24"+ on the butt seams with granular bentonite. (1) Test weld was done on the LLDPE and tested for peel and shear strength, (both passed) prior to welding on the cap. The welds were completed on the cap. One destruction sample was marked but has not been cut, and no pressure tests have been done at this time. Several areas have also been marked for bead repairs, but none have been done at this time. 1' of loose material (cushion soil) has been placed in the anchor trench to help hold the liner in place until Monday 11-1.

10-30-04

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Soft areas from 1st & 2nd proofrolls, repair in progress.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 51

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 11-1-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: — Temp. 31 ° at 0730 a.m. Temp. 40 ° at 0905 ~~p.m.~~ AM	
Observation Period:	

EQUIPMENT: 1- CAT 825G PAD-FOOT COMPACTOR
2- CAT 14G GRADERS
1- CAT 950B FRONT-END LOADER
3- CAT 633D SCRAPERS
2- CAT D6R LGP DOZER
1- CAT CS-583C VIBRATING SMOOTH DRUM COMPACTOR
2- WATER TRUCKS
1- CAT RUBBER TIRE BACKHOE
3- BOBCAT T300
2- CAT FORKLIFTS
1- CAT 325L BACKHOE
2- VOLVO DUMP TRUCKS

ONLY WORK PERFORMED TODAY WAS THE UNLOADING OF SLOPE LINER DUE TO RECENT SNOW & VERY WET CONDITIONS. TWO TRUCKS CARRYING 24 ROLLS (48 TOTAL) OF TEXDRAIN 200 DS8 13.5FT * 200FT * 200 MIL LINER WERE UNLOADED ONTO NORTH WEST LINER STORAGE AREA. UNLOADING OF TRUCK #1 BEGAN @ 0810 ↓

11-1-04

TRUCK #2 ARRIVED @ 0850. ALL LINER ROLLS APPEAR TO BE IN GOOD CONDITION (ie - NO GOUGES, WRAPPED IN PLASTIC, ETC.) WHILE ON TRUCK.

TETRATECH OFFSITE @ 0915.1

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

NONE

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

NONE

Copies to: John Rahe

Observer: ~~Josh Valentine~~ MARSHALL MASSARO

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 52

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 11-2-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 19 ° at 7:00 a.m. Temp. 46 ° at 3:00 p.m.	
Observation Period: 6:30am - 3:45pm	

EQUIPMENT: (1) Cat 825G, (1) Cat CS-583C, (2) Cat 14G, (3) Cat 633D, (1) Cat 950B, (2) Cat 016 IGP, (1) Cat 325L, (1) Cat Backhoe, (2) Cat Forklift, (2) watertrucks, (2) Volvo C35A, (3) Bobcat T300

The contractor started to place some fill on the very top of the cap. The subgrade as well as the fill had large amounts of frost and was continuing to freeze. The fill was stopped, scarified and left open until it was warmer and the frost had melted, the fill was continued soon after. The fill is very wet and is being placed in thin (8") lifts to aid in drying, but much of it will have to sit until dry (maybe days).

The cushion soil is very wet and is being left to dry. Due to the high moisture content it will have to be retested before any liner is placed ~~on~~ JN to the east.

The liner crew performed all the pressure tests on the FML placed to date, panels 1-4, and all passed. An extrusion trial seam was done and tested before

11-2-04

any patching was done, it was tested by QC and passed for ped and shear. The first destructive sample was taken and tested, and passed shear and ped. All the test and damaged areas were patched or beaded with the extrusion welder then tested with a vacume box, and all passed.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Soft areas from 1st & 2nd proofrolls, repair in progress.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 53

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 11-3-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 38 ° at 6:45 a.m. Temp. 54 ° at 4:30 p.m.	
Observation Period: 6:30am - 5:30pm	

EQUIPMENT: (1)Cat 825G, (1)Cat CS-583C, (2)Cat 14G, (3)Cat 6330 (2)Cat D6LGP, (1)Cat 325L, (1)Cat 950B (1)Cat Backhoe, (2)Cat Forklifts, (2) water trucks, (2) Volvo 35A, (3) Bobcat T300

The contractor continued to place fill on the southeast end of the cap. The material is being placed in 1'- lifts and rolled with a min of 4 passes of the 825.

The GCL was saturated on the south end of panel #1 as well as the 6"-8" ~~edge~~ NW east edge of panel #2. The south end was removed then replaced after the subgrade was reworked. The east edge will be overlapped 2' to cover the saturated area with good GCL.

The cushion layer was still too wet and soft to lay any new liner. The layer was left to dry all day, although some low areas were filled and rolled with the CS-583C at the end of the day.

11-3-04

The contractor cleaned all water, ice and mudd from the bottom of the anchor trench. Cushion soil was placed in 6" lifts and compacted with a plate tamper. A small test section was done in this manner as a test fill to finished grade. A density test was taken and failed. The area was recompacted with a front loader (950B) and retested and passed.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Soft areas from 1st & 2nd proofrolls, repair in progress. South end of GCL panel #1 saturated.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

South end of GCL panel #1 replaced.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 54

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 11-4-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 37 ° at 7:15 a.m. Temp. 47 ° at 5:00 p.m.	
Observation Period: 6:15am - 6:00pm	

EQUIPMENT: (1) Cat 825G (1) Cat CS-583E, (2) Cat 14G, (3) Cat 633D, (1) Cat 950B, (2) Cat DLGP, (1) Cat 325L (1) Cat Backhoe, (2) Cat Forklift, (2) water trucks, (2) Volvo C35A, (3) Bobcat T300

The contractor continued to place fill on the east end of the cap. The fill is being placed in 1'- lifts and compacted with a min of 4 passes of the 825.

The liner crew placed 23 panels of GCL and 7 panels of FML on section 1 of the cushion layer. Panel #14 and #15 of GCL overlapped the edges of panel #1 & #2 by 2' to cover the hydrated edge. The rest of the GCL edge seams were overlapped 6"+ and the butt seams 24"+, all butt seams were done with granular bentonite. The FML was overlapped 6" and fusion welded on all seams, and pressure tested. All pressure tests passed. The FML was walked several times to find defects or damage, and all were marked for patching or bead welds. The contractor was using the split bucket on the bobcat to deploy the FML which damaged the material. The panels deployed using this meathod have been marked for repair.

11-4-04

The contractor is clamping the liner closer to the end of the panel so that the damage is in the anchor trench or cut off the end.

The contractor continued to haul and rough grade cushion soil on regrade section 2.

The contractor started to place the north gas vent at the west end. The trench was excavated 1' deep and 2' wide then filled with clean drainage rock with the perforated pipe 4" down from the surface.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Soft areas from 1st proof roll, repair in progress.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

DAILY REPORT CQA SERVICES
ADVANCED TERRA TESTING. Inc.

PROJECT NAME:	JOB NUMBER:	GEOSYNTHETIC MATERIAL: 60 mil LLDPE, GCL
RFETS Present Landfill 60 mil LLDPE Primary and GCL Secondary Liners	2617-02	

DATE: 11/04/03

WEATHER and SITE CONDITIONS: 1300: 45 deg. F, ptly. cloudy, calm.

PERSONS CONTACTED: Josh Valentine (Tetra-Tech), Marshall Massaro (Tetra-Tech), Bob Davis (Kaiser-Hill), Matt Cashmier (Golder), Michael "Harry" Bolton (Stoller), Brian (Master Seamer, Colorado Lining).

PROJECT STATUS: Actual lining activity began late last week, Thursday/Friday. Inclement weather over weekend caused lining activity to cease until Thursday, November 4, 2004. Approximately 9 panels of LLDPE have been placed over GCL at the western end of the facility.

ITEMS COMPLETED: GCL placed to extent of approved subgrade, covered with LLDPE, seamed.

QUALITY ASSURANCE ACTIVITIES: Observed deployment of GCL Panels S-22, S-24, S-25, S-27; observed deployment and seaming of LLDPE Panels P-5, P-7 and P-8. Walked Primary Panels P-1 through P-8. Observed temporary storage location of geosynthetic products.

PROBLEMS NOTED: Numerous small rocks and a significant amount of soil debris are being carried (due to foot traffic) onto the lining system, especially in areas immediately adjacent to filled anchor trenches. An unusually large number of burnouts occurred during the seaming of Panels P-5 and P-7, due to an excessive amount of overlap between the panels. Method of deployment of LLDPE causing clamp marks in surface of lining system, requiring bead repairs and vacuum box testing. Welding machine operator changed running speed of the seaming device during production seaming of P-5/P-7.

PROBLEM RESOLUTIONS: Discussed above concerns with Josh Valentine, Marshall Massaro, Matt Cashmier, Harry Bolton and Brian. Lining system will be cleaned using brooms or leaf blowers, and QA/QC personnel will again walk the panels to observe if any further installation damage has occurred since placement, prior to deployment of the geocomposite drainage net material. QC personnel will verify overlap of FML seams prior to welding, in order to minimize potential for burnouts. If machine running speeds are changed during a production seam, operator will perform additional peel/shear tests at the end of seam, in order to demonstrate that change in machine operation has not materially affected seam quality. Deployment personnel will clamp FML in such a manner that clamp damage will be restricted to the anchor trench, so that repairs to the lining system will be minimized.

COMMENTS/OBSERVATIONS: General condition of temporary storage location for geosynthetic products is good. Products have appropriate dunnage, are stacked correctly, and temporary tarps are properly ballasted. Method of GCL placement and seaming appears adequate. Repairs due to "turning" of the Bobcat on the GCL have been minimized. If there is a requirement to provide calibration certificates for testing instrumentation (field tensiometer, vacuum box gauges, seam air pressure test gauges, thermometers, etc.), QA personnel should verify current documentation.

ATTACHMENTS: 4 Digital Images

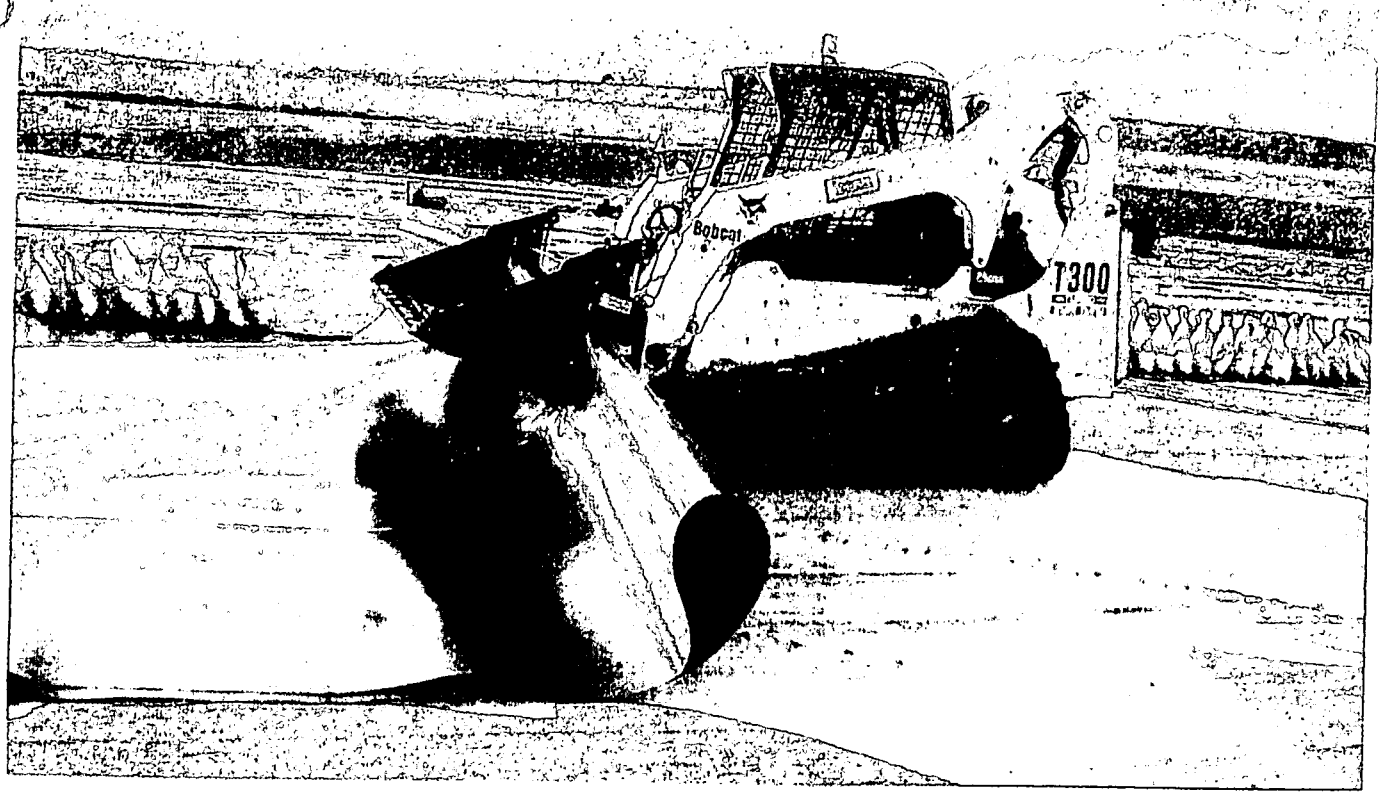
C Wienecke
QA Approval
Advanced Terra Testing, Inc.

11/08/04
Date

K:\TT2617\DA110404.lwp

Deploying LLDPE with clamp in Bobcat bucket

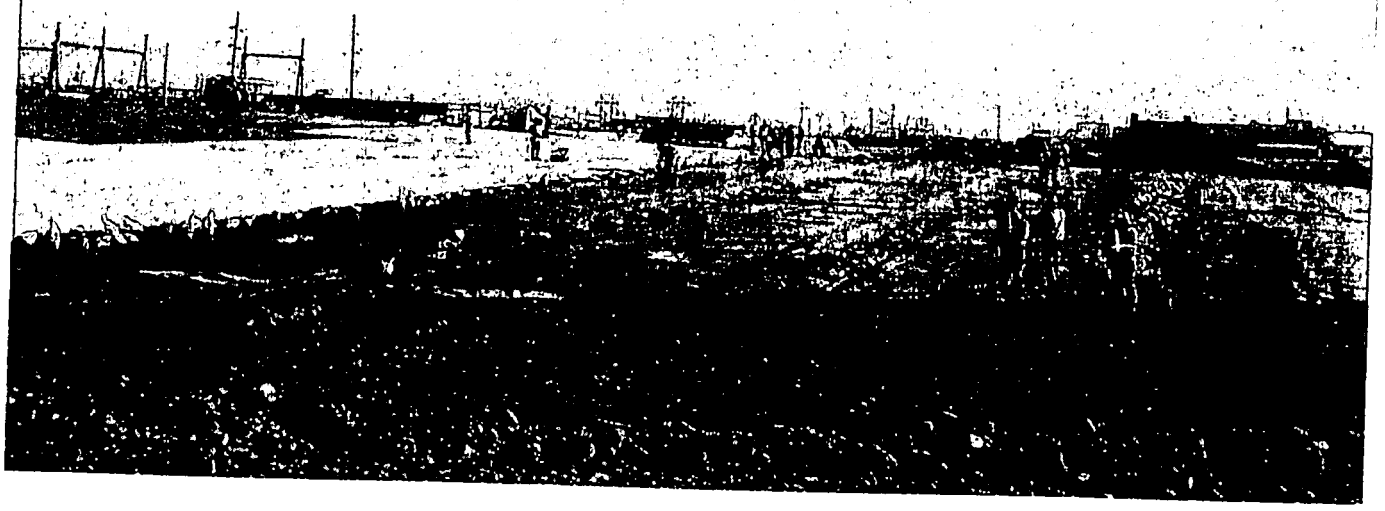
11/4/2004 4:06:32 PM



Clamp marks remaining in deployed LLDPE

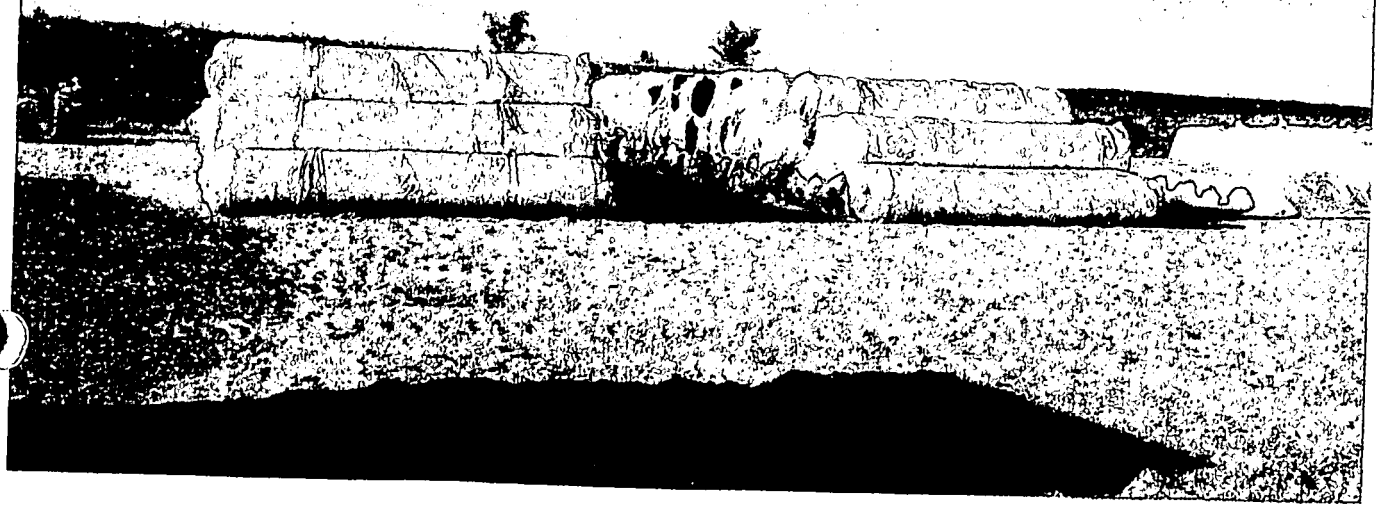
11/4/2004 3:48:23 PM

Sequence (left to right) - Subgrade, GCL, newly placed LLDPE, completed LLDPE



11/4/2004 3:48:47 PM

Temporary storage location for geosynthetic products



QUALITY ASSURANCE OBSERVATION REPORT NO. 55

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00 Date 11-5-04	
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 48 ° at 7:00 a.m. Temp. 57 ° at 5:00 p.m.	
Observation Period: 7:00am - 5:45pm	

EQUIPMENT: (1)Cat 825G, (2)Cat 14G, (1)Cat CS-563E, (3)Cat 1633D, (2)Cat D6LGP, (1)Cat 325L (1)Cat 950B (1)Cat Backhoe (2)Cat Forklift, (2) water trucks, (3) Bobcat T300 (2) Volvo C35A

The contractor continued to place fill on the east end of the cap. The RF ~~Alluvium~~ SW Alluvium is being placed in 1'- lifts and compacted with a min. of 4 passes with the 825.

The liner crew placed 10 panels of GCL on section 1. The edge seams were overlapped 6"+ and the butt seam were overlapped 24"+ with granular bentonite. The crew also placed and wedge welded 4 panels of FML. The welders also patched or beaded the areas marked on 11-4 with an extrusion welder. Test welds were done on wedge and extrusion welds before and work was done on the cap, ~~all~~ SR for peal and shear, all passed. The patches and beads done today have not been tested with the vacume box. Pressure tests were done on the wedge welds done on 11-4, and all passed.

11-5-04

The contractor continued to haul and rough grade cushion soil onto section 2. of the regrade surface.

The contractor was also placing cushion material in the anchor trench in 1' lifts and compacting with a hand tamper on the west end of section 1.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Soft areas from 1st proof roll, repair in progress.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 56

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 11-6-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 60 ° at 8:45 a.m. Temp. 73 ° at 2:00 p.m.	
Observation Period: 6:30am – 2:15pm	

EQUIPMENT: (1) Cat 825G, (1) Cat CS-563, (2) Cat 14G, (1) Cat 950B, (2) Cat D6 LGP, (1) Cat 633P (1) Cat 325L, (1) Cat Backhoe (2) Cat Forklift, (1) watertruck, (2) Volvo C35A, (3) Bobcat T300

The contractor is continuing to place fill on the east side of the cap. The material is being placed in 1'- lifts and compacted with a min. of 4 passes with the 825.

The liner crew repaired all the defect and distructive test areas on the FML placed on 11-5-04. The areas were either patched or beaded using the extrusion welder. A trial seam was done and tested (passed) before any welds were done on the cap. All the areas patched or bead welded on 11-5 and 11-6 were tested with the vacume box, and all passed. The liner crew also used blowers to clean the west end of the liner in preperation for the GCN.

The contractor is continuing to place cushion soil onto section 2 of the regrade surface. They are also continuing to backfill the anchor trench on section (1) with cushion material.

11-6-04

The material is being placed in 6" lifts then compacted using the jumping jack.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Soft areas from 1st proofroll, ready for inspection.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 57

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 11-8-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 49.9 ° at 0715 a.m. Temp 58.3 ° at 0440 p.m.	
Observation Period: 0715 - 0445	

EQUIPMENT: 1 - CAT 825 G PAD-FOOT COMPACTOR
2 - CAT 146 GRADER
1 - CAT 950B FRONT-END LOADER
3 - CAT 633 D SCRAPERS
2 - CAT D6R L6P DOZER
1 - CAT CS-583C VIBRATING SMOOTH DRUM COMPACTOR
2 - WATER TRUCKS
1 - CAT RUBBER TIRE BACKHOE
3 - BOBCAT T300
2 - CAT FORKLIFT
1 - CAT 325L BACKHOE
2 - VOLVO DUMP TRUCK

ON 11/8/04. SUBGRADE WAS RELEASED THROUGH STATION 19250 IN THE MORNING. A TOTAL OF 5 ROWS OF GCL & 3 ROWS OF FML WERE PLACED THROUGHOUT THE DAY.

~~ON THE SOUTH END OF~~ AM ON THE SOUTHWEST END OF GCL 5-58, A TRIANGULAR SHAPED SECTION OF GROUND WAS

11-8-04

EXPOSED TO ALLOW THE STRAIGHTENING OF THE GCL. TRIANGULAR AREA WAS APPROX. 50'*3' FROM NORTH TO SOUTH. EXPOSED AREA WAS PATCHED W/ GCL W/ A MINIMUM OF 1FT OVERLAP & GRANULAR BENTONITE PLACED @ THE SEAMS.

QC- SEVEN DESTRUCTIVE SAMPLES OF THE FML HAVE BEEN COLLECTED BY GOLDER & ALL HAVE PASSED. ALL TRIAL WELD SAMPLES (COLLECTED) BY GOLDER TWICE A DAY HAVE PASSED.

AN AREA OF THE PLF FROM PANELS 1-13 HAVE BEEN RELEASED FOR GDN PLACEMENT.

SEE GRID PAPER NOTES FOR MORE DETAIL

NINE BEADS WERE PLACED ON PANELS 1, 10, & 12 FOR THE GDN RELEASE TO OCCUR. ALL BEADS WERE VACCUUM TESTED AND PASSED.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK: ALL BEADS ON PANELS 1, 10, & 12 WERE REPAIRED PRIOR TO THE END OF THE DAY ON 11/8/04.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES: NO PREVIOUSLY REPORTED DEFICIENCIES

Copies to: John Rahe

Observer: ~~Josh Valentine~~ Marshal Massaro

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 58

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 11-9-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 53 ° at 7:00 a.m. Temp. 64 ° at 2:30 p.m.	
Observation Period: 6:20 am - 5:15 pm	

EQUIPMENT: (1)Cat 825G, (1)Cat CS-583C, (2)Cat 416, (3)Cat 963D, (2)Cat D6LGP, (1)Cat 950B (1)Cat 928F (2)Cat Forklift, (1)Cat Backhoe, (2) Volvo C35H, (1)Watertruck (3)Bobcat T300

The contractor continued to place and rough grade cushion material on section 2 ~~and~~ JAM and 3. The gas vent system was continued to the east placing the perforated pipe, graveled then 8oz nonwoven geotextile to help protect the GCL. The contractor also did a new test fill on the east end of the cap with the new import R.F. Alluvium. The test fill was done in 2 one foot lifts compacted with 4 passes of the 825 then 2 test holes were excavated. The test fill as well as the test holes looked very good, and no deflection was noted when the area was proof rolled.

The liner crew placed ±44000 sq/ft of GCL and FML on the cap. All the panels were inspected and documented as they were placed, and any defects found on the FML were marked for repair. All the seams were fusion welded, and some of the defect areas were patched or bead welded

11-9-04

with the extrusion welder, but none were vacuume tested. No pressure tests were done on the fusion seems.

The contractor placed large tarps on the subgrade (cushion soil) and the edge of the FML to help protect the GCL as well as some of the cushion soil from rain/snow.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Soft areas from 1st proofroll, repair completed.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 59

TETRA TECH RMC

TO: _____

_____

_____

Project No. 19-4886.001.00	Date 11-10-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 45 ° at 8:00 a.m. Temp. 41 ° at 1:00 p.m.	
Observation Period: 6:15am - 1:15pm	

EQUIPMENT: (1)Cat 825G, (1)Cat CS-583C, (2)Cat 816, (3)Cat 6330, (2)Cat D6LGP, (1)Cat 950B (1)Cat 325L, (1)Cat Backhoe, (2)Cat Forklift, (1)water truck, (2)Volvo C35A, (3)Bobcat T300

The contractor continued to place fill on the east end of the cap. The material is being placed in ~1' lifts and compacted with a min of 4 passes with the 825.

The contractor continued to haul and rough grade the cution material on section #3. The material is being placed, graded then compacted with the Cat CS-583C smooth drum compactor to help seal it from the snow/rain. Rocky Flats Alluvium is also being placed on the east end of the cap. The material is being placed in 1'- lifts and compacted with a min of 4 passes with the 825.

The liner crew spent the day filling sandbags due to rain.

The site was shut down early due to rain.

11-10-04

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Defects on FML placed on 11-9-04.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 60

TETRA TECH RMC

TO:

Project No. 19-4886.001.00	Date 11-11-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 38 ° at 7:00 a.m. Temp. 45 ° at 10:30 a.m.	
Observation Period: 6:30 am – 10:45 am	

EQUIPMENT: (1) Cat 825G, (1) Cat CS-583E, (2) Cat 14G, (3) Cat 633D, (2) Cat D6LGR, (1) Cat 325L, (1) Cat 950B (1) Cat Backhoe, (2) Cat Forklift, (2) Volvo A35C, (1) water truck (3) Bobcat T300

The contractor off loaded the last truckload of GDN onto staging area #3. All ordered FML, GCL and GDN have been delivered and staged on site. The contractor shut down the site due to snow/wet and muddy conditions.

11-11-04

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Defects found on FML placed on 11-9-04.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

~~Defects~~ JRJ None.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 61

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 11-12-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 30 ° at 7:00 a.m. Temp. 43 ° at 3:00 p.m.	
Observation Period: 6:15am - 4:00p.m	

EQUIPMENT: (1)Cat 825G, (1)Cat CS-583C, (1)Cat 950B, (1)Cat 325L, (2)Cat D6LGP, (3)Cat 633D (2)Cat 14G, (1)Cat Backhoe, (2)Cat Forklifts, (1)water truck (2)Volvo A35C (3)Bobcat T300

The contractor is placing import RF Alluvium on the east side of the cap. The wet material is being cut and stockpiled before the import material is placed. The material is being placed in 1' lifts and compacted with a min. of 4 passes with the 825. Much of the material is too wet and may have to be reworked at a later date.

The contractor continued to backfill the anchor trench on the north and south sides up to the edge of the liner. The material (cushion soil) is still a little wet and may have to be reworked at a later date.

The liner crew started to place GDN from the west end of the cap. The GDN is being placed with 6" overlap on edge seams and 2' overlap on butt seams with ties at 5' and 1' respectively. The nonwoven geosynthetic is being overlapped

11-12-04

and hystered after the ties are in place. The liner crew also completed patching and testing the remaining FML, all tests passed (vacuum & pressure).

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

None

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 62

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 11/15/04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 36.9 ° at 0705 a.m. Temp. 46.6 ° at 1855 p.m.	
Observation Period: 0630 – NA	

EQUIPMENT: 1-CAT 825G PAD-FOOT COMPACTOR
2-CAT 146 GRADERS
1-CAT 950B FRONT-END LOADER
3-CAT 633D SCRAPERS
2-CAT D6R LGP DOZER
1-CAT CS-583C VIBRATING SMOOTH DRUM COMPACTOR
2-WATER TRUCKS
1-CAT RUBBER TIRE BACKHOE
3-BOBCAT T300
2-CAT FORKLIFT
1-CAT 325L BACKHOE
2-VOLVO DUMP TRUCK

PRE RELEASED APPROVED SUBGRADE TO 19900
" " FML TO PANEL 19
GDN LAID UP TO PANEL 10

PRE-11/15/04

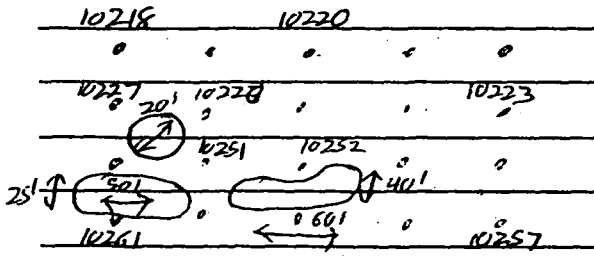
GDN RELEASED TO PANEL T-31
GCL RELEASED TO 19800 · CUSHION SOIL RELEASED TO 19925

11-15-04

CUSHION SOIL AT EASTERN EDGE OF FML-GCL IS SATURATED ABOUT 3" DEEP. REQUESTED THAT COLORADO LININGS REMOVE WET SOIL & REPLACE W/ DRY MATERIAL & COMPACT W/ JUMPER TAMPER, WET GCL WILL HAVE TO BE REMOVED OR OVERLAPPED W/ NEW GCL PRIOR TO COVERING W/ FML.

ANCHOR TRENCH ON NORTH SIDE (≈150FT) & SOUTH SIDE (≈100FT) (PANELS 16, 18 & 20 & 22) HAD TO BE REMOVED DUE TO WATER SATURATION. NEW SOIL WAS PLACED INTO TRENCH IN 1FT INCREMENTS & COMPACTED TO ≈98% (DENSITY TEST VIA NUKE GAUGE BY GOLDER).

A LARGE (≈6-8") FOLD WAS LOCATED AT NORTHERN END OF FML PANELS (AT TRENCH) 21, 23 & 24. FOLD WAS CUT DURING HEAT OF DAY & EXCESS FML WAS CUT & SEAMED TIGHT. SLIGHT HUMP IS PRESENT STILL, BUT ANY WATER WILL DRAIN N-NE TO PANEL 25 & OFF LANDFILL



SOFT SPOTS LOCATED ON NE SIDE OF LANDFILL, REMOVAL OR MESH COVERING WILL OCCUR.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK: SOFT SPOTS LOCATED ON NE PORTION OF LANDFILL B/W 10218-10261 & 10257

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

CERTIFIED ~~to~~ GDN TO PANEL T-31, BUT CHECK SPECS ON ~~10:1~~ SEW REQUIREMENTS ON 10:1 SLOPES.

MAKE SURE TOO MUCH WATER DOESN'T RUNOFF INTO TRENCH SOIL.

Copies to: John Rahe

Observer: ~~Josh Valentine~~ Marshall Massaro

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 63

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 11-16-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 38 ° at 7:00 a.m. Temp. 47 ° at 3:00 p.m.	
Observation Period: 6:30am – 6:00pm	

EQUIPMENT: (1)Cat 825G, (1)Cat CS-583C, (2)Cat 14G, (1)Cat 325L, (2)Cat 1633D, (2)Cat D6 LGP (1)Cat 950B (2)Cat Forklift, (1)Cat Backhoe, (2)Volvo A35C, (3) Volvo A30, (1) watertruck (3)Bobcat T300

The contractor continued placing cushion soil on section #3. The cushion soil is being placed, rough graded compacted, fine graded, surveyed then tested before being released for liner.

The contractor was also continuing to place the gas vent system on all three lines. The trench is being excavated to approx. 1'x1' and filled w/ drainage rock with the perforated pipe 4" from the top of the trench.

The liner crew placed GCL panels T-94 to T 102, FML panels P27 to P30, and 18 panels of GDN. The GCL was placed with a min. overlap of 6" on edge seams and 24" on butt seams, with granular bentonite on butt seams. The trial seam were tested for the wedge welder (and passed) prior to welding the FML. The FML was welded, but

no testing of these panels has been done. The final vacume box testing was done and passed on all prior panels.

The Contractor also started to place 10" cushion material on the west edge of the GDN. The material was being pushed using a D6 dozer, and was pushing the wrinkles ahead of the cushion material forming large wrinkles. The operation was stopped for the day to solve the wrinkle problem.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

- pressure & vacume box testing on panels P27 - P30.
- soft spots from last proof roll.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

- vacume box testing on panels P21, 23, 24.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 64

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 11-17-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 43 ° at 7:00 a.m. Temp. 53 ° at 4:00 p.m.	
Observation Period: 6:30am – 5:30pm	

EQUIPMENT: (1)Cat 825B, (1)Cat CS-583C, (2)Cat 816, (1)Cat 950B, (1)Cat 966F, (2)Cat 633D, (1)Cat 325L (2)Cat D6LGP, (1)Cat Backhoe, (2) Cat Forklift, (1) water truck (2) Volvo A35C, (3) Volvo A30 (3)Bobcat T300

The contractor continued to place cushion soil on section #3. The material is being placed, rough graded, compacted, final graded, surveyed and tested before being released for liner.

The contractor is also continuing to place the gas vent system. The trench is being excavated 1'x1', and the gravel placed with the top of the perforated 4" from the top of the trench.

The contractor continued to place 10" cushion soil on top of the GDN on the west edge. The material is being placed with the front-end loader dumping past the edge of the cushion soil to prevent any large wrinkles from forming. The area is only being rough graded at this time.

11-17-04

The liner crew placed GCL panels #T103 - T122, and FML panels P31 to P34. The seams and patches were tested (pressure or vacuum box) for panels P27-P30, and all passed.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

- Pressure tests and vacume box for FML panels P31-P34.
- Soft spots from last proofroll

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

- pressure & vacuum box testing for panels P27-P30, (passed)

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 65

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 11-16-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 42 ° at 7:00 a.m. Temp. 55 ° at 3:30 p.m.	
Observation Period: 7:00am – 5:30pm	

EQUIPMENT: (1) Cat 825C (1) Cat CS-583C, (2) Cat D6LGP, (2) Cat 633D (1) Cat 325L, (1) Cat 950B (1) Cat 966F, (2) Cat 14G, (1) Cat Backhoe, (1) Cat Forklift, (1) water truck, (2) Volvo A35C (3) Volvo A30C), (3) Bobcat T300

The contractor continued to place grade fill on the east side of the PLF. The fill (R.F. Alluvium) is being hauled from Centennial, spread in 1'-lifts and compacted with a min of 4 passes of the 825.

The contractor is also continuing to place 6" cushion material on section #3. The material is being graded, surveyed then tested before being released, QC and one QA density tests were taken. The 16" cushion layer is being placed on the GDN using the front loader to help reduce and control the wrinkles in the FML. None of the 16" has been compacted or cut to final grade at this time.

The liner crew placed GCL panels T123 - T148 and FML P31 - P43. The GCL was overlapped 6" on the edges and

2 feet on the butt seams with granular bentonite. The FML panels were all wedge welded after the test welds were complete. The seams for panels P27-P30 were pressure tested and all passed.

The contractor continued to install the gas vent system up to panel P43. The trench is being excavated 2' wide and 1' deep of the perforated pipe 4" from the top and backfilled with gravel. The top is being covered with a non woven geotextile to help protect the GCL.

The weekly QA/QC meeting was held and Bob Davis, John Rahe, EPA, CDPHE were on site.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Testing for panels P31-P43.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

Testing for panels P27-P30 (pressure) all passed.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 666

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 11-19-09
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 31 ° at 6:30 a.m. Temp. 56 ° at 3:00 p.m.	
Observation Period: 6:30 am – 5:15 pm	

EQUIPMENT: (1) 825G, (1) CS-583C, (2) Cat 14G, (2) Cat 633D, (2) Cat D6LGP, (1) Cat 325L, (2) Cat Backhoe (2) Cat Forklift, (1) Cat 950B, (1) Cat 966F, (2) Volvo A35C, (3) Volvo A30C, (3) Bobcat T300 (1) water truck

The contractor continued to place grade fill (RF Alluvium) from Centennial on the east end of the cap. The material is being placed in 1' lifts & compacted with a min. of 4 passes with the 825.

The contractor is also continuing to place 6" cushion soil on section #3. The material is being placed, compacted, cut to final grade, surveyed then tested before being released. The 10" cushion layer on the GDN is also being placed with the front loader to help control wrinkles. This area is being rough graded, but no compaction or testing has been done at this time.

The liner crew placed GCL panels 5149 - 5164, and

11-19-04

FML panels P44-P47. The GCL is being overlapped 6" on all edge seams and 2' on butt seams with granular bentonite.

The gas vent was installed to panel P47, in a 1' deep, 2' wide trench with the perforated pipe 4" from the top and back filled with gravel. The top is covered with a non woven geotextile to help protect the GCL

The edges of the FML and the anchor trench was covered with tarps and sand bags to help protect everything from the forcasted snow.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Testing for panels ~~P31~~ P44 - P47

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

Pressure tests for panels P31 - P43, all passed.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 67

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 11-20-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 30 ° at 7:00 a.m. Temp. 32 ° at 7:30 p.m.	
Observation Period: 6:15am – 7:30pm	

EQUIPMENT: (1) Cat 825G, (1) Cat CS-583C, (2) Cat 14G, (1) Cat 950B, (1) Cat 966F, (3) Cat 633D (1) Cat 325L, (2) Cat Backhoe, (2) Cat Forklift, (2) Cat D6LGP, (2) Volvo A35C, (2) Volvo A30C (1) water truck, (3) Bobcat T300

The contractor used a 14G grader to cut a drainage ditch at the access road in front of the lunch trailers to help eliminate ponding in this area.

The job was shutdown early due to snow.

11-20-09

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Testing for FML panels P44-P47.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 68

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 11-22-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 43.0° at 0655 a.m. Temp. — ° at — p.m.	
Observation Period: 0630 – ~~0420~~ MAM 1620	

EQUIPMENT: (1) CAT 825 G, (1) CAT CS-583C, (1) CAT 950B, (1) CAT 325L, (2) CAT D6LGP, (3) CAT 633D, (2) CAT 14G, (2) CAT BACKHOE, (2) CAT FORK LIFTS, (1) WATER TRUCK, ~~(2)~~ (4) VOLVO A35C, (3) BOBCAT T300 MAM

DUE TO WINTER WEATHER CONDITIONS (SNOW/WIND), THE MAIN OBJECTIVE FOR TODAY WILL BE TO PLACE ALLUVIUM ON EASTERN PORTIONS OF PLF. SOFT SPOTS WERE REPAIRED THE PREVIOUS WEEK. EASTERN TWO SOFT SPOTS WERE DOZED OUT & REPLACED W/ NEW ALLUVIUM WHILE SW SOFT SPOT WAS LINED W/ GEOGRID. AT 0700, THE FML WAS COVERED IN ≈ ½" OF ICE & SNOW. PLAN WAS TO WAIT FOR FML TO DRY BEFORE PLACING ANY MORE LINER. COLORADO LINER CREW SHOVELED SNOW OFF FML TO ASSIST W/ DRYING.

GOLDER COLLECTED SEVEN SEAMS FOR DESTRUCTIVE TESTING & STATED THAT THEY HAVE PULLED 24 DESTRUCTS TO DATE. TETRATECH RMC NEEDS TO PERFORM A DESTRUCT EVERY 20, DUE TO SITE/WEATHER CONDITIONS. DESTRUCTS + VACUUM + PRESSURE TESTS ~~+ LAYING OF~~ EDAL MAM TESTS ARE ALL THAT WILL BE PERFORMED TODAY. MAM

ALLUVIUM WAS BEING PLACED EAST OF POINTS 10202 – 10205 W/ 4 DUMPTRUCKS & SEMI-TRAILERS LINE FORMED BY

11-22-04

TARPS WERE PLACED OVER THE TRENCHES & TAPED TO THE SLOPE TO PREVENT ~~SUBGRADE~~ MMM PRECIP. FROM SATURATING THE TRENCHES.

QA OFFSITE @ 1620. QC (MGC) FROM GOLDER LOGGING ALL PRESSURE / VACUUM TESTS PERFORMED ON FML BY COLORADO LINER.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

SUBGRADE NEEDS TO DRY OUT & BE REWORKED BEFORE PLACING LINER ON PLF

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

PERFORM DESTRUCT TEST FROM SAMPLE COLLECTED TODAY (11/22/04)

Copies to: John Rahe

Observer: ~~Josh Valentine~~ Marshall Massaro

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 69

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 11-23-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 30 ° at 6:30 a.m. Temp. 37 ° at 5:00 p.m.	
Observation Period: 6:15am – 5:30pm	

EQUIPMENT: (1)Cat 825G, (1)Cat CS-583C, (2)Cat 14G, (3)Cat 633D, (2)Cat D6LGP (1)Cat 325L, (1)Cat 950B, (1)Cat 966F, (2)Cat backhoe, (1) watertruck (3)bobcat T300, (2)Cat Forklift, (2)Volvo A35C, (3) Volvo A30C

The contractor continued to place import RF Alluvium on the east side of the cap. The material was being placed in 1' lifts and compacted with a min of 4 passes with the 825

The liner crew placed 90,000 ± ft² of GDN today, all edge seams were overlapped 6" and tied every 5' and butt seams overlapped 2' and tied every 1'. The butt seams were capped with a strip of nonwoven material and hyster welded. The edge seams were either sewn or wedge welded.

A second proof roll was done on the regrade surface from the edge of section 3 to grade points 10222/10206. The area had some wet material on the surface that needs to be replaced before it is released.

11-23-04

All the FML placed was pressure & Vaccum tested and released for GCN up to pannel P47.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Wet material on regrade surface to grid line 10222/10206.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

Vaccum/Pressure testing on FML up to pannel P47.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 70

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 11-24-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 30 ° at 6:30 a.m. Temp. 35 ° at 12.00 p.m.	
Observation Period: 6:30am - 2:30	

EQUIPMENT: (1) Cat 825G, (1) Cat CS-583C, (2) Cat 14G, (3) Cat 6330, (2) Cat D6H LGP (1) Cat 325L, (1) Cat 950B, (1) Cat 966F (2) Cat Backhoe, (2) Cat Forklift, (2) Volvo C35A, (3) Volvo C30A, (1) water truck, (3) Bobcat T300

The Contractor continued to place import R.F. Alluvium on the east side of the cap. The material is being placed in 1' lifts and compacted with a min. of 4 passes w/ the 825.

The tarps were removed from the edge of the FML in hopes that it will dry over the holliday weekend. No other liner work was done due to snow and time constraints.

11-24-04

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

None

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

Soft areas in regrade surface from cushion section #3 to grid line 10206/10222, all passed.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 71

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 11-29-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 33.3 ° at 0700 a.m. Temp. — ° at — p.m.	
Observation Period: 0615 - 0715	

EQUIPMENT: (1) CAT 825G, (1) CAT CS-563C, (2) CAT 140, (1) CAT 950B, (1) CAT 950G, (1) CAT 966F, (3) CAT 633D, (1) CAT 325L, (2) CAT BACKHOE, (2) CAT FORKLIFT, (2) CAT 06LGP, (2) VOLVO H35C, (2) VOLVO A30C, (1) WATER TRUCK, (3) BOBCAT T300

NO LINER WORK PERFORMED DUE TO HEAVY SNOW THAT OCCURRED THE PREVIOUS WEEKEND. APPROX. 15" OF SNOW W/ 3' DRIFTS WERE ON SITE. ONLY SNOW PLOW / SNOW REMOVAL WORK WAS PERFORMED ON ROADWAYS.

TETRA TECH RMC OFFSITE @ 0715

11-29-04

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK: NONE

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES: NONE

Copies to: John Rahe

Observer: ~~Josh Valentine~~ Marshall Massaro

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 72

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 11-30-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 29 ° at 7:00 a.m. Temp. 37 ° at 10:00 a.m.	
Observation Period: 6:30am – 10:00am	

EQUIPMENT: (1) Cat 825G, (1) Cat CS-583C, (2) Cat 146, (1) Cat 966F, (1) Cat 950B, (3) Cat 633D (2) Cat D6LGP, (1) Cat 325L, (2) Cat Backhoe, (2) Cat Forklift, (2) Volvo A35C, (3) Volvo A30C, (1) water truck, (3) Bobcat T300

The contractor spent the day plowing snow off the regrade and 6" cushion layer surfaces. The snow is being loaded into the volvos to be hauled away from the cap. No other work was being done due to snow and cold temps.

11-30-04

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

None

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 73

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 12-1-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 16 ° at 7:00 a.m. Temp. 34 ° at 4:30 p.m.	
Observation Period: 6:15am – 4:30pm	

EQUIPMENT: (1)Cat 825G, (1)Cat CS-583C, (2)Cat 14G, (3)Cat 633D, (2)Cat 826GP, (1)Cat 950B (1)Cat 966F, (1)Cat 325L (2)Cat Backhoe, (2)Cat Forklift, (1) watertruck (2)VolvoC35A, (3) VolvoC30A, (3) Bobcat T300

The contractor continued to remove snow from the regrade and 6" cushion materials. The liner crew used a rotary broom on a Bobcat to clear snow off of the FML. The crew plans to start GCL on 12-2-04 after removing the remaining snow and ice off the FML.

12-1-04

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

None

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 74

TETRA TECH RMC

TO:

Project No. 19-4886.001.00	Date 12-2-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 19 ° at 7:00 a.m. Temp. 26 ° at 12:00 p.m.	
Observation Period: 7:00am – 4:30	

EQUIPMENT: (1) Cat 825G (1) Cat CS-583C (2) Cat 14G, (2) Cat D6LGP (3) Cat 633D, (1) Cat 325L (2) Cat Forklift, (2) Cat Backhoe, (1) Cat 950B, (1) Cat 966F (1) watertruck, (2) Volvo A35C, (3) Volvo A30C, (3) Bobcat T300

The contractor spent the day removing snow from the 6", 10" cushion and regrade surface. The snow was loaded into the Volvos and hauled off the cap. The liner crew spent the day brooming snow off the FML with the Bobcats, as well as using a bucket to remove the snow from the slopes next to the FML.

12-2-04

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

None

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 75

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 12-3-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 26 ° at 7:00 a.m. Temp. 35 ° at 5:00 p.m.	
Observation Period: 6:30 am - 5:00 pm	

EQUIPMENT (1) Cat 825G, (1) Cat CS583C, (2) Cat 14G, (2) Cat D6HGP, (3) Cat 963D, (1) Cat 325L (1) Cat 950B, (1) Cat 966F, (2) Cat Backhoe, (2) Cat Forklift, (1) watertruck, (2) Volvo C35A (3) Volvo C30A, (3) Bobcat T300

The contractor continued to remove snow off the FML. The FML was marked for repair in all defect areas found by QA/QC. The areas were patched or bead welded the vaccum box tested. The liner crew spent the afternoon placing GDN on the north half of the FML. The GDN was being overlapped 6" on side seams and 24" on butt seams with ties 5' and 1' respectivly. The edges were all being sewn. The liner crew is using the Bobcat to deploy the GDN, and any damage to the ends will be patched when the butt seams are capped.

Stoller removed a section 50'x200' of R.F. Alluvium Southeast of the 6" cushion to the bottom of frost up to 14". The material was frozen, & very wet.

12-3-04

The JAN New material was placed and compacted w/ a min of 4 passes w/ the 825. The area was proof rolled & released for cushion material

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Saturated 6" Cushion & RF Alluvium.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

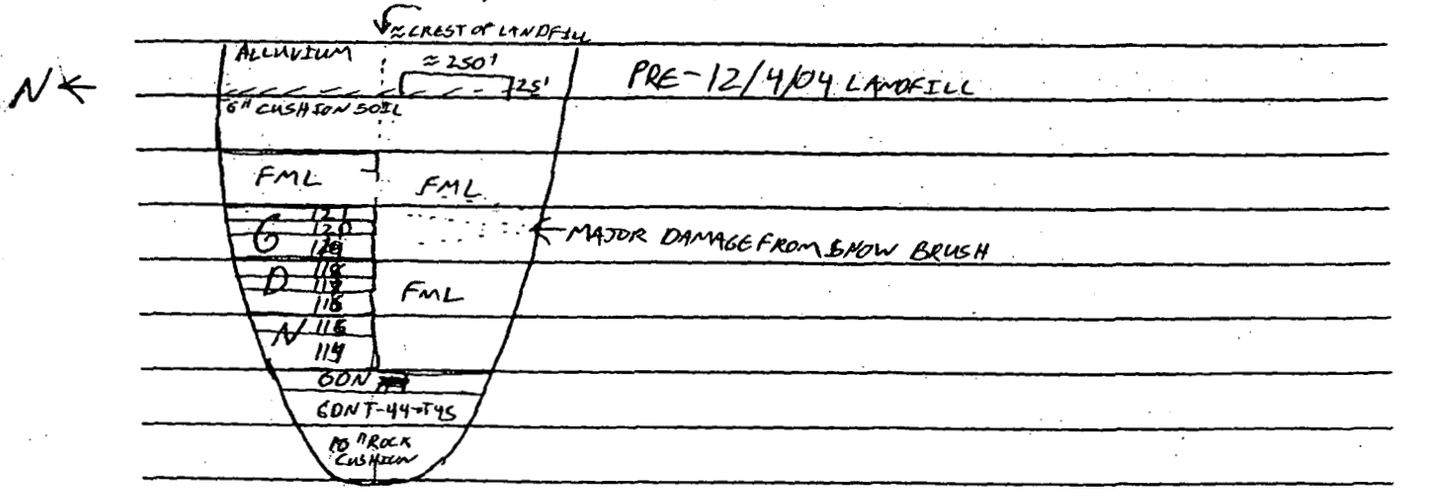
QUALITY ASSURANCE OBSERVATION REPORT NO. 76

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 12-4-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 35.9° at 0700 a.m. Temp. 36.0° at 1650 p.m.	
Observation Period: 0630 - 1650	

EQUIPMENT: (1) CAT 825G PAD-FOOT COMPACTOR, (2) CAT 14G GRADERS, (1) CAT 950B FRONT-END LOADER, (1) CAT 966F FRONT-END LOADER, (3) CAT 633D SCRAPERS, (2) CAT D6R LGP DOZER, (1) CAT CS-583C VIBRATING SMOOTH DRUM COMPACTOR, (1) WATER TRUCK, (1) CAT RUBBER TIRE BACKHOE, (3) BOBCAT T300, (2) CAT FORKLIFT, (1) CAT 325L BACKHOE



BOBCATS W/ SNOW BRUSHES ARE REMOVING SNOW FROM GDN & FML. FROM PREVIOUS DAY OF SNOW REMOVAL, FML PANELS P-38, P-39, & P-40 HAD DAMAGE FROM SKID PLATE ON BOBCAT SNOW BRUSH. ≈ EVERY 2FT ALONG LENGTH OF PANELS HAD A DIVIT OR SMALL HOLE FROM SKID PLATE. ≈ 150 DIVITS → ≈ 30-40 HOLES

12-4-04

WILL HAVE TO BE BEADED OR PATCHED,

ALLUVIUM, JUSTEAST OF 6" CUSHION LAYER, IS FROZEN IN MORNING, ≈ 10 INCHES OF OLD ALLUVIUM WAS REMOVED TO REMOVE FROST. DURING REMOVAL OF ALLUVIUM, SOME OLD PLASTIC GEO MESH WAS & PLASTIC TRASH WAS UNEARTHED @ ≈ 10", I TOLD NIELSON-SANKSA TO ONLY REMOVE ≈ 6" OF ALLUVIUM TO AID W/ THE REMOVAL OF FROZEN ALLUVIUM. IT WAS DECIDED THAT NEW ALLUVIUM WOULD BE PLACED @ 1pm TO ALLOW SOIL TO FURTHER THAW. AT 0755, THE ALLUVIUM BACKFILL THAT WAS BROUGHT IN WAS 31°F. NEW BACKFILL MUST BE PLACED, COMPACTED, & PROOF ROLLED BEFORE THE END OF THE DAY TO PREVENT FURTHER FREEZING & SOFTSPOTS FROM MOISTURE.

THE 10" ROCKCUSHION SOIL WAS BEING PLACED JUSTWEST OF FROM THE GDN PANELS T-44 & T-45 & MOVING TO THE EAST. AT 0935, THE CUSHION TEMP WAS 39°F & DID NOT HAVE ANY FROZEN CHUNKS.

ALLUVIUM (25' x 250') WAS SURVEYED, REGRADED, & PROOFROLLED. ALL AREAS WERE WITHIN SPEC. RANGES.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

SCRAPES/PUNCTURES ON FML PANELS P-38, P-39, & P-40 ALONG W/ SELECT BEADS TO WEST. REPAIRED BY ENDOGAS 12PM

CHECK GDN FOR HOLES/TEARS FROM SNOW REMOVAL PROCESS W/ BOBCAT BRUSHES & EDGES OF LANDFILL LINER HAVE BEEN TORN (GDN) BY REMOVAL OF SNOW BY TRACKHOE

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

Copies to: John Rahe

Observer: ~~Josh Valentine~~ / MARSHALL MASSARO

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 77

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 12-5-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 39.8 ° at 0700 a.m. Temp. 45.5 ° at 1440 p.m.	
Observation Period: 0630 - 1440	

EQUIPMENT: (1) CAT 835 6 PAD-FOOT COMPACTOR, (2) CAT 146 GRADERS, (1) CAT 950 B FRONT-END LOADER, (1) CAT 966F FRONT-END LOADER, (3) CAT 633D SCRAPERS, (2) CAT D6R LGP DOZER, (1) CAT CS-583C VIBRATING SMOOTH DRUM COMPACTOR, (2) CAT FORKLIFT, (1) CAT 325L BACKHOE

THE REMAINDER OF THE REGRADE SURFACE NORTH OF THE 25*250' THAT WAS COMPLETED ON SATURDAY WAS REMOVED TO A DEPTH OF ≈8-10" TO REMOVE ANY FROZEN / HIGH MOISTURE ALLUVIUM. SHEEPSFOOT COMPACTOR COMPACTED NEW SURFACE. NEW ALLUVIUM WAS TRUCKED IN & BROUGHT UP TO SET GRADE. BOULDERS GREATER THAN ≈10" WERE REMOVED FROM FILL. AREA WAS PROOF ROLLED AFTER COMPACTION. AREA ≈ 25'*400' TEMP OF ALLUVIUM AFTER SCRAPING: 32°F

GDN TO PANEL T-114 WAS WALKED & MARKED W/ PAINT FOR DEFECTS, ~~BAC~~ MANY HOLES THROUGH ALL 3 LAYERS OF THE GDN WERE FOUND NEAR THE TOE-SLOPES. SECTIONS WOULD BE REPAIRED BY PLACING A FELT LAYER UNDER THE HOLE, ZIPTYING THE TORN MESH TOGETHER, & WELDING AN ENTIRE 3-LAYER GDN OVER THE HOLE W/O ZIPTIES. AGREED UPON BY GOLDER, TETRATECH RMC, & STOLLER.

WEATHER: CLEAR, BREEZY, ≈40°F - 46°F

12-5-04

GDN WAS PLACED SOUTH OF PANELS 114 TO 121 TO APPROX. THE SOUTHERN ANCHOR TRENCH. ALL SEAMS WERE ZIPTIED + SEWN TOGETHER. GDN PLACEMENT TO THE EASTERN MOST SEAM OF THE FML WAS RELEASED.

ALLUVIUM REGRADE SURFACE FROM CREST TO THE NORTH + EAST OF CUSHION (25' x ~400') WAS CLEAR OF SOFT SPOTS.

COLORADO LINING OFF SITE @ 11:00 AM

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

GDN HOLES WERE MARKED + LOGGED. COLORADO LININGS BEGAN REPAIRING GDN.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES: NONE

Copies to: John Rahe

Observer: ~~Josh Valentine~~ MARSHALL MASSARO

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 78

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00 Date 12/6/04	
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 36.7 ° at 0700 a.m. Temp. 40.1 ° at 1655 p.m.	
Observation Period: 0630 - 1655	

EQUIPMENT: (1) CAT 825 6 PAD-FOOT COMPACTOR, (2) CAT 146 GRADERS, (1) CAT 950 B FRONT-END LOADER, (1) CAT 966F FRONT-END LOADER, (3) CAT 633D SCRAPERS, (2) CAT D6R LGP DOZER, (1) CAT CS-583C VIBRATING SMOOTH DRUM COMPACTOR, (2) CAT FORKLIFT, (1) CAT 325L BACKHOE

WEATHER: PARTLY CLOUDY, WINDY, ≈36°F - 50°F

MORNING: COLORADO LINING CAN NOT PLACE ANY MORE LINER ON PLF DUE TO WET 6" CUSHION CONDITIONS. ALL GDN IS FINISHED (EXCLUDING SIDESLOPES) UP TO THIRD TO LAST ~~FINAL~~ FML SEAM. COLO. LINING IS ~~ONLY~~ PATCHING GDN DEFECTS & GDN SEAMS. AFTERNOON: ~~THEY~~ ARE PLACING PANELS T-141 THROUGH T-149 OF GDN, COMPLETING GDN PLACEMENT TO EASTERN ~~FINAL~~ FML.

BLADES HAVE REMOVED ≈ 3" OF THE 6" CUSHION SOIL TO ALLOW DRYING. THE ≈ 3" CUSHION REMAINING IS SLIGHTLY FROZEN. IT WAS DECIDED THAT NO NEW CUSHION WILL BE DEPOSITED FOR 2 HOURS TO ALLOW THAW TIME (≈ CUSHION LAY TIME: 11-11:30 AM) AT 9:15 AM THE EDGES OF THE 10" CUSHION SOIL WAS FROZEN, RECHECKED 10" EDGE @ 11:30 AM AND MATERIAL WAS ~~NOT~~ THAWED.

ALL DEFECTS IN GDN WERE MARKED BY TETRATECH THROUGH T-130 (NEAR 6" ~~CUSHION/FML~~) & SURVEYED & LOGGED BY GOLDER.

12-6-04

THE 3" REMAINING OF CUSHION SOIL WAS TESTED FOR DENSITY BY GOLDER. THE DENSITIES WERE @ SPEC & MOISTURE WAS ≈ 11.5%, THE 3" CUSHION WAS SCARIFIED W/ A SHEEPSFOOT ROLLER TO CREATE A BETTER INTERFACE

GOLDER STATED THAT ≈ 14 DENSITY/MOISTURE TESTS WOULD BE PERFORMED ON 6" CUSHION LAYER, JUST EAST OF FML, TO DETERMINE IF SPECS. WERE BEING MET. DURING TESTS, GOLDER STATED THAT COMPACTION WAS 100% & MOISTURE WAS ARRUND 11.5% ON AVERAGE.

LINER & NIELSON CREWS WERE WORKING LATER THAN NORMAL TO PREPARE A 50' WIDE AREA ON THE 6" CUSHION TO PROVIDE SUFFICIENT AREA FOR ~~CUSH~~ LAYING LINER THE FOLLOWING DAY. NIELSON CREWS WERE TRENCHING AIR VENTS & ANCHOR TRENCHES IN PREP FOR TUESDAY

ALL LINER MATERIAL & CUSHION MATERIAL WAS PLACED ~~WITHIN THE~~ ACCORDING TO SPECS.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

CHECK GON FOR ROWS CONTAINING T109, T102, T-95, T-97 FOR DEFECTS SINCE SNOW IS CURRENTLY COVERING MUCH OF THE ROWS.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

ALL MARKED DEFECTS IN GON WERE SURVEYED AND REPAIRED, ~~ON~~

Copies to: John Rahe

Observer: ~~Josh Valentine~~ MARSHALL MASSARO

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 79

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00 Date 12/7/04	
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: PARTLY CLOUDY, BREEZY, WINDY, 38°F-52°F Temp. 38.3 ° at 0700 a.m. Temp. 44.3 ° at 1645 p.m:	
Observation Period: 0630 - 1645	

EQUIPMENT: (1) CAT 825 G PAD-FOOT COMPACTOR, (2) CAT 146 GRADERS, (1) CAT 950 B FRONT-END LOADER, (1) CAT 966F FRONT-END LOADER, (3) CAT 633D SCRAPERS, (2) CAT D6R LGP DOZER, (1) CAT CS-583C VIBRATING SMOOTH DRUM COMPACTOR, (2) CAT FORKLIFT, (1) CAT 325L BACKHOE

NIELSON/SANKSKA CREW WORKED LATE THE PREVIOUS NIGHT TO PREPARE ~~X~~ 400 FEET OF ANCHOR TRENCH & AIR VENT TRENCH FOR TODAY. TETRA TECH INSPECTED THE TRENCHES FOR DIMENSIONS (2'x2' FOR ANCHORS) & REMOVED ANY DEBRIS (ROCKS, SOIL CLUMPS, ICE) FROM THE TRENCH BOTTOMS. EDGES OF ANCHOR TRENCHES WERE SMOOTHED & ROUNDED FOR LINER. 6" CUSHION SOIL WAS TESTED BY GOLDER FOR MOISTURE & COMPACTION & WERE WITHIN SPECS. UP TO STATION 20100 E. SURVEY OF ELEVATION/GRADE WAS PERFORMED BY PARAGON & ~~WAS WITHIN THE~~ ELEVATIONS WERE WITHIN ACCEPTABLE RANGES UP TO STATION 20100 E. THE 6" CUSHION SOIL UP TO STATION 20100E WAS INSPECTED FOR OBSTRUCTIONS & DROPS OVER ½" TO MEET GCL SPECS.

COLORADO LINING LAID ~~THREE~~ FULL ROWS OF GCL (S-165 TO S-192) AND TWO FULL ROWS OF FML (P-51 & P-52) TO APPROXIMATELY ?

12-7-04

STATION 2008S E, ALL SEAMS ON GCL WERE OVERLAPPED & BENTONITE POWDER WAS ADDED WHERE REQUIRED. THE ~~NORTH~~ SOUTH ½ OF GCL AT APPROXIMATELY 2008 E WAS SLIGHTLY MOISTENED BY THE SNOW MELT. A 3 FOOT WIDE PIECE OF GCL WAS OVERLAPPED (1FT ON OLD GCL & 1FT ON 6" CUSHION) & BENTONITED AT SEAMS IN ADDITION TO THE STANDARD OVERLAP. ALL SEAMS OF THE FML WERE HEATWELDED & PRESSURE TESTED, ALL DEFECTS ON BOTH THE GCL & FML WERE SURVEYED IN BY PARAGON.

~~ROCK~~ REGRADE SOIL WAS ALLOWED TO DRY DURING MORNING HOURS, THEN PROOFROLLED W/ TWO PASSES OF A LOADED SCRAPER, AREA PROOF ROLLED OPENED UP ALLUVIUM TO ≈100FT EAST OF EXISTING 6" CUSHION. NO SOFT SPOTS WERE DETECTED DURING PROOFROLLING.

10" CUSHION SOIL WAS LAID DOWN ON GON UP TO THE SECOND SET OF AIR VENTS, EAST OF THE WEST EDGE. ALL CUSHION SOIL APPEARED TO BE WITHIN PROJECT SPECS.

NIELSON CREW IS WORKING LATE TO OPEN MORE AIR VENT/ANCHOR TRENCH FOR LINING CREW.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

NONE

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

CHECK ANCHOR TRENCHES FOR ICE & SOIL/ROCK DEBRIS FROM TRENCHING ACTIONS.

Copies to: John Rahe

Observer: ~~Josh Valentine~~ MARSHALL MASSARO

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 80

TETRA TECH RMC

TO:

Project No. 19-4886.001.00	Date 12-8-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 40 ° at 7:00 a.m. Temp. 50 ° at 2:30 p.m.	
Observation Period: 6:15am - 5:30pm	

EQUIPMENT: (1)Cat 825G, (1)Cat CS-583C, (2)Cat 14G, (3)Cat 633D, (2)Cat D6LGP, (1)Cat 950B (1)Cat 966F, (1)Cat 325L, (2) Cat Backhoe, (2) Cat Forklift, (2) Volvo A35C, (3) Volvo A30C (1) Watertruck, (3) Bobcat T300

The contractor continued to work on the regrade surface on the east side of the cap. The final proof roll was done to within 120' of the 5980 line, and all of it passed. The contractor also continued to place and finish grade the 6" cushion soil. QC & QA took moisture/density tests on the completed section of 6", and all passed.

S-193 to S-222

The liner crew placed GCL with 6" overlapp on the edge seams and 24" overlapp & granular bentonite on the butt seams. The crew placed 2 runs of FML P54-P59 until the wind was too high to place any more materials. The FML was air tested, and all passed, but no patching was done.

12-8-04

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Patches on FML (pannels P54-P59

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 81

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 12-9-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 40 ° at 7:00 a.m. Temp. 45 ° at 2:30 p.m.	
Observation Period: 7:30am – 5:00pm	

EQUIPMENT: (1)Cat 825G, (1)Cat CS-583C, (2)Cat 14G, (3)Cat 1633D, (2)Cat D6LGP, (1)Cat 950B (1)Cat 966F, (1)Cat 325L (2)Cat backhoe, (2)Cat Forklift, (1)water truck, (2) Volvo A35E, (3)Volvo A30C, (3)Bobcat T300

The contractor continued to cut/fill the regrade surface to final grade. The R.F. Alluvium is being placed in 1'- lifts and compacted with a min. of 4 passes with the 825 cat to the East/West line (5980). The contractor also continued to place a" cushion soil towards the East.

panels 5225 - 5246

The liner crew placed GCL overlapping the edge seams 6" and the bot seams 24" with granular bentonite. (panels P-61 to P-66)
The crew placed 3 runs of FML to cover all the GCL & sand bagged the edges to protect it from the wind. All seams were wedge welded and air tested, and all passed. The patches and repairs were started but not all have been completed or vaccum tested. The wedge and extrusion welders were tested in the morning and

12-9-04

after trench for peel and shear strength, and all passed

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Repairs on FML

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 82

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 12-10-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 40 ° at 7:00 a.m. Temp. — ° at — p.m.	
Observation Period: 6:15am - 10:15am	

EQUIPMENT: (1) Cat 825G, (1) Cat CS-583C, (2) Cat 14G, (3) Cat 330, (2) Cat D6L & P, (1) Cat 950B (1) Cat 966F, (1) Cat 325L, (2) Cat Backhoe, (2) Cat Forklift, (1) water truck, (2) Volvo A35C (3) Volvo A30D, (3) Bobcat T300

The Contractor did some final grading on the north drainage channel, and on the roads. The site was shut down due to high winds.

12-10-04

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Patche and repair FML.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 83

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00 Date 12-11-04	
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 60 ° at 7:00 a.m. Temp. 65 ° at 2:30 p.m.	
Observation Period: 6:30am 5:00pm	

EQUIPMENT: (1)Cat 825G, (1)Cat CS-583, (2)Cat IAG, (3)Cat 4330, (2)Cat D6LGP, (1)Cat 950B (1)Cat 966F, (1)Cat 325L, (2) Cat Backhoe, (2) Cat Forklift, (1) watertruck (2)Volvo A35C (3)Volvo A300, (3)Bobcat T300

The contractor continued to place R.F. Alluvium on the southeast corner of the 5980 line. The material was being placed in 1' lifts and compacted with a min of four passes with the 825. The Contractor also placed some 6" Cushion material 60' west of the Northeast corner of the 5980 line. The cushion material was being placed in thin lifts, and rough graded, being moisture conditioned as needed. No compaction was done today. Some grading was done on the 10" cushion layer, but none has been completed.

The liner crew placed GCL pannels S229 to S258, all pannels were overlapped 6" on edge seams and 2' on all butt seams with granular bentonite. They also placed FML pannels P67 + P68 and wedge welded them.

12-11-04

The weld seams were tested (fusion & extrusion) in the morning prior to welding on the cap, both passed. The crew did some pressure tests and did some patching, but none was completed. The crew shut down @ lunch for liner due to high winds.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Patching & vaccum testing FML.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 84

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 12-12-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 33 ° at 7:00 a.m. Temp. 36 ° at 3:00 p.m.	
Observation Period: 7:00am – 5:15pm	

EQUIPMENT: (1)Cat 825G, (2)Cat CS-583C, (2)Cat 14G, (3)Cat 330D, (1)Cat 950B, (1)Cat 966F, (2)Cat D6LGP, (1)Cat 325L, (2)Cat Backhoe, (2)Cat Forklift, (1) water truck (2)Volvo A35C, (3)Volvo A30D, (3)Bobcat T300

The liner crew placed GCL pannels S259 to S-278. The edge seam was overlapped 6" and all butt seams 24" with granular bentonite. The crew also placed FML pannels P69 to P72. The edges were overlapped 6" and wedge welded. The crew also did repairs on the FML out to pannel P-57, all repairs were vaccum tested, and all passed. The Fusion and extrusion welds were tested at the beginning of the day, and after lunch, all passed before welding was done on the cap. The contractor also placed GDN pannels T150 to T 174. The edges were overlapped 6" and tied every 5', and butt seams were tied ever 1'. The GDN was being deployed using the mule to pull it accross the cap.

12-12-04

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Repairs on FML P57 to P72.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

Repair and vaccum Test FML to P57, all passed.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 85

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 12-13-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: PARTLY CLOUDY, BREEZY, ~26°F - 58°F NO PRECIP.	
Temp. 26.8 ° at 0700 a.m.	
Temp. 43.4 ° at 1630 p.m.	
Observation Period: 6:30AM - 4:30PM	

EQUIPMENT: (1) CAT 825 G, (1) CAT CS-583C, (2) CAT 146, (3) CAT 6330, (2) CAT D6LGP, (1) CAT 950B, (1) CAT 966F, (1) CAT 325L, (2) CAT BACKHOE, (2) CAT FORKLIFT, (1) WATER TRUCK, (2) VOLVO A35C, (3) VOLVO A30C, (3) BUILT T300

COLORADO LINING CREW IS NOT WORKING TODAY AS A RESULT OF THE PROGRESS THE PREVIOUS WEEKEND. LINING IS UP TO ALL TRENCHING ACTIVITIES.

PROGRESS DURING THE MORNING WAS THE FOLLOWING: 10" CUSHION PLACED UP TO GDN PANELS T-75/82, BUCKETS UP THROUGH GDN T-143, GDN PLACED IN FULL LENGTHS TO T-152 ROW, GDN PLACED TO T-173 IN PARTIAL LENGTHS (≈150 FEET MISSING FROM SOUTH END OF 7 PANELS), FML UP TO P-73/74 (≈20280E), 6" CUSHION TO 20400E (NOT ALL TO GRADE), + REGRADE TO 20550E.

POTHOLES WERE DUG WITH A TRACKHOE BELOW HIGH WATER LINE ON POND EAST OF PLF. THIS WAS PERFORMED TO DETERMINE HOW THICK SEDIMENTS WERE AROUND DIFFERENT AREAS OF THE POND. APPROXIMATELY 4" OF SEDIMENT WAS FOUND NEAR THE HIGH WATER LINE + APPROXIMATELY 1 FOOT NEAR THE BASE. WATER WILL BE PUMPED TO SEPERATE POND & SEDIMENT WILL BE MIXED W/ KILN DUST & PLACED ON LANDFILL'S EASTERN FLANKS TO BE COVERED BY LINER + CUSHION.

12-13-04

ALL AIR VENTS & ANCHOR TRENCHES WERE COMPLETED TO STATION 20350E TO MEET SPECIFICATION.
ANCHOR TRENCHES NEED TO ~~BE~~ CHECKED FOR SHARP EDGES & DEBRIS PRIOR TO LAYING LINER.

HOLD POINT RELEASE FORM WAS SIGNED FOR STATIONS 20500E & 20550E FOR REGRADE.

~~NO WORK~~ MAM 12/13/04

WORK PERFORMED BY 1630 ON 12/13/04: 60" CUSHION = NO ADVANCEMENT, FML/GCL/GDN = NO ADVANCEMENT, ANCHOR TRENCHES/AIR VENTS = TO STATION 20350E, 6" CUSHION TO STATION 20450E (NOT ALL TO GRADE), ALLUVIUM/REGRADE IS COMPLETE TO STATION 20550E. ALL WORK WAS COMPLETED TO SPECIFICATIONS UNDER THE OBSERVANCE OF TETRATECH RMC (QA) & GOLDER (QC).

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK: PRESSURE TEST CUTS, ~~BEADS~~, & PATCHES ON FML NEED TO BE FIXED/PATCHED ASAP TO PREVENT WATER FROM CONTACTING GCL.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

~~CHECK ON~~ MAM

NONE

Copies to: John Rahe

Observer: ~~Josh Valentine~~ MARSHALL MASS. ARO

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 86

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 12-14-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 33 ° at 7:00 a.m. Temp. 49 ° at 3:00 p.m.	
Observation Period: 6:30am – 5:15pm	

EQUIPMENT: (1) Cat 825G, (2) Cat CS-583C, (2) Cat 14G, (3) Cat 330D, (2) Cat 10e LGP, (1) Cat 950B (1) Cat 966F (1) Cat 325L, (2) Cat Backhoe, (2) Cat Forklift, (1) watertruck, (2) Volvo A35C (3) Volvo A30D, (3) Bobcat T300

The contractor continued to place 6" cushion material towards the 5980 line. The material is being placed at existing moisture, graded then compacted using the CS-583C. The contractor also stockpiled RF Alluvium at the top of the east face.

The pond sediment removal was started today. The contractor used a dozer and a backhoe to wind row the sediment on the north side of the pond. No material was hauled up to the cap.

The liner crew placed GCL panels S279 to S298. The edge seams were overlapped 6" and the butt seams 24" with granular bentonite. FML panels P75 to P79 were also placed and fusion welded. Repairs,

12-14-04

pressure, and vaccum testing were continued on the FML. GDN panels T 175 to T 186 were placed and overlapped 6" on edge seams and tied every 5', and overlapped 24" on butt seams and tied every 12". The edge seam were all sewn, and capping the butt seams was started

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Repairs on FML placed today.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES: NONE

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 87

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 12-15-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 33 ° at 7:00 a.m. Temp. 43 ° at 4:00 p.m.	
Observation Period: 6:30am – 5:00pm	

EQUIPMENT: (1) Cat 825G, (1) Cat CS-583C, (2) Cat 14G, (3) Cat 633D, (2) Cat 826G GP, (1) Cat 950B (1) Cat 966F, (1) Cat 325L, (2) Cat Backhoe, (2) Cat Forklift, (2) Volvo A35C, (3) Volvo A30D, (1) water truck, (3) Bobcat T300

The contractor is continuing to place 6" Cushion material towards the 5980 line. The material is being hauled from Centennial and placed at existing moisture. Some rough grading is being done, but no compacting or final grading is being done on the 6" Cushion. The contractor is also starting to finish grade the west end of the 10" cushion, but none is ready for testing @ this time. The contractor is starting to haul the pond sediment to the east end of the 5980 line. The sediment is being stockpiled for further processing and drying at a later date. The contractor continued to place the gas vent system to the east. The perforated pipe is being placed in a 1x1' min. trench w/ a min of 4" of drainage rock cover. The top of the trench is being covered with 8oz nonwoven geotextile.

12-15-04

QA/QC tested 6" cushion and it was released w/ record survey to line 20450.

The liner crew placed pannels S-299 to S323 of GCL. The pannels were overlapped 6" on all edge seams & 24" on all butt seams w/ granular bentonite. The crew also placed pannels P80 to P86 of FML. the FML was overlapped 6" and wedge welded. Test welds were done in the morning and after lunch for fusion and extrusion welders, and both passed. Patching, pressure and vaccum testing was continued on the FML, and all tests passed today

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Patching & Vaccum/pressure testing of FML.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

Vaccum/pressure testing to pannel P72

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 88

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 12-16-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 27 ° at 6:30 a.m. Temp. — ° at — p.m.	
Observation Period: 6:30am – 5:15 pm	

EQUIPMENT: (1) Cat 825G, (2) Cat CS-583C, (2) Cat 14G, (3) Cat 633D, (2) Cat D6LGP, (1) Cat 950B (1) Cat 966F, (2) Cat 325L, (2) Cat backhoe, (2) Cat Forklift, (2) Volvo A35C, (3) Volvo A30D (1) water truck, (3) Bobcat T300

The contractor started to place the new cushion soil from La Farge. The material was being placed towards the 5980 line for the 6". The material came in very wet for the first few loads and was removed, the remaining loads were at an acceptable moisture. The area had been cleared of snow prior to placement of the 6" cushion.

The liner crew spent most of the day clearing snow off the FML and the released cushion material using the broom on the Bobcat. There were a couple of areas on the 6" that were saturated and had to be removed and replaced with new cushion material. The area was retested for moisture/density again, and all passed before it was released for liner. The crew also placed GDN panels T 187 to T 205, and overlapped edges 6" and tied every 5'

12-16-04

and overlapped butt seams 24" and tied every 12". The seams were also sewn, but only some have been capped.

The contractor also continued to remove pond sediment and haul it to the section just east of the 5980 line for further processing.

The weekly meeting was held and DOE, EPA, CDPHE, & John Rahe were on site. A tour was done after the meeting and the pond sediment was discussed, the problems will be resolved with a submittal from Bob Davis.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Patching/testing (vaccum & pressure) on FML.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 89

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 12-17-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 33 ° at 7:00 a.m. Temp. 50 ° at 3:00 p.m.	
Observation Period: 7:00am – 5:15	

EQUIPMENT: (1) Cat 825G, (2) Cat CS-583C, (3) Cat 633D, (2) Cat D6LGP, (2) Cat 325L, (2) Cat 950B (1) Cat 966F, (2) Cat Backhoe, (2) Cat Forklift, (2) Cat 14G, (2) Volvo A35C, (3) Volvo A30D (1) watertruck, (3) Bobcat T300

The contractor is continuing to place 6" and 10" cushion material from Lafarge. The 6" material is being placed at existing moisture, graded, compacted then tested before release. The 10" material is being placed using the front end loaders to help reduce wrinkles.

The liner crew placed GCL pannels S324 to S344 overlapping the edge seams 6" and the butt seams 24" with granular bentonite. The also placed FML pannels P88 to P91, and GDN pannels T206 to T215. The GDN was overlapped 6" on all edge seams & tied every 5', and 24" on butt seams and tied every 12", then sewn, and capped on the butt seams.

The contractor also continued to haul pond sediment

12-17-04

to the area just east of the 5980 line for processing at a later date.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Repairs and pressure/vaccum testing on FML.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

Repairs and pressure/vaccum testing on Prevous FML.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 90

TETRA TECH RMC

TO:

Project No. 19-4886.001.00	Date 12-16-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 31 ° at 7:00 a.m. Temp. 48 ° at 3:00 p.m.	
Observation Period: 7:00am – 3:30pm	

EQUIPMENT: (1) Cat 825G, (2) Cat CS-583C, (2) Cat 633D, (2) Cat 14G, (2) Cat 966GP, (2) Cat 325L (1) Cat 950B, (1) Cat 966F, (2) Cat Backhoe, (2) Cat Forklift, (2) Volvo A35C, (3) Volvo A30D (1) Water truck, (3) Bobcat T300

The contractor continued to place 10" cushion material from LaFarge. The material was placed at existing moisture using the front end loaders to help ~~eliminate~~ control JRV wrinkles in the FML. They also continued placing the gas vent system up to the 5980 line. The trench was excavated 12" deep and 12+" wide with ~~a min of~~ JRV 4" of cover over the perforated pipe and covered with a nonwoven geosynthetic to help protect the GCL. The anchor trench was backfilled on the south side with cushion material. The material was placed at existing moisture in 1'- lifts and compacted with a hand tamper. The contractor also continued to haul and stock pile pond sediment east of the 5980 line for processing at a later date.

12-18-04

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Patch and pressure/Vaccum testing of FML.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 91

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 12-19-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 32 ° at 7:00 a.m. Temp. 50 ° at 3:00 p.m.	
Observation Period: 6:15am – 3:45	

EQUIPMENT: (1) Cat 825G, (2) Cat CS-563C, (2) Cat 14G, (2) Cat D6LGP, (3) Cat 6330 (2) Cat 325L, (1) Cat 950B, (1) Cat 966F, (2) Cat Backhoe, (2) Cat Forklift, (2) Volvo A35C (3) Volvo A30D, (1) water truck, (3) Bobcat T300

GCL

The liner crew placed ~~GCL~~ new panels 5344 to 5377, overlapping the edge seams 6" and the butt seams 24" with granular bentonite. They crew also placed FML panels P91 to P99 and wedge welded all the seams. No testing or repairs were done today due to high winds.

12-19-04

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Patch, pressure/vaccum test FAIL.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 92

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00 Date 12/20/04	
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: CLEAR, EXTREMELY WINDY, ~~45~~ 50°F Temp. 48.8° at 0700 a.m. Temp. 52.2° at 1100 p.m. AM	
Observation Period: 0630 - 1100	

EQUIPMENT: (1) CAT 825 G, (2) CAT CS-583C, (3) CAT 633D, (2) CAT D6LGP, (2) CAT 325L, (1) CAT 950B, (1) CAT 966F, (2) CAT BACKHOE, (2) CAT FORKLIFT, (2) CAT 140, (2) VOLVO A35C, (3) VOLVO A300, (1) WATER TRUCK, (3) BOBCAT T300

DUE TO EXTREMELY HIGH WINDS (GUSTS UP TO 65 MPH) THE PLF WORK WAS SHUT DOWN FOR THE DAY FOR NIELSON CREW.

I PERFORMED A PLF CHECK TO MAKE SURE ALL LINER WAS SECURE. THE GDN ON THE EASTERN EDGE WAS ABOVE THE SANDBAGS USED TO HOLD IT DOWN FOR ≈150FT N-S. DUE TO THE DIRECTION OF WIND & DOWNWARD SLOPE OF THE CUSHION SOIL, NO ACTION WAS TAKEN.

THE COLORADO LINING CREW DID NOT PERFORM WORK IN THE MORNING DUE TO WINDS. CREW DECIDED TO WAIT AWHILE TO SEE IF DEPLOYMENT OF FML WOULD BE POSSIBLE LATER IN THE DAY. ACCORDING TO KAISER-HILL, @ ≈ 10:30 AM, NO FURTHER WORK WOULD BE PERFORMED ON PLF BY ANY CONTRACTOR DUE TO WINDS.

12-20-04

PERFORMED DESTRUCTIVE TESTING ON 3 PIECES OF FML, PANEL P-81/P-78, P-75/P-78, & P-74/P-76 ALL PASSED THE SPECIFICATION OF 75 ~~40~~ LBS FOR PEEL & 90 LBS FOR SHEAR. OBSERVED BY QA.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

REPAIRS ON FML

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

RE MAR 12/[redacted]/04 NONE

Copies to: John Rahe

Observer: ~~Josh Valentine~~ MARSHALL MASSARO

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 93

TETRA TECH RMC

TO: _____

_____

_____

Project No. 19-4886.001.00	Date 12/21/04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: PARTLY CLOUDY, BREEZY, ~30°F-40°F Temp. 31.5 ° at 0700 a.m. Temp. 43.0 ° at 1655 p.m.	
Observation Period: 0630 - 1655	

EQUIPMENT: (1) CAT 825G, (2) CAT 14G, (1) CAT 950B, (1) CAT 966F, (3) CAT 633D, (2) CAT D6R LGP, (1) CAT CS-583C, (1) WATER TRUCK, (1) CAT RUBBER TIRE BACKHOE, (3) BOBCAT T300, (2) CAT FORK LIFT, (1) CAT 325L BACKHOE

PRIOR TO WORK, 10" CUSHION WAS UP TO GDN ROW T-121, GDN WAS UP TO PANNEL T-203 ROW, & FML WAS UP TO P-99 ROW. BY THE END OF THE DAY, COLORADO LININGS LAID GCL (S-378 TO S-396) & FML (P-100 TO P-104) UP TO STATION 20550E. THIS WAS 3 ROWS OF GCL & 2 ROWS OF FML, GCL WAS INSTALLED TO SPEC. & FML WAS WELDED & INSPECTED FOR DEFECTS/HOLES.

DURING THE EARLY AFTERNOON, REGULATORS, QA, QC, & ENGINEERS MET AT THE SITE OF A 10" CUSHION SOIL TEST PAD TO TEST THE EFFECT OF THE 2' ROCK LAYER ON CUSHION. A 2' LAYER OF ROCK (10"-MAJORITY w/ SOME 2' BOULDERS) WAS COMPACTED USING ~~VIGOROUS~~ MOVEMENT OF A D6 DOZER. ROCK WAS REMOVED FROM CUSHION SURFACE TO SHOW IMPACT OF COMPACTION. NO ROCK WAS PUSHED MORE THAN 1" INTO CUSHION. TO SEE HOW A DROP IMPACT OF ROCK WOULD EFFECT CUSHION, A 10" ROCK WAS DROPPED ~10FT ONTO CUSHION. THE IMPACT RESULTED IN A 1½" CRATER. BOTH TESTS WERE DEEMED ACCEPTABLE TO ALLOW MACHINERY TO WORK ROCK LAYER ON 10" CUSHION.

12-21-04

THE VERY HIGH WINDS OF 12/20/04 PULLED THE GCN EASTWARD BEYOND THE 12/20/04 50" CUSHION. ALL THE 5' INCREMENT ZIP-TIES WERE RIPPED FROM THE GCN MESH DUE TO MESH FAILURE. THE WIND PUSHED THE GCN EASTWARD PULLING APART THE MESH, LEAVING A 2-6" GAP BETWEEN EACH PANNEL OF GCN. THE SEWN NON-WOVEN GEOSYNTHETIC WAS STILL IN TACT BUT WAS STRETCHED TO THE SEWN SEAM. BOB DAVIS INSTRUCTED EVERYBODY TO REPAIR & ZIPTIE THE GCN BACK TO ITS ORIGINAL CONDITION. THIS WORK IS TO BE PERFORMED ON 12/22/04 (WEDNESDAY).

A 6 FOOT SOFT SPOT APPROXIMATELY 1-2" DEEP IS LOCATED ON THE NE ~~AREA~~ OF THE LANDFILL ON THE SEAM OF FML PANNELS P-93/P-95, AREA IS MARKED FOR REPAIR & CHECK

KILN DUST FROM CEMEX IN LYONS WAS BEING MIXED W/ SEDIMENTS IN POND AREA TO SEE HOW EFFECTIVE PROCESS WAS & HOW MIXING WOULD TAKE PLACE AROUND THE POND.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

GCN SEAMS ARE PULLED APART

SOFT SPOT LOCATED ON SEAM OF FML PANNELS P-93/P-95.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

CHECK BEADS ON FML & SEAMS ON GCN.

Copies to: John Rahe

Observer: ~~Josh Valentine~~ MARSHALL MASSARO / JOSH VALENTINE

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 94

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 12-22-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 22 ° at 7:00 a.m. Temp. 21 ° at 3:00 p.m.	
Observation Period: 7:00am - 3:30pm	

EQUIPMENT: (1) Cat 826G, (2) Cat CS-583C (2) Cat 14G, (3) Cat 633D, (2) Cat D6LGP (1) Cat D8, (1) Cat 950B, (1) Cat 966F, (2) Cat 325L (2) Cat Backhoe, (2) Cat Forklift (2) Volvo A35C, (3) Volvo A30D, (1) watertruck, (3) Bobcat T300

The contractor spent the day removing snow from the 10" cushion layer as well as off the GDN with the Bobcat.

The liner crew spent the day cutting the stitching on the GDN, resetting the 6" overlap and tieing the net every 5'. Very little sewing was done due to the cold temp. and problems with the sewing machines.

12-22-04

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

- Patching a pressure/vaccum testing of FML
- Damaged GDN.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

In progress for GDN.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 95

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 12-23-04
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 3 ° at 7:00 a.m. Temp. 18 ° at 1:00 p.m.	
Observation Period: 7:00am - 1:45pm	

EQUIPMENT: (1) Cat 825G, (2) Cat CS-583C, (2) Cat 14G, (3) Cat 633D, (3) Cat D6LGP, (1) Cat D8, (1) Cat 950B, (1) Cat 966F, (2) Cat 325L (2) Cat Backhoe, (2) Cat Forklift, (1) Watertruck (2) Volvo A35C, (3) Volvo A30D, (3) Bobcat T300

The contractor spent the day removing snow from the 10" Cushion layer. No other work was done on site due to very cold temp and snow.

12-23-04

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Repairs on GCL

Repairs & pressure/vaccum testing on FML

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 96

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 1-3-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: CLEAR, BREEZY-CALM, ~20°F-36°F NO PRECIP. Temp. 21.2 ° at 0705 a.m. Temp. 28.3 ° at 0715 p.m.	
Observation Period: 0630 – 1715	

EQUIPMENT: (1) CAT 825G PAD FOOT COMPACTOR, (2) CAT 14G, (1) CAT 950B, (1) CAT 966F, (3) CAT 633D, (2) CAT D6R LGP, (1) CAT CS-583C, (1) WATER TRUCK, (1) CAT RUBBER TIRE BACKHOE, (3) BOBCAT T300, (2) CAT FORKLIFT, (1) CAT 325L

GDN PLACED PRIOR TO 1/3/05 AND EAST OF GDN PANEL T-174 HAD BEEN BLOWN EASTWARD BY WINDS THAT OCCURRED OVER THE HOLIDAY BREAK. DUE TO EXTREMELY COLD TEMPS. ON THURSDAY, 12/23/04, THE SEWING MACHINES WOULDN'T WORK, SO ZIP-TIES WERE ALL THAT HELD THE BLOWN GDN IN PLACE. THE ZIP-TIES BROKE IN THE WIND & CAUSED THE GDN MOVEMENT. MOST OF COLORADO LININGS CREW SPENT THE DAY REALIGNING, ZIPPING, LEISTERING, & PATCHING GDN TO MEET SPEC. PRESSURE TESTING & PATCHING OF THE FML CONTINUED TOWARDS THE EAST. NO MAJOR NONDISCONFORMITIES WERE NOTICED ON THE FML DUE TO WEATHER/WIND.

THE REMAINDER OF THE POND SEDIMENTS WERE BEING REMOVED & MIXED WITH LYONS KILN DUST ON THE EAST END OF PLF STAGING AREA. MIXING OF THE KILN DUST WOULD INITIALLY OCCUR W/ THE TRACKHOE FOLLOWED BY TWO DOZERS. SINCE SEDIMENT/KILN DUST MIX WILL BE MOVED FROM ITS CURRENT POSITION, 1FOOT LIFTS ARE NOT A CONCERN AT THIS

1-3-05

FINAL PLACEMENT.
TIME UNTIL PROOFROLLING OCCURS MIXTURE APPEARS TO BE VERY HETEROGENEOUS DUE TO LACK OF MIXING SO FURTHER MEASURES/EQUIPMENT MAY BE REQUIRED TO SUFFICIENTLY MIX SEDS. B/O DAVIS WILL INSPECT ON TUESDAY MORNING.

ROCK LAYER GRADATION PASSED & WILL BE HAULED IN ON TUESDAY (TOMORROW)

FML DESTRUCT Dp-054 PASSED ALL PEEL & SHEAR TESTING

10" CUSHION WAS PLACED THROUGHOUT THE DAY USING A ROTATION OF SEMI-TRAILERS. ALL CUSHION APPEARED TO BE SUFFICIENT FOR PLACEMENT. 10" CUSHION MOVED EASTWARD TO COVER PORTIONS OF GDN PANEL T-161

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

COMPLETE FML PRESSURE TESTS & COVER HOLES TO PREVENT PRECIP MOVEMENT INTO GCL, COVERED UNTESTED AREAS W/ SAND BAGS TO SLOW ANY WATER MOVEMENT. LEISTER WELD / SEW GDN SEAMS.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

CHECK ALL GDN SEAMS FOR SEWING & OVERLAP ON ENDS. EXTRUSION WELD PRESSURE TEST AREAS.

Copies to: John Rahe

Observer: Josh Valentine / MARSHALL MASSARO

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 97

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 1-4-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 21 ° at 7:00 a.m. Temp. 15 ° at 2:30 p.m.	
Observation Period: 6:30 am – 3:15	

EQUIPMENT: (1) Cat 825G, (2) Cat CS-583C, (2) Cat 14G, (3) Cat 6330, (1) Cat D8, (2) Cat D6 LGP (1) Cat 950B, (2) Cat 966F, (2) Cat 325L, (2) Cat Backhoe, (2) Cat Forklift, (2) Volvo A35C (3) Volvo A30D, (1) water truck, (3) Bobcat T300

The contractor continued to place 10" cushion material on the GDN. The Cat 966F was being used to spread and dump the material off the edge to help control wrinkles in the liner. The contractor also placed and spread a small amount of the 12" rock layer on the S.W. corner of the cap. The material was being spread using a Cat D6 LGP with very little segregation. Stoller also wanted to do a proof roll on the Asbestos area, it was rejected by QA due to frozen soil.

The liner crew placed 20,000± sq/ft of GDN, and spent the rest of the day doing repairs on the old GDN. The edge seams are being overlapped 6", tied every 5' then sewn. The butt seams are being overlapped 24" tied every 1' and capped. The seams that

1-4-05

don't have enough material to get the overlap have another piece spliced in to get the required overlap.

The contractor also finished removing the pond sediment from the main pond up to the PLE. There is still a small amount of sediment at the sump that will be removed @ a later date.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Testing & Patching on FML

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 98

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 1-5-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 4 ° at 7:00 a.m. Temp. 7 ° at 12:00 p.m.	
Observation Period: 7:00am - 12:30pm	

EQUIPMENT: (1) Cat 825G, (2) Cat CS-583C, (2) Cat 14G, (3) Cat 1e33D, (1) Cat D8, (2) Cat D6-LGP (1) Cat 950B, (1) Cat 966F, (2) Cat 325L (2) Cat Forklift (2) Cat Backhoe (2) Volvo A35C (3) Volvo A30D (3) Bobcat T300, (1) water truck

The contractor spent the day removing snow from the 10' Cushion layer, and the FML. The contractor also spread and did some discing of the pond sediment just east of the 5980 line. The material has CKD mixed in, but only with the backhoe. The disc is being used the mix better and help continue the reaction. The backhoe is being used to clean up the pond area now that all the sediment has been removed. No work was done on the liner today due to the cold temps

1-5-04

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Testing & patching on remaining FML

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 99

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 1-6-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 24 ° at 8:00 a.m. Temp. 32 ° at 4:00 p.m.	
Observation Period: 6:30am – 5:00	

EQUIPMENT: (1) Cat 825G, (2) Cat CS-583E, (2) Cat 14G, (3) Cat 1633D, (2) Cat D6-LGP, (1) Cat D8 (1) Cat 950B, (1) Cat 966F, (2) Cat 325L, (2) Cat Backhoe, (2) Cat Forklift (3) Volvo A30D, (2) Volvo A35C, (1) water truck, (3) Bobcat T300

The contractor spent the morning removing the remaining snow from the edge of the GDN and 10" cushion so that more 10" cushion could be placed. After the snow was cleared the contractor continued to place 10" cushion with the front loaders.

The liner crew also continued to remove snow from the FML. Repairs and testing were continued on the FML so that more GDN could be placed. One vacuum test failed on a patch, and was fixed, retested and passed. The contractor continued to place, tie & sew the GDN. The edge seams were overlapped 6" and tied ever 5', and butt seams overlapped 24", tied ever foot, and capped with nonwoven Geosynthetic.

1-6-05

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK: (for cold weather seaming)

- Patchwork/repairs & testing of FML (done before lunch, no 2nd trial weld)
- Sewing seams on GCN

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

- Tested repairs made on FML that was covered by GCN today.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 100

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 1-7-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 21 ° at 7:00 a.m. Temp. 28 ° at 2:00 p.m.	
Observation Period: 6:15am – 5:15 pm	

EQUIPMENT: (1) Cat 825G, (2) Cat CS-583C, (2) Cat 14G, (3) Cat 633D, (2) Cat D6 LGP, (1) Cat D8 (1) Cat 950B, (1) Cat 966F, (2) Cat 325L, (3) Volvo A30D, (2) Volvo A35C, (1) water truck (2) Cat Forklift, (2) Cat Backhoe, (3) Bobcat T300

The contractor continued to place 10" cushion and rock layer material. The cushion material is being placed and rough graded as it is placed with the front end loader. The west end of the cushion is being final graded, record surveyed and tested for moisture and density.

The liner crew continued repairs on the FML doing patching, bead welds and vacuum testing. The extent of the failed destruct (#58) was established and was approximately 600'. The repair is scheduled for 1-8-05. The crew also placed just under 89,000 sq ft of BDN. The edge seams were overlapped 6" (any short were repaired) and tied every 5'. The butt seams were overlapped 24" and tied

every 12" then capped with a non woven geosynthetic leister welded to the GDN. The edge material is being sewn after testing.

The contractor also finished removing pond sediment from the pond. The sediment that was placed on the north end of the 5980 line was mixed and compacted using the 6256, compaction in this area was acceptable for the first lift.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

- Failing seam from destruct #58
- patching / testing of FML

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

Continued patching and testing FML

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 101

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 1-8-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 42 ° at 8:00 a.m. Temp. 50 ° at 2:00 p.m.	
Observation Period: 7:30am - 3:30pm	

EQUIPMENT: (1) Cat 825G, (2) Cat CS-583C, (3) Cat 330, (2) Cat 966G, (1) Cat D8, (1) Cat 950B (1) Cat 966F, (2) Cat 14G, (2) Cat 325L, (2) Cat Forklift, (2) Cat backhoe (3) Volvo A30D, (2) Volvo A35C, (3) Bobcat t300, (1) water truck

The contractor continued to place 10" cushion and rock layer materials. The front loaders were being used to place the 10" to dump over the edge to help control the wrinkles in the liner. The 10" was shutdown for part of the afternoon due to damage to the GDN. The GDN had several repairs on the butt seams, and some sewing of edge seams. The repairs were completed and 10" was continued.

The liner crew placed 2 runs of GDN overlapping the edge seams 6" and tied every 5', and overlapping the butt seams 24" and tied every 1' then capped with a geosynthetics. A panel of GDN was torn out and blown away near the 10" cushion due to the high winds. (panels T303-T310) Some repairs were done on the FML ~~that~~ including the repair of the 600' failed seam.

1-8-05

Repairs were shut down due to high winds.

The contractor also continued to mix and compact the pond sediment in 8" lifts. The sediment placed ~~on~~ JKV has been dry enough to compact.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Repairs/testing of FML.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 102

TETRA TECH RMC

TO:

Project No. 19-4886.001.00	Date 1-9-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 38 ° at 7:00 a.m. Temp. 55 ° at 2:00 p.m.	
Observation Period: 7:00am - 3:30	

EQUIPMENT: (1) Cat 825G, (2) Cat CS-583C, (2) Cat 14G, (3) Cat 633D, (1) Cat D8, (2) Cat D6 GP (1) Cat D6 w disc, (1) Cat 950B, (1) Cat 966F, (2) Cat Forklifts, (2) Cat Backhoe (2) Cat 325L, (2) Volvo A35C, (3) Volvo A30D (1) watertruck, (3) Bobcat T300

The contractor is continuing to place 10" cushion material and rock layer material. The 10" cushion is being placed with the front end loaders to help control wrinkles in the liner. Then it is being rough graded with a grader. The rock layer is being placed using a Dozer.

The liner crew finished pressure testing the FML to the 5980 line, and all passed. Destruct #59 failed so destructs were removed from either side untill they passed peel and shear (200'±). The liner crew spent the day finishing sewing on GDN, and continuing on FML repairs. All FML repairs and testing were completed at the end of the day.
No new GDN was placed due to high winds.

1-9-05

Tetra Tech, Earthtech, Golder & Kaiser Hill performed a proof roll on the asbestos areas. The areas were rolled 2 passes first with an unloaded scraper, then loaded. ~~Two~~ Three soft areas were found, the repairs will be evaluated after grade stakes are placed and the depth of fill is known.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

- Soft areas in Asbestos areas.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

- All remaining repairs & testing on FM L to the 5980 line.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 103

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 1-10-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 28 ° at 7:00 a.m. Temp. 49 ° at 2:00 p.m.	
Observation Period: 6:15 am - 5:20 pm	

EQUIPMENT: (1) Cat 825G, (2) Cat CS-583C, (2) Cat 14G, (3) Cat 1633D, (2) Cat D6LGP, (1) Cat D8 (1) Cat D6 w/disc, (1) Cat 950B, (1) Cat Gdet F, (2) Cat forklift, (2) Cat 325L (2) Cat Backhoe, (2) Volvo A35C, (3) Volvo A30D, (1) water truck, (3) Bobcat T300

The contractor continued to place 10" cushion and rock layer material. The 10" cushion material is being placed with a front loader dumping over the edge to help control wrinkles. The area is graded, record surveyed & tested prior to release. The rock layer material is being dumped and then spread using a D6LGP dozer, no trucks are driving on the rock layer.

QA, QC, & Kaiser Hill reps did a proofroll on the south half of the pond sediment. The proof roll was done with a loaded scraper and 2 complete passes. The soft areas found were marked with paint. The contractor planned to disc these areas to aid in drying and recompact.

The liner crews placed GDN for half the day and then

(spotter/laborer struck w/ forklift, sprained knee)

1-10-05

they were shut down due to an injury. The GCN was overlapped 6" on all the edge seams and tied every 5' and then sewn. The butt seams were overlapped 24", tied every 12" then capped with a nonwoven geosynthetic strip heisted down.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Soft areas on asbestos & pond sediment areas.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 104

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 1-11-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 28 ° at 7:00 a.m. Temp. 36 ° at 2:00 p.m.	
Observation Period: 6:30am – 4:00pm	

EQUIPMENT: (1) Cat 325G, (2) Cat CS-583C, (2) Cat 14G, (3) Cat 623D, (1) Cat D8 (2) Cat D6LGP (1) Cat D6 w/disc, (1) Cat 950B, (1) Cat 916F, (2) Cat 325L, (2) Cat forklift, (2) Cat Backhoe (1) watertruck, (2) Volvo A35C, (3) Volvo A30D (3) Bobcat T300

The contractor continued to place 10" cushion and rock layer materials. The 10" cushion is being placed with a frontloader to help control wrinkles in the liner. The rock layer material is being spread with a D6LGP dozer, and no trucks or other equipment is driving on the layer.

The two soft spots on the asbestos area were covered with a nonwoven geosynthetic and geogrid, but no fill has been placed on them.

The contractor has been regrading and doing more processing and compacting of the pond sediment. The sediment soft spot has been left to dry.

The liner crew finished placing GDN to the 5980 line, to panel T370.

1-11-05

The edge seams were overlapped 6", tied every 5' then sewn or liestered. The butt seams were overlapped a min of 24", tied every 12" then capped with a nonwoven geosynthetic leistered down.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Soft spots on pond sediment and asbestos areas

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 105

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 1-12-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 27 ° at 8:00 a.m. Temp. 32 ° at 3:00 p.m.	
Observation Period: 6:30am – 4:00pm	

EQUIPMENT: (1)Cat 825G, (2)Cat CS-583C, (2) Cat 14G, (3)Cat 6330, (2)Cat D6LGP, (1)Cat D8 (1)Cat D6 w/disc, (1)Cat 950B, (1)Cat 966F, (2)Cat 325L, (2)Cat Backhoe, (2)Cat Forklift (3)Volvo A30D, (2) Volvo A35C, (3)Bobcat T300 (1) watertruck

The contractor spent most of the day clearing snow off the 10" cushion and the exposed GDN. There was a small section of 10" cushion cleared of snow and dry enough for rock, so a few loads of rock were delivered & spread in the afternoon. The rest of the 10" was too wet to work in the afternoon.

1-12-05

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Soft areas on asbestos & pond sediment areas.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 106

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 1-13-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 27 ° at 7:30 a.m. Temp. 37 ° at 3:30 p.m.	
Observation Period: 6:30am – 4:30 pm	

EQUIPMENT: (1) Cat 825G, (2) Cat CS-583C, (2) Cat 14G, (2) Cat D6LGP, (1) Cat D8, (2) Cat 325L (1) Cat 950B, (1) Cat 966F, (3) Cat 633D, (1) Cat D6w/disc, (2) Cat Backhoe (2) Cat Forklift, (2) Volvo A35G, (3) Volvo A30D, (3) Bobcat T300, (1) watertruck

The contractor hauled 10" cushion ~~in the morning~~ all day JRW and spread it to dry prior to placement. A front loader was used to dump the material over the edge to help control wrinkles in the liner. The contractor also continued to haul and place the rock layer material. The material is being spread using a D6 LGP. No other equipment is driving on the rock layer. The rock placement was slow in the afternoon due to very high winds and shutting down some of the haul trucks.
The contractor started to process the pond sediment by moving it around to aid in removing frost and air drying. No CKD could be delivered due to high winds.
The weekly meeting was held, CTR, EPA, CQAE & CDPHE

1-13-05

were on site.
No GCN has been damaged @ this time due to wind.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:
Soft spots on asbestos and pond sediment areas.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:
None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 107

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 1-14-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: PARTLY CLOUDY, BREEZY (-WINDY), ~20°F-40°F, NO PRECIP.	
Temp 23.9 ° at 0710 a.m.	
Temp. 40 ° at 1215 p.m.	
Observation Period: 0630-1215	

EQUIPMENT: (1) CAT 825G, (2) CAT CS-583C, (2) CAT 140, (3) CAT 633D, (1) CAT D8, (2) CAT D6LGP, (1) CAT D6 W/OISC, (1) CAT 950B, (1) CAT 966F, (2) CAT 325L, (2) CAT FORKLIFT, (2) CAT BACKHOE, (1) WATERTRUCK, (2) VOLVO A35C, (3) VOLVO A30D, (3) BOBCAT T300

MOST OF THE POND SEDIMENT, EXCLUDING AN ~12FT PILE, HAS BEEN LAID FLAT ON THE EASTERN EDGE OF LANDFILL. A CAT 825G + D6R ARE TILLING (ROLLING) SEDS. TO TRY + THAW MATERIAL. MOST OF SEDS. ARE FROZEN FOR ~4",

10" CUSHION HAD BEEN PLACED TO GON PANEL T-298 IN MORNING, NEW CUSHION FROM LAFARGE WAS TOO WET TO PLACE & CENTENNIAL CUSHION WAS EXHAUSTED BY 0830, SO NO NEW 10" COULD BE LAID. 966F LOADER WAS USED TO PLACE MATERIAL W/ ASSISTANCE OF BLADE

BULK GRADATION ON 10" ROCK LAYER (WAS) MATERIAL WAS BEING PERFORMED BY GOLDER DURING MORNING HOURS.

SOME OF COLORADO LINING CREW WAS ONSITE TO REMOVE SNOW FROM GON FOR 10" CUSHION PLACEMENT

1-14-05

AT 0900, A END-DUMP SEMI-TRAILER TIPPED OVER ON THE EAST END OF THE LANDFILL WHILE TRYING TO DUMP KILN DUST. NO PERSONNEL ~~WAS~~ WERE HURT, BUT HIGH WINDS CAUSED CONCERN OVER BLOWING KILN DUST. DUST WAS SPRAYED W/ WATER BY FIRE DEPARTMENT TO MINIMIZE BLOWING. A MEETING WAS HELD @ 10:30 TO DISCUSS SITUATION. SITE WAS SHUT DOWN FOR REMAINDER OF DAY (AFTER 0900) DUE TO INCIDENT.

NO WORK WILL BE PERFORMED OVER WEEKEND, JAN. 15-16TH

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

FROZEN POND SEDIMENT/KILN DUST MIXTURE

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

NONE

Copies to: John Rahe

Observer: ~~Josh Valentine~~ MARSHALL MASSARO

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 108

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00 Date 1-17-05	
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: PARTLY CLOUDY, BREEZY-WINDY, ~30°-48°F NO. PRECIP. Temp. 32.6 ° at 0740 a.m. Temp. 36.8 ° at 1640 p.m.	
Observation Period: 0630 – 1640	

EQUIPMENT: (1) CAT 825 G, (2) CAT CS-583C, (2) CAT 14G, (3) CAT 633D, (1) CAT D8J (2) CAT D6LGP, (1) CAT D6 W/DISK, (1) CAT 950B, (1) CAT 966F, (2) CAT 325L, (2) CAT FORKLIFT, (2) CAT BACKHOE, (1) WATER TRUCK, (2) VOLVO A35C, (3) VOLVO A30D, (3) BOBCAT T300

10" CUSHION SOIL IS BEING HAULED IN FROM CENTENNIAL BY VOLVO'S. THE CUSHION MATERIAL WAS INSPECTED BY QA & CONSIDERED ACCEPTABLE BASED ON VISUAL MOISTURE & GRADATION. THE AMBIENT AIR TEMPERATURE WAS ~35-40°F SO FROZEN CUSHION SOIL WAS NOT AN ISSUE, CUSHION "FINGERS" EXTENDED EAST TO GON PANEL T-299 & COMPLETED CUSHION WAS WEST OF T-299 BY 6 PANELS, 10" CUSHION WAS PLACED IN TO POSITION BY 2-966F LOADERS & 1-D6R DOZER.

ALL POND SEDIMENTS ON EASTERN EDGE OF ALF WERE LEVELED ~~PASTED~~ OUT BY THE D8R DOZER & COMPACTED WITH THE 825G SHEEPSFOOT COMPACTOR. SEDIMENTS & KILN MIXTURE APPEARS TO BE DRYING ENOUGH TO ALLOW SUFFICIENT COMPACTION. THE SEDIMENTS WILL BE WORKED ENOUGH TO BE PROOFROLLED W/ SCRAPER AROUND 9AM ON TUESDAY MORNING (1/18/05).

1-17-05

ROCK MATERIAL IS BEING PLACED ON NORTH SIDE OF LANDFILL USING VOLVOS & END-DUMPS FOR HAULING & A D6R FOR PLACEMENT. 10" MINUS ROCK USED IN ROCK LAYER IS BEING HAULED FROM IDAHO SPRINGS TO THE CENTENNIAL PIT WHERE IT IS MIXED W/ FINER MATERIAL TO CREATE THE ROCK LAYER. ROCK IS A GREYISH, QUARTZITE MATERIAL. MATERIAL IS ACCEPTABLE FOR THE ROCK LAYER & IS PLACED ~~AS~~ AN APPROX A 1FT LIFT.

HDPE RISERS ARE BEING INSTALLED BY COLORADO LININGS. TO ACCESS VENT, ALL LINING (GDN, FML, GCL) IS CUT APPROXIMATELY ~~1 METER~~ 1FT AROUND VENT. A 4" HDPE RISER IS INSTALLED WITH A FML COVERING ON THE BOTTOM 2FT. THIS COVERING IS EXTRUSION WELDED ON THE VERTICAL SEAM OF FML & THE TOP WHERE IT GOES FROM FML TO HDPE PIPE. PIECES OF GCL, FML, & GDN ARE PLACED OVER RISER PIPE & ATTACHED / BENTONITED TO CORRESPONDING LAYER. THE FML WAS EXTRUSION WELDED TO VERTICAL FML BOOT. ALL HORIZONTAL FML WELDS WERE VACUUM TESTED. PRIOR TO BACKFILLING RISER AREAS, A METAL BAND WAS PLACED AROUND FML RISER TO ADD ADDITIONAL SUPPORT. 10" CUSHION SOIL AROUND VENTS WILL BE COMPACTED W/ A TAMPER. VENT RISERS ARE COMPLETED & COVERED W/ CUSHION FOR WESTERN ENDS OF NORTH & SOUTH ROWS.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

NONE.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

NONE.

QA NEEDS TO PERFORM DENSITY TEST ON 10" CUSHION ON TUESDAY, JAN. 18.

Copies to: John Rahe

Observer: ~~Josh Valentine~~ MARSHALL MASSARO

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 109

TETRA TECH RMC

TO: _____

_____

_____

Project No. 19-4886.001.00	Date 1-18-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 51 ° at 6:30 a.m. Temp. 57 ° at 1:30 p.m.	
Observation Period: 6:30am - 5:15pm	

EQUIPMENT: (1) Cat 825B, (2) Cat CS-583C, (2) Cat 14G, (3) Cat 633D, (2) Cat D6 LGP, (1) Cat D8, (1) Cat D6 W/ disc, (1) Cat 950B, (1) Cat 966F, (2) Cat 325L, (2) Cat Backhoe (2) Cat Forklift, (1) water truck, (2) Volvo A35C (3) Volvo A30D, (3) Bobcat T300

The Contractor continued to place 10" cushion material on the GCL. The material is being spread to dry as needed then placed using a front loader to help control wrinkles in the liner. Density tests and record survey was done up to the 2000 grid line. They also continued to place the rock layer material using a D6 LGP, no other equipment was driven on the rock layer.

A proof roll was done on the entire pond sediment area, 2 passes with a loaded scraper, including the small section of Rocky Flats Alluvium where the very wet pond sediment had been placed. Three soft spots were found, one large one near the center, and one on the North side and one on the south side. The areas are schuled for repair on 1-19-05.

1-18-05

The liner crew continued to install the HDPE vertical gas vent pipes. The GCL and GDN are patched back, and the boots on the FML are being extrusion welded and vacuum tested. The pipes are then backfilled with cushion material and a hand tamper to keep them in place with the winds.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Soft spots on asbestos areas and pond sediment.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 110

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 1-19-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 54 ° at 8:00 a.m. Temp. 62 ° at 2:30 p.m.	
Observation Period: 5:30 am - 5:15 pm	

EQUIPMENT: (1) Cat 825G, (2) Cat CS-583C, (2) Cat 14G, (3) Cat 633D, (1) Cat D8 (2) Cat D6 LGP, (1) Cat D6 w/disc, (1) Cat 950B, (1) Cat 966F, (2) Cat 325L, (2) Cat Backhoe (2) Cat Forklift (1) watertruck (3) Volvo A30D (2) Volvo A35C, (3) Bobcat T300

The contractor is continuing to place 10" cushion material. Much of the cushion material being delivered is too wet and is being spread to dry before placement. The cushion is being placed using a front loader to help control wrinkles in the liner. The contractor also continued to place rock layer material using a D6 LGP, no other equipment is running on the rock layer.

The liner crews installed another vertical gas vent pipe. The HDPE pipe was ~~not~~ new extrusion welded in place, and vacuum tested around the boot. The GCL and GDN were repaired to spec.

QA & QC did another proof roll on the pond sediment areas after they had been reworked by air drying

1-19-05

, CKD, and re compaction. The center and south soft spots were within spec, but the North one will require more work. Two random potholes were excavated in the pond sediment to look for voids, none were found.

Clear and Grub was started at the northwest corner of the east face. Several of the trees were removed with the root balls, but a few areas will require a little more removal.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Soft spots in asbestos areas and north pond sediment.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

South and Center pond sediment soft spots.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 111

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 1-20-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 53 ° at 7:00 a.m. Temp. 70 ° at 3:00 p.m.	
Observation Period: 6:30am – 5:00pm	

EQUIPMENT: (1) Cat 825G, (2) Cat CS-583C, (2) Cat 146, (3) Cat 6330, (2) Cat D6LGP (1) Cat D8, (1) Cat D6 w/disc, (1) Cat 950B, (1) Cat 966F, (2) Cat 325L, (2) Cat Backhoe, (2) Cat Forklift, (1) water truck (2) Volvo A35C, (3) Volvo A30D, (3) Bobcat T300, (1) Hand Tamper.

The contractor continued to place 10" cushion, rock layer, and Rocky Flats Alluvium. The 10" cushion is being placed using a front end loader to help control wrinkles in the liner. The rock layer is being placed using a D6 LGP, no other vehicles have been driven on the rock layer. No major segregation has been observed in the rock layer. The Rocky Flats Alluvium is being spread as fill east of the 5980 line in less than 1' lifts and compacted with a min. of 4 passes with the 825.

The final soft spot on the pond sediment was inspected and released for placement of R.F. Alluvium.

Clear and Grub was continued on the East face,

but very little was done due to uncovering a bag of asbestos on the north embankment on the east face.

The liner crew continued to install the verticle gas vent pipes. The GCL and GDN are being repaired per spec. The FML boot is being extrusion welded to the pipe as well as the FML panel then vacuum tested. The verticle pipes are backfilled with cushion material and a hand tamper. Many of the gas vent pipes are not plum, so they will need to be straightened.

The weekly meeting was held, DOE, EPA, CDPHE, CTR + CQAE were on site, EPA issued a Stop work on the east Face.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Soft spots on asbestos areas; vent pipes not straight (plum).

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

Final soft spot on pond sediment.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 112

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 1-21-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 51 ° at 7:00 a.m. Temp. 65 ° at 5:00 p.m.	
Observation Period: 6:30 am – 5:00 pm	

EQUIPMENT: (1) Cat 825G, (1) Cat CS-583C, (2) Cat 140, (3) Cat 6330, (1) Cat D8 (2) Cat D6 LGP, (1) Cat D6 w/blade, (1) Cat 950B, (1) Cat 966F, (2) Cat 325L, (2) Cat Backhoe, (2) Cat Forklift, (1) water truck, (2) Volvo A35C, (3) Volvo A30D (3) Bobcat T300

The contractor continued to place 10" cushion and Rock Layer material. The 10" Cushion is being placed with a front end loader to help control wrinkles in the liner. The rock layer is being placed with a D6 LGP, and no other vehicles are allowed. The contractor also hauled and placed the first couple of loads of 22" R.F. Alluvium on the West side. The material is being spread using another D6 LGP.

Fill was also being placed on the cap east of the 5980 line. The R.F. Alluvium is being placed in 12" minus lifts and compacted with a min of 4 passes with the 825.

1-21-05

The EPA, CDPHE, DOE, CTR were on site to observe some ~~potholes~~ test pits on the northwest corner of the pond. The test pits were wet, but stable soils/weathered bedrock was 3'-5' deep from the surface.
The liner crew placed the final gas vents up to the 5980 line. Gas vent pipes are HDPE poly Pipe 4810 SDR11 ~~ASTM~~ P.E. 3408 ASTM D2513 (equivalent to sch. 80 HDPE pipe).

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Soft areas in the asbestos areas.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

~~None~~ Density/Moisture retests on 10" Cushion (Passed)

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 113

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 1-22-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 35 ° at 7:00 a.m. Temp. 43 ° at 2:30 p.m.	
Observation Period: 6:30am - 5:30pm	

EQUIPMENT: (1) Cat 825G, (2) Cat CS-583C, (2) Cat 14G, (3) Cat 633D, (1) Cat D8, (2) Cat D6 LGP, (1) Cat D6 w/disc, (1) Cat 950B, (1) Cat 966F, (2) Cat 325L, (2) Cat Backhoe, (2) Cat Forklift, (1) water truck, (3) Volvo A30D, (2) Volvo A35C, (1) Hand tamper

The contractor is continuing to place 10" Cushion, rock layer and R.F. Alluvium. The 10" Cushion is being placed using a ~~D6 LGP, no other equipment is running on the~~ 14 front end loader to help control the wrinkles in the liner. The rock layer is being placed with a D6 LGP, no other equipment is running on the rock layer. The 22" R.F. Alluvium is being placed with a D6 LGP with no compaction. The R.F. Alluvium fill being placed east of the 5980 line is in less than 12" lifts and compacted with a min of 4 passes with the 825.

1-22-05

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Soft spots in asbestos areas.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 114

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 1-24-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 40 ° at 7:30 a.m. Temp. 60 ° at 3:00 p.m.	
Observation Period: 6:30am - 5:30pm	

EQUIPMENT: (1)Cat 825G, (2)Cat CS-583C, (2)Cat 14G, (2)Cat 14GP, (3)Cat 633D (1)Cat D8, (1)Cat D6 w/disc, (1)Cat 950B, (1)Cat 966F, (2)Cat 325L (2)Cat Backhoe ~~(1)Cat F~~ (1)water truck, (2)Volvo A35C, (3)Volvo A30D, (2)bobcat T300 (1)Hand tamper

The contractor continued to place rock layer material and R.F. Alluvium. The rock layer is being placed with a D6LGP, no other equipment is driving on the rock layer. The 22" R.F. Alluvium is being placed using another D6LGP, and currently no other equipment is driving on the 22" layer. R.F. Alluvium is also being placed as fill east of the 5980 line in 12" minus lifts. The lifts are compacted with a min of 4 passes with the 825.

The EPA, DOE, CDPHE, Fish & Wildlife & CTR were on site to look at the 22" R.F. Alluvium, and observe a test pit on the south side of the east face.

1-24-05

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Soft spots on asbestos areas.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 115

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 1-25-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 36 ° at 7:00 a.m. Temp. 57 ° at 3:00 p.m.	
Observation Period: 7:00am - 4:30pm	

EQUIPMENT: (1)Cat 825G, (2)Cat CS-583C, (2)Cat 14G, (3)Cat 633D, (2)Cat D6LGP (1)Cat 950B, (1) Cat 966F, (1)Cat D6 w/olise, (1)Cat D8, (2)Cat 325L, (2) Cat Backhoe, (2) Volvo A35C, (3) Volvo A30C, (1) watertruck (2) Bobcat T300 (1) Hand tamper

The contractor is continuing to place rock layer and R.F. Alluvium. The rock layer material is being placed using a D6LGP, no other equipment has been driven on the rock layer. The 12" R.F. Alluvium is also being placed with a D6LGP in one lift, any rocks greater then 12" are being removed. R.F. Alluvium is also being placed as fill east of the 5900 line. The material is being placed at existing moisture in 12" minus lifts and compacted with a min of 4 passes with the 825.

1-25-05

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Soft spots on asbestos areas.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 116

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 1-27-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 28 ° at 7:00 a.m. Temp. 44 ° at 3:00 p.m.	
Observation Period: 6:15 am - 5:30 pm	

EQUIPMENT: (1) Cat 825G, (1) Cat CS-583C, (2) Cat 14G, (1) Cat 950B, (1) Cat 966F, (3) Cat 633D (2) Cat 325L, (2) Cat D6LGP, (1) Cat D8, (2) Cat Backhoe, (1) Cat Forklift + (1) Cat D6 (1) Watertruck, (2) Volvo A35C, (3) Volvo A30D, (1) Bobcat T300

The contractor is continuing to place rock layer material and R.F Alluvium. The rock layer is being placed with a D6LGP, no other equipment is operating on the rock layer. The 22" R.F Alluvium is also being placed with a D6LGP to minamize compaction. The Volvos are driving on the 22" layer and dumping near the edge. The areas used as haul roots will be scarified to loosen the material. R.F Alluvium is also being placed as fill east of the 5980 line. The material is being placed in 12" maxs lifts and compacted with a min. of 4 passes with the 825.

Clear & Grub was started on the south side of the east face. The process went very slow due to finding trash and a bag of asbestos.

1-27-05

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Soft spots in asbestos areas.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 117

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 1-28-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 33 ° at 7:00 a.m. Temp. 46 ° at 3:00 p.m.	
Observation Period: 6:30am - 5:15pm	

EQUIPMENT: (1)Cat 825G, (1)Cat CS-583C, (2)Cat 14G, (3)Cat 633D, (1)Cat D8, (2)Cat D6LGP (1)Cat D6, (1)Cat 950B, (1)Cat 966F, (2)Cat 325L, (2)Cat Backhoe, (1)Cat Forklift (1)water truck, (2)Volvo A35C, (3)Volvo A30D, (1)bobcat T300.

The contractor was continuing to place RF Alluvium and rock layer materials. The rock layer is being placed with a D6LGP, no other equipment is running on the rock layer. The 22" R.F. Alluvium layer is being placed with a D6LGP. The haul trucks are driving on top of the 22 layer and dumping @ the edge of the rock layer. The contractor will scarify the entire 22" R.F. Alluvium layer that is being driven on. The R.F. Alluvium that was being placed as fill east of the 5980 line was spread in a 9" loose lift and compacted with a min. of 4 passes with the 825.

The contractor also continued to Clear and Grub the south side of the east face. The cleared material was being hauled to the topsoil stockpile to be replaced @ the end of the project.

1-28-05

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Salt spots on asbestos areas.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 118

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 1-29-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 28 ° at 7:00 a.m. Temp. — ° at — p.m.	
Observation Period: 7:00am - 3:45 pm	

EQUIPMENT: (1)Cat 825G, (1)Cat CS-583C, (2)Cat 14G, (3)Cat 633D, (1)Cat D8, (1)Cat D6, (2)Cat D6LGP, (1)Cat 950B, (1)Cat 966F, (2)Cat 325L, (2)Cat Backhoe, (1)Cat Forklift, (1) water truck, (2)Volvo A35C, (3)Volvo A30D, (1)Bobcat T-300

The contractor is continuing to place rock layer and R.F. Alluvium. The rock layer is being placed using a D6LGP, and no other equipment is operating on the rock layer. The 22" layer of R.F. Alluvium is also being spread using a D6LGP with the haul trucks dumping @ the edge of the rock layer. The areas driven on by the trucks will be scarified at a later date. The R.F. Alluvium placed east of the 5980 line is being spread in a 1' minus lift, and compacted with a min. of 4 passes with the 825.

Clear cut Grub was also continued on the south side of the east face. The stripped material was being hauled to the topsoil pit for placement @ the end of the project.

1-29-05

QA/QC did another proofroll on the next 50' section (to the 20700 grid line) on the regrade surface on top of the pond sediment. The area was rolled with a loaded scraper 2 complete passes. No soft spots were found.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Soft spots in asbestos areas.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

1-31-05

QUALITY ASSURANCE OBSERVATION REPORT NO. 119

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 1-30-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: CLOUDY, CALM-BREEZY, 25°F- Temp. 25.0° at 0715 a.m. ≈6" SNOW ON SITE Temp 37.0° at 1230 p.m.	
Observation Period: 0630 - 1245	

EQUIPMENT: (1) CAT 825G, (2) CAT CS-583C, (2) CAT 140, (3) CAT 6330, (1) CAT D8, (2) CAT D6LGP, (1) CAT D6 W/DISC, (1) CAT 950B, (1) CAT 966F, (2) CAT 325L, (2) CAT FORKLIFT, (2) CAT BACKHOE, (1) WATER TRUCK, (2) VOLVO A35C, (3) VOLVO A30D, (3) BOBCAT T300

THE WORK PERFORMED TODAY BY NIELSON-SKANSKA WAS THE REMOVAL OF SNOW (4-6") FROM THE 10" CUSHION SOIL AND THE SEDIMENT DEPOSIT AREA. SOME SNOW WAS ALSO REMOVED FROM THE 24" ALLUVIUM TO MINIMIZE SNOWMELT & ALLOW EASIER ACCESS FOR EQUIPMENT ON TUESDAY/WEDNESDAY. BLADES WERE THE ONLY HEAVY MACHINERY PERMITTED ON THE 10" TO PLOW SNOW TO MINIMIZE IMPACTS TO THE LINER BELOW. SOME OF THE RUTS CAUSED BY THE TIRES WERE ≈6" DEEP DUE TO HIGH MOISTURE. IN NO PLACE WAS THE LINER EXPOSED, SO DAMAGE IS UNLIKELY. THE 10" CUSHION LAYER WILL HAVE TO BE REGRADED & TESTED FROM THE 5980 LINE TO ≈60 FT WEST. SNOW REMOVAL FROM THE AREA EAST OF THE 5980 LINE USED VOLVOS, FRONT END LOADERS, & BLADES. ALL SNOW ON THE 10" ROCK LAYER WAS LEFT IN PLACE TO MINIMIZE IMPACTS TO THE 10" CUSHION!

1-31-05

EAST TOESLOPE & PASSIVE TREATMENT AREA WAS NOT WORKED ON DUE TO SNOW CONDITIONS.

COLORADO LININGS UNLOADED TWO FLATBED TRAILERS (24 ROLLS EACH) OF GDN LINER ONTO THE AREA NW OF THE PLF. ALL ROLLS WERE INSPECTED BY GOLDER'S LOGGER.

SITE-WIDE WORK STOPPED AROUND 12:30 PM.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

VERY WET SOILS NEED TO DRY OUT; PRIOR TO FUTURE WORK.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

INSPECT 10" CUSHION SOIL FOR MOISTURE PRIOR TO PLACING 10" ROCK LAYER

Copies to: John Rahe

Observer: ~~Josh Valentine~~ MARSHALL MASSARO

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 120

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 2-1-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 16 ° at 7:00 a.m. Temp. 34 ° at 3:00 p.m.	
Observation Period: 7:00am - 4:30pm	

EQUIPMENT: (1)Cat 825G, (1)Cat CS-583C, (2)Cat 14G, (3)Cat 633D, (2)Cat D6 LGP (1)Cat D6, (1)Cat D8, (1)Cat 950B, (1)Cat 966F, (1)Cat Forklift, (2)Cat 325L, (2)Cat Backhoe, (3)Volvo A30D, (2)Volvo A35C, (1)water truck, (1) Bobcat T300, (1) hand tamper

The contractor continued to clear snow from the Cap. Due to snow and mud the only material being placed is the 22" R.F. Alluvium. The snow has been removed in the areas that the 22" is being placed. The material is being placed with 2 D6LGP dozers

Three test pits were excavated near the new seep treatment system to the toe of the 4:1 slope to check the depth to stable soils. The depth to stable soils ranged from 1'-3'.

The damage to the seep capture system is being reviewed for repair or replacement. The seep was diverted to the edge of the pond, as well as

2-1-05

a temporary treatment system. The cause of the damage is not clear but the northeast corner of the original liner is torn.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

- Soft spots in asbestos areas.
- Damaged liner @ seep capture.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 121

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 2-2-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 23 ° at 7:00 a.m. Temp. 35 ° at 4:00 p.m.	
Observation Period: 7:00am – 4:46 pm	

EQUIPMENT: (1) Cat 825G, (1) Cat CS-583C, (2) Cat 14G, (3) Cat 6330, (1) Cat D6, (2) Cat D6LGP (1) Cat D8, (2) Cat 325L, (1) Cat 950B, (1) Cat 966F, (1) Cat Backhoe, (1) Cat Forklift (2) Volvo A35C, (3) Volvo A30D, (1) water truck, (1) Bobcat T300, (1) hand tamper

The contractor continued to place the 22" R.F. Alluvium layer using a blade and a D8 Dozer to place the material.

The contractor also started the sob-ex just east of the seep capture system. The material being removed was hauled and stockpiled near the topsoil area. The seep was diverted further down stream and a temporary treatment system was built.

The site was shut down early due to a haul truck rolling over on the 22" R.F. Alluvium material.

2-2-05

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Soft spots in asbestos areas.
Damage @ seep capture system.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 122

TETRA TECH RMC

TO: _____

_____

_____

Project No. 19-4886.001.00	Date 2-3-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 30 ° at 7:00 a.m. Temp. 46 ° at 5:00 p.m.	
Observation Period: 6:30am - 5:45pm	

EQUIPMENT: (1) Cat 825B, (1) Cat CS-583C, (2) Cat 14G, (3) Cat 653D, (1) Cat D6, (2) Cat D6 LGP (1) Cat D8, (2) Cat 325L, (1) Cat 950B, (1) Cat 966F, (1) Cat Forklift, (1) Cat Backhoe, (2) Volvo A35C, (3) Volvo A30D, (1) Watertruck, (1) Bobcat T300 (1) Hand tamper

The contractor continued to sub-ex the soft material around the seep. The soft material was being loaded into the Volvos and hauled to the stock-piles near the top soil pile. The section at the bottom of the seep is getting very deep, and the soils are still a little soft, so the contractor was directed by the CTR to place a layer of rip rap in the bottom to help stabalize it.

The weekly meeting was held and DOE, EPA, CDPHE, CTR were all on site and the CQAE was on site later in the day. The repair of the seep colection was discussed, and the plan is to use a barier against the drainage rock and place a bentonite cutoff wall that will seal

2-3-05

both sides and the bottom liner.

The rest of the site was still shut down due to the rolled haul truck

A new piece of liner will be placed around the drainage rock to act as a barrier between the rock and bentonite. The bentonite wall will extend from below the liner to the concrete box and wrap around the north east corner of the liner to seal the system.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Soft spots in asbestos areas.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 123

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 2-5-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 31 ° at 6:30 a.m. Temp. 49 ° at 2:00 p.m.	
Observation Period: 6:30am – 5:15pm	

EQUIPMENT: (1) Cat 825G, (1) Cat CS-583C, (2) Cat 14G, (2) Cat 325L, (1) D6LGP, (1) Cat D6 (1) Cat D8, (1) Cat 950B, (1) Cat 916eF, (3) Cat 633D, (1) Cat Forklift, (1) Cat Backhoe (2) Volvo A35C, (3) Volvo A30D, (1) watertruck, (1) Bobcat T300 (1) Hand tamper

The contractor continued to place and finish grade the 10" cushion that was saturated by the last snow. The 10" cushion was retested, surveyed and released for rock layer up to the 20450 grid line. The rock layer was also being placed and spread using a D6LGP dozer. No other equipment was being driven on top of the rock layer. A different Technique has been used to spread the rock layer to help reduce the segregation.

The site was shut down most of 2-4-05 due to the haul truck rolling. A small amount of 10" cushion was placed late in the afternoon.

2-5-05

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Soft spots in the asbestos areas.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 124

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 2-6-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 27 ° at 7:00 a.m. Temp. 29 ° at 11:30 p.m.	
Observation Period: 7:00am - 12:00	

EQUIPMENT: (1) Cat 825G, (1) Cat CS-583C, (2) Cat 14G, (1) Cat D6, (1) Cat D8, (2) Cat D6LGP (3) Cat 633D, (1) Cat 950B, (1) Cat 966F, (2) Cat 325L (1) Cat Backhoe, (1) Cat Forklift (1) water truck, (2) Volvo A35C, (3) Volvo A30D, (1) Bobcat T300, (1) Hand tamper.

The contractor continued to place the rock layer material using a D6LGP. No other equipment was operating on the rock layer. The contractor also spent the day final grading the regrade surface to the 20650 grid line.

2-6-05

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Soft spots in asbestos areas

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 125

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 2-7-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: CLOUDY, BREEZY, ≈23°F-28°F VERY HUMID, NO PRECIPITATION	
Temp. 23.2° at 0730 a.m.	
Temp. 27.4° at 1615 p.m.	
Observation Period: 0630-1630	

EQUIPMENT: (1) CAT 825G, (1) CAT CS-583C, (2) CAT 140, (3) CAT 633D, (2) CAT D6LGP, (1) CAT D6, (1) CAT D8, (1) CAT 950B, (1) CAT 966F, (1) CAT FORKLIFT, (2) CAT 325L, (2) CAT BACKHOE, (3) VOLVO A30D, (2) VOLVO A35C, (1) WATER TRUCK, (1) BOBCAT T300, (1) HAND TAMPER

STARTING LOCATIONS ON THE MORNING OF FEB. 7, 2005:
22" ≈ 19900E (DIAGONALS TO NW FROM THIS EASTING @ ~45°)
LINER ≈ 20550E (5980 LINE)
6" CUSHION ≈ 20560E
10" CUSHION ≈ 20525E

STOP LOCATIONS @ END OF DAY (X)
6" = 20560E ROCK LAYER = 20450E LINER = 20560E
10" = 20525E 22" = 19950E

CONTRACTORS ARE HAULING 10" ROCK LAYER MATERIAL VIA VOLVOS + SEMI-TRAILERS, WORK BEGAN ON THE SOUTHERN END OF THE LANDFILL + MOVED NORTH, CREATING ~~AN AREA~~ MAN A SECTION ABOUT 30FT WIDE. ROCK LAYER WAS COMPLETED TO STATION 20450E. 10" CUSHION WAS RELEASED TO 20450E. ROCK LAYER WAS BEING SPREAD BY A D6 DOZER. ALL ROCK LAYER MATERIAL APPEARS TO BE WITHIN SPECIFICATIONS & ~~BE~~ WAS BEING PLACED IN A NORTH-SOUTH FASHION TO MINIMIZE CHANNELS OF 10" ROCK WITHOUT INTERMEDIATE FINES.

2-7-05

AT EASTERN EDGE OF LANDFILL (SEEP AREA), A 325C TRACKHOE WAS REMOVING SOIL & CLAYSTONE ~~FROM~~ DOWN GRADIENT OF CONCRETE PASSIVE TREATMENT TANK. MATERIAL WAS HAULED AWAY VIA VOLVOS TO AN AREA JUST NW OF WESTERN GEOLINER STOCKPILE AREA. THE METAL & CONCRETE PASSIVE TREATMENT TANK (~~BOTH~~ EASTERN TANK) WAS REMOVED & DISPOSED OF AFTER CONSOLIDATION.

CONTRACTOR PLACED MINIMAL 6" CUSHION ON THE SOUTHERN END OF THE LANDFILL JUST EAST OF THE LINER. CUSHION MATERIAL WAS AT THE UPPER LIMIT FOR MOISTURE CONTENT. SOME BELLY DUMPS ~~COULD~~ HAD DIFFICULTY ~~NOT~~ UNLOADING CUSHION DUE TO MOISTURE, MOISTURE FROM PRECIPITATION MUST BE TAKEN INTO ACCOUNT IF MORE CUSHION IS TO BE PLACED ON TUESDAY.

ACCORDING TO JANUARY'S MONTHLY SUMMARY FROM TTRMC, 120 DENSITY TESTS FROM QC HAD BEEN PERFORMED ON 641,000 FT^2 OF 10" CUSHION MATERIAL, IN ACTUALITY, 120 TESTS HAD BEEN PERFORMED UP TO STATION 20450E, 10" CUSHION MATERIAL WAS PLACED UP TO STATION 20525E (±) SO 75FT OF MATERIAL HAD NOT BEEN TESTED OR RELEASED. ≈18 MORE DENSITY TESTS ARE ANTICIPATED PRIOR TO RELEASING THE 10" CUSHION TO STATION 20525E

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK: COLORADO LININGS ONSITE TO INSPECT GCL. GCL ON EASTERN EDGE OF LINER NEEDS TO BE OVERLAPPED ≈ 3-4FT DUE TO HYDRATION OF GCL BENTONITE

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES: GCL OVERLAP

Copies to: John Rahe

Observer: ~~Josh Valentine~~ MARSHALL MASSARO

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 126

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00 Date 2/8/05	
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: CLOUDY, CALM-BREEZY, ≈ 25°F-32°F HEAVY FOG W/ LIGHT SNOW/RAIN IN MORNING & PARTLY CLOUDY SKIES & NO PRECIPIN AFTERNOON	
Temp 24.8 ° at 0715 a.m.	
Temp 29.0 ° at 1700 p.m.	
Observation Period: 0630 – ~~0930~~ MAM 1700	

EQUIPMENT: (1) CAT 825G, (1) CAT CS-583C, (2) CAT 140, (3) CAT 633D, (2) CAT D6LGP, (1) CAT D6, (1) CAT D8, (1) CAT 950B, (1) CAT 966F, (1) CAT FORKLIFT, (2) CAT 325L, (2) CAT BACKHOE, (3) VOLVO A30D, (2) VOLVO A35C, (1) WATER TRUCK, (1) BOBCAT T300, (1) HAND TAMPER

APPROXIMATELY 1/4" OF SNOW FELL THE PREVIOUS NIGHT LEAVING A TRACE OF SNOW & FROZEN SOIL ACROSS THE SITE. 6" CUSHION WAS PLACED OVER FROZEN REGRADE SOILS AFTER 825 SHEEPSFOOT SCARIFIED SURFACE. MATERIAL WAS DRIER THAN PREVIOUS DAY * BUT STILL ABOVE OPTIMUM MOISTURE CONTENT, WITH THE DRIER AIR & SUNSHINE OF THE AFTERNOON, MATERIAL BEGAN TO DRY. 6" MATERIAL WAS WORKED INTO POSITION BY THE D8R DOZER & BLADE. CUSHION PLACEMENT EXTENDED 50' EAST TO THE 20600E LINE AND NORTH TO APPROXIMATELY 39900N (MAM) BY THE END OF THE DAY (ALL MAM OF CAP FROM SOUTH SIDE TO NORTH SIDE). OF CAP TO NORTH SIDE

22" LAYER OF ROCKY FLATS ALLUVIUM WAS PLACED BY TWO D6H DOZERS TO A MAXIMUM EASTERN EXTENT OF STATION 19950E. MOVEMENT OF THE ROCKY FLATS ALLUVIUM DID NOT MOVE MUCH FURTHER EASTWARD FROM YESTERDAY, BUT A GREAT DEAL OF PROGRESS WAS MADE TO THE NORTH & SOUTH OF THE PLF CREST.

2-8-05

ALL ALLUVIUM MATERIAL APPEARS TO BE OF GOOD GRADATION.

WORK IN THE SEEP AREA CONTINUED THROUGHOUT THE DAY. THE 325 TRACKHOE REMOVED MATERIAL FROM THE NORTH SIDE OF THE DRAINAGE & WAS HAULED TO THE GEOSYNTHETIC STOCKPILE AREA. RIP RAP MATERIAL (10-12" ROCK) WAS PLACED NEAR THE CENTER & NORTH OF THE SEEP CHANNEL TO HELP STABILIZE FUTURE MATERIAL PLACEMENT. VOLVO'S & THE 825 SHEEPSFOOT ROLLER WERE UTILIZED TO PLACE ROCKY FLATS ALLUVIUM ON THE SOUTH SIDE OF THE SEEP DRAINAGE AROUND THE VICINITY OF THE REMOVED PASSIVE TREATMENT TANK.

COLORADO LIVING CREW ~~NOT ON SITE~~ HAD DAY OFF, ONLY SELECT PERSONNEL ON SITE

NO ROCK LAYER WORK PERFORMED TODAY

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

NONE

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

NONE

Copies to: John Rahe

Observer: ~~Josh Valentine~~ MARSHALL MASSARO

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 127

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 2/9/05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: CLEAR, BREEZY-WINDY, ≈25°F - NO PRECIPITATION Temp. 27.4 ° at 0740 a.m. Temp. 36.0 ° at 1650 p.m.	
Observation Period: 0630-1700	

EQUIPMENT: (4) CAT 825G, (1) CAT CS-583C, (2) CAT 14G, (3) CAT 6330, (2) CAT D6L GP, (1) CAT D6, (1) CAT D8, (1) CAT 950B, (1) CAT 966F, (1) CAT FORKLIFT, (2) CAT 325L, (2) CAT BACKHOE, (3) VOLVO A30D, (2) VOLVO A35C, (1) WATER TRUCK, (1) BOBCAT T300, (1) HAND TAMPER

START LOCATIONS FOR DAY

6" CUSHION: 20600E (STILL NEEDS COMPACTION, TESTING, & GRADING)

10" CUSHION: 20525E

LINER: 20550E

22" ALLUVIUM: 19950E MAXIMUM EASTERLY, VOIDS TO NORTH & SOUTH

ROCK LAYER: 20450E

CONTRACTOR WAS REMOVING SOFT, CLAYEY MATERIAL OUT FROM THE NORTH SIDE OF THE SEEP AREA. REMOVED SEDIMENT WAS BEING DUMPED NEAR THE WESTERN GEOSYNTHETIC LINER STOCKPILE AREA. VOLVOS & 825 SHEEPSFOOT ROLLER ~~HAULED~~ HAULED & MOVED ROCKY FLATS ALLUVIUM INTO THE OLD PASSIVE TREATMENT AREA. THE OUTFLOW PIPE FOR THE SEEP HAS BEEN COVERED BY ≈6 FEET OF ALLUVIUM FOR A LENGTH OF ≈80 FEET. AT THE OUTLET OF THE PIPE, ~~A~~ AN 8-TIER PASSIVE TREATMENT SYSTEM W/ DROPS OF ≈1" HAS BEEN CONSTRUCTED. TO THE NORTH & WEST OF

2-9-05

THE CHANNEL, THE 325 TRACKHOE REMOVED VEGETATION FROM THE SLOPES.

6" CUSHION SOIL FROM LAFARGE WAS PLACED USING A GRADER & D8R DOZER. MATERIAL WAS FAIRLY MOIST BUT REMAINED IN THE LIMITS OF PLACEMENT. WINDY & SUNNY CONDITIONS ALLOWED FOR GOOD EVAPORATION ON 6" CUSHION. CUSHION WAS PLACED TO STATION 20650E, BUT NEEDS MORE SOIL & COMPACTION & GRADING PRIOR TO LINER PLACEMENT. DENSITY / MOISTURE TESTING WILL BE PERFORMED ON THURSDAY PRIOR TO LAYING LINER ON FRIDAY.

SOME COLORADO LINING PERSONNEL WERE ON SITE TO UNLOAD 4 ROLLS OF TEXTURED FML LINING. COLORADO LINING CREW IS SCHEDULED TO BE ON SITE ON 2/11/05 FOR GCL, FML, & GDN PLACEMENT.

ROLLER WAS COMPACTING 10" CUSHION BETWEEN ROCK LAYER & LINER.

22" ROCKY FLATS ALLUVIUM WAS PLACED BY 2-D6R DOZERS TO A MAXIMUM EASTWARD STATION OF 20000E. PORTIONS OF THE NORTH & SOUTH EDGES OF ROCK LAYER STILL NEED TO BE PLACED.

WORK ON ANCHOR TRENCHES & AIR VENT TRENCHES IS SCHEDULED FOR THURSDAY

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

HIGH MOISTURE CONTENT OF 6" CUSHION SOILS

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

PERFORM DENSITY TESTS ON 10" & 6" CUSHION

Copies to: John Rahe

Observer: ~~Josh Valentine~~ MARSHALL MASSARO

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 128

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 2-10-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 23 ° at 7:00 a.m. Temp. 37 ° at 5:00 p.m.	
Observation Period: 6:15am – 5:45	

EQUIPMENT: (1) Cat 825G, (1) Cat CS-583C, (2) Cat 14G, (3) Cat 623D, (1) Cat D6 (2) Cat D6 LGP, (1) Cat D8, (2) Cat 325L, (1) Cat 950B, (1) Cat 966F, (1) Cat Forklift, (2) Cat Backhoe, (1) Watertruck, (2) Volvo A35C, (3) Volvo A30D (1) Bobcat T300, (1) Hand Tamper.

The contractor continued to place the 22" layer of R.F. Alluvium. The material is being placed using a D6 LGP. The truck trafic is being minimized to help reduce compaction, no compactive effort is being used. The contractor also continued to place, compact and finish grade the 6" Cushion to grid line 20700. The 6" Cushion was tested, surveyed and released up to grid line 20800. R.F. Alluvium was placed in 1' minus lifts and compacted a min. of 4 passes with the 825 just east of the seep capture system.

The weekly meeting was held and the EPA, CDPHE, CTR and CDH&E were on site. A tour to look at

2-10-05

the progress was held after the meeting.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

- Soft spots in Asbestos Area
- Damage to seep capture system

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 129

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 2-11-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 28 ° at 6:45 a.m. Temp. 46 ° at 3:00 p.m.	
Observation Period: 6:45 am 5:45 pm	

EQUIPMENT: (1) Cat 825G, (1) Cat CS-583C, (2) Cat 14G, (3) Cat 633D, (1) Cat D6 (1) Cat D8, (2) Cat D6LGP, (1) Cat 950B, (1) Cat 966F, (2) Cat Backhoe (2) Cat 325L, (2) Cat Forklift, (1) watertruck, (1) Bobcat T300 (2) Volvo A35C, (3) Volvo A30D, (1) Hand tamper

The contractor continued to place the 22" R.F. Alluvium layer. The material is being placed with a D6LGP, and truck traffic has been kept to a minimum to keep the compaction as low as posible. R.F. Alluvium was also being placed as fill from the seep capture system out approximately 80' east. The material is being placed in 1' minus lifts and compacted with a min. of 4 passes with the 825. Sub-ex. was also continued on the north side of the east face to remove all the soft material. Asbestos was ~~hit~~ in the morning and the south side was shut down for most of the day for the asbestos to be removed. The 6" cushion was completed to the 20700 gridline. The area was surveyed, tested and released.

2-11-05

The liner crew was on-site, and started placing GCL and FML. The first run of GCL was overlapped so that the new material covered all the hydrated edges plus 6". The rest of the edge seams were overlapped 6", and all butt seams were overlapped a min. of 24" with granular bentonite. Pannels S-337 to S-414 were placed. Pannels P-105 to P-109 of FML were also placed, all edges were overlapped 6" and fusion welded. Trial welds were taken and tested (passed) prior to welding on the cap. No pressure tests or repairs were done today.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

- Soft Spots in Asbestos areas
- Damage to the seep collection system
- Testing & Repairs of FML placed 2-11

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 130

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 2-12-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 33 ° at 7:00 a.m. Temp. — ° at — p.m.	
Observation Period: 6:45 am — 5:15	

EQUIPMENT: (1) Cat 825G, (1) Cat CS-583C, (3) Cat 633D, (2) Cat 14G, (1) Cat D6
(1) Cat D8, (2) Cat D6LGP, (2) Cat 325L, (2) Cat Backhoe, (1) Cat 950B
(1) Cat 966F, (2) Cat Forklift, (1) watertruck, (1) Bobcat T300
(2) Volvo A35C, (3) Volvo A30D, (1) Hand tamper

The liner crew placed GCL pannels S-415 to S-450. The edge seams were overlapped 6" and the butt seams were over lapped 24" with granular bentonite. ~~The~~ FML pannels P-110 to P-117 were placed with 6" overlapp and fusion welded. Trial seams were done and tested (passed) in the morning and @ lunch prior to welding on the cap. Some pressure tests were done, but no patching or repairs were done today.

2-12-05

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

- Soft spots in asbestos areas
- Damage to seep capture system
- Repairs/Testing of FML from 2-11 & 2-12

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES: NONE

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 131

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 2-13-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 43 ° at 7:00 a.m. Temp. 44 ° at 9:30 a.m.	
Observation Period: 7:00am - 11:00am	

EQUIPMENT: (1) Cat 825G, (1) Cat CS-563C, (3) Cat 633D, (2) Cat 14G, (1) Cat D6, (1) Cat D8, (2) Cat 826GP, (1) Cat 950B, (1) Cat 966F, (2) Cat 325L, (2) Cat Backhoe, (2) Cat Forklift, (1) water truck, (1) Bobcat T300, (1) hand tamper, (2) Volvo A35C, (5) Volvo A30D

Due to the high winds no liner was placed. A few repairs were done, but no vacuum or pressure testing was done. A test weld was (trial weld) done and tested prior to welding on the cap. The end of the day was spent securing the FML for the wind.

2-13-05

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

- Soft spots in asbestos areas.
- Damage to seep capture system
- Repairs/testing of FML from 2-11 & 2-12

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 132

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 2-14-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: CLEAR, BREEZY, WIND, ≈40°F-55°F NO PRECIPITATION Temp. 42.3° at 0715 a.m. Temp. 51.7° at 1630 p.m.	
Observation Period: 0630 - 1630	

EQUIPMENT: (1) CAT 825G, (1) CAT CS-583C, (2) CAT 140, (3) CAT 633D, (2) CAT D6LGP, (1) CAT D6, (1) CAT D8, (1) CAT 950B, (1) CAT 966F, (1) CAT FORKLIFT, (2) CAT 325L, (2) CAT BACKHOE, (3) VOLVO A30D, (2) VOLVO A35C, (1) WATER TRUCK, (1) BOBCAT T300, (1) HANDTAMPER

CONTRACTOR CONTINUED TO PLACE ALLUVIUM IN EAST SEEP AREA USING VOLVOS & 825G SHEEPSFOOT COMPACTOR. ALLUVIUM IS APPROXIMATELY ONE FOOT BELOW CONCRETE TANK USED FOR OLD PASSIVE TREATMENT SYSTEM. 325 TRACKHOE CONTINUED TO REMOVE EXCESS SLOPE MATERIAL FROM THE NORTH SIDE OF THE SEEP AREA & HAVE VOLVOS DUMP NEAR WESTERN LINER STORAGE AREA.

COLORADO LINING CREW WAS ONSITE TO PLACE 2 PANELS WIDTHS OF GCL (S-451 TO S-457) AND 1 PANEL WIDTH OF FML (P-118 & P-117). GCL MATERIAL & FML LINER WAS PLACED ACCORDING TO SPECIFICATIONS. DEFECTS ON FML WERE REPAIRED (PUNCTURES, BURNOUTS, CREASES) FOR MOST OF LINER. REMAINING DEFECTS FROM PRESSURE TESTING WILL BE REPAIRED ON 2/15/05. SOME DESTRUCTS, VACUUM TESTS, & PRESSURE TESTS NEED TO BE PERFORMED ON TUESDAY. ALL GCL & FML LINER HAS BEEN PLACED TO STATION 20750 E.

2-14-05

CONTRACTORS CONTINUED TO PLACE 22" ALLUVIUM LAYER ON LANDFILL. BY THE END OF THE DAY, 22" HAD BEEN PLACED TO A MAXIMUM EASTING OF 200SOE. SOME OPEN AREAS REMAINED ON THE NORTH & SOUTH FLANKS.

ANCHOR TRENCHES USED FOR FML & GCL PLACED TODAY & ON SATURDAY WERE FILLED W/ CUSHION SOILS & COMPACTED IN LFT LIFTS. GOLDER PERFORMED DENSITY/MOISTURE TESTS TO ASSURE PROPER COMPACTION.

NO WORK WAS PERFORMED ON THE 10" ROCK LAYER.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

CUTS IN GDN BETWEEN 10" CUSHION & FML CREATED TO CHECK FOR FML FOLDS LARGER THAN SPEC; NO FOLDS WERE OUT OF SPEC.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES: NONE

Copies to: John Rahe

Observer: ~~Josh Valentine~~ / MARSHALL MASSARO

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 133

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 2-15-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 33 ° at 7:00 a.m. Temp. 36 ° at 11:00 p.m.	
Observation Period: 6:20am – 3:30pm	

EQUIPMENT: (1) Cat 825G, (1) Cat CS-583C, (2) Cat 14G, (3) Cat 633D, (1) Cat D6, (1) Cat D8 (2) Cat D6 LGP, (2) Cat 325L, (2) Cat Backhoe, (1) Cat 950B, (1) Cat 966F, (2) Cat Forklift (1) water truck, (2) Volvo A35C, (3) Volvo A30D, (1) Bobcat T300, (1) Hand tamper

The contractor continued to place the 22" R.F. Alluvium layer as well as fill @ the seep on the east face. The 22" layer was being placed using a D6LGP to help maximize compaction. The fill @ the seep was placed in 12" minus lifts and compacted with a min of 4 passes with the 825.

QC tested the destructive test for all of the FML placed on 2-11 and 2-12. Destruct # 0106 on panels P103 and P106 failed the peal test. New samples were taken on either side and both passed, the failing area is approx. 50' long. No repairs were done due to snow and wet conditions.

The job was shut down early due to snow.

2-15-05

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

- Soft spots in asbestos areas.
- Damage to seep capture system
- Failed destruct on FML, & repairs/testing

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 134

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 2-16-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 28 ° at 9:00 a.m. Temp. 37 ° at 2:00 p.m.	
Observation Period: 9:00am - 5:00pm	

EQUIPMENT: (1) Cat 825G, (1) Cat CS-583C, (2) Cat HG, (1) Cat D6, (1) Cat D8, (2) Cat D6LGP (3) Cat 633D, (2) Cat 325L, (1) Cat 950B (1) Cat 966F, (2) Cat Backhoe, (2) Cat Forklift (1) water truck, (2) Volvo A35C, (3) Volvo A30D, (1) Bobcat T300, (1) Hand tamper.

The contractor continued to place the 22" R.F. Alluvium layer using a D6LGP to spread the material. No compactive effort has been used, and truck traffic has been kept to a minimum to reduce compaction. The haul trucks were switched to bring fill to the east face after lunch. The R.F. Alluvium placed down stream of the seep capture system was placed in 1' lifts and compacted with a min of 4 passes with the 825. The liner crew spent the morning removing snow from all the exposed FML, No repairs could be done due to snow and water on the liner.

2-16-05

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

- Soft spots on asbestos areas
- Repairs/testing on FML
- Damage to seep capture system

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 135

TETRA TECH RMC

TO: _____

_____

_____

Project No. 19-4886.001.00	Date 2-17-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 30 ° at 8:00 a.m. Temp. 44 ° at 3:00 p.m.	
Observation Period: 7:30am - 5:00pm	

EQUIPMENT: (1) Cat 825G, (1) Cat CS-583C, (2) Cat 14G, (3) Cat 633D, (1) Cat D6, (1) Cat D8 (2) Cat D6LGP, (2) Cat 325L, (1) Cat 950B, (1) Cat 966F, (2) Cat backhoe, (2) Cat Forklift (1) water truck, (2) Volvo A35C, (3) Volvo A30D, (1) Bobcat T300, (1) Hand tamper.

The contractor continued to place 22" R.F. Alluvium material. The material is being placed using a D6LGP and truck traffic is being kept to a minimum to reduce compaction. QC took 3 samples for seive analysis on the 22" R.F. Alluvium material. The contractor is also continuing to place R.F. Alluvium from the seep capture system down stream approximately 100' to a depth of 12'-15' total. The material is being placed in 1'- lifts and compacted with a min. of 4 passes with the 825.

The liner crew completed all the repairs and vacuum/pressure testing on all of the remaining FML up to the 20700 gridline. The FML was inspected one final time by QA & QC and was released for GDN. GDN panels T383 to T376 were placed with

2-17-05

6" overlapp @ the edge seams & tied every 5' and sewn. The butt seams were overlapped 24", tied every 1' and capped with a piece of nonwoven geosynthetic.

The weekly meeting was held & EPA, CDPHE, CJR, DOE & CDAE were all present. 4 test pits were excavated in the 22" RF Alluvium material to look at compaction and particle size. The compaction on the nonhaul areas was low and ~~the~~ JRV SM correction on the haul roads. The average 6"+ particle size was estamated to be 5%± for the average of all 4 sites. An acid test was also done on all 4 sites to test for calcium carbonate and all were negative.

moderately dense

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

- Soft spots in asbestos areas
- Damage to the seep capture system

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

- Testing and repair of all remaining FML to 20700, all passed.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 136

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 2-18-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 20 ° at 7:00 a.m. Temp. 41 ° at 12:00 p.m.	
Observation Period: 6:45am - 5:15	

EQUIPMENT: (1)Cat 825G, (1) Cat CS-583C, (2)Cat 14G, (3)Cat 633D, (2)Cat D6LGP, (1)Cat D6, (1)Cat D8, (2)Cat 325L, (2)Cat Backhoe, (1)Cat 950B, (1)Cat 966F, (1) watertruck (2)Volvo A35C, (3) Volvo A30D, (1) Bobcat T300, (2) Cat Forklift, (1)Hand Tamper

The contractor continued to place the 22" RF Alluvium layer using a D6LGP and keeping truck tratic to a minum to help reduce compaction. QA walked the remaining exposed rock layer from approx gridline 20300 to 20550 to mark any areas of rock segregation. A total of approxamately 30 areas were marked. The marked areas were filled with a thin layer of cushion material to fill the voids.

RF Alluvium was also placed down stream of the seep collection system. The material was placed in 1'- 1lifts and compacted with a min. of 4 passes with the 825.

The remaining FML was inspected and released for GDN up to the 20700 gridline. The liner crew continued to place GDN, the edge seams were overlapped 6"

2-18-05

and tied every 5' and the butt seams were overlapped 24" and tied every 1'. The edge seams were sewn and a cap strip of nonwoven geotextile was heistered over the butt seams.

A meeting with the CTR & the contractor was held this morning to discuss the seep and drainage design on the east face. New drawings were given and the design "finalized."

Six more samples were taken for gradations of 3 new borrow areas by QC.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

- Soft spots in asbestos areas
- Damage to seep capture system.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES: NONE

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. ~~130~~ 137 rev

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 2-19-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 31 ° at 7:00 a.m. Temp. 42 ° at 2:00 p.m.	
Observation Period: 6:30 am – ~~5:30~~ 4:45	

EQUIPMENT: (1) Cat 825G, (1) Cat CS-583C, (2) Cat 14G, (3) Cat 633D, (1) Cat D6, (1) Cat D8 (2) Cat D6LGP, (1) Cat 950B, (1) Cat 966F, (2) Cat 325L, (2) Cat Forklift, (2) Cat Backhoe (2) Volvo A35C, (3) Volvo A30D, (1) watertruck (1) Bobcat T300, (1) Hand tamper

The contractor continued to place the 22" R.F. Alluvium layer using a D6LGP. The truck traffic was kept to a minum to help reduce compaction. The contractor also continued to place cushion material in the previously marked areas of rock layer segragation.

The seep capture system was repaired, and the outlet pipe to the future manhole was placed. The dirty gravel in the seep capture system was removed by hand. The old outlet pipe was cut and the new 4" sch 80 pvc one was glued in place with 2 45° elbows for the new alignment. The front of the damaged liner was exposed on the south, north and the bottom. A new piece of liner was placed inside the capture system so that the granular bentonite cutoff wall

2-19-05

would seal on both sides and the bottom. The bentonite cutoff wall and the washed gravel inside the capture system were placed @ the same time to support the new ~~Piece~~ Liner. The bentonite cutoff wall was approx 18"-24" thick. After the bentonite another clay cutoff wall was compacted around the outlet pipe approx 4' thick. The outlet pipe was placed to the 1st Future manhole bedded in drainage gravel 6" on the bottom and sides, and 24" on the top. The gravel was barito wraped with a non woven geotextile. The top of the seep capture system was also covered with a non woven geotextile over lapping the old cover by a min. of 6". The seep capture system and the outlet pipe was cover by a thin layer of R.F. Alluvium @ the end of the day. The old concrete vault was abandon by capping the inlet and filling it with pea gravel

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

- Soft spots in asbestos areas

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

- Repair of seep capture system complete.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 138

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 2-20-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 45 ° at 7:30 a.m. Temp. 52 ° at 2:30 p.m.	
Observation Period: 7:30am - 4:15pm	

EQUIPMENT: (1) Cat 825G, (1) Cat CS-583C, (2) Cat 14G, (3) Cat 633D, (1) Cat D6, (1) Cat D8 (2) Cat D6LGP, (1) Cat 950B, (1) Cat 916dF, (2) Cat 325L, (2) Cat Backhoe (2) Cat Forklift, (1) Bobcat T300, (3) Volvo A30D, (2) Volvo A35C, (1) watertruck (1) Hand tamper.

The contractor continued to place R.F. Alluvium on the seep capture system east to where the treatment system will be placed. The material is being placed in 1' - lifts and compacted with a min. of 4 passes with the 825.

The old temporary outlet pipe from the concrete vault was capped and backfilled.

The center section of the central portion of the east face was cleared and grubbed.

2-20-05

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Soft spots in asbestos areas.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 139 ~~140~~

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 2-21-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: PARTLY CLOUDY, WINDY, ≈ 40°F Temp. 41.2 ° at 0710 a.m. Temp. — ° at — p.m.	
Observation Period: 0630 - ~~0645~~	

EQUIPMENT: (1) CAT 825 G, (1) CAT CS-583C, (2) CAT 146, (3) CAT 633D, (2) CAT D6L GP, (1) CAT D6, (1) CAT D8, (2) CAT 325L, (2) CAT BACKHOE, (1) CAT 950B, (1) CAT 966F, (1) WATER TRUCK, (2) VOLVO A35C, (3) VOLVO A30D, (1) BOBCAT T300, (2) CAT FORKLIFT, (1) HAND TAMPER

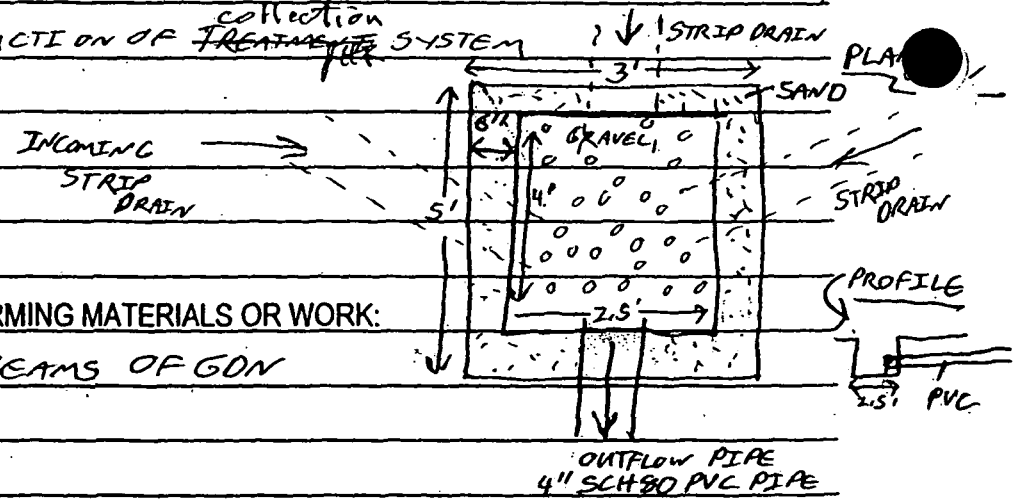
THE CONTRACTOR CONTINUED TO PLACE 22" ALLUVIUM USING TWO D6L GP DOZERS & ONE D8 DOZER. MATERIAL WAS HAULED USING VOLVOS & BELLY DUMPS. TRAFFIC WAS KEPT TO A MINIMUM TO MINIMIZE COMPACTION. ALLUVIUM HAD BEEN PLACED TO A MAXIMUM EASTING OF ≈ 20380E W/ AREAS ON THE NORTH & SOUTH FLANKS TO BE PLACED.

CONTRACTOR CONTINUED TO PLACE 10" CUSHION SOIL ON TOP OF CON. 10" CUSHION SOILS WERE PLACED TO A MAXIMUM EASTING OF ≈ 20600E USING VOLVOS & BELLY DUMPS. MATERIAL WAS DISTRIBUTED USING A 966F LOADER. THE GRADATION OF THE 10" CUSHION WAS WITHIN SPECIFICATION & THE MOISTURE LEVEL WAS NEAR THE MAXIMUM, ~~FAR~~ MMM MATERIAL WILL HAVE TIME TO DRY PRIOR TO PLACING ROCK LAYER.

~~#1140~~ 159
2/21/05

COLORADO LININGS PLACED ONE PANEL WIDTH OF GDN TO ≈2068SE C1 PANEL FROM 20700E), GDN WAS OVERLAPPED 6" + TIED EVERY 5FT AT THE EDGE SEAMS & OVERLAPPED A MINIMUM OF 24" ON THE END SEAMS. END SEAMS WERE ZIP TIED EVERY FOOT. EDGE SEAMS WERE SEWN FOR THEIR ENTIRE LENGTH. A CAP STRIP STILL NEEDS TO BE PLACED OVER END SEAMS & WILL BE PERFORMED ON 2/22/05.

CONTRACTOR BEGAN WORK ON THE CENTRAL PIPE CHANNEL FOR THE PASSIVE TREATMENT SYSTEM PLANT. CHANNEL BEGAN W/A 5'×3' HOLE W/ A 2'×2' TRENCH HEADING EASTWARD FROM TOE OF RLF. OPEN TRENCH & HOLE WERE FILLED W/ ≈2-3" OF ROCK (¾" GRAVEL) AS BEDDING MATERIAL. HOLE WAS FILLED W/ AN ADDITIONAL 1-2" OF FINE-MED. GRAINED SAND TO ADD CUSHIONING FOR LDPE TANK (TO BE FABRICATED BY COLO. LININGS USING FML). A 4" SCH 80 PVC WAS PLACED INTO TRENCH FOR OUTFLOW OF SEEP. THE FOLLOWING BRIEFLY DEPICTS THE CONSTRUCTION OF collection SYSTEM mm 3/22/05



DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

LEISTER WELD END SEAMS OF GDN PANELS.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES: NONE

Copies to: John Rahe

Observer: ~~Josh Valentine~~ MARSHALL MASSARO

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 140

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 2-22-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 29 ° at 7:00 a.m. Temp. 41 ° at 2:00 p.m.	
Observation Period: 6:15am – 5:15	

EQUIPMENT: (1)Cat 825G, (1)Cat CS-583C, (2)Cat 14G, (5)Cat 633D, (1)Cat D6, (1)Cat D8 (2)Cat D6LGP, (1)Cat 950B, (1)Cat 966E, (2)Cat 325L, (2)Cat Backhoe, (2) cat forklift (2)Volvo A35C, (3)Volvo A30D, (1)watertruck, (1) Bobcat T300, (1)Cat track skid steer (1)Hand tamper.

The contractor continued to place the 22" R.F. Alluvium layer using the D6LGP's. Truck tratic was kept to a minimum to reduce compaction, no compactive effort is being used. The contractor also continued to place and finish grade the 10" Cushion layer.

The liner crew constructed a LLDPE sump liner for the strip drains. The box was approx 2.5' x 4' x 6' high with an outlet pipe welded in place. The box had 3 inlet pipes that were connected to the strip drains and a cleanout pipe, all were 4" sch 80 PVC. The box was set in place, filled with drainage rock and backfilled at the same time to support the liner. The outlet pipe was extended out approx. 80' east to the approx. position

2-22-05

of the future manhole. The pipe was placed withe 6" of gravel on the sides and bottom, and 24" on the top. The entire system is wraped with non-woven geotextile

The contractor continued to place R.F. Alluvium at the base of the east face. The material is being placed in 1' minus lifts and compacted with a min of 4 passes with the 825.

Concurrent QA/QC Rock layer graduations were taken at the Centennial pit.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Soft spots in asbestos areas.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

141

QUALITY ASSURANCE OBSERVATION REPORT NO. ~~145~~ 141

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 2-23-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 33 ° at 7:00 a.m. Temp. 43 ° at 3:00 p.m.	
Observation Period: 6:30am - 4:30	

EQUIPMENT: (1) Cat 825G, (1) Cat CS-583C, (2) Cat 14G, (3) Cat 633D, (1) Cat D6, (1) Cat D8 (2) Cat D6LGP, (2) Cat 325L, (1) Cat 950B, (1) Cat 966F, (2) Cat Backhoe, (2) Cat Forklift (2) Volvo A35C, (3) Volvo A30D, (1) water truck, (1) Bobcat T300, (1) Hand tamper (1) Cat track skidsteer.

The contractor continued to place RF. Alluvium 22" layer. The material is being placed using a D6LGP. R.F. Alluvium was also being placed at the bottom of the east face as fill. The material is being placed in 1'- lifts and compacted with a min. of 4 passes with the 825.

The contractor started to place the strip drains on the south side of the east face. The strip drains were placed per the drawings plus 2 more verticle drains on the South side. The drains were stapled in place, spliced per the manufacture's spec. and covered with concrete sand. The drains to the central and north were connected to the sump and run a short distance so that some fill

2-23-05

Could be placed on the sump.

A meeting was held with Bob Davis & QC. to compile test data from the R.F. Alluvium and Rock layer materials for the weekly meetings.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Soft spots in asbestos areas.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 142

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 2-24-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 33 ° at 7:30 a.m. Temp. 46 ° at 3:30 p.m.	
Observation Period: 7:00am – 4:30pm	

EQUIPMENT: (1) Cat 825G, (1) Cat CS-583C, (2) Cat 14G, (5) Cat 730, (1) Cat D6, (1) Cat D8 (2) Cat D6LGP, (1) Cat 950B, (1) Cat 966F, (2) Cat 325L, (2) Cat Backhoe, (2) Cat Forklift, (1) Cat tracked skid steer, (1) water truck, (2) Volvo A35C (3) Volvo A30D, (1) Bobcat T300, (1) Hand tamper.

The contractor continued to place the 22" R.F. Alluvium layer using a D6LGP, any large rock greater than 12" is being removed as it is placed. The contractor also continued to place R.F. Alluvium at the base of the east face. The material is being placed in 1' lifts and compacted with 4 passes of the 825.

The contractor also continued to place the strip drains. The drains were completed on the central face, The drains were placed, stapled, and covered with sand. The main drain on the North side was started but not completed, it will be placed as the fill is placed.

2-24-05

Asbestos was hit on the south side of the east face. The area was cleaned up ~~the~~ in by the site asbestos team.

The weekly meeting was held & EPA, CDPHE, DOE, CTR & CRAE were all on site. A tour was done of the cap and east face after the meeting.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Soft spots in asbestos areas

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

2-25-05

QUALITY ASSURANCE OBSERVATION REPORT NO. 143

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 2-25-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 31 ° at 6:45 a.m. Temp. 49 ° at 3:00 p.m.	
Observation Period: 6:15am – 3:45pm	

EQUIPMENT: (1)Cat 825G, (1) Cat CS-583C, (2)Cat 14G, (3) Cat 6330, (1) Cat D6, (1) Cat D8 (2) Cat D6LGP, (1) Cat 950B, (1) Cat 966F, (2) Cat 325L, (2) Cat Backhoe (2) Cat Forklift, (1) Cat tracked skid steer, (1) Bobcat T300, (1) watertruck (2) Volvo A35C, (3) Volvo A30D, (1) Hand tamper.

The contractor started to place more rock layer material from the 20450 gridline. The material was being placed using a D6LGP, no other equipment was operating on the rock layer. The contractor also continued to place R.F. Alluvium for the buttress fill on the east face. The material is being placed in 1-lifts and compacted with a min of 4 passes with the 825. Two more strip drains were placed on the north side of the east face. The drains on the north side were covered with drainage rock and a layer of nonwoven geotextile. before RF Alluvium was placed.

2-25-05

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Silt spots in asbestos areas

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 144

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 2-26-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 27 ° at 7:00 a.m. Temp. 46 ° at 12:00 p.m.	
Observation Period: 6:45am - 2:00pm	

EQUIPMENT: (1) Cat 825G, (1) Cat CS-583C, (2) Cat 816, (3) Cat 633D, (1) Cat D6, (1) Cat D8, (2) Cat D6LGP, (1) Cat 950B, (1) Cat 966F, (2) Cat 325L, (2) Cat Backhoe, (2) Cat forklift, (1) Watertruck, (1) Cat tracked skid loader, (1) Hand tamper, (2) Volvo A35C, (3) Volvo A30D, (1) Bobcat T300

The contractor continued to place R.F. Alluvium on the east face. The material is being placed in 1'- lifts and compacted with a min of 4 passes with the 825. The contractor is also placing the 12" rock layer using a D6LGP, no other equipment is operating on the rock layer.

Three more strip drains were placed on the central section of the east face. The drains were spliced per the manufacturers spec. and stapled in place.

The contractor continued to finish grade and survey the 22" R.F. Alluvium layer.

Several bags of asbestos were removed from the cut

2-26-05

area on the south side of the east face. A few bags of asbestos were also uncovered on the north side of the east face. All of the asbestos was removed by the site asbestos crew.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

None

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

Inspected and released original soft spots in the asbestos areas, by proofroll of loaded haul trucks.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 145

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 2-28-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: CLEAR, BREEZY, ~27°F – NO PRECIPITATION Temp. 27 ° at 7:00 a.m. Temp. 39.8 ° at 1710 p.m.	
Observation Period: 0630-1710	

EQUIPMENT: (1) Cat 825G, (1) Cat CS-583C, (2) Cat 14G, (3) Cat 633D, (1) Cat D6, (1) Cat D8, (2) Cat D6LGP, (1) Cat 950B, (1) Cat 966F, (2) Cat 325L, (2) Cat Backhoe, (2) Cat Forklift, (1) Cat tracked skid loader, (1) Bobcat T300, (1) Water truck, (2) Volvo A35C, (3) Volvo A30D, (1) Hand tamper.

CONTRACTOR CONTINUED TO PLACE ROCKY FLATS ALLUVIUM ALONG THE TOE OF THE EASTERN FACE. VOLVOS WERE UTILIZED TO UNLOAD THE ALLUVIUM WHILE A SHEEPSFOOT ROLLER (825G) LEVELED & COMPACTED ALLUVIUM. A D8R DOZER WAS UTILIZED TO BRING THE EAST FACE TO GRADE.

ASBESTOS PACKAGED IN PLASTIC BAGS WAS DISCOVERED ON BOTH THE NE & SE FINGERS OF THE PLF AT DEPTHS OF 6" AND GREATER. SOME BAGS ARE BEING PACKAGED IN PLASTIC BAGS & STOCKPILED FOR FUTURE DISPOSAL & OTHERS ARE BEING LEFT IN PLACE. THE APPROXIMATE LIMITS OF THE ASBESTOS WERE IDENTIFIED BY KH & M HILL.

~~LARG~~ MAM 2/28/05 CONTRACTOR CONTINUED TO PLACE ROCK LAYER MATERIAL USING END DUMPS & A D6R DOZER. MANY LARGE BOULDERS (16 TO 20")

2-28-05

WERE PRESENT IN ROCK LAYER MATERIAL, LABOR CREW WAS FAIRLY EFFICIENT IN REMOVING LARGE MATERIAL W/ A BOBCAT LOADER.

EAST FACE ALLUVIUM MATERIAL BECAME TOO CLAYEY AROUND 2PM. QA & NEILSON PERSONNEL OBSERVED THE BORROW AREA NEAR BUILDING 371. ONLY 1/3 OF PILE WAS ACCEPTABLE FOR FILL & MATERIAL THAT HAD RECENTLY BEEN PLACED WAS FROM THE ~~ELAYE~~ MORE CLAYEY SIDE. NIELSONS DIRECTED LOADER OPERATER TO ONLY REMOVE FROM GOOD SIDE OF PILE. BY 4:30PM, THE GOOD ALLUVIUM STOCKPILE WAS EXHAUSTED, A NEW BORROW AREA IS REQUIRED.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

LARGE BOULDERS IN BIOTA/ROCK LAYER MATERIAL

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

CHECK NEW ROCKY FLATS ALLUVIUM PLACED ON EAST END.

Copies to: John Rahe

Observer: Josh Valentine UNTIL 11AM / MARSHALL MASSARO AFTER 11AM

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 146

TETRA TECH RMC

TO: _____

_____

_____

Project No. 19-4886.001.00	Date 3-1-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 33 ° at 7:00 a.m. Temp. 49 ° at 3:30 p.m.	
Observation Period: 6:30am – 5:00pm	

EQUIPMENT: (1) Cat 825G, (1) Cat CS-583C, (2) Cat 14G, (3) Cat 633D, (1) Cat D6, (1) Cat D8 (2) Cat D6 LGP, (1) Cat 950B, (1) Cat 966F, (2) Cat 325L, (2) Cat Backhoe, (2) Cat Forklift (1) Watertruck, (1) Cat Track skid Loader, (1) Bobcat T300, (1) Hand tamper (2) Volvo A35C, (3) Volvo A30D

The contractor continued to place R.F. Alluvium as fill on the east face. The material from the 371 Borrow pile had some balls of clay, and was inspected and rejected for future material. The 371 pile may be used at a later date if more of the R.F. Alluvium with the sandy Clay is encountered. All of the R.F. Alluvium is being hauled from centennial today. The material is being placed in 1'- lifts and compacted with a min of 4 passes with the 825.

The contractor continued to place the rock layer with a D6 LGP. No other equipment was operating on the rock layer.

3-1-05

The 2" topsoil layer was started from the west end of the landfill. The material is being placed with a scraper from the stockpile and rough graded with a grader.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

~~None~~ JRJ

None

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 147

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 3-2-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 36 ° at 7:00 a.m. Temp. 49 ° at 5:00 p.m.	
Observation Period: 6:45am - 4:45pm	

EQUIPMENT: (1) Cat 825G, (1) Cat CS-583C, (2) Cat 14G, (3) Cat 613D, (1) Cat D6, (1) Cat D8 (2) Cat D6 LGP, (1) Cat 950B, (1) Cat 966F, (2) Cat 325L, (2) Cat Backhoe, (2) Cat Forklift (1) Cat tracked skid loader, (1) Bobcat T300, (1) water truck, (2) Volvo A35C (3) Volvo A30D, (1) Hand tamper.

The contractor continued to place RF Alluvium on the east face the material is being placed in 1'-lifts and compacted with a min of 4 passes with the 825. The material is being moisture conditioned as needed before being ~~compaction~~ compacted.

The contractor also continued to place the rock layer using a D6LGP. No other equipment is being operated on top of the rock layer. QA walked the rock layer and marked any segregated areas for repair. The marked areas were being fill with a layer of cushion material.

3-2-05

The 2" topsoil layer was continued. The material was being hauled from our original clear & grub pile with a scraper and rough graded with a grader. Trash and any other debris is being removed from the material.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

None

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 148

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 3-3-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 37 ° at 7:00 a.m. Temp. 51 ° at 2:00 p.m.	
Observation Period: 7:00am – 5:00pm	

EQUIPMENT: (1) Cat 825G, (1) Cat CS-583C, (2) Cat 14G (3) Cat 330, (1) Cat D6, (1) Cat D8 (2) Cat D6LGP, (2) Cat 325L, (1) Cat 950B, (1) Cat 966F, (2) Cat Backhoe, (2) Cat Forklift (1) Cat tracked skid loader, (1) Water truck, (1) Bobcat T300, (2) Volvo A35C (3) Volvo A30D, (1) Hand Tamper.

The contractor continued to place RF Alluvium on the east face. The material is being placed in 1'- lifts, moisture conditioned as needed and compacted with a min of 4 passes with the 825.

The contractor also continued to place the rock layer. The material is being placed with a D6 LGP, and no other equipment is operating on the rock layer.

The 2" layer was also continued. The material is being hauled from the original clear & grub pile. The material is being placed with a scraper and rough graded using a grader.

3-3-05

The segregated areas in the rock layer are being filled with cushion soil. The cushion material is very wet, so it will be reworked after it dries out enough to work down into the rock.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

None

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 149

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 3-4-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: CLEAR, CALM - BREEZY, ≈ 38°F - NO PRECIPITATION Temp. 38.5° at 0715 a.m. Temp. 54.2° at 1615 p.m.	
Observation Period: 0630 – 1615	

EQUIPMENT: (1) CAT 825 G, (2) CAT CS-583C, (2) CAT 14G, (3) CAT 633D, (1) CAT D8, (2) CAT D6LGP, (1) CAT D6 W/DISK, (1) CAT 950B, (1) CAT 966F, (2) CAT 325L, (2) CAT FORKLIFT, (2) CAT BACKHOE, (1) WATER TRUCK, (2) VOLVO A35C, (3) VOLVO A30D, (3) BOBCAT T300

PRIOR TO TODAY'S WORK, THE 22" RF ALLUVIUM WAS AT ≈ 20400E, THE ROCK LAYER WAS TO ≈ 20630E; AND 2" TOPSOIL LAYER WAS TO ≈ 20100E ON SOUTH SIDE OF PLF.

CONTRACTOR PLACED ~~ROCK LAYER~~ 22" ALLUVIUM MATERIAL ON THE NE EDGE OF ALLUVIUM/ROCK LAYER BORDER. MATERIAL WAS HAULED USING VOLVOS & SEMI TRAILERS (SIDE DUMPS) & PLACED USING A D6H DOZER & BLADE, LARGE ROCKS (12" +) WERE REMOVED FROM ALLUVIUM. ROCK LAYER WAS SURVEYED & RELEASED TO 20450E FOR 22" ALLUVIUM PLACEMENT.

CONTRACTOR CONTINUED TO PLACE RF ALLUVIUM ALONG THE EASTERN FACE. MATERIAL WAS HAULED USING VOLVO'S AND BELLY DUMPS. MATERIAL WAS PLACED USING A D8 DOZER, A D6 DOZER, A SHEEPSFOOT COMPACTOR, & A BLADE. SURVEYORS STAKED THE SLOPE SO MATERIAL COULD BE

3-4-05

PLACED TO GRADE.

T300 BOBCAT WAS UTILIZED TO PLACE CUSHION MATERIAL ON ROCK LAYER LOCATIONS WHERE SEGREGATION OCCURRED, AT LOCATIONS WHERE "ROCK DRAINS" WERE EVIDENT, ~2-3" OF CUSHION WERE PLACED. & COMPACTED USING THE T300.

PERIMETER TRENCH MATERIAL ON THE SE CORNER OF PLF WAS INSPECTED FOR USE AS ALLUVIUM OR TOPSOIL. THE WESTERN HALF OF MATERIAL CONTAINED TOO MUCH CLAY AND WAS WHITE (POSSIBLY $CaCO_3$) SO IT WAS DECIDED THAT MATERIAL WOULD NOT BE USED. THE EASTERN HALF WAS DARKBROWN TO BROWN, CONTAINED AGGREGATE, & CONTAINED VEGETATION, THIS MATERIAL, APPROXIMATELY 10-12 LOADS, WAS ACCEPTABLE FOR 2" TOPSOIL PLACEMENT

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

10 ROLLS OF GCL DO NOT MEET THE ~~SHRINK/SWELL~~ FREE SWELL SPECIFICATIONS, MAM 3/4/05 NEW GCL SAMPLES ARE BEING SENT DIRECTLY FROM THE MANUFACTURER TO ADVANCE TERRA TESTING FROM NEW GCL ROLLS TO BE USED ON SITE

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

RF ALLUVIUM IS BEING HAULED FROM CENTENNIAL PIT SO GRADATION MEETS SPECIFICATIONS, (NOT TOO CLAYEY OR ORGANIC)

Copies to: John Rahe

Observer: ~~Josh Valentine~~ MARSHALL MASSARO

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 150

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 3-5-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 37 ° at 7:30 a.m. Temp. 57 ° at 1:00 p.m.	
Observation Period: 8:00am - 2:00pm	

EQUIPMENT: (1) Cat 825G, (1) Cat CS-583C, (2) Cat 14G, (1) Cat D6e, (1) Cat D8, (2) Cat D6LGP (1) Cat 950B, (1) Cat 966F, (3) Cat 6330, (2) Cat 325L, (2) Cat Backhoe, (2) Cat Forklift (1) Cat Tracked skid loader, (1) Bobcat T300, (3) Volvo A30D, (2) Volvo A35C (1) water truck, (1) Hand tamper

The contractor continued to place RF Alluvium on the east face. The material is being placed in 1'- lifts and compacted with a min of 4 passes with the 825. The area was being surveyed and cut to grade using a dozer and the grader.

The contractor also continued to place the 22" RF Alluvium layer. The layer was being placed with a D6LGP.

No 2" or rock layer was placed today

3-5-05

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

None

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 151

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 3-7-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: PARTLY CLOUDY, BREEZY, ≈29°F-55°F NO PRECIPITATION	
Temp. 29.0 ° at 0705 a.m.	
Temp. 50.1 ° at 1645 p.m.	
Observation Period: 0630 - 1645	

EQUIPMENT: (1) CAT 825G, (1) CAT CS-583C, (2) CAT 14G, (3) CAT 633D, (1) CAT D6, (1) CAT D8, (2) CAT D6 LGP, (1) CAT 950B, (1) CAT 966F, (2) CAT 325L, (2) CAT BACKHOE, (2) CAT FORKLIFT, (1) WATERTRUCK, (1) CAT TRACK SKID LOADER, (1) BOBCAT T300, (1) HAND TAMPER, (2) VOLVO A35C, (3) VOLVO A30D

CONTRACTOR CONTINUED TO PLACE 22" ROCKY FLATS ALLUVIUM USING TWO D6R DOZERS & A966 LOADER. MATERIAL WAS HAULED USING VOLVOS AND SEMI TRAILERS (SIDE & END-DUMPS). MATERIAL WAS FROM THE CENTENNIAL PIT AND WAS OF A GOOD GRADATION. MATERIAL WAS PLACED TO AN APPROXIMATE STATION OF 2042SE.

CONTRACTOR GRADED THE NORTH & WEST SIDES OF THE EAST FACE TO MEET SLOPE REQUIREMENTS (4:1). A BLADE WAS UTILIZED FOR THIS PROCESS. NO NEW ALLUVIUM WAS ADDED TO THE EAST FACE.

FOR APPROXIMATELY 3 HOURS DURING THE DAY, A SCRAPER WAS UTILIZED TO PLACE TOPSOIL ON THE SW PORTION OF THE PLF.

3-7-05

AT ~~3~~ 3/7/05 MAM 1500, STATE, EPA, & KH OFFICIALS MET ON THE PLF TO DETERMINE COMPACTION OF THE 22" RF ALLUVIUM LAYER & THE 2" TOPSOIL LAYER, USING THE BLADE'S RIPPERS, TEST STRIPS WERE CREATED TO DETERMINE COMPACTION & RIPPER EFFECTIVENESS. ~~FINDINGS WE~~ MAM 3/7/05 TESTS SHOWED THAT RIPPING OCCURRED TO ≈ 9" & COMPACTION WAS HIGH ON THE 22" LAYER. A DECISION WAS MADE TO STOP 2" TOPSOIL PLACEMENT UNTIL THE 22" LAYER COULD BE CERTIFIED TO GRADE AND RIPPED. THEN ONCE THE 2" TOPSOIL LAYER IS PLACED, THE 2" & 22" LAYERS WILL BE RIPPED AS ONE TO AID IN THE REVEGETATION PROCESS.

CUSHION SOIL WAS PLACED ON "ROCK DRAINS" PRESENT IN THE 10" ROCK LAYER. AFTER PLACEMENT, CUSHION MATERIAL WAS DRIVEN INTO THE ROCK LAYER USING THE BOBCAT T300.

NEW ROLLS OF GCL (TO REPLACE THE 10 DEFECTIVE ROLLS) WILL BE MANUFACTURED ON TUESDAY, MARCH 8TH, SAMPLES ARE TO BE SENT DIRECTLY FROM ~~SCTCO~~ MAM (SP) CEPCO TO ADVANCE TERRA TESTING ON WEDNESDAY, MARCH 9TH FOR ARRIVAL BY THURSDAY OR FRIDAY. (PER COLORADO LINING)

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

NONE

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

NONE

Copies to: John Rahe

Observer: ~~Josh Valentine~~ MARSHALL MASSARO

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 152

TETRA TECH RMC

TO:

Project No. 19-4886.001.00	Date 3-8-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 33 ° at 10:00 a.m. Temp. 51 ° at 2:00 p.m.	
Observation Period: 7:00am - 4:30pm	

EQUIPMENT: (1)Cat 825G, (1)Cat CS-583C, (3)Cat 14G, (3)Cat 633D, (1)Cat D6, (1)Cat D8, (2)Cat D6LGP (2)Cat 325L, (1)Cat 950B, (1)Cat 966F, (2)Cat Backhoe, (2)Cat forklift, (1)Bobcat T300 (1)Cat tracked skid loader, (2)Volvo A35C, (3)Volvo A30D, (1) Watertruck, (1)Hand tamper

The contractor spent the day placing and ripping the 22" R.F. Alluvium layer. The material is being placed with a D6LGP. After placement it is finish graded and ripped 12" with a grader.

The contractor also started to remove the asbestos from outside the anchor trench on the south asbestos area. Approx. 20 bags were removed today.

The final proofroll was completed today on the asbestos areas. It was done with 2 complete passes with a loaded scraper. No soft areas were marked for repair

3-8-05

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 153

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 3-9-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 46 ° at 7:00 a.m. Temp. 51 ° at 3:00 p.m.	
Observation Period: 7:00am - 3:00pm	

EQUIPMENT: (1) Cat 825G, (1) Cat CS-583C, (3) Cat 14G, (3) Cat 633D, (1) Cat D6, (1) Cat D8, (2) Cat D6LGP (1) Cat 950B, (1) Cat 966F, (2) Cat 325L, (2) Cat Backhoe, (2) Cat Forklift, (1) Cat tracked skid loader (1) Watertruck, (1) Bobcat T300, (2) Volvo A35C, (3) Volvo A30D, (1) Hand tamper

The Contractor continued to place the 22" RF Alluvium layer with a D6LGP. The material was being placed, graded then ripped 12" prior to the placement of the 2" topsoil layer.

The contractor also continued to remove asbestos from the south east asbestos area outside of the anchor trench. The asbestos is being double bagged and placed into containers to be hauled off-site.

3-9-05

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

None

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 154

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 3-10-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: PARTLY CLOUDY, CLOUDY, BREEZY-WINDY, ≈48°F - 52°F, NO PRECIP, Temp. 48.0 ° at 1000 a.m. Temp. 48.8 ° at 1635 p.m.	
Observation Period: 1000 - 1635	

EQUIPMENT: (1) CAT 825G, (1) CAT CS-583C, (2) CAT 140, (3) CAT 633D, (1) CAT D6, (1) CAT D8, (2) CAT D6 LGP, (1) CAT 950B, (1) CAT 966F, (2) CAT 325L, (2) CAT BACKHOE, (2) CAT FORKLIFT, (1) WATER TRUCK, (1) CAT TRACK SKID LOADER, (1) BOBCAT T300, (1) HANDTAMPER, (2) VOLVO A35C, (3) VOLVO A30D

CONTRACTOR CONTINUED TO PLACE 2'2" ROCKY FLATS ALLUVIUM USING A D6 DOZER TO STATION 20600E. MATERIAL WAS HAULED USING VOLVO'S AND SEMI-TRAILERS (BELLY & SIDE DUMPS). MATERIAL WAS OF GOOD GRADATION & MOISTURE.

A 325 TRACKHOE & 966F LOADER WERE UTILIZED TO REMOVE ASBESTOS FROM THE NE AND SE PORTIONS OF THE LANDFILL. MATERIAL WAS BAGGED WHEN NECESSARY & PLACED INTO INTERMODALS FOR TRANSPORT OFF SITE. THE SE ASBESTOS AREA WAS FILLED WITH ROCKY FLATS ALLUVIUM, COMPACTED WITH AN 825, & REGRADED.

3-10-05

CONTRACTOR REMOVED ALLUVIUM FROM THE PASSIVE TREATMENT SYSTEM AREA TO GAIN ACCESS TO THE LEAKAGE OF SEEP WATER AROUND THE SYSTEM. THE TRENCH WAS APPROXIMATELY 30 FEET LONG, 8 FEET WIDE, & 10 FEET ~~FALL~~ MMM 3/10/05 DEEP. A TRENCH BOX IS TO BE PLACED INTO TRENCH FOR SAFETY.

QC (GOLDER) PERFORMED TWO BULK GRADATIONS ON THE 22" ROCKY FLATS ALLUVIUM. THE TWO STATIONS WERE #10009 AND #10055. EACH SAMPLE CONSISTED OF APPROXIMATELY 1 TO 1.5 TONS. GRADATIONS WERE PERFORMED IN AN ACCEPTABLE AND REPRESENTATIVE MANNER UNDER THE ~~SUAS~~ MMM 3/10/05 OBSERVANCE OF QA.

RECENTLY, EROSION CONTROL NETTING WAS DELIVERED TO THE PLF SITE. 288 ROLLS OF SC150 EROSION CONTROL NETTING (COCONUT & STRAW MIXTURE) AND 576 ROLLS OF C350 COMPOSITE TURF REINFORCEMENT MAT ~~WER~~ 3/10/05 MMM (COCONUT) WERE DELIVERED. THE COVERAGE FOR THE SC150 IS 497,664 FT^2 AND 207,360 FT^2 FOR THE C350.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

NONE

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

NONE

Copies to: John Rahe

Observer: ~~Josh Valentine~~ MARSHALL MASSARO

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 155

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 3-11-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: CLEAR, CALM-WINDY, ~42°F-60°F NO PRECIPITATION Temp. 41.9 ° at 0715 a.m. Temp. 59.9 ° at 1615 p.m.	
Observation Period: 0630 - 1615	

EQUIPMENT: (1) CAT 825G, (1) CAT CS-583C, (2) CAT 14G, (3) CAT 633D, (1) CAT D6, (1) CAT D8, (2) CAT D6LGP, (1) CAT 950B, (1) CAT 966F, (2) CAT 325L, (2) CAT BACKHOE, (2) CAT FORK LIFT, (1) WATER TRUCK, (1) CAT TRACK SKID LOADER, (1) BOBCAT T300, (1) HAND TAMPER, (2) VOLVO A35C, (3) VOLVO A30D

CONTRACTOR CONTINUED TO REMOVE ASBESTOS FROM THE NE ARM OF THE LANDFILL USING A 966F LOADER AND A 325 TRACKHOE. MORE MATERIAL NEEDS TO BE REMOVED FROM VICINITY. MATERIAL IS BEING PLACED IN INTERMODLES FOR TRANSPORT. THE HOLE CREATED IN THE SE ARM ASBESTOS AREA WAS FILLED WITH ROCKY FLATS ALLUVIUM USING A D6 DOZER AND AN 825 FOR COMPACTION.

CONTRACTOR BEGAN PLACING 6" CUSHION MATERIAL FROM HOLD POINT STATION 39800N SOUTH. MATERIAL WAS FROM THE CENTENNIAL PIT AND WAS OF GOOD GRADATION AND MOISTURE. MATERIAL WAS PLACED USING A D6R DOZER AND HAULED VIA VOLVOS AND SEMI-TRAILERS (BELLY AND ~~END~~ SIDE DUMPS). MAM 3/11/05 PRIOR TO 6" CUSHION PLACEMENT, SURFACE OF REGRADE WAS

3-11-05

SCARIFIED USING AN 825.

CONTRACTOR PLACED 2" TOPSOIL MATERIAL ON THE WESTERN SIDE SLOPES OF THE PLF. MATERIAL WAS DARK BROWN TO BLACK, ORGANIC, + WAS OF GOOD GRADATION. MATERIAL WAS PLACED USING A DBR DOZER + HAULED VIA VOLVOS.

22" ALLUVIUM WAS COMPLETED TO STATION 20600E THE PREVIOUS DAY. QC (GOLDER) PERFORMED THREE (3) BULK GRADATIONS ON THE 22" ALLUVIUM. LOCATIONS WERE RANDOMLY GENERATED, EACH LOCATION WAS APPROXIMATELY 3'*4'*20" (DEPTH) AND WEIGHED JUST OVER A TON. GRADATIONS WERE PERFORMED AT LOCATIONS 10084, 10137, AND 10165.

CONTRACTOR COMPLETED PLACEMENT OF TRENCH BOXES (2) TO SAFELY INVESTIGATE SEEP SYSTEM PROBLEMS. SEEP FLOW IS NOT ENTERING THE DESIGNED LOPE BOX + PASSING THROUGH THE PIPE. WATER IS PASSING THROUGH GRAVEL / SAND LAYERS SURROUNDING THE OUTLET PIPE.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

SMALL SOFT SPOT ON REGRADE SURFACE ON NORTH ARM OF ~~D~~ MAM 3/IVOS PLF. AREA IS APPROXIMATELY 4'*10FT.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

NONE

Copies to: John Rahe

Observer: ~~Josh Valentine~~ MARSHALL MASSARO

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 156

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 3-12-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 50 ° at 8:00 a.m. Temp. 63 ° at 3:45 p.m.	
Observation Period: 7:00am — 3:30pm	

EQUIPMENT: (1) Cat 825G, (1) Cat CS-583C, (3) Cat AG, (3) Cat 6330, (1) Cat D6, (1) Cat D8 (2) Cat D6LGP, (2) Cat 325L, (1) Cat 950B, (1) Cat 966F, (1) Cat skid loader, (2) Cat Backhoe (2) Cat Forklift, (1) Watertruck, (1) Hand tamper, (2) Volvo A35C (3) Volvo A30D (1) Bobcat T300

The contractor hauled 2" topsoil from the original borrow pile and placed it on the cap. The material was being rough graded as it was placed.

The contractor also excavated the strip drain sump and another pothole to look at the 2 main strip drains from the north side. The water appears to be running under the strip drains, and bypassing the sump by going under the liner and following the sump/pipe bedding. A meeting is scheduled for 3-14 to discuss posible solutions.

3-12-05

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

None

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 157

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 3-14-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: CLOUDY, BREEZY-CALM, ~25°F-30, LT SNOW ~2-3" OF SNOW ON GROUND Temp. 25.7° at 0715 a.m. Temp. 24.3° at 1645 p.m.	
Observation Period: 0630-1645	

EQUIPMENT: (1) CAT 825G, (1) CAT CS-583C, (2) CAT 140, (3) CAT 633D, (1) CAT D6, (1) CAT D8, (2) CAT D6LGP, (1) CAT 950B, (1) CAT 966F, (2) CAT 325L, (2) CAT BACKHOE, (2) CAT FORKLIFT, (1) WATER TRUCK, (1) CAT TRACK SKID LOADER, (1) BOBCAT T300, (1) HAND TAMPER, (2) VOLVO A35C, (3) VOLVO A30D

CONTRACTOR CONTINUED TO REMOVE ASBESTOS FROM THE NE ARM OF THE PLFULSING A325 TRACKHOE, MATERIAL WAS BAGGED AND PLACED IN INTERMODALS FOR TRANSPORT AND DISPOSAL.

CONTRACTOR FILLED IN THE HOLE ON THE EAST FACE USED TO LOCATE THE NORTHERN STRIP DRAIN. ROCKY FLATS ALLUVIUM OF ACCEPTABLE GRADATION WAS PLACED INTO HOLE AFTER REPAIRING TORN STRIP DRAIN. THE HOLE ~~SOUTH~~ MAM 3/14/05 / TRENCH CREATED TO LOCATE THE PASSIVE TREATMENT BOX IS STILL IN PLACE. A MEETING W/ STOLLER, EARTH TECH, KAISER-HILL, CRA, AND NIELSON SKANSKA WAS CONDUCTED TO DETERMINE OPTIONS FOR SEEP WATER BYPASSING THE FML BOX. THE OPTION OF LEAVING THE STRIP DRAINS AND FML BOX IN PLACE AND ALLOWING THE SEEP

3-14-05
#157

WATER TO FLOW THROUGH THE SAND/GRAVEL (OVER THE COMPACTED ALLUVIUM AND UNDER THE STRIP DRAIN), THE SEEP WATER WOULD THEN BE COLLECTED AS DISCHARGE THROUGH THE GRAVEL DRAIN RATHER THAN THE PIPE. THIS PROCEDURE WOULD ELIMINATE THE FML BOX. STATE AND FEDERAL OFFICIALS HAVE TO APPROVE PRIOR TO ANY FINAL DECISION.

CONTRACTOR CONTINUED TO PLACE 2" TOPSOIL ON THE SW SIDE SLOPES OF THE PLF. VOLVOS WERE UTILIZED TO HAUL THE MATERIAL AND A DOLGP DOZER PLACED THE MATERIAL. MATERIAL WAS OF GOOD GRADATION AND ORGANIC MATTER.

CONTRACTOR REMOVED SNOW FROM SE PORTION OF LANDFILL TO AID WITH DRYING THE 6" CUSHION AND REGRADE SOILS. THERE IS APPROXIMATELY 2-3" OF SNOW ACROSS THE SITE.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:
SOFT SPOT (≈5'*8') ON NE ARM OF PLF

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES: NONE

Copies to: John Rahe

Observer: ~~Josh Valentine~~ MARSHALL MASSARO

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 158

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 3/15/05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 30 ° at 7:00 a.m. Temp. 40 ° at 3:30 p.m.	
Observation Period: 7:00am - 5:00pm	

EQUIPMENT: (1) Cat 325C, (1) Cat CS-553C, (3) Cat 14G, (3) Cat 623D, (1) Cat D6, (1) Cat D8, (2) Cat D6LGP (1) Cat 950B, (1) Cat 966F, (2) Cat 325D, (1) Cat tracked skid loader, (2) Cat Backhoe, (2) Cat Forklift (1) watertruck, (1) Bobcat T300, (1) Hand tamper, (3) Volvo A35C, (3) Volvo A30D

The contractor continued to place the 22" R.F. Alluvium layer, and the 2" topsoil layer. The materials are being placed using a D6LGP, and finish graded using a grader.

The contractor also continued to remove asbestos from the northeast asbestos area outside of the anchor trench. The asbestos is being loaded into containers to be taken off site.

The contractor repaired the stripdrains on the north pothole. One stripdrain was patched with a piece of nonwoven geotextile, and the other by splicing a new piece @ the damaged area. The excavation was back filled with the 825. The material was placed in 1' max lifts and compacted with a

3-16-05

min of 4 passes with the 825. The sump for the stripdrains was also repaired. The low spot was removed in front of the sump and the liner adjusted so that the water was draining into the sump. The stripdrain was reconnected and covered with gravel and a piece of non woven geotextile. The trench boxes were removed but the excavation has not been back filled.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

None

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None JAW Soft spot noted on report # 157 is not significant enough for repair.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 159

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 3-16-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 36 ° at 8:00 a.m. Temp. 46 ° at 4:15 p.m.	
Observation Period: 7:00am – 6:00pm	

EQUIPMENT: (1)Cat 825G, (1)Cat CS-583C, (3)Cat 14G, (3)Cat 330D, (1)Cat D6, (1)Cat D8, (2)Cat D6LGP, (2)Cat 325L, (1)Cat 950B, (1)Cat 966F, (2)Cat Backhoe, (2)Cat Forklift, (1)Cat Tracked skid Loader, (1)Sheepsfoot Wheel for 325L, (1)Bobcat T300, (2)Volvo A35C, (3)Volvo A30D, (1)water truck, (1)Hand tamper.

The contractor continued to place and finish grade the 22" R.F. Alluvium layer. The material is being placed using a D6LGP, and finish graded using a grader.

The cushion soil on the east face was finish graded, but no new material was delivered.

The contractor also continued to remove asbestos from the northeast asbestos area and place it into removal containers. The asbestos is only being removed from the area outside of the liner anchor trench.

QC did 2 more large gradations on the R.F. Alluvium at the Centennial pit for comparison.

3-16-05

A new test fill was done to check the new sheepfoot wheel on the excavator. The fill was done in 2 1' lifts and compacted with 6 passes and test pitted. The test pit showed no large material and good compaction. The new sheepfoot wheel was used on the lower section of the strip drain seep excavation, and around the vertical pipes. The material was placed in 1' lifts and compacted with a min. of 6 passes with the wheel. The upper section of the excavation was compacted with the 825. The material was placed in 1' lifts and compacted with a min of 4 passes with the 825.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

None

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 160

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 3-17-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 33 ° at 7:00 a.m. Temp. 49 ° at 3:30 p.m.	
Observation Period: 6:45am - 3:30	

EQUIPMENT: (1)Cat 825G, (1)Cat CS-583C, (3)Cat 14G, (3)Cat 633D, (1)Cat D6e, (1)Cat D8, (2)Cat D6LGP (2)Cat 325L, (1)Cat 930B, (1)Cat 966F, (2)Cat Backhoe, (1)Cat tracked skid loader (1)Bobcat T300, (1) water truck, (1) Sheep foot wheel for Backhoe, (2) Volvo A35C (3)Volvo A30D, (1) Hand tamper, (2) Cat Forklift.

- The contractor continued to place the 22" RF Alluvium layer. The material is being placed with a D6LGP and finish graded using a grader. The 2" topsoil layer is also being finish graded on the west end, but no new material is being hauled.

The contractor also restarted the 6" cushion haul from LaFarge. The material is being placed on the south asbestos area towards the north. The material is being placed and rough graded. The material is over optimum moisture content so it is being allowed to dry as needed. No compaction has been done in this area @ this time.

3-17-05

The backfill placed in the northeast asbestos area was removed and replaced with some large rock and R.F. Alluvium to help stabalize the area.

The weekly meeting was held and the EPA, CDPHE, CTR & CQAE were there for the meeting and tour.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

None

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 161

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 3-18-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: PARTLY CLOUDY, BREEZY -WINDY ≈33°F-47°F Temp 033.1° at 0715 a.m. Temp. 46.1° at 1630 p.m.	
Observation Period: 0630 - 1630	

EQUIPMENT: (1) CAT 825G, (1) CAT CS-583C, (2) CAT 140, (3) CAT 633D, (1) CAT D6, (1) CAT D8, (2) CAT D6LGP, (1) CAT 950B, (1) CAT 966F, (2) CAT 325L, (2) CAT BACK HOE, (2) CAT FORKLIFT, (1) WATERTRUCK, (1) CAT TRACK SKID LOADER, (1) BOBCAT T300, (1) HAND TAMPER, (2) VOLVO A35C, (3) VOLVO A30D

CONTRACTOR CONTINUED TO PLACE 22" ALLUVIUM MATERIAL ON THE NORTH SIDE SLOPES OF THE PLF USING A D8 DOZER. MATERIAL WAS HAULED USING VOLVOS. A VISUAL INSPECTION OF THE ALLUVIUM MATERIAL PRESENTED A MATERIAL OF GOOD GRADATION. * ROCKY FLATS ALLUVIUM WAS PLACED OVER AREAS WHERE ASBESTOS WAS REMOVED FROM THE NE ARM OF THE PLF. MATERIAL WAS COMPACTED USING AN 825 SHEEPSFOOT ROLLER.

CONTRACTOR CONTINUED TO PLACE ROCKY FLATS ALLUVIUM ALONG THE NORTH HALF OF THE EAST FACE. TO BRING THE SLOPE TO GRADE. AFTER RELEASING THE NORTH HALF, AN 825 SHEEPSFOOT WAS UTILIZED TO SCARIFY THE FACE PRIOR TO 6" CUSHION PLACEMENT.

3-18-05

CONTRACTOR PLACED 6" CUSHION MATERIAL ON SE ARM OF LANDFILL USING A D6LGP DOZER. MATERIAL WAS HAULED USING SEMI TRAILERS (BELLY DUMPS). MATERIAL WAS OF GOOD GRADATION AND MOISTURE. CUSHION MATERIAL PLACED ON THE SOUTH HALF OF THE EAST WAS COMPACTED USING A CS-583C SMOOTH DRUM ROLLER. TWO PASSES WITH THE ROLLER WERE PERFORMED ACROSS THE SOUTH HALF OF THE FACE.

TWO 325 TRACKHOES WERE USED TO ~~THIN OUT~~ MAM 3/16/05 LESSEN THE THICKNESS OF THE TOPSOIL ALONG THE WEST HALF OF THE NORTH PLF SIDESLOPES. SOME LOCATIONS CONTAINED APPROXIMATELY 10" OF TOPSOIL.

CONTRACTOR UNLOADED 48→50 POUND BAGS OF MEDIUM CHIP BENTONITE TO BE USED FOR THE EAST SEEP PASSIVE TREATMENT SYSTEM.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK: NONE

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES: NONE

Copies to: John Rahe

Observer: ~~Josh Valentine~~ MARSHALL MASSARO

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 162

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 3-19-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 53 ° at 7:00 a.m. Temp. 61 ° at 4:00 p.m.	
Observation Period: 7:00am – 4:30pm	

EQUIPMENT: (1) Cat 825G, (1) Cat CS-583C, (3) Cat 14G, (3) Cat 633D, (1) Cat D6, (1) Cat D8, (2) Cat D6 LGP (1) Cat 950B, (1) Cat 966F, (2) Cat 325L, (2) Cat Backhoe, (2) Cat Forklift, (1) Cat tracked skid loader, (1) sheep foot wheel for backhoe, (1) water truck, (2) Volvo A35C, (3) Volvo A30D (1) Hand tamper, (1) Bobcat T300.

The contractor continued to place 6" cushion material on the east face and the asbestos areas. The material is being placed @ existing moisture, rough graded, finish graded then compacted. The south side of the east face was tested for moisture & density, and all tests taken were within specification. The anchor trench was being excavated on the south side of the east face @ the bottom of the slope.

3-19-05

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

None

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 163

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 3-21-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: CLOUDY, CALM - BREEZY, ≈ 33°F - 55°F LIGHT SNOW AND DRIZZLE DURING A.M. HOURS Temp. 33.7 ° at 0715 a.m. Temp. 51.1 ° at 1700 p.m.	
Observation Period: 0630 - 1700	

EQUIPMENT: (1) CAT 825G, (1) CAT CS-583C, (2) CAT 14G, (3) CAT 633D, (1) CAT D6, (1) CAT D8, (2) CAT D6LGP, (1) CAT 950B, (1) CAT 966F, (2) CAT 325 L, (2) CAT BACKHOE, (2) CAT FORKLIFT, (1) WATER TRUCK, (1) CAT TRACK SKID LOADER, (1) BOBCAT T300, (1) HANDTAMPER, (2) VOLVO A35C, (3) VOLVO A30D

CONTRACTOR COMPLETED ANCHOR TRENCHES ALONG THE SE ARM AND SE SLOPE TOE FOR LINER PLACEMENT. TRENCHES WERE CUT USING A 325 TRACKHOE & MATERIAL WAS HAULED OFF VIA A VOLVO. TRENCHES WERE 2' * 2' FOR THEIR ENTIRE LENGTH.

CONTRACTOR CONTINUED TO PLACE 6" CUSHION SOIL NORTH OF STATION 3980N USING A D6LGP DOZER AND A 14G BLADE. MATERIAL WAS HAULED USING VOLVOS AND SEMI TRAILERS (BELLY DUMPS). CUSHION MATERIAL WAS OF GOOD GRADATION AND MOISTURE.

CONTRACTOR CONTINUED TO PLACE 2" TOPSOIL MATERIAL UP TO STATION 19700E. MATERIAL WAS HAULED VIA VOLVOS

3-21-05

AND ~~PLACED USING~~ (mm 3/21/05) A 633D SCRAPER AND LEVELED USING A 966 LOADER AND A ~~BLADE~~ (146), MATERIAL WAS OF GOOD GRADATION AND ORGANIC MATTER. THE HOLD POINT FOR THE 2" MATERIAL IS AT ~~19700E~~ 20150 (mm 3/21/05). ALL 22" ROCKY FLATS ALLUVIUM HAS BEEN RELEASED UP TO ~~19700E~~ 20150 AND 2" TOPSOIL LAYER WAS ~~APPROVED~~ (mm 3/21/05) RELEASED UP TO 19700E ~~AS well.~~ (mm 3/21/05) ~~ONCE~~ CONTRACTOR BEGAN RIPPING THE 2"/22" LAYERS UP TO STATION 19700E USING A 146 ~~BLADE~~ (mm 3/21/05). RIPPING OCCURRED IN A CRISS-CROSS PATTERN (PERPENDICULAR).

COLORADO LINING CREW WAS ON-SITE TO BEGIN LAYING LINER. ONE PANEL OF GCL (CS-463, DN TYPE) AND ONE PANEL OF TEXTURED FML WERE PLACED IN AN EAST-WEST DIRECTION ALONG THE EAST FACE. LINING BEGAN IN THE UPPER TRENCH AND TERMINATED AT THE LOWER TRENCH. PRIOR TO DEPLOYING THE LINER, ~~THE~~ (mm 3/21/05) ~~PORTIONS OF THE~~ (mm 3/21/05) THE 6" CUSHION MATERIAL WAS ROLLED WITH THE CS-563C TO REMOVE EDGES GREATER THAN ½". THE ANCHOR TRENCH EDGES WERE SMOOTHED TO MINIMIZE THE ~~SHARPNESS~~ (mm 3/21/05) IMPACT TO THE LINER

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK: PORTIONS OF THE 6" CUSHION MATERIAL NEED TO BE ROLLED AND/OR RAKED TO ~~KOMPRESS~~ EDGES TO LESS THAN ½". REMAINING TRENCH EDGES MUST BE SMOOTHED AND MATERIAL REMOVED FROM TRENCHES PRIOR TO DEPLOYING LINER

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

NONE

Copies to: John Rahe

Observer: ~~Josh Valentine~~ MARSHALL MASSARO

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 164

TETRA TECH RMC

TO:

Project No. 19-4886.001.00	Date 3-22-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 38 ° at 8:00 a.m. Temp. 49 ° at 4:30 p.m.	
Observation Period: 6:15 am - 7:15 pm	

EQUIPMENT: (1) Cat 825G, (1) Cat CS-583C, (3) Cat 14G, (3) Cat 633D, (1) Cat D6, (1) Cat D8, (2) Cat D6LGP (1) Cat 950B, (1) Cat 966F, (2) Cat 325L, (2) Cat Backhoe, (2) Cat Forklift, (1) Cat tracked skid Loader (1) Bobcat T300, (1) watertruck, (2) Volvo A35C, (3) Volvo A30D, (1) Hand tamper, (1) Disc

The contractor finished ripping and discing the 2" layer up to the 19700 gridline. The 2" layer was released up to the 20150 gridline, but has not been ripped & disced. The contractor also continued to finish grade the 22" layer up to the 5980 line.

The anchor trench was continued around the southeast end of the east face (Top and bottom anchor trenches). The trench was cleared of any large debris and the edges cut as smooth as possible.

The liner crew placed GCL pannels S-464 to S-504 overlapped 6" on all edge seams and 24+" on all butt seams with granular bentonite. The crew also placed textured FML pannels P-121 to P-136, all were overlapped

3-22-05

6" and fusion welded. Trial seams were performed at the beginning of the day and at lunch prior to welding on the cap (they all passed).

QA+QC did nuclear density testing on more of the 6" cushion, all tests were within specification.

I visited and did the QA on the seed mixes @ the Arkansas Seed Company for reves of the P.L.F. Seed tags were collected and seed was mixed per the specs.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

None

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

~~None~~ The anchor trench was cleared of any large debris, & the 6" cushion was rolled or graded to remove any edges greater then ½".

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 165

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 3-23-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 29 ° at 7:00 a.m. Temp. 41 ° at 3:00 p.m.	
Observation Period: 6:40am - 5:15pm	

EQUIPMENT: (1) Cat 825G, (1) Cat CS-583C, (3) Cat 14G, (3) Cat 6330, (1) Cat D6 w/disc, (1) Cat D8 (2) Cat D6LGP, (2) Cat 325L, (2) Cat Backhoe, (2) Cat Forklift, (1) Cat 950B, (1) Cat 966F (1) Cat tracked skid loader, (1) Bobcat T300, (1) Water truck, (2) Volvo A35C (3) Volvo A30D (1) Hand tamper

The contractor continued to place & finish grade the 22" layer. The 22" layer was released up to the 20450. The 6" cushion material was also released from the 39800 gridline to the 39900 gridline. The anchor trench was continued at the top and bottom of the east face. The anchor trench was cleaned of any large debris and the ~~sides~~ edges smoothed as much as possible prior to the placement of liner.

The liner crew placed GCL (DN) panels S-505 to S-521. The edge seams were overlapped a min of 10" and all butt seams were overlapped a min of 24" with granular bentonite. Textured FML panels P137 to P144 were also placed and fusion welded. The welders

3-23-05

did test welds at the beginning of the day and at lunch, and all were passing prior to welding on the cap. No testing or repairs have been done on the east face at this time.

The anchor trench back fill was started @ the southeast corner of the east face. The material was placed in 1' max lifts and compacted with a hand tamper. Approximately 50' was completed.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

None

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 166

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 3-24-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 33 ° at 7:00 a.m. Temp. 33 ° at 4:00 p.m.	
Observation Period: 7:00am – 5:00pm	

EQUIPMENT: (1) Cat CS-583C, (3) Cat 14G, (3) Cat 6330, (1) Cat 950B, (1) Cat 966F, (1) Cat D6 w/ disc (2) Cat D6LGP, (2) Cat 325L, (1) Cat Backhoe, (2) Cat forklift, (1) Cat track loader (1) Cat tracked skid loader, (1) Bobcat T300, (2) Volvo A35C, (3) Volvo A30D (1) water truck, (2) Hand tampers.

The contractor spent the day hauling 2" topsoil layer toward the 20450 line. The contractor also continued to backfill the anchor trench from the southeast corner down the slope approximately 75'. The material is being placed in 1'-lifts and compacted using a handtamper.

The liner crew placed GCL panels S522 to S533 on the east face. The edge seams were overlapped a min of 6" and butt seams a min of 24" with granular bentonite. They also placed FML P145 to P149. All FML seams were overlapped 6" and fusion welded. Test welds were done at the beginning of the day and after lunch, and all were passing prior to welding on the cap.

3-24-05

The weekly meeting was held with the EPA, CDPHE, CTR & CRAE.

Work was slow today due to fog and snow.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

None

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 167

TETRA TECH RMC

TO:

Project No. 19-4886.001.00	Date 3-25-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 24 ° at 7:30 a.m. Temp. 45 ° at 3:00 p.m.	
Observation Period: 7:00am – 8:45am	

EQUIPMENT: (1) Cat CS-583C, (3) Cat 14G, (3) Cat 633D, (1) Cat D6 w/disk, (2) Cat D6LGP (1) Cat 950B, (1) Cat 966F, (2) Cat 325L, (1) Cat backhoe, (1) Cat Forklift, (1) Cat track loader, (1) Cat tracked skid loader, (1) Bobcat T300, (1) Watertruck, (2) Volvo A35C (3) Volvo A300, (2) Hand tampers.

The site was shut down first thing in the morning due to snow & ice. No work was done today. The contractor will no be back on-site until 3-28-05 due to weather.

3-25-05

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

None

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 168

TETRA TECH RMC

TO:

Project No. 19-4886.001.00	Date 3-28-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: CLOUDY, CALM - WINDY, ≈44°F - 72°F NO PRECIP.	
Temp. 44.6° at 0655 a.m.	
Temp. 68.9° at 1645 p.m.	
Observation Period: 0630 - 1645	

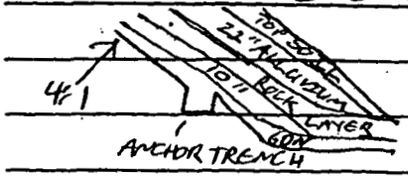
EQUIPMENT: (1) CAT 825 G, (1) CAT CS-583C, (3) 14G, (3) CAT 633D, (1) CAT D6 w/ DISC, (1) CAT D8, (2) CAT D6 LGP DOZER, (2) CAT 325L TRACKHOE, (2) CAT BACKHOE, (2) CAT FORKLIFT, (1) CAT 950 B, (1) CAT 966F, ~~[illegible]~~ MM (1) 953C TRACK LOADER, (1) BOBCAT T300, (1) WATERTRUCK, (2) VOLVO A35C, (3) VOLVO A30D, (1) HAND TAMPER

NIELSONS-SKANSKA PERSONNEL WERE NOT ON SITE AS A RESULT OF A 3-DAY EASTER WEEKEND.

COLORADO LINING CREW WAS ONSITE TO WORK ON FML-T REPAIRS & OTHER TESTING. ALL ~~[illegible]~~ MM 3/28/05 PRESSURE TESTS, REPAIR BEADS/WELDS WERE COMPLETED FOR THE LINER ON THE SOUTH HALF OF THE EAST FACE. DESTRUCTIVE TEST PANELS WERE PULLED (DP-078 THROUGH DP-083) AND ALL PASSED SPECIFICATIONS. PATCHWORK AND VACUUM TESTING WAS PERFORMED ON ALL LINER EAST OF AND INCLUDING PANEL P-127. GDN CAN BE PLACED UP TO THIS POINT ONCE ADDITIONAL CUSHION SOIL IS PLACED INTO THE LOWER ANCHOR TRENCH. APPROXIMATELY 3 TO 10 INCHES OF CUSHION NEED TO BE PLACED IN ORDER TO SMOOTH OUT THE INTERFACE

3-28-05

BETWEEN THE FML-T AND THE REGRADE/ALLUVIUM SURFACE. GDN PLACEMENT WILL BEGIN ON TUESDAY, MARCH 29 TO A POINT APPROXIMATELY 20-22 FEET FROM THE CENTERLINE OF THE LOWER ANCHOR TRENCH. THIS WILL ALLOW THE GDN TO END WITHIN THE ROCK LAYER, NOT THE 10" CUSHION.



SEED APPLICATION CALIBRATION OCCURRED ON THE TRUAX MODEL FLXII-818 ~~BEGINNING~~ MAR 31/2005, SEEDING PERSONNEL, K-H, EPA CONSULTANT (DAVE BUCKNER), & TETRA TECH RMC WERE PRESENT TO CALIBRATE THE APPLICATOR TO A SMALL SEED BOX MIX, COOL SEED BOX MIX, AND A FLUFFY SEED BOX MIX. THE TARGET APPLICATION RATES FOR THE SMALL SEED BOX (SSB) & THE FLUFFY SEED BOX MIX (FSB), 0.8 LBS/AC AND 3.72 LBS/AC, RESPECTIVELY, COULD NOT BE ACHIEVED. THE MINIMUM SETTING ON THE APPLICATOR PERMITTED 1.09 LBS/AC AND 6.81 LBS/AC FOR SSB AND FSB, RESPECTIVELY, IT WAS AGREED UPON THAT THIS QUANTITY WAS PERMISSABLE, THE TARGET APPLICATION FOR THE COOL SEED BOX MIX (CSB) WAS 9.3 LBS/AC, AFTER SEVERAL TRIALS, AN APPLICATION OF 8.87 LBS/AC WAS DETERMINED TO BE ACCEPTABLE ~~FOR APPLICATION~~ MAR 31/2005.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

DESTRUCTS/VACCUUM TESTS WEST OF P-127 (FML-T), NEED TO PLACE ADDITIONAL CUSHION INTO TOE SLOPE ANCHOR TRENCH TO SMOOTH OUT FML-T AND ANCHOR TRENCH INTERFACE.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

EAST FACE, TOE ANCHOR TRENCH, DESTRUCTIVE TESTS; PRESSURE TESTS WEST OF P-127

Copies to: John Rahe

Observer: ~~Josh Valentine~~ MARSHALL MASSARO

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 169

TETRA TECH RMC

TO: _____

Project No: 19-4886.001.00	Date 3-29-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 44 ° at 6:30 a.m. Temp. 76 ° at 4:15 p.m.	
Observation Period: 6:20am – 5:15pm	

EQUIPMENT: (1) Cat CS-583C, (3) Cat 633D, (3) Cat 14G, (2) Cat D6LGP, (1) Cat D6 w/disk, (1) Cat 950B (1) Cat 966F, (2) Cat 325L, (1) Cat Backhoe, (1) Cat tracked loader, (1) Cat tracked skid loader, (1) Bobcat T300, (1) Cat Forklift, (2) Volvo A35C, (6) Volvo A30D, (1) water truck (2) Hand tampers.

The contractor continued to finish grade the 2" topsoil layer, and it was released up to the 20300 grid line for ripping & disking. Ripping was started in this area but none was completed for seeding. The contractor also continued to finish grade the 6" cushion layer on the northeast end of the east face. The cushion was also smoothed and prepped for liner on the south half of the top "flat" section from the 5980 line to the top anchor trench.

The lower anchor trench was backfilled from the southeast corner to just North of the seep collection cleanout pipes. The material was placed in 12" minus lifts and compacted with hand tampers. QC took nuclear moisture density tests on the anchor trench as well

3-29-05

as some on the northern half of the east face, and all were within specification.

The liner crew placed GCL DN pannels S 524 to S 539 on the east face. The edge seams were overlapped 6" min and butt seams 24" min with granular bentonite. FML pannels P150 to P153 were also placed on the east face. The seams were overlapped 6" and fusion welded. Test welds were done and passed all testing prior to welding on the cap. No repairs or testing has been done on these pannels. GDN pannels T431 to T473 were placed starting on the south east corner to the north on the east face. The edge seams were overlapped 6", tied every 5' then sewn. The butt seams were overlapped 24" & and tied every 12", but no cap strips have been leistered on top at this time. GDN was extended 19'-20' below anchor trench.

The seeding crew planted seed on just under an acre on the far west end using the drilling machine.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

None

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

More cushion material was placed, as well as coder temps smoothed out interface west of P-127

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

OBSERVATION REPORT NO. 170

TETRA TECH RMC

TO: _____

_____

_____

Project No. 19-4886.001.00	Date 3/30/05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 34 ° at 7:00 a.m. Temp. 33 ° at 4:30 p.m.	
Observation Period: 6:25 am - 5:00 pm	

Equipment: (1) Cat CS-583C, (3) Cat 14G, (3) Cat 1e330, (2) Cat D6LGP, (1) Cat D6 w/ Disk (1) Cat 950B, (1) Cat 966F, (2) Cat 325L, (1) Cat Backhoe, (1) Cat Forklift, (2) Hand tampers (1) Cat track loader, (1) Cat tracked skid loader, (1) Bobcat T300, (1) Watertruck (2) Volvo A35C, (3) Volvo A30D

The contractor continued to rip and disk the 2" layer both directions up to the 20450 grid line. The seeding crew drill seeded approx. 1 more acre on the west end of the cap and hydro mulched the seed placed on 3/29/05.

The dirt crew started to place the 10" cushion material on the southeast corner of the east face. The material was placed on the flat area on top then using the track loader a small section on the 4/1 slope. The crew also started to excavate the area for the manholes and the seep treatment system.

Copies to:

Observer: Josh Valentine

Reviewing Engineer: John Rahe

3/30/05

The liner crew placed GDN panels T475 to T491 on the east face. The edge seams were overlapped 6", tied every 5' and the nonwoven sewn shut. The butt seams were overlapped 24" and tied every 12" with a capstrip / sistered over the top. GCL ST panels ~~or~~ S540 to S516 were placed from the 5980 line toward the east face on the south side. The edge seams were overlapped 6" and the butt seams 24" with granular bentonite. Smooth FML panels P154 to P1162 were placed on top of the GDN ST. The edges were overlapped 6" and fusion welded. Test welds were done ~~and~~ and passing prior to weldings on the cap. No testing or repairs were done on panels P154 to P1162.

GCh MAH 4/1/05

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

None

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 171

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 3/31/05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 31 ° at 8:00 a.m. Temp. 44 ° at 4:30 p.m.	
Observation Period: 7:00am – 5:40pm	

EQUIPMENT: (1) Cat CS-583c, (3) Cat 14G, (3) Cat 633D, (1) Cat D8 w/disk, (2) Cat D6LGP (1) Cat 950B, (1) Cat 966F, (1) Cat trackloader, (2) Cat 325L, (1) Cat tracked skidloader, (1) Cat Backhoe, (1) Cat forklift, (1) Bobcat T300 (1) Watertruck, (2) Hand tampers, (2) Volvo A35C, (3) Volvo A30D

The contractor continued to place 10" cushion from the southeast corner to the north. The material was being hauled with a volvo, pushed down the previously placed 10" then placed from the bottom up with the track loader. The anchor trench was backfilled from the 5980 line to the east approx 100' on the south side. The material was being placed in 12"~ lifts and compacted with a hand tamper.

The liner crew completed all the testing and repairs on FML Panels P154 to P162 as well as the 2 northern panels of textured on the east face. All tests were passing including all pressure and vacuum tests. Test welds were done in the

3/31/05

morning and after lunch with the extrusion welders, and all were passing prior to welding on the Cap.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

None

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 172

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 4/1/05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: CLEAR, CALM-WINDY, ~36F-58F NO PRECIP.	
Temp. 36.0 ° at 0705 a.m.	
Temp. ____ ° at ____ p.m.	
Observation Period: 0630 -	

EQUIPMENT: (1) CAT CS-583C, (3) CAT 146, (3) CAT 633D, (1) CAT D6 W/DISC, (2) CAT D6 LGP, (1) CAT 950B, (1) CAT 966F, (1) CAT TRACKLOADER, (2) CAT 325L, (1) CAT TRACKED SKID LOADER, (1) CAT BACKHOE, (1) CAT FORKLIFT, (1) BOBCAT T300, (1) WATER TRUCK, (2) HAND TAMPERS, (2) VOLVO A35C, (3) VOLVO A30D, (1) FLX-II DRILL SEEDER W/ TRACTOR, (1) MULCHER TRUCK

COLORADO LINING WAS ONSITE TO PLACE LINER ON THE SE ARM OF THE LANDFILL, SOUTH OF 39850N AND EAST OF ~~THE 5760~~ MM 4/1/05 20700E. GCL WAS PLACED TO PANEL S-590, COMPLETING THE SOUTH HALF. SEAMS WERE OVERLAPPED 6" ON EDGES AND 2 FEET AT BUTT SEAMS. GRANULAR BENTONITE ADDED AT BUTT SEAMS. 60ML WAS PLACED TO PANEL P-172, COMPLETING THE SOUTH HALF. SEAMS WERE WELDED, PRESSURE TESTED, AND VACUUM TESTED WHERE REQUIRED. ALL TESTS PASSED. GDN WAS PLACED TO PANEL T-517. EDGE SEAMS WERE ZIP TIED EVERY 5 FEET AND SEWN TOGETHER. BUTT SEAMS WERE ZIP TIED EVERY 1 FOOT AND OVERLAIN BY A NON WOVEN GEOSYNTHETIC MM ~~THE~~ LEISTER WELDED TO THE GDN. APPROXIMATELY 4 PANELS WERE NOT COMPLETELY FINISHED BY THE END OF THE DAY. WORK IS TO BE COMPLETED ON SATURDAY, APRIL 2.

4-1-05

CONTRACTOR PLACED 10" CUSHION MATERIALS ON THE SOUTH HALF OF THE EAST FACE (SOUTH OF 39850N), MATERIAL WAS HAULED VIA VOLVOS AND PLACED USING A D6H DOZER AND TRACK LOADER. NO TIRE VEHICLES WERE PERMITTED ON THE FACE. CUSHION MATERIAL WAS OF GOOD GRADATION AND MOISTURE. CONTRACTOR FILLED IN THE SOUTH PERIMETER TRENCHES WITH CUSHION SOILS IN 12" LIFTS AND COMPACTED USING A HAND TAMPER. MORE ANCHOR TRENCH WAS DUG USING A 325 TRACK HOE ON THE NORTH HALF CREST.

QA AND QC PERFORMED DENSITY TESTS ON THE NORTH SIDE OF THE EAST FACE (NORTH OF 39850N). ALL TESTS PASSED DENSITY AND MOISTURE SPECIFICATIONS. TWO SAND CONE TESTS WERE PERFORMED BY QC AT CL-200 AND CL-209.

SEEDING CREW COMPLETED SEEDING TO 20150 EAST USING THE FLX-II DRILL SEEDER. CREW CONTINUED TO PLACE MULCH ALONG THE WESTERN PORTION OF LANDFILL TO A MAXIMUM EASTING OF 19800E.

D6H DOZER W/ DISK WAS DISCING CAP EAST OF 20150E.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

NONE

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

NONE

Copies to: John Rahe

Observer: ~~Josh Valentine~~ MARSHALL MASSARO

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 173

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 4/2/05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: PARTLY CLOUDY ~~MISTY~~ mm 40's, CALM - WINDY Temp. 46.8 ° at 0700 a.m. ~47°F-67°F, NO PRECIP. Temp. 67.1 ° at 1615 p.m.	
Observation Period: 0620 - 1615	

EQUIPMENT: (1) CAT CS-583C, (3) CAT 14G, (3) CAT 6330, (1) CAT D6 W/DISC, (2) CAT D6L6P, (1) CAT 950 B, (1) CAT 966F, (1) CAT TRACKLOADER, (2) CAT 325 L, (1) CAT TRACKED SKID LOADER, (1) CAT BACKHOE, (1) CAT FORKLIFT, (1) BOBCAT T300, (1) WATER TRUCK, (2) HAND TAMPERS, (2) VOLVO A35C, (3) VOLVO A30D, (1) FLX-II DRILL SEEDER W/TRACTOR, (1) MULCHER TRUCK

SEEDING CREW WAS ONSITE TO SEED PORTIONS OF THE PLF BETWEEN 201SOE AND 204SOE USING THE FLX-II DRILL SEEDER. SEEDING CREW CONTINUED TO MULCH THE CAP TO A MAXIMUM EASTING OF 200SOE AT A RATE OF 3,500 LBS/ACRE.

CONTRACTOR COMPLETED THE 6" CUSHION ON THE NORTH HALF OF THE EAST FACE. SURFACE WAS SMOOTH DRUM ROLLED AND FREE OF EDGES OF 1/2 INCH OR GREATER. TRENCHES WERE CONSTRUCTED (2'*2') ALONG THE CREST OF THE NORTH 1/2 FACE, ALONG THE NORTHERN EDGE OF THE 6", AND ALONG THE EASTERN EDGE OF THE 6" CUSHION. SOME ASBESTOS WAS REMOVED FROM THE NE CORNER WHILE TRENCHING. TRENCHING WAS PERFORMED WITH A 325 TRACKHOE.

4-2-05

CONTRACTOR CONTINUED TO PLACE 10" CUSHION MATERIAL ALONG THE SOUTH HALF OF THE EAST FACE TO ≈ 39850N. PLACEMENT WAS PERFORMED USING A953C, 06H, & 146 AND MATERIAL WAS HAULED USING VOLVOS. ADDITIONAL 10" CUSHION MATERIAL WAS PLACED BETWEEN 20700E AND 20800E ON THE CAP OF THE PLE USING A966F LOADER. MATERIAL WAS HAULED USING VOLVOS, MATERIAL WAS OF GOOD MOISTURE AND GRADATION.

COLORADO LINING COMPLETED THE GDN PLACEMENT ON THE SOUTH HALF OF THE CAP. ALL DEFECTS WERE PATCHED WHERE NECESSARY. ALL SIDE SEAMS WERE ZIPTIED EVERY 5' AND SEWN. ALL BUTT SEAMS WERE ZIPTIED EVERY FOOT & ~~LEISIG~~ MAM 4/11/05 PATCHED. CREW BEGAN PLACING GCL (BENTOMAT DN) NORTH OF THE 39850N LINE TO ≈ 40050N AND COVERING GCL WITH FML-T. GCL AND FML WAS ~~OVERLAP~~ MAM 4/11/05 APPLIED ACCORDING TO SPECIFICATIONS, ALL GCL WAS COVERED PRIOR TO DAYS END. ALL TRENCHES WERE FREE OF DEBRIS / CLODS PRIOR TO PLACEMENT OF LINER.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

NONE

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

NONE

Copies to: John Rahe

Observer: ~~Josh Valentino~~ MARSHALL MASSARO

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 174

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 4/3/05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: CLOUDY - PARTLY CLOUDY MAM 4/3/05, CALM - WINDY ~55°F - 68°F, NO PRECIP.	
Temp. 553 ° at 0855 a.m.	
Temp. 661 ° at MAM 4/3/05 1515 p.m.	
Observation Period: 0715 - 1515	

EQUIPMENT: (1) CAT CS-583C, (3) CAT 146, (3) CAT 633D, (1) CAT D6 W/ DISC, (2) CAT D6LGP, (1) CAT 950B, (1) CAT 966F, (1) CAT TRACKLOADER, (2) CAT 325L, (1) CAT TRACKED SKID LOADER, (1) CAT BACKHOE, (2) CAT FORKLIFT, (1) (2) MAM 4/3/05 BOBCAT T300, (1) WATER TRUCK, (2) HAND TAMPERS, (2) VOLVO A35C, (3) VOLVO A30D, (1) FLX-II DRILL SEEDER W/ TRACTOR, (1) MULCHER TRUCK

NIELSONS - SKANSKA CREW IS NOT ON SITE TODAY, STOLLER, GOLDER, TETRA TECH RMC, COLORADO LINING, & PARAGON ARE ON SITE.

COLORADO LINING CONTINUED TO PLACE LINER NORTH OF ~4005ON ON THE EAST FACE AND THE NE ARM. ALL AREA EAST AND SOUTH OF THE CREST ANCHOR TRENCH WAS COVERED. GCL (BENTOMAT DN) WAS PLACED ON ALL ~~FACE~~ MAM 4/3/05 EAST FACE SLOPES. GCL (BENTOMAT ST) WAS PLACED ON THE TOP OF THE NE ARM. ALL GCL WAS PLACED ACCORDING TO SPECIFICATIONS WITH A MINIMUM OF 8" OVERLAP AT EDGES AND 2FT MINIMUM OVERLAP AT ALL BUTT SEAMS. ALL BUTT SEAMS WERE SEALED WITH GRANULAR BENTONITE. GCL WAS PLACED TO PANEL S-656. FML-T (MAM CAS HIGHEST ASPERITY UP) WAS PLACED OVER THE GCL, ALL SEAMS WERE WELDED ACCORDING

4-3-05

TO SPECIFICATIONS. FML-T WAS PLACED TO PANEL P-197A, ALL FML HAS BEEN PLACED EAST AND SOUTH OF THE NE ARM CREST ANCHOR TRENCH. ALL TRENCHES WERE CLEARED OF DEBRIS AND ALL 6" CUSHION WAS FREE OF EDGES GREATER THAN ½ INCH PRIOR TO LINER PLACEMENT. NO REPAIRS OR TESTING WAS PERFORMED ON THE LINER TODAY.

HOLD POINTS ARE FOLLOWING (APPROXIMATELY):

10" ROCK LAYER = 20600E

22" ROCKY FLATS ALLUVIUM = 20550E

2" TOPSOIL = 20470E

SEEDING + MULCHING = ~~20470E~~ MAM 4/5/05 20150E

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

NONE

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

NONE.

Copies to: John Rahe

Observer: ~~Josh Valentine~~ MARSHALL MASSARO

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 175

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 4/4/05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: PARTLY CLOUDY, CALM - BREEZY Temp. 48.4 ° at 0700 a.m. 24HR F-65, NO PRECIP. Temp. 65.3 ° at 1630 p.m.	
Observation Period: 0620-1630	

EQUIPMENT: (1) CAT CS-583C, (3) CAT 146, (3) CAT 633D, (1) CAT D6 W/DISC, (2) CAT D6 LGP, (1) CAT 950 B, (1) CAT 966F, (1) CAT TRACK LOADER, (2) CAT 325 L, (1) CAT TRACKED SKID LOADER, (1) CAT BACKHOE, (2) CAT FORK LIFT, (1) BOBCAT T300, (1) WATER TRUCK, (2) HAND TAMPERS, (2) VOLVO A35C, (3) VOLVO A30D, (1) FLX-II DRILL SEEDER W/ TRACTOR, (1) MULCHER TRUCK

NEILSONS-SKANSKA CONTINUED TO PLACE 10" CUSHION MATERIAL FROM CENTENNIAL ALONG THE TOP OF THE SE PORTION OF THE PLF. CUSHION MATERIAL WAS HAULED VIA VOLVOS AND WORKED USING A 966F LOADER, 146 BLADE, AND A CAT TRACKED LOADER. MATERIAL WAS OF GOOD GRADATION AND MOISTURE. SOME ROCKS WERE PRESENT, BUT WERE REMOVED WHEN LOCATED. THE CREST ANCHOR TRENCH ON THE SOUTH HALF WAS FILLED WITH 4" OF 3/4" DRAIN ROCK PRIOR TO PLACING A 4" CORRUGATED FRENCH DRAIN PIPE ON ~~GRAVEL~~ MAM 4/4/05 ROCK. THE REMAINDER OF THE TRENCH WAS THEN FILLED WITH 3/4" ROCK AND COVERED WITH A NON WOVEN GEOTEXTILE. ONCE COVERED, 18" CUSHION WAS PLACED OVER GEOTEXTILE. ADDITIONAL PLACEMENT OF CUSHION MATERIAL WAS PLACED IN THE NORTH, EAST,

AND SOUTH ANCHOR TRENCHES SURROUNDING THE NE ARM & FACE. MATERIAL WAS PLACED IN 8" TO 12" LIFTS AND COMPACTED USING A HAND TAMPER. QA/QC PERFORMED DENSITY TESTING TO VERIFY COMPACTION AND MOISTURE. ALL TESTS WERE WITHIN SPECIFICATION.

COLORADO LINING PLACED GCL AND FML ON THE EXPOSED 6" CUSHION NORTH & WEST OF THE NORTH HALF'S CREST ANCHOR TRENCH. ALL LINING WAS PLACED ACCORDING TO SPECIFICATIONS. AFTER COMPLETING THIS PARCEL, ALL FML AND GCL WAS PLACED FOR THE PLF. LINING CREW PERFORMED ALL PRESSURE AND VACUUM TESTING, BEADS, PATCHING, AND WELDED ALL SEAMS. ALL LINER (FML) IS COMPLETE, GRANTED THE DESTRUCTIVE TESTS PASS, THESE WILL BE PERFORMED ON TUESDAY, APRIL 5. LINER WAS PLACED TO GCL, ~~BS-665~~ AND FML, P-202.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

NONE

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

NONE

Copies to: John Rahe

Observer: ~~Josh Valentine~~ MARSHALL MASSARO

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 176

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 4/5/05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: CLOUDY, WINDY, ~ 45°F-54°F Temp. 44.1° at 0715 a.m. VERY LIGHT RAIN FOR 1 HOUR DURING AM. Temp. 54.0° at 1630 p.m.	
Observation Period: 0630 - 1630	

EQUIPMENT: (1) CAT CS-583C, (3) CAT 14G, (3) CAT 633D, (1) CAT D6 W/DISC, (2) CAT D6LGP, (1) CAT 950B, (1) CAT 966F, (1) 953C TRACK LOADER, (2) CAT 325L, (1) CAT TRACKED SKID LOADER, (1) CAT BACKHOE, (2) CAT FORKLIFT, (1) BOBCAT T300, (1) WATER TRUCK, (2) HAND TAMPERS, (2) VOLVO A35C, (3) VOLVO A30D, (1) FLX-II DRILL SEEDER W/ TRACTOR, (1) MULCHER TRUCK

CONTRACTOR CONTINUED TO PLACE 10" CUSHION MATERIAL FROM CENTENNIAL AND LAFARGE ON THE SE ARM OF THE PLF. CUSHION WAS PLACED EAST OF THE 5980 LINE AND SOUTH OF THE 39850 GRIDLINE ON THE TOP ONLY. CUSHION MATERIAL WAS HAULED USING VOLVOS AND BELLY DUMP SEMI-TRUCKS AND WAS PLACED USING A 966F LOADER AND A 14G BLADE. ALL CUSHION MATERIAL WAS OF GOOD GRADATION AND MOISTURE.

CUSHION SOIL WAS PLACED INTO THE REMAINING ANCHOR TRENCH AT THE BASE OF THE NORTH SIDE OF THE EAST FACE. MATERIAL WAS PLACED IN 12" LIFTS AND COMPACTED USING

A HAND TAMPER.

A PORTION OF THE 10" CUSHION ON THE EAST FACE WAS TESTED FOR COMPACTION AND MOISTURE. ALL TESTING RESULTED IN PASSING VALUES AND 10" CUSHION WAS RELEASED FOR THE EAST FACE, SOUTH OF THE 39750 GRIDLINE. ONCE RELEASED, CONTRACTOR BEGAN PLACING ROCK LAYER MATERIAL ON THE EAST FACE, SOUTH OF THE 39750 GRIDLINE. MATERIAL WAS HAULED USING VOLVOS AND PLACED USING A D6LGP DOZER AND A 953C TRACK LOADER. PLACEMENT WAS PERFORMED IN A MANNER TO MINIMIZE SEGREGATION OF THE LARGER ROCKS AND FINES. NO "ROCK DRAINS" WERE PRESENT IN THE ≈100 FEET PLACED.

CONCRETE FORM CREW WAS ON SITE TO FORM THE CONCRETE DROP STRUCTURE ~~ON~~ REQUIRED IN THE SEEP AREA. QC/QA IS TO BE PERFORMED ON STRUCTURE ONCE FORMING IS COMPLETE.

D6 W/ DISC IS DISKING SIDESLOPES OF PLF AND CAP BETWEEN STATIONS 20150 AND 20450E

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

NONE

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

NONE

Copies to: John Rahe

Observer: ~~Josh Valentine~~ MARSHALL MASSARO

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 177

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 4/6/05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: CLEAR, CALM - WIND 0 MPH, ~33°F TO 66°F, NO PRECIP. Temp 32.9 ° at 0710 a.m. Temp 66.4 ° at 1725 p.m.	
Observation Period: 0630-1725	

EQUIPMENT: (1) CAT CS-583C, (3) CAT 146, (3) CAT 633D, (1) CAT D6 W/DISC, (2) CAT D6 LGP, (1) CAT 950B, (1) CAT 966F, (2) 953C TRACK LOADER, (2) CAT 325L, (1) CAT TRACKED SKID LOADER, (1) CAT BACKHOE, (1) ~~(2)~~ MAN CAT FORKLIFT, (1) BOBCAT T300, (1) WATER TRUCK, (2) HAND TAMPERS, (2) VOLVO A35C, (3) VOLVO A30D, (1) FLX-II DRILL SEEDER W/ TRACTOR, (1) MULCHER TRUCK, (1) D5M LGP DOZER

CONTRACTOR CONTINUED TO PLACE 10" CUSHION MATERIAL ON THE SE ARM AND THE EAST FACE, SOUTH OF THE 39850 GRIDLINE. MATERIAL WAS HAULED USING VOLVOS AND BELLY DUMP SEMI-TRUCKS. D6 AND 953C TRACK LOADER PLACED CUSHION ~~ACR~~ MAN DOWN THE EAST FACE. A966F LOADER AND A146 BLADE PLACED AND GRADED THE SE ARM. CUSHION MATERIAL WAS OF GOOD GRADATION AND MOISTURE.

CONTRACTOR CONTINUED TO PLACE ROCK LAYER MATERIAL ON THE FACE SOUTH OF THE 39750 GRIDLINE. MATERIAL WAS HAULED USING VOLVOS AND PLACED USING A D5M LGP DOZER AND A 953C TRACK LOADER. MATERIAL WAS DUMPED ON THE CAP, SCOOPED UP

BY THE 953C AND DUMPED NEAR THE BASE OF THE SLOPE FOR THE DOZER TO LEVEL OUT. MATERIAL WAS OF GOOD GRADATION.

LINER CREW PLACED GDN NORTH OF THE 39850 GRIDLINE. ALL GDN WAS PLACED, SEWN, & ZIPTIED ACCORDING TO SPECIFICATIONS UP TO THE 20850 GRIDLINE. CAPPING OF THE BUTT SEAMS MAM 4/7/05 ~~IS TO BE~~ WAS COMPLETED ~~TOMORROW~~. APPROXIMATELY 71,075 SQFT. OF GDN WAS PLACED TODAY.

SEEDING CREW SEEDED THE AREA BETWEEN 20150E AND 20450E USING THE FLX-II DRILL SEEDER. SEEDING WAS ONLY PERFORMED IN AN EAST-WEST DIRECTION TODAY. CROSS SEEDING IS TO BE PERFORMED LATER. MULCHING CREW SPRAYED MULCH MIX ON THE CAP TO APPROXIMATELY 20,000E.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

NONE

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

NONE

Copies to: John Rahe

Observer: ~~Josh Valentine~~ MARSHALL MASSARO

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 178

TETRA TECH RMC

TO: _____

_____

_____

Project No. 19-4886.001.00	Date 4/7/05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: CLEAR, BALM-BREEZY, NW 30-35 MPH Temp. 39.1 ° at 0730 a.m. NO PRECIPITATION Temp. 69.0 ° at 1540 p.m.	
Observation Period: 0630 – 1540	

EQUIPMENT: (3) CAT 146, (1) CAT CS-583C, (3) CAT 633D, (1) CAT D6 W/DISC, (2) CAT D6L GP, (1) CAT D5M LGP, (1) CAT 950B, (1) CAT 966F, (1) 953C TRACK LOADER, (2) CAT 325L, (1) CAT TRACKED SKID LOADER, (1) CAT BACK HOE, (1) CAT FORKLIFT, (1) BOBCAT T300, (1) WATER TRUCK, (2) HAND TAMPERS, (2) VOLVO A35C, (3) VOLVO A30D, (1) FLX-II DRILL SEEDER W/ TRACTOR, (1) MULCHER TRUCK, (1) 963 C TRACK LOADER

CONTRACTOR CONTINUED TO PLACE 10" CUSHION MATERIAL ALONG THE EAST FACE AND ON THE CAP (EAST OF THE S980 LINE). MATERIAL WAS HAULED USING VOLVOS AND BELLY DUMP SEMI-TRAILERS AND WAS PLACED ON THE CAP USING A 966 F LOADER, 950B LOADER, AND A 146 BLADE. A 953C AND A 963C TRACK LOADER AND A D6 DOZER PLACED MATERIAL ON THE FACE UP TO THE 39900N GRIDLINE. ALL MATERIAL WAS OF GOOD GRADATION AND MOISTURE.

ROCK LAYER MATERIAL WAS PLACED ON THE EAST FACE UP TO THE 39850N GRIDLINE. MATERIAL WAS HAULED USING VOLVOS AND PLACED USING A 953C AND A D6 DOZER. ROCK LAYER MATERIAL WAS ADVANCED EASTWARD FROM THE S980 LINE ON THE SOUTH END OF THE PLF. MATERIAL WAS HAULED USING VOLVOS AND END-DUMP TRAILERS AND PLACED USING A D6 DOZER.

4-7-05

QC PERFORMED GRADATION TESTS AT EENTENNIAL ON THE ROCK LAYER MATERIAL.

LINING CREW COMPLETED THE GDN ON THE NE ARM AND FACE, ALL LINING WAS PLACED ACCORDING TO SPECIFICATIONS, GDN WAS PLACED TO PANEL T-625. GDN EXTENDED PAST THE PERIMETER ANCHOR TRENCHES BY 15 TO 20 FEET.

CONCRETE FORM CREW WAS ON-SITE TO FORM THE BASE PAD FOR THE SEEP TREATMENT SYSTEM. SIZE 4, GRADE 60 REBAR WAS USED FOR STRUCTURAL STABILITY. FORMS WERE INSPECTED AND RELEASED BY CQAM, CTR, ENGINEERS, & CONCRETE REPRESENTATIVES FOR CONCRETE PLACEMENT.

SEEDING CREW CONTINUED TO SEED IN AN EAST-WEST DIRECTION BETWEEN 20150 E AND 20450 E USING THE FLX-II. SEEDERS HAND SEEDED PORTIONS OF THE PERIMETER SLOPES WHERE THE FLX-II COULD NOT REACH. THE MULCH CREW CONTINUED TO MULCH THE SW SIDESLOPES OF THE PLF.

WEEKLY MEETING WAS HELD TO DISCUSS PLF ISSUES, CDPHE/EPA, DOE, CTR, CQAM, CQAE, STOLLER, & EARTH TECH ENGINEERS ATTENDED.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

NONE

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

NONE

Copies to: John Rahe

Observer: ~~Josh Valentine~~ MARSHALL MASSARO

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 179

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 4/8/05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 43 ° at 7:00 a.m. Temp. 74 ° at 3:30 p.m.	
Observation Period: 7:00am - 5:15pm	

EQUIPMENT: (1) Cat CS-583C, (2) Cat 633D, (2) Cat 14G, (1) Cat D6 w/ otsk, (1) Cat D6LGP (1) Cat D5 LGP, (1) Cat track loader, (1) Cat 950B, (1) Cat 966F, (2) Cat 325L (1) Cat Backhoe, (1) Cat tracked skid loader, (1) water truck, (2) Hand tampers, (2) Volvo A35C, (3) Volvo A30D, (1) Cat Forklift, (1) Drillseeder (1) Hydro mulch truck

The contractor continued to place 10" cushion on the east face. The material was placed using a D6LGP and a track loader then compacted using a Cat CS-583C in static mode. The cleanouts for the seep capture system were back filled and compacted using hand tampers.

Rock layer material was placed on the south side of the east face using a D5LGP dozer by pushing upslope

The seeding crew was out finishing some hydro mulch on the south side perimiter channel.

The first section of drainage channel was released on the west end. and the contractor started to place the nonwoven geotextile and the washed rock on the bottom.

The liner crew was on-site cleaning and loading

out their equipment. 4-8-04

The slab was cast for the seep treatment system. The steel and forms including the keyway, waterstop and outlet pipe were within spec. The truck did not start to pour until 120min past batch time, and finish until after 180 min past batch. The field testing was done on the concrete and all tests were within spec. After discussing the time issue with Bob Davis it was decided to cast the concrete and accept the possibility of some lower strength than to have a cold joint in the slab. The concrete was not sprayed with curing compound but was covered for the night. Curing compound is scheduled for 4-9-05 within 24 hours of the pour.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

None

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 180

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 4/9/05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 48 ° at 7:30 a.m. Temp. 59 ° at 1:45 p.m.	
Observation Period: 7:00am - 2:15	

EQUIPMENT: (1) Cat CS-583C, (3) Cat 14G, (1) Cat D6LGP, (1) Cat D5LGP, (1) Cat D6 w/ disk, (1) Cat 950B (1) Cat 966F, (1) Cat track loader, (1) Cat tracked skid loader, (1) Cat Backhoe, (2) Cat 325L (1) Cat Forklift, (2) Cat 6330, (2) Volvo A35C, (3) Volvo A30D, (1) Water truck (2) Hand tampers, (1) Drill seeder, (1) Hydro mulch truck.

The contractor is continuing to place 10" cushion on the north side of the east face. The material is being placed using a D6LGP and the track loader bottom to top from the side. The central section of the east face is being rolled, finish graded, surveyed and tested. Placement of the 10" cushion was finished by the end of the day.

The rock layer was also being placed on the south side of the east face above the 4:1 slope. the material was being placed using a D5LGP, no other equipment was operating on the rock layer.

The concrete crew was on site preping ~~the~~ the seep treatment slab for the wall forms.

4-9-05

The seeding crew was hydro mulching more of the channels, but was shut down in the morning due to no MSDS & wind.

More geotextile and gravel was placed in the drainage channel at the southeast corner of the site, no riprap has been delived or placed at this time.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

None

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 181

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 4-12-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 40 ° at 7:00 a.m. Temp. 45 ° at 2:00 p.m.	
Observation Period: 6:20 am – 4:45	

EQUIPMENT: (1) CS-583C, (2) Cat 633D, (3) Cat 14G, (1) Cat D6 w/disk, (1) Cat D6LGP (1) Cat D5 LGP, (2) Cat track Loaders, (2) Cat 325L, (1) Cat tracked skid loader (1) Cat Backhoe, (1) Cat Forklift, (1) Cat 950B, (1) Cat 966F, (2) Volvo A35C (3) Volvo A30D, (1) Watertruck, (2) Hand tampers, (1) Drill seeder (1) Hydro-mulch truck

No work was done on-site on 4-11-05 or today due to snow/water and muddy conditions.

A meeting was held with the CJR, Earthtech, Kaiser Hill, and QA to discuss design and field changes for the CCR report.

4-12-05

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

~~None~~ Soft/wet 10" cushion material on the east face due to snow.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 182

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 4-13-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 40 ° at 7:00 a.m. Temp. 62 ° at 12:00 p.m.	
Observation Period: 6:35am – ~~5:45~~ 4:45	

EQUIPMENT: (1) Cat CS-563C, (2) Cat 633D, (3) Cat AG, (1) Cat D6 w/blade, (1) Cat D6LGP, (1) Cat D5LGP (1) Cat 950B, (1) Cat 966F, (2) Cat 325L (1) Cat Backhoe, (1) Cat Forklift, (2) Cat track loader (1) Cat tracked skid loader, (2) Volvo A35C, (3) Volvo A30D, (1) water truck (2) Hand tamper, (1) drill seeder, (1) Hydro-Mulch truck.

The contractor spent the day removing snow from the north ~~face~~ side of the east face to help it dry faster. The site is still too wet to do any work on the cap.

The concrete crew was on site setting forms and steel for the walls of the seep treatment system, but none is ready for inspection @ this time.

4-13-05

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

~~None~~ Soft/wet 10" Cushion material on the east face due to snow.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 183

TETRA TECH RMC

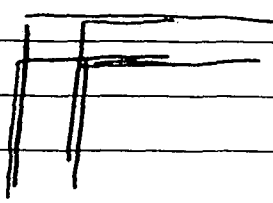
TO: _____

Project No. 19-4886.001.00	Date 4-14-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 40 ° at 7:00 a.m. Temp. 67 ° at 3:00 p.m.	
Observation Period: 6:30am - 3:30pm	

EQUIPMENT: (1) Cat CS-563C, (3) Cat 140, (1) Cat D6e w/disk, (1) Cat D6LGP, (1) Cat D5 LGP, (1) Cat 950B (1) Cat 966F, (2) Cat 325L, (1) Cat Backhoe, (2) Cat track loaders, (1) Cat tracked skid loader (2) Volvo A35C, (3) Volvo A30D, (1) water truck, (1) drill seeder, (1) Hydro-mulch truck (2) Hand tampers, (2) Cat 6330

No work was done on the cap due to wet muddy conditions.

The concrete crew was continuing to form the walls for the seep treatment system. The ~~steel~~ rebar reinforcing steel was in spected and it was within spec everywhere except the corner reinforcements. The corner steel was placed inside to outside, this was oked by Earthtech and left in place.



The weekly meeting was held with DOE, EPA, CDPHE, CTR, CQAE and SQAM.

4-14-05

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

Soft/wet 10" cushion material on the east face due to snow.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 184

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 4-15-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 38 ° at 7:00 a.m. Temp. 56 ° at 4:00 p.m.	
Observation Period: 6:45am – 5:00pm	

EQUIPMENT: (1)Cat CS-583C, (3)Cat 14G, (1)Cat D6w/disk, (1)Cat D6LGP, (1)Cat D5LGP (1)Cat 950B, (1)Cat 966F, (2)Cat 325L, (2)Cat 633D, (1) Cat Backhoe, (2)Cat track loaders (1)Cat tracked skid loader, (2) Volvo A35C, (3) Volvo A30D, (1) water truck (2)Hand tampers, (1) drill seeder, (1) Hydro-mulch truck

The contractor started to rework and replace the wet 10" cushion material on the east face. The dryer material is being resurveyed, graded if needed then compacted using a Cat CS-583C smooth drum roller. The material this is very wet is being removed and replaced with new dryer material. Nuclear moisture density tests were taken on the south ½ of the east face, the tests were within specification although there are still a few small soft areas being reworked. The area will be released after testing and the record surveys are within spec.

The concrete for the walls on the seep treatment

4-15-05

system was canceled due to the forms not being completed. The forms and steel were inspected and within spec. The concrete is rescheduled for 4-16-05.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

The north half of the east face is still very wet/soft but is currently being reworked.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

The south half of the east face is being finish graded and compacted, & tested. This area is awaiting a record survey to be released.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 185

TETRA TECH RMC

TO:

Project No. 19-4886.001.00	Date 4-16-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. ~~60~~ 38° at 6:30 a.m. Temp. 60 ° at 1:30 p.m.	
Observation Period: 6:30am - 3:00pm	

EQUIPMENT: (1) Cat CS-583C, (3) Cat 14G, (2) Cat 633D, (1) Cat D6 w/disk, (1) Cat D6LGP, (1) Cat D5LGP (1) Cat 950B, (1) Cat 966F, (2) Cat track loaders, (2) Cat 325L, (1) Cat Backhoe (1) Cat tracked skid loader, (2) Volvo A35C, (3) Volvo A30D, (1) watertruck (1) drill seeder, (1) Hydro-Mulch truck, (2) Hand tampers

The contractor continued to repair the 10" Cushion material. The top and the south half of the east face were completed, tested, and released for rock layer.

The rock layer was restarted on the top south end of the east face. The rock is being placed using a D6LGP and a track loader, no other equipment is operating on the rock layer.

The walls were cast on the seep treatment system. The slump was tested to be 5" (spec. Max 4"), but was cast due to the use of the concrete pumper, and to help reduce segragation in the walls. The air test was done several times, and gave results from 10% to 12%.

These numbers were not realistic indicating that there could be a problem with the air meter although it appeared to be functioning. With no other meter to check the result, and with half of the walls cast the rest of the ~~proof~~ walls. were completed.

The erosion matt 125 was started from the west end of the cap. The material was placed & pinned per the manufactures spec.

The concrete cast was 1" over the spec and will be accepted/rejected after compressive strengths are done.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

10" cushion soft/wet on North side of the east face.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

10" cushion released on south & central faces as well as the top.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 186

TETRA TECH RMC

TO:

Project No. 19-4886.001.00	Date 4-17-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 54 ° at 7:30 a.m. Temp. 66 ° at 11:00 a.m.	
Observation Period: 7:00 am – 11:45 am	

EQUIPMENT: (1) Cat CS-583C, (3) Cat 14G, (2) Cat 633D, (1) Cat D6 w/disk, (1) Cat D6LGP, (1) Cat D5LGP (1) Cat 950B, (1) Cat 966F, (2) Cat track Loaders, (2) Cat 325L, (1) Cat tracked skid loader (1) Cat Backhoe, (1) Water truck, (2) Volvo A35C, (3) Volvo A30D (2) Hand tamper (1) Drill seeder, (1) Hydromulch truck

The contractor continued to finish grade and compact the 10" Cushion material. The ~~50~~ in record survey was completed for all of the 10" Cushion material, but the north end of the east face has not been tested at this time.

The rock layer was being placed on the slope of the east face using a track Loader to move the rock down the slope and a D5LGP spreading it up the slope. Only the LGP Dozers are operating on the rock layer.

The 22" RF Alluvium was placed on the rock layer at the southeast end from the existing stockpiles at the edge.

The contractor was also doing some regrading on the east end of the south east channel.

4-17-05

The seeding crew was on-site continuing to place the erosion mat 125 on the west end of the cap. The mat is being placed and stapled per the specs.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

None Density tests on north side of east face to complete 10" rework

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 187

TETRA TECH RMC

TO:

Project No. 19-4886.001.00	Date 4-18-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: CLEAR, CALM - BREEZY, ~50°F - NO PRECIPITATION Temp. 49.0 ° at 0700 a.m. Temp. 75.1 ° at 1640 p.m.	
Observation Period: 0630 - 1640	

EQUIPMENT: (1) CAT CS-583C, (2) CAT 633 D, (3) CAT 14G, (1) CAT D6 W/ DISK, (1) CAT D6LGP, (1) CAT D5 LGP, (1) 950B, (1) CAT 966F, (1) CAT 325L, (1) CAT 325C, (1) CAT 426B BACKHOE, (1) CAT FORK LIFT, (2) CAT TRACKLOADER (953C & 963C), (2) CAT TRACKED SKID LOADER, (2) VOLVO A35C, (3) VOLVO A30D, (1) WATER TRUCK, (2) HAND TAMPER, (1) FLX-II DRILL SEEDER, (1) MULCH TRUCK

CONTRACTOR CONTINUED TO PLACE ROCK LAYER MATERIAL ALONG THE EAST FACE NORTH OF APPROXIMATELY 39850. MATERIAL WAS HAULED USING VOLVOS AND END DUMP SEMI-TRAILERS. MATERIAL WAS PLACED USING A 953C, 963C, D6R, AND D5LGP. MATERIAL WAS TRACKED TO THE BASE OF THE EAST FACE BY THE 953C/963C AND THEN PUSHED UP THE FACE USING A D6R/D5LGP. MATERIAL WAS OF GOOD GRADATION AND LITTLE SEGREGATION OCCURRED DURING PLACEMENT.

22" ROCKY FLATS ALLUVIUM WAS PLACED ALONG PORTIONS OF THE EASTERN LIMIT OF EXISTING ALLUVIUM (≈ THE 20600E GRIDLINE). MATERIAL WAS HAULED USING VOLVOS AND PLACED

4-18-05

mm: 4/18/05

USING A D6H DOZER, LARGE BOULDERS (GREATER THAN 12") WERE REMOVED FROM ALLUVIUM ~~WHERE~~ mm 4/18/05.

CREW WAS ON-SITE TO PLACE EROSION MATTING (C125) ON THE SOUTH HALF OF THE CAP, WEST OF APPROXIMATELY 20100E. NO SEEDING OR MULCHING OCCURRED TODAY.

D6 DOZER WITH DISC CONTINUED TILLING/DISCING THE 2" TOPSOIL BETWEEN THE 20150E AND 20450E GRIDLINES.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

NONE

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

NONE

Copies to: John Rahe

Observer: ~~Josh Valentine~~ MARSHALL MASSAKO

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 188

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 4-19-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 45 ° at 7:30 a.m. Temp. 71 ° at 3:00 p.m.	
Observation Period: 7:00am - 5:30pm	

EQUIPMENT: (1) Cat CS583C, (3) Cat 14G, (2) Cat 16 330D, (1) Cat D6 w/ disk, (1) Cat D6 LGP, (1) Cat D5 LGP (1) Cat D5 LGP, (2) Cat 325L, (1) Cat Backhoe, (1) Cat 950B, (1) Cat 966F, (1) Cat track loader (2) Volvo A35C, (3) Volvo A30D, (1) Watertruck, (1) Drill seeder, (1) Hydro-Mulch truck

The contractor continued to place rock layer and RF Alluvium on the east face. The rock layer was completed on the 4:1 slope. The material was hauled down the slope using a track loader, piled then placed pushing up hill using a D6 LGP. Only LGP equipment was now operating on the rock layer.

A small amount of 22" RF Alluvium was placed on the south east corner of the cap. The material was being placed using a D5 LGP and rough graded.

The concrete crew was on-site forming the steps for the seep treatment system. The steps were check for level ness, and a few

4-19-05

will need to be adjusted prior to the pour on 4-20-05.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

~~None~~ Out of level steps in seep treatment structure.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 189

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 4-20-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 40 ° at 7:00 a.m. Temp. 46 ° at 4:00 p.m.	
Observation Period: 6:45am –	

EQUIPMENT: (1) Cat CS-583C, (2) Cat 14G, (2) Cat 633D, (1) Cat D6w/disc, (1) Cat D6LGP, (1) Cat D5LGP (1) Cat 950B, (1) Cat 966F, (1) Cat track loader, (2) Cat 325L, (1) Cat Backhoe (2) Volvo A35C (3) Volvo A30D, (1) water truck, (1) Drill seeder, (1) Hydro-Mulch truck

The contractor continued to place the rock layer on the east face. All of the rock was placed with the exception of a narrow haul road. The material was being placed using a D5LGP, no other equipment was operating on the rock layer. The 22" R.F. Alluvium was also continued to approx. the 20650 grid line.

The manhole base was set for the seep capture system per the plans. The bentonite cutoff wall was also started.

The steps for the seep treatment system were cast today. The forms were checked and adjusted one last time before casting. The concrete was tested

4-20-05

for air by QA and QC, and slump by QC, and both were within spec. prior to casting.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

None

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

~~None~~ Steps were adjusted and leveled in seep treatment structure.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 190

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 4/21/05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 38 ° at 7:00 a.m. Temp. 55 ° at 3:00 p.m.	
Observation Period: 7:00am – 5:15pm	

EQUIPMENT: (2)Cat 14G, (2)Cat 330, (1)Cat D6 w/disk, (1)Cat D6LGP (1)Cat D5LGP, (1)Cat 950B (1)Cat 966F, (2)Cat 325L, (1)Cat Track loader, (2)Volvo A35C (3)Volvo A30D, (1) watertruck (1)Drill seeder, (1)Hydro-Mulch truck, (2)Hand tampers

The contractor finished placing and rough grading the rock layer. The material was placed using a D6LGP, no other equipment was operated on the rock layer. The 6" - 22" R.F. Alluvium was continued to approximately the 20750 gridline.

The second manhole was set at the seep treatment area. The Bentonite Cutoff wall was filled & hydrated with the first 2 lifts of Bentonite. The 6" lifts were hydrated 1gal/10 lbs. The perforated pipe at the cutoff wall was moved to the bottom of the trench with a piece of FML @ the very base of the trench per the discussion with EPA & Earthtech. A small amount of bentonite was placed under the FML to help it seal and force the water

in-to the pipe.

The concrete crew placed the steel and formed the final wall section on the seep treatment structure, and all was within spec.

Golder ran the last 4 ASTM 5519 gradations on the R.F. Alluvium, and the final 1 on the 2" topsoil layer.

The weekly meeting was held, QC, QA, CQAE, DOE, EPA, and CDPHE were on site for the meeting and tour.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

None

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 91

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 4/22/05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 38 ° at 7:00 a.m. Temp. 54 ° at 2:00 p.m.	
Observation Period: 6:30am - 5:15	

EQUIPMENT: (2)Cat 14G, (2)Cat 633D, (1)Cat D6 w/ disc, (1)Cat D6 LGP, (1)Cat D5 LGP (1)Cat 950B, (1)Cat 966F, (2)Cat 325L, (1)Cat track loader, (1) water truck (2)Volvo A35C, (3) Volvo A30D, (1) hand tamper, (1) Drill seeder, (1) Hydro-mobil

The contractor is continuing to place the 22" on the east face. The material has been placed up to the ~~top~~ crest of the 4:1 slope on top, and a small amount has been placed at the central section of the base of the 4:1.

The Bentonite wall was also continued at the seep treatment system. The bentonite was placed in 6" lifts, hydrated 1gal/10lbs and left for 15 min per lift. The inlet/outlet pipes for the strip drain manhole were grouted in place. The excavation for the GWIS pipe was started on the north side, but no pipe has been placed.

The concrete crew cast the final SW wall

4/22/05

section on the seep treatment structure. The concrete was tested by QC prior to placement and was within spec.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

None

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 192

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 4-23-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 41 ° at 7:00 a.m. Temp. 56 ° at 3:00 p.m.	
Observation Period: 7:00 am - 3:00 pm	

EQUIPMENT: (2) Cat 14G, (2) Cat 633D, (1) Cat D6 W/disk, (1) Cat D6 LGP, (1) Cat D5 LGP (1) Cat 950B, (1) Cat 966F (1) Cut track loader, (2) Cat 325L, (2) Volvo A35C (3) Volvo A30D (1) Water truck, (1) Hand tamper, (1) Drill seeder, (1) Hydro-Mulch truck,

The contractor continued to place RF Alluvium on the east face on the 4:1 slope, the north and central sides. Some of the material was placed from the bottom up, and some was place from the top at an angle down the slope.

More Bentonite was placed in the cut-off wall near the seep treatment system. The bentonite was placed in 6"- lifts, hydrated 1gal/10lbs and left for 15 min. 60 feet of pipe was placed for the north GWIS line from the manhole @ the seep treatment system. The pipe was bedded with cushion material compacted to a min of 90%. The first lift of backfill was also done on the pipe with 1'- of cushion compacted with a hand tamper.

4-23-05

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

None

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 193

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 4/24/05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 39 ° at 8:00 a.m. Temp. 47 ° at 1:30 p.m.	
Observation Period: 7:00am - 2:00pm	

EQUIPMENT: (2) Cat 14G, (2) Cat 633D, (2) Cat 325L, (1) Cat D6w/disk, (1) Cat D6LGP (1) Cat D5LGP, (1) Cat 950B, (1) Cat 966F, (1) Cat track Loader, (1) water truck (2) Volvo A35C, (3) Volvo A30D, (1) Drill seeder, (1) Hydro-Mulch truck

The contractor continued to place the 22" R.F. Alluvium on the central section of the 4:1 east face. The material was placed from the bottom up and from the top down at an angle so that the liner isn't loaded by the weight of the material at the crest. The north side of the east face was finish graded.

Backfill of the manholes at the seep treatment structure was started. The material (Cushion) was placed in 6" lifts and compacted using a hand tamper.

The bentonite cutoff wall was also continued at the seep treatment structure. The bentonite was placed in 6" lifts, hydrated 1gal/10lbs and let stand for a min. of 15 min.

4/24/05

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

None

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 194

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 4/25/05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: CLOUDY, BREEZY, ~40°F - HEAVY RAIN PREVIOUS NIGHT LIGHT RAIN IN MORNING Temp. 40.5° at 0720 a.m. Temp. 40.5° at 0745 p.m.	
Observation Period: 0630 – ~~0750~~ 0810 MM 4/25/05	

EQUIPMENT: (2) CAT 14G, (2) CAT 633D, (1) CAT D6 W/ DISC, (1) CAT D6LGP, (1) CAT D5 LGP, (1) CAT 950 B, (1) CAT 966F, (2) CAT 325L, (1) CAT TRACK LOADER (953C), (1) WATER TRUCK, (2) VOLVO A35C, (3) VOLVO A30D (1) HAND TAMPER, (1) FLX-II DRILLSEEDER, (1) HYDROMULCHER

DUE TO HEAVY PRECIPITATION THE PREVIOUS NIGHT, NO WORK WAS PERFORMED ON THE PLF. THE 325L TRACKHOE CREATED SMALL DIVERSIONS TO CHANNEL WATER INTO DITCH SYSTEMS.

QA RELEASED 22" ROCKY FLATS ALLUVIUM UP TO STATION 20550E BASED ON PARAGON SURVEY

4/25/05

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

NONE

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

NONE

Copies to: John Rahe

Observer: ~~Josh Valentine~~ MARSHALL MASSARO

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 195

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 4-26-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 33 ° at 6:30 a.m. Temp. 63 ° at 4:30 p.m.	
Observation Period: 6:15am – 5:00pm	

EQUIPMENT: (2) Cat 14G, (1) Cat D6w/disk, (1) D6 LGP, (1) D5 LGP, (2) Cat 633D, (2) Cat 325L (1) Cat 950B, (1) Cat 966F, (1) water truck, (2) Volvo A35C, (3) Volvo A30D (1) Drill seeder, (1) Hydromulch truck, (1) Hand tamper.

The contractor continued to place the 22" layers of R.F. Alluvium on the central and south sides of the east face.

The pipe from the north GWTS to the manhole @ the seep treatment system was completed but not hooked up. The center section of the line has been bedded in compacted cushion material then backfilled with R.F. Alluvium. QC did 2 nuclear moisture/density tests on the cushion, and both were within spec 90%+ and ±2% moisture. Some work was done on the south GWTS line, but no pipe has been set at this time.

~~The area~~ No work was done around the

4-26-05

seep treatment system due to wet muddy conditions from rain on the evening of 4-24-05. This area will require some cleanup before any further work can be done.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

None

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 196

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 4-27-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 37 ° at 7:00 a.m. Temp. 42 ° at 5:00 p.m.	
Observation Period: 7:00am – 5:00pm	

EQUIPMENT: (2) Cat 14G, (2) Cat 633D, (2) Cat 325L, (1) Cat D6 w/disk, (1) Cat D6LGP (1) Cat D5LGP, (1) Cat 950B, (1) Cat 966F, (1) water truck, (2) Volvo A35C, (3) Volvo A30D (1) Hand tamper, (1) Drill seeder, (1) Hydro-Mulch truck, (1) Cat track loader

The contractor continued to place 22" RF Alluvium on the south side of the east face. The material was placed from the top down using a D6LGP. The material was placed at an angle to reduce the stress on the liner at the crest.

The contractor also continued to backfill the seep treatment structure and surrounding area. The backfill material (cushion) was placed in 6" lifts and compacted using a hand tamper. The bentonite cutoff wall was also continued in 6" - lifts, hydrated 1gal/10 lbs and allowed to sit for 15 min to hydrate. The perforated pipe was placed on the strip drain outlet line, as well as a piece of liner at the bottom to direct all the water from the gravel into the pipe.

4-27-05

The forms were stripped from the seep treatment structure and any defects in the steps were grouted. At the end of the day the flow from the seep capture system was connected and allowed to flow through the seep treatment structure.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

None

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 197

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 4-28-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 32 ° at 6:30 a.m. Temp. 34 ° at 2:00 p.m.	
Observation Period: 6:20 am - 2:45 pm	

EQUIPMENT: (2) Cat 14G, (2) Cat 633D, (2) Cat 325L, (1) Cat D6w/disk, (1) Cat D6LGP, (1) Cat D5LGP (1) Cat 950B, (1) Cat 966F, (1) Cat track loader, (1) watertruck, (1) Hand tamper (2) Volvo A35C, (3) Volvo A30D, (1) Drill seeder, (1) Hydro-Mulch truck.

No work was done today due to snowy/rainy conditions on-site. A QC/QA meeting was held to discuss the CCR report, QA, QC, CTR, CQAE, and surveyors attended.

4-28-05

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

None

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 198

TETRA TECH RMC

TO: _____

_____

_____

Project No. 19-4886.001.00	Date 5/2/05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: CLOUDY, CALM, ≈30°F NO PRECIPITATION IN MORNING Temp. 30.4 ° at 0655 a.m. Temp. ____ ° at ____ p.m.	
Observation Period: 0630 –	

EQUIPMENT: (2) CAT 14G, (2) CAT 6330, (2) CAT 325L, (1) CAT D6 W/DISK, (1) CAT D6LGP, (1) CAT D5LGP, (1) CAT 950B, (1) CAT 966F, (1) CAT TRACK LOADER, (1) WATER TRUCK, (1) HAND TAMPER, (2) VOLVO A35C, (3) VOLVO A30D, (1) FLX-II DRILL SEEDER, (1) HYDRO-MULCH TRUCK

NO WORK WAS PERFORMED TODAY DUE TO RAINY/SNOWY CONDITIONS PRESENT ON-SITE. NO WORK WAS PERFORMED FROM THURSDAY (4-28-05) THROUGH TODAY (5-2-05) DUE TO SATURATED CONDITIONS

5-2-05

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

NONE

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

NONE

Copies to: John Rahe

Observer: ~~Josh Valentine~~ MARSHALL MASSARO

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 199

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 5-3-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 36 ° at 7:00 a.m. Temp. 70 ° at 4:30 p.m.	
Observation Period: 6:45am - 5:15pm	

EQUIPMENT: (2) Cat 14G, (2) Cat 633D, (1) Cat 950B, (1) Cat 966F, (1) Cat D6LGP, (1) Cat D5LGP (1) Cat D6 w/disk, (2) Cat 325L, (1) Cat track Loader, (2) Volvo A35C, (3) Volvo A30D (1) watertruck, (1) Hand tamper, (1) Drill seeder, (1) Hydro-mulch truck (1) trencher

The contractor restarted work today after not working 4-28-05 to 5-2-05 due to rain/snow, the 22" RF alluvium was continued on the south side of the east face. The material was being placed using a D5 + D6LGP dozer pushing from the top down at an angle to reduce the stress on the liner. The bentonite wall was continued as well as back fill around the seep treatment with cushion material. The bentonite was placed in 6" - lifts, hydrated 1gal/10 lbs and allowed to sit for 15 min. The cushion material was being compacted using the bucket on the backhoe as well as the hand tamper.

5-3-05

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

None

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 200

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 5-4-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 48 ° at 7:30 a.m. Temp. 66 ° at 2:30 p.m.	
Observation Period: 7:30am - 5:30p.m.	

EQUIPMENT: (2) Cat 14G, (2) Cat 633D, (2) Cat 325L, (1) Cat D6 LGP, (1) Cat D5 LGP (1) Cat D6 w/ Disk, (1) Cat 950B, (1) Cat 966F, (1) Cat track Loader, (1) Hand tamper (1) water truck, (2) Volvo A35C, (3) Volvo A30D, (1) Drill seeder (1) Hydro-mulch truck, (1) trencher.

- The contractor continued to place the 22" R.F. alluvium material on the south side of the east face. The material was placed using a D5/D6 LGP pushing from the top down at an angle to reduce the stress on the liner. Backfill of the seep treatment structure was also continued.
- The south GWIS line was placed from the manhole at the seep treatment area to the transite pipe. Both tie-ins were made, but no flow was observed. The pipe was 8" bell & spigot bedded and backfilled with cushion material. The cushion material was placed in 6" lifts and compacted with a hand tamper.
- No 2" material was placed today

5-4-05

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

None.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None.

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 201

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 5-5-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 49 ° at 7:00 a.m. Temp. 80 ° at 3:00 p.m.	
Observation Period: 6:00am - 5:00	

EQUIPMENT: (2) Cat 14G, (2) Cat 6330, (1) Cat D5LGP (1) Cat D6LGP, (1) Cat D6 w/blade (1) Cat 950B, (1) Cat 966F, (1) Cat 325L (1) Watertruck, (1) Cat track Loader (2) Volvo A35C, (3) Volvo A30D, (1) Hand tamper, (1) Drill seeder (1) Hydro-mulch truck

The contractor completed the bentonite cutoff wall at the seep treatment system. The bentonite was placed in 6" lifts and hydrated 1gal/4lbs and allowed to sit for a min of 15 min. After all the bentonite was placed a piece of non woven geotextile was placed over the top and covered with cushion material and R.F. Alluvium. Backfill around the seep treatment structure was also continued. The box was backfilled with cushion material placed in 6" lifts and compacted using a hand tamper.

The 22" R.F. Alluvium layer was completed on

the east face, but it has not been finish graded at this time. A small section of 2" material was also placed on the north side of the east face. The R.F. crew started to remove the pond sediment and other excess material off site.

The erosion mat crew placed C150 east to approx 20550 on the south side. The material was placed in a anchor trench a min of 6" deep, overlapped down hill, and pinned per spec. to the toe of the perimeter Channel. Hydro-mulch was also done on the seeded area on the north side around grid line 20400.

QA testing was done (ASTM D422/D5519) on the 2", 22", and 12" rip rap materials.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

None

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 202

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 5-6-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Temp. 49 ° at 7:30 a.m. Temp. ____ ° at ____ p.m.	
Observation Period: 7:30 am - 11:30 am	

EQUIPMENT: (2) Cat 14G, (2) Cat 633D, (1) Dat D6LGP, (1) Cat D5LGP, (1) Cat Dozer w/disk (1) Cat 950B, (1) Cat 966F, (1) Cat 325L, (1) Cat track loader, (1) water truck (1) Hand tamper, (2) Volvo A35C, (3) Volvo A30D, (1) Drill seeder (1) Hydro-Mulch truck.

The contractor placed a small amount of 22' R.F. Alluvium to complete the finish grading on the south side of the east face. The contractor also continued to haul and place the 2" topsoil material on the east face.

The erosion mat crew continued to place C150 mat on the perimeter channel slopes. C150 was placed to approx 20200 grid line from the west end on the north side. The mat is placed in a 6" deep anchor trench, backfilled then rolled overlapping down slope to the invert of the channel, & pinned per spec.

5-6-05

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

None

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Josh Valentine

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 203

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 5-7-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: PARTLY CLOUDY, CALM-WINDY, ~50°F-60°F Temp. 49.5° at 0705 a.m. Temp 60.8° at 1635 p.m.	
Observation Period: 0630 - ~~1635~~ 1710 MM 5/7/05	

EQUIPMENT: (2) CAT 146, (2) CAT 633D, (1) CAT D6LGP, (1) CAT D5LGP, (1) CAT D6 W/DISK, (1) CAT 950B, (1) CAT 966F, (1) CAT 325L, (1) CAT TRACK LOADER, (1) WATER TRUCK, (1) HAND TAMPER, (2) VOLVO A35C, (3) VOLVO A30D, (1) DRILL SEEDER FLX-II, (1) HYDRO MULCH TRUCK

THE REMAINING AREAS OF THE EAST FACE WERE RELEASED FOR THE PLACEMENT OF TOPSOIL. THE CONTRACTOR PLACED 2" TOPSOIL MATERIAL ALONG THE EASTERN CAP AND EAST FACE. MATERIAL WAS HAULED USING VOLVOS, BELLY DUMP SEMI-TRUCKS, AND A SCRAPER (633D). MATERIAL WAS PLACED USING A D5LGP ALONG THE EAST FACE AND A D6H, 146, & 953C TRACK LOADER ON THE CAP. ALL 2" TOPSOIL WAS PLACED BY THE END OF THE DAY.

EROSION MATTING CREW COMPLETED C1SO PLACEMENT ALONG AVAILABLE SIDESLOPES ON THE NORTH, WEST, & SOUTH SIDES OF THE PLF. A 6" X 6" ANCHOR TRENCH WAS CONSTRUCTED AT THE TOP OF THE SIDE SLOPES TO ANCHOR C1SO MATTING. SOME C12S MATTING WAS PLACED ON THE CAP. THE C12S MATTING

5-7-05

WAS STAPLED EVERY 1.5 FT TO 2 FT ALONG THE EDGES, EVERY FOOT AT BUTT SEAMS, AT EVERY GREEN DOT (≈EVERY 4 FEET LENGTHWISE, OFFSET 2 FEET EVERY 1.5 FEET ACROSS MATTING), ~~MATTING IS SECURE AND HELD~~ MM 5/7/05 SPECIFICATIONS FOR THE C125 MATTING STATE THAT RED DOT PATTERNS SHOULD BE USED CONSISTING OF 0.7 STAPLES PER SQUARE YARD, SINCE THE GREEN DOT PATTERN (1.7 STAPLES PER SQUARE YARD) WAS USED ON ALL C125 PLACED, IT WAS DECIDED THAT MAINTAINING THE GREEN DOT PLACEMENT WOULD OCCUR FOR THE REMAINDER OF THE LANDFILL (PER CONTRACTOR SUPERINTENDENT).

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

NONE

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

NONE

Copies to: John Rahe

Observer: ~~Josh Valentine~~ MARSHALL MASSARO

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 204

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 5/8/05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: CLOUDY, WINDY, ~50°F-60°F Temp. 52.3 ° at 0650 a.m. Temp 59.2 ° at 1110 p.m.	
Observation Period: 0630 - 1110	

EQUIPMENT: (2) CAT 14G, (2) CAT 633D, (1) CAT D6 LGP, (1) CAT D5 LGP, (1) CAT D6 w/ DISK, (1) CAT 950B, (1) CAT 966F, (1) CAT 325L, (1) CAT TRACK LOADER, (1) WATER TRUCK, (1) HAND TAMPER, (2) VOLVO A35C, (3) VOLVO A30D, (1) FLX-II DRILL SEEDER, (1) HYDROMULCH TRUCK, (1) MAN LIFT

WITH THE COMPLETION OF THE 2" TOPSOIL LAYER, THE CONTRACTOR PLACED STOCKPILED ~~MM~~ 2" TOPSOIL MATERIAL ALONG THE EAST FACE BERM ALIGNMENT. MATERIAL WAS HAULED USING VOLVOS AND A 633D SCRAPER. PLACEMENT OF THE MATERIAL WAS PERFORMED USING A 14G BLADE, D8R DOZER, & A966F LOADER.

THE 2" TOPSOIL ~~MAT~~ MM 5/8/05 LAYER WAS RELEASED BY QA BASED ON FIELD INSPECTION + SURVEY INFORMATION.

CONTRACTOR COMPLETED THE PLACEMENT OF MANHOLE COVERS ON THE GEEP TREATMENT SYSTEM.

5-8-05

THE SEEDING/EROSION MATTING CREW WAS NOT ON-SITE. PRIOR WORK EXTENDED THE C125 MATTING TO APPROXIMATELY THE 5980 LINE ON THE SOUTH HALF OF THE CAP.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK: MORE WASHED ORAIN ROCK WILL HAVE TO BE PLACED IN SOUTHEAST PERIMETER CHANNEL. MUCH OF THE MATERIAL WAS WASHED AWAY DURING PREVIOUS STORM EVENTS.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:
NONE

Copies to: John Rahe

Observer: ~~Josh Valentine~~ MARSHALL MASSARO

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 205

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 5-9-05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: PARTLY CLOUDY, BREEZY, 40's-80°F Temp. 45.5° at 0720 a.m. NO PRECIPITATION Temp. 80.0° at 1705 p.m.	
Observation Period: 0630-1740	

EQUIPMENT: (2) CAT 146, (2) CAT 633D, (1) CAT D6 LGP, (1) CAT D5 LGP, (1) CAT D6 W/ DISK, (1) CAT 950B, (1) CAT 966F, (2) CAT 325L, (1) CAT TRACKLOADER 963C, (1) WATER TRUCK, (1) HANDTAMPER, (2) VOLVO A35C, (3) VOLVO A30D, (1) FLX-II DRILL SEEDER, (1) HYDROMULCH TRUCK, (1) MAN-LIFT

CONTRACTOR PLACED RIPRAP MATERIAL IN THE SE PERIMETER CHANNEL. MATERIAL WAS UNDERLAIN BY WASHED, 3/4" GRAVEL AND A NON-WOVEN GEOTEXTILE. ALL RIPRAP MATERIAL WAS HAULED USING VOLVOS AND PLACED USING 325 TRACKHOES. RIPRAP MATERIAL MET THE D50 SPECIFICATIONS. THE RIPRAP WAS PLACED ALONG THE SIDES AND BASE OF THE P-CHANNEL TO PROVIDE A MINIMUM 2 FOOT DEEP, RIPRAP LINED CHANNEL.

ALL 22" RFA, 2" TOPSOIL, 3/4" DRAIN ROCK BEDDING, & RIPRAP WAS SURVEYED AND RELEASED. AFTER RELEASE OF THE 2", 2-146 BLADES RIPPED THE 2" & 22" LAYERS TO A DEPTH OF APPROXIMATELY 9". RIPPING OCCURRED IN BOTH AN EAST-WEST AND NORTH-SOUTH DIRECTION. ~~FOLLOWING~~ MAN S/9/05 + AFTER RIPPING,

5-9-05

A D6 DOZER TRAILING A DISK BROKE APART LARGE SOIL CLODS ON THE SURFACE.

EROSION MATTING CREW PLACED C125 MATERIAL ON THE CAP. MATTING WAS STAPLED USING THE GREEN DOT PATTERN ACCORDING TO MANUFACTURERS SPECIFICATIONS.

RIPRAP MATERIAL WAS PLACED ~~AT THE~~ MPM 5/10/05 BELOW THE SEEP TREATMENT SYSTEM TO PROVIDE AN ADDITIONAL EROSION CONTROL

A MEETING WAS HELD TO ~~PERFORM~~ CREATE MPM 5/10/05 A FINAL WALK THROUGH CHECKLIST FOR THE PLF ACTIVITIES. ATTENDANCE CONSISTED OF CDPHE, EPA, COLO. DEPARTMENT OF FISH & WILDLIFE, KAISER-HILL, QA, & DESIGN ENGINEERING PERSONNEL. ITEMS TO BE COMPLETED ARE THE FOLLOWING: CLOSE OUT ALL WORK PACKAGES, COMPLETE QC PACKAGE, FINAL SURVEY, COMPLETE CAPS FOR AIR ~~SUMP~~ RAM VENTS & CLEANOUTS, CULVERTS, COMPLETE RIPPING & DISKING, FABRICATE SEEP I-BEAMS, REMOVE WESTERN CULVERTS, CLEAR SOIL & DEBRIS FROM POND SPILLWAY, FINAL REGRADING.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

NONE

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

ADDITIONAL DRAIN ROCK WAS PLACED IN THE SE PERIMETER CHANNEL TO REPLACE ROCK THAT HAD WASHED AWAY DURING PREVIOUS STORM.

Copies to: John Rahe

Observer: ~~Josh Valentine~~ MARSHALL MASSARO

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 206

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 5/10/05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: CLEAR, CALM - BREEZY, NSSOF-70F Temp. 58.7° at 0755 a.m. NO PRECIPITATION Temp. 69.7° at 1615 p.m.	
Observation Period: 0630 - 4:45pm	

EQUIPMENT: (2) CAT 14G, (2) CAT 633D, (1) CAT D6LGP, (1) CAT D5LGP, (1) CAT D6 W/DISK, (1) CAT 950B, (1) CAT 966F, (2) CAT 325L, (1) 963C CAT TRACKLOADER, (1) WATER TRUCK, (1) HAND TAMPER, (2) VOLVO A35C, (3) VOLVO A30D, (1) FLX-II DRILL SEEDER, (1) HYDROMULCH TRUCK, (1) MAN LIFT

CONTRACTOR REMOVED EXISTING CULVERTS FROM THE SE PERIMETER CHANNEL AND THE NORTH CENTRAL PERIMETER CHANNEL USING A 325L TRACKHOE. PEA GRAVEL WAS PLACED AS A BEDDING FOR THE NEW HDPE CULVERTS (4" MINIMUM). DOUBLE CULVERTS WERE PLACED ON SE P-CHANNEL AND WERE COVERED USING CUSHION MATERIAL. MATERIAL WAS COMPACTED USING HAND TAMPERS TO A MINIMUM OF 90% COMPACTION. DOUBLE CULVERTS ON NORTH P-CHANNEL WERE COMPLETED IN THE SAME MANNER AND SET AT A MINIMUM 2% SLOPE.

5-10-05

EROSION MATTING CREW CONTINUED TO PLACE C125 MATTING ON THE PLF CAP. PROGRESS WAS MADE TOWARDS THE S980 LINE. EROSION MATTING WAS PLACED ACCORDING TO MANUFACTURERS SPECIFICATIONS, A 3700 DITCH WITCH WAS ON-SITE TO REMOVE RUTS IN 2" MATERIAL CREATED BY THE HYDRO MULCHER DURING WET CONDITIONS. A D6R DOZER TRAILING A DISK COMPLETED DISKING THE AREA EAST OF THE S980 LINE, INCLUDING THE BERM EAST FACE. EAST FACE WILL BE BROADCAST SEEDED.

SMALL WESTERN BERMS OF EAST CREST BERM ARE GOING TO BE REPLACED WITH 45 FEET OF D_{50}=6" RIP RAP, RIPRAP WILL EXTEND WEST FROM THE BERM FOR 45 FEET. MATERIAL WILL BE COVERED WITH BOULDERS (MINIMUM 18"), DESIGN APPROVED BY EARTH TECH.

JOHN DEERE TRACTOR COMPLETED DRILL SEEDING OF TOP OF PLF BUT, DIDN'T PLANT EAST OF THE SLOPE/GRADE BREAK @ EAST FACING SLOPE.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

NONE

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

NONE

Copies to: John Rahe

Observer: ~~Josh Valentine~~ MARSHALL MASSARO / PATRICK NEEDERMEYER

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 207

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 05/11/05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Rainy, foggy, mild breeze, ~ 35-40°F Temp. 38 ° at 6:30 a.m. Temp. ____ ° at ____ p.m.	
Observation Period:	

EQUIPMENT:

Inclement weather, no work to be performed today.

QUALITY ASSURANCE OBSERVATION REPORT NO. 202

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 5/12/05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Clear to partly cloudy, thunderstorms expt'd pm Temp. N/A ° at _____ a.m. Temp. N/A ° at _____ p.m.	
Observation Period: 6:30am to 1:30 pm	

EQUIPMENT: Cat 325 L track hoe, cat 325 Cu track hoe, Cat 966F Articulated loader, Rome TRH 24-50 Disc, Cat D6tt XL Dozer, (2) Cat 14-G graders w/ 4 tooth rippers on back ends, Fuel Truck, Volvo A 30 D articulated dumptruck, (2) Volvo A35 C articulated dumptrucks, (2) Volvo A30 C on trailers ready to leave PLF, Mechanics truck, (2) Cat 633 D scrapers, Cat 633 D scraper, Cat 963 C Dozer, Man lift, water truck, Flex II drill seeder, Ditch witch 3700, Cat 950 B articulated loader, Cat D5 M dozer.

Clayey-sand red-brown cushion completed to 1 ft. above culverts @ SE corner of PLF; Cat D5 dozer topped cushion w/ rocky flats alluvium & compacted w/ tracks; rip rap placed around E & W. ends of culverts to spec.; vent caps placed on landfill vents securely to spec. on Wed.—checked today; @ NE culverts cushioned lifts placed to 1 ft. above top of culverts to spec.; ~~rocky flats alluvium placed above first to existing roadway grade.~~ Final compaction ~~by Cat 966 F loader.~~ Rip rap to be placed in pm—weather permitting. Demobe of equipment to occur in pm as well.

[Thursday, 05/12/05]

Ripped & disced areas outside of ditch surrounding landfill w/ scraper ed 6330 & Rome TRH 2450 Disc. These areas are @ the SE corner of the landfill E. of QA/QC trailers, & W. of power/transformer station. 3 trailers removed from site @ SE corner (@ entrance to PLF)

Mtg. in the morning, reviewed safety issues & importance of gloves.

Discussed job's intended progress for pm w/ Dan of Stoller & determined QA ~~unnecessary~~ oversight could be accomplished next day. Confirmed decision to leave site w/ John Rahe & Bruce Marshall @ 12:30 pm & left site to take field truck in for minor repairs & maintainence.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

None.

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None.

Copies to: John Rahe

Observer: ~~Josh Valentine~~ Patrick Niedermeyer

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 209

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 05/13/05
Project: Rocky Flats RCRA Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Stoller	
Subcontractor Superintendent: Paul Kreitz	
Weather Conditions: Partly cloudy & breezy Temp. N/A ° at _____ a.m. Temp. N/A ° at _____ p.m.	
Observation Period: 7:15am to _____	

EQUIPMENT: _____

En route to site car trouble – arrived @ site 7:11am. Recieved Golder QC report from 5/10/05 from Jade Woo of CH2M. Observed remaining fill being placed @ NE culverts. Brought fill up to existing grade – final compaction & soil manipulation by Cat 966F loader. Rip rap was placed as per spec. on 5/12/05 in pm. Observed berm over top of landfill be extended down 4:1 slope on South edge of landfill into ditch. Rip rap to be placed next. Observed track hoe spread rocky flats alluvium just S South & E East of passive treatment system @ toe of East face. Crews continuing to place matting on top of landfill per spec. working their way East from ~100yds W. of NE culverts.

05/13/05

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

None

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: ~~Josh Valentine~~ P. Niedermeyer

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 210

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 08-01-05
Project: Rocky Flats RCRA (PLF) Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Envirocon	
Subcontractor Superintendent: Greg Church	
Weather Conditions: Temp. 81 ° at 8:52 a.m. Temp. NA ° at _____ p.m.	
Observation Period: 6:30a - 3:30p	

EQUIPMENT: Cat 325C-L excavator, ~~Cat D5M dozer~~ (not Gary available)

Excavator began cutting/shaping east end of north channel North channel completely surveyed in, south channel not surveyed in yet. The former GWIS pipeline was excavated w/ the 325 approximately 120' (12-10' pipe lengths) until it attained 3+ ft. of cover. Laborer worked w/ 325 operator to pothole north GWIS (current) pipeline that crosses north channel. 325 cont'd excavating north channel w/ iterative staking & marking cut/fills w/ spraypaint. ~~tk~~ Lightning shut down for ~2hrs in afternoon. Bob Davis told QA & Earth Tech we were no longer needed @ ~3:30 pm. QA transfered pictures to memory device for tranfer to CD & left RFETS @ 4:10 pm.

Top 10ft & bottom 10 ft left to excavate, entire trench still needs finish work. Old GWIS pipeline appeared to have no water in it. (north GWIS pipeline only - south not excavated yet) New GWIS pipeline appeared in good shape - no breaks visible.

08-01-05

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

None

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Patrick Niedermeyer

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 211

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 08-02-05
Project: Rocky Flats RCRA (PLF) Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Envirocon	
Subcontractor Superintendent: Greg Church	
Weather Conditions: Temp. NA ° at _____ a.m. Temp. NA ° at _____ p.m.	
Observation Period: 6:30am – 4:35pm	

EQUIPMENT: Cat 325C-L Excavator, Cat D5M Dozer, Cat ~~9~~ 966G loader.

Cat 325C-L & D5 dozer backfilled excavation after removing 120 ft. of the old GWIS pipeline on north side of landfill pond. North end of pipeline left open & not backfilled for later grouting. 325 & D5 completed finish grade of north channel at 1100am. Surveyor completed staking south channel alignment. Wildlife biologist came out @ lunch & checked tree south of south channel for owl's nest. 2 owls seen in tree both Mon & Tues mornings. Biologist gave the ok to take down tree – no owl nest. D5 dozer began ripping & regrading north access road that runs in a generally E-W alignment on north side of landfill pond. ~~325 & D5 cont'd~~ Rip rap arrived @ RFETS from A. Frye in Idaho Springs w/ further loads coming in throughout the day. Gravel arrived in pm. Both stockpiled approx. 200 yards SE of channel excavation along SE corner of

landfill cap. 8oz. geotextile, (roll id: 30015480, GT180, 180 300) arrived at east face in pm. QA cut off identifying labels & removed paperwork from packaging for documentation. Cat 966G loader transported existing riprap from south channel to west end of north access road where D5 spread around embankment.

Lightning shutdown from ~1:10 pm until 4:15pm. No further work after lightning warning lifted.

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

None

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Patrick Niedermeyer

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 212

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 8/3/05
Project: Rocky Flats RCRA (PLF) Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Envirocon	
Subcontractor Superintendent: Greg Church	
Weather Conditions: Temp. NA ° at _____ a.m. Temp. NA ° at _____ p.m.	
Observation Period: 6:30 am – 4:40 pm	

EQUIPMENT: Cat 325C-L Excavator, (2) Cat 966G Loaders, Cat D5M Dozer

325 excavator cont'd digging & shaping south channel. ~~Laborers~~ Laborers began laying geotextile in north channel after it was to grade & surveyed. 966 Loader brought in gravel from stockpile & placed over geotextile. Laborers spread gravel (1½ in.(-)) in 4 in. lift over geotextile. Surveyors checked gravel thickness on north channel & told QA it was to spec. (2) 966 ~~& 325~~ loaders brought in gravel & placed in south channel & 325 roughed out the lift. Laborers fine tuned the 1½ in. gravel to meet the 4 in. lift & was confirmed by surveyor. (2) 966 loaders imported VL rip rap to both north & south channels but more was needed. Lightning shut down @ 345 pm to continue work on riprap tomorrow, weather permitting.

As of every day QA transfered the days photos to CD & dropped off

8/3/05

at Mint View for Bob Davis (K-H)

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

None

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Patrick Niedermeyer

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 213

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 8/4/05
Project: Rocky Flats RCRA (PLF) Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Envirocon	
Subcontractor Superintendent: Greg Church	
Weather Conditions: Temp. 69 ° at 6:30 a.m. Temp. ____ ° at ____ p.m.	
Observation Period: 8:30 am - 9:15 am	

EQUIPMENT:

Not working - rained out all day.

Visited site w/ Ryan Archibald (Earth Tech) & Bob Davis (K-H) @ 8:30 am to view erosion & surface water runoff during rain event. Photo documented area & left site @ 9:15 am.

Went back to Original Landfill where work cont'd.

Left RFETS at ~10 am.

8/4/05

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

N/A (none)

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

N/A (none)

Copies to: John Rahe

Observer: Patrick Niedermeyer

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 214 ~~215~~

MAM 8/15/05

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00 Date 8-8-05	
Project: Rocky Flats RCRA (PLF) Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Envirocon	
Subcontractor Superintendent: Greg Church	
Weather Conditions: Partly cloudy, hot, dry. Temp. 75 ° at 7:10 a.m. Temp. NA ° at _____ p.m.	
Observation Period: 6:30am – 5pm	

EQUIPMENT: (1) Cat 325C-L excavator, (1) Cat 966G loader, Cat D5M dozer

Cat 325 excavator cont'd placing riprap in both north & south channels. Cat 966 loader brought in VL riprap from stockpile to channels. Cat D5M cont'd regrading area bordered to the north by east face's erosion matting, to the west by the north channel, & to the south by the Land Fill Pond. Dozer worked from west working east.

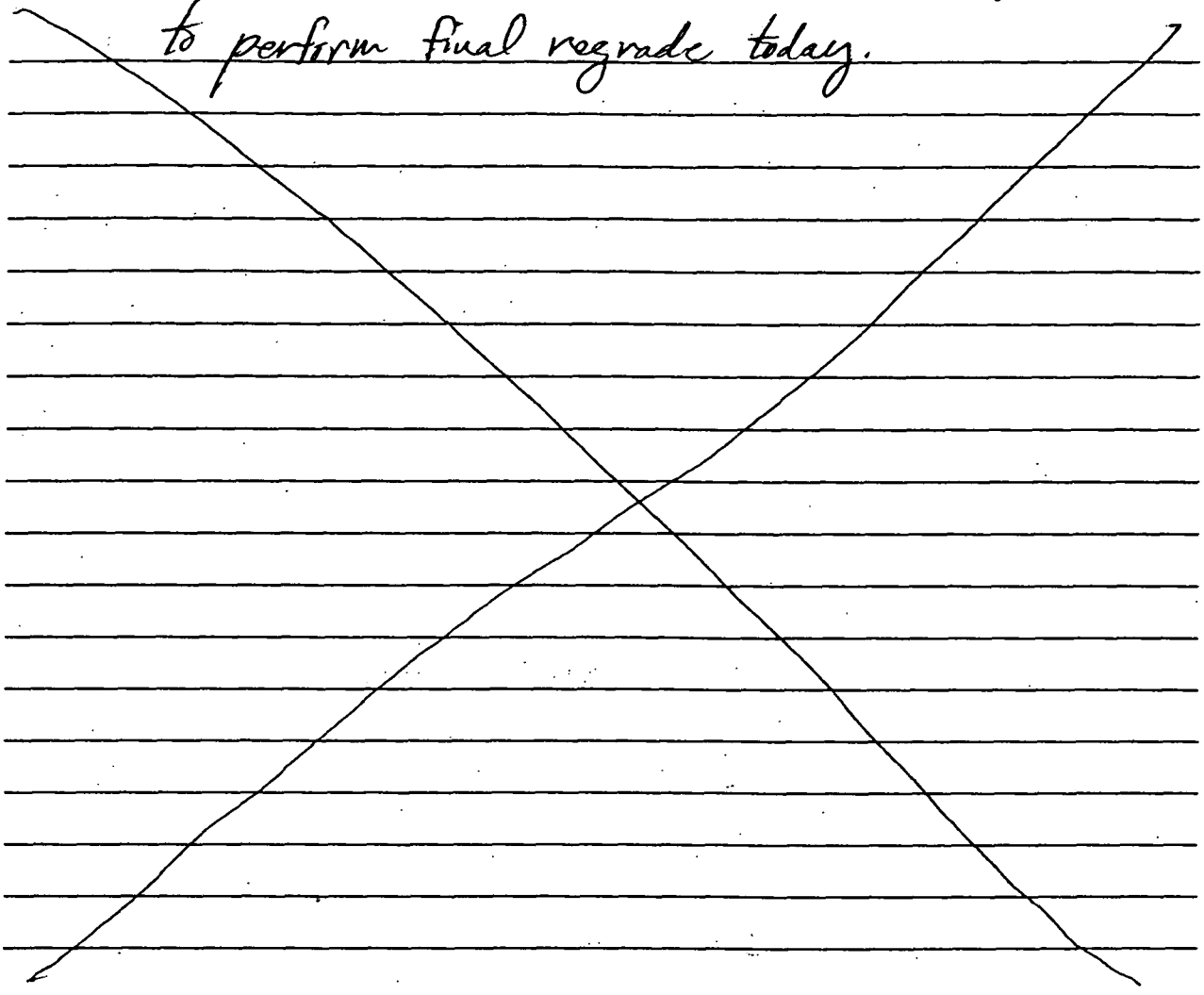
Surveyor confirmed riprap to grade in south channel – both now complete.

Transite pipe - end grouted - ready for final backfill.

D5M, 325C-L began regrading area between channels upslope of treatment cell & below east face's erosion matting. 966 imported REA for placement in area. Area too wet (from borrow pit) dry

8-8-05

to perform final regrade today.



DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

None

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Patrick Niedermeyer

Reviewing Engineer: John Rahe

QUALITY ASSURANCE OBSERVATION REPORT NO. 215 ~~216~~ Run 8/15/05

TETRA TECH RMC

TO: _____

Project No. 19-4886.001.00	Date 8-9-05
Project: Rocky Flats RCRA (PLF) Landfill Cover	
Owner: DOE	
Contractor: Kaiser Hill	
Contractor Superintendent: Bob Davis	
Subcontractor: Envirocon	
Subcontractor Superintendent: Greg Church	
Weather Conditions: Cloudy to partly cloudy - warm Temp. 81 ° at 907 a.m. Temp. NA ° at _____ p.m.	
Observation Period: 6:30am – 9:00am	

EQUIPMENT: Cat 325 C-L Excavator, Cat 966 G Loader.

966 brought in RFA from borrow pit to southside of south channel. 325 placed RFA in area between channels & finish graded area to Earth Tech's specifications. QA left site @ 0900 after photo documenting fill/grade work. 9am Work called due to rain & severe weather early am ~7:15 am+/- Envirocon to hand ~~seeding~~ areas of regrade & placing erosion matting around treatment cell & manholes to spec.

QA, ~~QC~~ Earthtech & Bob Davis met @ site in the 9am rain @ 8am to perform final inspection of channels. All in agreement that design & construction was sufficient.

8-9-05

DEFICIENCIES AND NON-CONFORMING MATERIALS OR WORK:

None

FOLLOW-UP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES:

None

Copies to: John Rahe

Observer: Patrick Niedermeyer

Reviewing Engineer: John Rahe

APPENDIX G-2: WEEKLY QA REPORTS

WEEKLY FIELD MONITORING SUMMARY NUMBER 1
August 23 THROUGH September 1, 2004
CONSTRUCTION QUALITY ASSURANCE
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
GOLDEN, COLORADO

Introduction

Tetra Tech has prepared this weekly summary of Construction Quality Assurance (CQA) monitoring and testing performed for construction of the present landfill cap from August 26 through September 1, 2004. This weekly report summarizes the construction activities, CQA and Construction Quality Control (CQC) testing, and surveying activities for Present Landfill (PLF) liner construction, geosynthetic deliveries and all related construction activities for the construction of the PLF Accelerated Action.

Tetra Tech is the on-site CQA Engineer (CQAE) providing CQA services as a subcontractor to the Rocky Flats Contractor Kaiser-Hill Company, LLC (K-H). The Program Management Contractor (PMC) team is providing the CQC services for the PLF. The PMC team consists of S.M. Stoller Corporation as the prime with Nelsons-Skanka, Colorado Lining International, Golder Associates, Inc. and Paragon Surveying. Golder Associates is performing the CQC services. Advanced Terra Testing Inc. of Lakewood, Colorado is performing CQA laboratory testing services for soils and geosynthetics.

Construction Synopsis

The construction subcontractor is S.M. Stoller Corporation (Stoller). Paragon Surveying (Paragon) of Denver, Colorado is the subcontractor's surveyor.

Equipment

Stoller had the following equipment on site:

- (1) Cat 825G pad-foot compactor
- (2) Cat 14G graders
- (1) Cat 950B front-end loader
- (2) Cat 633D scrapers
- (1) Cat CS-583C vibrating smooth drum compactor
- (2) water trucks

Stoller spent much of the week continuing to grade the haul road, using gravel to stabilize soft areas and road base as a final surface. Grading was also done around the construction trailers. Stoller also started to build the equipment wash pad and set the scale to weigh incoming trucks.

Concrete barriers were placed on and around the cap, such as monitor wells and other critical areas, to protect them during construction. Clear and grub was started west of the 5280 contour. During clear and grub on the west-end of the site on September 1, 2004, the original landfill cover was cut and waste was exposed. The site was immediately shut down for analysis of the waste materials.

Field Action Items

During this reporting period, no field action items were issued.

Nonconformances

- QC (Golder) performed a preliminary sieve analysis on the rock-layer material. Preliminary results do not meet the revised specification.

Record Surveys

Paragon set overlot grading stakes on a 50-foot grid over the entire landfill area. The grade elevations are in question, and are currently being reviewed.

Hold Point Release

During this reporting period, no hold point releases were issued.

CQAE Geosynthetics Sampling, Testing, and Materials Received

Geosynthetic Clay Liner

The GCL material (Bentomat ST) submittals were reviewed by the Contractor's Technical Representative (CTR) for K-H and the CQAE and the approval to purchase the material was given to the PMC with specific qualifications. During this period, zero rolls were delivered to site and zero conformance samples were collected and shipped for testing.

Geomembrane

The geomembrane material (60-mil LLDPE) submittals were reviewed by the CTR and CQAE, and approval to purchase the material was given to the PMC with specific qualifications. During this period, zero rolls were delivered to site and zero conformance samples were collected and shipped for testing.

Geosynthetic Composite Drainage Net

The GDN material (TexDrain 200 DS 8) submittals were reviewed by the CTR and the CQAE, and approval to purchase the material was given to the PMC with specific

qualifications. During this period, zero rolls were delivered to site and zero conformance samples were collected and shipped for testing.

CQAE and CQC Soil Sampling and Testing

The Site Quality Assurance Manager (SQAM) working with the CQAE monitored the construction contractor's activities during the week. No CQA soil samples were obtained and no CQC tests were performed during the week. The SQAM reviewed the PMC's earthwork work plan.

The PMC submitted grain size analyses of the soil cushion (and foundation) material, which were reviewed by the CTR and CQAE and found to be in conformance with the specifications. CQC performed an on-site sieve analysis of the rock-layer material. Preliminary calculations indicate that it does not meet revised specifications. A new sample is scheduled to be retested Thursday, September 2, 2004.

Meetings

A CQA meeting was held on Wednesday August 25 at the EPA's offices with the CTR, CQAE, project designers (Earth Tech) and CDPHE with the purpose of presenting the EPA's and CDPHE's requirements for CQA documentation.

The first site construction meeting was held on Thursday August 26 with the CTR and representatives from EPA, CDPHE, CQAE and the PMC.

CAQ and CQC Personnel On-site

CQAE personnel (SQAM) were onsite Monday through Friday during the period of this report. CQC personnel were also onsite during the period.

Josh Valentine, SQAM
Tetra Tech

9/1/04
Date

John H. Rahe, P.E., CQAE
Tetra Tech

9/1/04
Date

Distribution:
CQAE (John Rahe)
CTR (Bob Davis)
EPA
CDPHE

WEEKLY FIELD MONITORING SUMMARY NUMBER 2
September 2 THROUGH September 8, 2004
CONSTRUCTION QUALITY ASSURANCE
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
GOLDEN, COLORADO

Introduction

Tetra Tech has prepared this weekly summary of Construction Quality Assurance (CQA) monitoring and testing performed for construction of the present landfill cap from September 2 through September 8, 2004. This weekly report summarizes the construction activities, CQA and Construction Quality Control (CQC) testing, and surveying activities for Present Landfill (PLF) liner construction, geosynthetic deliveries and all related construction activities for the construction of the PLF Accelerated Action.

Tetra Tech is the on-site CQA Engineer (CQAE) providing CQA services as a subcontractor to the Rocky Flats Contractor Kaiser-Hill Company, LLC (K-H). The Program Management Contractor (PMC) team is providing the CQC services for the PLF. The PMC team consists of S.M. Stoller Corporation as the prime with Nelsons-Skanska, Colorado Lining International and Golder Associates, Inc. Golder Associates is performing the CQC services. Advanced Terra Testing Inc. of Lakewood, Colorado is performing CQA laboratory testing services for soils and geosynthetics.

Construction Synopsis

The construction subcontractor is S.M. Stoller Corporation (Stoller). Paragon Surveying (Paragon) of Denver, Colorado is the subcontractor's surveyor.

Equipment

Stoller had the following equipment on site:

- (1) Cat 825G pad-foot compactor
- (2) Cat 14G graders
- (1) Cat 950B front-end loader
- (2) Cat 633D scrapers
- (1) Cat CS-583C vibrating smooth drum compactor
- (2) water trucks

Stoller had an incident involving a water truck and a grader at the end of the day on September 2, and the project site was shut down for the remainder of the day. Stoller did not work from September 3rd through the 6th due to the Labor Day holiday. No work was done on the landfill on September 7th due to the incident while it was investigated and training was held.

Stoller spent the remainder of the week clearing and grubbing the west side of the landfill cap. The vegetation was being windrowed with the graders then picked up with the scrapers and stockpiled. There were numerous areas of trash exposed by the grading process; these areas were surveyed and evaluated.

The drill rig and drilling crew were onsite on September 8, 2004 to drill test bores on the landfill cap, although no drilling was done. Drilling is scheduled to begin on Thursday, September 9.

Field Action Items

During this reporting period, no field action items were issued.

Nonconformances

- QC (Golder) performed a second sieve analysis on the rock-layer material. The results do not meet specification.

Record Surveys

During this reporting period, no record surveys were performed.

Hold Point Release

During this reporting period, no hold point releases were issued.

CQAE Geosynthetics Sampling, Testing, and Materials Received

Geosynthetic Clay Liner

An order was placed for Geosynthetic clay liner materials. During this period, zero rolls were delivered to site and zero conformance samples were collected and shipped for testing.

Geomembrane

An order was placed for Geomembrane. During this period, zero rolls were delivered to site and zero conformance samples were collected and shipped for testing.

Geosynthetic Composite Drainage Net

An order was placed for Geosynthetic composite drainage net. During this period, zero rolls were delivered to site and zero conformance samples were collected and shipped for testing.

CQAE and CQC Soil Sampling and Testing

The Site Quality Assurance Manager (SQAM) working with the CQAE monitored the construction contractor's activities during the week. No CQA soil samples were obtained and no CQC tests were performed during the week. CQC performed a second on-site sieve analysis of the rock-layer material. Final calculations indicate that it does not meet revised specifications.

Meetings

The weekly site construction meeting was held on Thursday, September 2 with the CTR and representatives from CQC, CQAE and the PMC.

CAQ and CQC Personnel On-site

CQAE personnel (SQAM) were onsite Monday through Friday during the period of this report. CQC personnel ~~were~~ also onsite as needed.

Josh Valentine, SQAM — 9-9-04
Tetra Tech — Date

John H. Rahe, P.E., CQAE — 9/9/04
Tetra Tech — Date

Distribution: CQAE (John Rahe)
CTR ~~PMC~~ (Bob Davis)
EPA, CDPHE

MAM
5/4/05

WEEKLY FIELD MONITORING SUMMARY NUMBER 3
September 9,THROUGH September 15, 2004
CONSTRUCTION QUALITY ASSURANCE
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
GOLDEN, COLORADO

Introduction

Tetra Tech has prepared this weekly summary of Construction Quality Assurance (CQA) monitoring and testing performed for construction of the present landfill cap from August 26 through September 1, 2004. This weekly report summarizes the construction activities, CQA and Construction Quality Control (CQC) testing, and surveying activities for Present Landfill (PLF) liner construction, geosynthetic deliveries and all related construction activities for the construction of the PLF Accelerated Action.

Tetra Tech is the on-site CQA Engineer (CQAE) providing CQA services as a subcontractor to the Rocky Flats Contractor Kaiser-Hill Company, LLC (K-H). The Program Management Contractor (PMC) team is providing the CQC services for the PLF. The PMC team consists of S.M. Stoller Corporation as the prime with Nelsons-Skanka, Colorado Lining International and Golder Associates, Inc. Golder Associates is performing the CQC services. Advanced Terra Testing Inc. of Lakewood, Colorado is performing CQA laboratory testing services for soils and geosynthetics.

Construction Synopsis

The construction subcontractor is S.M. Stoller Corporation (Stoller). Paragon Surveying (Paragon) of Denver, Colorado is the subcontractor's surveyor.

Equipment

Stoller had the following equipment on site:

- (1) Cat 825G pad-foot compactor
- (2) Cat 14G graders
- (1) Cat 950B front-end loader
- (2) Cat 633D scrapers
- (1) Cat CS-583C vibrating smooth drum compactor
- (2) Water trucks
- (1) Cat Backhoe
- (1) Bobcat mower

Stoller completed clear and grub on the west half of the landfill cap, and started to mow the area around the pond. Earth Tech is continuing to drill on the cap to determine what is causing the soft areas, as well as boring and sampling two holes on the east face. Proof

rolling was started on the cap using a loaded scraper with a representative from Stoller QC, CQA, Kaiser Hill, and Earth Tech. The first pass was completed from the west end to the southeast entrance road. The area was marked several times per pass to make sure no areas were missed. Paint marks as well as flags were used to mark any soft areas that were not within specification. The second pass was started and is completed from the west end approximately two thirds of the way the southeast entrance. The second pass was marked in the same manner as the first, but is being performed 90 degrees to the first.

Field Action Items

During this reporting period, no field action items were issued.

Nonconformances

- Several soft areas were marked during the proof roll and will be surveyed and plotted on a map after the proof roll is completed. The areas will be accessed for repair after the grading plan is finalized and the test bores are completed and analized.

Record Surveys

Paragon

Hold Point Release

During this reporting period, no hold point releases were issued.

CQAE Geosynthetics Sampling, Testing, and Materials Received

Geosynthetic Clay Liner

The GCL material (Bentomat ST) is on order. During this period, zero rolls were delivered to site and zero conformance samples were collected and shipped for testing.

Geomembrane

The geomembrane material (60-mil LLDPE) is on order. During this period, zero rolls were delivered to site and zero conformance samples were collected and shipped for testing.

Geosynthetic Composite Drainage Net

The GDN material (TexDrain 200 DS 8) is on order. During this period, zero rolls were delivered to site and zero conformance samples were collected and shipped for testing.

CQAE and CQC Soil Sampling and Testing

The Site Quality Assurance Manager (SQAM) working with the CQAE monitored the construction contractor's activities during the week. No CQA soil samples were obtained. CQC performed an on-site sieve analysis of the rock-layer material.

Meetings

The weekly site construction meeting was held on Thursday September 9.

CQA and CQC Personnel On-site

CQAE personnel (SQAM), and CQC were onsite Monday through Friday during the period of this report.

Josh Valentine, SQAM — 9-15-04
Tetra Tech — Date

John H. Rahe, P.E., CQAE — 9/15/04
Tetra Tech — Date

Distribution:
CQAE (John Rahe)
CTR (Bob Davis)
EPA
CDPHE

WEEKLY FIELD MONITORING SUMMARY NUMBER4
September 16, THROUGH September 22, 2004
CONSTRUCTION QUALITY ASSURANCE
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
GOLDEN, COLORADO

Introduction

TetraTech has prepared this weekly summary of Construction Quality Assurance (CQA) monitoring and testing performed for construction of the present landfill cap from September 16 through September 22, 2004. This weekly report summarizes the construction activities, CQA and Construction Quality Control (CQC) testing, and surveying activities for the Present Landfill (PLF) liner construction, geosynthetic deliveries and all related activities for the construction of the PLF Accelerated Action.

Tetra Tech is the on-site CQA Engineer (CQAE) providing CQA services as a subcontractor to the Rocky Flats Contractor Kaiser-Hill Company, LLC (K-H). Earth Tech is the design engineer for the PLF contracted by Kaiser-Hill Company. The Program Management Contractor (PMC) team is providing the CQC services for the PLF. The PMC team consists of S.M. Stoller Corporation as the prime with Neilson-Skanska, Colorado Linings International, Paragon Surveying and Golder Associates, Inc. Golder Associates is performing the CQC services. Advanced Terra Testing Inc. of Lakewood, Colorado is Performing CQA laboratory testing services for soils and geosynthetics.

Construction Synopsis

The construction subcontractor is S.M. Stoller Corporation (Stoller). Paragon Surveying (Paragon) of Denver, Colorado is the subcontractor's surveyor.

Equipment

Stoller had the following equipment on site:

- (1) Cat 825G pad-foot compactor
- (2) Cat 14G Graders
- (1) Cat 950B front-end loader
- (2) Cat 633D scrapers
- (1) Cat D6N LGP dozer
- (1) Cat CS-583C vibrating smooth drum compactor
- (2) Water Trucks
- (1) Cat Rubber Tire Backhoe
- (1) Bobcat Mower
- Cat Forklift

The second pass of the proof roll was completed from the west end to the southeast entrance. There is still one section on the east end that has not been proof rolled due to

rebar and other debris, this section will be rolled at a later date. The soft areas were marked, surveyed and mapped for all proof rolled areas. The current Soft Spot Area map has 18 soft spots marked for repair. The drill rig was used to evaluate many of the soft areas including depth of cover, type of material and possible reason for the deflection. The designer and construction subcontractor are currently evaluating the best methods to fix these areas.

The ramps were also completed and the road cut for the remaining test bores on the east face. Drilling was slow due to weather and breakdowns so very few bores were completed this week. The test fill area was surveyed, and the first one foot loose lift on Rocky Flats Alluvium was placed, mixed and moisture conditioned. The area is currently saturated due to rain, so no compaction has been done. The cushion soils are being delivered and stock piled for the test fill. The contractor also started to cut and remove the vegetation around the pond.

Field Action Items

During this period, no field action items were issued.

Nonconformances

- Several soft areas were marked during the proof roll and have been surveyed and mapped. The areas are currently being evaluated for the best procedure to stabilize them.

Record Surveys

- The soft areas have been surveyed and mapped up to current edge of the proof roll.

Hold Point Release

During this reporting period, no hold point releases were issued.

CQAE Geosynthetic Sampling, Testing, and Materials Received

Geosynthetis Clay Liner

The GCL material (Bentomat ST) is on order. During this period, zero rolls were delivered to site and zero conformance samples were collected and shipped for testing.

Geomembrane

The Geomembrane material (60-mil LLDPE) is on order. During this period, zero rolls were delivered to site and zero conformance samples were collected and shipped for testing.

Geosynthetis Composite Drainage Net

The GDN material (TexDrain 200 DS 8) is on order. During this period, zero rolls were delivered to site and zero conformance samples were collected and shipped for testing.

CQAE and CQC Soil Sampling and Testing

The Site Quality Assurance Manager (SQAM) working with the CQAE monitored the construction contractor's activities during the week. No CQA samples were obtained.

Meetings

The weekly site meeting was held on site on Thursday September 16, and the QC/QA meeting was held immediately after. EPA was on site for a tour after the meetings. A preliminary meeting was held on site on Monday September 20, discussing the lining package and procedures.

CQA and CQC Personnel On-Site

CQAE personnel (SQAM), and CQC were on site Monday through Friday during working hours for this reporting period.

Josh Valentine, SQAM
Tetra Tech

9-22-04
Date

John H. Rahe, P.E., CQAE
Tetra Tech

9/22/04
Date

Distribution:
CQAE (John Rahe)
CTR (Bob Davis)
EPA
CDPHE

WEEKLY FIELD MONITORING SUMMARY NUMBER 5
September 23, THROUGH September 29, 2004
CONSTRUCTION QUALITY ASSURANCE
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
GOLDEN, COLORADO

Introduction

TetraTech has prepared this weekly summary of Construction Quality Assurance (CQA) monitoring and testing performed for construction of the present landfill cap from September 23 through September 29, 2004. This weekly report summarizes the construction activities, CQA and Construction Quality Control (CQC) testing, and surveying activities for the Present Landfill (PLF) liner construction, geosynthetic deliveries and all related activities for the construction of the PLF Accelerated Action.

Tetra Tech is the on-site CQA Engineer (CQAE) providing CQA services as a subcontractor to the Rocky Flats Contractor Kaiser-Hill Company, LLC (K-H). Earth Tech is the design engineer for the PLF contracted by Kaiser-Hill Company. The Program Management Contractor (PMC) team is providing the CQC services for the PLF. The PMC team consists of S.M. Stoller Corporation as the prime with Neilson-Skanska, Colorado Linings International, Paragon Surveying and Golder Associates, Inc. Golder Associates is performing the CQC services. Advanced Terra Testing Inc. of Lakewood, Colorado is Performing CQA laboratory testing services for soils and geosynthetics.

Construction Synopsis

The construction subcontractor is S.M. Stoller Corporation (Stoller). Paragon Surveying (Paragon) of Denver, Colorado is the subcontractor's surveyor.

Equipment

Stoller had the following equipment on site:

- (1) Cat 825G pad-foot compactor
- (2) Cat 14G Graders
- (1) Cat 950B front-end loader
- (2) Cat 633D scrapers
- (1) Cat D6N LGP dozer
- (1) Cat CS-583C vibrating smooth drum compactor
- (2) Water Trucks
- (1) Cat Rubber Tire Backhoe
- (1) Bobcat Mower
- (1) Cat Forklift
- (1) Cat 325L Backhoe

The first lift of the test fill was dried out after the rain and compacted with the Cat 825G, four complete passes. The first lift was proof rolled using a loaded scraper with the EPA present, no soft areas were observed. The second one foot lift was placed after the proof roll. The lift was scarified to aid in mixing then compacted with four passes of the Cat 825G and sealed with the smooth drum to help protect it from the rain. Three test pits were excavated to look for voids and compaction, EPA was on site to observe and found no voids, and found compaction to be acceptable. The test fill has been worked to help aid in drying, but it has been too wet due to rain to place the cushion soils.

The test bores on the east face have been completed. The devegetation is also continuing around the pond including the removal of the material in the roll-offs. The contractor has also been removing the concrete and other debris on the east side of the cap so that the proof roll can be completed.

Field Action Items

During this period, no field action items were issued.

Nonconformances

- Several soft areas were marked during the proof roll and have been surveyed and mapped. The areas are currently being evaluated for the best procedure to stabilize them.

Record Surveys

- The test fill was surveyed for all tests taken as well as for lift thicknesses on all layers.

Hold Point Release

During this reporting period, no hold point releases were issued.

CQAE Geosynthetic Sampling, Testing, and Materials Received

Geosynthetic Clay Liner

The GCL material (Bentomat ST) is on order. During this period, zero rolls were delivered to site and zero conformance samples were collected and shipped for testing.

Geomembrane

The Geomembrane material (60-mil LLDPE) is on order. During this period, zero rolls were delivered to site and zero conformance samples were collected and shipped for testing.

Geosynthetic Composite Drainage Net

The GDN material (TexDrain 200 DS 8) is on order. During this period, zero rolls were delivered to site and zero conformance samples were collected and shipped for testing.

CQAE and CQC Soil Sampling and Testing

The Site Quality Assurance Manager (SQAM) working with the CQAE monitored the construction contractor's activities during the week. No CQA samples were obtained.

Meetings

The weekly site meeting was held on site on Thursday September 23, and the QC/QA meeting was held immediately after. EPA was on site on September 23, 27 and 28 to observe the test fill.

CQA and CQC Personnel On-Site

CQAE personnel (SQAM), and CQC were on site Monday through Friday during working hours for this reporting period. John Rahe the CQAE was on site on September 23, for the weekly meeting as well as to observe the test fill.

9-29-04

Josh Valentine, SQAM
Tetra Tech

Date

9/29/04

John H. Rahe, P.E., CQAE
Tetra Tech

Date

Distribution:
CQAE (John Rahe)
CTR (Bob Davis)
EPA
CDPHE

WEEKLY FIELD MONITORING SUMMARY NUMBER 6
September 30, THROUGH October 6, 2004
CONSTRUCTION QUALITY ASSURANCE
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
GOLDEN, COLORADO

Introduction

TetraTech has prepared this weekly summary of Construction Quality Assurance (CQA) monitoring and testing performed for construction of the present landfill cap from September 23 through September 29, 2004. This weekly report summarizes the construction activities, CQA and Construction Quality Control (CQC) testing, and surveying activities for the Present Landfill (PLF) liner construction, geosynthetic deliveries and all related activities for the construction of the PLF Accelerated Action.

Tetra Tech is the on-site CQA Engineer (CQAE) providing CQA services as a subcontractor to the Rocky Flats Contractor Kaiser-Hill Company, LLC (K-H). Earth Tech is the design engineer for the PLF contracted by Kaiser-Hill Company. The Program Management Contractor (PMC) team is providing the CQC services for the PLF. The PMC team consists of S.M. Stoller Corporation as the prime with Neilson-Skanska, Colorado Linings International, Paragon Surveying and Golder Associates, Inc. Golder Associates is performing the CQC services. Advanced Terra Testing Inc. of Lakewood, Colorado is Performing CQA laboratory testing services for soils and geosynthetics.

Construction Synopsis

The construction subcontractor is S.M. Stoller Corporation (Stoller). Paragon Surveying (Paragon) of Denver, Colorado is the subcontractor's surveyor.

Equipment

Stoller had the following equipment on site:

- (1) Cat 825G pad-foot compactor
- (2) Cat 14G Graders
- (1) Cat 950B front-end loader
- (2) Cat 633D scrapers
- (1) Cat D6R LGP dozer
- (1) Cat CS-583C vibrating smooth drum compactor
- (2) Water Trucks
- (1) Cat Rubber Tire Backhoe
- (1) Bobcat Mower
- (1) Cat Forklift
- (1) Cat 325L Backhoe
- (1) Volvo Dump Truck

Stoller started to cut from the top of the landfill based on the new design. The cut material was being placed as fill on the south and west sides. The fill is being placed in one foot or thinner lifts, allowed to dry as needed then compacted with four passes of the 825. Some trash is being encountered in the cut areas, it is currently being stock piled and scanned. The trash will either be removed or placed elsewhere on site.

The six inch lift of cushion material was placed on the test fill. The lift was compacted with two passes of the Cat CS-583C vibrating smooth drum compactor, surveyed and tested. QC took five nuclear density tests and all were within specification for moisture and density (95% Density ±2% Moisture). The ten inch lift was also placed on the test fill. The lift was compacted with three passes of the Cat CS-583C vibrating smooth drum compactor, surveyed and tested. QC took five nuclear density tests and all were within specification for moisture and density (95% Density ±2% Moisture). QC also took one sandcone test on each lift for correlation. EPA was on-site to observe the final lifts and testing of the test fill, the test fill has been completed.

Stoller started soft spot repair on areas 1, 2 and 3 per the repair procedures. Soft areas 1 and 2 was treated as seeps and little excavating was done. The areas were smoothed and covered with geotextile and geogrid per the manufacturers specifications. Soft area 3 was excavated three feet when water was encountered. The area was cleaned and covered with geotextile and geogrid per the manufacturers specifications. Areas 2 and 3 are to be backfilled with a layer of rock material on the geogrid due to water, very little fill was placed due to problems with the rock material.

Stoller completed the three staging areas for the geosynthetics. 72 rolls of the 60mil LLDPE have been delivered and offloaded onto the staging areas for storage. The rolls have been inspected and documented as they are unloaded.

Field Action Items

During this period, no field action items were issued.

Nonconformances

- Several soft areas were marked during the proof roll and have been surveyed and mapped. The areas are currently being repaired, but none have been completed.

Record Surveys

- The test fill was surveyed for all tests taken as well as for lift thicknesses on all layers.

Hold Point Release

During this reporting period, no hold point releases were issued.

CQAE Geosynthetic Sampling, Testing, and Materials Received

Geosynthetic Clay Liner

The GCL material (Bentomat ST) is on order. During this period, zero rolls were delivered to site and zero conformance samples were collected and shipped for testing.

Geomembrane

72 rolls of Geomembrane material (60-mil LLDPE) have been delivered and have been unloaded onto the three staging areas. Conformance samples have been received at Advanced Terra Testing from the manufacturer and are currently being tested.

Geosynthetic Composite Drainage Net

The GDN material (TexDrain 200 DS 8) is on order. During this period, zero rolls were delivered to site and zero conformance samples were collected and shipped for testing.

CQAE and CQC Soil Sampling and Testing

The Site Quality Assurance Manager (SQAM) working with the CQAE monitored the construction contractor's activities during the week. No CQA samples were obtained. CQC preformed 10 nuclear density and 2 sandcone tests on the cushion layer of the test fill.

Meetings

The weekly site meeting was held on site on Thursday September 30, and the QC/QA meeting was held immediately after. EPA was on site on September 30, October 4 and 5, to observe the final lifts on the test fill.

CQA and CQC Personnel On-Site

CQAE personnel (SQAM), and CQC were on site Monday through Friday during working hours for this reporting period

Josh Valentine, SQAM
Tetra Tech

10-6-04
Date

John H. Rahe, P.E., CQAE
Tetra Tech

10/6/04
Date

Distribution:

CQAE (John Rahe)
CTR (Bob Davis)
EPA
CDPHE

WEEKLY FIELD MONITORING SUMMARY NUMBER 7
October 7, THROUGH October 13, 2004
CONSTRUCTION QUALITY ASSURANCE
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
GOLDEN, COLORADO

Introduction

TetraTech has prepared this weekly summary of Construction Quality Assurance (CQA) monitoring and testing performed for construction of the present landfill cap from September 23 through September 29, 2004. This weekly report summarizes the construction activities, CQA and Construction Quality Control (CQC) testing, and surveying activities for the Present Landfill (PLF) liner construction, geosynthetic deliveries and all related activities for the construction of the PLF Accelerated Action.

Tetra Tech is the on-site CQA Engineer (CQAE) providing CQA services as a subcontractor to the Rocky Flats Contractor Kaiser-Hill Company, LLC (K-H). Earth Tech is the design engineer for the PLF contracted by Kaiser-Hill Company. The Program Management Contractor (PMC) team is providing the CQC services for the PLF. The PMC team consists of S.M. Stoller Corporation as the prime with Neilson-Skanska, Colorado Linings International, Paragon Surveying and Golder Associates, Inc. Golder Associates is performing the CQC services. Advanced Terra Testing Inc. of Lakewood, Colorado is Performing CQA laboratory testing services for soils and geosynthetics.

Construction Synopsis

The construction subcontractor is S.M. Stoller Corporation (Stoller). Paragon Surveying (Paragon) of Denver, Colorado is the subcontractor's surveyor.

Equipment

Stoller had the following equipment on site:

- (1) Cat 825G pad-foot compactor
- (2) Cat 14G Graders
- (1) Cat 950B front-end loader
- (3) Cat 633D scrapers
- (2) Cat D6R LGP dozer
- (1) Cat CS-583C vibrating smooth drum compactor
- (2) Water Trucks
- (1) Cat Rubber Tire Backhoe
- (1) Bobcat Mower
- (1) Cat Forklift
- (1) Cat 325L Backhoe
- (2) Volvo Dump Truck

Stoller stopped cutting from the top of the landfill due to trash and soft areas, most of the current cut is coming from the new perimeter channel. The perimeter channel has been cut wider in some areas to provide more fill for the cap which had been approved in a meeting earlier in the week. The cut material was being placed as fill on the south and west sides. The fill is being placed in one foot or thinner lifts, allowed to dry as needed then compacted with a minimum of four passes of the 825. The area on the west end is being blue topped and cut to final grade in preparation for the cushion soils. The piles of trash have been loaded and hauled to the east end on the fill and spread in a one foot or less lift. The trash was covered by a thin lift (6"-8") of Rocky Flats Alluvium to keep it from getting tangled in the compactor, and then it was compacted with four passes of the 825.

Stoller continued soft spot repair on areas 1, 2, 3, 4, 5, 6, 7, 8, 13, 14, 15, 16 and 17. Areas 6, 7 and 8 are being combined into one area due to the short distances between them. Area 8 is also being left uncovered on the north and east sides in case it has to be enlarged after the proof roll on the east end. The areas are being excavated until trash was encountered then smoothed and covered with a nonwoven geotextile and geogrid overlapped a minimum of 2 feet and tied at least every 5 feet with cable ties per the manufacturer's specifications. Backfill of these areas is currently in progress.

Stoller received all 79 rolls of the 60mil LLDPE, and offloaded them onto the staging areas for storage. Stoller also received and offloaded 17 rolls of Geosynthetic Clay Liner (GCL) on to staging area number 3 and covered with a large tarp. All rolls have been inspected and documented.

Field Action Items

During this period, no field action items were issued.

Nonconformances

Several soft areas were marked during the proof roll and have been surveyed and mapped. The areas are currently being repaired, but none have been completed.

Record Surveys

During this reporting period, no record surveys were done.

Hold Point Release

During this reporting period, no hold point releases were issued.

CQAE Geosynthetic Sampling, Testing, and Materials Received

Geosynthetic Clay Liner

17 rolls of GCL material (Bentomat ST) have been delivered and offloaded. All rolls have been inspected and logged. Conformance samples have been received at Advanced Terra Testing from the manufacturer and are currently being tested.

Geomembrane

79 rolls of Geomembrane material (60-mil LLDPE) have been delivered; all rolls have been received and are being stored in the staging areas. All rolls have been inspected and logged. Conformance samples have been received at Advanced Terra Testing from the manufacturer and are currently being tested.

Geosynthetic Composite Drainage Net

The GDN material (TexDrain 200 DS 8) is on order. During this period, zero rolls were delivered to site and zero conformance samples were collected and shipped for testing.

CQAE and CQC Soil Sampling and Testing

The Site Quality Assurance Manager (SQAM) working with the CQAE monitored the construction contractor's activities during the week. No CQA samples were obtained. CQC sampled four areas in the perimeter channel for gradations to confirm the material is Rocky Flats Alluvium.

Meetings

The weekly site meeting was held on site on Thursday October 7, and the QC/QA meeting was held immediately after. EPA and John Rahe were on site for the weekly and QC/QA meetings, as well as a tour afterward. Another QC/QA meeting was held on October 10, representatives from Stoller, Golder (QC), Earth Tech, Tetra Tech (QA) including John Rahe (CQAE), to review responsibilities and reporting.

CQA and CQC Personnel On-Site

CQAE personnel (SQAM), and CQC were on site Monday through Saturday during working hours for this reporting period

Josh Valentine, SQAM
Tetra Tech

10-14-04
Date

John H. Rahe, P.E., CQAE
Tetra Tech

10/14/08
Date

Distribution:

CQAE (John Rahe)
CTR (Bob Davis)
EPA
CDPHE

WEEKLY FIELD MONITORING SUMMARY NUMBER 8
October 14, THROUGH October 20, 2004
CONSTRUCTION QUALITY ASSURANCE
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
GOLDEN, COLORADO

Introduction

TetraTech has prepared this weekly summary of Construction Quality Assurance (CQA) monitoring and testing performed for construction of the present landfill cap from September 23 through September 29, 2004. This weekly report summarizes the construction activities, CQA and Construction Quality Control (CQC) testing, and surveying activities for the Present Landfill (PLF) liner construction, geosynthetic deliveries and all related activities for the construction of the PLF Accelerated Action.

Tetra Tech is the on-site CQA Engineer (CQAE) providing CQA services as a subcontractor to the Rocky Flats Contractor Kaiser-Hill Company, LLC (K-H). Earth Tech is the design engineer for the PLF contracted by Kaiser-Hill Company. The Program Management Contractor (PMC) team is providing the CQC services for the PLF. The PMC team consists of S.M. Stoller Corporation as the prime with Neilson-Skanska, Colorado Linings International, Paragon Surveying and Golder Associates, Inc. Golder Associates is performing the CQC services. Advanced Terra Testing Inc. of Lakewood, Colorado is Performing CQA laboratory testing services for soils and geosynthetics.

Construction Synopsis

The construction subcontractor is S.M. Stoller Corporation (Stoller). Paragon Surveying (Paragon) of Denver, Colorado is the subcontractor's surveyor.

Equipment

Stoller had the following equipment on site:

- (1) Cat 825G pad-foot compactor
- (2) Cat 14G Graders
- (1) Cat 950B front-end loader
- (3) Cat 633D scrapers
- (2) Cat D6R LGP dozer
- (1) Cat CS-583C vibrating smooth drum compactor
- (2) Water Trucks
- (1) Cat Rubber Tire Backhoe
- (2) Bobcat T300
- (2) Cat Forklift
- (1) Cat 325L Backhoe
- (2) Volvo Dump Truck

Stoller finished the regrade on the west 300 feet of the cap in preparation for the cushion soils. The area was proof rolled with a loaded 633D scraper two complete passes. The area was rolled east to west on the first pass, and north to south on the second pass. Alignment marks were made approximately every 100 feet every pass to make sure the entire area was rolled. Soft areas with 1-3 inches of deflection were marked with paint, surveyed then repaired. The soft areas were removed and replaced with dryer material and compacted, or scarified dried then recompacted with 4 passes of the 825. The soft areas were reinspected for less than one inch of deflection prior to approval of the proof roll. The record survey was done after the area was approved by QA/QC. The approved area was traversed with the 825 to roughen the surface in final preparation for the 6" cushion layer. The cushion layer is currently being delivered and placed, but none has been compacted at this time. QA/QC personnel did another rough proof roll on the top of the cap to look for any obvious soft areas within the next section scheduled for approval. Soft spot #18 was noted as well as 3 other large areas that showed up after the cuts in this area were complete, all four were marked and surveyed. The areas have been excavated as deep as possible without hitting an excessive amount of trash (1'-2'). Soft spot #18 was excavated to 1' and covered with a woven geotextile and covered with a geocell material and is currently being backfilled. The geocell material is being used as a test on soft spot #18 to see if we can use it to fix soft areas with a minimum amount of cutting into the cap. The three remaining soft spots were backfilled with rock material and are awaiting final approval.

Stoller is also continuing to place fill on the north and south sides of the cap. The fill is being placed in one foot or thinner lifts, allowed to dry as needed then compacted with a minimum of four passes of the 825.

Stoller received and offloaded 95 rolls of Geosynthetic Clay Liner (GCL) and 96 rolls of Geosynthetic Drainage Net (GDN) on to staging area number 3 and covered them with a large tarp for storage. All rolls have been inspected and documented.

Field Action Items

During this period, no field action items were issued.

Nonconformances

Several soft areas were marked during the first and second proof roll and have been surveyed and mapped. The areas are currently being repaired.

Record Surveys

The west section, approximately 300 feet of the regraded surface has been surveyed to confirm the final grade before cushion soils are placed. The new soft spots have also been surveyed.

Hold Point Release

During this reporting period, no hold point releases were issued.

CQAE Geosynthetic Sampling, Testing, and Materials Received

Geosynthetic Clay Liner

95 rolls of GCL material (Bentomat ST) have been delivered and offloaded. All rolls have been inspected, logged and covered with a tarp for storage. Conformance samples have been received at Advanced Terra Testing from the manufacturer and are currently being tested. No MQC data has been received on the GCL at this time.

Geomembrane

79 rolls of Geomembrane material (60-mil LLDPE) have been delivered; all rolls have been received and are being stored in the staging areas. All rolls have been inspected, logged and covered with a tarp for storage. MQC data has been reviewed and appeared to be within specification of the QA/QC plans. Conformance samples have been received at Advanced Terra Testing from the manufacturer and are currently being tested.

Geosynthetic Composite Drainage Net

96rolls of GDN material (TexDrain 200 DS 8) have been delivered and offloaded. All rolls have been inspected, logged and covered with a tarp for storage. Conformance samples have been received at Advanced Terra Testing from the manufacturer and are currently being tested. No MQC data has been received at this time.

CQAE and CQC Soil Sampling and Testing

The Site Quality Assurance Manager (SQAM) working with the CQAE monitored the construction contractor's activities during the week. No CQA samples were obtained.

Meetings

The weekly site meeting was held on site on Thursday October 14, and the QC/QA meeting was held immediately after. EPA, CDPHE and John Rahe were on site for the weekly and QC/QA meetings, as well as a tour afterward.

CQA and CQC Personnel On-Site

CQAE personnel (SQAM), and CQC were on site Monday through Friday during working hours for this reporting period.

Josh Valentine, SQAM
Tetra Tech

10-20-04
Date

John H. Rahe, P.E., CQAE
Tetra Tech

10/20/04
Date

Distribution:

CQAE (John Rahe)
CTR (Bob Davis)
EPA
CDPHE

WEEKLY FIELD MONITORING SUMMARY NUMBER 9
October 21, THROUGH October 27, 2004
CONSTRUCTION QUALITY ASSURANCE
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
GOLDEN, COLORADO

Introduction

TetraTech has prepared this weekly summary of Construction Quality Assurance (CQA) monitoring and testing performed for construction of the present landfill cap from October 21through October 27, 2004. This weekly report summarizes the construction activities, CQA and Construction Quality Control (CQC) testing, and surveying activities for the Present Landfill (PLF) liner construction, geosynthetic deliveries and all related activities for the construction of the PLF Accelerated Action.

Tetra Tech is the on-site CQA Engineer (CQAE) providing CQA services as a subcontractor to the Rocky Flats Contractor Kaiser-Hill Company, LLC (K-H). Earth Tech is the design engineer for the PLF contracted by Kaiser-Hill Company. The Program Management Contractor (PMC) team is providing the CQC services for the PLF. The PMC team consists of S.M. Stoller Corporation as the prime with Neilson-Skanska, Colorado Linings International, Paragon Surveying and Golder Associates, Inc. Golder Associates is performing the CQC services. Advanced Terra Testing Inc. of Lakewood, Colorado is Performing CQA laboratory testing services for soils and geosynthetics.

Construction Synopsis

The construction subcontractor is S.M. Stoller Corporation (Stoller). Paragon Surveying (Paragon) of Denver, Colorado is the subcontractor's surveyor.

Equipment

Stoller had the following equipment on site:

- (1) Cat 825G pad-foot compactor
- (2) Cat 14G Graders
- (1) Cat 950B front-end loader
- (3) Cat 633D scrapers
- (2) Cat D6R LGP dozer
- (1) Cat CS-583C vibrating smooth drum compactor
- (2) Water Trucks
- (1) Cat Rubber Tire Backhoe
- (3) Bobcat T300
- (2) Cat Forklift
- (1) Cat 325L Backhoe
- (2) Volvo Dump Truck

Stoller is continuing to place fill on the north, east and south sides of the cap. The material is being hauled from the 280 stockpile and placed at existing moisture. The fill is being placed in one foot or thinner lifts, allowed to dry as needed then compacted with a minimum of four passes of the 825.

QA/QC personnel continued the first proof roll on the east end to the 5980 line including the trash placement area and the rebar area as well as the northeast corner. The second proof roll was also done on the south and north sides up to soft spot 8. The area was rolled with a loaded 633D scraper (the 825 in the rebar area) two complete passes. Alignment marks were made approximately every 100 feet every pass to make sure the entire area was rolled. Soft areas with 1-3 inches of deflection were marked with paint and surveyed for repair. The soft areas on the south side were scarified and left to dry before recompacting with 4 passes of the 825 and reevaluating. The graphite area was also proof rolled and had a large soft area through the center. Approximately one foot of material was removed and replaced with dryer material then compacted and reevaluated. The center still had one small soft area that was removed down to two feet and left open to dry before placing nonwoven geotextile and geogrid and backfilling with dryer material. The area was evaluated one last time and released all the way to the 300 foot mark. The geocell area failed the proof roll and had to be reworked. The area was excavated from 18'-24", covered with nonwoven geotextile and geogrid before being backfilled. The area was reproof rolled and was within specification.

The cushion layer has been placed on the west 300 feet of the cap at existing moisture, graded and compacted. The area has been inspected for rocks and any roll marks more than ½", and when found were reworked to meet specification. The record survey has been done on the south half and all wooden hubs have been removed and filled in with cushion soil. The north half is sill being graded and finished rolled. Several nuclear density tests were also done at the end of the day by QC personnel, and all have been within specification at this time.

Stoller started the seep capture system at the pond. The holding area has been excavated and the liner placed per the design. The seep is currently flowing into the holding area. The pump and holding tank have not been installed.

Stoller received and offloaded 119 rolls of Geosynthetic Clay Liner (GCL) and 96 rolls of Geosynthetic Drainage Net (GDN) on to staging areas 2 and 3, and covered them with a large tarp for storage. All rolls have been inspected and documented.

Field Action Items

During this period, no field action items were issued.

Nonconformances

Several soft areas were marked during the first and second proof roll and have been surveyed and mapped. The areas are currently being repaired.

Record Surveys

The west section, approximately 300 feet of the cushion surface is currently being surveyed to confirm the final grade before liner is placed. The new soft spots have also been surveyed.

Hold Point Release

During this reporting period the hold point release was issued for the regrade surface prior to the placement of cushion soil on the west 300' of the PLF.

CQAE Geosynthetic Sampling, Testing, and Materials Received

Geosynthetic Clay Liner

119 rolls of GCL material (Bentomat ST) have been delivered and offloaded. All rolls have been inspected, logged and covered with a tarp for storage. Conformance samples have been received at Advanced Terra Testing from the manufacturer and are currently being tested. MQC data has been received on the GCL and is currently being reviewed, and has been within specification to date.

Geomembrane

79 rolls of Geomembrane material (60-mil LLDPE) have been delivered; all rolls have been received and are being stored in the staging areas. All rolls have been inspected, logged and covered with a tarp for storage. MQC data has been reviewed and is within specification as required by the QA/QC plans. Conformance samples have been received at Advanced Terra Testing from the manufacturer and are currently being tested.

Geosynthetic Composite Drainage Net

96 rolls of GDN material (TexDrain 200 DS 8) have been delivered and offloaded. All rolls have been inspected, logged and covered with a tarp for storage. Conformance samples have been received at Advanced Terra Testing from the manufacturer and are currently being tested. MQC data has been received on the GDN and is currently being reviewed.

CQAE and CQC Soil Sampling and Testing

The Site Quality Assurance Manager (SQAM) working with the CQAE monitored the construction contractor's activities during the week. No CQA samples were obtained.

Meetings

The weekly site meeting was held on site on Thursday October 21, and the QC/QA meeting was held immediately after. EPA, CDPHE and John Rahe were on site for the weekly and QC/QA meetings, as well as a tour afterward.

CQA and CQC Personnel On-Site

CQAE personnel (SQAM), and CQC were on site Monday through Saturday during working hours for this reporting period.

Josh Valentine, SQAM
Tetra Tech

10-28-04
Date

John H. Rahe, P.E., CQAE
Tetra Tech

10/28/04
Date

Distribution:
CQAE (John Rahe)
CTR (Bob Davis)
EPA
CDPHE

WEEKLY FIELD MONITORING SUMMARY NUMBER 10
October 28, THROUGH November 3 , 2004
CONSTRUCTION QUALITY ASSURANCE
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
GOLDEN, COLORADO

Introduction

TetraTech has prepared this weekly summary of Construction Quality Assurance (CQA) monitoring and testing performed for construction of the present landfill cap from October 28 through November 3, 2004. This weekly report summarizes the construction activities, CQA and Construction Quality Control (CQC) testing, and surveying activities for the Present Landfill (PLF) liner construction, geosynthetic deliveries and all related activities for the construction of the PLF Accelerated Action.

Tetra Tech is the on-site CQA Engineer (CQAE) providing CQA services as a subcontractor to the Rocky Flats Contractor Kaiser-Hill Company, LLC (K-H). Earth Tech is the design engineer for the PLF contracted by Kaiser-Hill Company. The Program Management Contractor (PMC) team is providing the CQC services for the PLF. The PMC team consists of S.M. Stoller Corporation as the prime with Neilson-Skanska, Colorado Linings International, Paragon Surveying and Golder Associates, Inc. Golder Associates is performing the CQC services. Advanced Terra Testing Inc. of Lakewood, Colorado is Performing CQA laboratory testing services for soils and geosynthetics.

Construction Synopsis

The construction subcontractor is S.M. Stoller Corporation (Stoller). Paragon Surveying (Paragon) of Denver, Colorado is the subcontractor's surveyor.

Equipment

Stoller had the following equipment on site:

- (1) Cat 825G pad-foot compactor
- (2) Cat 14G Graders
- (1) Cat 950B front-end loader
- (3) Cat 633D scrapers
- (2) Cat D6R LGP dozer
- (1) Cat CS-583C vibrating smooth drum compactor
- (2) Water Trucks
- (1) Cat Rubber Tire Backhoe
- (3) Bobcat T300
- (2) Cat Forklift
- (1) Cat 325L Backhoe
- (2) Volvo Dump Truck

Stoller is continuing to place fill on the east and south sides of the cap. The material is being hauled from the 280 stockpile or the perimeter channel and placed at existing moisture. The fill is being placed in one foot or thinner lifts, allowed to dry as needed then compacted with a minimum of four passes of the 825.

The liner crew placed the first 12 panels of GCL on the west 80' of the cap. The GCL was placed with 6 inch overlap on the edge seams and a 2 foot overlap on the butt seams, with granular bentonite on the butt seams. The GCL was damaged in two areas during the lay down process, and was patched per the specifications. The GCL was also damaged (hydrated due to snow) along the east edge and a large section on the southwest corner of panel number 1. The section on panel 1 was removed and replaced; the edge will be overlapped 2 feet with the next panel to cover the hydrated area. The liner crew also placed 4 panels of FML over the top of the GCL. The FML was inspected and marked for any defects. The panels were wedge welded and pressure tested on all seams, and all passed. The defect areas were all either patched or bead welded with an extrusion welder. The destructive sample taken was patched using an extrusion welder. All patches and bead welds were tested with a vacuum box, and all passed. The welders performed test weld at the beginning of each day for peel and shear strengths for wedge and extrusion welders. The test passed before any welding was done on the cap.

Stoller also started to repair the large soft areas on the northeast side of the cap. The areas are being excavated as deep as possible to trash, or until stable layer is encountered. The areas have been evaluated and will be fixed with nonwoven geosynthetic and geogrid or by backfilling with compacted Rocky Flats Alluvium.

Stoller received and offloaded 119 rolls of Geosynthetic Clay Liner (GCL) and 96 rolls of Geosynthetic Drainage Net (GDN) on to staging areas 2 and 3, and covered them with a large tarp for storage. All rolls have been inspected and documented.

Field Action Items

During this period, no field action items were issued.

Nonconformances

Several soft areas were marked during the first and second proof roll and have been surveyed and mapped. The areas are currently being repaired.

Record Surveys

Record surveys have been completed on the west 300' of the cushion material (Section 1). The record survey for the next 200' of the regrade surface has also been completed (Section 2). All panels of GCL and FML have been surveyed after placement.

Hold Point Release

During this reporting period the hold point release was issued for the regrade surface prior to the placement of cushion soil on section 2 of the PLF. A hold point release has also been signed for Section 1 of the cushion soil, the west 300' for liner. Daily hold point releases have also been signed when liner has been placed to allow for the next layer of liner.

CQAE Geosynthetic Sampling, Testing, and Materials Received

Geosynthetic Clay Liner

119 rolls of GCL material (Bentomat ST) have been delivered and offloaded. All rolls have been inspected, logged and covered with a tarp for storage. Conformance samples have been received at Advanced Terra Testing from the manufacturer. The QA conformance samples have been tested and are within specification. MQC data has been received on the GCL and is currently being reviewed, and has been within specification to date.

Geomembrane

79 rolls of Geomembrane material (60-mil LLDPE) have been delivered; all rolls have been received and are being stored in the staging areas. All rolls have been inspected, logged and covered with a tarp for storage. MQC data has been reviewed and is within specification as required by the QA/QC plans. Conformance samples have been received at Advanced Terra Testing from the manufacturer. The QA conformance samples have been tested and are within specification.

Geosynthetic Composite Drainage Net

96 rolls of GDN material (TexDrain 200 DS 8) have been delivered and offloaded. All rolls have been inspected, logged and covered with a tarp for storage. Conformance samples have been received at Advanced Terra Testing from the manufacturer and are currently being tested. MQC data has been received on the GDN and is currently being reviewed.

CQAE and CQC Soil Sampling and Testing

The Site Quality Assurance Manager (SQAM) working with the CQAE monitored the construction contractor's activities during the week. No CQA samples were obtained.

Meetings

The weekly site meeting was held on site on Thursday October 28, and the QC/QA meeting was held immediately after. EPA, CDPHE and John Rahe were on site for the weekly and QC/QA meetings, as well as a tour afterward.

CQA and CQC Personnel On-Site

CQAE personnel (SQAM), and CQC were on site Monday through Saturday during working hours for this reporting period.

Josh Valentine, SQAM
Tetra Tech

11-4-04
Date

John H. Rahe, P.E., CQAE
Tetra Tech

11/4/04
Date

Distribution:
CQAE (John Rahe)
CTR (Bob Davis)
EPA
CDPHE

WEEKLY FIELD MONITORING SUMMARY NUMBER 11
November 4, THROUGH November 10, 2004
CONSTRUCTION QUALITY ASSURANCE
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
GOLDEN, COLORADO

Introduction

TetraTech has prepared this weekly summary of Construction Quality Assurance (CQA) monitoring and testing performed for construction of the present landfill cap from November 4 through November 10, 2004. This weekly report summarizes the construction activities, CQA and Construction Quality Control (CQC) testing, and surveying activities for the Present Landfill (PLF) liner construction, geosynthetic deliveries and all related activities for the construction of the PLF Accelerated Action.

Tetra Tech is the on-site CQA Engineer (CQAE) providing CQA services as a subcontractor to the Rocky Flats Contractor Kaiser-Hill Company, LLC (K-H). Earth Tech is the design engineer for the PLF contracted by Kaiser-Hill Company. The Program Management Contractor (PMC) team is providing the CQC services for the PLF. The PMC team consists of S.M. Stoller Corporation as the prime with Neilson-Skanska, Colorado Linings International, Paragon Surveying and Golder Associates, Inc. Golder Associates is performing the CQC services. Advanced Terra Testing Inc. of Lakewood, Colorado is Performing CQA laboratory testing services for soils and geosynthetics.

Construction Synopsis

The construction subcontractor is S.M. Stoller Corporation (Stoller). Paragon Surveying (Paragon) of Denver, Colorado is the subcontractor's surveyor.

Equipment

Stoller had the following equipment on site:

- (1) Cat 825G pad-foot compactor
- (2) Cat 14G Graders
- (1) Cat 950B front-end loader
- (3) Cat 633D scrapers
- (2) Cat D6R LGP dozer
- (1) Cat CS-583C vibrating smooth drum compactor
- (1) Water Trucks
- (1) Cat Rubber Tire Backhoe
- (3) Bobcat T300
- (2) Cat Forklift
- (1) Cat 325L Backhoe
- (2) Volvo Dump Truck

Stoller is continuing to place grading fill on the east side of the cap. The material is being hauled from the perimeter channel and placed at existing moisture. The fill is being placed in one foot or thinner lifts, allowed to dry as needed then compacted with a minimum of four passes of the 825. The contractor performed a test fill on the east end of the cap using the new import Rocky Flats Alluvium. This RF Alluvium is similar to the original except that it has a slightly higher plasticity. The test fill was done in two one foot lifts, surveyed, and each lift compacted with four passes of the 825. The area was proof rolled with two passes of a loaded scraper, and no deflection was observed by QA, QC, Earth Tech, or Kaiser Hill representatives. Two test pits were excavated to look for voids and any loose compaction, none were found. Stoller is also continuing to place cushion soil on section one and two. The material is being placed, cut to final grade, and compacted with the Cat CS-583C then record surveyed. Then QC tests the moisture and density, and if everything passes and the area is free of any divots or protrusions greater than ½ inch it is released for liner.

The liner crew has placed a total of 89 panels of GCL on the west 400 feet of the cap. The GCL was placed with 6 inch overlap on the edge seams and a 2 foot overlap on the butt seams, with granular bentonite on the butt seams. The liner crew also placed a total of 26 panels of FML over the top of the GCL. The FML was inspected and marked for any defects on a continual basis. The panels were wedge welded and pressure tested on all seams, and all passed. The defect areas were all either patched or bead welded with an extrusion welder. The destructive samples taken were patched using an extrusion welder. All patches and bead welds were tested with a vacuum box, and all passed. The welders performed test welds at the beginning of each day and after lunch for peel and shear strengths for wedge and extrusion welders. The tests passed before any welding was done on the cap. All destructive samples taken to date have been tested by QC and have been within specification for both shear and peel strengths.

The contractor has also started the installation of the gas vent system from the west end of the vent. The perforated pipe is being placed in a one foot deep trench with washed drainage gravel. The top of the pipe four inches from the top of the trench, and the surface is covered with a strip of 8oz. nonwoven geotextile to help protect the GCL. The vertical pipe has not been set at this time, the ends are being surveyed and the liner will be cut when they are ready for installation.

Stoller received and offloaded 119 rolls of Geosynthetic Clay Liner (GCL) and 96 rolls of Geosynthetic Drainage Net (GDN) on to staging areas 2 and 3, and covered them with a large tarp for storage. All rolls have been inspected and documented.

Field Action Items

During this period, no field action items were issued.

Nonconformances

None

Record Surveys

Record surveys have been completed on the west 450' of the cushion material (Section 1). The record survey for the next 300' of the regrade surface has also been completed (Section 3). All panels of GCL and FML have been surveyed after placement.

Hold Point Release

During this reporting period the hold point release was issued for the regrade surface prior to the placement of cushion soil on section 3 of the PLF. A hold point release has also been signed for Section 2 of the cushion soil, the west 450' for liner. Daily hold point releases have also been signed when liner has been placed to allow for the next layer of liner.

CQAE Geosynthetic Sampling, Testing, and Materials Received

Geosynthetic Clay Liner

446 rolls of GCL material (Bentomat ST) have been delivered and offloaded. All rolls have been inspected, logged and covered with a tarp for storage. Conformance samples have been received at Advanced Terra Testing from the manufacturer. The QA conformance samples have been tested and are within specification. MQC data has been received on the GCL and is currently being reviewed, and has been within specification to date.

Geomembrane

79 rolls of Geomembrane material (60-mil LLDPE) have been delivered; all rolls have been received and are being stored in the staging areas. All rolls have been inspected, logged and covered with a tarp for storage. MQC data has been reviewed and is within specification as required by the QA/QC plans. Conformance samples have been received at Advanced Terra Testing from the manufacturer. The QA conformance samples have been tested and are within specification.

Geosynthetic Composite Drainage Net

402 rolls of GDN material (TexDrain 200 DS 8) have been delivered and offloaded. All rolls have been inspected, logged and covered with a tarp for storage. Conformance

samples have been received at Advanced Terra Testing from the manufacturer and are currently being tested. MQC data has been received on the GDN and is currently being reviewed.

CQAE and CQC Soil Sampling and Testing

The Site Quality Assurance Manager (SQAM) working with the CQAE monitored the construction contractor's activities during the week. No CQA samples were obtained.

Meetings

The weekly site meeting was held on site on Thursday November 4, and the QC/QA meeting was held immediately after. EPA, CDPHE, CQAE and CTR were on site for the weekly and QC/QA meetings, as well as a tour afterward.

CQA and CQC Personnel On-Site

CQAE personnel (SQAM), and CQC were on site Monday through Saturday during working hours for this reporting period.

Josh Valentine, SQAM — 11-11-04
Tetra Tech — Date

John H. Rahe, P.E., CQAE — 11/8/04
Tetra Tech — Date

Distribution:
CQAE (John Rahe)
CTR (Bob Davis)
EPA
CDPHE

WEEKLY FIELD MONITORING SUMMARY NUMBER 12
November 11, THROUGH November 17, 2004
CONSTRUCTION QUALITY ASSURANCE
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
GOLDEN, COLORADO

Introduction

TetraTech has prepared this weekly summary of Construction Quality Assurance (CQA) monitoring and testing performed for construction of the present landfill cap from November 11 through November 17, 2004. This weekly report summarizes the construction activities, CQA and Construction Quality Control (CQC) testing, and surveying activities for the Present Landfill (PLF) liner construction, geosynthetic deliveries and all related activities for the construction of the PLF Accelerated Action.

Tetra Tech is the on-site CQA Engineer (CQAE) providing CQA services as a subcontractor to the Rocky Flats Contractor Kaiser-Hill Company, LLC (K-H). Earth Tech is the design engineer for the PLF contracted by Kaiser-Hill Company. The Program Management Contractor (PMC) team is providing the CQC services for the PLF. The PMC team consists of S.M. Stoller Corporation as the prime with Neilson-Skanska, Colorado Linings International, Paragon Surveying and Golder Associates, Inc. Golder Associates is performing the CQC services. Advanced Terra Testing Inc. of Lakewood, Colorado is Performing CQA laboratory testing services for soils and geosynthetics.

Construction Synopsis

The construction subcontractor is S.M. Stoller Corporation (Stoller). Paragon Surveying (Paragon) of Denver, Colorado is the subcontractor's surveyor.

Equipment

Stoller had the following equipment on site:

- (1) Cat 825G pad-foot compactor
- (2) Cat 14G Graders
- (1) Cat 950B front-end loader
- (1) Cat 966F front-end loader
- (3) Cat 633D scrapers
- (2) Cat D6R LGP dozer
- (1) Cat CS-583C vibrating smooth drum compactor
- (1) Water Trucks
- (1) Cat Rubber Tire Backhoe
- (3) Bobcat T300
- (2) Cat Forklift
- (1) Cat 325L Backhoe

- (2) Volvo A35C Dump Truck
- (3) Volvo A30C Dump Truck

Stoller is continuing to place grading fill on the east side of the cap. The material is being hauled from Centennial and placed at existing moisture. The fill is being placed in one foot or thinner lifts, allowed to dry as needed then compacted with a minimum of four passes of the 825. Stoller is also continuing to place cushion soil on section two and three. The material is being placed, graded to final grade, and compacted with the Cat CS-583C (in either vibratory or static mode) then record surveyed. Then QC tests the moisture and density, and if everything passes and the area is free of any divots or protrusions greater than ½ inch it is released for liner. Stoller is also starting to place the 10 inch cushion layer on the west end of the GDN. The material is being hauled to the edge of the liner and placed using a dozer or a front-end loader. The loader is being used to dump material over the edge of the pile to help control the wrinkles in the FML. No final grading or testing has been done at this time on the 10 inch layer.

The liner crew has placed a total of 117 panels of GCL on the west 500 feet of the cap form the beginning of the project. The GCL was placed with 6 inch overlap on the edge seams and a 2 foot overlap on the butt seams, with granular bentonite on the butt seams. The liner crew also placed a total of 34 panels of FML over the top of the GCL from the beginning of the project. The FML was inspected and marked for any defects on a continual basis. The panels were wedge welded and pressure tested on all seams, and all passed. The defect areas were all either patched or bead welded with an extrusion welder. The destructive samples taken were patched using an extrusion welder. All patches and bead welds were tested with a vacuum box, and all passed. The welders performed test welds at the beginning of each day and after lunch for peel and shear strengths for wedge and extrusion welders. The tests passed before any welding was done on the cap. All destructive samples taken to date have been tested by QC and have been within specification for both shear and peel strengths. Stoller has also been placing GDN on top of the FML prior to the placement of the 10 inch cushion material. The GDN is being overlapped six inches on all edge seams and two feet on all butt seams and tied every five feet and one foot respectively. The edge seams are being lyster welded after being tied, and the butt seams are capped with a nonwoven geosynthetic and lyster welded.

The contractor has also continued the installation of the gas vent system from the west end of the vent. The perforated pipe is being placed in a one foot deep by one foot wide minimum trench with washed drainage gravel. The top of the pipe is four inches from the top of the trench, and the surface is covered with a strip of 8oz. nonwoven geotextile to help protect the GCL. The vertical pipe has not been set at this time, the ends are being surveyed and the liner will be cut when they are ready for installation.

Field Action Items

During this period, no field action items were issued.

Nonconformances

None

Record Surveys

Record surveys have been completed on the west 600' of the six inch cushion material (Section 2). The record survey for the next 300' of the regrade surface has also been completed (Section 3, 900' from the west end). All panels of GCL and FML have been surveyed after placement.

Hold Point Release

During this reporting period the hold point release was issued for a portion of Section 3 of the six inch cushion soil, and the west 600' for FML liner. Daily hold point releases have also been signed when liner has been placed to allow for the next layer of liner.

CQAE Geosynthetic Sampling, Testing, and Materials Received

Geosynthetic Clay Liner

446 rolls of GCL material (Bentomat ST) have been delivered and offloaded. All rolls have been inspected, logged and covered with a tarp for storage. Conformance samples have been received at Advanced Terra Testing from the manufacturer. The QA conformance samples have been tested and are within specification. MQC data has been received on the GCL and is currently being reviewed, and has been within specification to date.

Geomembrane

79 rolls of Geomembrane material (60-mil LLDPE) have been delivered; all rolls have been received and are being stored in the staging areas. All rolls have been inspected, logged and covered with a tarp for storage. MQC data has been reviewed and is within specification as required by the QA/QC plans. Conformance samples have been received at Advanced Terra Testing from the manufacturer. The QA conformance samples have been tested and are within specification.

Geosynthetic Composite Drainage Net

402 rolls of GDN material (TexDrain 200 DS 8) have been delivered and offloaded. All rolls have been inspected, logged and covered with a tarp for storage. Conformance samples have been received at Advanced Terra Testing from the manufacturer and are

currently being tested. MQC data has been received on the GDN and is currently being reviewed.

CQAE and CQC Soil Sampling and Testing

The Site Quality Assurance Manager (SQAM) working with the CQAE monitored the construction contractor's activities during the week. No CQA samples were obtained.

Meetings

The weekly site meeting was canceled due to weather and the holiday.

CQA and CQC Personnel On-Site

CQAE personnel (SQAM), and CQC were on site Monday through Saturday during working hours for this reporting period.

Josh Valentine, SQAM
Tetra Tech

11-18-04
Date

John H. Rahe, P.E., CQAE
Tetra Tech

11/18/04
Date

Distribution:
CQAE (John Rahe)
CTR (Bob Davis)
EPA
CDPHE

WEEKLY FIELD MONITORING SUMMARY NUMBER 13
November 18, THROUGH December 1, 2004
CONSTRUCTION QUALITY ASSURANCE
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
GOLDEN, COLORADO

Introduction

TetraTech has prepared this weekly summary of Construction Quality Assurance (CQA) monitoring and testing performed for construction of the present landfill cap from November 18 through December 1, 2004. This weekly report summarizes the construction activities, CQA and Construction Quality Control (CQC) testing, and surveying activities for the Present Landfill (PLF) liner construction, geosynthetic deliveries and all related activities for the construction of the PLF Accelerated Action.

Tetra Tech is the on-site CQA Engineer (CQAE) providing CQA services as a subcontractor to the Rocky Flats Contractor Kaiser-Hill Company, LLC (K-H). Earth Tech is the design engineer for the PLF contracted by Kaiser-Hill Company. The Program Management Contractor (PMC) team is providing the CQC services for the PLF. The PMC team consists of S.M. Stoller Corporation as the prime with Neilson-Skanska, Colorado Linings International, Paragon Surveying and Golder Associates, Inc. Golder Associates is performing the CQC services. Advanced Terra Testing Inc. of Lakewood, Colorado is Performing CQA laboratory testing services for soils and geosynthetics.

Construction Synopsis

The construction subcontractor is S.M. Stoller Corporation (Stoller). Paragon Surveying (Paragon) of Denver, Colorado is the subcontractor's surveyor.

Equipment

Stoller had the following equipment on site:

- (1) Cat 825G pad-foot compactor
- (2) Cat 14G Graders
- (1) Cat 950B front-end loader
- (1) Cat 966F front-end loader
- (3) Cat 633D scrapers
- (2) Cat D6R LGP dozer
- (1) Cat CS-583C vibrating smooth drum compactor
- (1) Water Trucks
- (1) Cat Rubber Tire Backhoe
- (3) Bobcat T300
- (2) Cat Forklift
- (1) Cat 325L Backhoe

- (2) Volvo A35C Dump Truck
- (3) Volvo A30C Dump Truck

Stoller is continuing to place grading fill on the east side of the cap. The material is being hauled from Centennial and placed at existing moisture. The fill is being placed in one foot or thinner lifts, allowed to dry as needed then compacted with a minimum of four passes of the 825. Stoller is also continuing to place 6 inch cushion soil on section three. The material is being placed, graded to final grade, and compacted with the Cat CS-583C (in either vibratory or static mode) then record surveyed. Then QC tests the moisture and density, and if everything passes and the area is free of any divots or protrusions greater than ½ inch it is released for liner. Stoller is also continuing to place the 10 inch cushion layer on the west end of the GDN. The material is being hauled to the edge of the liner and placed using a front-end loader. The loader is being used to dump material over the edge of the pile to help control the wrinkles in the FML. No final grading or testing has been done at this time on the 10 inch layer.

The liner crew has placed a total of 164 panels of GCL on the west 700 feet of the cap form the beginning of the project. The GCL was placed with 6 inch overlap on the edge seams and a 2 foot overlap on the butt seams, with granular bentonite on the butt seams. The liner crew also placed a total of 47 panels of FML over the top of the GCL from the beginning of the project. The FML was inspected and marked for any defects on a continual basis. The panels were wedge welded and pressure tested on all seams, and all passed. The defect areas were all either patched or bead welded with an extrusion welder. The destructive samples taken were patched using an extrusion welder. All patches and bead welds were tested with a vacuum box, and all passed. The welders performed test welds at the beginning of each day and after lunch for peel and shear strengths for wedge and extrusion welders. The tests passed before any welding was done on the cap. All destructive samples taken to date have been tested by QC and have been within specification for both shear and peel strengths. Colorado Linings has also been placing GDN on top of the FML prior to the placement of the 10 inch cushion material. The GDN is being overlapped six inches on all edge seams and two feet on all butt seams and tied every five feet and one foot respectively. The edge seams are being wedge welded or sewn after being tied, and the butt seams are capped with a nonwoven geosynthetic and lyster welded.

The contractor has also continued the installation of the gas vent system from the west end of the landfill vent. The perforated pipe is being placed in a one foot deep by one foot wide minimum trench with washed drainage gravel. The top of the pipe is four inches from the top of the trench, and the surface is covered with a strip of 8oz /square yard. nonwoven geotextile to help protect the GCL. The vertical pipe has not been set at this time, the ends are being surveyed and the liner will be cut when they are ready for installation.

The work was slow during this period due to the holiday and wet cold snowy weather. Much of the work done during this reporting period was done November 18-24.

Field Action Items

During this period, no field action items were issued.

Nonconformances

None

Record Surveys

Record surveys have been completed on the west 675' of the six inch cushion material (Section 2). The record survey for the next 300' of the regrade surface has also been completed (Section 3, 900' from the west end). All panels of GCL, FML and GDN have been surveyed after placement.

Hold Point Release

During this reporting period the hold point release was issued for a portion of Section 3 of the six inch cushion soil, and the west 675' for FML liner. Daily hold point releases have also been signed when liner has been placed to allow for the next layer of liner.

CQAE Geosynthetic Sampling, Testing, and Materials Received

Geosynthetic Clay Liner

446 rolls of GCL material (Bentomat ST) have been delivered and offloaded. All rolls have been inspected, logged and covered with a tarp for storage. Conformance samples have been received at Advanced Terra Testing from the manufacturer. The QA conformance samples have been tested and are within specification. MQC data has been received on the GCL and is currently being reviewed, and has been within specification to date.

Geomembrane

79 rolls of Geomembrane material (60-mil LLDPE) have been delivered; all rolls have been received and are being stored in the staging areas. All rolls have been inspected, logged and covered with a tarp for storage. MQC data has been reviewed and is within specification as required by the QA/QC plans. Conformance samples have been received at Advanced Terra Testing from the manufacturer. The QA conformance samples have been tested and are within specification.

Geosynthetic Composite Drainage Net

402 rolls of GDN material (TexDrain 200 DS 8) have been delivered and offloaded. All rolls have been inspected, logged and covered with a tarp for storage. Conformance samples have been received at Advanced Terra Testing from the manufacturer and are currently being tested. MQC data has been received on the GDN and is currently being reviewed.

CQAE and CQC Soil Sampling and Testing

The Site Quality Assurance Manager (SQAM) working with the CQAE monitored the construction contractor's activities during the week. A CQA sample was obtained for peel and sheer testing of the FML, as well as a nuclear density test on the 6" cushion material.

Meetings

The weekly site meeting was canceled due to weather and the holiday.

CQA and CQC Personnel On-Site

CQAE personnel (SQAM), and CQC were on site Monday through Saturday during working hours for this reporting period except for November 25-28 for the holiday.

12-2-04

Josh Valentine, SQAM — Date
Tetra Tech

12/2/04

John H. Rahe, P.E., CQAE — Date
Tetra Tech

Distribution:
CQAE (John Rahe)
CTR (Bob Davis)
EPA
CDPHE

WEEKLY FIELD MONITORING SUMMARY NUMBER 14
December 2, THROUGH December 8, 2004
CONSTRUCTION QUALITY ASSURANCE
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
GOLDEN, COLORADO

Introduction

TetraTech has prepared this weekly summary of Construction Quality Assurance (CQA) monitoring and testing performed for construction of the present landfill cap from December 2 through December 8, 2004. This weekly report summarizes the construction activities, CQA and Construction Quality Control (CQC) testing, and surveying activities for the Present Landfill (PLF) liner construction, geosynthetic deliveries and all related activities for the construction of the PLF Accelerated Action.

Tetra Tech is the on-site CQA Engineer (CQAE) providing CQA services as a subcontractor to the Rocky Flats Contractor Kaiser-Hill Company, LLC (K-H). Earth Tech is the design engineer for the PLF contracted by Kaiser-Hill Company. The Program Management Contractor (PMC) team is providing the CQC services for the PLF. The PMC team consists of S.M. Stoller Corporation as the prime with Neilson-Skanska, Colorado Linings International, Paragon Surveying and Golder Associates, Inc. Golder Associates is performing the CQC services. Advanced Terra Testing Inc. of Lakewood, Colorado is Performing CQA laboratory testing services for soils and geosynthetics.

Construction Synopsis

The construction subcontractor is S.M. Stoller Corporation (Stoller). Paragon Surveying (Paragon) of Denver, Colorado is the subcontractor's surveyor.

Equipment

Stoller had the following equipment on site:

- (1) Cat 825G pad-foot compactor
- (2) Cat 14G Graders
- (1) Cat 950B front-end loader
- (1) Cat 966F front-end loader
- (3) Cat 633D scrapers
- (2) Cat D6R LGP dozer
- (1) Cat CS-583C vibrating smooth drum compactor
- (1) Water Trucks
- (1) Cat Rubber Tire Backhoe
- (3) Bobcat T300
- (2) Cat Forklift
- (1) Cat 325L Backhoe

- (2) Volvo A35C Dump Truck
- (3) Volvo A30C Dump Truck

Stoller has been removing the top of the Rocky Flats Alluvium down to 14 inches to remove frost in order to continuing to place grading fill on the east side of the cap. The new material is being hauled from Centennial and placed at existing moisture. The fill is being placed in one foot or thinner lifts, and then compacted with a minimum of four passes of the 825. Stoller is also removing and replacing soft and frozen areas on the 6 inch cushion layer just east of the edge of the previously placed FML. The new material is being placed, graded to final grade, and compacted with the Cat CS-583C (in either vibratory or static mode) then record surveyed. Then QC is retesting the moisture and density, and if everything passes and the area is free of any divots or protrusions greater than ½ inch it is released for liner. Stoller is also continuing to place the 10 inch cushion layer on the west end of the GDN. The material is being hauled to the edge of the liner and placed using a front-end loader. The loader is being used to dump material over the edge of the pile to help control the wrinkles in the FML. No final grading or testing has been done at this time on the 10 inch layer.

The liner crew spent the first part of this reporting period removing snow from the GDN and FML using a rotary broom on a Bobcat as well as hand brooms and shovels. The GDN has some damage due to snow removal, all areas have been documented by QC and repairs are in progress. The damaged areas are being covered with a GDN patch and leister welded in place per the specifications. The crew has placed a total of 219 panels of GCL on the west 775 feet of the cap from the beginning of the project. The GCL was placed with 6 inch overlap on the edge seams and a 2 foot overlap on the butt seams, with granular bentonite on the butt seams. The liner crew also placed a total of 57 panels of FML over the top of the GCL from the beginning of the project. The FML was inspected and marked for any defects on a continual basis. The panels were wedge welded and pressure tested on all seams, and all passed. The defect areas were all either patched or bead welded with an extrusion welder. The destructive samples taken were patched using an extrusion welder. All patches and bead welds were tested with a vacuum box, and all passed. The welders performed test welds at the beginning of each day and after lunch for peel and shear strengths for wedge and extrusion welders. The tests passed before any welding was done on the cap. All 38 destructive samples taken to date have been tested by QC and have been within specification for both shear and peel strengths. Colorado Linings has also placed a total of 149 panels of GDN on top of the FML prior to the placement of the 10 inch cushion material. The GDN is being overlapped six inches on all edge seams and tied every 5 feet, and two feet on all butt seams and tied every foot. The edge seams are being wedge welded or sewn after being tied, and the butt seams are capped with a nonwoven geosynthetic and leister welded.

The contractor has also continued the installation of the gas vent system from the west end of the landfill vent. The perforated pipe is being placed in a one foot deep by one foot wide minimum trench with washed drainage gravel. The top of the pipe is four inches from the top of the trench, and the surface is covered with a strip of 8oz /square

yard nonwoven geotextile to help protect the GCL. The vertical pipe has not been set at this time, the ends are being surveyed and the liner will be cut when they are ready for installation.

Field Action Items

During this period, no field action items were issued.

Nonconformances

None

Record Surveys

Record surveys have been completed on the west 775' of the six inch cushion material (Section 3). The record survey for the next 300' of the regrade surface has also been completed (Section 3, 1075' from the west end). The section of 6 inch cushion that was reworked due to frost and wet material was resurveyed prior to release. All panels of GCL, FML and GDN have been surveyed after placement.

Hold Point Release

During this reporting period the hold point release was issued for a portion of Section 3 of the six inch cushion soil, and the west 775' for FML liner. Daily hold point releases have also been signed when liner has been placed to allow for the next layer of liner.

CQAE Geosynthetic Sampling, Testing, and Materials Received

Geosynthetic Clay Liner

446 rolls of GCL material (Bentomat ST) have been delivered and offloaded. All rolls have been inspected, logged and covered with a tarp for storage. Conformance samples have been received at Advanced Terra Testing from the manufacturer. The QA conformance samples have been tested and are within specification. MQC data has been received on the GCL and is currently being reviewed, and has been within specification to date.

Geomembrane

79 rolls of Geomembrane material (60-mil LLDPE) have been delivered; all rolls have been received and are being stored in the staging areas. All rolls have been inspected, logged and covered with a tarp for storage. MQC data has been reviewed and is within specification as required by the QA/QC plans. Conformance samples have been

received at Advanced Terra Testing from the manufacturer. The QA conformance samples have been tested and are within specification.

Geosynthetic Composite Drainage Net

402 rolls of GDN material (TexDrain 200 DS 8) have been delivered and offloaded. All rolls have been inspected, logged and covered with a tarp for storage. Conformance samples have been received at Advanced Terra Testing from the manufacturer and are currently being tested. MQC data has been received on the GDN and is currently being reviewed.

CQAE and CQC Soil Sampling and Testing

The Site Quality Assurance Manager (SQAM) working with the CQAE monitored the construction contractor's activities during the week. A CQA sample was obtained for peel and sheer testing of the FML, as well as a nuclear density test on the 6" cushion material.

Meetings

The weekly site meeting was held on-site on December 2, with only site personnel, Bob Davis, and John Rahe.

CQA and CQC Personnel On-Site

CQAE personnel (SQAM), and CQC were on site Monday through Sunday during working hours for this reporting period.

12-11-04

Josh Valentine, SQAM
Tetra Tech

Date

12/14/04

John H. Rahe, P.E., CQAE
Tetra Tech

Date

Distribution: CQAE (John Rahe)

CTR (Bob Davis)
EPA
CDPHE

WEEKLY FIELD MONITORING SUMMARY NUMBER 15
December 9, THROUGH December 15, 2004
CONSTRUCTION QUALITY ASSURANCE
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
GOLDEN, COLORADO

Introduction

TetraTech has prepared this weekly summary of Construction Quality Assurance (CQA) monitoring and testing performed for construction of the present landfill cap from December 9 through December 15, 2004. This weekly report summarizes the construction activities, CQA and Construction Quality Control (CQC) testing, and surveying activities for the Present Landfill (PLF) liner construction, geosynthetic deliveries and all related activities for the construction of the PLF Accelerated Action.

Tetra Tech is the on-site CQA Engineer (CQAE) providing CQA services as a subcontractor to the Rocky Flats Contractor Kaiser-Hill Company, LLC (K-H). Earth Tech is the design engineer for the PLF contracted by Kaiser-Hill Company. The Program Management Contractor (PMC) team is providing the CQC services for the PLF. The PMC team consists of S.M. Stoller Corporation as the prime with Neilson-Skanska, Colorado Linings International, Paragon Surveying and Golder Associates, Inc. Golder Associates is performing the CQC services. Advanced Terra Testing Inc. of Lakewood, Colorado is Performing CQA laboratory testing services for soils and geosynthetics.

Construction Synopsis

The construction subcontractor is S.M. Stoller Corporation (Stoller). Paragon Surveying (Paragon) of Denver, Colorado is the subcontractor's surveyor.

Equipment

Stoller had the following equipment on site:

- (1) Cat 825G pad-foot compactor
- (2) Cat 14G Graders
- (1) Cat 950B front-end loader
- (1) Cat 966F front-end loader
- (3) Cat 633D scrapers
- (2) Cat D6R LGP dozer
- (1) Cat CS-583C vibrating smooth drum compactor
- (1) Water Trucks
- (1) Cat Rubber Tire Backhoe
- (3) Bobcat T300
- (2) Cat Forklift
- (1) Cat 325L Backhoe

- (2) Volvo A35C Dump Truck
- (3) Volvo A30C Dump Truck

The contractor is continuing to place the import Rocky Flats Alluvium, the material is being hauled from Centennial and placed at existing moisture. The fill is being placed in one foot or thinner lifts, and then compacted with a minimum of four passes of the 825. Stoller also continued to place the 6 inch cushion material towards the 5980 line. The material is being placed, graded to final grade, and compacted with the Cat CS-583C (in either vibratory or static mode) then record surveyed. Then QC is testing the moisture and density, and if everything passes and the area is free of any divots or protrusions greater than ½ inch it is released for liner. Stoller is also continuing to place the 10 inch cushion layer on the west end of the GDN. The material is being hauled to the edge of the liner and placed using a front-end loader. The loader is being used to dump material over the edge of the pile to help control the wrinkles in the FML. The contractor has started to finish grade some of the 10 inch cushion, but none is ready for testing at this time. Stoller started to remove the pond sediment from the north and west sides of the pond. The sediment is being hauled with the Volvos to the east edge of the 5980 line and stockpiled for further processing at a later date.

The crew has placed a total of 323 panels of GCL on the west 925 feet of the cap from the beginning of the project. The GCL was placed with 6 inch overlap on the edge seams and a 2 foot overlap on the butt seams, with granular bentonite at the butt seams. The liner crew also placed a total of 87 panels of FML over the top of the GCL from the beginning of the project. The FML was inspected and marked for any defects on a continual basis. The panels were wedge welded and pressure tested on all seams, and all passed. The defect areas were all either patched or bead welded with an extrusion welder. The destructive samples taken were patched using an extrusion welder. All patches and bead welds were tested with a vacuum box, and all passed. The welders performed test welds at the beginning of each day and after lunch for peel and shear strengths for wedge and extrusion welders. Two of the test welds failed and had to be retested prior to welding on the cap. All 51 destructive samples taken to date on FML seams have been tested by QC and have been within specification for both shear and peel strengths. Colorado Linings has also placed a total of 186 panels of GDN on top of the FML prior to the placement of the 10 inch cushion material. The GDN is being overlapped six inches on all edge seams and tied every 5 feet, and two feet on all butt seams and tied every foot. The edge seams are being sewn after being tied, and the butt seams are capped with a nonwoven geosynthetic and leister welded. Due to high winds no liner was placed for two days this week.

The contractor has also continued the installation of the gas vent system from the west end of the landfill vent to line 20400. The perforated pipe is being placed in a one foot deep by one foot wide minimum trench with washed drainage gravel. The top of the pipe is four inches from the top of the trench, and the surface is covered with a strip of 8oz /square yard nonwoven geotextile to help protect the GCL. The vertical pipe has not been set at this time, the ends are being surveyed and the liner will be cut when they are

ready for installation. The vertical vent pipe locations on the west end have been cordoned off so that no 10 inch cushion is placed around a 10 foot diameter circle to allow for the pipe installation.

Field Action Items

During this period, no field action items were issued.

Nonconformances

Two test welds failed during this reporting period. The welds were redone, retested and passed before any welding was done on the cap

Record Surveys

Record surveys have been completed on the west 1025' of the six inch cushion material (Section 3). The record survey for the regrade surface to the 5980 line has also been completed. All panels of GCL, FML and GDN have been surveyed after placement.

Hold Point Release

During this reporting period the hold point release was issued for a portion of Section 3 of the six inch cushion soil to the 20450 survey line(1025' from the west end), and the west 850' for FML liner. Daily hold point releases have also been signed when liner has been placed to allow for the next layer of liner.

CQAE Geosynthetic Sampling, Testing, and Materials Received

Geosynthetic Clay Liner

446 rolls of GCL material (Bentomat ST) have been delivered and offloaded. All rolls have been inspected, logged and covered with a tarp for storage. Conformance samples have been received at Advanced Terra Testing from the manufacturer. The QA conformance samples have been tested and are within specification. MQC data has been received on the GCL, reviewed, and has been within specification to date.

Geomembrane

79 rolls of Geomembrane material (60-mil LLDPE) have been delivered; all rolls have been received and are being stored in the staging areas. All rolls have been inspected, logged and covered with a tarp for storage. MQC data has been reviewed and is within specification as required by the QA/QC plans. Conformance samples have been received at Advanced Terra Testing from the manufacturer. The QA conformance samples have been tested and are within specification.

Geosynthetic Composite Drainage Net

402 rolls of GDN material (TexDrain 200 DS 8) have been delivered and offloaded. All rolls have been inspected, logged and covered with a tarp for storage. Conformance samples have been received at Advanced Terra Testing from the manufacturer and testing has been completed and reviewed.

CQAE and CQC Soil Sampling and Testing

The Site Quality Assurance Manager (SQAM) working with the CQAE monitored the construction contractor's activities during the week. A total of 2 CQA destructive samples have been obtained for peel and sheer testing of the FML, as well as a total of 5 nuclear density tests on the 6" cushion material.

Meetings

The weekly site meeting was held on-site on December 9, QC/QA personnel EPA, CDPHE, and Bob Davis.

CQA and CQC Personnel On-Site

CQAE personnel (SQAM), and CQC were on site Monday through Sunday during working hours for this reporting period.

Josh Valentine, SQAM
Tetra Tech

12-16-04
Date

John H. Rahe, P.E., CQAE
Tetra Tech

12/16/04
Date

Distribution: CQAE (John Rahe)
CTR (Bob Davis)
EPA
CDPHE

WEEKLY FIELD MONITORING SUMMARY NUMBER 16
December 16, THROUGH December 22, 2004
CONSTRUCTION QUALITY ASSURANCE
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
GOLDEN, COLORADO

Introduction

TetraTech has prepared this weekly summary of Construction Quality Assurance (CQA) monitoring and testing performed for construction of the present landfill cap from December 16 through December 22, 2004. This weekly report summarizes the construction activities, CQA and Construction Quality Control (CQC) testing, and surveying activities for the Present Landfill (PLF) liner construction, geosynthetic deliveries and all related activities for the construction of the PLF Accelerated Action.

Tetra Tech is the on-site CQA Engineer (CQAE) providing CQA services as a subcontractor to the Rocky Flats Contractor Kaiser-Hill Company, LLC (K-H). Earth Tech is the design engineer for the PLF contracted by Kaiser-Hill Company. The Program Management Contractor (PMC) team is providing the CQC services for the PLF. The PMC team consists of S.M. Stoller Corporation as the prime with Neilson-Skanska, Colorado Linings International, Paragon Surveying and Golder Associates, Inc. Golder Associates is performing the CQC services. Advanced Terra Testing Inc. of Lakewood, Colorado is Performing CQA laboratory testing services for soils and geosynthetics.

Construction Synopsis

The construction subcontractor is S.M. Stoller Corporation (Stoller). Paragon Surveying (Paragon) of Denver, Colorado is the subcontractor's surveyor.

Equipment

Stoller had the following equipment on site:

- (1) Cat 825G pad-foot compactor
- (2) Cat 14G Graders
- (1) Cat 950B front-end loader
- (1) Cat 966F front-end loader
- (3) Cat 633D scrapers
- (2) Cat D6R LGP dozer
- (1) Cat D8 dozer
- (1) Cat D6 dozer with Rome Plow
- (2) Cat CS-583C vibrating smooth drum compactor
- (1) Water Trucks
- (1) Cat Rubber Tire Backhoe
- (3) Bobcat T300

- (2) Cat Forklift
- (2) Cat 325L Backhoe (1) long reach
- (2) Volvo A35C Dump Truck
- (3) Volvo A30C Dump Truck

Stoller has completed placing the 6 inch cushion material to the 5980 line. The material was placed, graded to final grade, and compacted with the Cat CS-583C (in either vibratory or static mode) then record surveyed. Then QC/QA tested the moisture and density, and all passed. Then the area was inspected to make sure the area was free of any divots or protrusions greater than ½ inch and it was released for liner. Stoller is also continuing to place the 10 inch cushion layer on the west end of the GDN. The material is being hauled to the edge of the liner and placed using a front-end loader. The loader is being used to dump material over the edge of the pile to help control the wrinkles in the FML. The contractor has started to finish grade some of the 10 inch cushion, but none is ready for testing at this time. Stoller continued to remove the pond sediment from the sides of the pond. The dry sediment is being hauled with the Volvos to the east edge of the 5980 line and stockpiled for further processing at a later date. The very wet pond sediment is being treated in place with the CKD before it will be hauled to the cap. The CKD is being mixed into the pond using the long reach backhoe, and allowed to stand overnight. None has been dewatered enough to haul to the cap at this time.

The crew has placed a total of 396 panels of GCL on the west 1125 feet of the cap from the beginning of the project to the 5980 line. The GCL was placed with 6 inch overlap on the edge seams and a 2 foot overlap on the butt seams, with granular bentonite at the butt seams. The liner crew also placed a total of 104 panels of FML over the top of the GCL from the beginning of the project. The FML was inspected and marked for any defects on a continual basis. The panels were wedge welded and pressure tested on all seams, and all passed. The defect areas were all either patched or bead welded with an extrusion welder. The destructive samples taken were patched using an extrusion welder. All patches and bead welds were tested with a vacuum box, and all passed. The welders performed test welds at the beginning of each day and after lunch for peel and shear strengths for wedge and extrusion welders. Sixty four destructive samples have been marked, and approximately 60 tested to date on the FML seams. All seams that have been tested by QC have been within specification for both shear and peel strengths. Colorado Linings has also placed a total of 215 panels of GDN on top of the FML prior to the placement of the 10 inch cushion material. The GDN is being overlapped six inches on all edge seams and tied every 5 feet, and overlapped two feet on all butt seams and tied every foot. The edge seams are being sewn after being tied, and the butt seams are capped with a nonwoven geosynthetic and leister welded. Due to some very high winds (100+ mph) the exposed GDN was damaged. The internal ties failed to hold the net together, so the GDN was pulled apart from panel T153 to T215. The stitching held and kept the panels from blowing away. The panels are currently being cut apart, overlapped 6 inches and retied every 5 feet then resewn. The butt seams had very little damage, but any damaged areas found were retied every 1 foot and the cap strips were leistered back

in place. The FML had no wind damage, but a wrinkle was pushed from the east end near the GDN that may need some attention at a later date.

The contractor has also installed the gas vent system from the west end of the landfill vent to the 5980 line. The perforated pipe was placed in a one foot deep by one foot wide minimum trench with washed drainage gravel. The top of the pipe is four inches from the top of the trench, and the surface is covered with a strip of 8oz /square yard nonwoven geotextile to help protect the GCL. The vertical pipe has not been set at this time, the ends are being surveyed and the liner will be cut when they are ready for installation. The vertical vent pipe locations on the west end have been cordoned off so that no 10 inch cushion is placed around a 10 foot diameter circle to allow for the vertical pipe installation.

Field Action Items

During this period, no field action items were issued.

Nonconformances

The wind damaged areas on the GDN are currently being repaired.

Record Surveys

Record surveys have been completed on the west 1125' of the six inch cushion material (Section 3). The record survey for the regrade surface to the 5980 line has also been completed. All panels of GCL, FML and GDN have been surveyed after placement. The GDN will be resurveyed after the wind repairs are complete.

Hold Point Release

During this reporting period the hold point release was issued for the remaining six inch cushion soil to the 5980 line. Daily hold point releases have also been signed when liner has been placed to allow for the next layer of liner.

CQAE Geosynthetic Sampling, Testing, and Materials Received

Geosynthetic Clay Liner

446 rolls of GCL material (Bentomat ST) have been delivered and offloaded. All rolls have been inspected, logged and covered with a tarp for storage. Conformance samples have been received at Advanced Terra Testing from the manufacturer. The QA conformance samples have been tested and are within specification. MQC data has been received on the GCL, reviewed, and has been within specification to date.

Geomembrane

79 rolls of Geomembrane material (60-mil LLDPE) have been delivered; all rolls have been received and are being stored in the staging areas. All rolls have been inspected, logged and covered with a tarp for storage. MQC data has been reviewed and is within specification as required by the QA/QC plans. Conformance samples have been received at Advanced Terra Testing from the manufacturer. The QA conformance samples have been tested and are within specification.

Geosynthetic Composite Drainage Net

402 rolls of GDN material (TexDrain 200 DS 8) have been delivered and offloaded. All rolls have been inspected, logged and covered with a tarp for storage. Conformance samples have been received at Advanced Terra Testing from the manufacturer and testing has been completed and reviewed.

CQAE and CQC Soil Sampling and Testing

The Site Quality Assurance Manager (SQAM) working with the CQAE monitored the construction contractor's activities during the week. A total of 3 CQA destructive samples have been obtained for peel and sheer testing of the FML, as well as a total of 6 nuclear density tests on the 6" cushion material.

Meetings

The weekly site meeting was held on-site on December 16, QC/QA personnel EPA, CDPHE, DOE, John Rahe, and Bob Davis.

CQA and CQC Personnel On-Site

CQAE personnel (SQAM), and CQC were on site Monday through Sunday during working hours for this reporting period.

12-22-04

Josh Valentine, SQAM — Date
Tetra Tech

12/22/04

John H. Rahe, P.E., CQAE — Date
Tetra Tech

Distribution:
CQAE (John Rahe)
CTR (Bob Davis)
EPA
CDPHE

WEEKLY FIELD MONITORING SUMMARY NUMBER 17
December 23, 2004 THROUGH January 5, 2005
CONSTRUCTION QUALITY ASSURANCE
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
GOLDEN, COLORADO

Introduction

TetraTech has prepared this weekly summary of Construction Quality Assurance (CQA) monitoring and testing performed for construction of the present landfill cap from December 23, 2004 through January 5, 2005. This weekly report summarizes the construction activities, CQA and Construction Quality Control (CQC) testing, and surveying activities for the Present Landfill (PLF) liner construction, geosynthetic deliveries and all related activities for the construction of the PLF Accelerated Action.

Tetra Tech is the on-site CQA Engineer (CQAE) providing CQA services as a subcontractor to the Rocky Flats Contractor Kaiser-Hill Company, LLC (K-H). Earth Tech is the design engineer for the PLF contracted by Kaiser-Hill Company. The Program Management Contractor (PMC) team is providing the CQC services for the PLF. The PMC team consists of S.M. Stoller Corporation as the prime with Neilson-Skanska, Colorado Linings International, Paragon Surveying and Golder Associates, Inc. Golder Associates is performing the CQC services. Advanced Terra Testing Inc. of Lakewood, Colorado is Performing CQA laboratory testing services for soils and geosynthetics.

Construction Synopsis

The construction subcontractor is S.M. Stoller Corporation (Stoller). Paragon Surveying (Paragon) of Denver, Colorado is the subcontractor's surveyor.

Equipment

Stoller had the following equipment on site:

- (1) Cat 825G pad-foot compactor
- (2) Cat 14G Graders
- (1) Cat 950B front-end loader
- (1) Cat 966F front-end loader
- (3) Cat 633D scrapers
- (2) Cat D6R LGP dozer
- (1) Cat D8 dozer
- (1) Cat D6 dozer with Rome Plow
- (2) Cat CS-583C vibrating smooth drum compactor
- (1) Water Trucks
- (1) Cat Rubber Tire Backhoe
- (3) Bobcat T300

- (2) Cat Forklift
- (2) Cat 325L Backhoe (1) long reach
- (2) Volvo A35C Dump Truck
- (3) Volvo A30C Dump Truck

Stoller is continuing to place the 10 inch cushion layer on the west end of the GDN. The material is being hauled to the edge of the liner and placed using a front-end loader. The loader is being used to dump material over the edge of the pile to help control the wrinkles in the FML and GDN. The contractor has started to finish grade some of the 10 inch cushion, approximately 175 feet has been tested for compaction, surveyed and released. Stoller continued to remove the pond sediment from the sides of the pond. The dry sediment was hauled with the Volvos to the east edge of the 5980 line and stockpiled for further processing at a later date. The very wet pond sediment was treated in place with the CKD before being hauled to the cap. The CKD was mixed into the pond using the long reach backhoe, and allowed to stand for several days before being hauled. All of the sediment was hauled to the east end of the 5980 line by 1/4/05. All of the sediment requires compaction on the PLF.

The liner crew has placed a total of 396 panels of GCL on the west 1125 feet of the cap from the beginning of the project to the 5980 line. The GCL was placed with 6 inch overlap on the edge seams and a 2 foot overlap on the butt seams, with granular bentonite at the butt seams. The liner crew also placed a total of 104 panels of FML over the top of the GCL from the beginning of the project. The FML was inspected and marked for any defects on a continual basis. The panels were wedge welded and pressure tested on all seams. One 60' section failed a pressure test and was capped with FML and extrusion welded. The defect areas were all either patched or bead welded with an extrusion welder. The destructive samples taken were patched using an extrusion welder. Many patches and bead welds were tested with a vacuum box, and all tested passed. Some patches and bead welds have not been vacuum tested at this time, testing will be done prior to placement of GDN. The welders performed test welds at the beginning of each day and after lunch for peel and shear strengths for wedge and extrusion welders. Sixty five destructive samples have been marked, and approximately 60 tested to date on the FML seams. All seams that have been tested by QC have been within specification for both shear and peel strengths. There was one seam that had a failed pressure test so approximately a 60 foot section was capped and extrusion welded.

Colorado Linings has also placed a total of 223 panels of GDN on top of the FML prior to the placement of the 10 inch cushion material. The GDN is being overlapped six inches on all edge seams and tied every 5 feet, and overlapped two feet on all butt seams and tied every foot. The edge seams are being sewn after being tied, and the butt seams are capped with a nonwoven geosynthetic and leister welded. Due to some very high winds (100+ mph) the exposed GDN was damaged. The internal ties failed to hold the net together, so the GDN was pulled apart from panel T153 to T215. The stitching held and kept the panels from blowing away. The panels have been cut apart, overlapped 6 inches and retied every 5 feet and currently being resewn. The butt seams had very little

damage, but any damaged areas found were retied every 1 foot and the cap strips were leistered back in place.

The contractor has also installed the gas vent system from the west end of the landfill vent to the 5980 line. The perforated pipe was placed in a one foot deep by one foot wide minimum trench with washed drainage gravel. The top of the pipe is four inches from the top of the trench, and the surface is covered with a strip of 8oz /square yard nonwoven geotextile to help protect the GCL. The vertical pipe has not been set at this time, the ends are being surveyed and the liner will be cut when they are ready for installation. The vertical vent pipe locations on the west end have been cordoned off so that no 10 inch cushion is placed around a 10 foot diameter circle to allow for the vertical pipe installation.

Field Action Items

During this period, no field action items were issued.

Nonconformances

The wind damaged areas on the GDN are currently being repaired as discussed above. The FML seam that failed and was capped with the extrusion needs to be vacuum tested.

Record Surveys

All panels of GCL, FML and GDN have been surveyed after placement. The GDN is being resurveyed as the wind repairs are completed. The first section of ten inch cushion material has been surveyed to approximately the 19600 grid line.

Hold Point Release

During this reporting period the hold point release was issued for the 10 inch cushion soil to approximately the 19600 grid line approximately 175' for the west end. Daily hold point releases have also been signed when liner has been placed to allow for the next layer of liner.

CQAE Geosynthetic Sampling, Testing, and Materials Received

Geosynthetic Clay Liner

446 rolls of GCL material (Bentomat ST) have been delivered and offloaded. All rolls have been inspected, logged and covered with a tarp for storage. Conformance samples have been received at Advanced Terra Testing from the manufacturer. The QA conformance samples have been tested and are within specification. MQC data has been received on the GCL, reviewed, and has been within specification to date.

Geomembrane

79 rolls of Geomembrane material (60-mil LLDPE) have been delivered; all rolls have been received and are being stored in the staging areas. All rolls have been inspected, logged and covered with a tarp for storage. MQC data has been reviewed and is within specification as required by the QA/QC plans. Conformance samples have been received at Advanced Terra Testing from the manufacturer. The QA conformance samples have been tested and are within specification.

Geosynthetic Composite Drainage Net

402 rolls of GDN material (TexDrain 200 DS 8) have been delivered and offloaded. All rolls have been inspected, logged and covered with a tarp for storage. Conformance samples have been received at Advanced Terra Testing from the manufacturer and testing has been completed and reviewed.

CQAE and CQC Soil Sampling and Testing

The Site Quality Assurance Manager (SQAM) working with the CQAE monitored the construction contractor's activities during the week. A total of 3 CQA destructive samples have been obtained for peel and sheer testing of the FML, as well as a total of 6 nuclear density tests on the 6" cushion material.

Meetings

The weekly site meeting was held on-site on December 22, QC/QA personnel attended, no one else attended due to the holiday.

CQA and CQC Personnel On-Site

CQAE personnel (SQAM), and CQC were on site December 23, 2004 and January 3-5, 2005.

Josh Valentine, SQAM — Date 1-6-05
Tetra Tech

John H. Rahe, P.E., CQAE — Date 1/6/05
Tetra Tech

Distribution:
CQAE (John Rahe)
CTR (Bob Davis)
EPA
CDPHE

WEEKLY FIELD MONITORING SUMMARY NUMBER 18
January 6, 2005 THROUGH January 12, 2005
CONSTRUCTION QUALITY ASSURANCE
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
GOLDEN, COLORADO

Introduction

TetraTech has prepared this weekly summary of Construction Quality Assurance (CQA) monitoring and testing performed for construction of the present landfill cap from January 6, 2004 through January 12, 2005. This weekly report summarizes the construction activities, CQA and Construction Quality Control (CQC) testing, and surveying activities for the Present Landfill (PLF) liner construction, geosynthetic deliveries and all related activities for the construction of the PLF Accelerated Action.

Tetra Tech is the on-site CQA Engineer (CQAE) providing CQA services as a subcontractor to the Rocky Flats Contractor Kaiser-Hill Company, LLC (K-H). Earth Tech is the design engineer for the PLF contracted by Kaiser-Hill Company. The Program Management Contractor (PMC) team is providing the CQC services for the PLF. The PMC team consists of S.M. Stoller Corporation as the prime with Neilson-Skanska, Colorado Linings International, Paragon Surveying and Golder Associates, Inc. Golder Associates is performing the CQC services. Advanced Terra Testing Inc. of Lakewood, Colorado is Performing CQA laboratory testing services for soils and geosynthetics.

Construction Synopsis

The construction subcontractor is S.M. Stoller Corporation (Stoller). Paragon Surveying (Paragon) of Denver, Colorado is the subcontractor's surveyor.

Equipment

Stoller had the following equipment on site:

- (1) Cat 825G pad-foot compactor
- (2) Cat 14G Graders
- (1) Cat 950B front-end loader
- (1) Cat 966F front-end loader
- (3) Cat 633D scrapers
- (2) Cat D6R LGP dozer
- (1) Cat D8 dozer
- (1) Cat D6 dozer with Rome Plow
- (2) Cat CS-583C vibrating smooth drum compactor
- (1) Water Trucks
- (1) Cat Rubber Tire Backhoe
- (3) Bobcat T300

- (2) Cat Forklift
- (2) Cat 325L Backhoe (1) long reach
- (2) Volvo A35C Dump Truck
- (3) Volvo A30C Dump Truck

Stoller is continuing to place the 10 inch cushion layer from the west end of the GDN. The material is being hauled to the edge of the liner and placed using a front-end loader. The loader is being used to dump material over the edge of the pile to help control the wrinkles in the FML and GDN. The contractor has been finish grading the 10 inch cushion after placement, approximately 575 feet (the 20000grid line) has been tested for compaction, surveyed and released for rock layer placement. The rock layer is being placed using end dumps and a D6 LGP dozer to spread the material. The rock has not shown any signs of any major segregation, and no other equipment has been running on the placed rock.

The asbestos areas were proof rolled, first with an empty scraper then with a loaded scraper, three soft areas were found. One soft spot was found on the South edge of the North asbestos area, and the other in the center of the South asbestos area. The third soft spot was very small and in an area of approximately 5 feet of fill, so no corrective actions were taken. The two large soft areas were rolled with a smooth drum roller and covered with a nonwoven geotextile and geogrid, no fill has been placed on top at this time.

The pond sediment has been mixed and spread into 8" lifts and compacted with the 825 up to a 24" final lift. The south end of the pond sediment was proof rolled with a loaded scraper, two passes. There was one large where soft area marked, but it has not been reworked at this time.

The liner crew has placed a total of 396 panels of GCL on the west 1125 feet of the cap from the beginning of the project to the 5980 line. The GCL was placed with 6 inch overlap on the edge seams and a 2 foot overlap on the butt seams, with granular bentonite at the butt seams. The liner crew also placed a total of 104 panels of FML over the top of the GCL from the beginning of the project. The FML was inspected and marked for any defects on a continual basis. The panels were wedge welded and pressure tested on all seams. The defect areas were all either patched or bead welded with an extrusion welder. The destructive samples taken were patched using an extrusion welder. All patches and bead welds were tested with a vacuum box, and all tested passed to the 5980 line. The welders performed test welds at the beginning of each day and after lunch for peel and shear strengths for wedge and extrusion welders. No welding has been done under the cold weather package to date. Sixty five destructive samples have been marked, and all have been tested by QC. Two destructive test areas (No. 58 and 59) failed the peel test; more destructive tests were taken on either side of the failed tests. The new tests were taken at a point half the distance to the next passing test until a passing test was obtained. The first seam was approximately 600' and the second 200'. The seams were repaired by trimming the excess FML off of one side of the seam, grinding the edge and extrusion

welding the entire length of the failure. The repaired seams were 100% vacuum tested and both passed.

Colorado Linings has also placed a total of 370 panels of GDN on top of the FML prior to the placement of the 10 inch cushion material. The GDN is being overlapped six inches on all edge seams and tied every 5 feet, and overlapped two feet on all butt seams and tied every foot. The edge seams are being sewn after being tied, and the butt seams are capped with a nonwoven geosynthetic and leister welded. All of the wind damaged GDN has been repaired reinspected and released.

Nonconformances

Soft spots found in the asbestos and pond sediment areas.

Record Surveys

All panels of GCL, FML and GDN have been surveyed after placement. The GDN is being resurveyed as the wind repairs are completed. The first section of ten inch cushion material has been surveyed to approximately the 19600 grid line.

Hold Point Release

During this reporting period the hold point release was issued for the 10 inch cushion soil to approximately the 20000 grid line approximately 575' for the west end. Daily hold point releases have also been signed when liner has been placed to allow for the next layer of liner.

CQAE Geosynthetic Sampling, Testing, and Materials Received

Geosynthetic Clay Liner

446 rolls of GCL material (Bentomat ST) have been delivered and offloaded. All rolls have been inspected, logged and covered with a tarp for storage. Conformance samples have been received at Advanced Terra Testing from the manufacturer. The initial QA conformance samples have been tested and are within specification. MQC data has been received on the GCL, reviewed, and has been within specification to date. Additional QA samples have been received for testing for the rest of the project.

Geomembrane

79 rolls of Geomembrane material (60-mil LLDPE) have been delivered; all rolls have been received and are being stored in the staging areas. All rolls have been inspected, logged and covered with a tarp for storage. MQC data has been reviewed and is within specification as required by the QA/QC plans. Conformance samples have been received at Advanced Terra Testing from the manufacturer. The initial QA conformance samples

have been tested and are within specification. Additional QA samples have been received for testing for the rest of the project.

Geosynthetic Composite Drainage Net

402 rolls of GDN material (TexDrain 200 DS 8) have been delivered and offloaded. All rolls have been inspected, logged and covered with a tarp for storage. The initial QA conformance samples have been tested and are within specification. Additional QA samples have been received for testing for the rest of the project.

CQAE and CQC Soil Sampling and Testing

The Site Quality Assurance Manager (SQAM) working with the CQAE monitored the construction contractor's activities during the week. A total of 3 CQA destructive samples have been obtained for peel and sheer testing of the FML, as well as a total of 6 nuclear density tests on the 6" cushion material.

Meetings

The weekly site meeting was held on-site on January 6, CQAE, CTR, EPA and CDPHE attended.

CQA and CQC Personnel On-Site

CQAE personnel (SQAM), and CQC were on site January 6-12, 2005, during working hours.

Josh Valentine, SQAM — 1-13-05 Date
Tetra Tech

John H. Rahe, P.E., CQAE — 1/13/05 Date
Tetra Tech

Distribution:
CQAE (John Rahe)
CTR (Bob Davis)
EPA
CDPHE

WEEKLY FIELD MONITORING SUMMARY NUMBER 19
January 13, 2005 THROUGH January 19, 2005
CONSTRUCTION QUALITY ASSURANCE
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
GOLDEN, COLORADO

Introduction

TetraTech has prepared this weekly summary of Construction Quality Assurance (CQA) monitoring and testing performed for construction of the present landfill cap from January 13, 2005 through January 19, 2005. This weekly report summarizes the construction activities, CQA and Construction Quality Control (CQC) testing, and surveying activities for the Present Landfill (PLF) liner construction, geosynthetic deliveries and all related activities for the construction of the PLF Accelerated Action.

Tetra Tech is the on-site CQA Engineer (CQAE) providing CQA services as a subcontractor to the Rocky Flats Contractor Kaiser-Hill Company, LLC (K-H). Earth Tech is the design engineer for the PLF contracted by Kaiser-Hill Company. The Program Management Contractor (PMC) team is providing the CQC services for the PLF. The PMC team consists of S.M. Stoller Corporation as the prime with Neilson-Skanska, Colorado Linings International, Paragon Surveying and Golder Associates, Inc. Golder Associates is performing the CQC services. Advanced Terra Testing Inc. of Lakewood, Colorado is Performing CQA laboratory testing services for soils and geosynthetics.

Construction Synopsis

The construction subcontractor is S.M. Stoller Corporation (Stoller). Paragon Surveying (Paragon) of Denver, Colorado is the subcontractor's surveyor.

Equipment

Stoller had the following equipment on site:

- (1) Cat 825G pad-foot compactor
- (2) Cat 14G Graders
- (1) Cat 950B front-end loader
- (1) Cat 966F front-end loader
- (3) Cat 633D scrapers
- (2) Cat D6R LGP dozer
- (1) Cat D8 dozer
- (1) Cat D6 dozer with Rome Plow
- (2) Cat CS-583C vibrating smooth drum compactor
- (1) Water Trucks
- (1) Cat Rubber Tire Backhoe
- (3) Bobcat T300

- (2) Cat Forklift
- (2) Cat 325L Backhoe (1) long reach
- (2) Volvo A35C Dump Truck
- (3) Volvo A30C Dump Truck
- (1) Hand Tamper

Stoller is continuing to place the 10 inch cushion layer from the west end of the GDN. The material is being hauled to the edge of the liner and placed using a front-end loader. The loader is being used to dump material over the edge of the pile to help control the wrinkles in the FML and GDN. The contractor has been finish grading the 10 inch cushion after placement, approximately 675 feet (the 20100grid line) has been tested for compaction, surveyed and released for rock layer placement. The rock layer is being placed using end dumps and a D6 LGP dozer to spread the material. The rock has not shown any signs of any major segregation, and no other equipment has been running on the placed rock.

All of the GCL, FML and GDN have been approved up to the 5980 line. The GDN is continually inspected after adverse weather or any event that may damage the material until it is covered with cushion.

The pond sediment area was proof rolled with a loaded scraper, two complete passes. This includes the small area of Rocky Flats Alluvium where the very wet pond sediment had been placed. Three soft areas were found on the pond sediment, one near the center, one on the south end and one on the north end. The south and center soft spots were reworked by air drying and mixing in more CKD, both passed a second proof roll. The north soft spot is currently be reworked. Two test holes were excavated in the pond sediment to look for voids, and none were found.

The liner crew started to install the HDPE vertical gas vent pipes. The liner is being cut and the pipe set in place. The GCL is patched using a larger patch of GCL and granular bentonite. Then a FML boot is placed over the pipe and extrusion welded to the pipe and the existing FML, and vacuum tested on the FML. Then the GDN is patched with a piece of GDN leister welded in place. After the liner is complete the pipe is backfilled with cushion material compacted by hand with a hand tamper.

Nonconformances

Soft spots found in the asbestos and one on the north end of the pond sediment. Some of the QC density tests were dry and out of spec for moisture on the south side of the 10" cushion near the 20150 grid line. The area is being reworked and will be retested.

Record Surveys

The next section of ten inch cushion material has been surveyed to approximately the 20100 grid line. The limits of the pond sediment east of the 5980 line.

Hold Point Release

During this reporting period the hold point release was issued for the 10 inch cushion soil to approximately the 20100 grid line approximately 675' from the west end. Daily hold point releases have also been signed when liner has been placed to allow for the next layer of liner.

CQAE Geosynthetic Sampling, Testing, and Materials Received

Geosynthetic Clay Liner

446 rolls of GCL material (Bentomat ST) have been delivered and offloaded. All rolls have been inspected, logged and covered with a tarp for storage. Conformance samples have been received at Advanced Terra Testing from the manufacturer. The initial QA conformance samples have been tested and are within specification. MQC data has been received on the GCL, reviewed, and has been within specification to date. Additional QA samples have been received for testing for the rest of the project, including the Bentomat DN.

Geomembrane

79 rolls of Geomembrane material (60-mil LLDPE) have been delivered; all rolls have been received and are being stored in the staging areas. All rolls have been inspected, logged and covered with a tarp for storage. MQC data has been reviewed and is within specification as required by the QA/QC plans. Conformance samples have been received at Advanced Terra Testing from the manufacturer. The initial QA conformance samples have been tested and are within specification. Additional QA samples have been received for testing for the rest of the project, including the 60mil textured LLDPE.

Geosynthetic Composite Drainage Net

402 rolls of GDN material (TexDrain 200 DS 8) have been delivered and offloaded. All rolls have been inspected, logged and covered with a tarp for storage. The initial QA conformance samples have been tested and are within specification. Additional QA samples have been received for testing for the rest of the project.

CQAE and CQC Soil Sampling and Testing

The Site Quality Assurance Manager (SQAM) working with the CQAE monitored the construction contractor's activities during the week. A total of 3 CQA destructive samples have been obtained for peel and sheer testing of the FML, as well as a total of 6 nuclear density tests on the 6" cushion material. Golder ran another large gradation on the rock layer material, preliminary results were within specification.

Meetings

The weekly site meeting was held on-site on January 6, CQAE, CTR, EPA and CDPHE attended.

CQA and CQC Personnel On-Site

CQAE personnel (SQAM), and CQC were on site January 13-19, 2005, during working hours.

Josh Valentine, SQAM — 1-20-05 Date
Tetra Tech

John H. Rahe, P.E., CQAE — 1/20/05 Date
Tetra Tech

Distribution:
CQAE (John Rahe)
CTR (Bob Davis)
EPA
CDPHE

WEEKLY FIELD MONITORING SUMMARY NUMBER 20
January 20, 2005 THROUGH January 26, 2005
CONSTRUCTION QUALITY ASSURANCE
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
GOLDEN, COLORADO

Introduction

TetraTech has prepared this weekly summary of Construction Quality Assurance (CQA) monitoring and testing performed for construction of the present landfill cap from January 20, 2005 through January 26, 2005. This weekly report summarizes the construction activities, CQA and Construction Quality Control (CQC) testing, and surveying activities for the Present Landfill (PLF) liner construction, geosynthetic deliveries and all related activities for the construction of the PLF Accelerated Action.

Tetra Tech is the on-site CQA Engineer (CQAE) providing CQA services as a subcontractor to the Rocky Flats Contractor Kaiser-Hill Company, LLC (K-H). Earth Tech is the design engineer for the PLF contracted by Kaiser-Hill Company. The Program Management Contractor (PMC) team is providing the CQC services for the PLF. The PMC team consists of S.M. Stoller Corporation as the prime with Neilson-Skanska, Colorado Linings International, Paragon Surveying and Golder Associates, Inc. Golder Associates is performing the CQC services. Advanced Terra Testing Inc. of Lakewood, Colorado is Performing CQA laboratory testing services for soils and geosynthetics.

Construction Synopsis

The construction subcontractor is S.M. Stoller Corporation (Stoller). Paragon Surveying (Paragon) of Denver, Colorado is the subcontractor's surveyor.

Equipment

Stoller had the following equipment on site:

- (1) Cat 825G pad-foot compactor
- (2) Cat 14G Graders
- (1) Cat 950B front-end loader
- (1) Cat 966F front-end loader
- (3) Cat 633D scrapers
- (2) Cat D6R LGP dozer
- (1) Cat D8 dozer
- (1) Cat D6 dozer with Rome Plow
- (2) Cat CS-583C vibrating smooth drum compactor
- (1) Water Trucks
- (1) Cat Rubber Tire Backhoe
- (3) Bobcat T300

- (2) Cat Forklift
- (2) Cat 325L Backhoe (1) long reach
- (2) Volvo A35C Dump Truck
- (3) Volvo A30C Dump Truck
- (1) Hand Tamper

Stoller continued to place the 10 inch cushion layer from the west end of the GDN. The material is being hauled to the edge of the liner and placed using a front-end loader. The loader is being used to dump material over the edge of the pile to help control the wrinkles in the FML and GDN. The contractor has finished placing the 10 inch up to the 5980 line and is doing the final grading and compaction. The 10 inch cushion has been tested for compaction, surveyed and released for rock layer placement up to the 20350 grid line (725' from the west end). The rock layer is being placed using end dumps and a D6 LGP dozer to spread the material. The rock has not shown any signs of any major segregation, and no other equipment has been running on the placed rock. The contractor also continued to place the 22" Rocky Flats Alluvium from the west end of the cap. The material is being placed with a D6 LGP Dozer. The material is being visually inspected for any rock over 12", and any found are being removed. No compactive effort is being used on the 22" layer,

All of the GCL, FML and GDN have been approved up to the 5980 line. The GDN has been continually inspected after adverse weather or any event that may damage the material until it was covered with cushion.

The regrade area on top of the pond sediment was proof rolled with a loaded scraper, two complete passes up to the 20600 grid line (50' east of the 5980 line). There were no soft spots found in this area.

The CTR and Regulators were on site to observe a test pit on the north and south sides of the east face to assess the subgrade and slope stability. The north side was very moist, and had approximately 3' of native overburden to weathered bedrock. The south side was much dryer and had only 6" to 1' of overburden to weathered bedrock. The depth to be excavated before fill placement will be assessed in the field by the Kaiser Hill geotech. A bag marked asbestos was uncovered during tree removal, the bag was removed by the site asbestos team. No other work was done on the east face for the week.

The liner crew completed the installation of the HDPE vertical gas vent pipes up to the 5980 line. The liner was cut and the pipe set in place. The GCL was patched using a larger patch of GCL and granular bentonite. Then a FML boot is placed over the pipe and extrusion welded to the pipe and the existing FML, and vacuum tested on the FML. Then the GDN was patched with a piece of GDN leister welded in place. After the liner is complete the pipe was backfilled with cushion material compacted by hand with a hand tamper.

Nonconformances

Soft spots found in the asbestos areas, they are currently being reworked. Preliminary results on a QA rock layer gradation taken on January 26, 2005 are out of specification for the 6" material.

Record Surveys

The next section of ten inch cushion material has been surveyed to approximately the 20350 grid line (725' from the west end).

Hold Point Release

During this reporting period the hold point release was issued for the 10 inch cushion soil to approximately the 20350 grid line approximately 725' from the west end.

CQAE Geosynthetic Sampling, Testing, and Materials Received

Geosynthetic Clay Liner

446 rolls of GCL material (Bentomat ST) have been delivered and offloaded. All rolls have been inspected, logged and covered with a tarp for storage. Conformance samples have been received at Advanced Terra Testing from the manufacturer. The initial QA conformance samples have been tested and are within specification. MQC data has been received on the GCL, reviewed, and has been within specification to date. Additional QA samples have been received for testing for the rest of the project, including the Bentomat DN, and are currently being reviewed.

Geomembrane

79 rolls of Geomembrane material (60-mil LLDPE) have been delivered; all rolls have been received and are being stored in the staging areas. All rolls have been inspected, logged and covered with a tarp for storage. MQC data has been reviewed and is within specification as required by the QA/QC plans. Conformance samples have been received at Advanced Terra Testing from the manufacturer. The initial QA conformance samples have been tested and are within specification. Additional QA samples have been tested for the rest of the project, including the 60mil textured LLDPE for the east face. One comformance test was out of specification for thickness and tear strength on a roll of 60mil LLDPE-T. This roll was rejected and further testing will be done on the adjacent rolls.

Geosynthetic Composite Drainage Net

402 rolls of GDN material (TexDrain 200 DS 8) have been delivered and offloaded. All rolls have been inspected, logged and covered with a tarp for storage. The initial QA conformance samples have been tested and are within specification. Additional QA samples have been received for testing for the rest of the project and are currently being reviewed.

CQAE and CQC Soil Sampling and Testing

The Site Quality Assurance Manager (SQAM) working with the CQAE monitored the construction contractor's activities during the week. QA ran a large gradation taken on January 26, 2005 on the rock layer material; preliminary results appear to be out of specification for the 6"fraction. This will be verified by a new QC test.

Meetings

The weekly site meeting was held on-site on January 20, CQAE, CTR, EPA,DOE and CDPHE attended.

CQA and CQC Personnel On-Site

CQAE personnel (SQAM), and CQC were on site January 20-26, 2005, during working hours.

Josh Valentine, SQAM — Date 1-27-05
Tetra Tech

John H. Rahe, P.E., CQAE — Date 1/27/05
Tetra Tech

Distribution:
CQAE (John Rahe)
CTR (Bob Davis)
EPA
CDPHE

WEEKLY FIELD MONITORING SUMMARY NUMBER 21
January 27, 2005 THROUGH February 2, 2005
CONSTRUCTION QUALITY ASSURANCE
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
GOLDEN, COLORADO

Introduction

TetraTech has prepared this weekly summary of Construction Quality Assurance (CQA) monitoring and testing performed for construction of the present landfill cap from January 27, 2005 through February 2, 2005. This weekly report summarizes the construction activities, CQA and Construction Quality Control (CQC) testing, and surveying activities for the Present Landfill (PLF) liner construction, geosynthetic deliveries and all related activities for the construction of the PLF Accelerated Action.

Tetra Tech is the on-site CQA Engineer (CQAE) providing CQA services as a subcontractor to the Rocky Flats Contractor Kaiser-Hill Company, LLC (K-H). Earth Tech is the design engineer for the PLF contracted by Kaiser-Hill Company. The Program Management Contractor (PMC) team is providing the CQC services for the PLF. The PMC team consists of S.M. Stoller Corporation as the prime with Neilson-Skanska, Colorado Linings International, Paragon Surveying and Golder Associates, Inc. Golder Associates is performing the CQC services. Advanced Terra Testing Inc. of Lakewood, Colorado is Performing CQA laboratory testing services for soils and geosynthetics.

Construction Synopsis

The construction subcontractor is S.M. Stoller Corporation (Stoller). Paragon Surveying (Paragon) of Denver, Colorado is the subcontractor's surveyor.

Equipment

Stoller had the following equipment on site:

- (1) Cat 825G pad-foot compactor
- (2) Cat 14G Graders
- (1) Cat 950B front-end loader
- (1) Cat 966F front-end loader
- (3) Cat 633D scrapers
- (2) Cat D6R LGP dozer
- (1) Cat D8 dozer
- (1) Cat D6 dozer with Rome Plow
- (1) Cat CS-583C vibrating smooth drum compactor
- (1) Water Trucks
- (1) Cat Rubber Tire Backhoe
- (1)Bobcat T300

- (1) Cat Forklift
- (2) Cat 325L Backhoe
- (2) Volvo A35C Dump Truck
- (3) Volvo A30C Dump Truck
- (1) Hand Tamper

The 10 inch cushion has been tested for compaction, surveyed and released for rock layer placement up to the 20550 grid line, the 5980 line (1150' from the west end). The rock layer is being placed using end dumps and a D6 LGP dozer to spread the material. The rock has a few small areas of segregation that we hope to eliminate by using a different method of placement. No other equipment has been running on the placed rock. The contractor also continued to place the 22" Rocky Flats Alluvium from the west end of the cap. The material is being placed with a D6 LGP Dozer. The material is being visually inspected for any rock over 12", and any found are being removed. No compactive effort is being used on the 22" layer. The areas that trucks and any other equipment are traveling will be scarified to help reduce compaction in the upper growth media zone. A haul truck rolled at the end of the day on 2/2/05 and the site was shutdown for the rest of the day to be evaluated.

The regrade area on top of the pond sediment was proof rolled with a loaded scraper, two complete passes up to the 20700 grid line (150' east of the 5980 line). There were no soft spots found in this area.

The seep collection area was excavated and a corner of the pre-existing collection liner was damaged. It is currently being reviewed for repair or replacement. Clear and grub was completed on the south side of the east face, all the soil removed was stockpiled with the other topsoil. Three more test pits were excavated near the area of the planned seep treatment system to check the depth of stable material. The stable material ranged from 3' to 1' in depth. The sub excavation was started in front of the seep after the test pits. The seep was temporarily rerouted further down the pond with a temporary cascade aeration treatment system.

Nonconformances

Soft spots found in the asbestos areas, are currently being reworked. The final results on a QA rock layer gradation taken on January 26, 2005 are out of specification for the 6" material. A new gradation is scheduled for later this week with QA and QC, pending the weather. A moisture content sample from one of the sandcone tests was out of specification (dry 2.5%), but the density was within the 95% standard proctor value. Some small areas of segregation in the rock layer have been noted.

Record Surveys

The next section of rock layer has been surveyed to the 20200 grid line (775' from the west end).

Hold Point Release

During this reporting period the hold point release was issued for the 10 inch cushion soil to approximately the 20350 grid line approximately 725' from the west end.

CQAE Geosynthetic Sampling, Testing, and Materials Received

Geosynthetic Clay Liner

472 rolls of GCL material (Bentomat ST) and 7 rolls of GCL material (Bentomat DN) have been delivered and offloaded. All rolls have been inspected, logged and covered with a tarp for storage. Conformance samples have been received at Advanced Terra Testing from the manufacturer. The initial QA conformance samples have been tested and are within specification. MQC data has been received on the GCL, reviewed, and has been within specification to date. Additional QA samples have been received for testing for the rest of the project, including the Bentomat DN, and are currently being completed and reviewed. One more sample of Bentomat ST has been received for testing for the extra material needed to finish the top of the cap. Additional MQC data is in progress and needed to complete the approval.

Geomembrane

79 rolls of Geomembrane material (60-mil LLDPE) have been delivered; all rolls have been received and are being stored in the staging areas. All rolls have been inspected, logged and covered with a tarp for storage. MQC data has been reviewed and is within specification as required by the QA/QC plans. Conformance samples have been received at Advanced Terra Testing from the manufacturer. The initial QA conformance samples have been tested and are within specification. Additional QA samples have been tested for the rest of the project, including the 60mil textured LLDPE for the east face. One comformance test was out of specification for thickness and tear strength on a roll of 60mil LLDPE-T. This roll was rejected and further testing is being done on subsequent rolls as well as two new lots. The final rolls of smooth 60 mil to finish the top of the cap have been tested and have been given preliminary approval.

Geosynthetic Composite Drainage Net

463 rolls of GDN material (TexDrain 200 DS 8) have been delivered and offloaded. All rolls have been inspected, logged and covered with a tarp for storage. The initial QA conformance samples have been tested and are within specification. Additional QA samples have been received and reviewed for testing for the rest of the project and have been given preliminary approval.

CQAE and CQC Soil Sampling and Testing

The Site Quality Assurance Manager (SQAM) working with the CQAE monitored the construction contractor's activities during the week. The remaining section of 10" cushion material to the 5980 line was tested for moisture and density.

Meetings

The weekly site meeting was held on-site on January 27, CTR, EPA, DOE and CDPHE attended. The CQAE did a site visit on the afternoon of January 27 after the meeting.

CQA and CQC Personnel On-Site

CQAE personnel (SQAM), and CQC were on site January 27 through February 2, 2005, during working hours.

Josh Valentine, SQAM — Date: 2-3-05
Tetra Tech

John H. Rahe, P.E., CQAE — Date: 2/3/05
Tetra Tech

Distribution:
CQAE (John Rahe)
CTR (Bob Davis)
EPA
CDPHE

WEEKLY FIELD MONITORING SUMMARY NUMBER 22
February 3, 2005 THROUGH February 9, 2005
CONSTRUCTION QUALITY ASSURANCE
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
GOLDEN, COLORADO

Introduction

TetraTech has prepared this weekly summary of Construction Quality Assurance (CQA) monitoring and testing performed for construction of the present landfill cap from February 3, 2005 through February 9, 2005. This weekly report summarizes the construction activities, CQA and Construction Quality Control (CQC) testing, and surveying activities for the Present Landfill (PLF) liner construction, geosynthetic deliveries and all related activities for the construction of the PLF Accelerated Action.

Tetra Tech is the on-site CQA Engineer (CQAE) providing CQA services as a subcontractor to the Rocky Flats Contractor Kaiser-Hill Company, LLC (K-H). Earth Tech is the design engineer for the PLF contracted by Kaiser-Hill Company. The Program Management Contractor (PMC) team is providing the CQC services for the PLF. The PMC team consists of S.M. Stoller Corporation as the prime with Neilson-Skanska, Colorado Linings International, Paragon Surveying and Golder Associates, Inc. Golder Associates is performing the CQC services. Advanced Terra Testing Inc. of Lakewood, Colorado is Performing CQA laboratory testing services for soils and geosynthetics.

Construction Synopsis

The construction subcontractor is S.M. Stoller Corporation (Stoller). Paragon Surveying (Paragon) of Denver, Colorado is the subcontractor's surveyor.

Equipment

Stoller had the following equipment on site:

- (1) Cat 825G pad-foot compactor
- (2) Cat 14G Graders
- (1) Cat 950B front-end loader
- (1) Cat 966F front-end loader
- (3) Cat 633D scrapers
- (2) Cat D6R LGP dozer
- (1) Cat D8 dozer
- (1) Cat D6 dozer with Rome Plow
- (1) Cat CS-583C vibrating smooth drum compactor
- (1) Water Trucks
- (1) Cat Rubber Tire Backhoe
- (1)Bobcat T300

- (1) Cat Forklift
- (2) Cat 325L Backhoe
- (2) Volvo A35C Dump Truck
- (3) Volvo A30C Dump Truck
- (1) Hand Tamper

The 10 inch cushion has been retested for compaction, surveyed and released for rock layer placement up to the 20500 grid line, 50' west of the 5980 line (1100' from the west end). The rock layer is being placed using end dumps and a D6 LGP dozer to spread the material. The new method of placement has been implemented and has helped minimize the segregation. No other equipment has been running on the placed rock. The contractor also continued to place the 22" Rocky Flats Alluvium to approximately 625' from the west end of the cap. The material is being placed with a D6 LGP Dozer. The material is being visually inspected for any rock over 12", and any found are being removed. No compactive effort is being used on the 22" layer. The areas that trucks and any other equipment are traveling will be scarified to help reduce compaction in the upper growth media zone. The liner was pulled back and inspected to see how far the GCL was hydrated. The GCL was hydrated approximately 3 feet in from the edge of the 5980 line, and will have to be removed or overlapped by new material when the liner is continued.

The contractor also started to place the 6" cushion layer east of the 5980 line. The material was being placed at existing moisture, and allowed to dry as needed then compacted and final graded.

The seep collection area was excavated and a corner of the pre-existing collection liner was damaged. It has been reviewed for repair and is scheduled to be repaired later this week. Clear and grub was completed on the south side of the east face. Clear and grub was also started on the central face, all the soil removed was stockpiled with the other topsoil. The sub excavation was continued in front of the seep to remove the soft material. A layer of riprap was placed at the bottom of the seep area to help stabilize the native material for placement of Rocky Flats Alluvium. An area down stream of the seep capture system has been filled with approximately 6'deep and 80 'long section from east to west of Rocky Flats Alluvium to bring it back up to grade. The material was placed in 1' minus lifts and compacted with a minimum of 4 passes with the 825. The seep was temporarily rerouted further down the pond with a temporary cascade aeration treatment system.

Nonconformances

Soft spots found in the asbestos areas, are currently being reworked. The final results on a QA rock layer gradation taken on January 26, 2005 are out of specification for the 6" material. A new gradation is scheduled for later this week with QA and QC, pending the weather. Damage to the seep collection system liner, repairs are to begin after fill is placed down stream of the seep.

Record Surveys

The next section of rock layer has been surveyed to the 20200 grid line (775' from the west end). The 10" cushion has been surveyed to the 20500 grid line (1100' from the west end).

Hold Point Release

During this reporting period the hold point release was reissued for the 10 inch cushion soil to approximately the 20500 grid line approximately 1100' from the west end.

CQAE Geosynthetic Sampling, Testing, and Materials Received

Geosynthetic Clay Liner

472 rolls of GCL material (Bentomat ST) and 58 rolls of GCL material (Bentomat DN) have been delivered and offloaded. All rolls have been inspected, logged and covered with a tarp for storage. Conformance samples have been received at Advanced Terra Testing from the manufacturer. The initial QA conformance samples have been tested and are within specification. MQC data has been received on the GCL, reviewed, and has been within specification to date. Additional QA samples have been received for testing for the rest of the project, including the Bentomat DN, and are currently being completed and reviewed. One more sample of Bentomat ST has been received for testing for the extra material needed to finish the top of the cap. Additional MQC data is in progress and needed to complete the approval.

Geomembrane

80 rolls of Geomembrane material (60-mil LLDPE), and 3 rolls of Textured Geomembrane material (60-mil LLDPE-T) have been delivered; all rolls have been received and are being stored in the staging areas. All rolls have been inspected, logged and covered with a tarp for storage. MQC data has been reviewed and is within specification as required by the QA/QC plans. Conformance samples have been received at Advanced Terra Testing from the manufacturer. The initial QA conformance samples have been tested and are within specification. Additional QA samples have been tested for the rest of the project, including the 60mil textured LLDPE for the east face. One comformance test was out of specification for thickness and tear strength on a roll of 60mil LLDPE-T. This roll was rejected and further testing is being done on subsequent rolls as well as two new lots. The final rolls of smooth 60 mil to finish the top of the cap have been tested and have been given approval.

Geosynthetic Composite Drainage Net

463 rolls of GDN material (TexDrain 200 DS 8) have been delivered and offloaded. All rolls have been inspected, logged and covered with a tarp for storage. The initial QA conformance samples have been tested and are within specification. Additional QA samples have been received and reviewed for testing for the rest of the project and have been given preliminary approval.

CQAE and CQC Soil Sampling and Testing

The Site Quality Assurance Manager (SQAM) working with the CQAE monitored the construction contractor's activities during the week. The remaining section of 10" cushion material to the 20500 grid line was retested for moisture and density.

Meetings

The weekly site meeting was held on-site on February 3, CTR, EPA, DOE and CDPHE attended. The CQAE did a site visit on the afternoon of February 3, after the meeting.

CQA and CQC Personnel On-Site

CQAE personnel (SQAM), and CQC were on site February 3 through February 9, 2005, during working hours.

Josh Valentine, SQAM — Date: 2-10-05
Tetra Tech

John H. Rahe, P.E., CQAE — Date: 2/10/05
Tetra Tech

Distribution:
CQAE (John Rahe)
CTR (Bob Davis)
EPA
CDPHE

WEEKLY FIELD MONITORING SUMMARY NUMBER 23
February 10, 2005 THROUGH February 16, 2005
CONSTRUCTION QUALITY ASSURANCE
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
GOLDEN, COLORADO

Introduction

TetraTech has prepared this weekly summary of Construction Quality Assurance (CQA) monitoring and testing performed for construction of the present landfill cap from February 10, 2005 through February 16, 2005. This weekly report summarizes the construction activities, CQA and Construction Quality Control (CQC) testing, and surveying activities for the Present Landfill (PLF) liner construction, geosynthetic deliveries and all related activities for the construction of the PLF Accelerated Action.

Tetra Tech is the on-site CQA Engineer (CQAE) providing CQA services as a subcontractor to the Rocky Flats Contractor Kaiser-Hill Company, LLC (K-H). Earth Tech is the design engineer for the PLF contracted by Kaiser-Hill Company. The Program Management Contractor (PMC) team is providing the CQC services for the PLF. The PMC team consists of S.M. Stoller Corporation as the prime with Neilson-Skanska, Colorado Linings International, Paragon Surveying and Golder Associates, Inc. Golder Associates is performing the CQC services. Advanced Terra Testing Inc. of Lakewood, Colorado is Performing CQA laboratory testing services for soils and geosynthetics.

Construction Synopsis

The construction subcontractor is S.M. Stoller Corporation (Stoller). Paragon Surveying (Paragon) of Denver, Colorado is the subcontractor's surveyor.

Equipment

Stoller had the following equipment on site:

- (1) Cat 825G pad-foot compactor
- (2) Cat 14G Graders
- (1) Cat 950B front-end loader
- (1) Cat 966F front-end loader
- (3) Cat 633D scrapers
- (2) Cat D6R LGP dozer
- (1) Cat D8 dozer
- (1) Cat D6 dozer with Rome Plow
- (1) Cat CS-583C vibrating smooth drum compactor
- (1) Water Trucks
- (2) Cat Rubber Tire Backhoe
- (1)Bobcat T300

- (1) Cat Forklift
- (2) Cat 325L Backhoe
- (2) Volvo A35C Dump Truck
- (3) Volvo A30C Dump Truck
- (1) Hand Tamper

The rock layer has been placed up to the 20500 grid line 1075' from the west end. The area has been completed and is currently waiting for a record survey. The contractor also continued to place the 22" Rocky Flats Alluvium to approximately 825' from the west end of the cap. The material is being placed with a D6 LGP Dozer. The material is being visually inspected for any rock over 12", and any found are being removed. No compactive effort is being used on the 22" layer. The areas that trucks and any other equipment are traveling will be scarified to help reduce compaction in the upper growth media zone.

The liner crew has placed a total of 457 panels of GCL on the west 1325 feet of the cap from the beginning of the project to the 20700 grid line. The GCL was placed with 6 inch overlap on the edge seams and a 2 foot overlap on the butt seams, with granular bentonite at the butt seams. The first edge seam was overlapped approximately 3' to cover the previously placed and hydrated GCL. The liner crew also placed a total of 119 panels of FML over the top of the GCL from the beginning of the project to the 20700 grid line. The FML was inspected and marked for any defects on a continual basis. The panels were wedge welded and pressure tested on all but the last seam. Destruct test number 066 failed a peel test. New samples were taken on either side to find the extent of the failing area. The area was approximately 50' long on the seam of panels P103 and P106. Due to weather very few repairs have been done on the panels placed after the 5980 line. The welders performed test welds at the beginning of each day and after lunch for peel and shear strengths for wedge and extrusion welders, and all were passing prior to welding on the cap.

The seep collection area was excavated and a corner of the pre-existing collection liner was damaged. It has been reviewed for repair and is scheduled to be repaired later this week. Clear and grub was completed on the south side of the east face. Clear and grub was also continued on the central and north faces, all the soil removed was stockpiled with the other topsoil. A couple of bags of asbestos were encountered on the north face, all were removed by the asbestos removal team. The sub excavation was completed down slope of the seep capture system to remove the soft material. A layer of riprap was placed at the bottom of the seep area to help stabilize the native material for placement of Rocky Flats Alluvium. An area down stream of the seep capture system has been filled with approximately 10'deep and 100' long section from east to west of Rocky Flats Alluvium to bring it back up to grade. The material was placed in 1' minus lifts and compacted with a minimum of 4 passes with the 825. The seep was temporarily rerouted further down the pond with a temporary cascade aeration treatment system.

Nonconformances

Soft spots found in the asbestos areas, are currently being reworked. The final results on a QA rock layer gradation taken on January 26, 2005 are out of specification for the 6" material. A new gradation is scheduled for later this week with QA and QC, pending the weather. Damage to the seep collection system liner, repairs are to begin after fill is placed down stream of the seep. A fusion weld failed a peel test on destruction test number 066 on panel seams P103 and P106. This will be repaired as soon as weather permits.

Record Surveys

The next section of rock layer has been surveyed to the 20200 grid line (775' from the west end). The 10" cushion has been surveyed to the 20500 grid line (1100' from the west end).

Hold Point Release

During this reporting period the hold point release was issued for the 6 inch cushion soil up to approximately the 20700 grid line approximately 1300' from the west end. A hold point was also signed for the 12 inch rock layer to the 20300 grid line approximately 900' from the west end.

CQAE Geosynthetic Sampling, Testing, and Materials Received

Geosynthetic Clay Liner

472 rolls of GCL material (Bentomat ST) and 58 rolls of GCL material (Bentomat DN) have been delivered and offloaded. All rolls have been inspected, logged and covered with a tarp for storage. Conformance samples have been received at Advanced Terra Testing from the manufacturer. The initial QA conformance samples have been tested and are within specification. MQC data has been received on the GCL, reviewed, and has been within specification to date. Additional QA samples have been received for testing for the rest of the project, including the Bentomat DN, and are currently being completed and reviewed. One more sample of Bentomat ST has been received for testing for the extra material needed to finish the top of the cap. Additional MQC data is in progress and needed to complete the approval.

Geomembrane

80 rolls of Geomembrane material (60-mil LLDPE), and 7 rolls of Textured Geomembrane material (60-mil LLDPE-T) have been delivered; all rolls have been received and are being stored in the staging areas. All rolls have been inspected, logged and covered with a tarp for storage. MQC data has been reviewed and is within specification as required by the QA/QC plans. Conformance samples have been received

at Advanced Terra Testing from the manufacturer. The initial QA conformance samples have been tested and are within specification. Additional QA samples have been tested for the rest of the project, including the 60mil textured LLDPE for the east face. One comformance test was out of specification for thickness and tear strength on a roll of 60mil LLDPE-T. This roll was rejected and further testing is being done on subsequent rolls as well as two new lots. The final rolls of smooth 60 mil to finish the top of the cap have been tested and have been given approval.

Geosynthetic Composite Drainage Net

463 rolls of GDN material (TexDrain 200 DS 8) have been delivered and offloaded. All rolls have been inspected, logged and covered with a tarp for storage. The initial QA conformance samples have been tested and are within specification. Additional QA samples have been received and reviewed for testing for the rest of the project and have been given preliminary approval.

CQAE and CQC Soil Sampling and Testing

The Site Quality Assurance Manager (SQAM) working with the CQAE monitored the construction contractor's activities during the week. Nuclear density and moisture tests were taken on the 6" cushion material, and all were within specification.

Meetings

The weekly site meeting was held on-site on February 10, CTR, EPA, DOE, CQAE and CDPHE attended.

CQA and CQC Personnel On-Site

CQAE personnel (SQAM), and CQC were on site February 10 through February 16, 2005, during working hours.

Josh Valentine, SQAM — Date 2-17-05
Tetra Tech

John H. Rahe, P.E., CQAE — Date 2/17/05
Tetra Tech

Distribution:
CQAE (John Rahe)
CTR (Bob Davis)
EPA
CDPHE

WEEKLY FIELD MONITORING SUMMARY NUMBER 24
February 17, 2005 THROUGH February 23, 2005
CONSTRUCTION QUALITY ASSURANCE
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
GOLDEN, COLORADO

Introduction

TetraTech has prepared this weekly summary of Construction Quality Assurance (CQA) monitoring and testing performed for construction of the present landfill cap from February 17, 2005 through February 23, 2005. This weekly report summarizes the construction activities, CQA and Construction Quality Control (CQC) testing, and surveying activities for the Present Landfill (PLF) liner construction, geosynthetic deliveries and all related activities for the construction of the PLF Accelerated Action.

Tetra Tech is the on-site CQA Engineer (CQAE) providing CQA services as a subcontractor to the Rocky Flats Contractor Kaiser-Hill Company, LLC (K-H). Earth Tech is the design engineer for the PLF contracted by Kaiser-Hill Company. The Program Management Contractor (PMC) team is providing the CQC services for the PLF. The PMC team consists of S.M. Stoller Corporation as the prime with Neilson-Skanska, Colorado Linings International, Paragon Surveying and Golder Associates, Inc. Golder Associates is performing the CQC services. Advanced Terra Testing Inc. of Lakewood, Colorado is Performing CQA laboratory testing services for soils and geosynthetics.

Construction Synopsis

The construction subcontractor is S.M. Stoller Corporation (Stoller). Paragon Surveying (Paragon) of Denver, Colorado is the subcontractor's surveyor.

Equipment

Stoller had the following equipment on site:

- (1) Cat 825G pad-foot compactor
- (2) Cat 14G Graders
- (1) Cat 950B front-end loader
- (1) Cat 966F front-end loader
- (3) Cat 633D scrapers
- (2) Cat D6R LGP dozer
- (1) Cat D8 dozer
- (1) Cat D6 dozer with Rome Plow
- (1) Cat CS-583C vibrating smooth drum compactor
- (1) Water Trucks
- (2) Cat Rubber Tire Backhoe
- (1)Bobcat T300

- (1) Cat Tracked Skid Steer Loader
- (1) Cat Forklift
- (2) Cat 325L Backhoe
- (2) Volvo A35C Dump Truck
- (3) Volvo A30C Dump Truck
- (1) Hand Tamper

The rock layer has been placed up to the 20500 grid line 1075' from the west end. The area has been completed and is currently waiting for a record survey. The contractor also continued to place the 22" Rocky Flats Alluvium to approximately the 20400 grid line. The material is being placed with a D6 LGP Dozer. The material is being visually inspected for any rock over 12", and any found are being removed. No compactive effort is being used on the 22" layer. The areas that trucks and any other equipment are traveling will be scarified to help reduce compaction in the upper growth media zone following placement of the 2" layer of growth media. QA/QC has been walking the 22" layer and the rock layer marking any large rocks to be removed. The rock layer has also been walked and marked for any areas of segregation. The areas of segregation are being filled and worked with a small amount cushion material to fill any voids prior to the placement of 22" layer.

Four test pits were excavated in the 22" Rocky Flats Alluvium layer to observe the compaction and estimate the 6" plus material. Acid tests were taken on all four sites to test for calcium carbonate, and all were negative. The compaction of the test pits ranged from low to moderate. The average estimate of the 6" plus material was 5%, although it varied from approximately 2%-10% at the different pits.

The liner crew has finished all of the repairs on the FML up to the 20700 grid line. All of the repairs have been tested and all were passing. The liner crew also installed the last two gas vent risers on the center and north vent systems. The liner is being cut and the pipe set in place. The GCL is patched using a larger patch of GCL and granular bentonite. Then a FML boot is placed over the pipe and extrusion welded to the pipe and the existing FML, and vacuum tested on the FML. Then the GDN is patched with a piece of GDN leister welded in place. After the liner is complete the pipe is backfilled with cushion material compacted by hand with a hand tamper.

Clear and grub was completed on the central and north faces, all the soil removed was stockpiled with the other topsoil. The material was placed in 1' minus lifts and compacted with a minimum of 4 passes with the 825. The seep collection system was repaired using a bentonite and clay cutoff wall. The entire damaged area was exposed on the bottom, north and south sides. A new piece of liner was placed as a barrier between the drainage rock inside and the bentonite cutoff wall. The bentonite was placed so that it sealed both sides as well as the bottom. The outlet pipe (3" Sch 80 PVC) was set in place and the bentonite and the clean drainage gravel were placed at the same time to support the liner barrier. Then a clay cutoff wall was compacted around the outlet pipe downstream of the bentonite. A piece of nonwoven geosynthetic was placed over the top

of the capture system overlapping the old geotextile to act as a filter. To finish the system both the inlet to the vault and the buried temporary pipes were plugged, and the vault filled with pea gravel. The seep was temporarily rerouted further down the pond through the new pipe to the temporary cascade aeration treatment system.

The strip drains were placed on the south face per the drawings and field fitting. The drains were stapled in place per the manufacturer's specifications and covered with clean concrete sand. The collection sump for the strip drains was also constructed and set in place. The sump was built out of LLDPE 60mil by the liner crew 2.5'x4'x6' tall with an outlet pipe welded in place. The outlet pipe consisted of 3 inlets for the strip drains and a cleanout. The sump will be filled with drainage rock and capped with a piece of nonwoven geotextile. The outlet pipes (4" Sch 80 PVC) for the seep capture and the strip drain sump have been placed to the approximate location of the manholes, approximately 80'. The pipes were placed with a minimum of 6" of gravel on the sides and bottom and 24" on top, and the entire system is wrapped with a nonwoven geotextile.

Nonconformances

Soft spots found in the asbestos areas, are currently being reworked. A test on GCL Bentomat ST roll number 708 was out of specification for the free swell test. New samples have been taken from roll numbers 707 and 709 for further testing.

Record Surveys

The next section of rock layer has been surveyed to the 20500 grid line (1025' from the west end).

Hold Point Release

A hold point was also signed for the 12 inch rock layer to the 20400 grid line approximately 1025' from the west end.

CQAE Geosynthetic Sampling, Testing, and Materials Received

Geosynthetic Clay Liner

472 rolls of GCL material (Bentomat ST) and 58 rolls of GCL material (Bentomat DN) have been delivered and offloaded. All rolls have been inspected, logged and covered with a tarp for storage. Conformance samples have been received at Advanced Terra Testing from the manufacturer. The initial QA conformance samples have been tested and are within specification. MQC data has been received on the GCL, reviewed, and has been within specification to date. Additional QA samples have been received for testing for the rest of the project, including the Bentomat DN, and are currently being completed and reviewed. Two more sample of Bentomat ST has been received for testing for the

extra material needed to finish the top of the cap. Additional MQC data is in progress and needed to complete the approval.

Geomembrane

80 rolls of Geomembrane material (60-mil LLDPE), and 10 rolls of Textured Geomembrane material (60-mil LLDPE-T) have been delivered; all rolls have been received and are being stored in the staging areas. All rolls have been inspected, logged and covered with a tarp for storage. MQC data has been reviewed and is within specification as required by the QA/QC plans. Conformance samples have been received at Advanced Terra Testing from the manufacturer. The initial QA conformance samples have been tested and are within specification. Additional QA samples have been tested for the rest of the project, including the 60mil textured LLDPE for the east face. One comformance test was out of specification for thickness and tear strength on a roll of 60mil LLDPE-T. This roll was rejected and further testing was performed on subsequent rolls as well as two new lots all conformance testing was within specification. The final rolls of smooth 60 mil to finish the top of the cap have been tested and have been given approval.

Geosynthetic Composite Drainage Net

463 rolls of GDN material (TexDrain 200 DS 8) have been delivered and offloaded. All rolls have been inspected, logged and covered with a tarp for storage. The initial QA conformance samples have been tested and are within specification. Additional QA samples have been received and reviewed for testing for the rest of the project and have been given approval.

CQAE and CQC Soil Sampling and Testing

The Site Quality Assurance Manager (SQAM) working with the CQAE monitored the construction contractor's activities during the week. Nuclear density and moisture tests were taken on the 6" cushion material, and all were within specification. Six samples of Rocky Flats Alluvium have been taken for the 22" layer. Six samples of Rocky Flats Alluvium were also taken at three other borrow sites. Concurrent QA/QC gradations were preformed on February 22, 2005 on the Rock Layer material as a retest of the QA test that was out of specification. Preliminary test results of the new gradations are within specification.

Meetings

The weekly site meeting was held on-site on February 17, CTR, EPA, DOE, CQAE and CDPHE attended.

CQA and CQC Personnel On-Site

CQAE personnel (SQAM), and CQC were on site February 17 through February 23, 2005, during working hours.

Josh Valentine, SQAM
Tetra Tech

2-24-05
Date

John H. Rahe, P.E., CQAE
Tetra Tech

2/24/05
Date

Distribution:
CQAE (John Rahe)
CTR (Bob Davis)
EPA
CDPHE

WEEKLY FIELD MONITORING SUMMARY NUMBER 25
February 24, 2005 THROUGH March 2, 2005
CONSTRUCTION QUALITY ASSURANCE
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
GOLDEN, COLORADO

Introduction

TetraTech has prepared this weekly summary of Construction Quality Assurance (CQA) monitoring and testing performed for construction of the present landfill cap from February 24, 2005 through March 2, 2005. This weekly report summarizes the construction activities, CQA and Construction Quality Control (CQC) testing, and surveying activities for the Present Landfill (PLF) liner construction, geosynthetic deliveries and all related activities for the construction of the PLF Accelerated Action.

Tetra Tech is the on-site CQA Engineer (CQAE) providing CQA services as a subcontractor to the Rocky Flats Contractor Kaiser-Hill Company, LLC (K-H). Earth Tech is the design engineer for the PLF contracted by Kaiser-Hill Company. The Program Management Contractor (PMC) team is providing the CQC services for the PLF. The PMC team consists of S.M. Stoller Corporation as the prime with Neilson-Skanska, Colorado Linings International, Paragon Surveying and Golder Associates, Inc. Golder Associates is performing the CQC services. Advanced Terra Testing Inc. of Lakewood, Colorado is Performing CQA laboratory testing services for soils and geosynthetics.

Construction Synopsis

The construction subcontractor is S.M. Stoller Corporation (Stoller). Paragon Surveying (Paragon) of Denver, Colorado is the subcontractor's surveyor.

Equipment

Stoller had the following equipment on site:

- (1) Cat 825G pad-foot compactor
- (2) Cat 14G Graders
- (1) Cat 950B front-end loader
- (1) Cat 966F front-end loader
- (3) Cat 633D scrapers
- (2) Cat D6R LGP dozer
- (1) Cat D8 dozer
- (1) Cat D6 dozer with Rome Plow
- (1) Cat CS-583C vibrating smooth drum compactor
- (1) Water Trucks
- (2) Cat Rubber Tire Backhoe
- (1)Bobcat T300

- (1) Cat Tracked Skid Steer Loader
- (1) Cat Forklift
- (2) Cat 325L Backhoe
- (2) Volvo A35C Dump Truck
- (3) Volvo A30C Dump Truck
- (1) Hand Tamper

The rock layer has been placed up to the 20700 grid line 1275' from the west end. The area has been completed and is currently waiting for a record survey. The contractor also continued to place the 22" Rocky Flats Alluvium to approximately the 20400 grid line. The material is being placed with a D6 LGP Dozer. The material is being visually inspected for any rock over 12", and any found are being removed. No compactive effort is being used on the 22" layer. The areas that trucks and any other equipment are traveling will be scarified to help reduce compaction in the upper growth media zone following placement of the 2" layer of growth media. QA/QC has been walking the 22" layer and the rock layer marking any large rocks to be removed. The rock layer has also been walked and marked for any areas of segregation. The areas of segregation are being filled and worked with a small amount cushion material to fill any voids prior to the placement of 22" layer.

The 2" layer of topsoil was started this week, only a small amount has been placed, and none has been surveyed at this time. The material is being placed with a scraper and rough graded using a grader.

The compacted buttress fill was continued on the east face with the Rocky Flats Alluvium. The borrow material from the 371 pile had too much clay in it to be used on the buttress fill, and was stopped on March 1, 2005. The material is currently being hauled from the Centennial pit. Very little of the clay material was placed on the fill, and all large clay balls were removed. The material was placed in 1' minus lifts and compacted with a minimum of 4 passes with the 825

The strip drains were placed on the north, south and central faces per the drawings and field fitted. The drains were spliced and stapled in place per the manufacturer's specifications and covered with clean concrete sand on the south and central faces. The strip drains on the north face was covered with clean drainage rock and nonwoven geotextile. The water is not coming out of the drain pipe from the sump. The water is bypassing the sump and traveling down the pipe bedding. This problem and the solution are currently being evaluated.

Asbestos has been recently uncovered on both the north and south asbestos areas. The limits of the asbestos areas are larger than originally marked; potholing will be done to find the extent of the asbestos. The liner may be enlarged, or the asbestos may be removed to solve the problem, both are currently being evaluated.

Nonconformances

A test on GCL Bentomat ST roll numbers 707, 708 and 709 were out of specification for the free swell test. New samples have been taken from roll numbers 706 and 710 for further testing. If these tests fail the contractor plans to reject all 10 rolls of Bentomat ST in this lot and have them replaced. Clay was observed in the Rocky Flats Alluvium coming from the 371 borrow pile, and the source was changed to Centennial. Asbestos has been found in the southeast and northeast corners of the asbestos areas approximately 50' outside the anchor trench. The fix for the asbestos is currently being evaluated.

Record Surveys

The next section of rock layer has been surveyed to the 20400 grid line (975' from the west end).

Hold Point Release

A hold point release was also signed for the 12 inch rock layer to the 20400 grid line approximately 1025' from the west end.

CQAE Geosynthetic Sampling, Testing, and Materials Received

Geosynthetic Clay Liner

472 rolls of GCL material (Bentomat ST) and 58 rolls of GCL material (Bentomat DN) have been delivered and offloaded. All rolls have been inspected, logged and covered with a tarp for storage. Conformance samples have been received at Advanced Terra Testing from the manufacturer. The initial QA conformance samples have been tested and are within specification. MQC data has been received on the GCL, reviewed, and has been within specification to date. Additional QA samples have been received for testing for the rest of the project, including the Bentomat DN, and are currently being completed and reviewed. A few more sample of Bentomat ST have been delivered to the QA lab for testing for the extra material needed to finish the top of the cap. Additional MQC data is in progress and needed to complete the approval.

Geomembrane

80 rolls of Geomembrane material (60-mil LLDPE), and 10 rolls of Textured Geomembrane material (60-mil LLDPE-T) have been delivered; all rolls have been received and are being stored in the staging areas. All rolls have been inspected, logged and covered with a tarp for storage. MQC data has been reviewed and is within specification as required by the QA/QC plans. Conformance samples have been received at Advanced Terra Testing from the manufacturer. The initial QA conformance samples have been tested and are within specification. Additional QA samples have been tested for the rest of the project, including the 60mil textured LLDPE for the east face. One

comformance test was out of specification for thickness and tear strength on a roll of 60mil LLDPE-T. This roll was rejected and further testing was performed on subsequent rolls as well as two new lots all conformance testing was within specification. The final rolls of smooth 60 mil to finish the top of the cap have been tested and have been given approval.

Geosynthetic Composite Drainage Net

463 rolls of GDN material (TexDrain 200 DS 8) have been delivered and offloaded. All rolls have been inspected, logged and covered with a tarp for storage. The initial QA conformance samples have been tested and are within specification. Additional QA samples have been received and reviewed for testing for the rest of the project and have been given approval.

CQAE and CQC Soil Sampling and Testing

The Site Quality Assurance Manager (SQAM) working with the CQAE monitored the construction contractor's activities during the week. Nuclear density and moisture tests were taken on the 10" cushion material, and all were within specification.

Meetings

The weekly site meeting was held on-site on February 24, CTR, EPA, DOE, CQAE and CDPHE attended.

CQA and CQC Personnel On-Site

CQAE personnel (SQAM), and CQC were on site February 24 through March 2, 2005, during working hours.

Josh Valentine, SQAM
Tetra Tech

2-3-05
Date

John H. Rahe, P.E., CQAE
Tetra Tech

2/3/05
Date

Distribution:
CQAE (John Rahe)
CTR (Bob Davis)
EPA
CDPHE

WEEKLY FIELD MONITORING SUMMARY NUMBER 26
March 3, 2005 THROUGH March 9, 2005
CONSTRUCTION QUALITY ASSURANCE
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
GOLDEN, COLORADO

Introduction

TetraTech has prepared this weekly summary of Construction Quality Assurance (CQA) monitoring and testing performed for construction of the present landfill cap from Mach 3, 2005 through March 9, 2005. This weekly report summarizes the construction activities, CQA and Construction Quality Control (CQC) testing, and surveying activities for the Present Landfill (PLF) liner construction, geosynthetic deliveries and all related activities for the construction of the PLF Accelerated Action.

Tetra Tech is the on-site CQA Engineer (CQAE) providing CQA services as a subcontractor to the Rocky Flats Contractor Kaiser-Hill Company, LLC (K-H). Earth Tech is the design engineer for the PLF contracted by Kaiser-Hill Company. The Program Management Contractor (PMC) team is providing the CQC services for the PLF. The PMC team consists of S.M. Stoller Corporation as the prime with Neilson-Skanska, Colorado Linings International, Paragon Surveying and Golder Associates, Inc. Golder Associates is performing the CQC services. Advanced Terra Testing Inc. of Lakewood, Colorado is Performing CQA laboratory testing services for soils and geosynthetics.

Construction Synopsis

The construction subcontractor is S.M. Stoller Corporation (Stoller). Paragon Surveying (Paragon) of Denver, Colorado is the subcontractor's surveyor.

Equipment

Stoller had the following equipment on site:

- (1) Cat 825G pad-foot compactor
- (3) Cat 14G Graders
- (1) Cat 950B front-end loader
- (1) Cat 966F front-end loader
- (3) Cat 633D scrapers
- (2) Cat D6R LGP dozer
- (1) Cat D8 dozer
- (1) Cat D6 dozer with Rome Plow
- (1) Cat CS-583C vibrating smooth drum compactor
- (1) Water Trucks
- (2) Cat Rubber Tire Backhoe
- (1)Bobcat T300

- (1) Cat Tracked Skid Steer Loader
- (1) Cat Forklift
- (2) Cat 325L Backhoe
- (2) Volvo A35C Dump Truck
- (3) Volvo A30C Dump Truck
- (1) Hand Tamper

The contractor continued to place the 22" Rocky Flats Alluvium to approximately the 20500 grid line. The material is being placed with a D6 LGP Dozer. The material is being visually inspected for any rock over 12", and any found are being removed. No compactive effort is being used on the 22" layer. The areas that trucks and any other equipment are traveling will be scarified to help reduce compaction in the upper growth media zone following placement of the 2" layer of growth media. QA/QC has been walking the 22" layer and the rock layer marking any large rocks to be removed. The rock layer has also been walked and marked for any areas of segregation. The areas of segregation are being filled and worked with a small amount cushion material to fill any voids prior to the placement of 22" layer.

The large gradation QC tests were started on the 22" Rocky Flats Alluvium layer and the 2" topsoil layer. A total of 9 areas were randomly chosen at control points, and marked by the survey crew. Two of the spots were excavated and the gradations started per the work plan.

The 2" layer of topsoil was started this week, only a small amount has been placed, and none has been surveyed at this time. The material is being placed with a scraper and rough graded using a grader.

The compacted buttress fill was completed on the east face with the Rocky Flats Alluvium. The material was placed in 1' minus lifts and compacted with a minimum of 4 passes with the 825 and finished graded.

The water from the strip drains is still bypassing the sump and traveling down the pipe bedding. The sump is scheduled to be excavated and repaired later this week.

The asbestos is being removed from the southeast asbestos area that was outside of the PLF cover anchor trench and loaded in removal containers.

Nonconformances

GCL Bentomat ST roll numbers 701 to 710 were out of specification for the free swell test. All of these rolls are being returned and a new batch will be sent. Test samples for the new rolls are being sent directly from the manufacturer for conformance testing.

Record Surveys

The next section of rock layer has been surveyed to the 20550 grid line (1125' from the west end).

Hold Point Release

A hold point release was also signed for the 12 inch rock layer to the 20550 grid line approximately 1125' from the west end.

CQAE Geosynthetic Sampling, Testing, and Materials Received

Geosynthetic Clay Liner

472 rolls of GCL material (Bentomat ST) and 58 rolls of GCL material (Bentomat DN) have been delivered and offloaded. All rolls have been inspected, logged and covered with a tarp for storage. Conformance samples have been received at Advanced Terra Testing from the manufacturer. The initial QA conformance samples have been tested and are within specification including the Bentomat DN. MQC data has been received on the GCL, reviewed, and has been within specification to date. Additional QA samples have been received for testing for the rest of the project, including the Bentomat DN. A new sample of Bentomat ST has been delivered to the QA lab for testing for the extra material needed to finish the top of the cap. Additional MQC data is in progress and needed to complete the approval.

Geomembrane

80 rolls of Geomembrane material (60-mil LLDPE), and 10 rolls of Textured Geomembrane material (60-mil LLDPE-T) have been delivered; all rolls have been received and are being stored in the staging areas. All rolls have been inspected, logged and covered with a tarp for storage. MQC data has been reviewed and is within specification as required by the QA/QC plans. Conformance samples have been received at Advanced Terra Testing from the manufacturer. The initial QA conformance samples have been tested and are within specification. Additional QA samples have been tested for the rest of the project, including the 60mil textured LLDPE for the east face. One comformance test was out of specification for thickness and tear strength on a roll of 60mil LLDPE-T. This roll was rejected and further testing was performed on subsequent rolls as well as two new lots and all conformance testing was within specification. The final rolls of smooth 60 mil to finish the top of the cap have been tested and have been given approval.

Geosynthetic Composite Drainage Net

463 rolls of GDN material (TexDrain 200 DS 8) have been delivered and offloaded. All rolls have been inspected, logged and covered with a tarp for storage. The initial QA conformance samples have been tested and are within specification. Additional QA

samples have been received and reviewed for testing for the rest of the project and have been given approval.

CQAE and CQC Soil Sampling and Testing

The Site Quality Assurance Manager (SQAM) working with the CQAE monitored the construction contractor's activities during the week. The large gradations for the 22" Rocky Flats Alluvium layer have been started.

Meetings

The weekly site meeting was held on-site on March 3, 2005, CTR, EPA, DOE, CQAE and CDPHE attended.

CQA and CQC Personnel On-Site

CQAE personnel (SQAM), and CQC were on site March 3 through March 9, 2005, during working hours.

3-10-05

Josh Valentine, SQAM — Date
Tetra Tech

3/10/05

John H. Rahe, P.E., CQAE — Date
Tetra Tech

Distribution:
CQAE (John Rahe)
CTR (Bob Davis)
EPA
CDPHE

WEEKLY FIELD MONITORING SUMMARY NUMBER 27
March 10, 2005 THROUGH March 16, 2005
CONSTRUCTION QUALITY ASSURANCE
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
GOLDEN, COLORADO

Introduction

TetraTech has prepared this weekly summary of Construction Quality Assurance (CQA) monitoring and testing performed for construction of the present landfill cap from Mach 10, 2005 through March 16, 2005. This weekly report summarizes the construction activities, CQA and Construction Quality Control (CQC) testing, and surveying activities for the Present Landfill (PLF) liner construction, geosynthetic deliveries and all related activities for the construction of the PLF Accelerated Action.

Tetra Tech is the on-site CQA Engineer (CQAE) providing CQA services as a subcontractor to the Rocky Flats Contractor Kaiser-Hill Company, LLC (K-H). Earth Tech is the design engineer for the PLF contracted by Kaiser-Hill Company. The Program Management Contractor (PMC) team is providing the CQC services for the PLF. The PMC team consists of S.M. Stoller Corporation as the prime with Neilson-Skanska, Colorado Linings International, Paragon Surveying and Golder Associates, Inc. Golder Associates is performing the CQC services. Advanced Terra Testing Inc. of Lakewood, Colorado is Performing CQA laboratory testing services for soils and geosynthetics.

Construction Synopsis

The construction subcontractor is S.M. Stoller Corporation (Stoller). Paragon Surveying (Paragon) of Denver, Colorado is the subcontractor's surveyor.

Equipment

Stoller had the following equipment on site:

- (1) Cat 825G pad-foot compactor
- (3) Cat 14G Graders
- (1) Cat 950B front-end loader
- (1) Cat 966F front-end loader
- (3) Cat 633D scrapers
- (2) Cat D6R LGP dozer
- (1) Cat D8 dozer
- (1) Cat D6 dozer with Rome Plow
- (1) Cat CS-583C vibrating smooth drum compactor
- (1) Water Trucks
- (2) Cat Rubber Tire Backhoe
- (1)Bobcat T300

- (1) Cat Tracked Skid Steer Loader
- (1) Cat Forklift
- (2) Cat 325L Backhoe
- (2) Volvo A35C Dump Truck
- (3) Volvo A30C Dump Truck
- (1) Hand Tamper
- (1) Sheep foot wheel on backhoe

The contractor continued to place the 22" Rocky Flats Alluvium to approximately the 20600 grid line. The material is being placed with a D6 LGP Dozer. No compactive effort is being used on the 22" layer. The entire area will be scarified to help reduce compaction in the upper growth media zone following placement of the 2" layer of growth media. QA/QC has been walking the 22" layer and the rock layer marking any rocks larger then 12" to be removed. The rock layer has also been walked and marked for any areas of segregation. The southeast corner of the east face has also been covered with 6" cushion material. The material has been placed and rough graded, but no compaction has been done at this time.

The large gradation QC tests were continued on the 22" Rocky Flats Alluvium layer and the 2" topsoil layer. A total of 9 areas were randomly chosen at control points, and marked by the survey crew. Eight of the tests were done on the 22" material and one on the 2" material. Two more samples of Rocky Flats Alluvium have also been taken at Centennial for comparison.

The 2" layer of topsoil was continued this week, only a small amount has been placed, and none has been surveyed at this time. The material is being placed with a scraper or haul truck and rough graded using a grader or LGP dozer.

The strip drain sump was excavated to see why it wasn't catching all the water from the strip drains. The sump was repaired by removing a low spot in front of the liner, and adjusting the liner so that the water was flowing into the sump. The sump was covered with gravel and a piece of nonwoven geotextile. The excavation was finally backfilled with a backhoe with a sheep foot wheel attached to the bucket. The material was placed in 1' minus lifts and compacted with a minimum of 6 passes. This method was tested earlier by doing a test fill using the same method. The second pothole on the strip drain was checked for water flow. The water was present and flowing but under the strip drain. The strip drains were repaired and the area backfilled. The material was placed in 1' minus lifts and compacted with a minimum of 4 passes with the 825 and finished graded.

The asbestos has been removed from the southeast asbestos area that was outside of the PLF cover anchor trench and loaded in removal containers. The area was finished by backfilling it to grade. The contractor is currently removing the asbestos from the northeast asbestos area outside of the PLF cover anchor trench and loading it into removal containers.

Nonconformances

None

Record Surveys

The next section of rock layer has been surveyed to the 20550 grid line (1125' from the west end).

Hold Point Release

A hold point release was also signed for the 12 inch rock layer to the 20550 grid line approximately 1125' from the west end.

CQAE Geosynthetic Sampling, Testing, and Materials Received

Geosynthetic Clay Liner

472 rolls of GCL material (Bentomat ST) and 58 rolls of GCL material (Bentomat DN) have been delivered and offloaded. All rolls have been inspected, logged and covered with a tarp for storage. Conformance samples have been received at Advanced Terra Testing from the manufacturer. The initial QA conformance samples have been tested and are within specification including the Bentomat DN. MQC data has been received on the GCL, reviewed, and has been within specification to date. Additional QA samples have been received for testing for the rest of the project, including the Bentomat DN. A new sample of Bentomat ST has been delivered to the QA lab for testing for the extra material needed to finish the top of the cap. Additional MQC data is in progress and needed to complete the approval.

Geomembrane

80 rolls of Geomembrane material (60-mil LLDPE), and 10 rolls of Textured Geomembrane material (60-mil LLDPE-T) have been delivered; all rolls have been received and are being stored in the staging areas. All rolls have been inspected, logged and covered with a tarp for storage. MQC data has been reviewed and is within specification as required by the QA/QC plans. Conformance samples have been received at Advanced Terra Testing from the manufacturer. The initial QA conformance samples have been tested and are within specification. Additional QA samples have been tested for the rest of the project, including the 60mil textured LLDPE for the east face. One comformance test was out of specification for thickness and tear strength on a roll of 60mil LLDPE-T. This roll was rejected and further testing was performed on subsequent rolls as well as two new lots and all conformance testing was within specification. The final rolls of smooth 60 mil to finish the top of the cap have been tested and have been given approval.

Geosynthetic Composite Drainage Net

463 rolls of GDN material (TexDrain 200 DS 8) have been delivered and offloaded. All rolls have been inspected, logged and covered with a tarp for storage. The initial QA conformance samples have been tested and are within specification. Additional QA samples have been received and reviewed for testing for the rest of the project and have been given approval.

Erosion Control Matting

A total of 288 rolls of erosion matt SC150, and a total of 576 rolls of C350 were previously delivered and off loaded. No QA samples have been taken at this time.

CQAE and CQC Soil Sampling and Testing

The Site Quality Assurance Manager (SQAM) working with the CQAE monitored the construction contractor's activities during the week. The large gradations for the 22" Rocky Flats Alluvium layer have been started.

Meetings

The weekly site meeting was held on-site on March 10, 2005, CTR, EPA, DOE, CQAE and CDPHE attended.

CQA and CQC Personnel On-Site

CQAE personnel (SQAM), and CQC were on site March 3 through March 9, 2005, during working hours.

Josh Valentine, SQAM — 3-17-05
Tetra Tech — Date

John H. Rahe, P.E., CQAE — 3/17/05
Tetra Tech — Date

Distribution:
CQAE (John Rahe)
CTR (Bob Davis)
EPA
CDPHE

WEEKLY FIELD MONITORING SUMMARY NUMBER 28
March 17, 2005 THROUGH March 23, 2005
CONSTRUCTION QUALITY ASSURANCE
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
GOLDEN, COLORADO

Introduction

TetraTech has prepared this weekly summary of Construction Quality Assurance (CQA) monitoring and testing performed for construction of the present landfill cap from Mach 17, 2005 through March 23, 2005. This weekly report summarizes the construction activities, CQA and Construction Quality Control (CQC) testing, and surveying activities for the Present Landfill (PLF) liner construction, geosynthetic deliveries and all related activities for the construction of the PLF Accelerated Action.

Tetra Tech is the on-site CQA Engineer (CQAE) providing CQA services as a subcontractor to the Rocky Flats Contractor Kaiser-Hill Company, LLC (K-H). Earth Tech is the design engineer for the PLF contracted by Kaiser-Hill Company. The Program Management Contractor (PMC) team is providing the CQC services for the PLF. The PMC team consists of S.M. Stoller Corporation as the prime with Neilson-Skanska, Colorado Linings International, Paragon Surveying and Golder Associates, Inc. Golder Associates is performing the CQC services. Advanced Terra Testing Inc. of Lakewood, Colorado is Performing CQA laboratory testing services for soils and geosynthetics.

Construction Synopsis

The construction subcontractor is S.M. Stoller Corporation (Stoller). Paragon Surveying (Paragon) of Denver, Colorado is the subcontractor's surveyor.

Equipment

Stoller had the following equipment on site:

- (1) Cat 825G pad-foot compactor
- (3) Cat 14G Graders
- (1) Cat 950B front-end loader
- (1) Cat 966F front-end loader
- (3) Cat 633D scrapers
- (2) Cat D6R LGP dozer
- (1) Cat D8 dozer
- (1) Cat D6 dozer with Rome Plow
- (1) Cat CS-583C vibrating smooth drum compactor
- (1) Water Trucks
- (2) Cat Rubber Tire Backhoe
- (1)Bobcat T300

- (1) Cat Tracked Skid Steer Loader
- (1) Cat Forklift
- (2) Cat 325L Backhoe
- (2) Volvo A35C Dump Truck
- (3) Volvo A30C Dump Truck
- (1) Hand Tamper
- (1) Sheep foot wheel on backhoe

The contractor continued to place the 22" Rocky Flats Alluvium to approximately the 20600 grid line. The material is being placed with a D6 LGP Dozer and finish graded. No compactive effort is being used on the 22" layer. QA/QC has been walking the 22" layer marking any rocks larger than 12" to be removed. The area is also inspected after ripping to mark and remove any large rocks before disking.

The 2" layer of topsoil was continued this week, only a small amount has been placed. The 2" layer has been ripped both directions 12" then disked both directions and is ready for seeding up to the 20150 gridline 775' from the west end.

The northeast asbestos area was very wet and soft where the asbestos was removed from outside the anchor trench. The excavation was reopened and stabilized using large rock then backfilling with a minimum of 2' of Rocky Flats Alluvium and compacted.

The contractor is excavating anchor trench for the east face liner using a tracked excavator. The trench is being excavated and cleaned of any large debris and the edges smoother as much as possible prior to the placement of the liner.

The east face liner was started this week on the south half of the east face. Approximately 50% of the face is covered with GCL Bentomat DN and textured FML from the southeast corner around to the center of the east face on the 4-1 slope. No repairs or testing have been done on the textured FML placed on the east face at this time.

The liner crew has placed a total of 521 panels of GCL on the west end up to the 5980 line and on the east face of the cap form the beginning of the project. The GCL was placed with 6 inch overlap on the edge seams and a 2 foot overlap on the butt seams, with granular bentonite on the butt seams. The liner crew also placed a total of 144 panels of FML over the top of the GCL from the beginning of the project. The FML was inspected and marked for any defects on a continual basis. The welders performed test welds at the beginning of each day and after lunch for peel and shear strengths for the wedge welders. The tests passed before any welding was done on the cap. No repairs or testing have been done on the textured FML placed on the east face at this time.

The 10 rolls of Bentomat ST that were rejected were removed form site and the 10 new rolls were delivered and off loaded. The QA testing has been done and approved for the 10 new rolls.

Nonconformances

None

Record Surveys

The 2" layer has been surveyed and released for seeding up to the 20150 gridline. The 6" cushion has been surveyed and released south of the 39900 gridline on the east face.

Hold Point Release

The 2" layer has been surveyed and released for seeding up to the 20150 gridline. The 6" cushion has been surveyed and released south of the 39900 gridline and east of the 5980 line on the east face.

CQAE Geosynthetic Sampling, Testing, and Materials Received

Geosynthetic Clay Liner

472 rolls of GCL material (Bentomat ST) and 58 rolls of GCL material (Bentomat DN) have been delivered and offloaded. All rolls have been inspected, logged and covered with a tarp for storage. Conformance samples have been received at Advanced Terra Testing from the manufacturer. The initial QA conformance samples have been tested and are within specification including the Bentomat DN. MQC data has been received on the GCL, reviewed, and has been within specification to date. Additional QA samples have been received for testing for the rest of the project, including the Bentomat DN. A new sample of Bentomat ST has been delivered to the QA lab for testing for the extra material needed to finish the top of the cap. All of the QA testing has been done on all Bentomat ST and DN on-site, and all has been within specification. Additional MQC data is in progress and needed to complete the approval.

Geomembrane

80 rolls of Geomembrane material (60-mil LLDPE), and 10 rolls of Textured Geomembrane material (60-mil LLDPE-T) have been delivered; all rolls have been received and are being stored in the staging areas. All rolls have been inspected, logged and covered with a tarp for storage. MQC data has been reviewed and is within specification as required by the QA/QC plans. Conformance samples have been received at Advanced Terra Testing from the manufacturer. The initial QA conformance samples have been tested and are within specification. Additional QA samples have been tested for the rest of the project, including the 60mil textured LLDPE for the east face. One comformance test was out of specification for thickness and tear strength on a roll of 60mil LLDPE-T. This roll was rejected and further testing was performed on subsequent rolls as well as two new lots and all conformance testing was within specification. The final rolls of smooth 60 mil to finish the top of the cap have been tested and have been given approval.

Geosynthetic Composite Drainage Net

463 rolls of GDN material (TexDrain 200 DS 8) have been delivered and offloaded. All rolls have been inspected, logged and covered with a tarp for storage. The initial QA conformance samples have been tested and are within specification. Additional QA samples have been received and reviewed for testing for the rest of the project and have been given approval.

Erosion Control Matting

A total of 288 rolls of erosion matt SC150, and a total of 576 rolls of C350 were previously delivered and off loaded. No QA samples have been taken at this time.

CQAE and CQC Soil Sampling and Testing

The Site Quality Assurance Manager (SQAM) working with the CQAE monitored the construction contractor's activities during the week. Moisture density (nuclear) testing of the 6" cushion was done on the east face as well as the south asbestos area, all areas were within specification.

Meetings

The weekly site meeting was held on-site on March 17, 2005, CTR, EPA, DOE, CQAE and CDPHE attended.

CQA and CQC Personnel On-Site

CQAE personnel (SQAM), and CQC were on site March 17-19 ~~through~~ and March 21-23, 2005, during working hours.

3-24-05

Josh Valentine, SQAM
Tetra Tech

Date

3/24/05

John H. Rahe, P.E., CQAE
Tetra Tech

Date

Distribution:
CQAE (John Rahe)
CTR (Bob Davis)
EPA
CDPHE

WEEKLY FIELD MONITORING SUMMARY NUMBER 29
March 24, 2005 THROUGH March 30, 2005
CONSTRUCTION QUALITY ASSURANCE
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
GOLDEN, COLORADO

Introduction

TetraTech has prepared this weekly summary of Construction Quality Assurance (CQA) monitoring and testing performed for construction of the present landfill cap from Mach 24, 2005 through March 30, 2005. This weekly report summarizes the construction activities, CQA and Construction Quality Control (CQC) testing, and surveying activities for the Present Landfill (PLF) liner construction, geosynthetic deliveries and all related activities for the construction of the PLF Accelerated Action.

Tetra Tech is the on-site CQA Engineer (CQAE) providing CQA services as a subcontractor to the Rocky Flats Contractor Kaiser-Hill Company, LLC (K-H). Earth Tech is the design engineer for the PLF contracted by Kaiser-Hill Company. The Program Management Contractor (PMC) team is providing the CQC services for the PLF. The PMC team consists of S.M. Stoller Corporation as the prime with Neilson-Skanska, Colorado Linings International, Paragon Surveying and Golder Associates, Inc. Golder Associates is performing the CQC services. Advanced Terra Testing Inc. of Lakewood, Colorado is Performing CQA laboratory testing services for soils and geosynthetics.

Construction Synopsis

The construction subcontractor is S.M. Stoller Corporation (Stoller). Paragon Surveying (Paragon) of Denver, Colorado is the subcontractor's surveyor.

Equipment

Stoller had the following equipment on site:

- (3) Cat 14G Graders
- (1) Cat 950B front-end loader
- (1) Cat 966F front-end loader
- (3) Cat 633D scrapers
- (2) Cat D6R LGP dozer
- (1) Cat D6 dozer with Rome Plow
- (1) Cat CS-583C vibrating smooth drum compactor
- (1) Water Trucks
- (1) Cat Rubber Tire Backhoe
- (1) Bobcat T300
- (1) Cat Tracked Skid Steer Loader
- (1) Cat Forklift

- (2) Cat 325L Backhoe
- (2) Volvo A35C Dump Truck
- (3) Volvo A30C Dump Truck
- (2) Hand Tamper
- (1) Sheep foot wheel on backhoe
- (1) FLX-II Drill Seeder
- (1) Hydro Mulch Truck
- (1) Tractor with Disk

The contractor continued to place the 22" Rocky Flats Alluvium to approximately the 20600 grid line. The material is being placed with a D6 LGP Dozer and finish graded. No compactive effort is being used on the 22" layer. QA/QC has been walking the 22" layer marking any rocks larger than 12" to be removed. The area is also inspected after ripping to mark and remove any large rocks before disking.

The 2" layer of topsoil was continued this week, only a small amount has been placed. The 2" layer has been ripped both directions 12" then disked both directions and is ready for seeding up to the 20450 gridline 1075' from the west end.

The seeding crew from Kaiser Hill was on-site drill seeding the west end up to approximately the 19550 gridline, approximately 1 acre. This area was also hydro mulched after the seed was planted, but no erosion mat has been placed. The seed drill was calibrated prior to seeding on the cap by QA and Kaiser Hill.

The contractor is excavating anchor trench for the east face liner using a tracked excavator. The trench is being excavated and cleaned of any large debris and the edges smoothed as much as possible prior to the placement of the liner. The excavation for the manholes and the seep treatment was also started.

The east face liner was continued this week on the south half of the east face. Approximately 50% of the face is covered with GCL Bentomat DN and textured FML and GDN from the southeast corner around to the center of the east face on the 4-1 slope. Testing and repairs were completed on all but the last 2 panels of FML on the north end. All of the pressure and vacuum tests, as well as the destructive tests were passing. GCL Bentomat ST, and smooth FML were placed on the flat section to tie the east face and the 5980 line together on the south side.

The liner crew has placed a total of 566 panels of GCL on the west end and on the east face of the cap form the beginning of the project. The GCL was placed with 6 inch overlap on the edge seams and a 2 foot overlap on the butt seams, with granular bentonite on the butt seams. The liner crew also placed a total of 162 panels of FML over the top of the GCL from the beginning of the project. The FML was inspected and marked for any defects on a continual basis. The welders performed test welds at the beginning of each day and after lunch for peel and shear strengths for the wedge welders. The tests passed before any welding was done on the cap. GDN was also started this week on the

east face, and a total of panels have been placed from the beginning of the project. The GDN is being placed with a 6" overlap on the edge seams, tied every 5' and the geotextile sewn shut. The butt seams are overlapped 24", tied every 12" and a nonwoven cap strip leister welded on top. The GDN was placed 19' beyond the anchor trench at the base of the slope so that it will daylight in the rock layer.

The 10" cushion layer was also started on the southeast corner of the east face. The material is being placed using a front end loader and the tracked loader dumping the material over the edge to help reduce wrinkles. No compaction or grading has been done in this area at this time.

Nonconformances

None

Record Surveys

The 2" layer has been surveyed and released for seeding up to the 20450 gridline.

Hold Point Release

The 2" layer has been surveyed and released for seeding up to the 20450 gridline

CQAE Geosynthetic Sampling, Testing, and Materials Received

Geosynthetic Clay Liner

472 rolls of GCL material (Bentomat ST) and 58 rolls of GCL material (Bentomat DN) have been delivered and offloaded. All rolls have been inspected, logged and covered with a tarp for storage. Conformance samples have been received at Advanced Terra Testing from the manufacturer. The initial QA conformance samples have been tested and are within specification including the Bentomat DN. MQC data has been received on the GCL, reviewed, and has been within specification to date. Additional QA samples have been received for testing for the rest of the project. A new sample of Bentomat ST has been delivered to the QA lab for testing for the extra material needed to finish the top of the cap. All of the QA testing has been done on all Bentomat ST and DN on-site, and all has been within specification. Additional MQC data is in progress and needed to complete the approval.

Geomembrane

80 rolls of Geomembrane material (60-mil LLDPE), and 10 rolls of Textured Geomembrane material (60-mil LLDPE-T) have been delivered; all rolls have been received and are being stored in the staging areas. All rolls have been inspected, logged

and covered with a tarp for storage. MQC data has been reviewed and is within specification as required by the QA/QC plans. Conformance samples have been received at Advanced Terra Testing from the manufacturer. The initial QA conformance samples have been tested and are within specification. Additional QA samples have been tested for the rest of the project, including the 60mil textured LLDPE for the east face. One comformance test was out of specification for thickness and tear strength on a roll of 60mil LLDPE-T. This roll was rejected and further testing was performed on subsequent rolls as well as two new lots and all conformance testing was within specification. The final rolls of smooth 60 mil to finish the top of the cap have been tested and have been given approval.

Geosynthetic Composite Drainage Net

463 rolls of GDN material (TexDrain 200 DS 8) have been delivered and offloaded. All rolls have been inspected, logged and covered with a tarp for storage. The initial QA conformance samples have been tested and are within specification. Additional QA samples have been received and reviewed for testing for the rest of the project and have been given approval.

Erosion Control Matting

A total of 288 rolls of erosion matt SC150, and a total of 576 rolls of C350 were previously delivered and off loaded. No QA samples have been taken at this time.

CQAE and CQC Soil Sampling and Testing

The Site Quality Assurance Manager (SQAM) working with the CQAE monitored the construction contractor's activities during the week. Moisture density (nuclear) testing of the 6" cushion was done on the east face as well as the south asbestos area, all areas were within specification. The SQAM did QA at the Arkansas Seed company to observe the seed mixing and collect the seed tickets.

Meetings

The weekly site meeting was held on-site on March 24, 2005, CTR, EPA, DOE, CQAE and CDPHE attended.

CQA and CQC Personnel On-Site

CQAE personnel (SQAM), and CQC were on site March 24, 25, and 28 through March 30, 2005, during working hours.

Josh Valentine, SQAM
Tetra Tech

3/31/05
Date

John H. Rahe, P.E., CQAE
Tetra Tech

3/31/05
Date

Distribution:

CQAE (John Rahe)
CTR (Bob Davis)
EPA
CDPHE

WEEKLY FIELD MONITORING SUMMARY NUMBER 30
March 31, 2005 THROUGH April 6, 2005
CONSTRUCTION QUALITY ASSURANCE
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
GOLDEN, COLORADO

Introduction

TetraTech has prepared this weekly summary of Construction Quality Assurance (CQA) monitoring and testing performed for construction of the present landfill cap from March 31, 2005 through April 6, 2005. This weekly report summarizes the construction activities, CQA and Construction Quality Control (CQC) testing, and surveying activities for the Present Landfill (PLF) liner construction, geosynthetic deliveries and all related activities for the construction of the PLF Accelerated Action.

Tetra Tech is the on-site CQA Engineer (CQAE) providing CQA services as a subcontractor to the Rocky Flats Contractor Kaiser-Hill Company, LLC (K-H). Earth Tech is the design engineer for the PLF contracted by Kaiser-Hill Company. The Program Management Contractor (PMC) team is providing the CQC services for the PLF. The PMC team consists of S.M. Stoller Corporation as the prime with Neilson-Skanska, Colorado Linings International, Paragon Surveying and Golder Associates, Inc. Golder Associates is performing the CQC services. Advanced Terra Testing Inc. of Lakewood, Colorado is performing CQA laboratory testing services for soils and geosynthetics.

Construction Synopsis

The construction subcontractor is S.M. Stoller Corporation (Stoller). Paragon Surveying (Paragon) of Denver, Colorado is the subcontractor's surveyor.

Equipment

Stoller had the following equipment on site:

- (3) Cat 14G Graders
- (1) Cat 950B front-end loader
- (1) Cat 966F front-end loader
- (3) Cat 633D scrapers
- (2) Cat D6R LGP dozer
- (1) Cat D6 dozer with Rome Plow
- (1) Cat CS-583C vibrating smooth drum compactor
- (2) Cat 953C Track Loader
- (1) Water Truck
- (1) Cat Rubber Tire Backhoe
- (1) Bobcat T300
- (1) Cat Tracked Skid Steer Loader
- (2) Cat Forklift

- (2) Cat 325L Backhoe
- (2) Volvo A35C Dump Truck
- (3) Volvo A30C Dump Truck
- (2) Hand Tamper
- (1) FLX-II Drill Seeder
- (1) Hydro Mulch Truck
- (1) Tractor with Disk

The contractor continued to excavate anchor trenches along the north half crest of the east face, as well as the northern and eastern perimeter of the east face. Anchor trenches were excavated using a tracked excavator. The trenches were cleaned of any large debris and the edges smoothed as much as possible prior to the placement of the liner.

The liner crew completed the placement and testing of FML on the southern portion of the southeastern arm of the PLF. Following FML placement and repairs, GDN was placed in accordance with specifications.

The 6" cushion soils along the north half of the east face were completed for liner placement. Cushion material was inspected for proper gradation, density, moisture content, and smoothness prior to placement of liner. All of the GCL and FML were placed on the PLF and were completed this week. GCL (Bentomat DN) and FML-T (textured with highest asperity upwards) was placed on all 4:1 slopes along the east face. Testing and repairs were completed on all FML placed by the end of the day on April 4, 2005. All of the pressure and vacuum tests, as well as the destructive tests were passing. GCL (Bentomat ST) and smooth FML were placed on the flat section to tie the east face and the 5980 line together.

The liner crew has placed a total of 665 panels (998,115 square feet) of GCL on the west end and on the east face of the cap from the beginning of the project. The GCL was placed with a minimum 6 inch overlap on the edge seams and a 2 foot overlap on the butt seams, with granular bentonite on the butt seams. The liner crew also placed a total of 202 panels (984,224 square feet) of FML over the top of the GCL from the beginning of the project. The FML was inspected and marked for any defects on a continual basis. The welders performed test welds at the beginning of each day and after lunch for peel and shear strengths for the wedge welders. The tests passed before any welding was done on the cap. GDN was placed north of the 39850 gridline beginning April 6, 2005. Approximately 606 panels (1,059,318 square feet) of GDN have been placed from the beginning of the project. The GDN is being placed with a 6" overlap on the edge seams, tied every 5' and the geotextile sewn shut. The butt seams are overlapped 24", tied every 12", and a nonwoven cap strip is leister welded on top.

Contractor began filling the crest anchor trench (south of the 39850 gridline) with drain rock. A minimum of 4" of drain rock (3/4 inch) were placed as bedding for the 4" corrugated, perforated drain pipe. After placement of the drain pipe, additional ¾" drain rock was placed over the pipe to fill the trench. A nonwoven geotextile was placed over the anchor trench to minimize the infiltration of fines. Perimeter anchor trenches were filled with cushion soils following the placement of GCL and FML. Cushion soils were

compacted in 12" lifts using hand tampers. Material compaction and moisture were tested by QA and QC prior to GDN placement over the top of the anchor trenches.

The contractor continued to place 10" cushion soils south of 39850 gridline and east of the 5980 line. Cushion material across the top was placed using a 966F loader and a 14G blade, while material on the east face was placed using a D6H dozer and a 953C track loader. All material was hauled using Volvos and belly dump semi-trailers in a manner to minimize wrinkles in the liner. Material was primarily from Centennial and was of good gradation and moisture. Only the D6H and the 953C were permitted on the east face 10" cushion soils due to liner strength concerns. 10" cushion material placed on the east face was roller compacted using a CS-583C smooth drum without any vibratory action. This was permitted to minimize possible impacts on the liner. A minimum of three passes were conducted with the smooth drum and density tests were conducted to ensure compaction. All density tests were passing prior to releasing east face areas for rock layer placement.

The contractor began placing rock layer material on the southern portions of the east face. Rock material was hauled from Centennial using Volvos and placed using a D6H dozer and a 953C track loader. Material placement is from the base of the slope to the top to minimize material segregation and safety concerns as a result of rolling rocks. Approval and release of the 10" cushion material has been performed for the placement of rock layer material on the east face south of the 39750 gridline.

No further placement of 2" topsoil or 22" Rocky Flats Alluvium has taken place this week.

Contractor continued to excavate RFA material for placement of the seep treatment system. A pad approximately 16 feet by 20 feet was excavated in the alluvium material. A non-woven geotextile material was placed on the pad prior to covering with approximately 10 inches of ¾" drain rock. A concrete crew was on-site to form the passive treatment aeration structure for the concrete pour. The pouring of concrete is scheduled for April 8, 2005.

The seeding crew was on-site drill seeding the west end of the cap to approximately the 20150 gridline. After seeding, hydro-mulching continued along the western portions of the PLF to a maximum easting of the 20050 gridline. Prior to placing seed and mulch, all 2" material was ripped both directions 12" then disked both directions. No erosion matting has been placed.

Nonconformances

None

Record Surveys

The 10" cushion layer on the east face has been surveyed and released for rock layer placement south of the 39750 gridline.

Hold Point Release

The 10" cushion layer on the east face has been surveyed and released for rock layer placement south of the 39750 gridline.

The FML north of the 39850 gridline has been inspected, QC tested, and released for GDN placement.

CQAE Geosynthetic Sampling, Testing, and Materials Received

Geosynthetic Clay Liner

472 rolls of GCL material (Bentomat ST) and 58 rolls of GCL material (Bentomat DN) have been delivered and offloaded. All rolls have been inspected, logged and covered with a tarp for storage. Conformance samples have been received at Advanced Terra Testing from the manufacturer. The initial QA conformance samples have been tested and are within specification including the Bentomat DN. MQC data has been received on the GCL, reviewed, and has been within specification to date. All of the QA testing has been done on all Bentomat ST and DN on-site, and all has been within specification.

Geomembrane

80 rolls of Geomembrane material (60-mil LLDPE), and 10 rolls of Textured Geomembrane material (60-mil LLDPE-T) have been delivered; all rolls have been received and are being stored in the staging areas. All rolls have been inspected, logged and covered with a tarp for storage. MQC data has been reviewed and is within specification as required by the QA/QC plans. Conformance samples have been received at Advanced Terra Testing from the manufacturer. The initial QA conformance samples have been tested and are within specification. Additional QA samples have been tested for the rest of the project, including the 60mil textured LLDPE for the east face. One comformance test was out of specification for thickness and tear strength on a roll of 60mil LLDPE-T. This roll was rejected and further testing was performed on subsequent rolls as well as two new lots and all conformance testing was within specification. The final rolls of smooth 60 mil to finish the top of the cap have been tested and given approval.

Geosynthetic Composite Drainage Net

463 rolls of GDN material (TexDrain 200 DS 8) have been delivered and offloaded. All rolls have been inspected, logged and covered with a tarp for storage. The initial QA conformance samples have been tested and are within specification. Additional QA samples have been received and reviewed for testing for the rest of the project and have been given approval.

Erosion Control Matting

A total of 288 rolls of erosion matt SC150, and a total of 576 rolls of C350 were previously delivered and off loaded. No QA samples have been taken at this time.

CQAE and CQC Soil Sampling and Testing

The Site Quality Assurance Manager (SQAM) working with the CQAE monitored the construction contractor's activities during the week. Moisture density (nuclear) testing of the 6" cushion was done on areas north of the 39850 gridline (northeast arm and face), all areas were within specification. Moisture density testing of the 10" cushion was performed on the east face and southeast arm, south of the 39750 gridline, and in all remaining anchor trench cushion soils; all were within specification.

Meetings

A meeting was conducted on-site on April 1, 2005 to discuss specifics of the passive treatment system; CTR, QA, designers, and project engineers attended.

CQA and CQC Personnel On-Site

CQAE personnel (SQAM), and CQC were on site March 31 through April 6, 2005, during working hours.

Marshall Massaro — 4/7/05

Marshall Massaro, SQAM
Tetra Tech

Date

John H. Rahe — 4/7/05

John H. Rahe, P.E., CQAE
Tetra Tech

Date

Distribution: CQAE (John Rahe)
CTR (Bob Davis)
EPA
CDPHE

WEEKLY FIELD MONITORING SUMMARY NUMBER 31
April 7, 2005 THROUGH April 13, 2005
CONSTRUCTION QUALITY ASSURANCE
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
GOLDEN, COLORADO

Introduction

TetraTech has prepared this weekly summary of Construction Quality Assurance (CQA) monitoring and testing performed for construction of the present landfill cap from April 7, 2005 through April 13, 2005. This weekly report summarizes the construction activities, CQA and Construction Quality Control (CQC) testing, and surveying activities for the Present Landfill (PLF) liner construction, geosynthetic deliveries and all related activities for the construction of the PLF Accelerated Action.

Tetra Tech is the on-site CQA Engineer (CQAE) providing CQA services as a subcontractor to the Rocky Flats Contractor Kaiser-Hill Company, LLC (K-H). Earth Tech is the design engineer for the PLF contracted by Kaiser-Hill Company. The Program Management Contractor (PMC) team is providing the CQC services for the PLF. The PMC team consists of S.M. Stoller Corporation as the prime with Neilson-Skanska, Colorado Linings International, Paragon Surveying and Golder Associates, Inc. Golder Associates is performing the CQC services. Advanced Terra Testing Inc. of Lakewood, Colorado is performing CQA laboratory testing services for soils and geosynthetics.

Construction Synopsis

The construction subcontractor is S.M. Stoller Corporation (Stoller). Paragon Surveying (Paragon) of Denver, Colorado is the subcontractor's surveyor.

Equipment

Stoller had the following equipment on site:

- (3) Cat 14G Graders
- (1) Cat 950B front-end loader
- (1) Cat 966F front-end loader
- (2) Cat 633D scrapers
- (1) Cat D6R LGP dozer
- (1) Cat D5R LGP dozer
- (1) Cat D6 dozer with Rome Plow
- (1) Cat CS-583C vibrating smooth drum compactor
- (2) Cat 953C Track Loader
- (1) Water Truck
- (1) Cat Rubber Tire Backhoe
- (1) Cat Tracked Skid Steer Loader
- (1) Cat Forklift
- (2) Cat 325L Backhoe
- (2) Volvo A35C Dump Truck

- (3) Volvo A30C Dump Truck
- (2) Hand Tamper
- (1) FLX-II Drill Seeder
- (1) Hydro Mulch Truck
- (1) Tractor with Disk

GDN was completed on the entire PLF this week. A total of 625 panels (1,061,001 square feet) of GDN have been placed from the beginning of the project. The GDN is being placed with a 6" overlap on the edge seams, tied every 5' and the geotextile sewn shut. The butt seams are overlapped 24", tied every 12", and a nonwoven cap strip is leister welded on top.

The contractor finished placing the 10" cushion material although the central and north sides of the east face have not been finish graded or released. Cushion material across the top was placed using a 966F loader and a 14G blade, while material on the east face was placed using a D6H LGP dozer and a 953C track loader. All material was hauled using Volvos and belly dump semi-trailers in a manner to minimize wrinkles in the liner. Material was primarily from Centennial and was of good gradation and moisture. Only the D6H LGP and the 953C track loader were permitted on the east face 10" cushion soils due to liner strength concerns. The 10" cushion material placed on the east face was roller compacted using a CS-583C smooth drum without any vibratory action. This was permitted to minimize possible impacts on the liner. A minimum of three passes were conducted with the smooth drum and density tests were conducted to ensure compaction. All density tests were passing prior to releasing east face areas for rock layer placement.

The contractor began placing rock layer material on the southern portions of the east face. Rock material was hauled from Centennial using Volvos to haul the material to the base of the slope and a D6H dozer and a 953C track loader pushing the rock up the slope. Material placement is from the base of the slope to the top to minimize material segregation and safety concerns as a result of rolling rocks. Approval and release of the 10" cushion material has been performed for the placement of rock layer material on the east face south of the 39900 gridline.

Placement of the 8 oz. geotextile and the ¾" drainage rock was started on the southeast chute from the west end. A total of approximately 200' of geotextile and rock has been placed toward the east. No riprap has been placed at this time.

No further placement of 2" topsoil or 22" Rocky Flats Alluvium has taken place this week.

The seeding crew was on-site drill seeding the west end of the cap to approximately the 20450 gridline. After seeding, hydro-mulching continued along the western portions of the PLF to a maximum easting of the 20450 gridline. Prior to placing seed and mulch, all 2" material was ripped both directions 12" then disked both directions. No erosion matting has been placed.

The project was very slow this week due to large amounts of snow, rain and wet muddy conditions from Sunday through Wednesday. Some of the cushion will require drying, reworking or replacement.

Nonconformances

None

Record Surveys

The 10" cushion layer on the east face has been surveyed and released for rock layer placement south of the 39900 gridline.

Hold Point Release

The 10" cushion layer on the east face has been surveyed, tested and released for rock layer placement south of the 39900 gridline. The remaining GDN was released for placement of 10" cushion material.

CQAE Geosynthetic Sampling, Testing, and Materials Received

Geosynthetic Clay Liner

472 rolls of GCL material (Bentomat ST) and 58 rolls of GCL material (Bentomat DN) have been delivered and offloaded. All rolls have been inspected, logged and covered with a tarp for storage. Conformance samples have been received at Advanced Terra Testing from the manufacturer. The initial QA conformance samples have been tested and are within specification including the Bentomat DN. MQC data has been received on the GCL, reviewed, and has been within specification to date. All of the QA testing has been done on all Bentomat ST and DN on-site, and all has been within specification.

Geomembrane

80 rolls of Geomembrane material (60-mil LLDPE), and 10 rolls of Textured Geomembrane material (60-mil LLDPE-T) have been delivered; all rolls have been received and are being sto`red in the staging areas. All rolls have been inspected, logged and covered with a tarp for storage. MQC data has been reviewed and is within specification as required by the QA/QC plans. Conformance samples have been received at Advanced Terra Testing from the manufacturer. The initial QA conformance samples have been tested and are within specification. Additional QA samples have been tested for the rest of the project, including the 60mil textured LLDPE for the east face. One comformance test was out of specification for thickness and tear strength on a roll of 60mil LLDPE-T. This roll was rejected and further testing was performed on subsequent rolls as well as two new lots and all conformance testing was within specification. The final rolls of smooth 60 mil to finish the top of the cap have been tested and given approval. The field destructive seam shear and peel tests were performed on the east face LLDPE and the LLDPE-T and all tests passed.

Geosynthetic Composite Drainage Net

463 rolls of GDN material (TexDrain 200 DS 8) have been delivered and offloaded. All rolls have been inspected, logged and covered with a tarp for storage. The initial QA conformance samples have been tested and are within specification. Additional QA samples have been received and reviewed for testing for the rest of the project and have been given approval.

Erosion Control Matting

A total of 288 rolls of erosion matt SC150, and a total of 576 rolls of C350 were previously delivered and off loaded. No QA samples have been taken at this time.

CQAE and CQC Soil Sampling and Testing

The Site Quality Assurance Manager (SQAM) working with the CQAE monitored the construction contractor's activities during the week. Moisture density (nuclear) testing of the 6" cushion was done on areas north of the 39850 gridline (northeast arm and face), all areas were within specification. Moisture density testing of the 10" cushion was performed on the east face and southeast arm, south of the 39750 gridline, and in all remaining anchor trench cushion soils; all were within specification. Some of the areas of 10" cushion will require retesting due to being wet this week.

Meetings

The weekly site meeting was held on-site on April 7, 2005, CTR, EPA, DOE, CQAE and CDPHE attended.

CQA and CQC Personnel On-Site

CQAE personnel (SQAM), and CQC were on site April 7 through April 13, 2005, during working hours.

Josh Valentine, SQAM
Tetra Tech

4/14/05
Date

John H. Rahe, P.E., CQAE
Tetra Tech

4/14/05
Date

Distribution: CQAE (John Rahe)
CTR (Bob Davis)
EPA
CDPHE

WEEKLY FIELD MONITORING SUMMARY NUMBER 32
April 14, 2005 THROUGH April 20, 2005
CONSTRUCTION QUALITY ASSURANCE
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
GOLDEN, COLORADO

Introduction

TetraTech has prepared this weekly summary of Construction Quality Assurance (CQA) monitoring and testing performed for construction of the present landfill cap from April 14, 2005 through April 20, 2005. This weekly report summarizes the construction activities, CQA and Construction Quality Control (CQC) testing, and surveying activities for the Present Landfill (PLF) liner construction, geosynthetic deliveries and all related activities for the construction of the PLF Accelerated Action.

Tetra Tech is the on-site CQA Engineer (CQAE) providing CQA services as a subcontractor to the Rocky Flats Contractor Kaiser-Hill Company, LLC (K-H). Earth Tech is the design engineer for the PLF contracted by Kaiser-Hill Company. The Program Management Contractor (PMC) team is providing the CQC services for the PLF. The PMC team consists of S.M. Stoller Corporation as the prime with Neilson-Skanska, Colorado Linings International, Paragon Surveying and Golder Associates, Inc. Golder Associates is performing the CQC services. Advanced Terra Testing Inc. of Lakewood, Colorado is performing CQA laboratory testing services for soils and geosynthetics.

Construction Synopsis

The construction subcontractor is S.M. Stoller Corporation (Stoller). Paragon Surveying (Paragon) of Denver, Colorado is the subcontractor's surveyor.

Equipment

Stoller had the following equipment on site:

- (2) Cat 14G Graders
- (1) Cat 950B front-end loader
- (1) Cat 966F front-end loader
- (2) Cat 633D scrapers
- (1) Cat D6R LGP dozer
- (1) Cat D5R LGP dozer
- (1) Cat D6 dozer with Rome Plow
- (1) Cat CS-583C vibrating smooth drum compactor
- (2) Cat 953C Track Loader
- (1) Water Truck
- (1) Cat Rubber Tire Backhoe
- (1) Cat Forklift
- (2) Cat 325L Backhoe
- (2) Volvo A35C Dump Truck
- (3) Volvo A30C Dump Truck

- (2) Hand Tamper
- (1) FLX-II Drill Seeder
- (1) Hydro Mulch Truck
- (1) Tractor with Disk

The contractor finished placing and finish grading all of the remaining 10" cushion material. The material was tested for moisture and density as well as record surveyed, and all was within specification. The contractor continued placing rock layer material on the east face. Rock material was hauled from Centennial using Volvos to haul the material to the top of the slope and a 953C track loader was used to haul the material down the slope and a D6H dozer was used to place the rock up the slope. Material placement is from the base of the slope to the top to minimize material segregation and safety concerns as a result of rolling rocks. The rock layer has been placed and rough graded on all of the 4:1 slope and all but a haul road on the top. The 22" layer of Rocky Flats Alluvium was continued to approximately the 20700 gridline. The material was being placed using the D6 dozer and rough graded. No 22" was record surveyed this week.

Placement of the 8 oz. geotextile and the ¾" drainage rock was continued on the southeast chute from the west end all the way to the end of the channel near the culvert. No riprap has been placed at this time.

The seeding crew was on-site drill seeding the central area of the cap to approximately the 20550 gridline. After seeding, hydro-mulching continued along the western portions of the PLF to a maximum easting of the 20550 gridline. Prior to placing seed and mulch, all 2" material was ripped both directions 12" then disked both directions. The C125 erosion mat was started this week from the west end of the cap to approximately the 20500 gridline.

The walls and the interior steps were cast in the seep treatment system structure this week. The concrete was tested for the walls and had a slump of 5", which is 1" above the specification, which was allowed due to the use of a pump truck and to help reduce segregation in the walls. The air results were also high, 10-12% which could be a problem with the air meter. The acceptance of this concrete will be reviewed when the compressive strengths are done. The concrete for the steps was tested for air by QA and QC due to the previous results on the walls, and both were within specification (6.3-6.7%), slump was also with specification (4"). The walls and steps were inspected for dimensions and reinforcing steel, and all were within specification prior to casting.

The manhole base for the seep capture system was set in place, and the excavation for the bentonite cutoff wall was started. The second manhole (north) cannot be placed until the seep treatment system is backfilled (pending concrete strength results) because the second manhole is only 4' deep.

Nonconformances

None

Record Surveys

The 10" cushion layer on the east face has been surveyed and released for rock layer placement on the entire east face. The rock layer was released to the 39600 and 20700 gridlines for 22" Alluvium placement.

Hold Point Release

The 10" cushion layer on the east face has been surveyed, tested and released for rock layer placement on the entire east face. The rock layer was released to the 39600 and 20700 gridlines for 22" Alluvium placement.

CQAE Geosynthetic Sampling, Testing, and Materials Received

All the GCL, FML and GDN have been QA tested and approved. All GCL, FML and GDN installations are complete and approved.

A total of 288 rolls of erosion mat SC150, and a total of 576 rolls of C350 were previously delivered and off loaded. Sufficient rolls of mat C125 have been delivered and offloaded. No QA samples of the C350 have been taken at this time.

CQAE and CQC Soil and Concrete Sampling and Testing

The Site Quality Assurance Manager (SQAM) working with the CQAE monitored the construction contractor's activities during the week. Moisture density testing of the 10" cushion was completed and all were within specification.

The 7 day concrete test cylinders were broken for the slab of the seep treatment structure and were 4,460 and 4,380psi.

Meetings

The weekly site meeting was held on-site on April 14, 2005, CTR, EPA, DOE, CQAE and CDPHE attended.

CQA and CQC Personnel On-Site

CQAE personnel (SQAM), and CQC were on site April 14 through April 20, 2005, during working hours.

Josh Valentine, SQAM
Tetra Tech

4/21/05
Date

John H. Rahe, P.E., CQAE
Tetra Tech

4/21/05
Date

Distribution:
CQAE (John Rahe)
CTR (Bob Davis)
EPA
CDPHE

WEEKLY FIELD MONITORING SUMMARY NUMBER 33
April 21, 2005 THROUGH April 27, 2005
CONSTRUCTION QUALITY ASSURANCE
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
GOLDEN, COLORADO

Introduction

TetraTech has prepared this weekly summary of Construction Quality Assurance (CQA) monitoring and testing performed for construction of the present landfill cap from April 21, 2005 through April 27, 2005. This weekly report summarizes the construction activities, CQA and Construction Quality Control (CQC) testing, and surveying activities for the Present Landfill (PLF) liner construction, geosynthetic deliveries and all related activities for the construction of the PLF Accelerated Action.

Tetra Tech is the on-site CQA Engineer (CQAE) providing CQA services as a subcontractor to the Rocky Flats Contractor Kaiser-Hill Company, LLC (K-H). Earth Tech is the design engineer for the PLF contracted by Kaiser-Hill Company. The Program Management Contractor (PMC) team is providing the CQC services for the PLF. The PMC team consists of S.M. Stoller Corporation as the prime with Neilson-Skanska, Colorado Linings International, Paragon Surveying and Golder Associates, Inc. Golder Associates is performing the CQC services. Advanced Terra Testing Inc. of Lakewood, Colorado is performing CQA laboratory testing services for soils and geosynthetics.

Construction Synopsis

The construction subcontractor is S.M. Stoller Corporation (Stoller). Paragon Surveying (Paragon) of Denver, Colorado is the subcontractor's surveyor.

Equipment

Stoller had the following equipment on site:

- (2) Cat 14G Graders
- (1) Cat 950B front-end loader
- (1) Cat 966F front-end loader
- (2) Cat 633D scrapers
- (1) Cat D6R LGP dozer
- (1) Cat D5R LGP dozer
- (1) Cat D6 dozer with Rome Plow
- (1) Cat 953C Track Loader
- (1) Water Truck
- (1) Cat Forklift
- (2) Cat 325L Backhoe
- (2) Volvo A35C Dump Truck
- (3) Volvo A30C Dump Truck

- (2) Hand Tamper
- (1) FLX-II Drill Seeder
- (1) Hydro Mulch Truck
- (1) Tractor with Disk

The contractor finished placing rock layer material on the east face. Rock material was hauled from Centennial using Volvos to haul the material to the top of the slope and a 953C track loader was used to haul the material down the slope and a D6H dozer was used to place the rock up the slope. Material placement was from the base of the slope to the top to minimize material segregation and safety concerns as a result of rolling rocks. The 22" layer of Rocky Flats Alluvium was completed on all but one small section on the south section of the east face. The material was being placed using the D6 dozer from the top of the slope down at an angle to reduce stress on the liner at the crest, as well as from the bottom with a 953C track loader at the toe of the slope.

The seeding crew was on-site broadcasting seed in the perimeter channels. After seeding, hydro-mulching continued along the western portions of the PLF to a maximum easting of the 20600 gridline. Prior to placing seed and mulch, all 2" material on the PLF was ripped both directions 12" then disked both directions. The C125 erosion mat was continued this week from the west end of the cap to approximately the 20600 gridline, and anchored with pins every 3' per the specifications.

The final wall section was cast in the seep treatment system structure this week. The concrete was tested for air content, slump and temperature prior to placement, and was within specification.

The north manhole base for the seep capture system was set in place, and the excavation and placement of the bentonite cutoff wall was continued. The structures were being backfilled with cushion material as the bentonite cutoff wall is placed. The cushion material is being placed in 6" lifts and compacted using a hand tamper. The north GWIS 8" PVC with bell and spigot joints was placed from the tie-in to the manhole near the seep treatment structure approximately 350 linear feet. The line was bedded in cushion material per the specifications and moisture/density tested by QC, and all were within specification. The inflow lines upstream of the bentonite wall were modified slightly by placing the pipes at the base of the trench with liner under the perforated pipes and bentonite under the liner to force all water in the gravel bedding into the pipes discharging to the seep treatment system.

Nonconformances

None

Record Surveys

The remaining rock layer was released for 22" alluvium placement on the east face.

Hold Point Release

The remaining rock layer was released for 22" alluvium placement.

CQAE Geosynthetic Sampling, Testing, and Materials Received

All the GCL, FML and GDN have been QA tested and approved. All GCL, FML and GDN installations are complete and approved.

A total of 288 rolls of erosion mat SC150, and a total of 576 rolls of C350 were previously delivered and off loaded. Sufficient rolls of mat C125 have been delivered and offloaded. No QA samples of the C350 have been taken at this time.

CQAE and CQC Soil and Concrete Sampling and Testing

The Site Quality Assurance Manager (SQAM) working with the CQAE monitored the construction contractor's activities during the week. Moisture density testing was preformed on the backfill of the north GWIS line as well as the backfill around the seep treatment structure, all were within specification.

The walls of the seep treatment structure had low 7 day compressive strength tests. The designers were notified and calculations were preformed to determine if 3000psi concrete would suffice. Indications are that it will be acceptable. Concrete was tested for the remaining east wall section on the seep treatment structure. The concrete was tested and was within specification for air content and slump prior to placement.

QC preformed 2 bulk gradation (ASTM D5519/D422) conformance tests on the import 2" topsoil from the Centennial Pit, and is awaiting lab results. QC also preformed 3 bulk gradations on the in-place 22" Rocky Flats Alluvium and one 2" in-place topsoil gradation (ASTM D5519/D422).

Meetings

The weekly site meeting was held on-site on April 21, 2005, EPA, DOE, CQAE and CDPHE attended.

CQA and CQC Personnel On-Site

CQAE personnel (SQAM), and CQC were on site April 21 through April 27, 2005, during working hours.

Josh Valentine, SQAM
Tetra Tech

4/28/05
Date

John H. Rahe, P.E., CQAE
Tetra Tech

4/28/05
Date

Distribution:
CQAE (John Rahe)
CTR (Bob Davis)
EPA
CDPHE

WEEKLY FIELD MONITORING SUMMARY NUMBER 34
April 28, 2005 THROUGH May 4, 2005
CONSTRUCTION QUALITY ASSURANCE
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
GOLDEN, COLORADO

Introduction

TetraTech has prepared this weekly summary of Construction Quality Assurance (CQA) monitoring and testing performed for construction of the present landfill cap from April 28, 2005 through March 4, 2005. This weekly report summarizes the construction activities, CQA and Construction Quality Control (CQC) testing, and surveying activities for the Present Landfill (PLF) liner construction, geosynthetic deliveries and all related activities for the construction of the PLF Accelerated Action.

Tetra Tech is the on-site CQA Engineer (CQAE) providing CQA services as a subcontractor to the Rocky Flats Contractor Kaiser-Hill Company, LLC (K-H). Earth Tech is the design engineer for the PLF contracted by Kaiser-Hill Company. The Program Management Contractor (PMC) team is providing the CQC services for the PLF. The PMC team consists of S.M. Stoller Corporation as the prime with Neilson-Skanska, Colorado Linings International, Paragon Surveying and Golder Associates, Inc. Golder Associates is performing the CQC services. Advanced Terra Testing Inc. of Lakewood, Colorado is performing CQA laboratory testing services for soils and geosynthetics.

Construction Synopsis

The construction subcontractor is S.M. Stoller Corporation (Stoller). Paragon Surveying (Paragon) of Denver, Colorado is the subcontractor's surveyor.

Equipment

Stoller had the following equipment on site:

- (2) Cat 14G Graders
- (1) Cat 950B front-end loader
- (1) Cat 966F front-end loader
- (2) Cat 633D scrapers
- (1) Cat D6R LGP dozer
- (1) Cat D5R LGP dozer
- (1) Cat D6 dozer with Rome Plow
- (1) Cat 963C Track Loader
- (1) Water Truck
- (2) Cat 325L Backhoe
- (2) Volvo A35C Dump Truck
- (3) Volvo A30C Dump Truck
- (1) Hand Tamper

- (1) FLX-II Drill Seeder
- (1) Hydro Mulch Truck
- (1) Tractor with Disk

The 22" layer of Rocky Flats Alluvium was completed on the east face. The material was placed using the D6 dozer from the top of the slope down at an angle to reduce stress on the liner at the crest, as well as from the bottom with a 963C track loader at the toe of the slope. No 2" material was placed this week.

The C125 erosion mat was continued this week from the west end of the cap to approximately the 20650 gridline, and anchored with pins every 3' per the specifications. Trenching and placement of the erosion mat C150 was done in the perimeter channel from approximate gridlines 19500 to 19700 on the south side to the approximate invert of the channel. The anchor trench is a minimum of 6" deep with the mat placed to the bottom. The anchor trench is then backfilled with the Rocky Flats alluvium removed from the trench.

The structures were being backfilled with cushion material as the bentonite cutoff wall is placed. The cushion material is being placed in 6" lifts and compacted using a hand tamper. The south GWIS 8" PVC with bell and spigot joints was placed from the tie-in to the manhole near the seep treatment structure approximately 300 linear feet. The line was bedded in cushion material per the specifications and compacted using a hand tamper to a minimum of 90%.

The work was very slow this week due to rain and snow, the job was shut down from April 28, 2005 to May 2, 2005.

Nonconformances

None

Record Surveys

None

Hold Point Release

None

CQAE Geosynthetic Sampling, Testing, and Materials Received

All the GCL, FML and GDN have been QA tested and approved. All GCL, FML and GDN installations are complete and approved.

A total of 288 rolls of erosion mat SC150, and a total of 576 rolls of C350 were previously delivered and off loaded. Sufficient rolls of mat C125 have been delivered and offloaded. No QA samples of the C350 have been taken at this time.

CQAE and CQC Soil and Concrete Sampling and Testing

The Site Quality Assurance Manager (SQAM) working with the CQAE monitored the construction contractor's activities during the week. Moisture density testing was preformed on the backfill of the south GWIS line, all were within specification.

Meetings

The weekly meeting was postponed until the following week.

CQA and CQC Personnel On-Site

CQAE personnel (SQAM), and CQC were on site April 28 and March 2 through March 4, 2005, during working hours.

Josh Valentine, SQAM
Tetra Tech

5/4/05
Date

John H. Rahe, P.E., CQAE
Tetra Tech

5/4/05
Date

Distribution:
CQAE (John Rahe)
CTR (Bob Davis)
EPA
CDPHE

WEEKLY FIELD MONITORING SUMMARY NUMBER 35
May 5, 2005 THROUGH May 11, 2005
CONSTRUCTION QUALITY ASSURANCE
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
GOLDEN, COLORADO

Introduction

Tetra Tech has prepared this weekly summary of Construction Quality Assurance (CQA) monitoring and testing performed for construction of the present landfill cap from May 5, 2005 through May 11, 2005. This weekly report summarizes the construction activities, CQA and Construction Quality Control (CQC) testing, and surveying activities for the Present Landfill (PLF) liner construction, geosynthetic deliveries and all related activities for the construction of the PLF Accelerated Action.

Tetra Tech is the on-site CQA Engineer (CQAE) providing CQA services as a subcontractor to the Rocky Flats Contractor Kaiser-Hill Company, LLC (K-H). Earth Tech is the design engineer for the PLF contracted by Kaiser-Hill Company. The Program Management Contractor (PMC) team is providing the CQC services for the PLF. The PMC team consists of S.M. Stoller Corporation as the prime with Neilson-Skanska, Colorado Linings International, Paragon Surveying and Golder Associates, Inc. Golder Associates is performing the CQC services. Advanced Terra Testing Inc. of Lakewood, Colorado is performing CQA laboratory testing services for soils and geosynthetics.

Construction Synopsis

The construction subcontractor is S.M. Stoller Corporation (Stoller). Paragon Surveying (Paragon) of Denver, Colorado is the subcontractor's surveyor.

Equipment

Stoller had the following equipment on site:

- (2) Cat 14G Graders
- (1) Cat 950B front-end loader
- (1) Cat 966F front-end loader
- (2) Cat 633D scrapers
- (1) Cat D6R LGP dozer
- (1) Cat D5R LGP dozer
- (1) Cat D6 dozer with Rome Plow
- (1) Cat 963C Track Loader
- (1) Water Truck
- (2) Cat 325L Trackhoe
- (2) Volvo A35C Dump Truck
- (3) Volvo A30C Dump Truck
- (1) Hand Tamper
- (1) FLX-II Drill Seeder
- (1) Hydro Mulch Truck

- (1) Tractor with Disk

The placement and grading of the 22" layer of Rocky Flats Alluvium was completed on May 6, 2005 and released by QA for 2" topsoil placement. The placement and grading of the 2" layer of topsoil was completed on May 8, 2005. Topsoil material was placed along the east face using a D5R dozer and a 963C trackloader. The topsoil material was surveyed and released to allow ripping and disking to occur. The 2" cover layer and the underlying 22" Rocky Flats Alluvium layer were ripped in an east-west and north-south direction to a depth of approximately 9" using 14G graders. After ripping, a D6R dozer trailing a disk tilled the surface to minimize the size of soil clods.

2" cover soil material was utilized to build the east berm from the north perimeter channel to the south perimeter channel. Material was placed to form a 2:1 (horizontal : vertical) east face and a 3:1 west face slope, uncompacted.

The seep treatment system was completed. The bentonite cutoff wall was completed by placing bentonite in 6" lifts and hydrating with one gallon of water for every ten pounds of bentonite. Lifts were conducted every 15 minutes to provide sufficient time for bentonite hydration. Following placement of bentonite, a nonwoven geotextile was placed over the wall followed by cushion material and Rocky Flats Alluvium. Cushion material was placed around the treatment system and compacted in 6" lifts using a hand-tamper.

The seeding and erosion matting crew was on-site to lay C125 and C150 erosion matting. C125 material was placed on the cap of the PLF up to the 5980 line. C150 material was placed on the PLF side of the perimeter channel up to the 5980 line. Liner was stapled according to manufacturer's specifications and overlapped in a downhill direction. A 6" x 6" trench was dug to anchor the C150 to the PLF slopes.

Riprap was hauled in to complete the southeast perimeter channel. Material was hauled in using Volvos and placed using a 325 trackhoe. Riprap was underlain by washed rock with a nonwoven geosynthetic beneath. QA testing on the riprap provided a D_{50} in excess of 12" that met specifications. All riprap material and bedding was surveyed by Paragon and released by QA.

Contractor placed 3' diameter, HDPE culverts (two each) along the northern and southeastern perimeter channels. Culverts were secured by compacted cushion material. Riprap was placed near the entrance and outfall of each culvert in a manner to minimize flow constraints caused by the riprap.

Nonconformances

None

Record Surveys

All 22" Rocky Flats Alluvium and 2" topsoil layers, the perimeter channel washed rock bedding and riprap were surveyed.

Hold Point Release

The 22" and 2" layers were released for the PLF.

CQAE Geosynthetic Sampling, Testing, and Materials Received

All the GCL, FML and GDN have been QA tested and approved. All GCL, FML and GDN installations are complete and approved.

A total of 288 rolls of erosion mat SC150, and a total of 576 rolls of C350 were previously delivered and off loaded. Sufficient rolls of mat C125 have been delivered and offloaded. Two QA samples of the C350 have been collected and sent to the lab for analysis.

CQAE and CQC Soil and Concrete Sampling and Testing

The Site Quality Assurance Manager (SQAM) working with the CQAE monitored the construction contractor's activities during the week. Gradation samples were collected on May 5, 2005 for the 2" topsoil, the 22" Rocky Flats Alluvium, and the riprap materials using the ASTM D422/D5519 methods. Results on the gradations are still pending.

Additional field QC and QA tests were performed on riprap at the Centennial Pit which indicated a D_{50} size less than 12". Therefore larger riprap was mixed with the materials to produce a riprap size meeting specifications.

Meetings

A meeting was held on May 9, 2005 to perform the final walk-through of all PLF activities. Attendance at the meeting consisted of personnel from the Department of Fish and Wildlife, Colorado Department of Public Health and Environment, Environmental Protection Agency, Kaiser-Hill, quality assurance, and the design engineer.

CQA and CQC Personnel On-Site

CQAE personnel (SQAM), and CQC were on site May 5 through May 11, 2005, during working hours.

J. H. Rahe 5/11/05

for Josh Valentine, SQAM — Date
Tetra Tech

J. H. Rahe 5/11/05

John H. Rahe, P.E., CQAE — Date
Tetra Tech

Distribution: CQAE (John Rahe)

APPENDIX G-3: MONTHLY QA REPORTS

MONTHLY QA REPORTS DO NOT
INCLUDE REFERENCE ATTACHMENTS. HOWEVER,
ATTACHMENTS ARE INCLUDED
ELSEWHERE IN APPENDICES F AND G

MONTHLY DATA SUMMARY NUMBER 1
August 23, THROUGH October 31, 2004
CONSTRUCTION QUALITY ASSURANCE
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
GOLDEN, COLORADO

Introduction

TetraTech has prepared this monthly summary of Construction Quality Control (CQC) and Quality Assurance (CQA) data testing performed for construction of the present landfill cap from August 23 through October 31, 2004. This monthly report summarizes the testing data and surveying activities for the Present Landfill (PLF) liner construction, geosynthetic deliveries and all related activities for the construction of the PLF Accelerated Action.

Tetra Tech is the on-site CQA Engineer (CQAE) providing CQA services as a subcontractor to the Rocky Flats Contractor Kaiser-Hill Company, LLC (K-H). Earth Tech is the design engineer for the PLF contracted by Kaiser-Hill Company. The Program Management Contractor (PMC) team is providing the CQC services for the PLF. The PMC team consists of S.M. Stoller Corporation as the prime with Neilson-Skanska, Colorado Linings International, Paragon Surveying and Golder Associates, Inc. Golder Associates is performing the CQC services. Advanced Terra Testing Inc. of Lakewood, Colorado is Performing CQA laboratory testing services for soils and geosynthetics.

Test Data Summary

From August 23 through October 31, 2004, bulk gradation testing was performed on the Rocky Flats Alluvium. Density tests have been performed on the test fill and on section 1 of the cushion soil. QC has also observed and documented the pressure and vacume tests on the FML. The testing was performed by Golder (CQC). No testing has been done by TetraTech (CQA).

Nonconformance Materials or Work

Soft areas form the first and second proof rolls. Repair of these areas is in progress.

Follow Up Retests and Inspections

Soft areas 1-18 have been repaired and inspected, and all are passing with 1 inch or less of deflection.

Record Surveys

Record surveys have performed on section 1 of the regrade and cushion surfaces, as well as all panels of the liner system.

Josh Valentine, SQAM
Tetra Tech

10/31/04
Date

John H. Rahe, P.E., CQAE
Tetra Tech

10/31/04
Date

Distribution:
CQAE (John Rahe)
CTR (Bob Davis)
EPA
CDPHE

MONTHLY DATA SUMMARY NUMBER 2
November 1, THROUGH November 30, 2004
CONSTRUCTION QUALITY ASSURANCE
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
GOLDEN, COLORADO

Introduction

TetraTech has prepared this monthly data summary of Construction Quality Control (CQC) and Quality Assurance (CQA) data testing performed for construction of the present landfill cap from November 1 through November 30, 2004. This monthly report summarizes the testing data and surveying activities for the Present Landfill (PLF) liner construction, geosynthetic deliveries and all related activities for the construction of the PLF Accelerated Action.

Tetra Tech is the on-site CQA Engineer (CQAE) providing CQA services as a subcontractor to the Rocky Flats Contractor Kaiser-Hill Company, LLC (K-H). Earth Tech is the design engineer for the PLF contracted by Kaiser-Hill Company. The Program Management Contractor (PMC) team is providing the CQC services for the PLF. The PMC team consists of S.M. Stoller Corporation as the prime with Neilson-Skanska, Colorado Linings International, Paragon Surveying and Golder Associates, Inc. Golder Associates is performing the CQC services. Advanced Terra Testing Inc. of Lakewood, Colorado is Performing CQA laboratory testing services for soils and geosynthetics.

Test Data Summary

This data summary includes all record surveys, final compiled QC field data, and field QA data for liner and soils. The QA lab data from Advanced Terra Testing for the liner conformance testing was distributed earlier in the month. A summary by the CQAE is attached.

Nonconformance Materials or Work

There were some areas on the 6 inch cushion that were tested for general information after the snow. Many of these density/moisture tests failed on moisture or density due to the snow. The areas were reworked and retested, and all passed; the passing tests were recorded and used for release.

Follow Up Retests and Inspections

None

Record Surveys

Record surveys were performed on all of the regrade and cushion surfaces, as well as all panels of the liner system.

Josh Valentine, SQAM
Tetra Tech

11/30/04
Date

John H. Rahe, P.E., CQAE
Tetra Tech

11/30/04
Date

Distribution:
CQAE (John Rahe)
CTR (Bob Davis)
EPA
CDPHE

MONTHLY DATA SUMMARY NUMBER 3
December 1, THROUGH December 31, 2004
CONSTRUCTION QUALITY ASSURANCE
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
GOLDEN, COLORADO

Introduction

TetraTech has prepared this monthly summary of Construction Quality Control (CQC) and Quality Assurance (CQA) data testing performed for construction of the present landfill cap from December 1 through December 31, 2004. This monthly report summarizes the testing data and surveying activities for the Present Landfill (PLF) liner construction, geosynthetic deliveries and all related activities for the construction of the PLF Accelerated Action.

Tetra Tech is the on-site CQA Engineer (CQAE) providing CQA services as a subcontractor to the Rocky Flats Contractor Kaiser-Hill Company, LLC (K-H). Earth Tech is the design engineer for the PLF contracted by Kaiser-Hill Company. The Program Management Contractor (PMC) team is providing the CQC services for the PLF. The PMC team consists of S.M. Stoller Corporation as the prime with Neilson-Skanska, Colorado Linings International, Paragon Surveying and Golder Associates, Inc. Golder Associates is performing the CQC services. Advanced Terra Testing Inc. of Lakewood, Colorado is Performing CQA laboratory testing services for soils and geosynthetics. Attached to this are the data sheets for this reporting period.

Field Test Data Summary to Date

Quality Control Item	QA/QC Item	QC Action	QA Action	Total QC Tests Taken	Total QA Tests Taken	Total Material Placed
6 inch Cushion	Field Density Test	1/5000sq/ft	1 per 20 QC	137	6 Average 97%, QC tests similar	647,500 sq/ft
6 inch Cushion	Field Sand Cone Density	1 per 20 Field Density Test	Observe	6	N/A	N/A
Black LLDPE Installation	Destructive Seam Testing LLDPE	1 per 500 feet of Seam	1 per 20 QC Samples	65	3	31,638 ft

Nonconformance Materials or Work

On 12/4 an extrusion trial weld failed, the weld was retested and passing tests were recorded prior to welding on the cap. On 12/21 a fusion trial weld failed on a peel test. The weld was redone and retested, and passing tests recorded prior to welding on the cap.

Follow Up Retests and Inspections

The trial extrusion weld on 12/4 was retested and passed, and the trial fusion weld on12/21 was retested and passed. The survey indicates that all grades are with in specification.

Record Surveys

Record surveys have performed out to the 5980 line of the regrade and cushion surfaces, as well as all panels of the liner system.

Josh Valentine, SQAM — 12/31/04
Tetra Tech — Date

John H. Rahe, P.E., CQAE — 12/31/04
Tetra Tech — Date

Distribution:
CQAE (John Rahe)
CTR (Bob Davis)
EPA
CDPHE

AMMENDED COVER SHEETS FEBUARY 11, 2005
MONTHLY DATA SUMMARY NUMBER 4
January 1, THROUGH January 31, 2005
CONSTRUCTION QUALITY ASSURANCE
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
GOLDEN, COLORADO

Introduction

TetraTech has prepared this monthly summary of Construction Quality Control (CQC) and Quality Assurance (CQA) data testing performed for construction of the present landfill cap from January 1 through January 31, 2005. This monthly report summarizes the testing data and surveying activities for the Present Landfill (PLF) liner construction, geosynthetic deliveries and all related activities for the construction of the PLF Accelerated Action.

Tetra Tech is the on-site CQA Engineer (CQAE) providing CQA services as a subcontractor to the Rocky Flats Contractor Kaiser-Hill Company, LLC (K-H). Earth Tech is the design engineer for the PLF contracted by Kaiser-Hill Company. The Program Management Contractor (PMC) team is providing the CQC services for the PLF. The PMC team consists of S.M. Stoller Corporation as the prime with Neilson-Skanska, Colorado Linings International, Paragon Surveying and Golder Associates, Inc. Golder Associates is performing the CQC services. Advanced Terra Testing Inc. of Lakewood, Colorado is Performing CQA laboratory testing services for soils and geosynthetics. Attached to this are the data sheets for this reporting period.

Field Test Data Summary to Date

All of the GCL, FML and GDN have been released up to the 5980 line during this month.

Quality Control Item	QA/QC Item	QC Action	QA Action	Total QC Tests Taken	Total QA Tests Taken	Total Material Placed
6 inch Cushion	Field Density Test	1/5000sq/ft	1 per 20 QC	137	6 Average 97%, QC tests similar	647,500 sq/ft
6 inch Cushion	Field Sand Cone Density	1 per 20 Field Density Test	Observe	6	N/A	N/A
Black LLDPE Installation	Destructive Seam Testing LLDPE	1 per 500 feet of Seam	1 per 20 QC Samples	65	3	31,638 ft

10 inch Cushion	Field Density Test	1/5000sq/ft	1 per 20 QC	120	6 Average 98%, QC tests similar	543,000 sq/ft
10 inch Cushion	Field Sand Cone Density Test	1 per 20 Field Density Test	Observe	6	N/A	N/A

Nonconformance Materials or Work

The soft spots on the asbestos areas have been covered with geogrid, but no fill has been placed on the geogrid. A QA gradation taken on 1/26/05 of the rock layer failed to meet specification for 6" minus material. A new gradation is scheduled for the week of 2/1/05, pending weather. A moisture sample from a sandcone test was out of specification (2.5% dry); the density was above 95% of the standard proctor (within specification). Some isolated areas of segregation in the rock layer have been observed. A new method of placement will be implemented to help reduce this on any further placement.

Follow Up Retests and Inspections

Retest of the rock layer gradation is scheduled for later this week. The soft spots in the asbestos areas are currently being reworked.

Record Surveys

Record surveys have performed out to the 5980 line of the regrade and cushion surfaces, as well as all panels of the liner system. The rock layer has been released to the 20200 grid line, and regrade surface has been released to the 20700 grid line.

Josh Valentine, SQAM — 2/11/05
Tetra Tech — Date

John H. Rahe, P.E., CQAE — 2/11/05
Tetra Tech — Date

Distribution:
CQAE (John Rahe)
CTR (Bob Davis)
EPA
CDPHE

MONTHLY DATA SUMMARY NUMBER 5
February 1, THROUGH February 28, 2005
CONSTRUCTION QUALITY ASSURANCE
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
GOLDEN, COLORADO

Introduction

TetraTech has prepared this monthly summary of Construction Quality Control (CQC) and Quality Assurance (CQA) data testing performed for construction of the present landfill cap from February 1 through February 28, 2005. This monthly report summarizes the testing data and surveying activities for the Present Landfill (PLF) liner construction, geosynthetic deliveries and all related activities for the construction of the PLF Accelerated Action.

Tetra Tech is the on-site CQA Engineer (CQAE) providing CQA services as a subcontractor to the Rocky Flats Contractor Kaiser-Hill Company, LLC (K-H). Earth Tech is the design engineer for the PLF contracted by Kaiser-Hill Company. The Program Management Contractor (PMC) team is providing the CQC services for the PLF. The PMC team consists of S.M. Stoller Corporation as the prime with Neilson-Skanska, Colorado Linings International, Paragon Surveying and Golder Associates, Inc. Golder Associates is performing the CQC services. Advanced Terra Testing Inc. of Lakewood, Colorado is Performing CQA laboratory testing services for soils and geosynthetics. Attached to this are the data sheets for this reporting period.

Field Test Data Summary to Date

All of the GCL, FML and GDN have been released up to the 20700 gridline during this month. All of the QA testing has been completed and approved for all of the geosynthetics for the east face.

Quality Control Item	QA/QC Item	QC Action	QA Action	Total QC Tests Taken	Total QA Tests Taken	Total Material Placed
6 inch Cushion	Field Density Test	1/5000sq/ft	1 per 20 QC	164	8 Average 97%, QC tests similar	787,500 sq/ft
6 inch Cushion	Field Sand Cone Density	1 per 20 Field Density Test	Observe	8	N/A	N/A

Black LLDPE Installation	Destructive Seam Testing LLDPE	1 per 500 feet of Seam	1 per 20 QC Samples	77	3	35,153 ft
10 inch Cushion	Field Density Test	1/5000sq/ft	1 per 20 QC	148	7 Average 98%, QC tests similar	697,500 sq/ft
10 inch Cushion	Field Sand Cone Density Test	1 per 20 Field Density Test	Observe	7	N/A	N/A
Rocky Flats Alluvium	Sieve Analysis/Atterberg limits ASTM D 422 and D 4318	1/6,500 cy	1 per 20 QC	6*	0	47,000 cy
Rock Layer	Sieve Analysis ASTM D 5519	1/6,500 cy	1 per 20 QC	6 total with 1 out of spec and 1 retest	1 out of spec, and 1 retest	23,500 cy
Rock Layer	Unconfined Compressive Strength ASTM D 2938	1/6,500 cy	1 per 20 QC	5	1	23,500 cy

* Further testing is scheduled for next week.

Nonconformance Materials or Work

The QA free swell test for the Bentomat ST for rolls 707, 708 and 709 have failed. Tests on rolls 706 and 710 are currently at the lab being tested. If rolls 706 and 710 fail the contractor plans to reject all 10 rolls of Bentomat ST and return them to the manufacturer for replacement. The previously noted segregated areas in the rock layer have been identified and corrected by distributing fines into the segregated areas. Clay was observed in some of the Rocky Flats Alluvium coming from the 371 borrow pile. The source was inspected and rejected for any further borrow. The Rocky Flats Alluvium has been switched back to Centennial.

Follow Up Retests and Inspections

A concurrent QA/QC retest of the rock layer gradation was done this month, and the preliminary results are within specification. The soft spots in the asbestos areas were covered with Rocky Flats Alluvium observed with loaded Volvos and other heavy equipment and no deflection was observed.

Record Surveys

Record surveys have performed out to the 20700 gridline of the regrade and cushion surfaces, as well as all panels of the liner system. The rock layer has been released to the 20400 grid line. The record surreys are not included in this report, the surveys are currently being processed and will be provided as soon as possible.

Josh Valentine, SQAM
Tetra Tech

2/28/05
Date

John H. Rahe, P.E., CQAE
Tetra Tech

2/28/05
Date

Distribution:
CQAE (John Rahe)
CTR (Bob Davis)
EPA
CDPHE

AMMENDED MONTHLY DATA SUMMARY NUMBER 6
March 1, THROUGH March 31, 2005
CONSTRUCTION QUALITY ASSURANCE
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
GOLDEN, COLORADO

Introduction

TetraTech has prepared this monthly summary of Construction Quality Control (CQC) and Quality Assurance (CQA) data testing performed for construction of the present landfill cap from March 1 through March 31, 2005. This monthly report summarizes the testing data and surveying activities for the Present Landfill (PLF) liner construction, geosynthetic deliveries and all related activities for the construction of the PLF Accelerated Action.

Tetra Tech is the on-site CQA Engineer (CQAE) providing CQA services as a subcontractor to the Rocky Flats Contractor Kaiser-Hill Company, LLC (K-H). Earth Tech is the design engineer for the PLF contracted by Kaiser-Hill Company. The Program Management Contractor (PMC) team is providing the CQC services for the PLF. The PMC team consists of S.M. Stoller Corporation as the prime with Neilson-Skanska, Colorado Linings International, Paragon Surveying and Golder Associates, Inc. Golder Associates is performing the CQC services. Advanced Terra Testing Inc. of Lakewood, Colorado is Performing CQA laboratory testing services for soils and geosynthetics. Attached to this are the data sheets for this reporting period.

Field Test Data Summary to Date

All of the GCL, FML and GDN have been released up to the 20700 gridline during this month. All of the QA testing has been completed and approved for all of the geosynthetics for the east face.

Quality Control Item	QA/QC Item	QC Action	QA Action	Total QC Tests Taken	Total QA Tests Taken	Total Material Placed
6 inch Cushion	Field Density Test	1/5000sq/ft	1 per 20 QC	209	11 Average 97%, QC tests similar	984,224 sq/ft
6 inch Cushion	Field Sand Cone Density	1 per 20 Field Density Test	Observe	11	N/A	N/A
Black LLDPE Installation	Destructive Seam Testing LLDPE	1 per 500 feet of Seam	1 per 20 QC Samples	100	6	47,210 ft

10 inch Cushion	Field Density Test	1/5000sq/ft	1 per 20 QC	190 (220) as of 4/18/05	9 (11) as of 4/18/05 Average 98%, QC tests similar	984,224 sq/ft
10 inch Cushion	Field Sand Cone Density Test	1 per 20 Field Density Test	Observe	9	N/A	N/A
Rocky Flats Alluvium	Atterberg limits D4318	1/6,500 cy	1 per 20 QC	10*	0*	61,000 cy Approximately
Rocky Flats Alluvium	Bulk Gradation ASTM D422 and D5519	1/6,500 cy	1 per 20 QC	9*	0*	61,000 cy Approximately
Rock Layer	Sieve Analysis ASTM D422/D 5519	1/6,500 cy	1 per 20 QC	7 total with 1 out of spec and 1 retest	1 out of spec, and 1 retest	36,420 cy
Rock Layer	Unconfined Compressive Strength ASTM D 2938	1/6,500 cy	1 per 20 QC	7	1	36,420 cy

* Further testing is scheduled for week of April 18 th.

Nonconformance Materials or Work

None

Follow Up Retests and Inspections

Rolls 701 through 710 of Bentomat ST were rejected and replaced. The new rolls were tested and within specification.

Record Surveys

The record survey has been completed for all of the liner placed on the cap, and the 6" cushion material. The 10" cushion has been record surveyed to the 39900 gridline. The rock layer has been released to the 20550 grid line.

Josh Valentine, SQAM
Tetra Tech

3/31/05
Date

John H. Rahe, P.E., CQAE
Tetra Tech

3/31/05
Date

Distribution:
CQAE (John Rahe)
CTR (Bob Davis)
EPA
CDPHE

APPENDIX G-4: QA FIELD TESTING

Mechanical Analysis
Sieve Test Data
ASTM D 5519
Method A

January 29, 2005

SAMPLING AND TEST METHOD FOR ROCKY FLATS PRESENT LANDFILL ROCK LAYER FIELD ANALYSIS

All QA, QC, or comparative testing must conform to the following sampling and test method. The SQAM or representative will direct the procurement of the test sample to ensure that an accurate and representative sample is obtained using the following procedure:

The sample will be taken from the raw materials piles at Centennial Pit near RFETS in the same ratios used to mix the final material. A Bobcat will be used to obtain the samples in the correct ratios. A minimum of 4000 pounds will be required for each sample. In the case of comparison testing the samples will be taken from the same raw material piles using the Bobcat bucket as a unit of measure with both parties getting samples of the same ratio and similar mass. The Standard Test Method for Particle Size Analysis of Natural and Man-Made Riprap Materials ASTM D5519-94 Method A is to be followed for the test method. A moisture sample is to be taken from the 3/8" and 1" minus as needed per ASTM D 2216 and a moisture correction is to be applied to that material.

12-INCH ROCK LAYER
FIELD GRADATION ANALYSIS

MECHANICAL ANALYSIS - SIEVE TEST DATA
ASTM D-5519 Method A

CLIENT Tetra Tech - RMC

JOB NO. 2617-05

BORING NO.	QARL-3	SAMPLED	1/26/05 KR/RS
DEPTH		DATE TESTED	1/26/05 KR/RS
SAMPLE NO.		WASH SIEVE	No
SOIL DESCR.	Field GSA	DRY SIEVE	Yes
LOCATION	Present Landfill		

DRY SIEVE ANALYSIS

Wt. Dry Soil (lbs) 3680

Sieve Number (Size)	Pan Weight (lbs)	Indiv. Wt. + Pan (lbs)	Indiv. Wt. Retain.	Cum. Wt. Retain.	Cum. % Retain.	% Finer By Wt.	
10"	0.00	0	0	0	0.0	100.0	
6"	0.00	931	931	931	25.3	74.7	≈ 67% X see QARL-4 Retest
3"	0.00	1178	1178	2109	57.3	42.7	
1"	0.00	726	726	2835	77.0	23.0	
3/8"	0.00	431	431	3266	88.7	11.3	
Remaining	0.00	415	415	3680	100.0	0.0	

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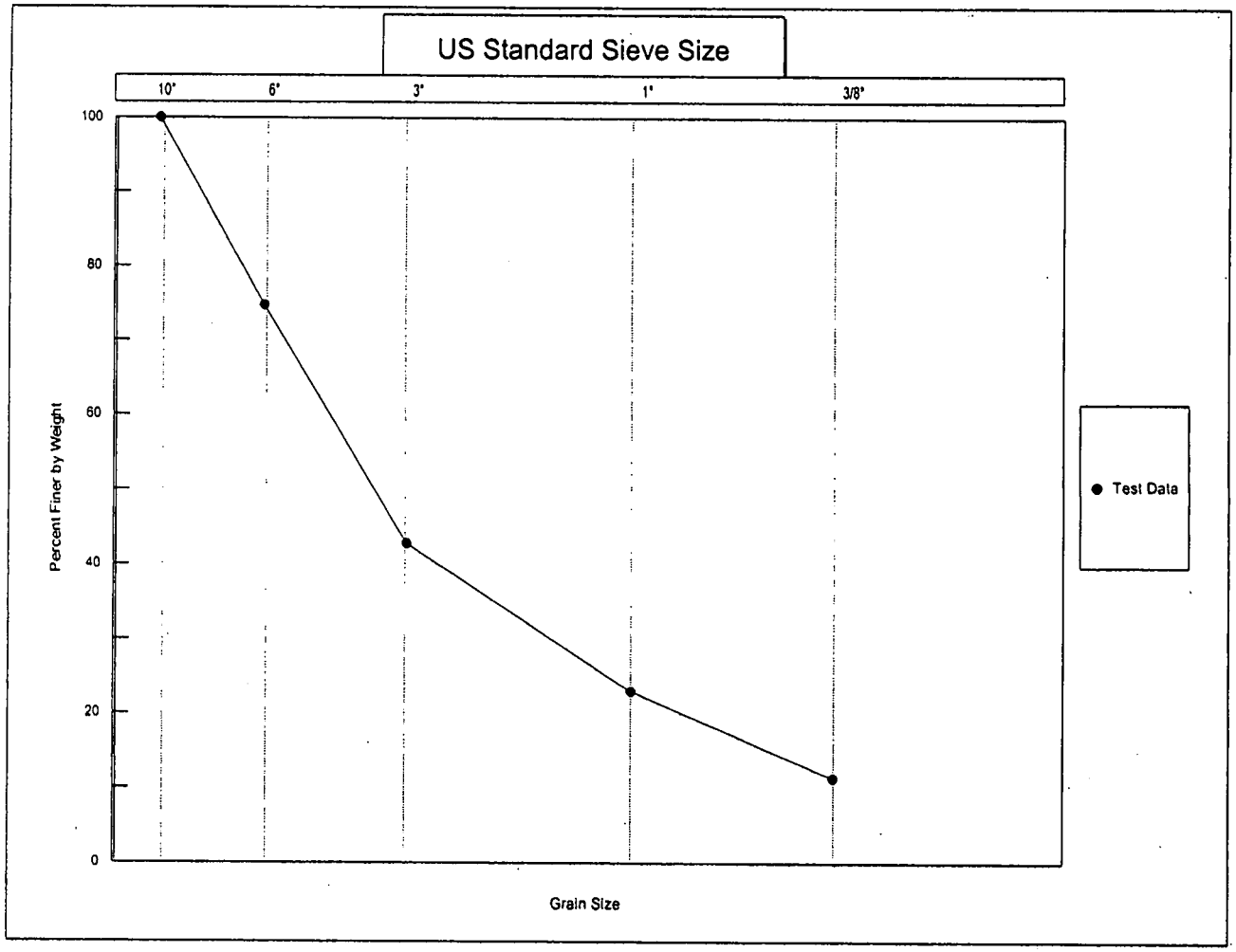
Data checked by: CJ Date: 01/27/05
FileName: TTM0FGSA

ADVANCED TERRA TESTING, INC.



Client: Tetra Tech - RMC Boring No.: QARL-3 Sample No.:
Job Number: 2617-05 Depth:
Classification_____

Advanced Terra Testing, Inc.

MECHANICAL ANALYSIS - SIEVE TEST DATA
ASTM D-5519 Method A

CLIENT Tetra Tech - RMC

JOB NO. 2617-05

BORING NO.	QARL-4	SAMPLED	2/22/05 RS/KR/CW
DEPTH		DATE TESTED	2/22/05 RS/KR/CW
SAMPLE NO.		WASH SIEVE	No
SOIL DESCR.	Field GSA	DRY SIEVE	Yes
LOCATION	Present Landfill		

DRY SIEVE ANALYSIS

Wt. Dry Soil (lbs) 4905.0

Sieve Number (Size)	Pan Weight (lbs)	Indiv. Wt. + Pan (lbs)	Indiv. Wt. Retain.	Cum. Wt. Retain.	Cum. % Retain.	% Finer By Wt.
10"	0.0	0.0	0.0	0.0	0.0	100.0
6"	0.0	2275.0	2275.0	2275.0	46.4	53.6
3"	0.0	1041.9	1041.9	3316.9	67.6	32.4
1"	0.0	585.5	585.5	3902.4	79.6	20.4
3/8"	0.0	414.8	414.8	4317.2	88.0	12.0
Remaining	0.0	587.8	587.8	4905.0	100.0	0.0

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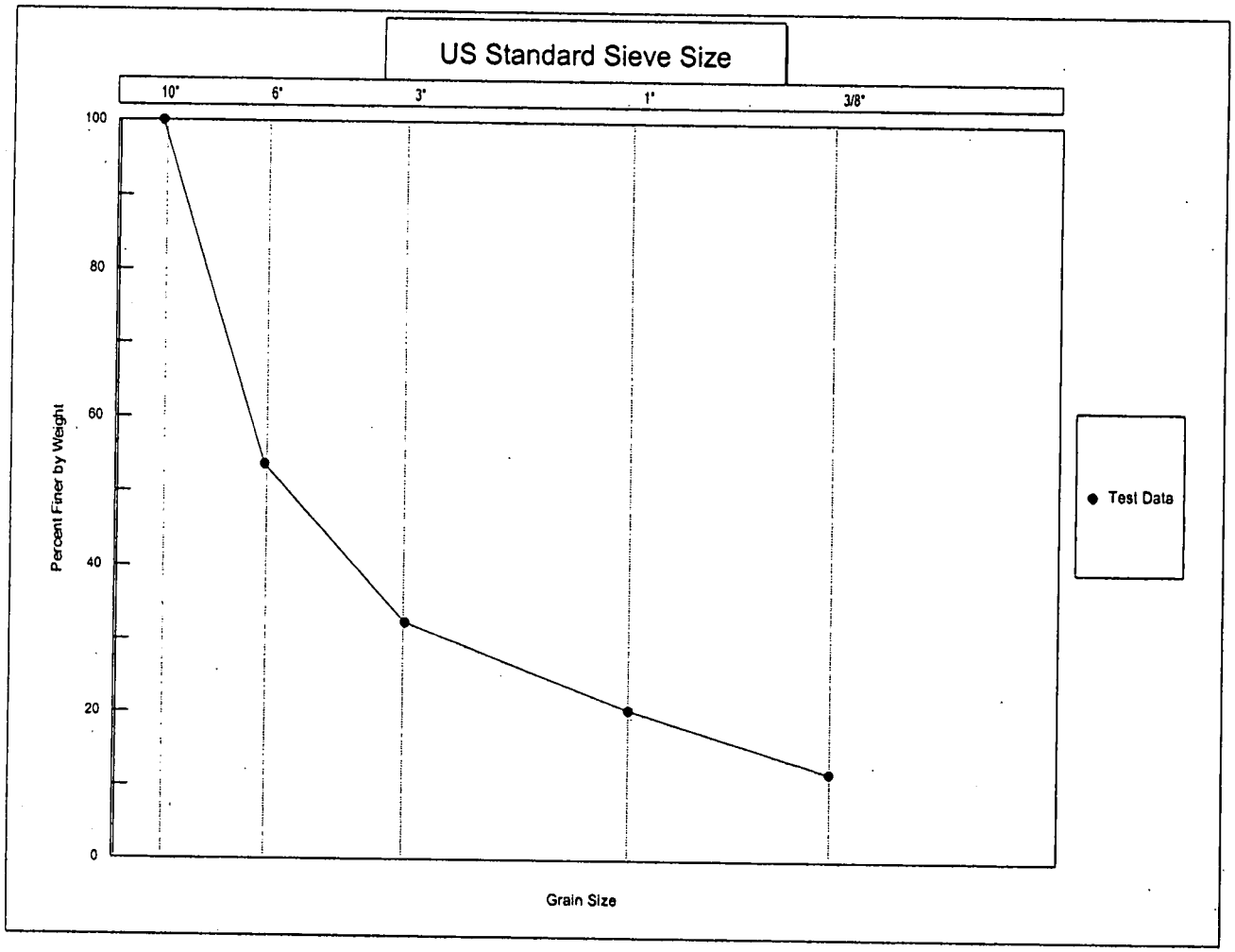
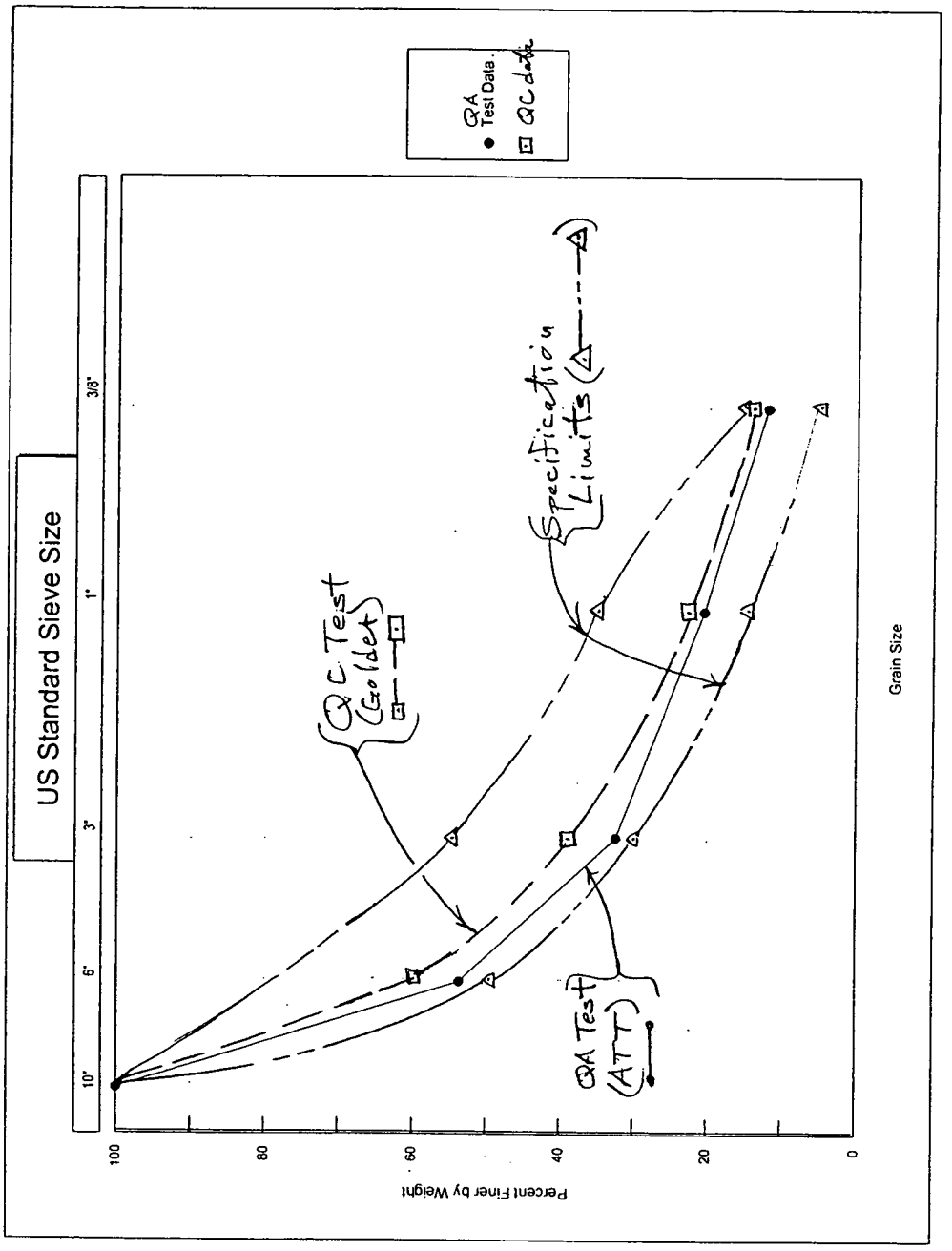
ADVANCED TERRA TESTING, INC.



Client: Tetra Tech - RMC Boring No.: QARL-4 Sample No.:
Job Number: 2617-05 Depth:
Classification_____

Advanced Terra Testing, Inc.

Field GSA Test (QA & QC) - 2/22/05



Client: Tetra Tech - RMC Boring No.: QARL-4

22-INCH LAYER RFA
GRAIN SIZE ANALYSIS
AND ATTERBERG LIMITS

MECHANICAL ANALYSIS - SIEVE TEST DATA
ASTM 5519 & ASTM D 422

CLIENT Tetra Tech - RMC

JOB NO. 2617-09

BORING NO.	
DEPTH	
SAMPLE NO.	22"Layer QA Sample
SOIL DESCR.	
LOCATION	Present Landfill

SAMPLED	5/5/09 CW/KR/RS
DATE TESTED	5/11/05 RS
WASH SIEVE	Yes on -3" Material
DRY SIEVE	Yes on +3" Material

MOISTURE DATA

HYGROSCOPIC	Yes
NATURAL	No

Wt. Wet Soil & Pan (g)	68.71
Wt. Dry Soil & Pan (g)	66.80
Wt. Lost Moisture (g)	1.91
Wt. of Pan Only (g)	3.63
Wt. of Dry Soil (g)	63.17
Moisture Content %	3.0

Wt. Hydrom. Sample Wet (g)	64.88
Wt. Hydrom. Sample Dry (g)	62.97

WASH SIEVE ANALYSIS

Wt. Total Sample Wet (g)	1620297.20
Weight of + #10 Before Washing (g)	1204002.32
Weight of + #10 After Washing (g)	1180664.15
Weight of - #10 Wet (g)	416294.88
Weight of - #10 Dry (g)	426730.48
Wt. Total Sample Dry (g)	1607394.63
Calc. Wt. "W" (g)	237.20
Calc. Mass + #10	174.23

Sieve Number (Size)	Pan Weight (g)	Indiv. Wt. + Pan (g)	Indiv. Wt. Retain.	Cum. Wt. Retain.	Cum. % Retain.	% Finer By Wt.
6"	0.00	111016.15	111016.15	111016.15	6.9	93.1
3"	0.00	257525.72	257525.72	368541.87	22.9	77.1
1 1/2"	0.00	436424.37	436424.37	804966.24	50.1	49.9
3/4"	0.00	149701.33	149701.33	954667.57	59.4	40.6
3/8"	0.00	106127.18	106127.18	1060794.75	66.0	34.0
#4	0.00	65988.60	65988.60	1126783.34	70.1	29.9
#10	0.00	53880.81	53880.81	1180664.15	73.5	26.5
#20	2.36	11.74	9.38	9.38	77.4	22.6
#40	2.36	11.14	8.78	18.16	81.1	18.9
#60	2.37	8.33	5.96	24.12	83.6	16.4
#100	2.36	7.13	4.77	28.89	85.6	14.4
#200	2.35	7.24	4.89	33.78	87.7	12.3

Data entered by: RS Date: 05/16/2005
Data checked by: CJ Date: 05/16/05
FileName: TTH022QA

ADVANCED TERRA TESTING, INC.

HYDROMETER ANALYSIS - SEDIMENTATION DATA
ASTM 5519 & ASTM D 422

CLIENT	Tetra Tech - RMC	JOB NO.	2617-09
BORING NO.		SAMPLED	5/5/09 CW/KR/RS
DEPTH		DATE TESTED	5/11/05 RS
SAMPLE NO.	22"Layer QA Sample	WASH SIEVE	Yes on -3" Material
SOIL DESCR.		DRY SIEVE	Yes on +3" Material
LOCATION	Present Landfill		

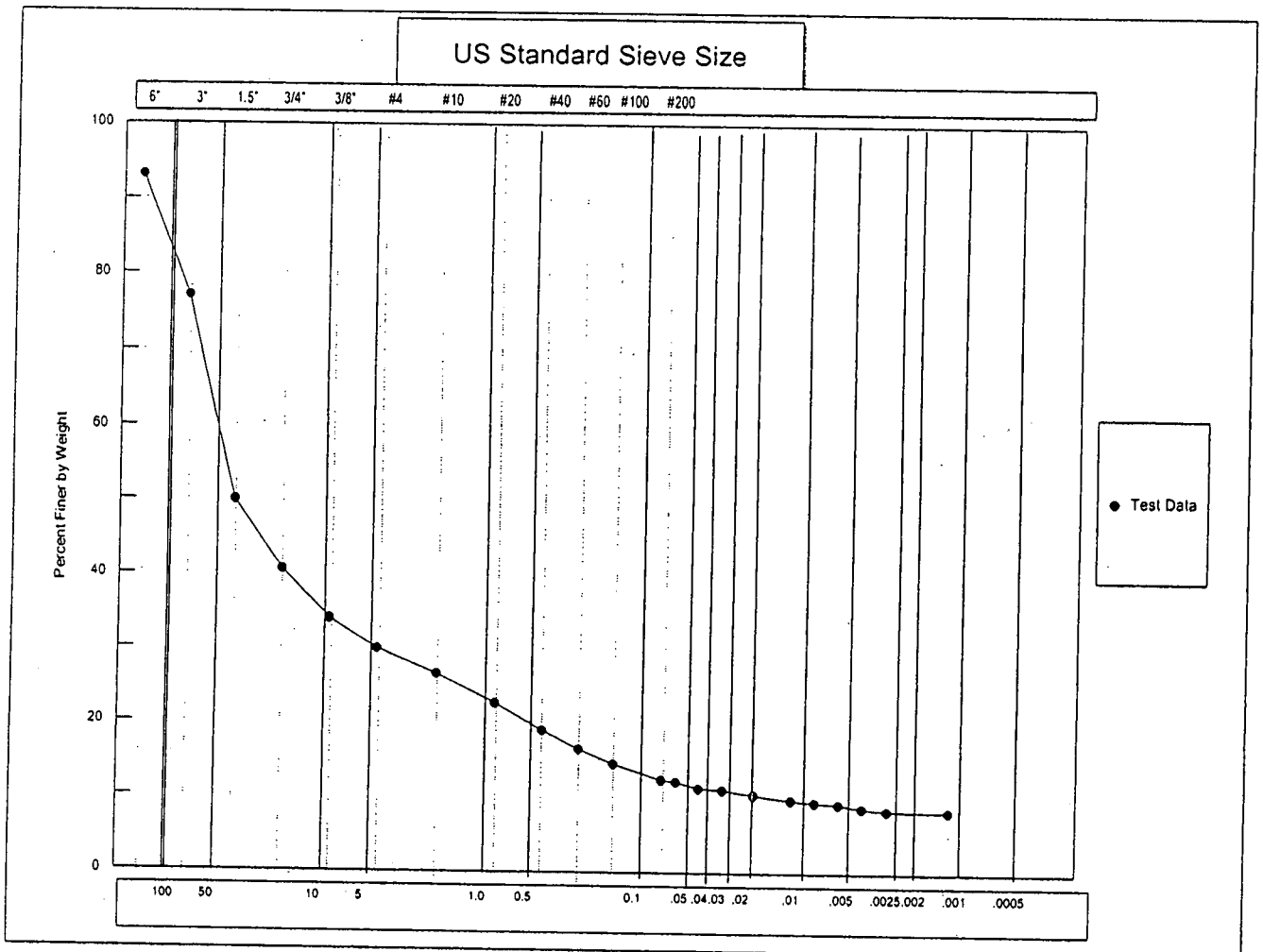
Hydrometer #	ASTM 152 H	Temp., Deg. C	23.0
Sp. Gr. of Soil	2.65	Temp. Coef. K	0.01317
Value of "alpha"	1.00	Wt. Dry Sample "W"	237.205
Deflocculant	Sodium Hexametaphosphate	% of Total Sample	100.0
Defloc. Corr'n	5.0		
Meniscus Corr'n	-0.5		

T Elapsed Time (min)	Hydrometer Reading Original	Corrected "R"	100Ra/W	% Total Sample	Effective Depth L	Grain Diameter (mm)
0.0	--	--	--	--	--	--
0.5	34.00	28.50	12.0	12.0	10.71	0.0610
1.0	32.00	26.50	11.2	11.2	11.04	0.0438
2.0	31.50	26.00	11.0	11.0	11.12	0.0311
5.0	30.00	24.50	10.3	10.3	11.37	0.0199
15.0	28.50	23.00	9.7	9.7	11.62	0.0116
30.0	27.75	22.25	9.4	9.4	11.74	0.0082
60.0	27.25	21.75	9.2	9.2	11.82	0.0058
120.0	26.00	20.50	8.6	8.6	12.03	0.0042
250.0	25.25	19.75	8.3	8.3	12.15	0.0029
1440.0	25.00	19.50	8.2	8.2	12.19	0.0012

Grain Diameter = K*(SQRT(L/T))

Data entered by: RS Date: 05/16/2005
Data checked by: CJ Date: 05/16/05
FileName: TTH022QA

ADVANCED TERRA TESTING, INC.



COBBLES	GRAVEL		SAND			SILT OR CLAY	USCS
	COARSE	FINE	CRS	MEDIUM	FINE		

COBBLES	PEBBLE GRAVEL				SAND			SILT	CLAY	WENTWORTH
TO BOULDERS	COARSE	MED	FINE	GRAN	COARSE	MED	FINE			

Client: Tetra Tech - RMC Boring No.:
Job Number: 2617-09 Depth:
Classification: **Classification Not Performed**

Sample No.: 22"Layer QA Sample

Advanced Terra Testing, Inc.

ATTERBERG LIMITS TEST
ASTM D 4318

CLIENT Tetra Tech-RMC JOB NO. 2617-09

BORING NO.
DEPTH
SAMPLE NO. 22" QA
SOIL DESCR.
LOCATION Present Landfill

DATE SAMPLED
DATE TESTED 05-11-05 SKL

Plastic Limit Determination

	1	2	3
Wt Dish & Wet Soil	5.97	5.83	5.94
Wt Dish & Dry Soil	5.30	5.17	5.24
Wt of Moisture	0.67	0.66	0.70
Wt of Dish	0.81	0.83	0.80
Wt of Dry Soil	4.49	4.34	4.44
Moisture Content	14.92	15.21	15.77

Liquid Limit Determination Device Number 0966

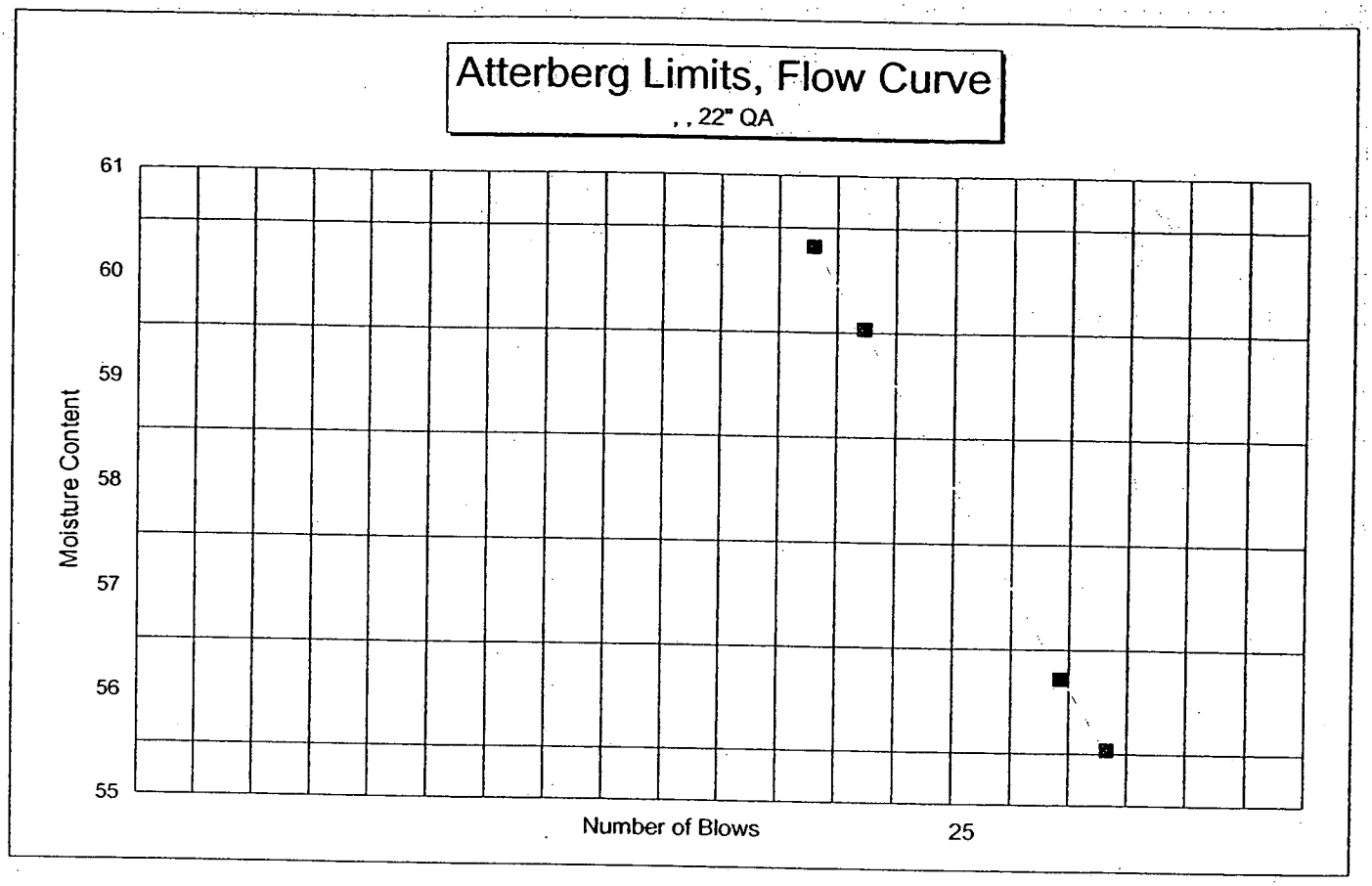
	1	2	3	4
Number of Blows	19	21	31	34
Wt Dish & Wet Soil	10.62	10.43	10.98	11.34
Wt Dish & Dry Soil	6.91	6.84	7.32	7.58
Wt of Moisture	3.71	3.59	3.66	3.76
Wt of Dish	0.76	0.81	0.81	0.81
Wt of Dry Soil	6.15	6.03	6.51	6.77
Moisture Content	60.33	59.54	56.22	55.54

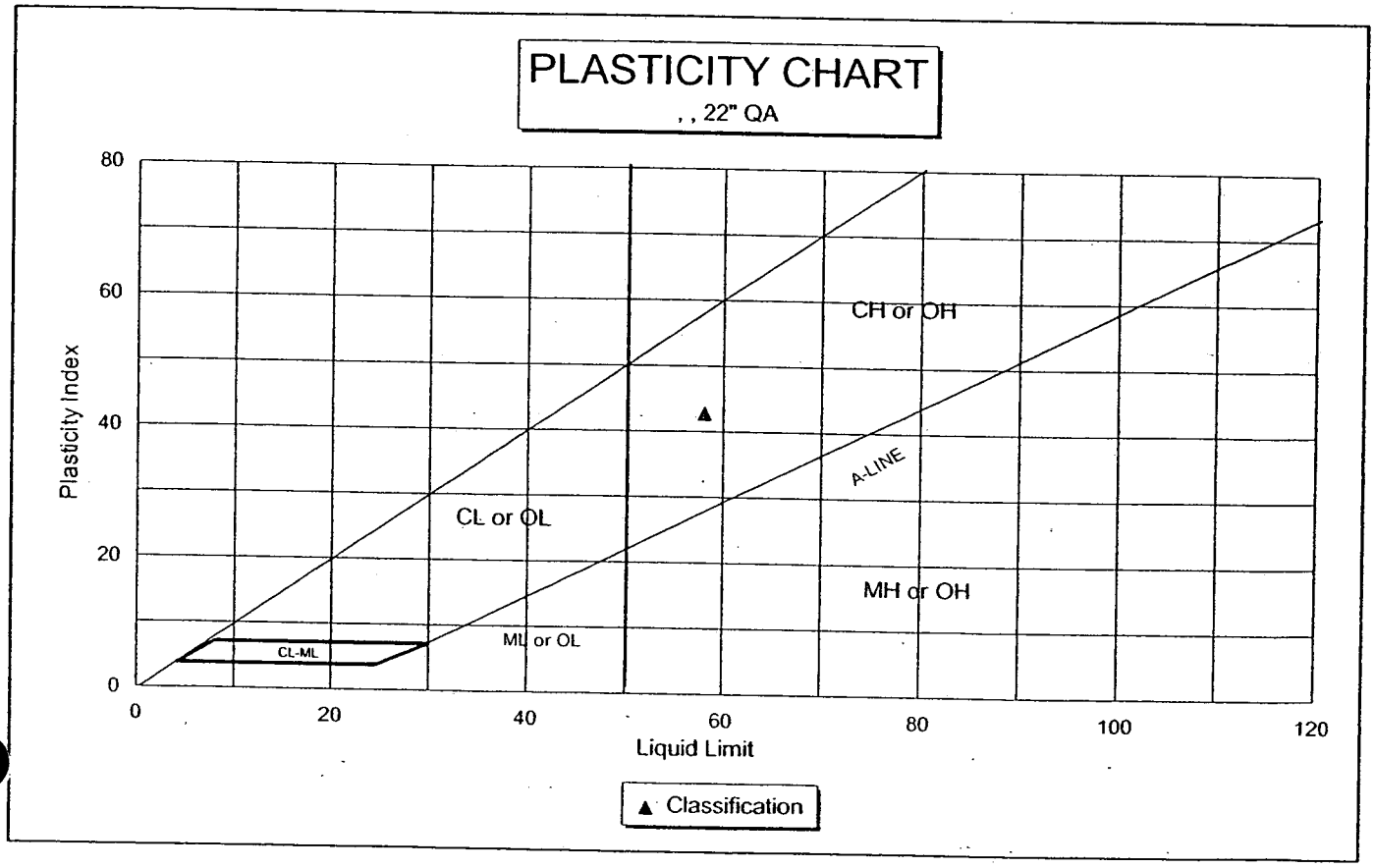
Liquid Limit	58.1
Plastic Limit	15.3
Plasticity Index	42.8

Atterberg Classification CH

Data entry by: SR Date: 05/12/2005
Checked by: SKL Date: 5/12/05
FileName: TTG022QA

ADVANCED TERRA TESTING, INC.


Atterberg Limits, Flow Curve
, , 22" QA
Moisture Content
61
60
59
58
57
56
55
Number of Blows
25


PLASTICITY CHART
, , 22" QA
Plasticity Index
80
60
40
20
0
CH or OH
A-LINE
CL or OL
MH or OH
CL-ML
ML or OL
0
20
40
60
80
100
120
Liquid Limit
▲ Classification

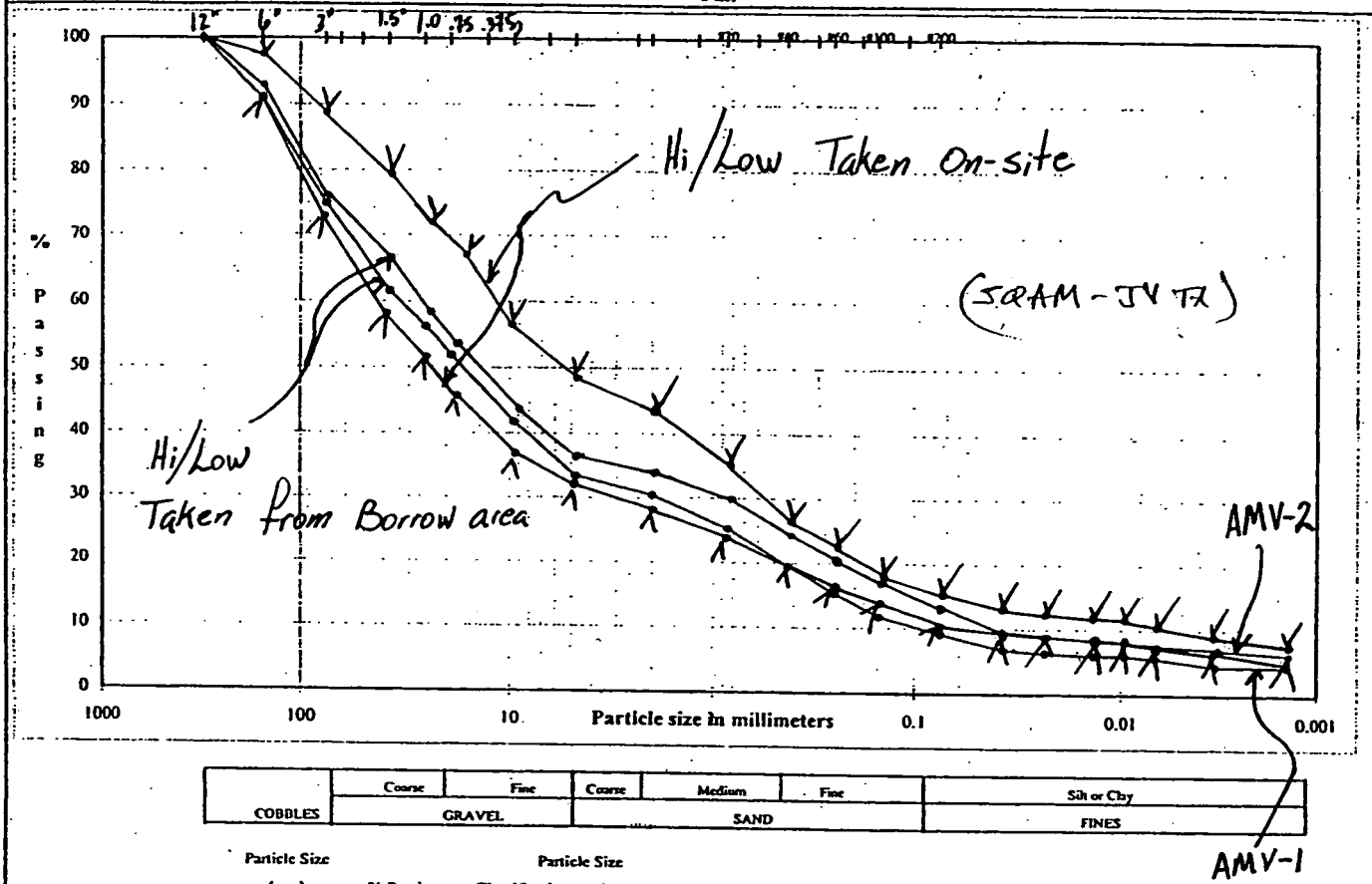
March-05

043-2246-0002

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318, D5519

PROJECT NAME: Rocky Flats/Field & Lab Testing/CO
SAMPLE ID: AMV-1 Depth:
TYPE: Pail



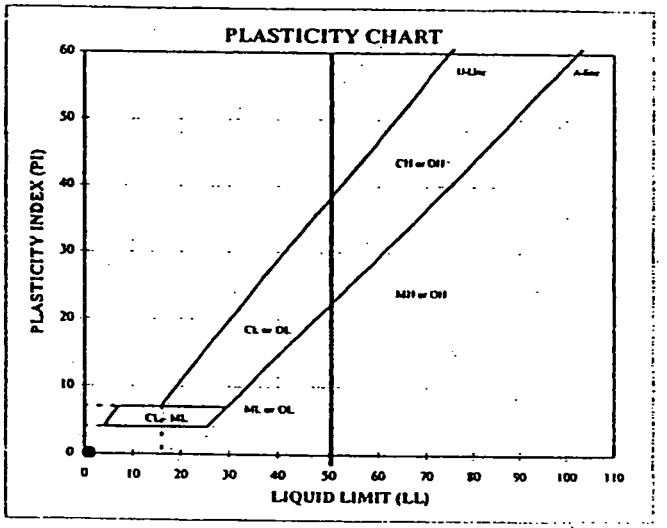
COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
12.0"	304.8	100.0	Cobbles	25.31
12.0"	304.8	100.0		
6.0"	154.2	90.9		
3.0"	75.0	74.7		
1.5"	37.5	61.6		
1.0"	25.0	56.1	Coarse Gravel	22.93
0.75"	19.0	51.8		
0.375"	9.5	41.8		
#4	4.8	33.4	Fine Gravel	18.37
#10	2.00	30.4	Coarse Sand	3.00
#20	0.85	25.3		
#40	0.43	19.5	Medium Sand	10.91
#60	0.25	15.3		
#100	0.15	11.8		
#200	0.075	9.1	Fine Sand	10.33

Hydrometer Analysis

(mm)	%Finer		
0.037	6.8		
0.023	6.3		
0.014	5.9	Fines	
0.0096	5.9	Silt or Clay	9.14
0.0068	5.6		
0.0033	4.4		
0.0014	4.4		



ATTERBERG LIMITS

M_c	LL	PL	PI	SpG (assumed)
–	–	–	–	2.70

DESCRIPTION: Moderate yellowish brown (10 YR 5/4)

USCS: –

TECH: MKS
DATE: 3/18/2005
REVIEW: NG

2-INCH LAYER RFA
GRAIN SIZE ANALYSIS
AND ATTERBERG LIMITS

MECHANICAL ANALYSIS - SIEVE TEST DATA
ASTM D5519 & ASTM D 422

CLIENT Tetra Tech - RMC

JOB NO. 2617-09

BORING NO.		SAMPLED	5/5/09 CW/KR/RS
DEPTH		DATE TESTED	5/11/05 RS
SAMPLE NO.	2"Layer QA Sample	WASH SIEVE	Yes on -3" Material
SOIL DESCR.		DRY SIEVE	Yes on +3" Material
LOCATION	Present Landfill		

MOISTURE DATA

HYGROSCOPIC	Yes
NATURAL	No

Wt. Wet Soil & Pan (g)	42.36
Wt. Dry Soil & Pan (g)	41.77
Wt. Lost Moisture (g)	0.59
Wt. of Pan Only (g)	3.62
Wt. of Dry Soil (g)	38.15
Moisture Content %	1.5
Wt. Hydrom. Sample Wet (g)	59.20
Wt. Hydrom. Sample Dry (g)	58.29

WASH SIEVE ANALYSIS

Wt. Total Sample Wet (g)	642201.09
Weight of + #10 Before Washing (g)	569607.02
Weight of + #10 After Washing (g)	565952.55
Weight of - #10 Wet (g)	72594.07
Weight of - #10 Dry (g)	75087.30
Wt. Total Sample Dry (g)	641039.84
Calc. Wt. "W" (g)	497.67
Calc. Mass + #10	439.37

Sieve Number (Size)	Pan Weight (g)	Indiv. Wt. + Pan (g)	Indiv. Wt. Retain.	Cum. Wt. Retain.	Cum. % Retain.	% Finer By Wt.
6"	0.00	25854.63	25854.63	25854.63	4.0	96.0
3"	0.00	97748.65	97748.65	123603.28	19.3	80.7
1 1/2"	0.00	238076.26	238076.26	361679.54	56.4	43.6
3/4"	0.00	105557.11	105557.11	467236.65	72.9	27.1
3/8"	0.00	51911.06	51911.06	519147.71	81.0	19.0
#4	0.00	29332.82	29332.82	548480.53	85.6	14.4
#10	0.00	17472.02	17472.02	565952.55	88.3	11.7
#20	2.30	10.73	8.43	8.43	90.0	10.0
#40	2.37	9.36	6.99	15.42	91.4	8.6
#60	2.35	8.55	6.20	21.62	92.6	7.4
#100	2.36	8.21	5.85	27.47	93.8	6.2
#200	2.37	8.22	5.85	33.32	95.0	5.0

Data entered by: RS Date: 05/16/2005
Data checked by: CJ Date: 05/16/05
FileName: TTH02QA

ADVANCED TERRA TESTING, INC.

HYDROMETER ANALYSIS - SEDIMENTATION DATA
ASTM D5519 & ASTM D 422

CLIENT	Tetra Tech - RMC	JOB NO.	2617-09
BORING NO.		SAMPLED	5/5/09 CW/KR/RS
DEPTH		DATE TESTED	5/11/05 RS
SAMPLE NO.	2"Layer QA Sample	WASH SIEVE	Yes on -3" Material
SOIL DESCR.		DRY SIEVE	Yes on +3" Material
LOCATION	Present Landfill		

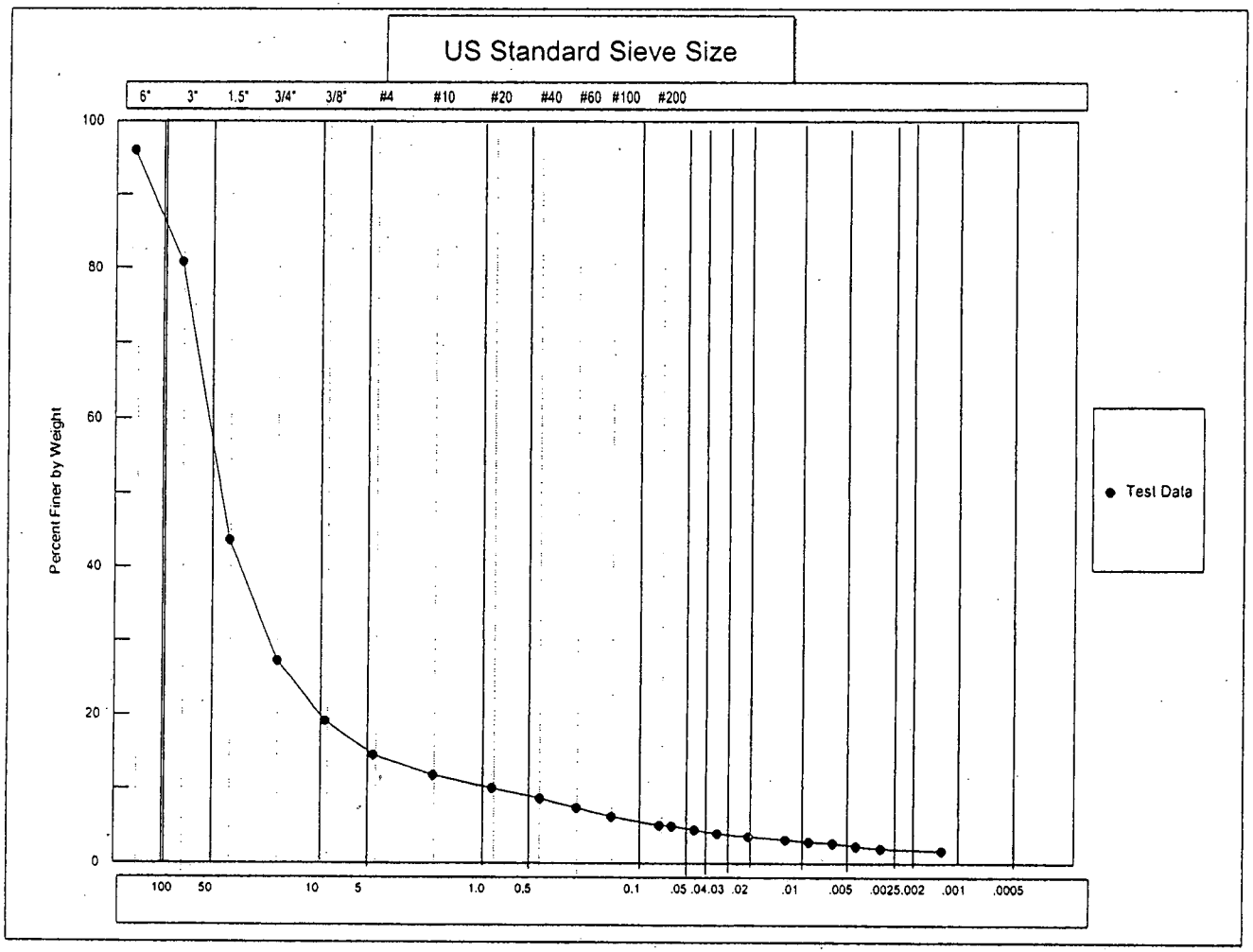
Hydrometer #	ASTM 152 H	Temp., Deg. C	23.0
Sp. Gr. of Soil	2.65	Temp. Coef. K	0.01317
Value of "alpha"	1.00	Wt. Dry Sample "W"	497.667
Deflocculant	Sodium Hexametaphosphate	% of Total Sample	100.0
Defloc. Corr'n	5.0		
Meniscus Corr'n	-0.5		

Elapsed Time (min)	Hydrometer Reading Original	Corrected "R"	100Ra/W	% Total Sample	Effective Depth L	Grain Diameter (mm)
0.0	--	--	--	--	--	--
0.5	30.00	24.50	4.9	4.9	11.37	0.0628
1.0	27.50	22.00	4.4	4.4	11.78	0.0452
2.0	25.00	19.50	3.9	3.9	12.19	0.0325
5.0	23.00	17.50	3.5	3.5	12.52	0.0208
15.0	21.00	15.50	3.1	3.1	12.85	0.0122
30.0	19.50	14.00	2.8	2.8	13.09	0.0087
60.0	18.75	13.25	2.7	2.7	13.22	0.0062
120.0	16.75	11.25	2.3	2.3	13.54	0.0044
250.0	15.00	9.50	1.9	1.9	13.83	0.0031
1440.0	13.50	8.00	1.6	1.6	14.08	0.0013

Grain Diameter = K*(SQRT(L/T))

Data entered by: RS Date: 05/16/2005
Data checked by: QJ Date: 05/16/05
FileName: TTH02QA

ADVANCED TERRA TESTING, INC.



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	CRS	MEDIUM	FINE	

USCS

COBBLES	PEBBLE GRAVEL				SAND			SILT	CLAY
TO BOULDERS	COARSE	MED	FINE	GRAN	COARSE	MED	FINE		

WENTWORTH

Client: Tetra Tech - RMC Boring No.: Sample No.: 2"Layer QA Sample

Job Number: 2617-09 Depth:

Classification: **Classification Not Performed**

Advanced Terra Testing, Inc.

ATTERBERG LIMITS TEST
ASTM D 4318

CLIENT Tetra Tech-RMC JOB NO. 2617-09

BORING NO.
DEPTH
SAMPLE NO. 2" QA
SOIL DESCR.
LOCATION Present Landfill

DATE SAMPLED
DATE TESTED 05-11-05 SKL

Plastic Limit Determination

	1	2	3
Wt Dish & Wet Soil	6.79	6.39	6.59
Wt Dish & Dry Soil	5.69	5.36	5.55
Wt of Moisture	1.10	1.03	1.04
Wt of Dish	0.81	0.74	0.81
Wt of Dry Soil	4.88	4.62	4.74
Moisture Content	22.54	22.29	21.94

Liquid Limit Determination Device Number 0966

	1	2	3	4	5
Number of Blows	15	19	23	34	27
Wt Dish & Wet Soil	11.65	11.72	10.90	12.38	10.94
Wt Dish & Dry Soil	8.45	8.53	8.00	9.15	8.05
Wt of Moisture	3.20	3.19	2.90	3.23	2.89
Wt of Dish	0.81	0.76	0.81	0.81	0.75
Wt of Dry Soil	7.64	7.77	7.19	8.34	7.30
Moisture Content	41.88	41.06	40.33	38.73	39.59

Liquid Limit	39.9
Plastic Limit	22.3
Plasticity Index	17.7

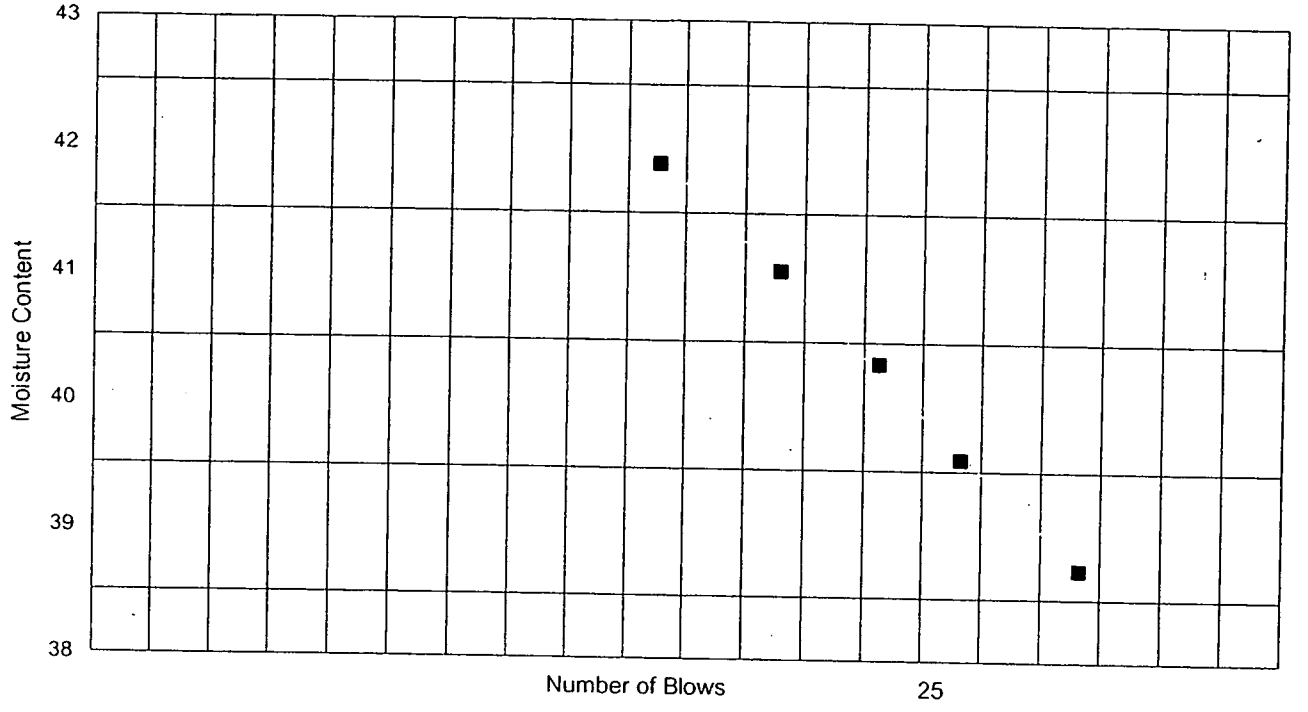
Atterberg Classification CL

Data entry by: SR Date: 05/12/2005
Checked by: SHC Date: 5/12/05
FileName: TTG02QA

ADVANCED TERRA TESTING, INC.

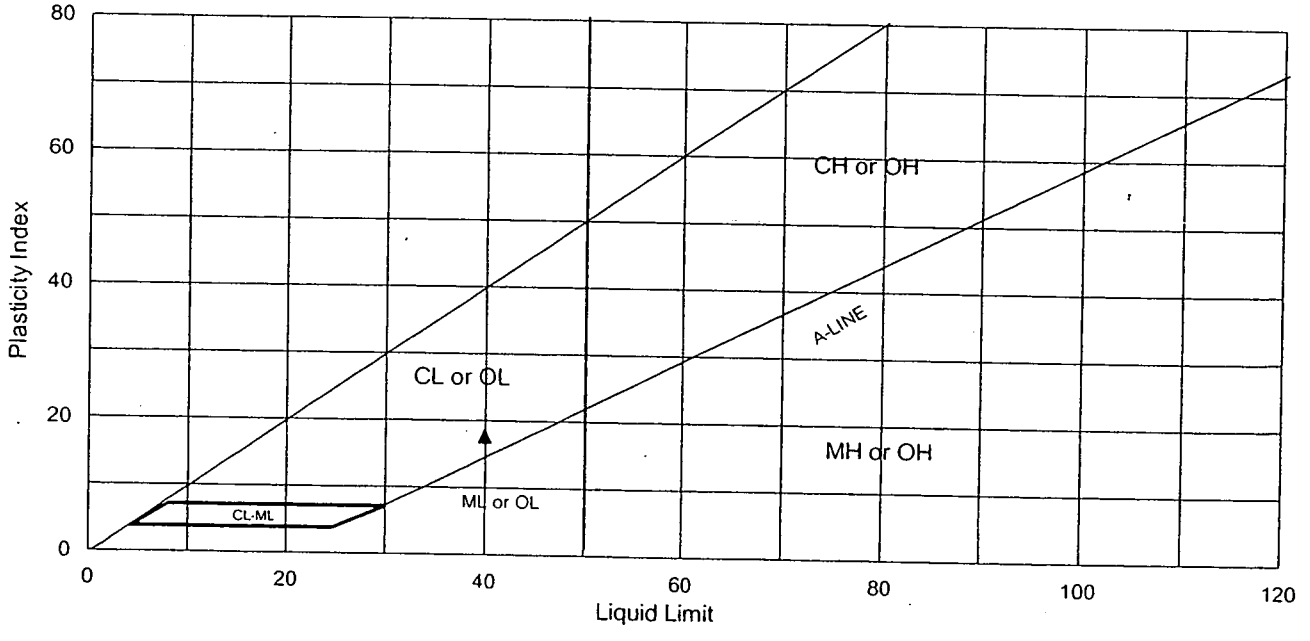
Atterberg Limits, Flow Curve

, , 2" QA



PLASTICITY CHART

, , 2" QA



▲ Classification

MECHANICAL ANALYSIS - SIEVE TEST DATA
ASTM D-5519 Method B

CLIENT Tetra Tech - RMC

JOB NO. 2617-09

BORING NO.	9" Rip-Rap QA	SAMPLED	5/5/05 CW/KR/RS
DEPTH		DATE TESTED	5/5/05 CW/KR/RS
SAMPLE NO.		WASH SIEVE	No
SOIL DESCR.	Field GSA	DRY SIEVE	Yes
LOCATION	Present Landfill		

DRY SIEVE ANALYSIS

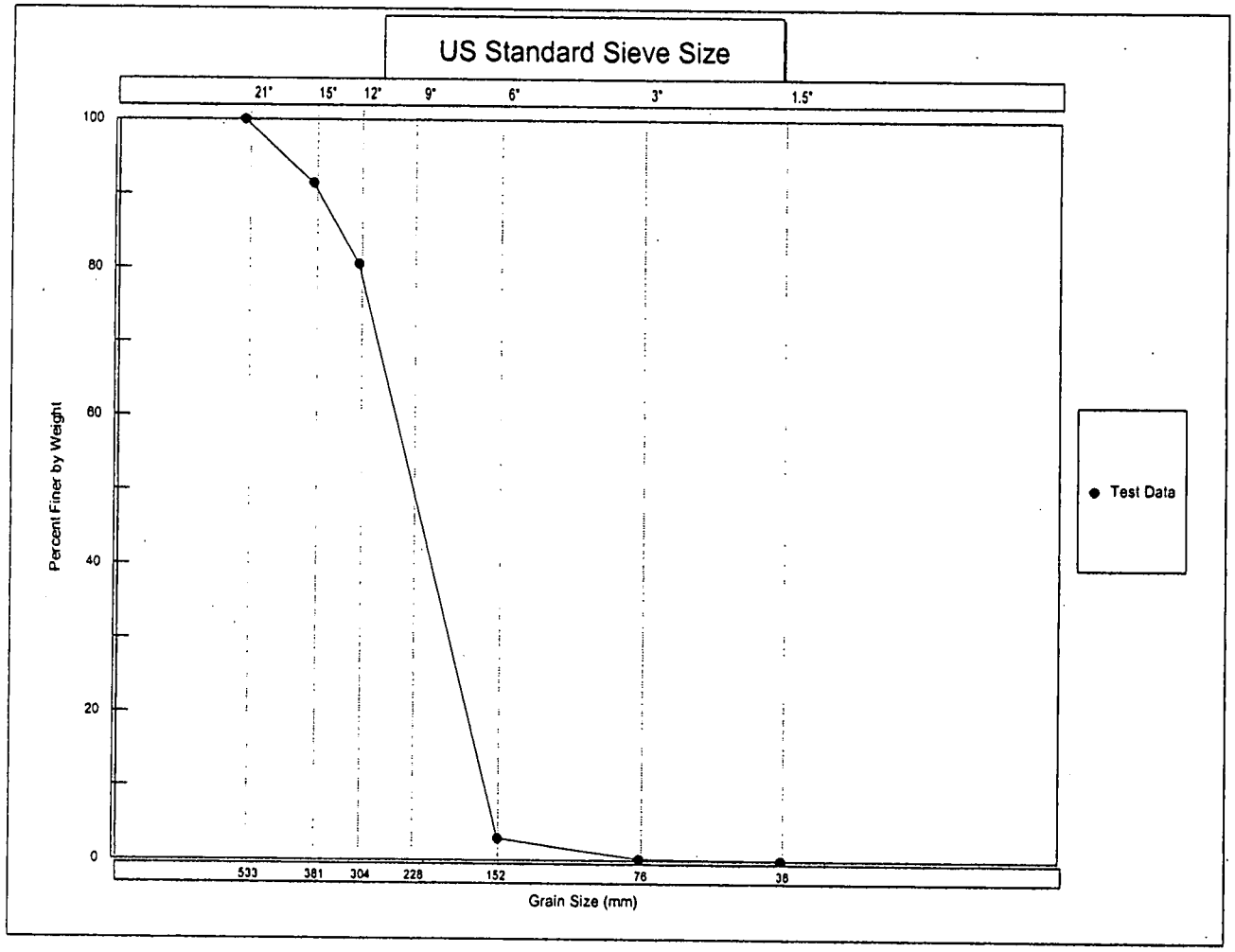
Wt. Dry Rock (lbs) 13283

Sieve Number (Size)	Pan Weight (lbs)	Indiv. Wt. + Pan (lbs)	Indiv. Wt. Retain.	Cum. Wt. Retain.	Cum. % Retain.	% Finer By Wt.
+21"	0.00	0.0	0	0	0.0	100.00
15-21"	0.00	1145.1	1145	1145	8.6	91.38
12-15"	0.00	1449.3	1449	2594	19.5	80.47
6-12"	0.00	10306.0	10306	12900	97.1	2.88
3-6"	0.00	357.8	358	13258	99.8	0.19
-3"	0.00	24.7	25	13283	100.0	0.00

Note: Rock density was estimated at 162pcf.

Data entered by: RS Date: 05/06/2005
Data checked by: CJ Date: 05/06/05
FileName: TTM0FGSB

ADVANCED TERRA TESTING, INC.



Client: Tetra Tech - RMC Boring No.: 9" Rip-Rap QA Sample No.:

Job Number: 2617-09 Depth:

Classification_____

Advanced Terra Testing, Inc.

APPENDIX G-5: QA LABORATORY TESTING

APPENDIX G-5.1: GEOSYNTHETICS TESTING

ADVANCED TERRA TESTING, Inc.
ATT
833 Parfet Street • Lakewood, Colorado 80215 • (303) 232-8308 • Fax: (303) 232-1579

Mr. Roy Spitzer
Tetra Tech - RMC
1900 S. Sunset Street, Suite 1-F
Longmont, CO 80501

November 09, 2004

RE: Present Landfill Design - RFETS
Golden, CO, Project #57378.5001

Dear Mr. Spitzer,

Thank you for choosing Advanced Terra Testing, Inc. for your geosynthetic testing needs.

Per your request we have completed testing on the various geosynthetic materials submitted for conformance testing.

The tables below represents the average results:

CETCO - Bentomat ST GCL - GCL Flux ASTM D 5887

Lot & Roll Number	Composite Permeability k (cm/sec)	Composite Index Flux qi (M^3/M^2)/SEC
200439LO, 9684	4.3E-09	6.9E-09
200439LO, 9728	3.3E-09	6.6E-09
200439LO, 9772	2.9E-09	4.0E-09
200440LO, 10503	3.8E-09	5.8E-09
200440LO, 10547	4.6E-09	7.0E-09
200440LO, 10591	2.8E-09	4.9E-09
200440LO, 10635	3.3E-09	6.6E-09
200440LO, 10679	4.1E-09	9.1E-09
200440LO, 10723	3.0E-09	4.0E-09
200440LO, 10767	4.4E-09	7.5E-09
200440LO, 10811	1.8E-09	5.5E-09

CETCO - Bentomat ST GCL - Mass/Unit Area & Moisture Content (GCL)

Lot & Roll Number	Composite Moisture Content (%)	Composite Mass/Unit Area (gms/m^2)	Dry Bentonite Mass/Unit Area (gms/m^2)	Mositure Content Bentonite (%)
200439LO, 9684	23.58	4634.8	4329.8	25.2
200439LO, 9728	23.13	4553.2	4248.2	24.8
200439LO, 9772	26.32	4210.1	3905.0	28.4
200440LO, 10503	24.78	4109.7	3804.7	26.8
200440LO, 10547	24.59	4453.6	4148.6	26.4
200440LO, 10591	26.69	4215.3	3910.3	28.9
200440LO, 10635	25.00	4906.6	4601.5	26.7
200440LO, 10679	25.55	4353.1	4048.1	27.5
200440LO, 10723	25.34	4679.4	4374.4	27.1
200440LO, 10767	25.91	4340.5	4035.5	27.9
200440LO, 10811	25.44	4497.6	4192.6	27.3

after manufacture of GCL materials; Raw bentonite MC < 12% (see Nov. 19 e-mail)

K:/TT2617/TTF11104.lwp

CETCO - Bentomat ST GCL - Moisture Content - ASTM D 2216

Lot & Roll Number	Moisture Content Bentonite (%)
200439LO, 9684	22.5
200439LO, 9728	18.8
200439LO, 9772	20.1
200440LO, 10503	22.7
200440LO, 10547	23.4
200440LO, 10591	22.6
200440LO, 10635	23.2
200440LO, 10679	24.6
200440LO, 10723	22.5
200440LO, 10767	25.2
200440LO, 10811	25.2

CETCO - Bentomat ST GCL - Peel Adhesion - ASTM D 4632/Modified

Lot & Roll Number	MD Load (lbs)	CDM Load (lbs)
200439LO, 9684	45.3	51.5
200439LO, 9728	41.9	46.3
200439LO, 9772	32.4	32.0
200440LO, 10503	47.2	48.6
200440LO, 10547	36.6	43.5
200440LO, 10591	32.4	44.8
200440LO, 10635	36.5	46.5
200440LO, 10679	34.4	43.8
200440LO, 10723	34.1	39.5
200440LO, 10767	35.0	41.5
200440LO, 10811	33.6	35.9

CETCO - Bentomat ST GCL - Swell Index - ASTM D 5890

Lot & Roll Number	Swell Index ($cc/^2gms$)
200439LO, 9684	29.5
200439LO, 9728	28.5
200439LO, 9772	28.0
200440LO, 10503	26.5
200440LO, 10547	26.0
200440LO, 10591	27.0
200440LO, 10635	31.0
200440LO, 10679	24.0
200440LO, 10723	28.0
200440LO, 10767	29.5
200440LO, 10811	27.5

CETCO - Bentomat ST GCL - Large Scale Internal Direct Shear - ASTM D 5321/Modified

Test Series	Normal Stress vs. Peak Shear Stress (Only)		
	Normal Stress Range (psf)	Friction Angle (Degrees)	Adhesion (psf)
DS1, Roll #10811, Lot #200440LO	200 - 600	34.5	394.7
DS2, Roll #9772, Lot #200439LO	200	N/A	N/A

Note: *Values for adhesion represent y-axis intercepts, and may not be true adhesion values.*

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See Nov. 19 e-mail

GSE 60 mil LLDPE - Product Code LLD060A000 - Thickness - ASTM D 5199

Roll & Resin Lot Number	Thickness (in)
101110562	0.0649
104123231, CRG812060	0.0611
104123238, CRG812060	0.0612
104123245, CRG812060	0.0609
104123251, CRG812060	0.0604
104123258, CRG812060	0.0611
104123267, CRG810060	0.0692
104123274, CRG812060	0.0644
104123282, CRG810060	0.0652
104123289, CRG810060	0.0639
104123296, CRG810060	0.0700
104123303, CRG810060	0.0623

GSE 60 mil LLDPE - Product Code LLD060A000 - Density - ASTM D 1505, Carbon Black Content - ASTM D 1603, Carbon Black Dispersion - ASTM D 5596

Roll & Resin Lot Number	Density (grams/cm³)	Carbon Black Content (%)	Carbon Black Dispersion *
101110562	0.9315	2.60	1
104123231, CRG812060	0.9320	2.34	1
104123238, CRG812060	0.9317	2.34	1
104123245, CRG812060	0.9315	2.31	1
104123251, CRG812060	0.9310	2.30	1
104123258, CRG812060	0.9322	2.30	1
104123267, CRG810060	0.9320	2.41	1
104123274, CRG812060	0.9317	2.34	1
104123282, CRG810060	0.9329	2.42	1
104123289, CRG810060	0.9310	2.32	1
104123296, CRG810060	0.9322	2.36	1
104123303, CRG810060	0.9317	2.36	1

Note: Carbon Black Dispersion (category rating per refernce chart PCN: 12-455960-38)

GSE 60 mil LLDPE - Product Code LLD060A000 - Tensile Strength - ASTM D 6693 Type IV

Roll & Resin Lot Number	MD Load @ Break (lbs/in width)	MD Elongation @ Break (%)	MD Load @ Yield (lbs/in width)	MD Elongation @ Yield (%)
101110562	288.2	795.5	96.0	18.6
104123231, CRG812060	301.0	938.8	95.4	23.7
104123238, CRG812060	311.3	964.6	92.4	24.8
104123245, CRG812060	296.9	933.7	89.9	24.9
104123251, CRG812060	302.7	928.0	93.1	23.5
104123258, CRG812060	283.3	907.7	90.1	24.5
104123267, CRG810060	274.6	821.3	95.1	12.6
104123274, CRG812060	284.4	915.2	88.6	24.2
104123282, CRG810060	291.6	873.2	95.4	25.3
104123289, CRG810060	281.4	898.7	89.6	23.3
104123296, CRG810060	293.0	932.9	93.6	22.8
104123303, CRG810060	271.8	854.3	89.6	22.6

avg. elong. ≥ 800 %

GSE 60 mil LLDPE - Product Code LLD060A000 - Tensile Strength - ASTM D 6693 Type IV

Roll & Resin Lot Number	CMD Load @ Break (lbs/in width)	CMD Elongation @ Break (%)	CMD Load @ Yield (lbs/in width)	CMD Elongation @ Yield (%)
101110562	289.4	810.2	95.1	17.8
104123231, CRG812060	272.8	856.0	94.3	22.6
104123238, CRG812060	300.6	947.0	95.0	21.7
104123245, CRG812060	314.0	1002.6	93.0	22.5
104123251, CRG812060	302.3	943.7	92.4	22.3
104123258, CRG812060	285.4	936.3	94.1	22.6
104123267, CRG810060	273.6	859.6	94.9	20.5
104123274, CRG812060	279.6	908.6	91.1	22.6
104123282, CRG810060	279.4	869.9	95.2	20.3
104123289, CRG810060	269.9	894.4	89.8	22.0
104123296, CRG810060	290.9	947.9	94.6	22.9
104123303, CRG810060	265.9	867.3	91.0	22.3

GSE 60 mil LLDPE - Product Code LLD060A000 - Tear Strength - ASTM D 1004C

Roll & Resin Lot Number	MD Load @ Break (lb/in width)	CMD Load @ Break (lb/in width)
101110562	35.8	36.4
104123231, CRG812060	35.0	37.6
104123238, CRG812060	35.3	38.4
104123245, CRG812060	34.0	37.5
104123251, CRG812060	34.8	37.0
104123258, CRG812060	34.2	36.2
104123267, CRG810060	40.2	40.3
104123274, CRG812060	40.1	39.9
104123282, CRG810060	40.2	41.7
104123289, CRG810060	38.6	40.0
104123296, CRG810060	38.8	39.9
104123303, CRG810060	38.7	39.2

GSE 60 mil LLDPE - Product Code LLD060A000 - Rod Puncture - ASTM D ~~4083~~ 4833

Roll & Resin Lot Number	Load (lbs)
101110562	114.3
104123231, CRG812060	119.7
104123238, CRG812060	120.2
104123245, CRG812060	118.7
104123251, CRG812060	118.8
104123258, CRG812060	118.4
104123267, CRG810060	121.4
104123274, CRG812060	118.3
104123282, CRG810060	124.8
104123289, CRG810060	120.2
104123296, CRG810060	118.4
104123303, CRG810060	118.1

CETCO - TEXDRAIN 200 DS8 - GDN - Adhesion and Bond Strength of Geocomposites

Lot Number	MD Load (lbs/in width)
C2-8-2-04-1917-200	2.9
C2-8-2-04-1948-200	2.3
C2-8-2-04-2015-200	2.4
C2-8-2-04-2048-200	3.0
C2-8-2-04-2111-200	3.9
C2-8-2-04-2160-200	2.0
C2-8-2-04-2196-200	2.8
C2-8-2-04-2266-200	2.6
C2-8-2-04-2301-200	2.7
No Identification	3.0
2230	3.0

CETCO - TEXDRAIN 200 DS8 - GDN - Tensile Strength - ASTM D 5035/Modified (Geonet Only)

Lot Number	MD Load (lbs/in width)
C2-8-2-04-1917-200	61.9
C2-8-2-04-1948-200	53.5
C2-8-2-04-2015-200	61.8
C2-8-2-04-2048-200	62.0
C2-8-2-04-2111-200	61.3
C2-8-2-04-2160-200	50.7
C2-8-2-04-2196-200	47.4
C2-8-2-04-2266-200	55.0
C2-8-2-04-2301-200	64.0
No Identification	52.9
2230	51.4

CETCO - TEXDRAIN 200 DS8 - GDN - Thickness - ASTM D 5199 (Geonet Only)

Lot Number	Thickness (in)
C2-8-2-04-1917-200	0.2219
C2-8-2-04-1948-200	0.2141
C2-8-2-04-2015-200	0.2152
C2-8-2-04-2048-200	0.2185
C2-8-2-04-2111-200	0.2182
C2-8-2-04-2160-200	0.2159
C2-8-2-04-2196-200	0.2231
C2-8-2-04-2266-200	0.2243
C2-8-2-04-2301-200	0.2193
No Identification	0.2198
2230	0.2295

CETCO - TEXDRAIN 200 DS8 - GDN - Density - ASTM D 1505, Carbon Black Content ASTM D 1603 (Geonet Only)

Lot Number	Density (grams/cm³)	Carbon Black Content (%)
C2-8-2-04-1917-200	0.9570	2.56
C2-8-2-04-1948-200	0.9591	2.50
C2-8-2-04-2015-200	0.9565	2.69
C2-8-2-04-2048-200	0.9591	2.65
C2-8-2-04-2111-200	0.9575	2.68
C2-8-2-04-2160-200	0.9583	2.26
C2-8-2-04-2196-200	0.9588	2.05
C2-8-2-04-2266-200	0.9565	2.70
C2-8-2-04-2301-200	0.9573	2.60
No Identification	0.9575	2.58
2230	0.9586	2.64

CETCO - TEXDRAIN 200 DS8 - GDN - Transmissivity - ASTM D 4716

Lot Number	Transmissivity MD (m²/sec)	Transmissivity MD (gal/min/ft)	Flow Rate (gal/min)
C2-8-2-04-1917-200	1.95E-03	9.40	0.95
C2-8-2-04-1948-200	1.52E-04	0.73	0.74
C2-8-2-04-2015-200	1.35E-04	0.65	0.66
C2-8-2-04-2048-200	1.40E-04	0.68	0.68
C2-8-2-04-2111-200	2.18E-03	10.51	1.07
C2-8-2-04-2160-200	1.55E-04	0.75	0.76
C2-8-2-04-2196-200	1.53E-04	0.74	0.75
C2-8-2-04-2266-200	2.05E-03	9.92	1.00
C2-8-2-04-2301-200	1.92E-03	9.28	0.94
No Identification	1.41E-04	0.68	0.69
2230	2.09E-03	10.08	1.02

CETCO - TEXDRAIN 200 DS8 - GDN - Puncture Resistance - ASTM D 4833 (Geotextile Only)

Lot Number	Load (lbs)
C2-8-2-04-1917-200	159.9
C2-8-2-04-1948-200	194.8
C2-8-2-04-2015-200	160.9
C2-8-2-04-2048-200	152.3
C2-8-2-04-2111-200	183.9
C2-8-2-04-2160-200	172.8
C2-8-2-04-2196-200	155.2
C2-8-2-04-2266-200	158.6
C2-8-2-04-2301-200	179.3
No Identification	159.9
2230	168.2

CETCO - TEXDRAIN 200 DS8 - GDN - Mass/Unit Area - ASTM D 5261 (Geotextile Only)

Lot Number	Mass/Unit Area (gms/m^2)	Mass/Unit Area (oz/yd^2)
C2-8-2-04-1917-200	379.3	11.2
C2-8-2-04-1948-200	391.4	11.5
C2-8-2-04-2015-200	356.7	10.5
C2-8-2-04-2048-200	375.4	11.1
C2-8-2-04-2111-200	362.9	10.7
C2-8-2-04-2160-200	374.4	11.0
C2-8-2-04-2196-200	359.4	10.6
C2-8-2-04-2266-200	366.8	10.8
C2-8-2-04-2301-200	367.4	10.8
No Identification	353.7	10.4
2230	354.3	10.5

CETCO - TEXDRAIN 200 DS8 - GDN - Apparent Opening Size - ASTM D 4751 (Geotextile Only)

Lot Number	Apparent Opening Size (U.S. standard sieve size)	Apparent Opening Size (mm)
C2-8-2-04-1917-200	100-140	0.147
C2-8-2-04-1948-200	100-140	0.150
C2-8-2-04-2015-200	100-140	0.147
C2-8-2-04-2048-200	100-140	0.148
C2-8-2-04-2111-200	100-140	0.148
C2-8-2-04-2160-200	100-140	0.148
C2-8-2-04-2196-200	100-140	.0148
C2-8-2-04-2266-200	100-140	0.147
C2-8-2-04-2301-200	100-140	.0147
No Identification	100-140	.0146
2230	100-140	.0147

Should you have any questions or require additional information please, feel free to give us call.

Sincerley,

Christopher Wienecke
Laboratory Director/Owner

Sharon Roberts
Geosynthetic Division Manager

K:/TT2617/TTF11104.lwp

Rahe, John -- MFG, Inc.

From: Rahe, John -- MFG, Inc.
Sent: Friday, November 19, 2004 1:36 PM
To: 'robert.davis@rfets.gov '
Cc: 'josh.valentine@ttrmc.com'
Subject: PLF Construction-Review of QA Laboratory Testing for Geosynthetics

Bob,

The following provides a review of the Quality Assurance laboratory testing performed for the geosynthetics delivered to date to the PLF construction site. The majority of these tests were performed by Advanced Terra Testing, Lakewood, CO (report dated November 9, 2004). Some of the tests (density, carbon black content, transmissivity and apparent opening size) were performed by Precision Labs, Anaheim, CA. A copy of this QA laboratory report was delivered to you on November 11.

I. GCL Test Results

A total of eleven samples of GCL were delivered to the laboratory and several tests were performed for each of these samples:

1) Permeability and Composite Index Flux (ASTM D 5887)- the permeability tests indicated an average (11 tests) permeability of 3.4(10)^-9 cm/sec, which is approximately 32 percent lower than the specification limits of 5(10)^-9 cm/sec; and the average index flux of approximately 6.2(10)^-9 cu m/sq m/sec (11 tests)is approximately 38 percent lower than the specification (QA/QC Plan)limit of 1(10)^-8 cu m/sq m/sec, both indicating acceptable conditions.

2) Mass/Unit Area (ASTM D 5993) and Moisture Content (GCL; ASTM D 2216) - the mass/unit area tests indicated an average (11 tests) bentonite mass per unit area of 4,145 grams/sq m (0.85 lbs/sq ft), which is approximately 13 percent higher than the minimum specification requirement of 0.75 lbs/sq ft. The average (11 tests) composite moisture content was 25.1 percent while the average bentonite moisture content was 22.8 percent, as measured in the lab. The bentonite moisture content is above the specification of 12 percent because the moisture content of materials as produced by the manufacturer are typically higher than the moisture content of the raw bentonite as delivered to the manuafacturer. The manufacturer's (CETCO) MQC data, submittal received October 27, 2004, indicated an average bentonite moisture content less than 10 percent (certification from American Colloid Company), which within specification. Therefore, the GCL material is acceptable for both mass/unit area and moisture content.

3) Peel Adhesion (ASTM 463Z, Modified) - indicated a minimum average (11 tests) peel strength of 37.2 lbs in the machine direction (the cross machine direction indicated an average peel strength of 43.1 lbs). The MD average peel strength is therefore more than twice the minimum specified peel strength of 15 lbs.

4) Swell Index (ASTM D 5890) - indicated an average (11 tests) swell index of 25.4 ml or cc/gm, which is approximately 5.8 percent higher than the minimum specification limit of 24 ml/gm.

5) Internal Shear Strength (ASTM D 5321 large scale, modified; two tests) - one was a single point test indicating a shear strength of 570 psf and one test was a three point test indicating an internal friction angle of 34.5 degrees and an adhesion of 394.7 psf. Using the minimum confining pressure of 200 psf, the latter test indicates a shear strength of approximately 530 psf. Therefore, both tests indicate an average composite shear strength approximately 10 percent higher than the specification requirement of 500 psf.

II. 60-Mil LLDPE Geomembrane (FML) Test Results

A total of twelve samples of the geomembrane materials were delivered to the laboratory

and the following tests were performed:

1) Thickness (ASTM D 5199), which indicated an average (12 tests) of approximately 63.7 mils, which is approximately 7 percent thicker than the specification, and no tests indicated a thickness less than 60 mils.

2) Density (ASTM D 1505) and Carbon Black Content (ASTM D 5596) - the average density (12 tests) was 0.931 gm/cc which is slightly higher than the specification of 0.92 gm/cc, and the average carbon black content was 2.37 percent, which is approximately 18 percent more than the minimum specification of 2 percent.

3) Tensile Strength (ASTM D 6693, Type IV)- indicated an average (12 tests) tensile strength in the machine direction (12 tests) of 290 lbs/in width (at over 800% elongation), which is approximately 27 percent higher than the minimum specification requirement of 228 lbs/in. The cross machine direction tensile strength tests were similar to the machine direction tests, all of which indicated higher tensile strengths than specified.

4) Tear Strength (ASTM D 1004C)- the average (12 tests) machine direction tear strength tests indicated 37.1 lbs/in, which is approximately 13 percent higher than the specified minimum tear strength of 33 lbs/in; cross machine tear strengths were slightly higher than the machine direction tear strengths, all of which were well in excess of the specified minimum.

5) Rod Puncture Strength (ASTM D 4833) - indicated and avergage (12 tests) puncture strength of 119.3 lbs, which is approximately 42 percent higher than the specified minimum puncture strength of 84 lbs.

These QA tests for the 60-mil LLDPE geomembrane all indicate material properties and strengths in excess of those specified.

III. GDN - TexDrain 200 DS8

A total of eleven samples of GDN were delivered to the laboratory and the following tests were performed:

1) Adhesion Bond Strength (GRI GC-7) of Geocomposite - indicated an average (11 tests) machine direction bond strength of 2.78 lbs, which is more than 2 times higher than the minimum required specification of 1 lb.

2) Tensile Strength (ASTM 5035/Modified), Geonet only - indicated an average (11 tests) machine direction tensile strength of 56.5 lbs/in width, which is approximately 25 percent higher than the minimum required specification of 45 lbs/in width.

3) Thickness (ASTM D 5199), Geonet only - indicated an average (11 tests) thickness of 220 mils, which is approximately 10 percent higher than the minimum specification of 200 mils.

4) Density (ASTM D 1505) and Carbon Black Content (ASTM D 1603), Geonet only - the average (11 tests) density indicated 0.958 gm/cc, which is slightly over the specification of 0.94 gm/cc, and the average carbon black content was 2.54, which is approximately 27 percent higher than the minimum specification requirement of 2 percent.

5) Transmissivity (ASTM D 4716) - five of these tests were performed with a hydraulic gradient of 0.1 at a normal pressure of 209 psf which indicated an average transmissivity of 9.9 gal/min/ft width, which is many times over the specified minimum of 0.19 gal/min/ft; and six of these tests were performed with a hydraulic gradient of 1.0 at a normal pressure of 15,000 psf which indicated an average transmissivity of 0.69 gal/min/ft width, which approximately 3.6 times higher than the specified minimum transmissivity.

6) Puncture Resistance (ASTM D 4833), Geotextile only - indicated an average (11 tests) puncture strength of 168 lbs, which is approximately 40 percent higher than the minimum specified puncture strength for an 8 oz/sy non-woven geotextile of 120 lbs.

7) Mass/Unit Area (ASTM D 5261), Geotextile only - indicated an average (11 tests) of approximately 10.8 oz/sy, which is approximately 35 percent higher than the minimum

specified mass/unit area of 8 oz/sy.

8) Apparent Opening Size (AOS; ASTM D4751), Geotextile only - indicated an average AOS of approximately 0.148 mm, which is very near the specification of 0.15 mm, and is less than the maximum specified limit of 0.18 mm.

These QA tests indicate that the GDN materials have geonet, geotextile and geocomposite properties in excess of those specified.

The QA laboratory testing program indicates that all of the geosynthetic materials provided for the PLF construction meet or exceed specification requirements. This QA testing program should be adequate for up to 1.1 million square feet of GCL, FML and GDN installed at the project.

Let me know if you have any questions regarding this QA laboratory summary review.

Thanks,
John

John H. Rahe, P.E.
Tetra Tech/MFG
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GCL FLUX
ASTM D 5887

CLIENT Tetra Tech -RMC JOB NO. 2617-02

LOT NO.	200439LO	PROJECT	Present Landfill Design RFETS
ROLL NO.	9684	TEST STARTED	9-29-04 CAL
SAMPLE NO.		TEST FINISHED	10-08-04 CAL
MAT'L TYPE	Bentomat ST	CELL NUMBER	10P
TEST TYPE	TX/Flux		
CONF. PRES. PSF	576	SITE LEACHATE WATER	No
		DI WATER	Yes

MOISTURE/DENSITY DATA FOR COMPOSITE SAMPLE	BEFORE TEST	AFTER TEST
Wt. GCL + Moisture (g)	49.1	96.2
Wt. Wet GCL & Pan (g)	57.2	104.3
Wt. Dry GCL & Pan (g)	47.5	47.5
Wt. Lost Moisture (g)	9.7	56.8
Wt. of Pan Only (g)	8.1	8.1
Wt. of Dry GCL (g)	39.4	39.4
Moisture Content %	24.5	144.1
Wet Density PCF	57.0	164.8
Dry Density PCF	45.8	67.5

Init. Diameter	(in)	4.000	(cm)	10.160
Init. Area	(sq in)	12.566	(sq cm)	81.078
Init. Height	(in)	0.261	(cm)	0.663
Vol. Bef. Consol.	(cu ft)	0.00190		
Vol. After Consol.	(cu ft)	0.00129		
Porosity %		155.77		
Constant Head	(PSI)	2.00	(cm)	140.79

Time Min	Time Sec	Init. Burette CC	Final Burette CC	Head Corr. CM	Composite **INDEX FLUX qi** **(M^3/M^2)/SEC**	Composite Permeability k cm/sec
120.0	7200	48.8	16.7	29.7	5.50E-07	3.8E-07
240.0	14400	49.0	13.1	31.6	3.07E-07	2.2E-07
120.0	7200	49.5	42.8	15.1	1.15E-07	7.1E-08
180.0	10800	42.8	35.8	22.6	7.99E-08	5.2E-08
180.0	10800	35.8	32.6	28.1	3.65E-08	2.5E-08
180.0	10800	32.6	31.8	30.3	9.14E-09	6.4E-09
900.0	54000	49.7	46.4	13.0	7.54E-09	4.6E-09
1440.0	86400	46.4	41.7	17.4	6.71E-09	4.2E-09
1440.0	86400	41.7	32.9	24.7	1.26E-08	8.4E-09
120.0	7200	46.5	44.3	15.9	3.77E-08	2.3E-08
120.0	7200	44.3	43.9	17.3	6.85E-09	4.3E-09
120.0	7200	43.9	43.5	17.8	6.85E-09	4.3E-09
120.0	7200	43.5	43.1	18.2	6.85E-09	4.3E-09

Average - Last 3 Values, Composite Permeability k (cm/sec) **4.3E-09**
Average - Last 3 Values, Composite Index Flux qi (M3/M2)SEC **6.9E-09**

Data entry by: CAL/CJW/SR Date: 10/18/2004
Checked by: KE Date: 10/18/04
FileName: TTP09684

ADVANCED TERRA TESTING, INC.

GCL FLUX
ASTM D 5887

CLIENT Tetra Tech -RMC

JOB NO. 2617-02

LOT NO.	200439LO	PROJECT	Present Landfill Design RFETS
ROLL NO.	9684	TEST STARTED	9-29-04 CAL
SAMPLE NO.		TEST FINISHED	10-08-04 CAL
MAT'L TYPE	Bentomat ST	CELL NUMBER	10P
TEST TYPE	TX/Flux		
CONF. PRES. PSF	576	SITE LEACHATE WATER	No
		DI WATER	Yes

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
80.0	75.0	6.7	43.0				
80.0	76.0		14.4				

Initial Height (in)	0.261	Init. Vol. (CC)	53.76
Height Change (in)	0.029	Vol. Change (CC)	34.90
Ht. After Cons. (in)	0.232	Cell Exp. (CC)	17.61
Initial Area (sq in)	12.566	Net Change (CC)	17.29
Area After Cons. (sq in)	9.590	Cons. Vol. (CC)	36.47

Data entry by: CAL/CJW/SR Date: 10/18/2004
Checked by: KR Date: 10/18/04
FileName: TTP09684

ADVANCED TERRA TESTING, INC.

GCL FLUX
ASTM D 5887

CLIENT Tetra Tech -RMC

JOB NO. 2617-02

LOT NO.	200439L0	PROJECT	Present Landfill Design RFETS
ROLL NO.	9728	TEST STARTED	10-11-04 CAL
SAMPLE NO.		TEST FINISHED	10-15-04 CAL
MAT'L TYPE	Bentomat ST	CELL NUMBER	12P
TEST TYPE	TX/Flux		
CONF. PRES. PSF	576	SITE LEACHATE WATER	No
		DI WATER	Yes

MOISTURE/DENSITY DATA FOR COMPOSITE SAMPLE	BEFORE TEST	AFTER TEST
Wt. GCL + Moisture (g)	48.1	88.0
Wt. Wet GCL & Pan (g)	56.4	96.4
Wt. Dry GCL & Pan (g)	47.3	47.3
Wt. Lost Moisture (g)	9.2	49.1
Wt. of Pan Only (g)	8.4	8.4
Wt. of Dry GCL (g)	38.9	38.9
Moisture Content %	23.5	126.1
Wet Density PCF	51.4	101.6
Dry Density PCF	41.6	44.9

Init. Diameter (in)	4.000	(cm)	10.160
Init. Area (sq in)	12.566	(sq cm)	81.078
Init. Height (in)	0.284	(cm)	0.721
Vol. Bef. Consol. (cu ft)	0.00206		
Vol. After Consol. (cu ft)	0.00191		
Porosity %	90.79		
Constant Head (PSI)	2.00	(cm)	140.79

Time Min	Time Sec	Init. Burette CC	Final Burette CC	Head Corr. CM	Composite INDEX FLUX qi $(M^3/M^2)/SEC$	Composite Permeability k cm/sec
150.0	9000	49.4	48.8	11.9	8.22E-09	3.9E-09
920.0	55200	48.8	45.1	14.2	8.27E-09	4.0E-09
240.0	14400	45.1	44.4	16.6	6.42E-09	3.2E-09
240.0	14400	44.4	43.6	17.5	6.42E-09	3.2E-09
960.0	57600	43.6	40.4	19.6	6.85E-09	3.5E-09

Average - Last 3 Values, Composite Permeability k (cm/sec) **3.3E-09**
Average - Last 3 Values, Composite Index Flux qi (M3/M2)SEC **6.6E-09**

Data entry by: CAL/SR Date: 10/18/2004
Checked by: KR Date: 10/18/04
FileName: TTP09728

ADVANCED TERRA TESTING, INC.

GCL FLUX
ASTM D 5887

CLIENT Tetra Tech -RMC

JOB NO. 2617-02

LOT NO.	200439L0	PROJECT	Present Landfill Design RFETS
ROLL NO.	9728	TEST STARTED	10-11-04 CAL
SAMPLE NO.		TEST FINISHED	10-15-04 CAL
MAT'L TYPE	Bentomat ST	CELL NUMBER	12P
TEST TYPE	TX/Flux		
CONF. PRES. PSF	576	SITE LEACHATE WATER	No
		DI WATER	Yes

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
80.0	75.0	6.9	31.6				
80.0	76.0		21.4				

Initial Height (in)	0.284	Init. Vol. (CC)	58.45
Height Change (in)	0.031	Vol. Change (CC)	16.30
Ht. After Cons. (in)	0.253	Cell Exp. (CC)	11.92
Initial Area (sq in)	12.566	Net Change (CC)	4.38
Area After Cons. (sq in)	13.050	Cons. Vol. (CC)	54.07

Data entry by: CAL/SR Date: 10/18/2004
Checked by: KR Date: 10/18/04
FileName: TTP09728

ADVANCED TERRA TESTING, INC.

GCL FLUX
ASTM D 5887

CLIENT Tetra Tech - RMC

JOB NO. 2617-02

LOT NO.	200439LO	PROJECT	Present Landfill Design-RFETS
ROLL NO.	#9772	TEST STARTED	9-29-04 CAL
SAMPLE NO.		TEST FINISHED	10-09-04 CAL
MAT'L TYPE	GCL	CELL NUMBER	8P
TEST TYPE	TX/Flux		
CONF. PRES. PSF	576	SITE LEACHATE WATER	No
		DI WATER	Yes

MOISTURE/DENSITY DATA FOR COMPOSITE SAMPLE	BEFORE TEST	AFTER TEST
Wt. GCL + Moisture (g)	52.9	90.1
Wt. Wet GCL & Pan (g)	61.2	98.5
Wt. Dry GCL & Pan (g)	50.6	50.6
Wt. Lost Moisture (g)	10.7	47.9
Wt. of Pan Only (g)	8.4	8.4
Wt. of Dry GCL (g)	42.2	42.2
Moisture Content %	25.2	113.6
Wet Density PCF	53.4	132.7
Dry Density PCF	42.6	62.1

Init. Diameter	(in)	4.000	(cm)	10.160
Init. Area	(sq in)	12.566	(sq cm)	81.078
Init. Height	(in)	0.300	(cm)	0.762
Vol. Bef. Consol.	(cu ft)	0.00218		
Vol. After Consol.	(cu ft)	0.00150		
Porosity %		113.02		
Constant Head	(PSI)	2.00	(cm)	140.79

Time Min	Time Sec	Init. Burette CC	Final Burette CC	Head Corr. CM	Composite **INDEX FLUX qi** **(M^3/M^2)/SEC**	Composite Permeability k cm/sec
160.0	9600	49.0	48.3	12.4	8.99E-09	5.3E-09
900.0	54000	48.3	44.5	14.8	8.68E-09	5.2E-09
4320.0	259200	44.5	32.1	23.7	5.90E-09	3.8E-09
1442.0	86520	32.1	28.9	32.2	4.56E-09	3.2E-09
1440.0	86400	28.9	26.0	35.5	4.14E-09	3.0E-09
1440.0	86400	26.0	23.6	38.4	3.43E-09	2.5E-09

Average - Last 3 Values, Composite Permeability k (cm/sec) **2.9E-09**
Average - Last 3 Values, Composite Index Flux qi (M3/M2)SEC **4.0E-09**

Data entry by: CAL/SR Date: 10/18/2004
Checked by: KR Date: 10/18/04
FileName: TTP09772

ADVANCED TERRA TESTING, INC.

GCL FLUX
ASTM D 5887

CLIENT Tetra Tech - RMC

JOB NO. 2617-02

LOT NO.	200439LO	PROJECT	Present Landfill Design-RFETS
ROLL NO.	#9772	TEST STARTED	9-29-04 CAL
SAMPLE NO.		TEST FINISHED	10-09-04 CAL
MAT'L TYPE	GCL	CELL NUMBER	8P
TEST TYPE	TX/Flux		
CONF. PRES. PSF	576	SITE LEACHATE WATER	No
		DI WATER	Yes

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
80.0	75.0	6.7	43.0				
80.0	76.0		14.4				

Initial Height (in)	0.300	Init. Vol. (CC)	61.79
Height Change (in)	0.053	Vol. Change (CC)	32.00
Ht. After Cons. (in)	0.247	Cell Exp. (CC)	12.63
Initial Area (sq in)	12.566	Net Change (CC)	19.37
Area After Cons. (sq in)	10.478	Cons. Vol. (CC)	42.42

Data entry by: CAL/SR Date: 10/18/2004
Checked by: KR Date: 10/18/04
FileName: TTP09772

ADVANCED TERRA TESTING, INC.

GCL FLUX
ASTM D 5887

CLIENT Tetra Tech RMC

JOB NO. 2617-02

LOT NO.	200440L0	PROJECT	Present Landfill Design RFETS
ROLL NO.	10503	TEST STARTED	10-09-04 CAL
SAMPLE NO.		TEST FINISHED	10-15-04 CAL
MAT'L TYPE	Bentomat ST GCL	CELL NUMBER	8P
TEST TYPE	TX/Flux		
CONF. PRES. PSF	576	SITE LEACHATE WATER	No
		DI WATER	Yes

MOISTURE/DENSITY DATA FOR COMPOSITE SAMPLE	BEFORE TEST	AFTER TEST
Wt. GCL + Moisture (g)	47.6	85.6
Wt. Wet GCL & Pan (g)	55.8	93.7
Wt. Dry GCL & Pan (g)	47.6	47.6
Wt. Lost Moisture (g)	8.2	46.1
Wt. of Pan Only (g)	8.1	8.1
Wt. of Dry GCL (g)	39.5	39.5
Moisture Content %	20.7	116.8
Wet Density PCF	53.8	125.9
Dry Density PCF	44.5	58.1

Init. Diameter	(in)	4.000	(cm)	10.160
Init. Area	(sq in)	12.566	(sq cm)	81.078
Init. Height	(in)	0.269	(cm)	0.682
Vol. Bef. Consol.	(cu ft)	0.00195		
Vol. After Consol.	(cu ft)	0.00150		
Porosity %		108.63		
Constant Head	(PSI)	2.00	(cm)	140.79

Time Min	Time Sec	Init. Burette CC	Final Burette CC	Head Corr. CM	Composite INDEX FLUX qi $(M^3/M^2)/SEC$	Composite Permeability k cm/sec
155.0	9300	49.1	47.4	12.8	2.25E-08	1.2E-08
900.0	54000	47.4	37.2	19.3	2.33E-08	1.3E-08
240.0	14400	37.2	36.0	25.5	1.03E-08	6.0E-09
240.0	14400	36.0	35.2	26.6	6.85E-09	4.0E-09
970.0	58200	35.2	31.6	29.0	7.63E-09	4.6E-09
240.0	14400	31.6	30.3	31.7	1.11E-08	6.9E-09
240.0	14400	30.3	29.3	32.9	8.57E-09	5.3E-09
960.0	57600	29.3	25.8	35.4	7.60E-09	4.9E-09
240.0	14400	25.8	25.1	37.7	5.57E-09	3.6E-09
240.0	14400	25.1	24.4	38.4	6.00E-09	3.9E-09
956.0	57360	24.4	21.7	40.3	5.81E-09	3.9E-09

Average - Last 3 Values, Composite Permeability k (cm/sec) **3.8E-09**
Average - Last 3 Values, Composite Index Flux qi (M3/M2)SEC **5.8E-09**

Data entry by: CL/SR Date: 10/18/2004
Checked by: KP Date: 10/18/04
FileName: TTP00503

ADVANCED TERRA TESTING, INC.

GCL FLUX
ASTM D 5887

CLIENT Tetra Tech RMC

JOB NO. 2617-02

LOT NO.	200440L0	PROJECT	Present Landfill Design RFETS
ROLL NO.	10503	TEST STARTED	10-09-04 CAL
SAMPLE NO.		TEST FINISHED	10-15-04 CAL
MAT'L TYPE	Bentomat ST GCL	CELL NUMBER	8P
TEST TYPE	TX/Flux		
CONF. PRES. PSF	576	SITE LEACHATE WATER	No
		DI WATER	Yes

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
80.0	75.0	7.8	35.8				
80.0	76.0		28.7				

Initial Height (in)	0.269	Init. Vol. (CC)	55.32
Height Change (in)	0.035	Vol. Change (CC)	25.50
Ht. After Cons. (in)	0.234	Cell Exp. (CC)	12.63
Initial Area (sq in)	12.566	Net Change (CC)	12.87
Area After Cons. (sq in)	11.087	Cons. Vol. (CC)	42.45

Data entry by: CL/SR Date: 10/18/2004
Checked by: KR Date: 10/18/04
FileName: TTP00503

ADVANCED TERRA TESTING, INC.

GCL FLUX
ASTM D 5887

CLIENT Tetra Tech RMC

JOB NO. 2617-02

LOT NO.	200440L0	PROJECT	Present Landfill Design RFETS
ROLL NO.	10547	TEST STARTED	10-08-04 CL
SAMPLE NO.		TEST FINISHED	10-13-04 CAL
MAT'L TYPE	Bentomat ST GCL	CELL NUMBER	7P
TEST TYPE	TX/Flux		
CONF. PRES. PSF	576	SITE LEACHATE WATER	No
		DI WATER	Yes

MOISTURE/DENSITY DATA FOR COMPOSITE SAMPLE	BEFORE TEST	AFTER TEST
Wt. GCL + Moisture (g)	55.2	98.0
Wt. Wet GCL & Pan (g)	63.1	105.9
Wt. Dry GCL & Pan (g)	51.7	51.7
Wt. Lost Moisture (g)	11.4	54.2
Wt. of Pan Only (g)	7.9	7.9
Wt. of Dry GCL (g)	43.9	43.9
Moisture Content %	25.9	123.5
Wet Density PCF	62.9	100.1
Dry Density PCF	49.9	44.8

Init. Diameter	(in)	4.000	(cm)	10.160
Init. Area	(sq in)	12.566	(sq cm)	81.078
Init. Height	(in)	0.266	(cm)	0.676
Vol. Bef. Consol.	(cu ft)	0.00194		
Vol. After Consol.	(cu ft)	0.00216		
Porosity %		88.57		
Constant Head	(PSI)	2.00	(cm)	140.79

Time Min	Time Sec	Init. Burette CC	Final Burette CC	Head Corr. CM	Composite **INDEX FLUX qi** **(M^3/M^2)/SEC**	Composite Permeability k cm/sec
63.0	3780	49.3	32.4	20.9	5.53E-07	3.8E-07
60.0	3600	49.5	35.5	19.1	4.80E-07	3.2E-07
120.0	7200	35.5	22.2	34.0	2.28E-07	1.7E-07
120.0	7200	49.2	36.5	18.7	2.18E-07	1.4E-07
120.0	7200	36.5	30.0	29.2	1.11E-07	8.1E-08
120.0	7200	30.0	24.8	35.5	8.91E-08	6.9E-08
900.0	54000	49.2	14.9	30.5	7.83E-08	5.8E-08
240.0	14400	48.2	47.7	13.1	4.28E-09	2.7E-09
240.0	14400	47.7	46.8	13.9	7.71E-09	4.9E-09
970.0	58200	46.8	43.3	16.3	7.42E-09	4.8E-09
240.0	14400	43.3	42.6	18.6	6.00E-09	4.0E-09

Average - Last 3 Values, Composite Permeability k (cm/sec) **4.6E-09**
Average - Last 3 Values, Composite Index Flux qi (M3/M2)SEC **7.0E-09**

Data entry by: CL/SR Date: 10/18/2004
Checked by: KR Date: 10/18/04
FileName: TTP00547

ADVANCED TERRA TESTING, INC.

GCL FLUX
ASTM D 5887

CLIENT Tetra Tech RMC

JOB NO. 2617-02

LOT NO.	200440L0	PROJECT	Present Landfill Design RFETS
ROLL NO.	10547	TEST STARTED	10-08-04 CL
SAMPLE NO.		TEST FINISHED	10-13-04 CAL
MAT'L TYPE	Bentomat ST GCL	CELL NUMBER	7P
TEST TYPE	TX/Flux		
CONF. PRES. PSF	576	SITE LEACHATE WATER	No
		DI WATER	Yes

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
80.0	75.0	5.2	32.8				
80.0	76.0		17.0				

Initial Height (in)	0.266	Init. Vol. (CC)	54.85
Height Change (in)	-0.042	Vol. Change (CC)	11.80
Ht. After Cons. (in)	0.308	Cell Exp. (CC)	18.14
Initial Area (sq in)	12.566	Net Change (CC)	-6.34
Area After Cons. (sq in)	12.108	Cons. Vol. (CC)	61.18

Data entry by: CL/SR Date: 10/18/2004
Checked by: KR Date: 10/18/04
FileName: TTP00547

ADVANCED TERRA TESTING, INC.

GCL FLUX
ASTM D 5887

CLIENT Tetra Tech RMC

JOB NO. 2617-02

LOT NO.	200440LO	PROJECT	Present Landfill Design RFETS
ROLL NO.	10591	TEST STARTED	10-6-04 CL
SAMPLE NO.		TEST FINISHED	10-11-04 CAL
MAT'L TYPE	Bentomat ST GCL	CELL NUMBER	9P
TEST TYPE	TX/Flux		
CONF. PRES. PSF	576	SITE LEACHATE WATER	No
		DI WATER	Yes

MOISTURE/DENSITY DATA FOR COMPOSITE SAMPLE	BEFORE TEST	AFTER TEST
Wt. GCL + Moisture (g)	45.2	90.2
Wt. Wet GCL & Pan (g)	53.6	98.7
Wt. Dry GCL & Pan (g)	45.0	45.0
Wt. Lost Moisture (g)	8.6	53.6
Wt. of Pan Only (g)	8.4	8.4
Wt. of Dry GCL (g)	36.6	36.6
Moisture Content %	23.6	146.6
Wet Density PCF	52.9	101.2
Dry Density PCF	42.8	41.0

Init. Diameter	(in)	4.000	(cm)	10.160
Init. Area	(sq in)	12.566	(sq cm)	81.078
Init. Height	(in)	0.259	(cm)	0.658
Vol. Bef. Consol.	(cu ft)	0.00188		
Vol. After Consol.	(cu ft)	0.00197		
Porosity %		96.34		
Constant Head	(PSI)	2.00	(cm)	140.79

Time Min	Time Sec	Init. Burette CC	Final Burette CC	Head Corr. CM	Composite INDEX FLUX qi $(M^3/M^2)/SEC$	Composite Permeability k cm/sec
60.0	3600	45.60	37.70	20.0	2.71E-07	1.5E-07
60.0	3600	37.70	31.90	27.5	1.99E-07	1.1E-07
60.0	3600	31.90	31.50	30.8	1.37E-08	8.2E-09
997.0	59820	31.50	21.90	36.3	1.98E-08	1.2E-08
60.0	3600	21.90	21.70	41.6	6.85E-09	4.5E-09
60.0	3600	21.70	21.65	41.8	1.71E-09	1.1E-09
60.0	3600	21.65	21.55	41.9	3.43E-09	2.3E-09
60.0	3600	21.55	21.45	42.0	3.43E-09	2.3E-09
1320.0	79200	49.50	34.90	19.4	2.27E-08	1.2E-08
60.0	3600	34.90	34.80	27.4	3.43E-09	2.0E-09
120.0	7200	34.80	34.50	27.6	5.14E-09	3.0E-09
120.0	7200	34.50	34.20	28.0	5.14E-09	3.0E-09
120.0	7200	34.20	33.95	28.3	4.28E-09	2.5E-09

Average - Last 3 Values, Composite Permeability k (cm/sec) **2.8E-09**

Average - Last 3 Values, Composite Index Flux qi (M3/M2)SEC **4.9E-09**

Data entry by: CAL/CJW/SR Date: 10/18/2004

Checked by: KR Date: 10/18/04

FileName: TTP00591

ADVANCED TERRA TESTING, INC.

GCL FLUX
ASTM D 5887

CLIENT Tetra Tech RMC

JOB NO. 2617-02

LOT NO.	200440LO	PROJECT	Present Landfill Design RFET
ROLL NO.	10591	TEST STARTED	10-6-04 CL
SAMPLE NO.		TEST FINISHED	10-11-04 CAL
MAT'L TYPE	Bentomat ST GCL	CELL NUMBER	9P
TEST TYPE	TX/Flux		
CONF. PRES. PSF	576	SITE LEACHATE WATER	No
		DI WATER	Yes

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
80.0	75.0	9.3	36.8				
80.0	76.0		19.0				

Initial Height (in)	0.259	Init. Vol. (CC)	53.34
Height Change (in)	-0.005	Vol. Change (CC)	9.70
Ht. After Cons. (in)	0.264	Cell Exp. (CC)	12.04
Initial Area (sq in)	12.566	Net Change (CC)	-2.34
Area After Cons. (sq in)	12.869	Cons. Vol. (CC)	55.68

Data entry by: CAL/CJW/SR Date: 10/18/2004
Checked by: KR Date: 10/18/04
FileName: TTP00591

ADVANCED TERRA TESTING, INC.

GCL FLUX
ASTM D 5887

CLIENT Tetra Tech RMC

JOB NO. 2617-02

LOT NO.	200440L0	PROJECT	Present Landfill Design RFETS
ROLL NO.	10635	TEST STARTED	10-9-04 CL
SAMPLE NO.		TEST FINISHED	10-19-04 CAL
MAT'L TYPE	Bentomat ST GCL	CELL NUMBER	10P
TEST TYPE	TX/Flux		
CONF. PRES. PSF	576	SITE LEACHATE WATER	No
		DI WATER	Yes

MOISTURE/DENSITY DATA FOR COMPOSITE SAMPLE	BEFORE TEST	AFTER TEST
Wt. GCL + Moisture (g)	46.8	92.9
Wt. Wet GCL & Pan (g)	54.8	100.8
Wt. Dry GCL & Pan (g)	44.9	44.9
Wt. Lost Moisture (g)	9.9	56.0
Wt. of Pan Only (g)	8.0	8.0
Wt. of Dry GCL (g)	36.9	36.9
Moisture Content %	26.8	151.6
Wet Density PCF	55.3	88.4
Dry Density PCF	43.6	35.1

Init. Diameter	(in)	4.000	(cm)	10.160
Init. Area	(sq in)	12.566	(sq cm)	81.078
Init. Height	(in)	0.257	(cm)	0.652
Vol. Bef. Consol.	(cu ft)	0.00187		
Vol. After Consol.	(cu ft)	0.00232		
Porosity %		85.31		
Constant Head	(PSI)	2.00	(cm)	140.79

Time Min	Time Sec	Init. Burette CC	Final Burette CC	Head Corr. CM	Composite **INDEX FLUX qi** **(M^3/M^3)/SEC**	Composite Permeability k cm/sec
240.0	14400	11.9	8.7	54.2	2.74E-08	1.9E-08
962.0	57720	48.7	25.4	25.0	4.98E-08	2.6E-08
240.0	14400	25.4	20.7	40.3	4.03E-08	2.4E-08
1260.0	75600	49.5	27.5	23.4	3.59E-08	1.8E-08
120.0	7200	27.5	27.1	35.6	6.85E-09	3.9E-09
1440.0	86400	49.6	44.1	14.3	7.85E-09	3.7E-09
300.0	18000	44.1	43.1	17.9	6.85E-09	3.3E-09
930.0	55800	43.1	40.3	19.9	6.19E-09	3.0E-09
240.0	14400	40.3	39.5	21.9	6.85E-09	3.4E-09

Average - Last 3 Values, Composite Permeability k (cm/sec) **3.3E-09**
Average - Last 3 Values, Composite Index Flux qi (M3/M2)SEC **6.6E-09**

Data entry by: CL/SR Date: 10/21/2004
Checked by: Cal Date: 10/21/04
FileName: TTP00635

ADVANCED TERRA TESTING, INC.

GCL FLUX
ASTM D 5887

CLIENT Tetra Tech RMC

JOB NO. 2617-02

LOT NO.	200440L0	PROJECT	Present Landfill Design RFETS
ROLL NO.	10635	TEST STARTED	10-9-04 CL
SAMPLE NO.		TEST FINISHED	10-19-04 CAL
MAT'L TYPE	Bentomat ST GCL	CELL NUMBER	10P
TEST TYPE	TX/Flux		
CONF. PRES. PSF	576	SITE LEACHATE WATER	No
		DI WATER	Yes

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
80.0	75.0	5.9	34.3				
80.0	76.0		10.8				

Initial Height (in)	0.257	Init. Vol. (CC)	52.89
Height Change (in)	-0.016	Vol. Change (CC)	4.90
Ht. After Cons. (in)	0.273	Cell Exp. (CC)	17.61
Initial Area (sq in)	12.566	Net Change (CC)	-12.71
Area After Cons. (sq in)	14.672	Cons. Vol. (CC)	65.60

Data entry by: CL/SR Date: 10/21/2004
Checked by: Cal Date: 10/21/04
FileName: TTP00635

ADVANCED TERRA TESTING, INC.

GCL FLUX
ASTM D 5887

CLIENT Tetra Tech RMC

JOB NO. 2617-02

LOT NO.	200440LO	PROJECT	Present Landfill Design RFETS
ROLL NO.	10679	TEST STARTED	10-6-04 CL
SAMPLE NO.		TEST FINISHED	10-11-04 CL
MAT'L TYPE	Bentomat ST GCL	CELL NUMBER	11P
TEST TYPE	TX/Flux		
CONF. PRES. PSF	576	SITE LEACHATE WATER	No
		DI WATER	Yes

MOISTURE/DENSITY DATA FOR COMPOSITE SAMPLE	BEFORE TEST	AFTER TEST
Wt. GCL + Moisture (g)	48.8	93.4
Wt. Wet GCL & Pan (g)	57.1	101.7
Wt. Dry GCL & Pan (g)	47.4	47.4
Wt. Lost Moisture (g)	9.6	54.3
Wt. of Pan Only (g)	8.3	8.3
Wt. of Dry GCL (g)	39.2	39.2
Moisture Content %	24.5	138.4
Wet Density PCF	54.6	102.9
Dry Density PCF	43.8	43.2

Init. Diameter	(in)	4.000	(cm)	10.160
Init. Area	(sq in)	12.566	(sq cm)	81.078
Init. Height	(in)	0.271	(cm)	0.688
Vol. Bef. Consol.	(cu ft)	0.00197		
Vol. After Consol.	(cu ft)	0.00200		
Porosity %		95.73		
Constant Head	(PSI)	2.00	(cm)	140.79

Time Min	Time Sec	Init. Burette CC	Final Burette CC	Head Corr. CM	Composite INDEX FLUX qi $(M^3/M^2)/SEC$	Composite Permeability k cm/sec
100.0	6000	49.90	14.60	30.2	7.26E-07	3.8E-07
260.0	15600	49.20	22.90	26.1	2.08E-07	1.0E-07
977.0	58620	22.90	1.20	52.3	4.57E-08	3.0E-08
60.0	3600	49.50	49.10	11.7	1.37E-08	6.1E-09
60.0	3600	49.10	48.80	12.0	1.03E-08	4.6E-09
60.0	3600	48.80	48.55	12.3	8.57E-09	3.8E-09
60.0	3600	48.55	48.30	12.6	8.57E-09	3.8E-09

Average - Last 3 Values, Composite Permeability k (cm/sec) **4.1E-09**
Average - Last 3 Values, Composite Index Flux qi (M3/M2)SEC **9.1E-09**

Data entry by: CAL/CJW/SR Date: 11/02/2004
Checked by: CJ Date: 11/02/04
FileName: TTP00679

ADVANCED TERRA TESTING, INC.

GCL FLUX
ASTM D 5887

CLIENT Tetra Tech RMC

JOB NO. 2617-02

LOT NO.	200440LO	PROJECT	Present Landfill Design RFET
ROLL NO.	10679	TEST STARTED	10-6-04 CL
SAMPLE NO.		TEST FINISHED	10-11-04 CL
MAT'L TYPE	Bentomat ST GCL	CELL NUMBER	11P
TEST TYPE	TX/Flux		
CONF. PRES. PSF	576	SITE LEACHATE WATER	No
		DI WATER	Yes

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
80.0	75.0	9.0	33.4				
80.0	76.0		27.4				

Initial Height (in)	0.271	Init. Vol. (CC)	55.82
Height Change (in)	0.022	Vol. Change (CC)	12.70
Ht. After Cons. (in)	0.249	Cell Exp. (CC)	13.56
Initial Area (sq in)	12.566	Net Change (CC)	-0.86
Area After Cons. (sq in)	13.887	Cons. Vol. (CC)	56.68

Data entry by: CAL/CJW/SR Date: 11/02/2004
Checked by: CJW Date: 11/02/04
FileName: TTP00679

ADVANCED TERRA TESTING, INC.

GCL FLUX
ASTM D 5887

CLIENT Tetra Tech -RMC

JOB NO. 2617-02

LOT NO.	200440L0	PROJECT	Present Landfill Design RFETS
ROLL NO.	10723	TEST STARTED	10-11-04 CAL
SAMPLE NO.		TEST FINISHED	10-19-04 CAL
MAT'L TYPE	Bentomat ST	CELL NUMBER	11P
TEST TYPE	TX/Flux		
CONF. PRES. PSF	576	SITE LEACHATE WATER	No
		DI WATER	Yes

MOISTURE/DENSITY DATA FOR COMPOSITE SAMPLE	BEFORE TEST	AFTER TEST
Wt. GCL + Moisture (g)	57.4	102.4
Wt. Wet GCL & Pan (g)	65.9	110.9
Wt. Dry GCL & Pan (g)	54.0	54.0
Wt. Lost Moisture (g)	11.9	56.9
Wt. of Pan Only (g)	8.5	8.5
Wt. of Dry GCL (g)	45.5	45.5
Moisture Content %	26.2	125.0
Wet Density PCF	59.8	103.9
Dry Density PCF	47.4	46.2

Init. Diameter	(in)	4.000	(cm)	10.160
Init. Area	(sq in)	12.566	(sq cm)	81.078
Init. Height	(in)	0.291	(cm)	0.739
Vol. Bef. Consol.	(cu ft)	0.00212		
Vol. After Consol.	(cu ft)	0.00217		
Porosity %		92.45		
Constant Head	(PSI)	2.00	(cm)	140.79

Time Min	Time Sec	Init. Burette CC	Final Burette CC	Head Corr. CM	Composite INDEX FLUX qi $(M^3/M^2)/SEC$	Composite Permeability k cm/sec
120.0	7200	49.0	37.2	18.4	2.02E-07	1.3E-07
120.0	7200	37.2	31.9	27.7	9.08E-08	6.3E-08
960.0	57600	49.3	27.3	23.7	4.71E-08	3.1E-08
240.0	14400	27.3	24.1	37.4	2.74E-08	2.1E-08
240.0	14400	24.1	21.3	40.7	2.40E-08	1.9E-08
962.0	57720	49.5	38.5	17.4	2.35E-08	1.5E-08
240.0	14400	38.5	36.7	24.4	1.54E-08	1.0E-08
1260.0	75600	49.6	35.5	19.0	2.30E-08	1.5E-08
120.0	7200	35.5	34.9	27.0	1.03E-08	7.1E-09
1440.0	86400	34.9	28.5	30.8	9.14E-09	6.5E-09
300.0	18000	28.5	27.8	34.7	4.80E-09	3.5E-09
930.0	55800	27.8	25.9	36.1	4.20E-09	3.1E-09
240.0	14400	25.9	25.5	37.4	3.43E-09	2.6E-09
240.0	14400	25.5	25.0	37.9	4.28E-09	3.3E-09

Average - Last 3 Values, Composite Permeability k (cm/sec) **3.0E-09**

Average - Last 3 Values, Composite Index Flux qi (M3/M2)SEC **4.0E-09**

Data entry by: CAL/SR Date: 10/21/2004

Checked by: cal Date: 10/21/04

FileName: TTP00723

ADVANCED TERRA TESTING, INC.

GCL FLUX
ASTM D 5887

CLIENT Tetra Tech -RMC

JOB NO. 2617-02

LOT NO.	200440L0	PROJECT	Present Landfill Design RFETS
ROLL NO.	10723	TEST STARTED	10-11-04 CAL
SAMPLE NO.		TEST FINISHED	10-19-04 CAL
MAT'L TYPE	Bentomat ST	CELL NUMBER	11P
TEST TYPE	TX/Flux		
CONF. PRES. PSF	576	SITE LEACHATE WATER	No
		DI WATER	Yes

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
80.0	75.0	7.4	31.9				
80.0	76.0		19.9				

Initial Height (in)	0.291	Init. Vol. (CC)	59.96
Height Change (in)	-0.012	Vol. Change (CC)	12.00
Ht. After Cons. (in)	0.303	Cell Exp. (CC)	13.56
Initial Area (sq in)	12.566	Net Change (CC)	-1.56
Area After Cons. (sq in)	12.383	Cons. Vol. (CC)	61.52

Data entry by: CAL/SR Date: 10/21/2004
Checked by: cal Date: 10/21/04
FileName: TTP00723

ADVANCED TERRA TESTING, INC.

GCL FLUX
ASTM D 5887

CLIENT Tetra Tech -RMC

JOB NO. 2617-02

LOT NO.	200440L0	PROJECT	Present Landfill Design RFETS
ROLL NO.	10767	TEST STARTED	10-11-04 CAL
SAMPLE NO.		TEST FINISHED	10-16-04 CAL
MAT'L TYPE	GCL	CELL NUMBER	9P
TEST TYPE	TX/Flux		
CONF. PRES. PSF	576	SITE LEACHATE WATER	No
		DI WATER	Yes

MOISTURE/DENSITY DATA FOR COMPOSITE SAMPLE	BEFORE TEST	AFTER TEST
Wt. GCL + Moisture (g)	47.3	91.7
Wt. Wet GCL & Pan (g)	57.5	101.8
Wt. Dry GCL & Pan (g)	47.9	47.9
Wt. Lost Moisture (g)	9.6	53.9
Wt. of Pan Only (g)	10.2	10.2
Wt. of Dry GCL (g)	37.7	37.7
Moisture Content %	25.5	143.0
Wet Density PCF	55.8	133.4
Dry Density PCF	44.5	54.9

Init. Diameter	(in)	4.000	(cm)	10.160
Init. Area	(sq in)	12.566	(sq cm)	81.078
Init. Height	(in)	0.257	(cm)	0.653
Vol. Bef. Consol.	(cu ft)	0.00187		
Vol. After Consol.	(cu ft)	0.00151		
Porosity %		125.76		
Constant Head	(PSI)	2.00	(cm)	140.79

Time Min	Time Sec	Init. Burette CC	Final Burette CC	Head Corr. CM	Composite INDEX FLUX qi $(M^3/M^2)/SEC$	Composite Permeability k cm/sec
30.0	1800	49.9	42.4	15.1	5.14E-07	3.0E-07
60.0	3600	49.5	36.2	18.7	4.56E-07	2.8E-07
60.0	3600	36.2	25.3	31.9	3.73E-07	2.5E-07
60.0	3600	25.3	17.0	42.3	2.84E-07	2.1E-07
60.0	3600	17.0	12.4	49.4	1.58E-07	1.3E-07
120.0	7200	48.8	30.4	22.2	3.15E-07	2.0E-07
120.0	7200	30.4	28.3	33.4	3.60E-08	2.5E-08
960.0	57600	49.4	45.7	13.6	7.92E-09	4.6E-09
240.0	14400	45.7	44.9	16.0	6.85E-09	4.1E-09
240.0	14400	44.9	44.0	16.9	7.71E-09	4.6E-09

Average - Last 3 Values, Composite Permeability k (cm/sec) **4.4E-09**
Average - Last 3 Values, Composite Index Flux qi (M3/M2)SEC **7.5E-09**

Data entry by: CAL/SR Date: 10/18/2004
Checked by: KP Date: 10/18/04
FileName: TTP00767

ADVANCED TERRA TESTING, INC.

GCL FLUX
ASTM D 5887

CLIENT Tetra Tech -RMC

JOB NO. 2617-02

LOT NO.	200440L0	PROJECT	Present Landfill Design RFETS
ROLL NO.	10767	TEST STARTED	10-11-04 CAL
SAMPLE NO.		TEST FINISHED	10-16-04 CAL
MAT'L TYPE	GCL	CELL NUMBER	9P
TEST TYPE	TX/Flux		
CONF. PRES. PSF	576	SITE LEACHATE WATER	No
		DI WATER	Yes

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
80.0	75.0	8.3	32.8				
80.0	76.0		24.4				

Initial Height (in)	0.257	Init. Vol. (CC)	52.95
Height Change (in)	0.011	Vol. Change (CC)	22.10
Ht. After Cons. (in)	0.246	Cell Exp. (CC)	12.04
Initial Area (sq in)	12.566	Net Change (CC)	10.06
Area After Cons. (sq in)	10.634	Cons. Vol. (CC)	42.89

Data entry by: CAL/SR Date: 10/18/2004
Checked by: KR Date: 10/18/04
FileName: TTP00767

ADVANCED TERRA TESTING, INC.

GCL FLUX
ASTM D 5887

CLIENT Tetra Tech RMC

JOB NO. 2617-02

LOT NO.	200440L0	PROJECT	Present Landfill Design RFETS
ROLL NO.	10811	TEST STARTED	10-13-04 CL
SAMPLE NO.		TEST FINISHED	10-18-04 CAL
MAT'L TYPE	GCL	CELL NUMBER	7P
TEST TYPE	TX/Flux		
CONF. PRES. PSF	576	SITE LEACHATE WATER	No
		DI WATER	Yes

MOISTURE/DENSITY DATA FOR COMPOSITE SAMPLE	BEFORE TEST	AFTER TEST
Wt. GCL + Moisture (g)	46.6	81.7
Wt. Wet GCL & Pan (g)	54.5	89.6
Wt. Dry GCL & Pan (g)	45.5	45.5
Wt. Lost Moisture (g)	9.0	44.1
Wt. of Pan Only (g)	7.9	7.9
Wt. of Dry GCL (g)	37.6	37.6
Moisture Content %	24.0	117.4
Wet Density PCF	53.5	83.7
Dry Density PCF	43.1	38.5

Init. Diameter (in)	4.000	(cm)	10.160
Init. Area (sq in)	12.566	(sq cm)	81.078
Init. Height (in)	0.264	(cm)	0.671
Vol. Bef. Consol. (cu ft)	0.00192		
Vol. After Consol. (cu ft)	0.00215		
Porosity %	72.40		
Constant Head (PSI)	2.00	(cm)	140.79

Time Min	Time Sec	Init. Burette CC	Final Burette CC	Head Corr. CM	Composite INDEX FLUX qi (M^3/M^2)/SEC	Composite Permeability k cm/sec
240.0	14400	49.7	49.1	11.6	5.14E-09	1.6E-09
1380.0	82800	49.1	45.0	14.1	6.11E-09	2.0E-09
1440.0	86400	45.0	41.3	18.4	5.28E-09	1.7E-09

Average - Last 3 Values, Composite Permeability k (cm/sec) **1.8E-09**
Average - Last 3 Values, Composite Index Flux qi (M3/M2)SEC **5.5E-09**

Data entry by: CL/SR Date: 10/20/2004
Checked by: cal Date: 10/21/04
FileName: TTP00811

ADVANCED TERRA TESTING, INC.

GCL FLUX
ASTM D 5887

CLIENT Tetra Tech RMC

JOB NO. 2617-02

LOT NO.	200440L0	PROJECT	Present Landfill Design RFETS
ROLL NO.	10811	TEST STARTED	10-13-04 CL
SAMPLE NO.		TEST FINISHED	10-18-04 CAL
MAT'L TYPE	GCL	CELL NUMBER	7P
TEST TYPE	TX/Flux		
CONF. PRES. PSF	576	SITE LEACHATE WATER	No
		DI WATER	Yes

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
80.0	75.0	3.8	24.0				
80.0	76.0		15.4				

Initial Height (in)	0.264	Init. Vol. (CC)	54.39
Height Change (in)	0.047	Vol. Change (CC)	11.60
Ht. After Cons. (in)	0.217	Cell Exp. (CC)	18.14
Initial Area (sq in)	12.566	Net Change (CC)	-6.54
Area After Cons. (sq in)	17.124	Cons. Vol. (CC)	60.93

Data entry by: CL/SR Date: 10/21/2004
Checked by: cal Date: 10/21/04
FileName: TTP00811

ADVANCED TERRA TESTING, INC.

MASS/UNIT AREA & MOISTURE CONTENT (GCL)
ASTM D 5993

CLIENT: Tetra Tech - RMC JOB NO.: 2617-02
PROJECT: Present Landfill Design, RFETS, Golden, CO

ROLL NO.	9684	9684	9684	9684
LOT NO.	200439LO	200439LO	200439LO	200439LO
SAMPLE NO.	1	2	3	4
SAMPLED	09/22/04 SW	09/22/04 SW	09/22/04 SW	09/22/04 SW
DATE TESTED	09/27/04 JTR	09/27/04 JTR	09/27/04 JTR	09/27/04 JTR
GCL DESCRIPTION	Bentomat ST	Bentomat ST	Bentomat ST	Bentomat ST
MASS/UNIT AREA DETERMINATIONS				
Sample Length (in)	4.000	3.990	4.000	4.000
Sample Width (in)	4.000	3.970	3.980	4.000
Sample Area (cm²)	103.23	102.20	102.71	103.23
Mass/Unit Area (gms/m²) Composite	4682.0	4572.6	4461.1	4716.9
Mass of Textile (gms)	3.15	3.12	3.13	3.15
Mass/Unit Area (gms/m²) Bentonite	4377.0	4267.6	4156.1	4411.8
MOISTURE DETERMINATIONS				
Wt. of Wet GCL & Dish (gms)	67.930	66.550	64.760	68.190
Wt. of Dry GCL & Dish (gms)	56.550	55.080	54.180	56.990
Net Loss of Moisture (gms)	11.38	11.47	10.58	11.20
Wt. of Dish (gms)	8.220	8.350	8.360	8.300
Wt. of Dry GCL (gms)	48.33	46.73	45.82	48.69
Moisture Content (Composite) (%)	23.5	24.5	23.1	23.0
Moisture Content (Bentonite) (%)	25.2	26.3	24.8	24.6

ROLL NO.	9684
LOT NO.	200439LO
SAMPLE NO.	5
SAMPLED	09/22/04 SW
DATE TESTED	09/27/04 JTR
GCL DESCRIPTION	Bentomat ST
MASS/UNIT AREA DETERMINATIONS	
Sample Length (in)	4.000
Sample Width (in)	3.980
Sample Area (cm²)	102.71
Mass/Unit Area (gms/m²) Composite	4741.5
Mass of Textile (gms)	3.13
Mass/Unit Area (gms/m²) Bentonite	4436.5
MOISTURE DETERMINATIONS	
Wt. of Wet GCL & Dish (gms)	68.280
Wt. of Dry GCL & Dish (gms)	56.730
Net Loss of Moisture (gms)	11.55
Wt. of Dish (gms)	8.030
Wt. of Dry GCL (gms)	48.70
Moisture Content (Composite) (%)	23.7
Moisture Content (Bentonite) (%)	25.3

Note: Mass of Geotextile was taken from the GFR Specifier's Guide, 2004. Assumed CETCO Bentomat ST Product.

Average Moisture Content (%) (Composite) (5 samples)	**23.58**
Average Mass/Unit Area (Composite) (5 Samples) (gms/m²)	**4634.8**
Average Mass/Unit Area (Dry Bentonite) (5 Samples) (gms/m²)	**4329.8**
Average Moisture Content (%) (Bentonite) (5 samples)	**25.2**

Data entered by: CJW Date: 10/08/2004
Data checked by: JTR Date: 10/8/04
FileName: TTMA9684

ADVANCED TERRA TESTING, INC.

MASS/UNIT AREA & MOISTURE CONTENT (GCL)
ASTM D 5993

CLIENT: Tetra Tech - RMC JOB NO.: 2617-02
PROJECT: Present Landfill Design, RFETS, Golden, CO

ROLL NO.	9728	9728	9728	9728
LOT NO.	200439LO	200439LO	200439LO	200439LO
SAMPLE NO.	1	2	3	4
SAMPLED	09/22/04 SW	09/22/04 SW	09/22/04 SW	09/22/04 SW
DATE TESTED	09/27/04 JTR	09/27/04 JTR	09/27/04 JTR	09/27/04 JTR
GCL DESCRIPTION	Bentomat ST	Bentomat ST	Bentomat ST	Bentomat ST
MASS/UNIT AREA DETERMINATIONS				
Sample Length (in)	3.980	4.000	4.000	4.000
Sample Width (in)	4.000	4.030	4.000	4.000
Sample Area (cm²)	102.71	104.00	103.23	103.23
Mass/Unit Area (gms/m²) Composite	4692.8	4725.0	4637.4	4488.2
Mass of Textile (gms)	3.13	3.17	3.15	3.15
Mass/Unit Area (gms/m²) Bentonite	4387.8	4420.0	4332.4	4183.2
MOISTURE DETERMINATIONS				
Wt. of Wet GCL & Dish (gms)	67.280	69.900	67.810	65.180
Wt. of Dry GCL & Dish (gms)	56.600	57.120	56.540	54.780
Net Loss of Moisture (gms)	10.68	12.78	11.27	10.40
Wt. of Dish (gms)	8.400	7.980	8.670	8.450
Wt. of Dry GCL (gms)	48.20	49.14	47.87	46.33
Moisture Content (Composite) (%)	22.2	26.0	23.5	22.4
Moisture Content (Bentonite) (%)	23.7	27.8	25.2	24.1

ROLL NO.	9728
LOT NO.	200439LO
SAMPLE NO.	5
SAMPLED	09/22/04 SW
DATE TESTED	09/27/04 JTR
GCL DESCRIPTION	Bentomat ST
MASS/UNIT AREA DETERMINATIONS	
Sample Length (in)	3.980
Sample Width (in)	4.000
Sample Area (cm²)	102.71
Mass/Unit Area (gms/m²) Composite	4222.6
Mass of Textile (gms)	3.13
Mass/Unit Area (gms/m²) Bentonite	3917.6
MOISTURE DETERMINATIONS	
Wt. of Wet GCL & Dish (gms)	61.080
Wt. of Dry GCL & Dish (gms)	51.750
Net Loss of Moisture (gms)	9.33
Wt. of Dish (gms)	8.380
Wt. of Dry GCL (gms)	43.37
Moisture Content (Composite) (%)	21.5
Moisture Content (Bentonite) (%)	23.2

Note: Mass of Geotextile was taken from the GFR Specifier's Guide, 2004. Assumed CETCO Bentomat ST Product.

Average Moisture Content (%) (Composite) (5 samples)	**23.13**
Average Mass/Unit Area (Composite) (5 Samples) (gms/m²)	**4553.2**
Average Mass/Unit Area (Dry Bentonite) (5 Samples) (gms/m²)	**4248.2**
Average Moisture Content (%) (Bentonite) (5 samples)	**24.8**

Data entered by: CJW Date: 10/02/2004
Data checked by: JTR Date: 10/6/04
FileName: TTMA9728

ADVANCED TERRA TESTING, INC.

MASS/UNIT AREA & MOISTURE CONTENT (GCL)
ASTM D 5993

CLIENT: Tetra Tech - RMC JOB NO.: 2617-02
PROJECT: Present Landfill Design, RFETS, Golden, CO

ROLL NO.	9772	9772	9772	9772
LOT NO.	200439LO	200439LO	200439LO	200439LO
SAMPLE NO.	1	2	3	4
SAMPLED	09/22/04 SW	09/22/04 SW	09/22/04 SW	09/22/04 SW
DATE TESTED	09/24/04 JTR	09/24/04 JTR	09/24/04 JTR	09/24/04 JTR
GCL DESCRIPTION	Bentomat ST	Bentomat ST	Bentomat ST	Bentomat ST
MASS/UNIT AREA DETERMINATIONS				
Sample Length (in)	4.000	4.000	3.900	3.980
Sample Width (in)	3.980	3.890	3.900	4.020
Sample Area (cm²)	102.71	100.39	98.13	103.22
Mass/Unit Area (gms/m²) Composite	4290.7	4303.4	4588.9	4726.7
Mass of Textile (gms)	3.13	3.06	2.99	3.15
Mass/Unit Area (gms/m²) Bentonite	3985.7	3998.3	4283.8	4421.6
MOISTURE DETERMINATIONS				
Wt. of Wet GCL & Dish (gms)	64.170	63.960	63.720	70.420
Wt. of Dry GCL & Dish (gms)	52.500	52.430	53.130	57.470
Net Loss of Moisture (gms)	11.67	11.53	10.59	12.95
Wt. of Dish (gms)	8.430	9.230	8.100	8.680
Wt. of Dry GCL (gms)	44.07	43.20	45.03	48.79
Moisture Content (Composite) (%)	26.5	26.7	23.5	26.5
Moisture Content (Bentonite) (%)	28.5	28.7	25.2	28.4

ROLL NO.	9772
LOT NO.	200439LO
SAMPLE NO.	5
SAMPLED	09/22/04 SW
DATE TESTED	09/24/04 JTR
GCL DESCRIPTION	Bentomat ST
MASS/UNIT AREA DETERMINATIONS	
Sample Length (in)	4.000
Sample Width (in)	4.000
Sample Area (cm²)	103.23
Mass/Unit Area (gms/m²) Composite	3140.7
Mass of Textile (gms)	3.15
Mass/Unit Area (gms/m²) Bentonite	2835.7
MOISTURE DETERMINATIONS	
Wt. of Wet GCL & Dish (gms)	49.680
Wt. of Dry GCL & Dish (gms)	40.480
Net Loss of Moisture (gms)	9.20
Wt. of Dish (gms)	8.060
Wt. of Dry GCL (gms)	32.42
Moisture Content (Composite) (%)	28.4
Moisture Content (Bentonite) (%)	31.4

Note: Mass of Geotextile was taken from the GFR Specifier's Guide, 2004. Assumed CETCO Bentomat ST Product.

Average Moisture Content (%) (Composite) (5 samples)	**26.32**
Average Mass/Unit Area (Composite) (5 Samples) (gms/m²)	**4210.1**
Average Mass/Unit Area (Dry Bentonite) (5 Samples) (gms/m²)	**3905.0**
Average Moisture Content (%) (Bentonite) (5 samples)	**28.4**

Data entered by: CJW Date: 10/02/2004
Data checked by: JTR Date: 10/8/04
FileName: TTMA9772

ADVANCED TERRA TESTING, INC.

MASS/UNIT AREA & MOISTURE CONTENT (GCL)
ASTM D 5993

CLIENT: Tetra Tech-RMC JOB NO.: 2617-02
PROJECT: Present Landfill Desing-RFETS, Golden, CO

ROLL NO.	10503	10503	10503	10503
LOT NO.	200440L0	200440L0	200440L0	200440L0
SAMPLE NO.	1	2	3	4
SAMPLED				
DATE TESTED	10-04-04 JTR	10-04-04 JTR	10-04-04 JTR	10-04-04 JTR
GCL DESCRIPTION	Bentomat ST	Bentomat ST	Bentomat ST	Bentomat ST
MASS/UNIT AREA DETERMINATIONS				
Sample Length (in)	8.010	8.000	8.000	7.900
Sample Width (in)	3.950	3.990	3.900	3.980
Sample Area (cm²)	204.13	205.94	201.29	202.85
Mass/Unit Area (gms/m²) Composite	3619.8	4205.7	4335.0	5084.0
Mass of Textile (gms)	6.23	6.28	6.14	6.19
Mass/Unit Area (gms/m²) Bentonite	3314.8	3900.7	4030.0	4779.0
MOISTURE DETERMINATIONS				
Wt. of Wet GCL & Dish (gms)	106.910	125.000	124.030	143.370
Wt. of Dry GCL & Dish (gms)	89.460	102.800	103.220	119.090
Net Loss of Moisture (gms)	17.45	22.20	20.81	24.28
Wt. of Dish (gms)	15.570	16.190	15.960	15.960
Wt. of Dry GCL (gms)	73.89	86.61	87.26	103.13
Moisture Content (Composite) (%)	23.6	25.6	23.8	23.5
Moisture Content (Bentonite) (%)	25.8	27.6	25.7	25.0

ROLL NO.	10503
LOT NO.	200440L0
SAMPLE NO.	5
SAMPLED	
DATE TESTED	10-04-04 JTR
GCL DESCRIPTION	Bentomat ST
MASS/UNIT AREA DETERMINATIONS	
Sample Length (in)	8.000
Sample Width (in)	4.000
Sample Area (cm²)	206.45
Mass/Unit Area (gms/m²) Composite	3303.9
Mass of Textile (gms)	6.30
Mass/Unit Area (gms/m²) Bentonite	2998.9
MOISTURE DETERMINATIONS	
Wt. of Wet GCL & Dish (gms)	102.860
Wt. of Dry GCL & Dish (gms)	84.260
Net Loss of Moisture (gms)	18.60
Wt. of Dish (gms)	16.050
Wt. of Dry GCL (gms)	68.21
Moisture Content (Composite) (%)	27.3
Moisture Content (Bentonite) (%)	30.0

Note: Mass of Geotextile was taken from the GFR Specifier's Guide, 2004. Assumed CETCO Bentomat ST Product.

Average Moisture Content (%) (Composite) (5 samples)	**24.78**
Average Mass/Unit Area (Composite) (5 Samples) (gms/m²)	**4109.7**
Average Mass/Unit Area (Dry Bentonite) (5 Samples) (gms/m²)	**3804.7**
Average Moisture Content (%) (Bentonite) (5 samples)	**26.8**

Data entered by: SR Date: 10/06/2004
Data checked by: JTR Date: 10/6/04
FileName: TTMA0503

ADVANCED TERRA TESTING, INC.

ASS/UNIT AREA & MOISTURE CONTENT (GCL)
ASTM D 5993

CLIENT: Tetra Tech - RMC JOB NO.: 2617-02
PROJECT: Present Landfill Design, RFETS, Golden, CO

ROLL NO.	10547	10547	10547	10547
LOT NO.	200440LO	200440LO	200440LO	200440LO
SAMPLE NO.	1	2	3	4
SAMPLED				
DATE TESTED	10-06-04 JTR	10-06-04 JTR	10-06-04 JTR	10-06-04 JTR
GCL DESCRIPTION	Bentomat ST	Bentomat ST	Bentomat ST	Bentomat ST
MASS/UNIT AREA DETERMINATIONS				
Sample Length (in)	7.900	8.000	8.000	8.000
Sample Width (in)	4.000	4.000	4.000	4.000
Sample Area (cm²)	203.87	206.45	206.45	206.45
Mass/Unit Area (gms/m²) Composite	4141.4	5130.5	4736.7	4133.2
Mass of Textile (gms)	6.22	6.30	6.30	6.30
Mass/Unit Area (gms/m²) Bentonite	3836.3	4825.5	4431.7	3828.2
MOISTURE DETERMINATIONS				
Wt. of Wet GCL & Dish (gms)	119.360	148.730	139.550	123.220
Wt. of Dry GCL & Dish (gms)	99.510	122.110	113.670	101.560
Net Loss of Moisture (gms)	19.85	26.62	25.88	21.66
Wt. of Dish (gms)	15.080	16.190	15.880	16.230
Wt. of Dry GCL (gms)	84.43	105.92	97.79	85.33
Moisture Content (Composite) (%)	23.5	25.1	26.5	25.4
Moisture Content (Bentonite) (%)	25.4	26.7	28.3	27.4

ROLL NO.	10547
T NO.	200440LO
AMPLE NO.	5
AMPLED	
DATE TESTED	10-06-04 JTR
GCL DESCRIPTION	Bentomat ST
MASS/UNIT AREA DETERMINATIONS	
Sample Length (in)	8.000
Sample Width (in)	3.980
Sample Area (cm²)	205.42
Mass/Unit Area (gms/m²) Composite	4126.2
Mass of Textile (gms)	6.27
Mass/Unit Area (gms/m²) Bentonite	3821.2
MOISTURE DETERMINATIONS	
Wt. of Wet GCL & Dish (gms)	119.630
Wt. of Dry GCL & Dish (gms)	100.600
Net Loss of Moisture (gms)	19.03
Wt. of Dish (gms)	15.840
Wt. of Dry GCL (gms)	84.76
Moisture Content (Composite) (%)	22.5
Moisture Content (Bentonite) (%)	24.2

Note: Mass of Geotextile was taken from the GFR Specifier's Guide, 2004. Assumed CETCO Bentomat ST Product.

Average Moisture Content (%) (Composite) (5 samples)	**24.59**
Average Mass/Unit Area (Composite) (5 Samples) (gms/m²)	**4453.6**
Average Mass/Unit Area (Dry Bentonite) (5 Samples) (gms/m²)	**4148.6**
Average Moisture Content (%) (Bentonite) (5 samples)	**26.4**

ta entered by: SR Date: 10/08/2004
a checked by: JTR Date: 10/8/04
eName: TTMA0547

ADVANCED TERRA TESTING, INC.

MASS/UNIT AREA & MOISTURE CONTENT (GCL)
ASTM D 5993

CLIENT: Tetra Tech-RMC JOB NO.: 2617-02
PROJECT: Present Landfill Desing-RFETS, Golden, CO

ROLL NO.	10591	10591	10591	10591
LOT NO.	200440L0	200440L0	200440L0	200440L0
SAMPLE NO.	1	2	3	4
SAMPLED				
DATE TESTED	10-04-04 JTR	10-04-04 JTR	10-04-04 JTR	10-04-04 JTR
GCL DESCRIPTION	Bentomat ST	Bentomat ST	Bentomat ST	Bentomat ST
MASS/UNIT AREA DETERMINATIONS				
Sample Length (in)	8.020	8.000	7.980	7.970
Sample Width (in)	4.000	4.000	4.000	3.990
Sample Area (cm²)	206.97	206.45	205.94	205.16
Mass/Unit Area (gms/m²) Composite	3496.2	3829.0	5312.4	3799.9
Mass of Textile (gms)	6.31	6.30	6.28	6.26
Mass/Unit Area (gms/m²) Bentonite	3191.2	3524.0	5007.3	3494.9
MOISTURE DETERMINATIONS				
Wt. of Wet GCL & Dish (gms)	107.850	117.460	152.600	116.000
Wt. of Dry GCL & Dish (gms)	88.530	94.330	124.480	93.030
Net Loss of Moisture (gms)	19.32	23.13	28.12	22.97
Wt. of Dish (gms)	16.170	15.280	15.080	15.070
Wt. of Dry GCL (gms)	72.36	79.05	109.40	77.96
Moisture Content (Composite) (%)	26.7	29.3	25.7	29.5
Moisture Content (Bentonite) (%)	29.3	31.8	27.3	32.0

ROLL NO.	10591
LOT NO.	200440L0
SAMPLE NO.	5
SAMPLED	
DATE TESTED	10-04-04 JTR
GCL DESCRIPTION	Bentomat ST
MASS/UNIT AREA DETERMINATIONS	
Sample Length (in)	7.940
Sample Width (in)	4.000
Sample Area (cm²)	204.90
Mass/Unit Area (gms/m²) Composite	4639.3
Mass of Textile (gms)	6.25
Mass/Unit Area (gms/m²) Bentonite	4334.3
MOISTURE DETERMINATIONS	
Wt. of Wet GCL & Dish (gms)	132.030
Wt. of Dry GCL & Dish (gms)	110.790
Net Loss of Moisture (gms)	21.24
Wt. of Dish (gms)	15.730
Wt. of Dry GCL (gms)	95.06
Moisture Content (Composite) (%)	22.3
Moisture Content (Bentonite) (%)	23.9

Note: Mass of Geotextile was taken from the GFR Specifier's Guide, 2004. Assumed CETCO Bentomat ST Product.

Average Moisture Content (%) (Composite) (5 samples)	**26.69**
Average Mass/Unit Area (Composite) (5 Samples) (gms/m²)	**4215.3**
Average Mass/Unit Area (Dry Bentonite) (5 Samples) (gms/m²)	**3910.3**
Average Moisture Content (%) (Bentonite) (5 samples)	**28.9**

Data entered by: SR Date: 10/08/2004
Data checked by: JTR Date: 10/8/04
FileName: TTMA0591

ADVANCED TERRA TESTING, INC.

ASS/UNIT AREA & MOISTURE CONTENT (GCL)
ASTM D 5993

CLIENT: Tetra Tech - RMC — JOB NO.: 2617-02
PROJECT: Present Landfill Design, RFETS, Golden, CO

ROLL NO.	10635	10635	10635	10635
LOT NO.	200440LO	200440LO	200440LO	200440LO
SAMPLE NO.	1	2	3	4
SAMPLED				
DATE TESTED	10-06-04 JTR	10-06-04 JTR	10-06-04 JTR	10-06-04 JTR
GCL DESCRIPTION	Bentomat ST	Bentomat ST	Bentomat ST	Bentomat ST
MASS/UNIT AREA DETERMINATIONS				
Sample Length (in)	8.000	7.940	8.000	8.000
Sample Width (in)	4.000	4.000	3.970	3.930
Sample Area (cm²)	206.45	204.90	204.90	202.84
Mass/Unit Area (gms/m²) Composite	4503.2	4737.4	5040.4	5553.7
Mass of Textile (gms)	6.30	6.25	6.25	6.19
Mass/Unit Area (gms/m²) Bentonite	4198.2	4432.3	4735.4	5248.7
MOISTURE DETERMINATIONS				
Wt. of Wet GCL & Dish (gms)	131.460	137.310	145.120	157.980
Wt. of Dry GCL & Dish (gms)	109.010	112.980	119.340	127.690
Net Loss of Moisture (gms)	22.45	24.33	25.78	30.29
Wt. of Dish (gms)	16.040	15.910	16.060	15.040
Wt. of Dry GCL (gms)	92.97	97.07	103.28	112.65
Moisture Content (Composite) (%)	24.1	25.1	25.0	26.9
Moisture Content (Bentonite) (%)	25.9	26.8	26.6	28.5

ROLL NO.	10635
LOT NO.	200440LO
SAMPLE NO.	5
SAMPLED	
DATE TESTED	10-06-04 JTR
GCL DESCRIPTION	Bentomat ST
MASS/UNIT AREA DETERMINATIONS	
Sample Length (in)	8.000
Sample Width (in)	4.030
Sample Area (cm²)	208.00
Mass/Unit Area (gms/m²) Composite	4698.1
Mass of Textile (gms)	6.34
Mass/Unit Area (gms/m²) Bentonite	4393.1
MOISTURE DETERMINATIONS	
Wt. of Wet GCL & Dish (gms)	136.740
Wt. of Dry GCL & Dish (gms)	113.330
Net Loss of Moisture (gms)	23.41
Wt. of Dish (gms)	15.610
Wt. of Dry GCL (gms)	97.72
Moisture Content (Composite) (%)	24.0
Moisture Content (Bentonite) (%)	25.6

Note: Mass of Geotextile was taken from the GFR Specifier's Guide, 2004. Assumed CETCO Bentomat ST Product.

Average Moisture Content (%) (Composite) (5 samples)	**25.00**
Average Mass/Unit Area (Composite) (5 Samples) (gms/m²)	**4906.6**
Average Mass/Unit Area (Dry Bentonite) (5 Samples) (gms/m²)	**4601.5**
Average Moisture Content (%) (Bentonite) (5 samples)	**26.7**

Data entered by: SR — Date: 10/08/2004
Data checked by: JTR — Date: 10/8/04
FileName: TTMA0635

ADVANCED TERRA TESTING, INC.

MASS/UNIT AREA & MOISTURE CONTENT (GCL)
ASTM D 5993

CLIENT: Tetra Tech - RMC JOB NO.: 2617-02
PROJECT: Present Landfill Design, RFETS, Golden, CO

ROLL NO.	10679	10679	10679	10679
LOT NO.	200440LO	200440LO	200440LO	200440LO
SAMPLE NO.	1	2	3	4
SAMPLED				
DATE TESTED	10-06-04 JTR	10-06-04 JTR	10-06-04 JTR	10-06-04 JTR
GCL DESCRIPTION	Bentomat ST	Bentomat ST	Bentomat ST	Bentomat ST
MASS/UNIT AREA DETERMINATIONS				
Sample Length (in)	8.000	8.000	8.000	7.950
Sample Width (in)	4.000	4.000	4.030	4.010
Sample Area (cm²)	206.45	206.45	208.00	205.67
Mass/Unit Area (gms/m²) Composite	4077.0	4815.2	5039.9	3716.6
Mass of Textile (gms)	6.30	6.30	6.34	6.27
Mass/Unit Area (gms/m²) Bentonite	3772.0	4510.2	4734.9	3411.5
MOISTURE DETERMINATIONS				
Wt. of Wet GCL & Dish (gms)	121.940	139.200	146.370	111.200
Wt. of Dry GCL & Dish (gms)	100.100	114.110	119.990	91.680
Net Loss of Moisture (gms)	21.84	25.09	26.38	19.52
Wt. of Dish (gms)	15.930	14.700	15.160	15.240
Wt. of Dry GCL (gms)	84.17	99.41	104.83	76.44
Moisture Content (Composite) (%)	25.9	25.2	25.2	25.5
Moisture Content (Bentonite) (%)	28.0	26.9	26.8	27.8

ROLL NO.	10679
LOT NO.	200440LO
SAMPLE NO.	5
SAMPLED	
DATE TESTED	10-06-04 JTR
GCL DESCRIPTION	Bentomat ST
MASS/UNIT AREA DETERMINATIONS	
Sample Length (in)	8.000
Sample Width (in)	4.000
Sample Area (cm²)	206.45
Mass/Unit Area (gms/m²) Composite	4116.7
Mass of Textile (gms)	6.30
Mass/Unit Area (gms/m²) Bentonite	3811.7
MOISTURE DETERMINATIONS	
Wt. of Wet GCL & Dish (gms)	122.850
Wt. of Dry GCL & Dish (gms)	100.850
Net Loss of Moisture (gms)	22.00
Wt. of Dish (gms)	15.860
Wt. of Dry GCL (gms)	84.99
Moisture Content (Composite) (%)	25.9
Moisture Content (Bentonite) (%)	28.0

Note: Mass of Geotextile was taken from the GFR Specifier's Guide, 2004. Assumed CETCO Bentomat ST Product.

Average Moisture Content (%) (Composite) (5 samples)	**25.55**
Average Mass/Unit Area (Composite) (5 Samples) (gms/m²)	**4353.1**
Average Mass/Unit Area (Dry Bentonite) (5 Samples) (gms/m²)	**4048.1**
Average Moisture Content (%) (Bentonite) (5 samples)	**27.5**

Data entered by: SR Date: 10/07/2004
Data checked by: JTR Date: 10/8/04
FileName: TTMA0679

ADVANCED TERRA TESTING, INC.

MASS/UNIT AREA & MOISTURE CONTENT (GCL)
ASTM D 5993

CLIENT: Tetra Tech - RMC JOB NO.: 2617-02
PROJECT: Present Landfill Design, RFETS, Golden, CO

ROLL NO.	10723	10723	10723	10723
LOT NO.	200440LO	200440LO	200440LO	200440LO
SAMPLE NO.	1	2	3	4
SAMPLED				
DATE TESTED	10-07-04 JTR	10-07-04 JTR	10-07-04 JTR	10-07-04 JTR
GCL DESCRIPTION	Bentomat ST	Bentomat ST	Bentomat ST	Bentomat ST
MASS/UNIT AREA DETERMINATIONS				
Sample Length (in)	8.000	7.980	8.000	8.010
Sample Width (in)	4.020	3.960	4.000	4.000
Sample Area (cm²)	207.48	203.88	206.45	206.71
Mass/Unit Area (gms/m²) Composite	4868.3	3798.9	4558.0	4555.2
Mass of Textile (gms)	6.33	6.22	6.30	6.31
Mass/Unit Area (gms/m²) Bentonite	4563.3	3493.9	4253.0	4250.2
MOISTURE DETERMINATIONS				
Wt. of Wet GCL & Dish (gms)	141.000	111.890	134.980	134.160
Wt. of Dry GCL & Dish (gms)	116.090	92.510	109.410	109.370
Net Loss of Moisture (gms)	24.91	19.38	25.57	24.79
Wt. of Dish (gms)	15.080	15.060	15.310	15.210
Wt. of Dry GCL (gms)	101.01	77.45	94.10	94.16
Moisture Content (Composite) (%)	24.7	25.0	27.2	26.3
Moisture Content (Bentonite) (%)	26.3	27.2	29.1	28.2

ROLL NO.	10723
LOT NO.	200440LO
SAMPLE NO.	5
SAMPLED	
DATE TESTED	10-07-04 JTR
GCL DESCRIPTION	Bentomat ST
MASS/UNIT AREA DETERMINATIONS	
Sample Length (in)	7.990
Sample Width (in)	3.990
Sample Area (cm²)	205.68
Mass/Unit Area (gms/m²) Composite	5616.6
Mass of Textile (gms)	6.27
Mass/Unit Area (gms/m²) Bentonite	5311.5
MOISTURE DETERMINATIONS	
Wt. of Wet GCL & Dish (gms)	158.690
Wt. of Dry GCL & Dish (gms)	131.500
Net Loss of Moisture (gms)	27.19
Wt. of Dish (gms)	15.980
Wt. of Dry GCL (gms)	115.52
Moisture Content (Composite) (%)	23.5
Moisture Content (Bentonite) (%)	24.9

Note: Mass of Geotextile was taken from the GFR Specifier's Guide, 2004. Assumed CETCO Bentomat ST Product.

Average Moisture Content (%) (Composite) (5 samples)	**25.34**
Average Mass/Unit Area (Composite) (5 Samples) (gms/m²)	**4679.4**
Average Mass/Unit Area (Dry Bentonite) (5 Samples) (gms/m²)	**4374.4**
Average Moisture Content (%) (Bentonite) (5 samples)	**27.1**

Data entered by: SR Date: 10/08/2004
Data checked by: JTR Date: 10-8-04
FileName: TTMA0723

ADVANCED TERRA TESTING, INC.

MASS/UNIT AREA & MOISTURE CONTENT (GCL)
ASTM D 5993

CLIENT: Tetra Tech - RMC JOB NO.: 2617-02
PROJECT: Present Landfill Design, RFETS, Golden, CO

ROLL NO.	10767	10767	10767	10767
LOT NO.	200440LO	200440LO	200440LO	200440LO
SAMPLE NO.	1	2	3	4
SAMPLED				
DATE TESTED	10-07-04 JTR	10-07-04 JTR	10-07-04 JTR	10-07-04 JTR
GCL DESCRIPTION	Bentomat ST	Bentomat ST	Bentomat ST	Bentomat ST
MASS/UNIT AREA DETERMINATIONS				
Sample Length (in)	8.000	8.000	7.990	8.000
Sample Width (in)	4.000	3.980	4.000	3.970
Sample Area (cm^2)	206.45	205.42	206.19	204.90
Mass/Unit Area (gms/m^2) Composite	3655.6	4602.3	4695.1	4189.3
Mass of Textile (gms)	6.30	6.27	6.29	6.25
Mass/Unit Area (gms/m^2) Bentonite	3350.6	4297.3	4390.1	3884.3
MOISTURE DETERMINATIONS				
Wt. of Wet GCL & Dish (gms)	110.690	134.820	136.720	125.480
Wt. of Dry GCL & Dish (gms)	90.550	110.770	112.830	101.960
Net Loss of Moisture (gms)	20.14	24.05	23.89	23.52
Wt. of Dish (gms)	15.080	16.230	16.020	16.120
Wt. of Dry GCL (gms)	75.47	94.54	96.81	85.84
Moisture Content (Composite) (%)	26.7	25.4	24.7	27.4
Moisture Content (Bentonite) (%)	29.1	27.2	26.4	29.6

ROLL NO.	10767
LOT NO.	200440LO
SAMPLE NO.	5
SAMPLED	
DATE TESTED	10-07-04 JTR
GCL DESCRIPTION	Bentomat ST
MASS/UNIT AREA DETERMINATIONS	
Sample Length (in)	8.000
Sample Width (in)	4.000
Sample Area (cm^2)	206.45
Mass/Unit Area (gms/m^2) Composite	4560.4
Mass of Textile (gms)	6.30
Mass/Unit Area (gms/m^2) Bentonite	4255.4
MOISTURE DETERMINATIONS	
Wt. of Wet GCL & Dish (gms)	134.380
Wt. of Dry GCL & Dish (gms)	110.530
Net Loss of Moisture (gms)	23.85
Wt. of Dish (gms)	16.380
Wt. of Dry GCL (gms)	94.15
Moisture Content (Composite) (%)	25.3
Moisture Content (Bentonite) (%)	27.1

Note: Mass of Geotextile was taken from the GFR Specifier's Guide, 2004. Assumed CETCO Bentomat ST Product.

Average Moisture Content (%) (Composite) (5 samples)	**25.91**
Average Mass/Unit Area (Composite) (5 Samples) (gms/m^2)	**4340.5**
Average Mass/Unit Area (Dry Bentonite) (5 Samples) (gms/m^2)	**4035.5**
Average Moisture Content (%) (Bentonite) (5 samples)	**27.9**

Data entered by: SR Date: 10/08/2004
Data checked by: JTR Date: 10/8/04
FileName: TTMA0767

ADVANCED TERRA TESTING, INC.

ASS/UNIT AREA & MOISTURE CONTENT (GCL)
ASTM D 5993

CLIENT: Tetra Tech - RMC JOB NO.: 2617-02
PROJECT: Present Landfill Design, RFETS, Golden, CO

ROLL NO.	10811	10811	10811	10811
LOT NO.	200440LO	200440LO	200440LO	200440LO
SAMPLE NO.	1	2	3	4
SAMPLED				
DATE TESTED	10-07-04 JTR	10-07-04 JTR	10-07-04 JTR	10-07-04 JTR
GCL DESCRIPTION	Bentomat ST	Bentomat ST	Bentomat ST	Bentomat ST
MASS/UNIT AREA DETERMINATIONS				
Sample Length (in)	8.020	8.000	8.000	8.000
Sample Width (in)	4.030	4.000	4.010	4.000
Sample Area (cm²)	208.52	206.45	206.97	206.45
Mass/Unit Area (gms/m²) Composite	4161.2	4902.4	4660.6	4548.8
Mass of Textile (gms)	6.36	6.30	6.31	6.30
Mass/Unit Area (gms/m²) Bentonite	3856.2	4597.4	4355.6	4243.8
MOISTURE DETERMINATIONS				
Wt. of Wet GCL & Dish (gms)	123.350	142.320	136.650	134.080
Wt. of Dry GCL & Dish (gms)	102.020	117.610	112.850	110.400
Net Loss of Moisture (gms)	21.33	24.71	23.80	23.68
Wt. of Dish (gms)	15.250	16.400	16.390	16.490
Wt. of Dry GCL (gms)	86.77	101.21	96.46	93.91
Moisture Content (Composite) (%)	24.6	24.4	24.7	25.2
Moisture Content (Bentonite) (%)	26.5	26.0	26.4	27.0

ROLL NO.	10811
OT NO.	200440LO
AMPLE NO.	5
SAMPLED	
DATE TESTED	10-07-04 JTR
GCL DESCRIPTION	Bentomat ST
MASS/UNIT AREA DETERMINATIONS	
Sample Length (in)	7.950
Sample Width (in)	4.020
Sample Area (cm²)	206.19
Mass/Unit Area (gms/m²) Composite	4215.1
Mass of Textile (gms)	6.29
Mass/Unit Area (gms/m²) Bentonite	3910.1
MOISTURE DETERMINATIONS	
Wt. of Wet GCL & Dish (gms)	127.790
Wt. of Dry GCL & Dish (gms)	103.170
Net Loss of Moisture (gms)	24.62
Wt. of Dish (gms)	16.260
Wt. of Dry GCL (gms)	86.91
Moisture Content (Composite) (%)	28.3
Moisture Content (Bentonite) (%)	30.5

Note: Mass of Geotextile was taken from the GFR Specifier's Guide, 2004. Assumed CETCO Bentomat ST Product.

Average Moisture Content (%) (Composite) (5 samples)	**25.44**
Average Mass/Unit Area (Composite) (5 Samples) (gms/m²)	**4497.6**
Average Mass/Unit Area (Dry Bentonite) (5 Samples) (gms/m²)	**4192.6**
Average Moisture Content (%) (Bentonite) (5 samples)	**27.3**

ata entered by: SR Date: 10/08/2004
ta checked by: JTR Date: 10/8/04
leName: TTMA0811

ADVANCED TERRA TESTING, INC.

Moisture Content Determinations
ASTM D 2216

CLIENT: Tetra Tech-RMC JOB NO.: 2617-02
LOCATION: Present Landfill Design-RFETS, Golden, CO

ROLL NUMBER	9972	9684
LOT NUMBER	200439LO	200439LO
SAMPLE NO.		
DATE SAMPLED		
DATE TESTED	10-08-04 JTR	10-08-04 JTR
GCL DESCRIPTION	Bentomat ST	Bentomat ST
MOISTURE DETERMINATIONS		
Wt. of Wet Soil & Dish (gms)	55.37	31.65
Wt. of Dry Soil & Dish (gms)	46.86	26.69
Net Loss of Moisture (gms)	8.51	4.96
Wt. of Dish (gms)	4.46	4.66
Wt. of Dry Soil (gms)	42.40	22.03
Moisture Content (%)	20.1	22.5

Data entered by: SR Date: 10/13/2004
Data checked by: SHL Date: 10/25/04
FileName: TTN07284

ADVANCED TERRA TESTING, INC.

Moisture Content Determinations
ASTM D 2216

CLIENT: Tetra Tech - RMC JOB NO.: 2617-02
LOCATION: Present Landfill Design - RFETS, Golden, CO

BORING	
SAMPLE DEPTH	
ROLL NUMBER	9728
LOT NUMBER	200439L0
DATE TESTED	09-29-04 SR
SOIL DESCRIPTION	
MOISTURE DETERMINATIONS	
Wt. of Wet Soil & Dish (gms)	115.27
Wt. of Dry Soil & Dish (gms)	97.75
Net Loss of Moisture (gms)	17.52
Wt. of Dish (gms)	4.47
Wt. of Dry Soil (gms)	93.28
Moisture Content (%)	18.8

Data entered by:
Data checked by: JTR
Name:

SR
Date: 10/8/04

Date: 09/30/2004

TTN09728

ADVANCED TERRA TESTING, INC.

Moisture Content Determinations
ASTM D 2216

CLIENT: Tetra Tech-RMC JOB NO.: 2617-02
LOCATION: Present Landfill Design-RFETS, Golden CO

LOT NUMBER	200440L0	200440L0
SAMPLE DEPTH		
ROLL NUMBER	10591	10503
DATE SAMPLED		
DATE TESTED	10-04-04 JTR	10-04-04 JTR
CGL DESCRIPTION	Bentomat ST	Bentomat ST
MOISTURE DETERMINATIONS		
Wt. of Wet Soil & Dish (gms)	31.81	56.49
Wt. of Dry Soil & Dish (gms)	26.76	46.87
Net Loss of Moisture (gms)	5.05	9.62
Wt. of Dish (gms)	4.38	4.53
Wt. of Dry Soil (gms)	22.38	42.34
Moisture Content (%)	22.6	22.7

Data entered by: JTR SR Date: 10/08/2004
Data checked by: JTR Date: 10/8/04
FileName: TTN09103 ADVANCED TERRA TESTING, INC.

Moisture Content Determinations
ASTM D 2216

CLIENT: Tetra Tech - RMC JOB NO.: 2617-02
LOCATION: Present Landfill Design-RFETS, Golden, CO

ROLL NO.	10679	10635	10547
LOT NO.	200440L0	200440L0	200440L0
SAMPLE NO.			
SAMPLED			
DATE TESTED	10-06-04 JTR	10-06-04 JTR	10-06-04 JTR
GCL DESCRIPTION	Bentomat ST	Bentomat ST	Bentomat ST
MOISTURE DETERMINATIONS			
Wt. of Wet Soil & Dish (gms)	61.18	48.30	48.32
Wt. of Dry Soil & Dish (gms)	50.00	40.05	40.00
Net Loss of Moisture (gms)	11.18	8.25	8.32
Wt. of Dish (gms)	4.64	4.56	4.42
Wt. of Dry Soil (gms)	45.36	35.49	35.58
Moisture Content (%)	24.6	23.2	23.4

Data entered by: JTR
checked by: JTR
Name:

SR
Date: 10/8/04
TTN0957

Date: 10/08/2004

ADVANCED TERRA TESTING, INC.

Moisture Content Determinations
ASTM D 2216

CLIENT: Tetra Tech - RMC JOB NO.: 2617-02
LOCATION: Present Landfill Design-RFETS, Golden, CO

ROLL NO.	10723	10767	10811
LOT NO.	200440L0	200440L0	200440L0
SAMPLE NO.			
SAMPLED			
DATE TESTED	10-07-04 JTR	10-07-04 JTR	10-07-04 SR
GCL DESCRIPTION	Bentomat ST	Bentomat ST	Bentomat ST
MOISTURE DETERMINATIONS			
Wt. of Wet Soil & Dish (gms)	48.73	48.15	46.60
Wt. of Dry Soil & Dish (gms)	40.60	39.34	38.13
Net Loss of Moisture (gms)	8.13	8.81	8.47
Wt. of Dish (gms)	4.46	4.42	4.53
Wt. of Dry Soil (gms)	36.14	34.92	33.60
Moisture Content (%)	22.5	25.2	25.2

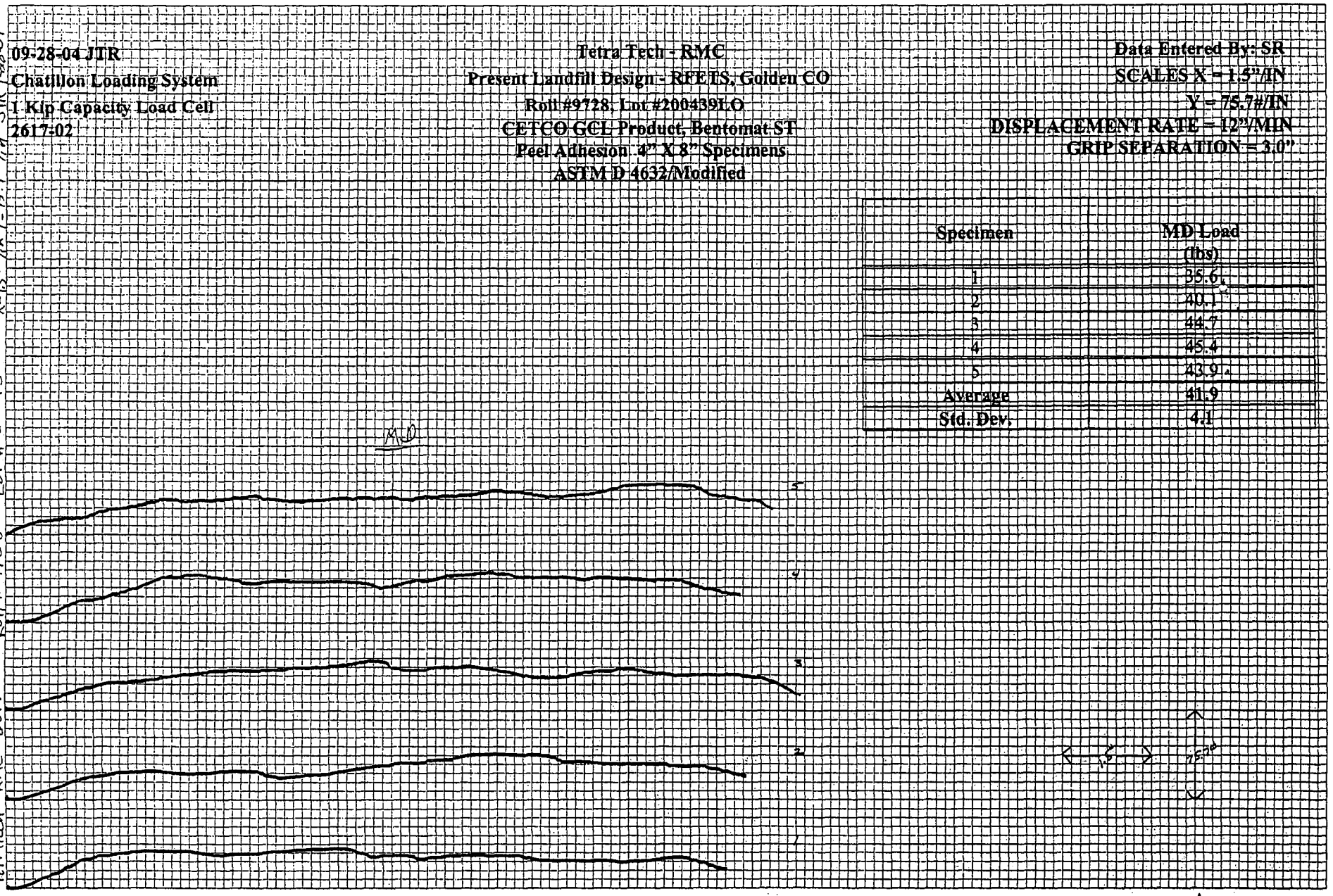
Data entered by: JTR SR Date: 10/08/2004
Data checked by: Date: 10/8/04
FileName: TTN0371 ADVANCED TERRA TESTING, INC.

09-28-04 JTR
Chatillon Loading System
1 Kip Capacity Load Cell
2617-02

Tetra Tech - RMC
Present Landfill Design - REELS, Golden CO
Roll #9728, Lot #200439LO
CETCO GCL Product, Bentomat ST
Peel Adhesion 4" X 8" Specimens
ASTM D 4632/Modified

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN
DISPLACEMENT RATE = 12"/MIN
GRIP SEPARATION = 3.0"

Specimen	MD Load (lbs)
1	35.6
2	40.1
3	44.7
4	45.4
5	43.9
Average	41.9
Std. Dev.	4.1



Tetratech - RMC 2617-02 Roll # 9728 Lot # 200439LO X=1.5"/in Y=75.7#/in JTR 9-28-04

Data Checked By: JTR Date: 9/30/04
Filename: K:/TT2617/TTPA9728.lwp

ADVANCED TERRA TESTING, Inc

09-28-04 JTR

Chatillon Loading System

1 Kip Capacity Load Cell

2617-02

Tetra Tech - RMC

Present Landfill Design - RFETS, Golden CO

Roll #9728, Lot #2004391.0

CETCO GCL Product, Bentomat ST

Peel Adhesion 4" X 8" Specimens

ASTM D 4632/Modified

Data Entered By: SR

SCALES X = 1.5"/IN

Y = 75.7#/IN

DISPLACEMENT RATE = 12"/MIN

GRIP SEPARATION = 3.0"

Specimen	CMD Load (lbs)
1	46.2
2	47.7
3	44.7
4	39.4
5	53.7
Average	46.3
Std. Dev.	5.2

CMD

Tetra tech - RMC 2617-02 Roll # 9728 Lot # 2004391.0 X=1.5"/in Y=75.7#/in JTR 9-28-04

Data Checked By: JTR Date: 9/30/04

Filename: K:/TT2617/TTPA972C.lwp

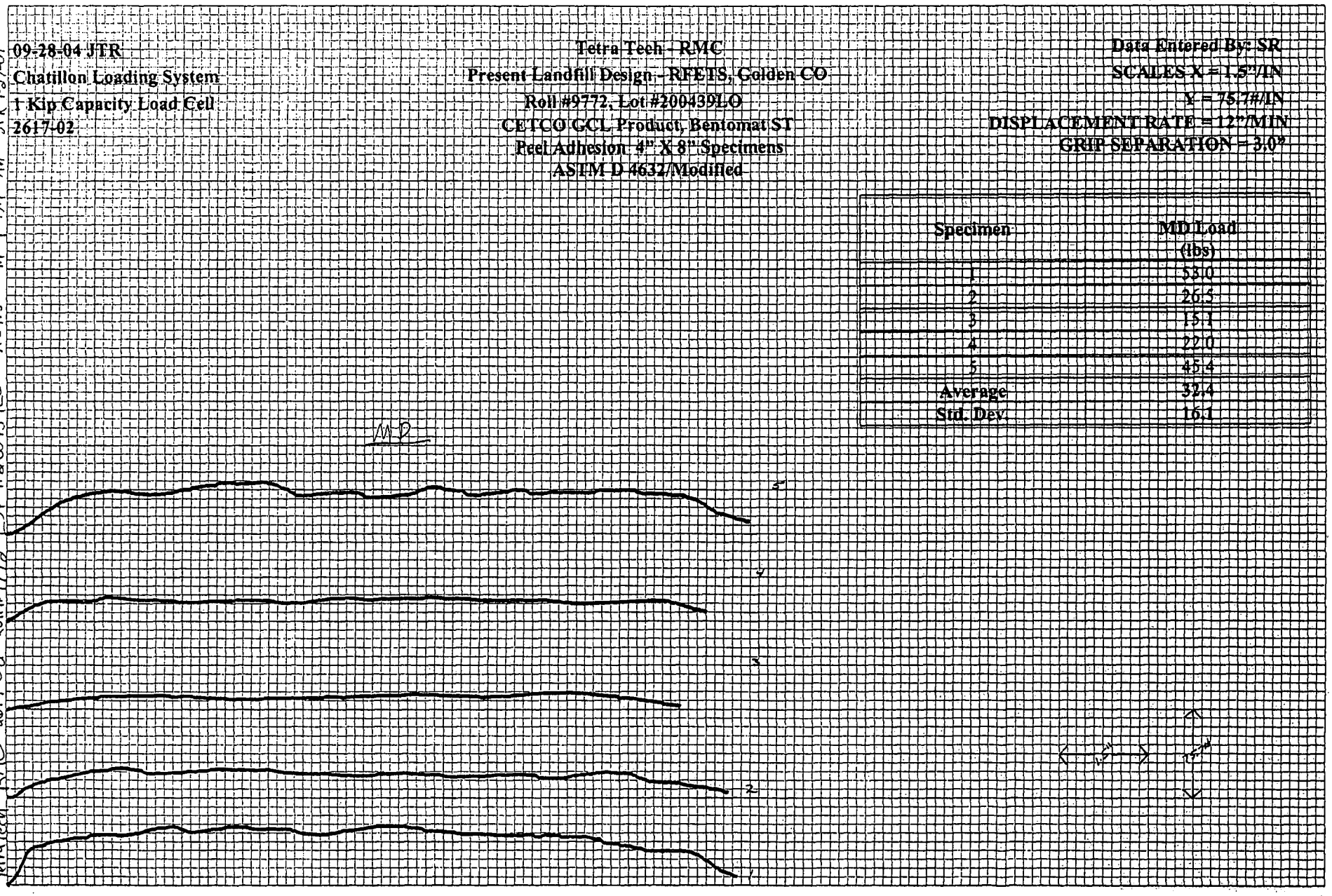
ADVANCED TERRA TESTING, Inc

09-28-04 JTR
Chatillon Loading System
1 Kip Capacity Load Cell
2617-02

Tetra Tech - RMC
Present Landfill Design - RFETS, Golden CO
Roll #9772, Lot #20043LO
CETCO GCL Product, Bentomat ST
Peel Adhesion 4" X 8" Specimens
ASTM D 4632/Modified

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN
DISPLACEMENT RATE = 12"/MIN
GRIP SEPARATION = 3.0"

Specimen	MD Load (lbs)
1	53.0
2	26.5
3	15.1
4	22.0
5	45.4
Average	32.4
Std. Dev.	16.1



SR 9-27-04
Y=75.7#/in X=1.5"/in Lot #20043LO Roll#9772 2617-02 Tetratech-RMC

Data Checked By: JTR Date: 9/30/04
Filename: K:/TT2617/TTPA9772.lwp

ADVANCED TERRA TESTING, Inc

09-28-04 JTR
Chatillon Loading System
1 Kip Capacity Load Cell
2617-02

Tetra Tech - RMC
Present Landfill Design - RFETS, Golden CO
Roll #9772, Lot #200439LO
CETCO GCL Product, Bentomat ST
Peel Adhesion 4" X 8" Specimens
ASTM D 4632/Modified

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN
DISPLACEMENT RATE = 12"/MIN
GRIP SEPARATION = 3.0"

Specimen	CMD Load (lbs)
1	31.8
2	37.9
3	25.0
4	32.6
5	32.6
Average	32.0
Std. Dev.	4.6

JTR 9-27-04 Y= 75.7 #'s/in X= 1.5 "/in Lot# 200439LO Roll# 9772 2617-02 Tetratech-RMC

CMD

Data Checked By: JTR Date: 9/30/04
Filename: K:/TT2617/TTPA977C.lwp

ADVANCED TERRA TESTING, Inc

09-28-04 JTR

Chatillon Loading System

1 Kip Capacity Load Cell

2617-02

Tetra Tech - RMC

Present Landfill Design - RFETS, Golden CO

Roll #9684, Lot #200439LO

CETCO GCL Product: Bentomat ST

Peel Adhesion 4" X 8" Specimens

ASTM D 4632/Modified

Data Entered By: SR

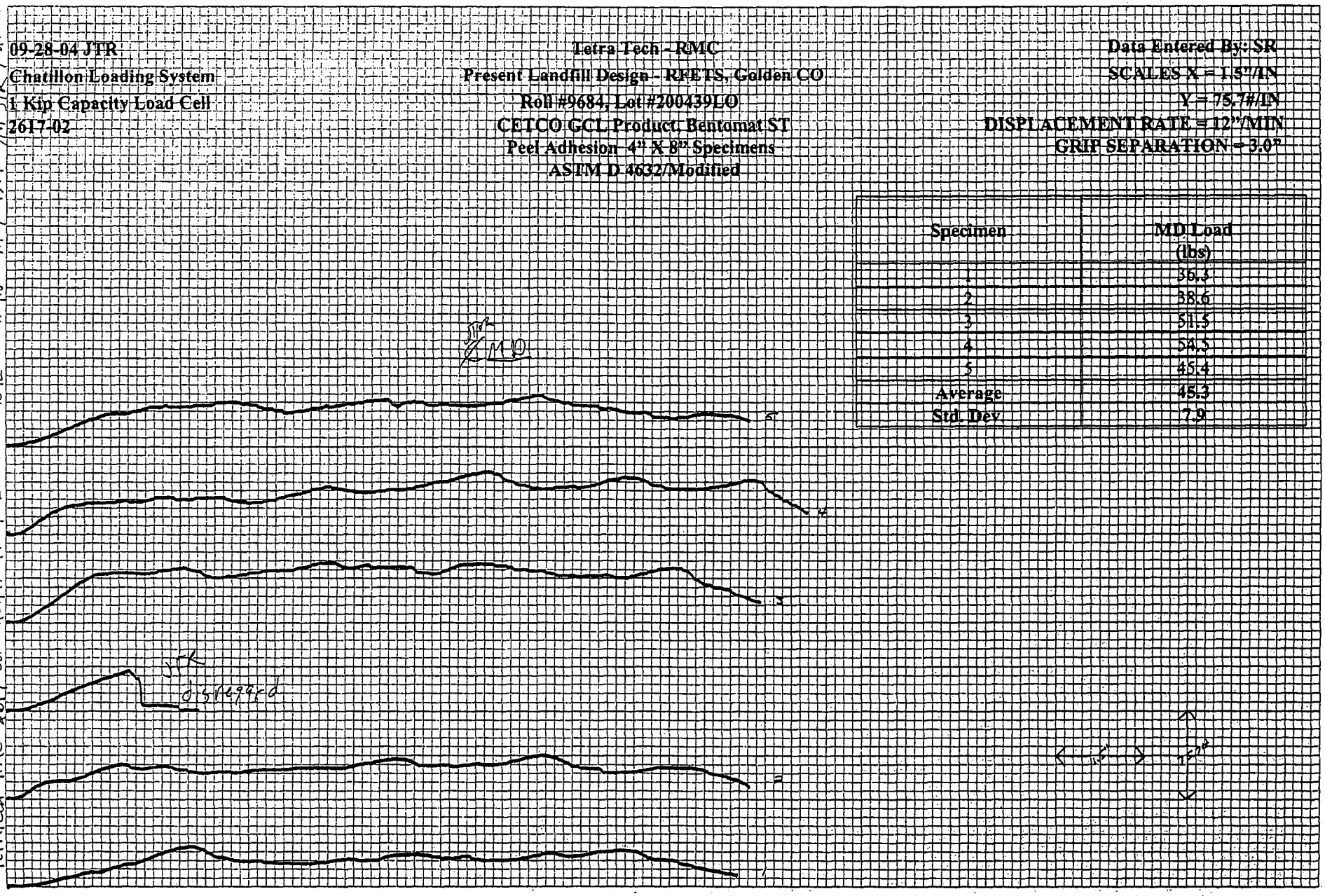
SCALES X = 1.5"/IN

Y = 75.7#/IN

DISPLACEMENT RATE = 12"/MIN

GRIP SEPARATION = 3.0"

Specimen	MD Load (lbs)
1	36.3
2	38.6
3	51.5
4	54.5
5	45.4
Average	45.3
Std. Dev.	7.9



Tetra Tech - RMC 2617-02 Roll # 9684 Lot # 200439LO X=1.5"/in Y=75.7#/in JTR 9-28-04

Data Checked By: JTR Date: 9/30/04

Filename: K:/TT2617/TTPA9684.lwp

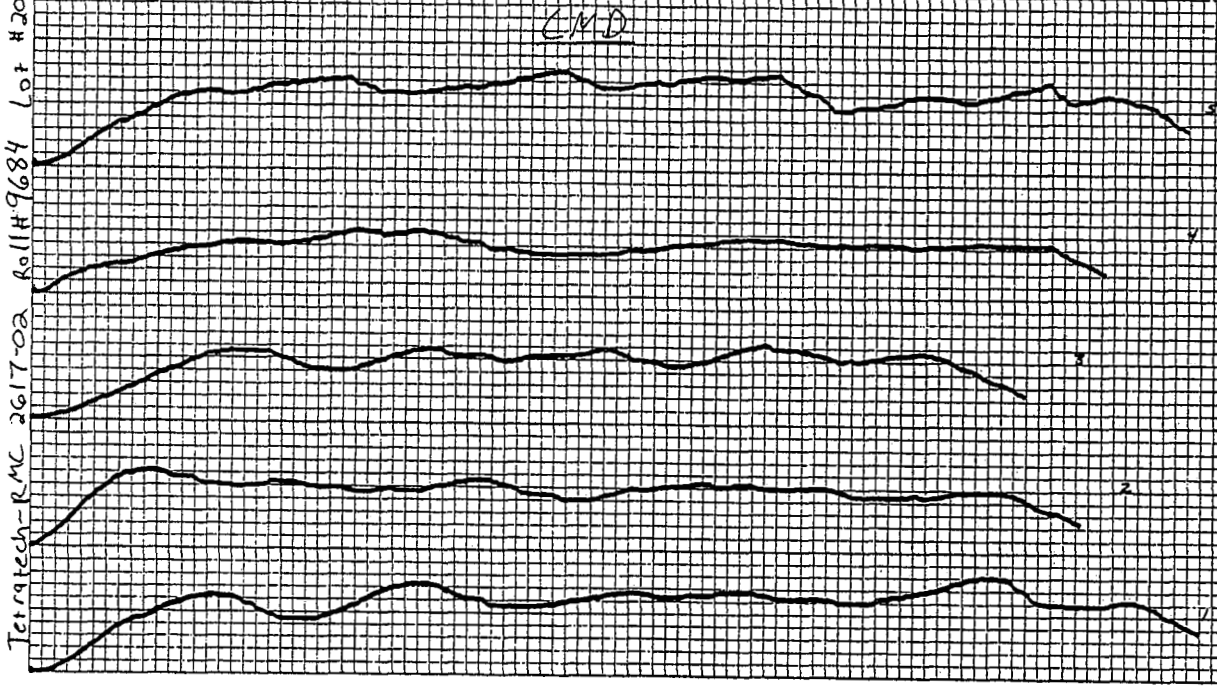
ADVANCED TERRA TESTING, Inc.

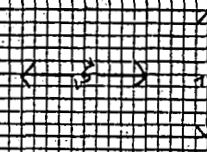
09-28-04 JTR
Chatillon Loading System
1 Kip Capacity Load Cell
2617-02

Tetra Tech - RMC
Present Landfill Design - RFETS, Golden CO
Roll #9684, Lot #200439LO
CETCO GCL Product, Bentomat ST
Peel Adhesion 4" X 8" Specimens
ASTM D 4632/Modified

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN
DISPLACEMENT RATE = 12"/MIN
GRIP SEPARATION = 3.0"

Specimen	CMD Load (lbs)
1	62.1
2	47.7
3	47.7
4	39.4
5	60.5
Average	51.5
Std. Dev.	9.6





Data Checked By: JTR Date: 9/30/04
Filename: K:/TT2617/TTPA968C.lwp

ADVANCED TERRA TESTING, Inc

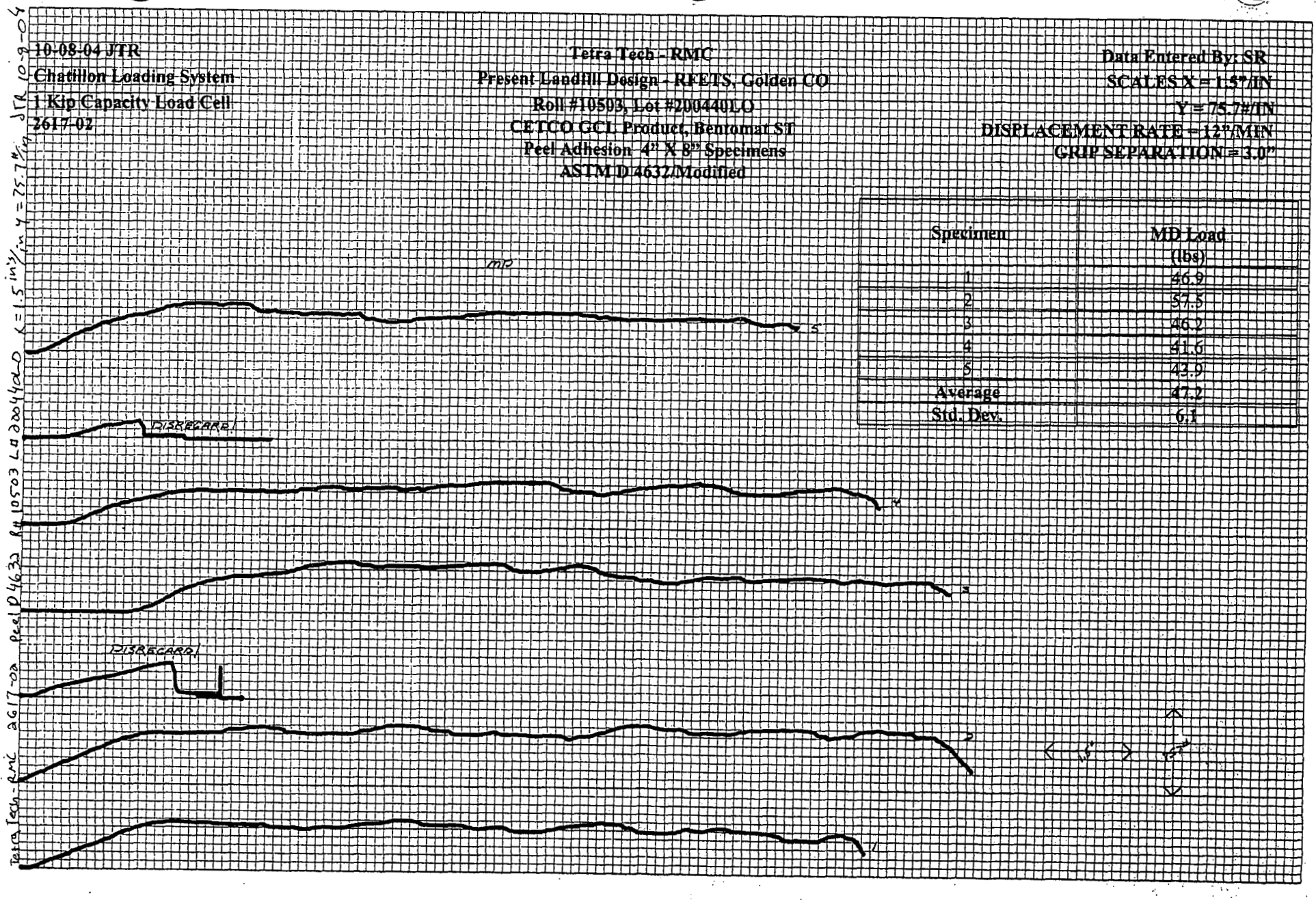
Terratech-RMC 2617-02 Roll#9684 Lot #200439LO X=1.5"/in Y=75.7#/in JTR 9-28-04

10-08-04 JTR
Chatillon Loading System
1 Kip Capacity Load Cell
2617-02

Tetra Tech - RMC
Present Landfill Design - RFETS, Golden CO
Roll #10503, Lot #200440LO
CETCO GCL Product, Bentomat ST
Peel Adhesion 4" X 8" Specimens
ASTM D4632/Modified

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN
DISPLACEMENT RATE = 12"/MIN
GRIP SEPARATION = 3.0"

Specimen	MD Load (lbs)
1	46.9
2	57.5
3	46.2
4	41.6
5	42.9
Average	47.2
Std. Dev.	6.1



Data Checked By: JTR Date: 10/18/04
Filename: K:/TT2617/TTPA0503.lwp

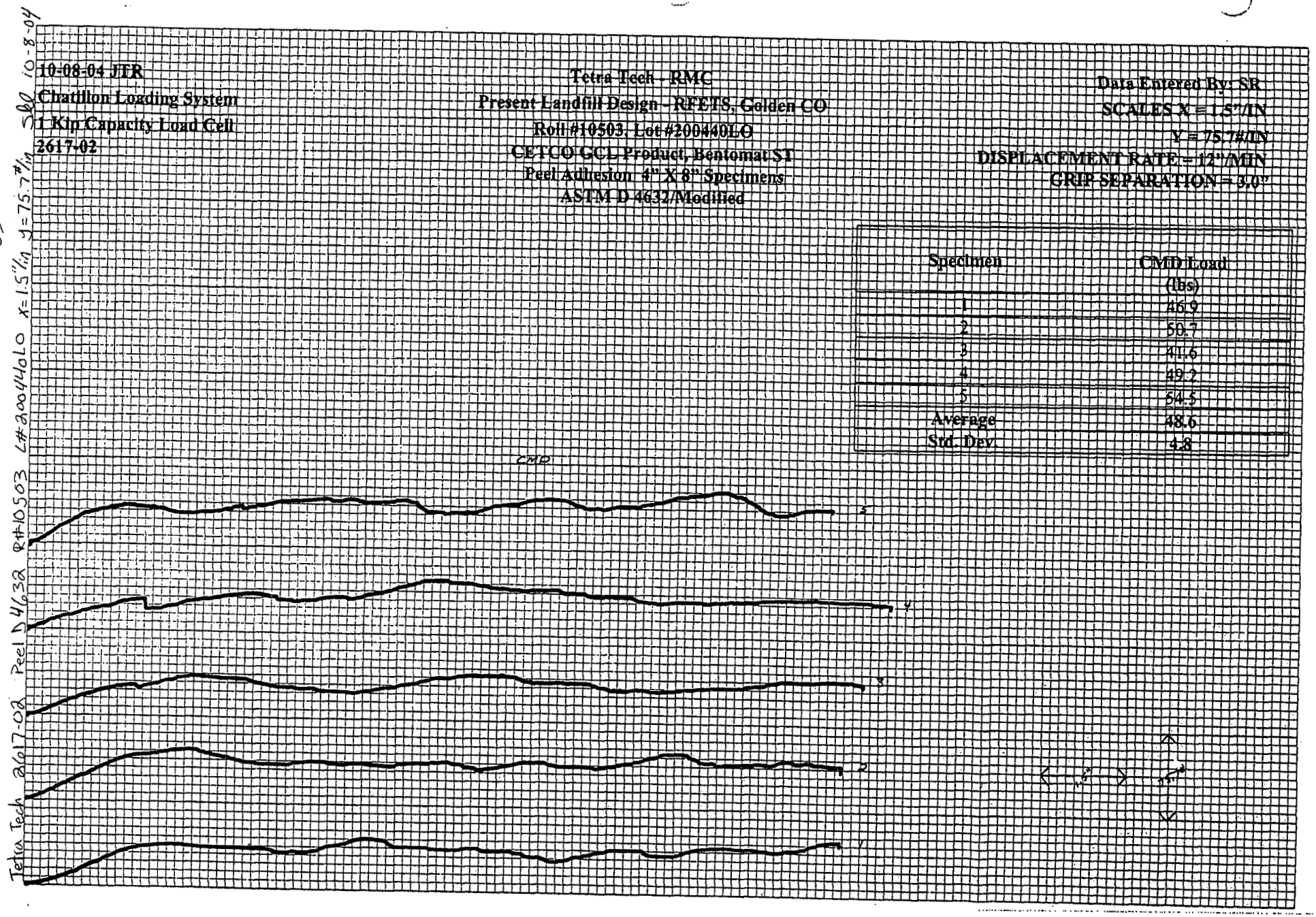
ADVANCED TERRA TESTING, Inc

10-8-04 JTR
Chatillon Loading System
1 Kip Capacity Load Cell
2617-02

Tetra Tech - RMC
Present Landfill Design - RFETS, Golden CO
Roll #10503, Lot #200440LO
CETCO GCL Product, Bentomat ST
Peel Adhesion 4" X 8" Specimens
ASTM D 4632/Modified

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN
DISPLACEMENT RATE = 12"/MIN
GRIP SEPARATION = 3.0"

Specimen	CMD Load (lbs)
1	46.9
2	50.7
3	41.6
4	49.2
5	54.5
Average	48.6
Std. Dev.	4.8



Data Checked By: JTK Date: 10/18/04
Filename: K:/TT2617/TTPAC503.lwp

ADVANCED TERRA TESTING, Inc

10-08-04 JTR

Chatillon Loading System

1 Kip Capacity Load Cell

2617-02

Tetra Tech - RMC

Present Landfill Design - RFETS, Golden CO

Roll #10547, Lot #200440LO

CETCO GCL Product, Bentomat ST

Peel Adhesion 4" X 8" Specimens

ASTM D 4632/Modified

Data Entered By: SR

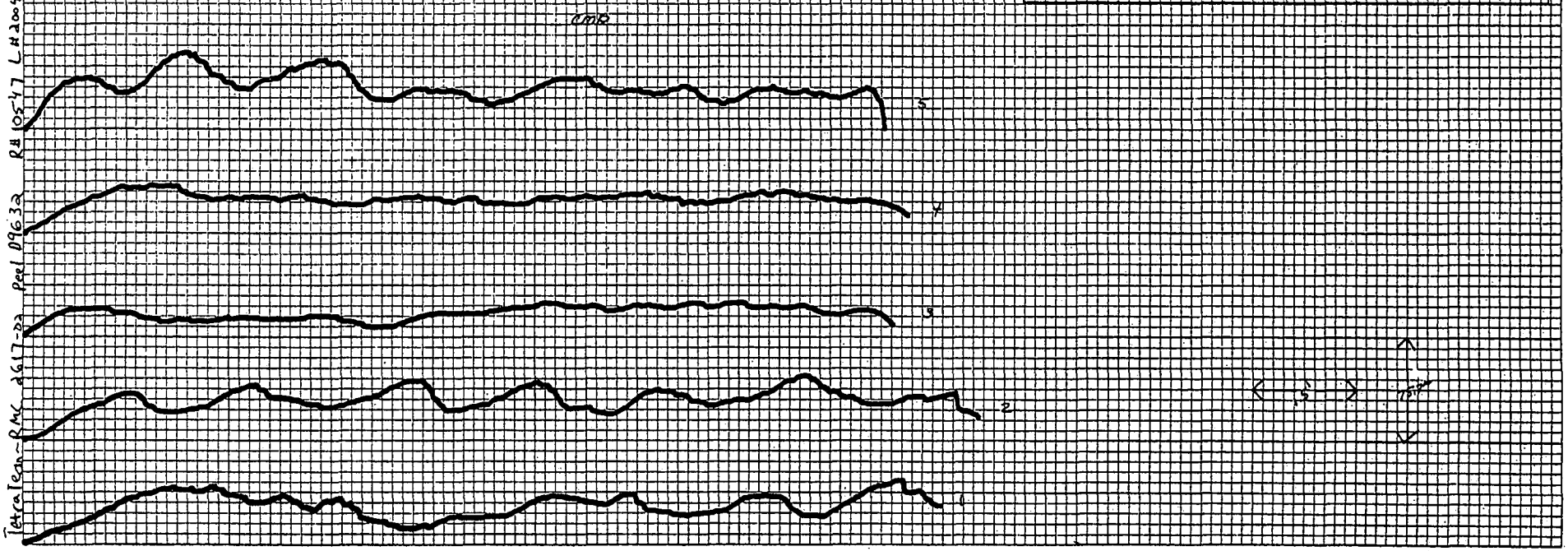
SCALES X = 1.5"/IN

Y = 75.7#/IN

DISPLACEMENT RATE = 12"/MIN

GRIP SEPARATION = 3.0"

Specimen	CMD Load (lbs)
1	47.7
2	49.2
3	26.5
4	37.1
5	56.8
Average	43.5
Std. Dev.	11.8



Data Checked By: JTR Date: 10/18/04

Filename: K:/TT2617/TTPAC547.lwp

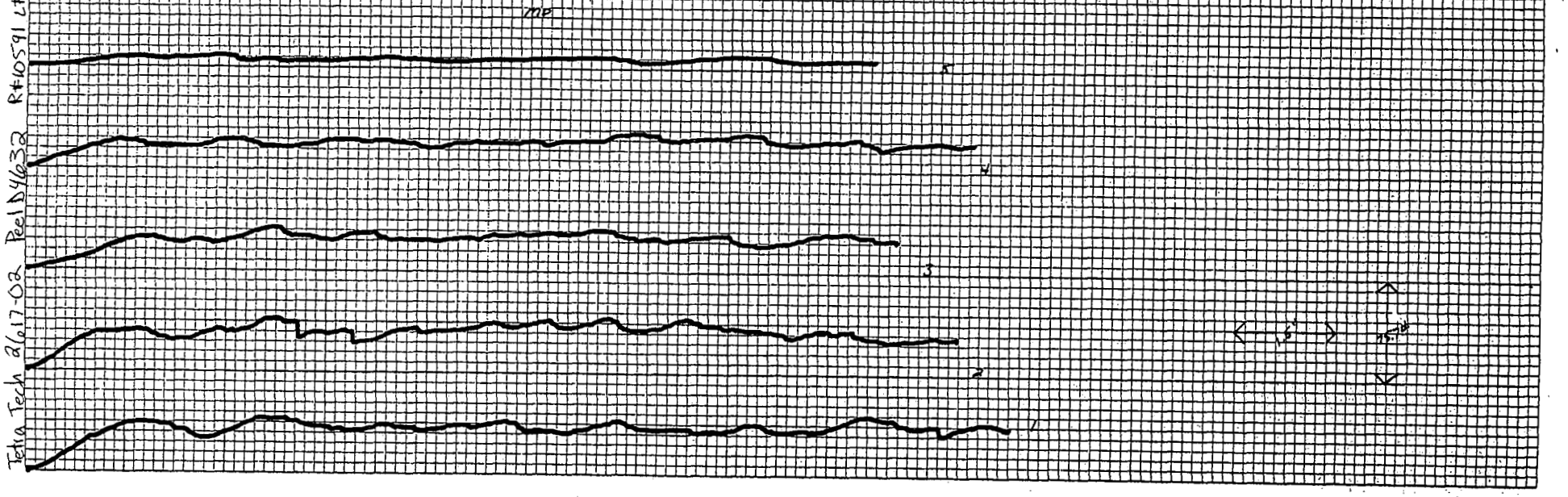
ADVANCED TERRA TESTING, Inc

10-08-04 SKL
Chatillon Loading System
1 Kip Capacity Load Cell
2617-02

Tetra Tech - RMC
Present Landfill Design - RFETS, Golden CO
Roll #10591, Lot #20044010
CETCO GCL Product, Bentomat ST
Peel Adhesion 4" X 8" Specimens
ASTM D 4632/Modified

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN
DISPLACEMENT RATE = 12"/MIN
GRIP SEPARATION = 3.0"

Specimen	MD Load (lbs)
1	46.2
2	42.4
3	34.1
4	29.5
5	9.8
Average	32.4
Std. Dev.	14.3



MD
10-8-04 SKL
Tetra Tech 2617-02 Peel D4632 R#10591 Lot# 20044010 x=1.5"/in y=75.7#/in

Data Checked By: JTR Date: 10/19/04
Filename: K:/TT2617/TTPA0591.lwp

ADVANCED TERRA TESTING, Inc

10-08-04 SKL

Chatillon Loading System

1 Kip Capacity Load Cell

2617-02

Tetra Tech - RMC

Present Landfill Design - RFETS, Golden CO

Roll #10591, Lot #200440LO

CETCO GCL Product, Bentomat ST

Peel Adhesion 4" X 8" Specimens

ASTM D 4632/Modified

Data Entered By: SR

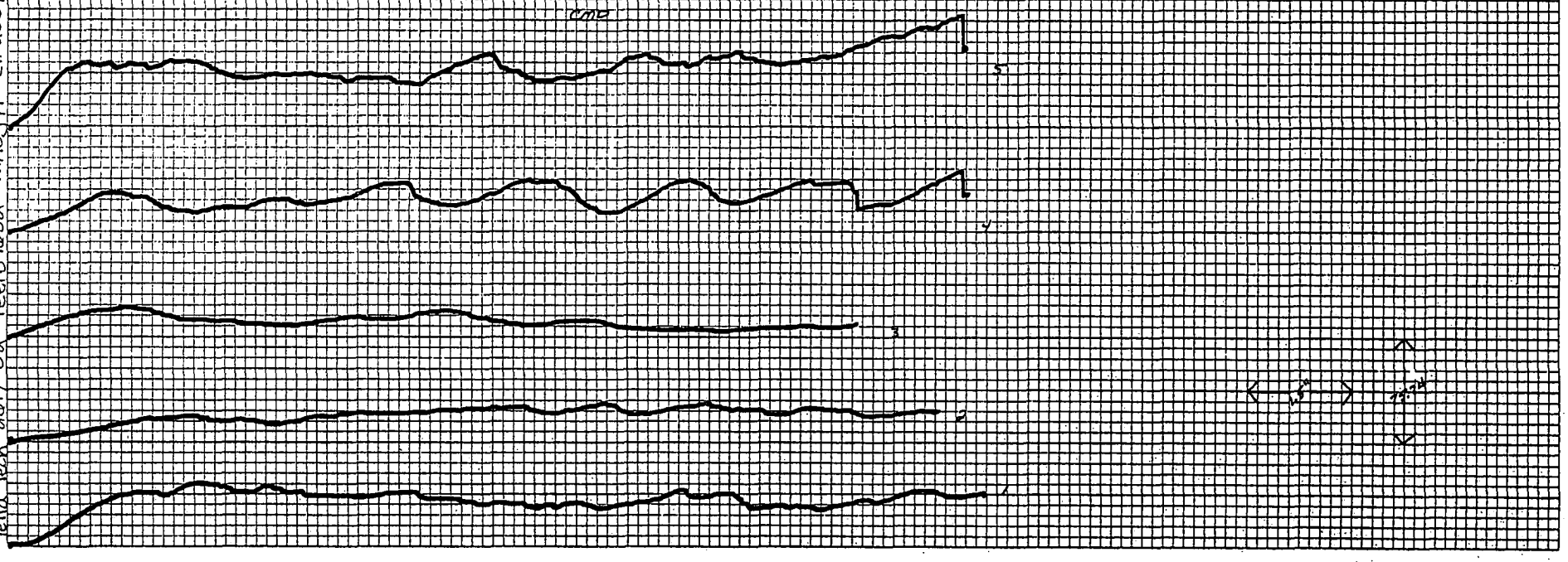
SCALES X = 1.5"/IN

Y = 75.7#/IN

DISPLACEMENT RATE = 12"/MIN

GRIP SEPARATION = 3.0"

Specimen	CMD Load (lbs)
1	46.9
2	29.5
3	22.7
4	44.7
5	80.2
Average	44.8
Std. Dev.	22.2



Tetra Tech 2617-02 Peel D4632 R#10591 Lot#200440LO x=1.5"/in Y=75.7#/in Skl 10-8-04

Data Checked By: JTK Date: 10/18/04

Filename: K:/TT2617/TTPAC591.lwp

ADVANCED TERRA TESTING, Inc

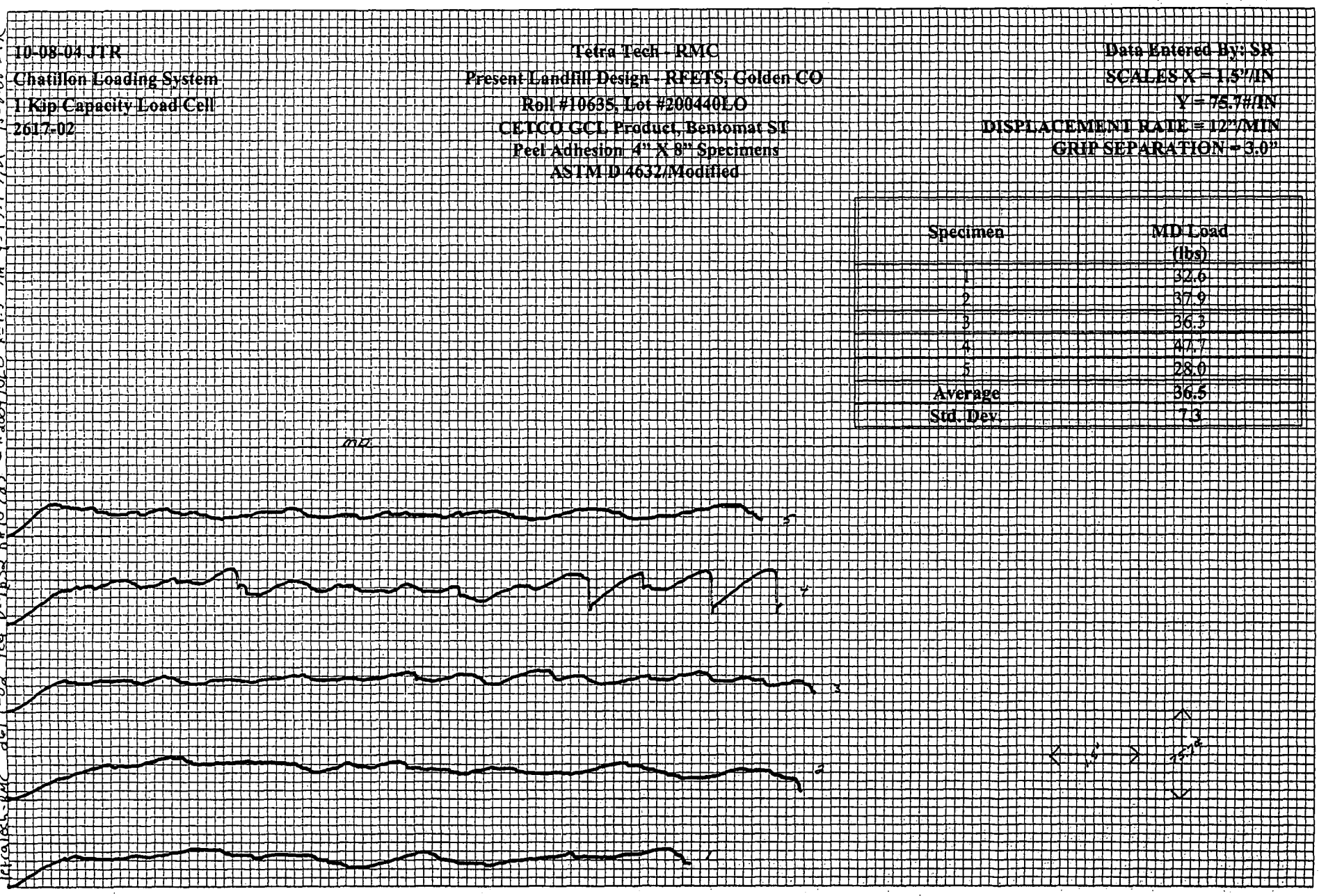
10-08-04 JTR

Chatillon Loading System
1 Kip Capacity Load Cell
2617-02

Tetra Tech - RMC
Present Landfill Design - RFETS, Golden CO
Roll #10635, Lot #200440LO
CETCO GCL Product, Bentomat ST
Peel Adhesion 4" X 8" Specimens
ASTM D 4632/Modified

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN
DISPLACEMENT RATE = 12"/MIN
GRIP SEPARATION = 3.0"

Specimen	MD Load (lbs)
1	32.6
2	37.9
3	36.3
4	47.7
5	28.0
Average	36.5
Std. Dev.	7.3



Data Checked By: JTR Date: 10/18/04
Filename: K:/TT2617/TTPA0635.lwp

ADVANCED TERRA TESTING, Inc

10-08-04 JTR

Chatillon Loading System

1 Kip Capacity Load Cell

2617-02

Tetra Tech - RMC

Present Landfill Design - RFETS, Golden CO

Roll #10635, Lot #200440LO

CETCO GCL Product, Bentomat ST

Peel Adhesion 4" X 8" Specimens

ASTM D 4632/Modified

Data Entered By: SR

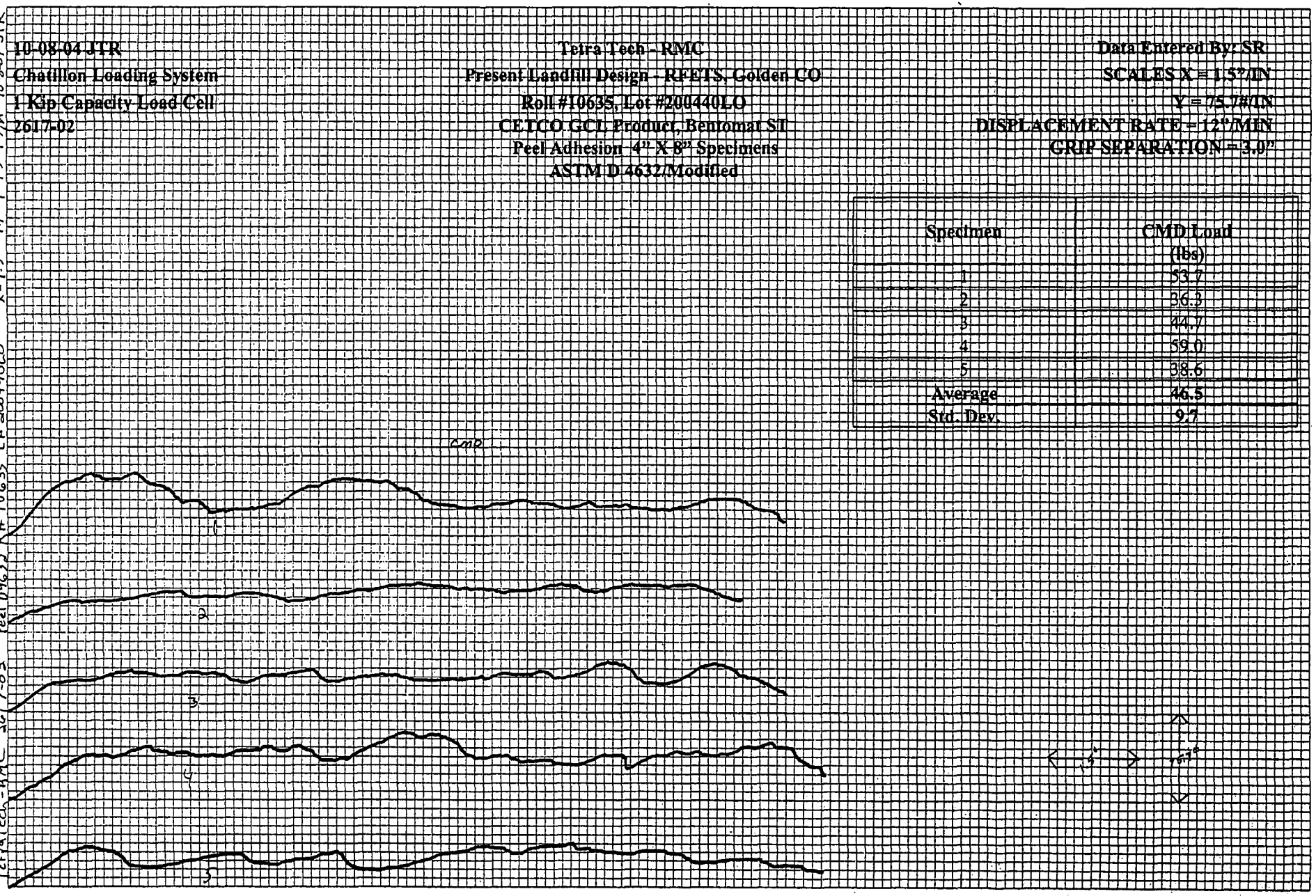
SCALES X = 1.5"/IN

Y = 75.7#/IN

DISPLACEMENT RATE = 12"/MIN

GRIP SEPARATION = 3.0"

Specimen	CMD Load (lbs)
1	53.7
2	36.3
3	44.7
4	59.0
5	38.6
Average	46.5
Std. Dev.	9.7



CMD

10-8-04 JTR Y=75.7#/in X=1.5"/in Peel D4632 R# 10635 Lot# 200440LO TerraTech-RMC 2617-02

Data Checked By: JTR Date: 10/18/04

Filename: K:/TT2617/TTPAC635.lwp

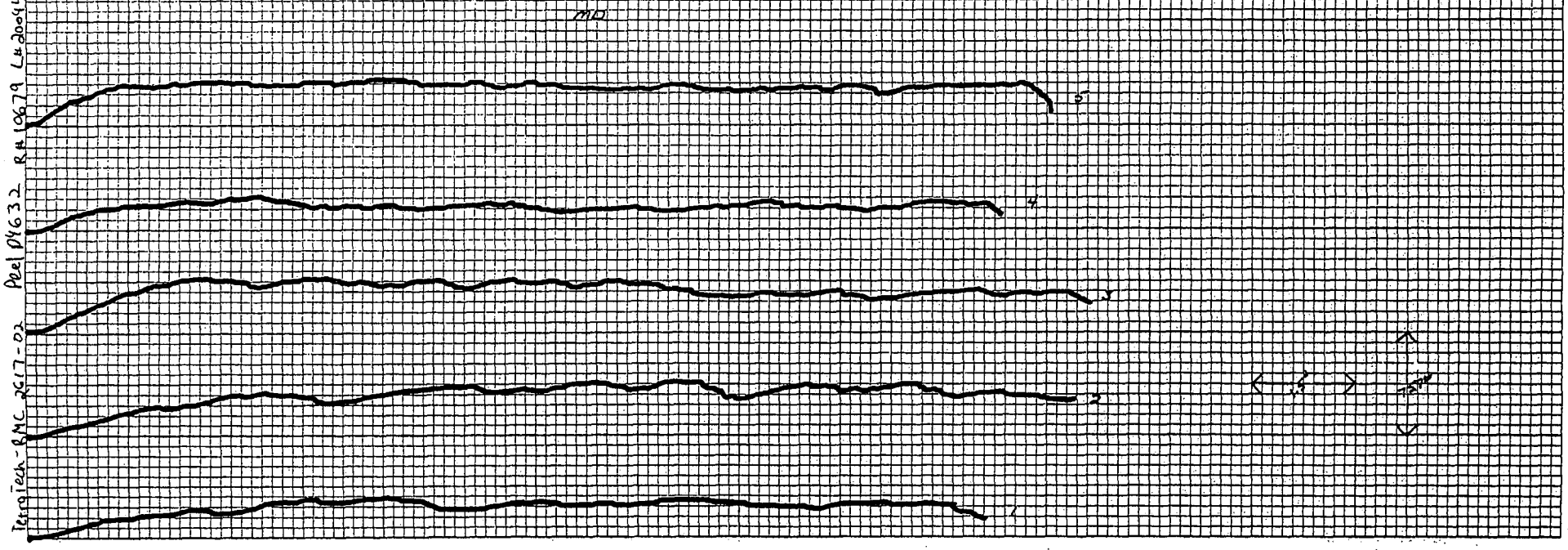
ADVANCED TERRA TESTING, Inc

10-08-04 JTR
Chatillon Loading System
1 Kip Capacity Load Cell
2617-02

Tetra Tech - RMC
Present Landfill Design - RFETS, Golden CO
Roll #10679, Lot #200440LO
CETCO GCL Product, Bentomat ST
Peel Adhesion 4" X 8" Specimens
ASTM D 4632/Modified

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN
DISPLACEMENT RATE = 12"/MIN
GRIP SEPARATION = 3.0"

Specimen	MD Load (lbs)
1	31.0
2	40.1
3	40.9
4	25.0
5	34.8
Average	34.4
Std. Dev.	6.6



MD
TetraTech-RMC 2617-02 Peel D4632 R# 10679 L# 200440LO X=1.5 in/in Y=75.7#/in JTR 10/8/04

Data Checked By: JTR Date: 10/18/04
Filename: K:/TT2617/TTPA0679.lwp

ADVANCED TERRA TESTING, Inc

10-08-04 JTR
Chatillon Loading System
1 Kip Capacity Load Cell
2617-02

Tetra Tech - RMC
Present Landfill Design - RFETS, Golden CO
Roll #10679, Lot #200440LO
CETCO GCL Product, Bentomat ST
Peel Adhesion 4" X 8" Specimens
ASTM D 4632/Modified

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN
DISPLACEMENT RATE = 12"/MIN
GRIP SEPARATION = 3.0"

Specimen	CMD Load (lbs)
1	45.4
2	54.5
3	23.5
4	43.9
5	51.5
Average	43.8
Std. Dev.	12.1

Data Checked By: JTR Date: 10/18/04
Filename: K:/TT2617/TTPAC679.lwp

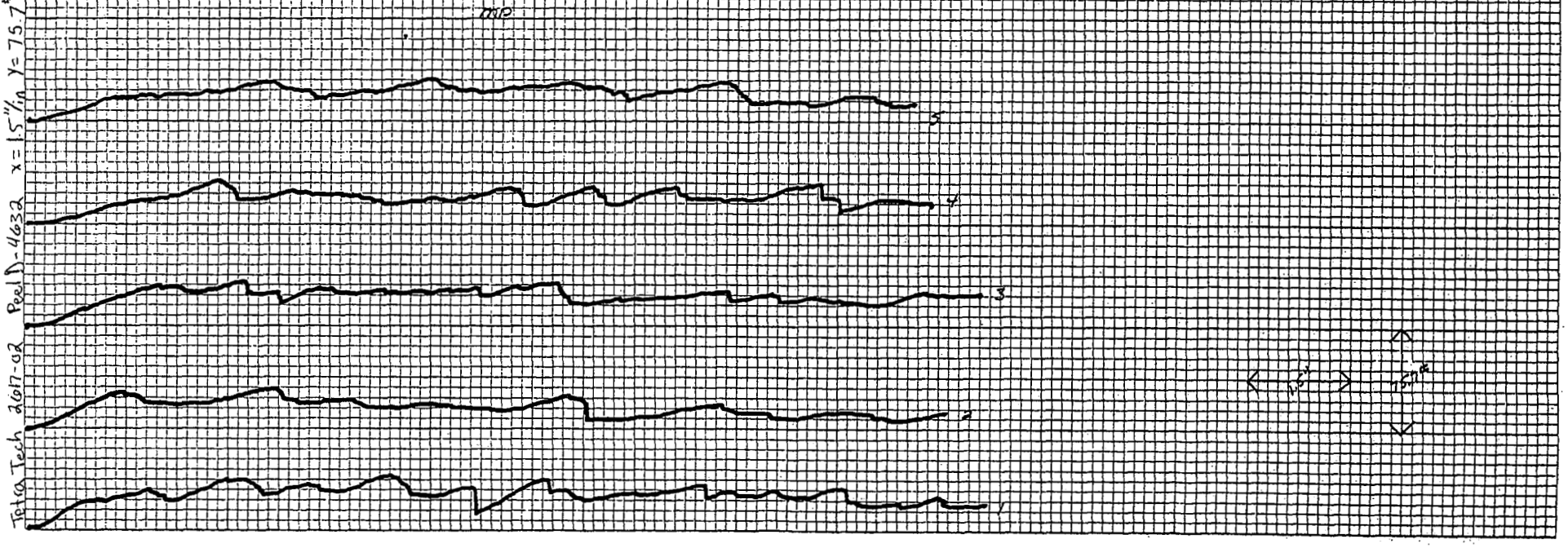
ADVANCED TERRA TESTING, Inc

10-07-04 SKL
Chatillon Loading System
1 Kip Capacity Load Cell
2617-02

Tetra Tech - RMC
Present Landfill Design - RFETS, Golden CO
Roll #10723, Lot #200440LO
CETCO GCL Product, Bentomat ST
Peel Adhesion 4" X 8" Specimens
ASTM D 4632/Modified

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN
DISPLACEMENT RATE = 12"/MIN
GRIP SEPARATION = 3.0"

Specimen	MD Load (lbs)
1	41.6
2	30.3
3	34.1
4	32.6
5	31.8
Average	34.1
Std. Dev.	4.4



Tetra Tech 2617-02 Peel D-4632 x=1.5"/in y=75.7#/in 10-07-04 SKL Rl# 10723 Lt# 200440LO

Data Checked By: JTR Date: 10/18/04
Filename: K:/TT2617/TTPA0723.lwp

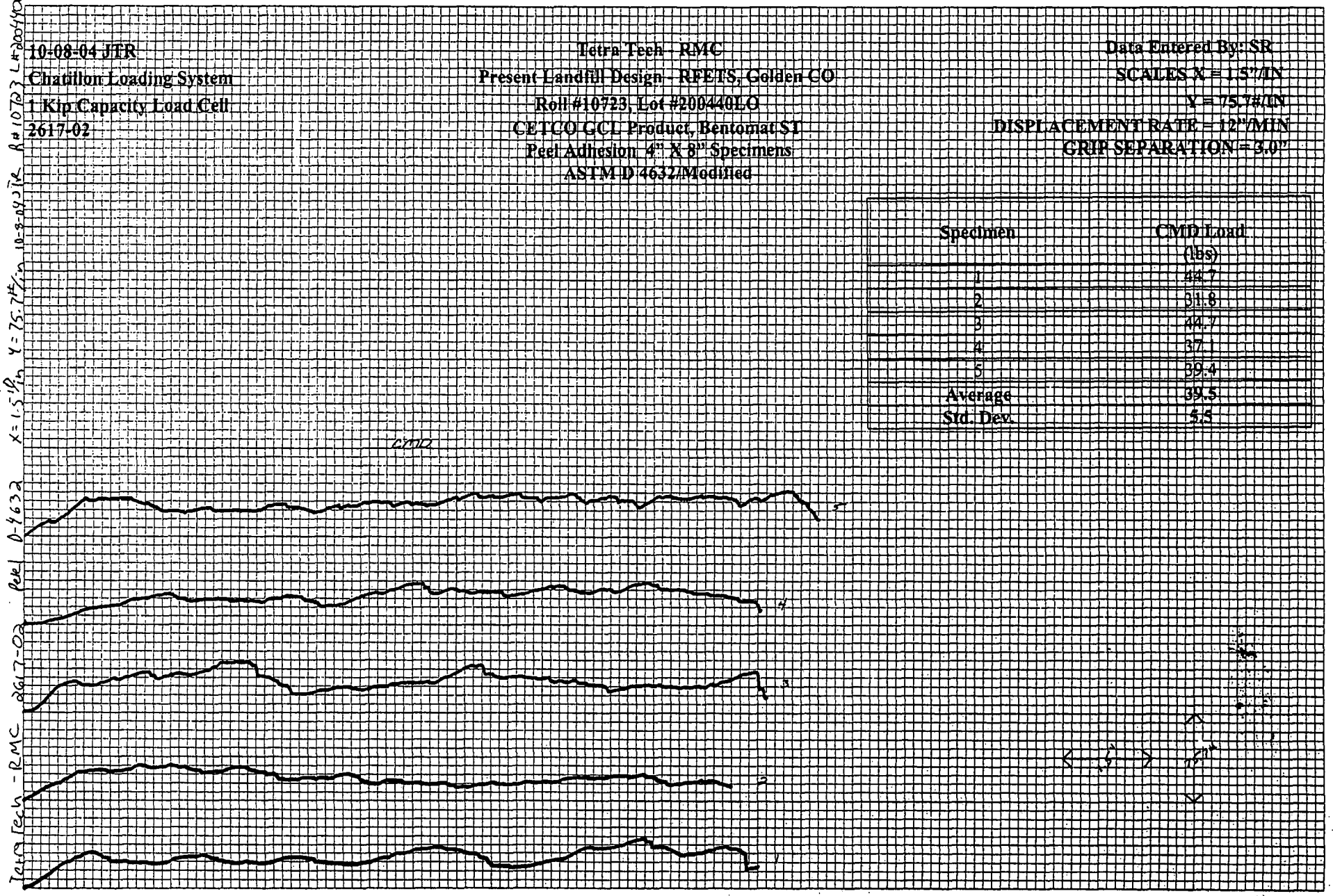
ADVANCED TERRA TESTING, Inc

10-08-04 JTR
Chatillon Loading System
1 Kip Capacity Load Cell
2617-02

Tetra Tech - RMC
Present Landfill Design - RFETS, Golden CO
Roll #10723, Lot #200440LO
CETCO GCL Product, Bentomat ST
Peel Adhesion 4" X 8" Specimens
ASTM D 4632/Modified

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN
DISPLACEMENT RATE = 12"/MIN
GRIP SEPARATION = 3.0"

Specimen	CMD Load (lbs)
1	44.7
2	31.8
3	44.7
4	37.1
5	39.4
Average	39.5
Std. Dev.	5.5



Data Checked By: JTR Date: 10/18/04
Filename: K:/TT2617/TTPAC723.lwp

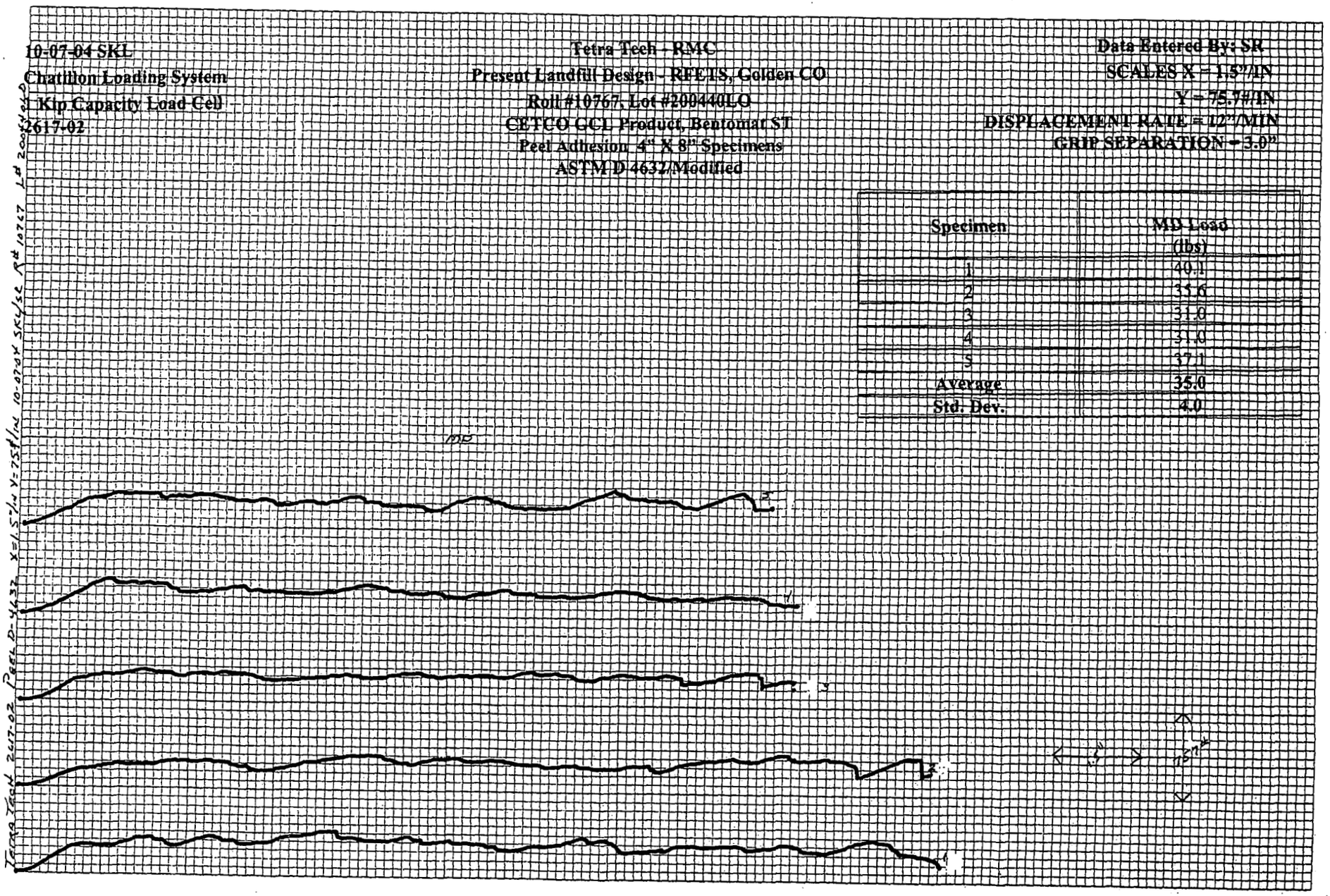
ADVANCED TERRA TESTING, Inc

10-07-04 SKL
Chatillon Loading System
1 Kip Capacity Load Cell
2617-02

Tetra Tech - RMC
Present Landfill Design - RFETS, Golden CO
Roll #10767, Lot #200440LO
CETCO GCL Product, Bentomat ST
Peel Adhesion 4" X 8" Specimens
ASTM D 4632/Modified

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN
DISPLACEMENT RATE = 12"/MIN
GRIP SEPARATION = 3.0"

Specimen	MD Load (lbs)
1	40.1
2	35.6
3	31.0
4	31.0
5	37.1
Average	35.0
Std. Dev.	4.0



Data Checked By: JTR Date: 10/18/04
Filename: K:/TT2617/TTPA0767.lwp

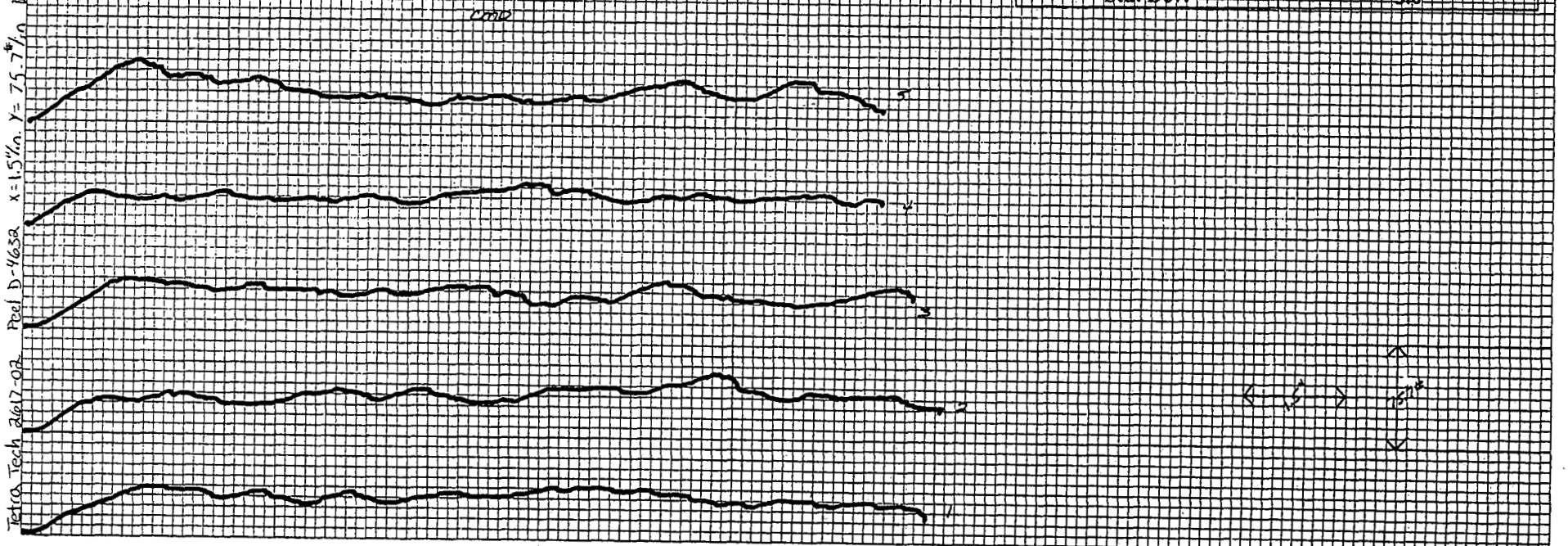
ADVANCED TERRA TESTING, inc

10-07-04 SKL
Chatillon Loading System
1 Kip Capacity Load Cell
2617-02

Tetra Tech - RMC
Present Landfill Design - RFETS, Golden CO
Roll #10767, Lot #200440LO
CETCO GCL Product, Bentomat ST
Peel Adhesion 4" X 8" Specimens
ASTM D 4632/Modified

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN
DISPLACEMENT RATE = 12"/MIN
GRIP SEPARATION = 3.0"

Specimen	CMD Load (lbs)
1	39.4
2	48.4
3	38.6
4	34.8
5	46.2
Average	41.5
Std. Dev.	5.6



Data Checked By: JTR Date: 10/18/04
Filename: K:/TT2617/TTPAC767.lwp

ADVANCED TERRA TESTING, Inc

10-08-04 JTR
Chatillon Loading System
1 Kip Capacity Load Cell
2617-02

Tetra Tech - RMC
Present Landfill Design - RFETS, Golden CO
Roll #10811, Lot #200440LO
CETCO GCL Product, Bentomat ST
Peel Adhesion 4" X 8" Specimens
ASTM D 4632/Modified

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN
DISPLACEMENT RATE = 12"/MIN
GRIP SEPARATION = 3.0"

Specimen	MD Load (lbs)
1	36.3
2	28.0
3	39.4
4	32.6
5	31.8
Average	33.6
Std. Dev.	4.4

Data Checked By: JTR Date: 10/19/04
Filename: K:/TT2617/TTPA0811.lwp

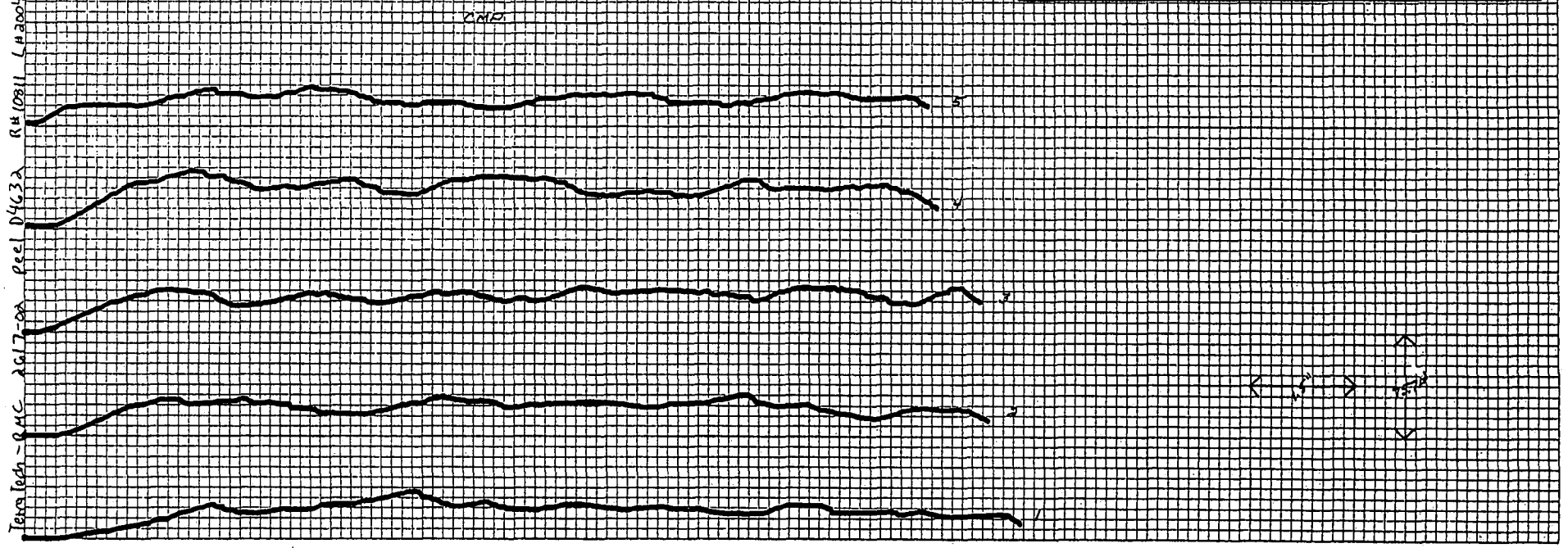
ADVANCED TERRA TESTING, Inc

10-08-04 JTR
Chatillon Loading System
1 Kip Capacity Load Cell
2617-02

Tetra Tech - RMC
Present Landfill Design - RFETS, Golden CO
Roll #10811, Lot #200440LO
CETCO GCL Product, Bentomat ST
Peel Adhesion 4" X 8" Specimens
ASTM D 4632/Modified

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN
DISPLACEMENT RATE = 12"/MIN
GRIP SEPARATION = 3.0"

Specimen	CMD Load (lbs)
1	37.1
2	31.8
3	34.1
4	45.4
5	31.0
Average	35.9
Std. Dev.	5.8



Data Checked By: JTR Date: 10/18/04
Filename: K:/TT2617/TTPAC811.lwp

ADVANCED TERRA TESTING, Inc

SWELL INDEX
ASTM D 5890

Client Name: Tetra Tech-RMC

Job No.: 2617-02

Type of Bentonite: Bentomat ST
Leachate: DI Water

Date Sampled:
Date Tested: 10-06&13-04 BKL/DPM

Project Description: Present Landfill Design - RFETS, Golden, CO

OVEN-DRIED SAMPLES			
SAMPLE NO.	**SWELL INDEX CC/2 gms**	**START TEMP. °C**	**END TEMP. °C**
Lot #200439LO, Roll #9772	29.5	23.7	22.3
Lot #200439LO, Roll #9684	28.5	23.7	22.2
Lot #200439LO, Roll #9728	28.0	23.7	22.2
Lot #200440LO, Roll #10591	26.5	23.3	21.7
Lot #200440LO, Roll #10635	26.0	23.4	21.6
Lot #200440LO, Roll #10547	27.0	23.4	21.6
Lot #200440LO, Roll #10811	31.0	23.3	21.6
Lot #200440LO, Roll #10503	24.0	23.3	21.5
Lot #200440LO, Roll #10767	28.0	23.2	21.5
Lot #200440LO, Roll #10723	29.5	23.2	21.5
Lot #200440LO, Roll #10679	27.5	23.1	21.6

DATA ENTERED BY: SR DATE: 10-18-04
DATA CHECKED BY: JTR DATE: 10/18/04
FILENAME: K:\TT2617\TTSIRFET.lwp

ADVANCED TERRA TESTING, inc

From: Rahe, John -- MFG, Inc.
Sent: Tuesday, October 05, 2004 11:34 AM
To: 'cweinecke@terratesting.com'
Cc: 'Davis, Robert W.'
Subject: CQA Laboratory Testing for Rocky Flats PLF Geosysnthetics

Chris,

It was good to meet with you the other day and see that you are making progress on the QA conformance testing for the geosynthetics for the Rocky Flats PLF closure. I understand that you have received twelve samples (roll width X 1 m) of 60-mil LLDPE from GSE (along with their MQC data), eleven samples of the GDN (Texdrain 200 DS 8) from CETCO and eleven samples of the GCL (Bentomat ST) from CETCO (the latter two without MQC data). I further understand that you have begun cutting samples and performing QA conformance tests for the materials based upon the latest version of Table 4.1 of the QA/QC Plan sent to you last Friday from Earth Tech. Eleven of each geosynthetic sample should be tested to provide for one test for each 100,000 square feet installed; the twelfth sample of LLDPE should be held for now. Depending upon the final quantities of materials to be installed, based upon Colorado Lining's Final Panel Liner Layout Diagrams (not yet received) and the final design for the east slope of the PLF cover, additional samples of GDN, GCL and LLDPE-T may need to be tested.

The two remaining questions that you had regarding testing protocol were: 1) Internal Shear Testing for the GCL based upon ASTM D 6243, and 2) Transmissivity Testing for the GDN based upon ASTM D 4716. The Internal Shear Testing for the GCL should include two tests: a) one test on one of the first samples received using a single point with a saturated sample with a 200 psf confining pressure to replicate the testing performed by CETCO to obtain a zero angle shear strength, and b) one test on one of the last samples received using a three point saturated test with confining pressures of 200, 400 and 600 psf to obtain an internal friction angle as well as cohesion. The Transmissivity Tests to be performed for the GDN should be single point tests, with alternating samples using: a) water at 20 degrees C with a gradient of 1.0 under a confining pressure of 15,000 psf between two steel plates after one hour, and b) a gradient of 0.1 under a confining pressure of 209 psf after one hour. If eleven transmissivity tests are performed, six should be performed with the higher gradient and pressure and five with the lower gradient and pressure.

Please let me know if you have any further questions.

Thanks,
John

John H. Rahe, P.E.
Tetra Tech/MFG
303-447-0913 (ext. 104)
303-981-2656 (cell)

LARGE SCALE INTERNAL DIRECT SHEAR TEST DATA

ASTM D 5321/Modified - 12" x 12" Box

CLIENT:	Tetra Tech-RMC	Date:	11/5/04
Project No:	2617-02	Test date:	11/2/04-11/4/04
Project:	Present Landfill Design-RFETS	Technician:	JTR
Interface:	Roll#10811, Lot#200440LO	Shear Rate:	.00656 in/min
Special conditions:		Test Series:	DS1

Displacement (inches)	Normal Force 200 psf Shear Stress (psf)	Normal Force 400 psf Shear Stress (psf)	Normal Force 600 psf Shear Stress (psf)
0	0	0	0
0.032	83	119	147
0.088	108	136	254
0.143	153	206	310
0.202	173	244	353
0.259	196	287	400
0.318	219	325	443
0.376	244	360	483
0.435	269	392	528
0.491	292	423	562
0.551	316	451	602
0.606	337	476	639
0.666	359	505	662
0.722	380	521	677
0.782	397	544	705
0.839	415	566	727
0.897	430	583	753
0.955	442	601	770
1.015	460	619	780
1.069	472	634	791
1.129	485	651	795
1.189	500	661	777
1.248	507	676	777
1.303	513	686	768
1.363	517	694	762
1.423	517	692	752
1.481	513	692	740
1.538	517	692	713
1.597	520	692	675
1.658	517	686	662
1.716	512	689	652
1.774	503	674	640
1.831	503	671	630
1.895	497	667	619

Data Entered By: JTR Date: 11-05-04

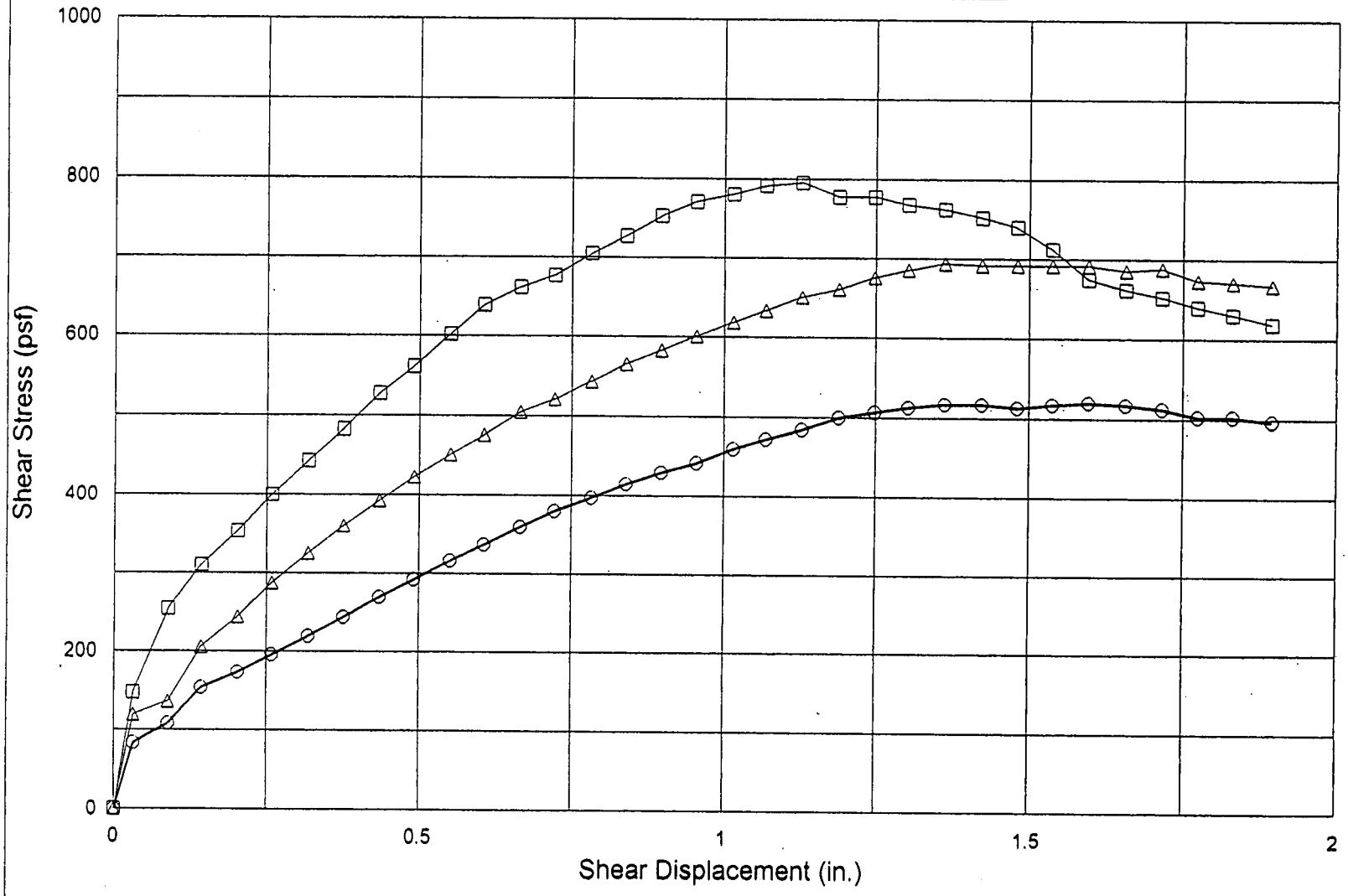
Data Checked By: CJ Date: 11/05/04

File Name: TTDS0811

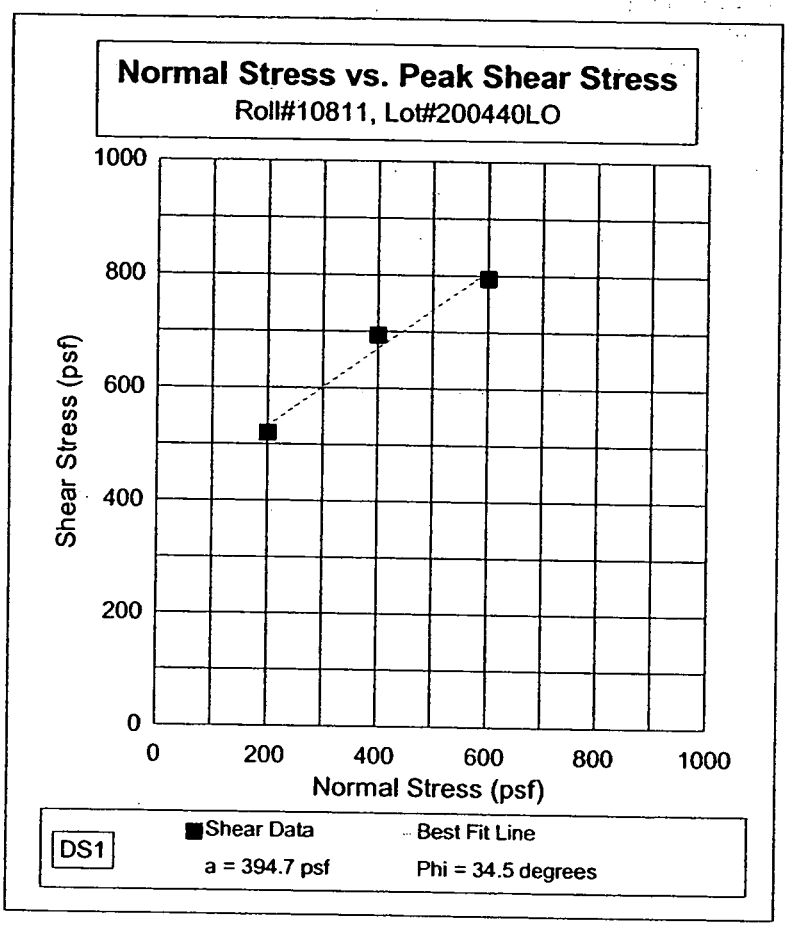
Advanced Terra Testing, Inc.

Shear Stress vs. Displacement

Roll#10811, Lot#200440LO



DS1



NOTE: Post-Peak data not analyzed.

LARGE SCALE INTERNAL DIRECT SHEAR TEST DATA

ASTM D 5321/Modified - 12" x 12" Box

CLIENT:	Tetra Tech - RMC	Date:	11-09-04
Project No:	2617-02	Test date:	11-01-04
Project:	Present Landfill Design - RFETS	Technician:	JTR/CJW
Interface:	Roll #9772, Lot #200439LO	Shear Rate:	0.00656"/min
Special conditions:		Test Series:	DS-2

Displacement (inches)	Normal Force 200 psf Shear Stress (psf)
0	0
0.033	75
0.09	126
0.146	154
0.202	183
0.261	211
0.32	234
0.376	254
0.436	279
0.494	305
0.551	330
0.609	355
0.667	378
0.724	398
0.784	418
0.841	435
0.899	453
0.955	473
1.013	490
1.07	508
1.131	526
1.188	541
1.247	549
1.304	549
1.365	559
1.423	559
1.48	564
1.539	569
1.599	571
1.657	573
1.714	578
1.775	573
1.833	573
1.893	564

NOTE: Per client request only one point was required.

Data Entered By: SR Date: 11-09-04

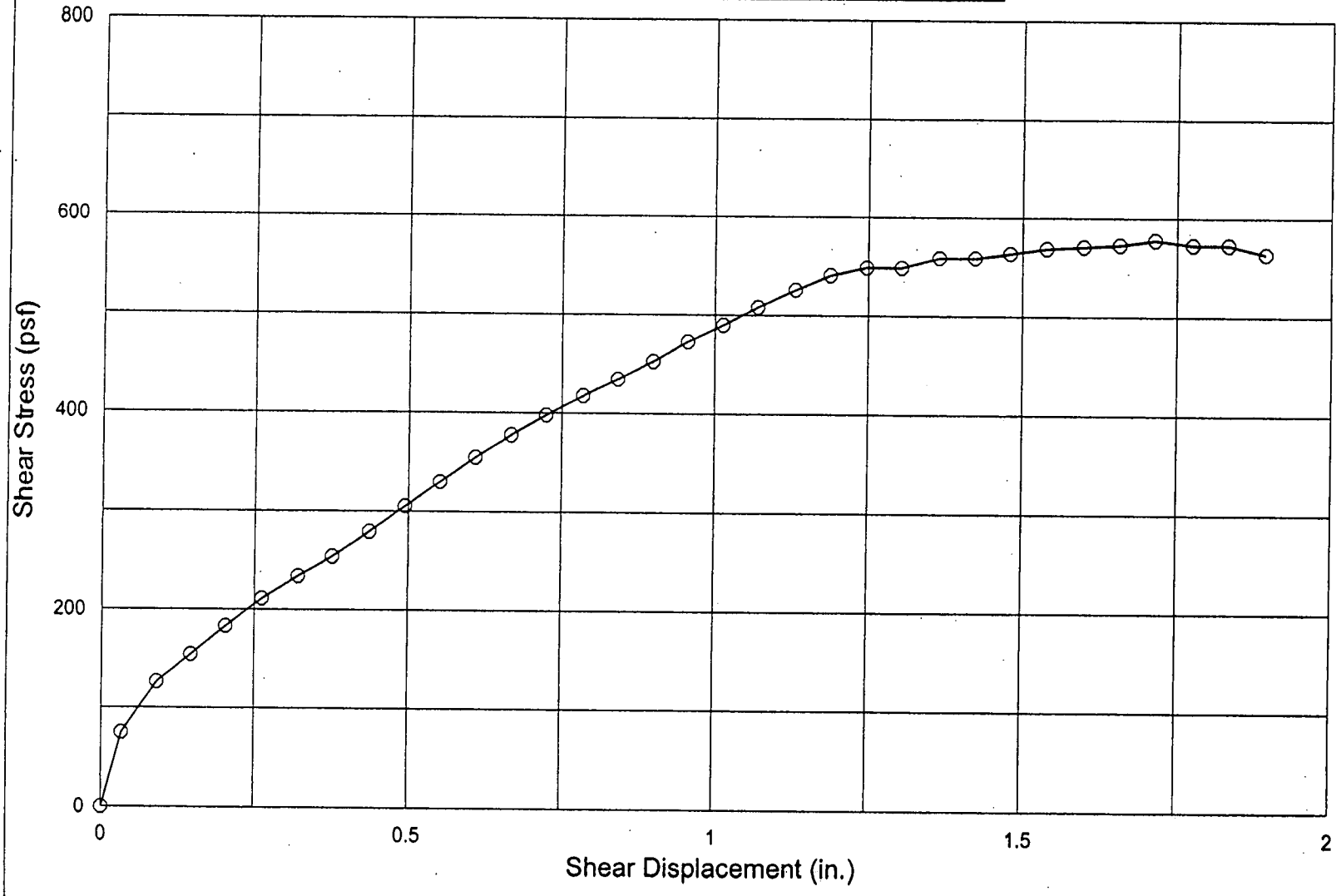
Data Checked By: CJ Date: 11/09/04

File Name: TTDSDS2

Advanced Terra Testing, Inc.

Shear Stress vs. Displacement

Roll #9772, Lot #200439LO



DS-2

THICKNESS
ASTM D 5199
(IN.)

CLIENT: Tetra Tech-RMC

JOB NO.: 2617-02

PROJECT: Present Landfill-RFETS, Golden, CO

DATE: 10-25-04 JTR

60 mil LLDPE
Roll #101110562

1	0.0637	2	0.0655	3	0.0667	4	0.0621	5	0.0646
	0.0643		0.0673		0.0660		0.0660		0.0716
	0.0653		0.0657		0.0658		0.0627		0.0624
	0.0638		0.0649		0.0659		0.0640		0.0620
	0.0648		0.0655		0.0661		0.0617		0.0641
Average	0.0644	Average	0.0658	Average	0.0661	Average	0.0633	Average	0.0649
								AVERAGE FOR 5 SPECIMENS	0.0649

DATA ENTERED BY: SR
DATA CHECKED BY: JTR
FILENAME: TTH0562

DATE: 11/02/2004
DATE: 11/02/04

ADVANCED TERRA TESTING, INC.

THICKNESS
ASTM D 5199
(IN.)

CLIENT: Tetra Tech-RMC

JOB NO.: 2617-02

PROJECT: Present Landfill-RFETS, Golden, CO

DATE: 10-03-04 JTR

Roll #104123231, Resin Lot #CRG812060, Product Code #LLD060A000, 60 mil LLDPE

1	0.0614	2	0.0611	3	0.0601	4	0.0607	5	0.0598
	0.0642		0.0616		0.0602		0.0602		0.0618
	0.0605		0.0603		0.0613		0.0611		0.0606
	0.0627		0.0610		0.0587		0.0631		0.0608
	0.0610		0.0611		0.0579		0.0603		0.0656
Average	0.0619	Average	0.0610	Average	0.0596	Average	0.0611	Average	0.0617
								AVERAGE FOR 5 SPECIMENS	0.0611

DATA ENTERED BY: SR
DATA CHECKED BY: JTR
FILENAME: TTTH3231

DATE: 10/04/2004
DATE: 10/8/04

ADVANCED TERRA TESTING, INC.

THICKNESS
ASTM D 5199
(IN.)

CLIENT: Tetra Tech-RMC

JOB NO.: 2617-02

PROJECT: Present Landfill-RFETS, Golden, CO

DATE: 10-04-04 JTR

Roll #104123238, Resin Lot #CRG812060, Product Code #LLD060A000, 60 mil LLDPE

1	0.0601	2	0.0598	3	0.0606	4	0.0628	5	0.0639
	0.0605		0.0600		0.0603		0.0624		0.0626
	0.0601		0.0623		0.0603		0.0640		0.0618
	0.0618		0.0597		0.0599		0.0625		0.0594
	0.0616		0.0594		0.0607		0.0620		0.0614
Average	0.0608	Average	0.0602	Average	0.0604	Average	0.0627	Average	0.0618
								AVERAGE FOR 5 SPECIMENS	0.0612

DATA ENTERED BY: SR
DATA CHECKED BY: JTR
FILENAME: TTTH3238

DATE: 10/04/2004
DATE: 10/8/04

ADVANCED TERRA TESTING, INC.

THICKNESS
ASTM D 5199
(IN.)

CLIENT: Tetra Tech-RMC

JOB NO.: 2617-02

PROJECT: Present Landfill-RFETS, Golden, CO

DATE: 10-04-04 JTR

Roll #104123245, Resin Lot #CRG812060, Product Code #LLD060A000, 60 mil LLDPE

1	0.0616	2	0.0607	3	0.0591	4	0.0610	5	0.0690
	0.0609		0.0605		0.0595		0.0605		0.0611
	0.0608		0.0609		0.0579		0.0603		0.0628
	0.0601		0.0599		0.0578		0.0605		0.0591
	0.0605		0.0616		0.0580		0.0601		0.0681
Average	0.0608	Average	0.0607	Average	0.0584	Average	0.0605	Average	0.0640
								AVERAGE FOR 5 SPECIMENS	0.0609

DATA ENTERED BY: SR
DATA CHECKED BY: JTR
FILENAME: TTTH3245

DATE: 10/04/2004
DATE: 10/8/04

ADVANCED TERRA TESTING, INC.

THICKNESS
ASTM D 5199
(IN.)

CLIENT: Tetra Tech-RMC

JOB NO.: 2617-02

PROJECT: Present Landfill-RFETS, Golden, CO

DATE: 10-04-04 JTR

Roll #104123251, Resin Lot #CRG812060, Product Code #LLD060A000, 60 mil LLDPE

1	0.0626	2	0.0623	3	0.0596	4	0.0618	5	0.0593
	0.0617		0.0625		0.0595		0.0590		0.0593
	0.0651		0.0630		0.0602		0.0593		0.0597
	0.0599		0.0601		0.0573		0.0601		0.0585
	0.0607		0.0635		0.0571		0.0589		0.0579
Average	0.0620	Average	0.0623	Average	0.0587	Average	0.0598	Average	0.0589
							AVERAGE FOR 5 SPECIMENS		0.0604

DATA ENTERED BY: SR
DATA CHECKED BY: JTR
FILENAME: TTTH3251

DATE: 10/04/2004
DATE: 10/8/04

ADVANCED TERRA TESTING, INC.

THICKNESS
ASTM D 5199
(IN.)

CLIENT: Tetra Tech-RMC

JOB NO.: 2617-02

PROJECT: Present Landfill-RFETS, Golden, CO

DATE: 10-03-04 JTR

Roll #104123258, Resin Lot #CRG812060, Product Code #LLD060A000, 60 mil LLDPE

1	0.0647	**2**	0.0616	**3**	0.0609	**4**	0.0668	**5**	0.0585
	0.0612		0.0607		0.0588		0.0616		0.0629
	0.0645		0.0640		0.0612		0.0609		0.0610
	0.0605		0.0573		0.0612		0.0613		0.0604
	0.0618		0.0577		0.0608		0.0596		0.0588
Average	0.0625	**Average**	0.0602	**Average**	0.0606	**Average**	0.0620	**Average**	0.0603
								AVERAGE FOR 5 SPECIMENS	**0.0611**

DATA ENTERED BY: SR
DATA CHECKED BY: JFA
FILENAME: TTTH3258

DATE: 10/08/2004
DATE: 10/8/04

ADVANCED TERRA TESTING, INC.

THICKNESS
ASTM D 5199
(IN.)

CLIENT: Tetra Tech-RMC

JOB NO.: 2617-02

PROJECT: Present Landfill-RFETS, Golden, CO

DATE: 10-02-04 SKL

Roll #104123267, Resin Lot #CRG812060, Product Code #LLD060A000, 60 mil LLDPE

1	0.0771	2	0.0641	3	0.0883	4	0.0639	5	0.0707
	0.0639		0.0612		0.0865		0.0627		0.0621
	0.0653		0.0680		0.0658		0.0636		0.0678
	0.0603		0.0910		0.0681		0.0614		0.0712
	0.0779		0.0655		0.0693		0.0617		0.0722
Average	0.0689	Average	0.0699	Average	0.0756	Average	0.0626	Average	0.0688
								AVERAGE FOR 5 SPECIMENS	0.0692

DATA ENTERED BY: SR
DATA CHECKED BY: JTR
FILENAME: TTTH3267

DATE: 10/02/2004
DATE: 10/8/04

ADVANCED TERRA TESTING, INC.

THICKNESS
ASTM D 5199
(IN.)

CLIENT: Tetra Tech-RMC

JOB NO.: 2617-02

PROJECT: Present Landfill-RFETS, Golden, CO

DATE: 10-02-04 SKL

Roll #104123274, Resin Lot #CRH810060, Product Code #LLD060A000, 60 mil LLDPE

1	0.0624	2	0.0661	3	0.0678	4	0.0604	5	0.0631
	0.0635		0.0614		0.0639		0.0680		0.0642
	0.0615		0.0605		0.0699		0.0665		0.0646
	0.0614		0.0635		0.0620		0.0608		0.0707
	0.0620		0.0700		0.0671		0.0602		0.0685
Average	0.0621	Average	0.0643	Average	0.0661	Average	0.0631	Average	0.0662
								AVERAGE FOR 5 SPECIMENS	0.0644

DATA ENTERED BY: SR
DATA CHECKED BY: JTR
FILENAME: TTTH3274

DATE: 10/04/2004
DATE: 10/8/04

ADVANCED TERRA TESTING, INC.

THICKNESS
ASTM D 5199
(IN.)

CLIENT: Tetra Tech-RMC

JOB NO.: 2617-02

PROJECT: Present Landfill-RFETS, Golden, CO

DATE: 10-02-04 SKL

Roll #104123282, Resin Lot #CRH810060, Product Code #LLD060A000, 60 mil LLDPE

1	0.0667	2	0.0626	3	0.0620	4	0.0630	5	0.0634
	0.0653		0.0718		0.0601		0.0623		0.0622
	0.0718		0.0635		0.0671		0.0661		0.0765
	0.0669		0.0624		0.0638		0.0655		0.0659
	0.0655		0.0630		0.0619		0.0654		0.0658
Average	0.0672	Average	0.0646	Average	0.0630	Average	0.0644	Average	0.0667
								AVERAGE FOR 5 SPECIMENS	0.0652

DATA ENTERED BY: SR
DATA CHECKED BY: JTR
FILENAME: TTTH3282

DATE: 10/02/2004
DATE: 10/8/04

ADVANCED TERRA TESTING, INC.

THICKNESS
ASTM D 5199
(IN.)

CLIENT: Tetra Tech-RMC

JOB NO.: 2617-02

PROJECT: Present Landfill-RFETS, Golden, CO

DATE: 10-02-04 SKL

Roll #104123289, Resin Lot #CRH810060, Product Code #LLD060A000, 60 mil LLDPE

1	0.0687	2	0.0617	3	0.0637	4	0.0621	5	0.0586
	0.0676		0.0629		0.0652		0.0604		0.0592
	0.0630		0.0700		0.0640		0.0612		0.0659
	0.0665		0.0674		0.0659		0.0631		0.0634
	0.0635		0.0650		0.0655		0.0613		0.0630
Average	0.0658	Average	0.0654	Average	0.0649	Average	0.0616	Average	0.0620
								AVERAGE FOR 5 SPECIMENS	0.0639

DATA ENTERED BY: SR
DATA CHECKED BY: SIR
FILENAME: TTTH3289

DATE: 10/02/2004
DATE: 10/8/04

ADVANCED TERRA TESTING, INC.

THICKNESS
ASTM D 5199
(IN.)

CLIENT: Tetra Tech-RMC JOB NO.: 2617-02

PROJECT: Present Landfill-RFETS, Golden, CO DATE: 10-02-04 SKL

Roll #104123296, Resin Lot #CRH810060, Product Code #LLD060A000, 60 mil LLDPE

1	0.0733	**2**	0.0901	**3**	0.0762	**4**	0.0723	**5**	0.0712
	0.0619		0.0659		0.0635		0.0638		0.0594
	0.0824		0.0775		0.0617		0.0768		0.0672
	0.0605		0.0697		0.0780		0.0782		0.0609
	0.0615		0.0585		0.0696		0.0786		0.0732
Average	0.0679	**Average**	0.0723	**Average**	0.0698	**Average**	0.0739	**Average**	0.0664
								AVERAGE FOR 5 SPECIMENS	**0.0700**

DATA ENTERED BY: SR DATE: 10/02/2004
DATA CHECKED BY: JTR DATE: 10/8/04
FILENAME: TTTH3296

ADVANCED TERRA TESTING, INC.

THICKNESS
ASTM D 5199
(IN.)

CLIENT: Tetra Tech-RMC JOB NO.: 2617-02

PROJECT: Present Landfill-RFETS, Golden, CO DATE: 10-02-04 SKL

Roll #104123303, Resin Lot #CRH810060, Product Code #LLD060A000, 60 mil LLDPE

1	0.0638	**2**	0.0604	**3**	0.0682	**4**	0.0599	**5**	0.0655
	0.0593		0.0590		0.0624		0.0594		0.0626
	0.0722		0.0611		0.0627		0.0662		0.0630
	0.0599		0.0637		0.0619		0.0592		0.0638
	0.0582		0.0599		0.0627		0.0601		0.0629
Average	0.0626	**Average**	0.0608	**Average**	0.0635	**Average**	0.0609	**Average**	0.0636
								AVERAGE FOR 5 SPECIMENS	**0.0623**

DATA ENTERED BY: SR DATE: 10/02/2004
DATA CHECKED BY: JTR DATE: 10/8/04
FILENAME: TTTH3303

ADVANCED TERRA TESTING, INC.

ISO 9001 - 2000

Precision Geosynthetic Laboratories

October 20, 2004

Sharon Roberts
Advanced Terra Testing
833 Parfet Street
Lakewood, CO 80215

Dear Ms. Roberts: RE: Present Landfill Design / Proj # 2617-02

Thank you for consulting Precision Geosynthetic Laboratories for your material testing needs.

Enclosed is the ***final*** laboratory report for the testing of one (1) LLDPE Geomembrane sample received October 15, 2004.

It should be noted that the test specimen and test sample used for this report was believed to be representative of the material produced under the designation herein stated. However, these results are indicative of only the specimens that were actually tested. The testing herein is based upon accepted industry practice as well as the test method listed. Precision Geosynthetic Laboratories neither accepts responsibility for nor makes claims to the final use and purpose of the material.

By accepting the data and results represented on this report, Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims arising out of the use of this data to the cost for the respective test(s) represented in this report, and Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liability in excess of the aforementioned limit.

The test data and all associated project information shall be held in confidence, not to be reproduced except in full and disclosed to other parties with the authorization of Client.

It is a company policy to keep the physical records of each job for 2 years since the receipt of the samples and keep the electronic file for 7 years. ***Failed seam samples are kept for 7 years; good seam samples are disposed after 2 weeks and conformance samples are disposed after 1 month.*** Should you need us to keep them longer, please advise us in writing.

If you have any questions or if we may be of further service, please do not hesitate to call at 800-522-4599.

Sincerely,

PRECISION GEOSYNTHETIC LABORATORIES

Maria Espitia
Quality Assurance

Cora B. Queja
Vice President

Enclosure: (Job No. G041272)

ISO 9001 - 2000

Precision Geosynthetic Laboratories

CLIENT: Advanced Terra Testing
PROJECT: Present Landfill Design / Proj # 2617-02

VERIFICATION OF MATERIAL PROPERTIES
(PGL Job No. G041272)

MATERIAL DESCRIPTION: LLDPE Geomembrane

SAMPLE(S) SENT BY: Advanced Terra Testing

DATE RECEIVED: October 15, 2004 **DATE REPORTED:** October 20, 2004

SAMPLE IDENTIFICATIONS:

SAMPLE ID	PRECISION CONTROL NUMBER
R#101110562	5942

TESTS REQUIRED:

TEST METHOD	DESCRIPTION
ASTM D1505	Density
ASTM D1603	Carbon Content
ASTM D5596	Carbon Black Dispersion

TEST CONDITIONS: The sample was conditioned for a minimum one hour in the laboratory at 22 ± 2°C (71.6 ± 3.6°F) and at 60 ± 10% relative humidity prior to test.

TEST RESULTS:

The test results are summarized in Table 1. The units in which the data are reported are included on this table.

PRECISION GEOSYNTHETIC LABORATORIES
Initials: MC #: 013
Date: 10/20/04

Maria Espitia
Quality Assurance

Cora B. Queja
Vice President

1160 North Gilbert Street, Anaheim, CA. 92801, Tel# 714-520-9631, Fax# 714-520-9637

TA 1.

MATERIAL PROPERTIES

CLIENT: ADVANCED TERRA TESTING

PROJECT: Present Landfill Design / Proj. #2617-02

Date Received: **10/15/2004**
Date Reported: **10/20/2004**
Client Sample ID: **R#101110562**
Material Description: **LLDPE Geomembrane**

QC'd By: ME
PGL Job No.: **G041272**
PGL Control No.: **5942**

		SPECIMENS												
		1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Proj. Specs.
METHOD	**DESCRIPTION**													
ASTM D1505	Density (grams/ cm.3)	0.9315	0.9315	0.9315								0.9315	0.0000	0.92 min.
ASTM D1603	Carbon Black Content (percent)	2.61	2.59									2.60	0.01	2%
ASTM D5596	Carbon Black Dispersion (category rating per reference chart PCN: 12-455960-38)	1	1	1	1	1	1	1	1	1	1	1	N/A	1 or 2

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION
DC#1987 Record #268

Precision Geosynthetic Laboratories

ISO 9001 - 2000

ISO 9001 - 2000

Precision Geosynthetic Laboratories

October 08, 2004

Sharon Roberts
Advanced Terra Testing
833 Parfet Street
Lakewood, CO 80215

Dear Ms. Roberts: RE: Present Landfill Design / Proj # 2617-02

Thank you for consulting Precision Geosynthetic Laboratories for your material testing needs.

Enclosed is the ***final*** laboratory report for the testing of eleven (11) 60 mil LLDPE Geomembrane sample received October 05, 2004.

It should be noted that the test specimen and test sample used for this report was believed to be representative of the material produced under the designation herein stated. However, these results are indicative of only the specimens that were actually tested. The testing herein is based upon accepted industry practice as well as the test method listed. Precision Geosynthetic Laboratories neither accepts responsibility for nor makes claims to the final use and purpose of the material.

By accepting the data and results represented on this report, Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims arising out of the use of this data to the cost for the respective test(s) represented in this report, and Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liability in excess of the aforementioned limit.

The test data and all associated project information shall be held in confidence, not to be reproduced except in full and disclosed to other parties with the authorization of Client.

It is a company policy to keep the physical records of each job for 2 years since the receipt of the samples and keep the electronic file for 7 years. ***Failed seam samples are kept for 7 years; good seam samples are disposed after 2 weeks and conformance samples are disposed after 1 month.*** Should you need us to keep them longer, please advise us in writing.

If you have any questions or if we may be of further service, please do not hesitate to call at 800-522-4599.

Sincerely,

PRECISION GEOSYNTHETIC LABORATORIES

Maria Espitia
Quality Assurance

Cora B. Queja
Vice President

Enclosure: (Job No. G041219)

ISO 9001 - 2000

Precision Geosynthetic Laboratories

CLIENT: Advanced Terra Testing
PROJECT: Present Landfill Design / Proj # 2617-02

VERIFICATION OF MATERIAL PROPERTIES
(PGL Job No. G041219)

MATERIAL DESCRIPTION: 60 mil LLDPE Geomembrane

SAMPLE(S) SENT BY: Advanced Terra Testing

DATE RECEIVED: October 05, 2004 **DATE REPORTED:** October 08, 2004

SAMPLE IDENTIFICATIONS:

SAMPLE ID	PRECISION CONTROL NUMBER
R#104123296 L#CRH810060	5675
R#104123303 L#CRH810060	5676
R#104123267 L#CRG812060	5677
R#104123282 L#CRH810060	5678
R#104123289 L#CRH810060	5679
R#104123274 L#CRH810060	5680
R#104123258 L#CRG812060	5681
R#104123231 L#CRG812060	5682
R#104123245 L#CRG812060	5683
R#104123238 L#CRG812060	5684
R#104123251 L#CRG812060	5685

TESTS REQUIRED:

TEST METHOD	DESCRIPTION
ASTM D1505	Density
ASTM D1603	Carbon Content
ASTM D5596	Carbon Black Dispersion

TEST CONDITIONS: The samples were conditioned for a minimum one hour in the laboratory at 22 ± 2°C (71.6 ± 3.6°F) and at 60 ± 10% relative humidity prior to test.

TEST RESULTS:

The test results are summarized in Table(s) 1 to 11. The units in which the data are reported are included on these tables.

PRECISION GEOSYNTHETIC LABORATORIES

Initials: MC
Date: 10/8/04

Maria Espitia
Quality Assurance

Cora B. Queja
Vice President

1160 North Gilbert Street, Anaheim, CA. 92801, Tel# 714-520-9631, Fax# 714-520-9637
DC#2000 Record#281

TABLE 8.

MATERIAL PROPERTIES

CLIENT: ADVANCED TERRA TESTING

PROJECT: Present Landfill Design / Proj# 2617-02

Date Received: **10/5/2004**
Date Reported: **10/8/2004**
Client Sample ID: **R#104123231 L#CRG812060**
Material Description: **60 mil LLDPE Geomembrane**

QC'd By: ME
PGL Job No.: **G041219**
PGL Control No.: **5682**

		SPECIMENS												Proj.
		1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Specs.
METHOD	**DESCRIPTION**													
ASTM D1505	Density (grams/ cm.3)	0.9320	0.9320	0.9320								0.9320	0.0000	0.92 min.
ASTM D1603	Carbon Black Content (percent)	2.34	2.34									2.34	0.00	2%
ASTM D5596	Carbon Black Dispersion (category rating per reference chart PCN: 12-455960-38)	1	1	1	1	1	1	1	1	1	1	1	N/A	1 or 2

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION
DC#1981 Record #268

Precision Geosynthetic Laboratories

ISO 9001 - 2000

TA[illegible]10.

MATERIAL PROPERTIES

CLIENT: ADVANCED TERRA TESTING

PROJECT: Present Landfill Design / Proj# 2617-02

Date Received: **10/5/2004**
Date Reported: **10/8/2004**
Client Sample ID: **R#104123238 L#CRG812060**
Material Description: **60 mil LLDPE Geomembrane**

QC'd By: ME
PGL Job No.: **G041219**
PGL Control No.: **5684**

		SPECIMENS												
		1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Proj. Specs.
METHOD	**DESCRIPTION**													
ASTM D1505	Density (grams/ cm.3)	0.9317	0.9317	0.9317								0.9317	0.0000	0.92 min.
ASTM D1603	Carbon Black Content (percent)	2.35	2.34									2.34	0.01	2%
ASTM D5596	Carbon Black Dispersion (category rating per reference chart PCN: 12-455960-38)	1	1	1	1	1	1	1	1	1	1	1	N/A	1 or 2

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION
DC#1987 Record #268

Precision Geosynthetic Laboratories

ISO 9001 - 2000

TABLE 9.

MATERIAL PROPERTIES

CLIENT: ADVANCED TERRA TESTING

PROJECT: Present Landfill Design / Proj# 2617-02

Date Received: **10/5/2004**
Date Reported: **10/8/2004**
Client Sample ID: **R#104123245 L#CRG812060**
Material Description: **60 mil LLDPE Geomembrane**

QC'd By: ME
PGL Job No.: **G041219**
PGL Control No.: **5683**

		SPECIMENS												
		1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Proj. Specs.
METHOD	**DESCRIPTION**													
ASTM D1505	Density (grams/ cm.3)	0.9315	0.9315	0.9315								0.9315	0.0000	0.92 min.
ASTM D1603	Carbon Black Content (percent)	2.29	2.33									2.31	0.03	2%
ASTM D5596	Carbon Black Dispersion (category rating per reference chart PCN: 12-455960-38)	1	1	1	1	1	1	1	1	1	1	1	N/A	1 or 2

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION
DC#198 / Record #268

ISO 9001 - 2000
GAI-LAP
ANSI-RAB
PERRY JOHNSON REGISTRARS, INC.

TAL[illegible]1.

MATERIAL PROPERTIES

CLIENT: ADVANCED TERRA TESTING

PROJECT: Present Landfill Design / Proj# 2617-02

Date Received: **10/5/2004**
Date Reported: **10/8/2004**
Client Sample ID: **R#104123251 L#CRG812060**
Material Description: **60 mil LLDPE Geomembrane**

QC'd By: me
PGL Job No.: **G041219**
PGL Control No.: **5685**

		SPECIMENS												
		1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Proj. Specs.
METHOD	**DESCRIPTION**													
ASTM D1505	Density (grams/ cm.3)	0.9310	0.9310	0.9310								0.9310	0.0000	0.92 min.
ASTM D1603	Carbon Black Content (percent)	2.29	2.30									2.30	0.01	2%
ASTM D5596	Carbon Black Dispersion (category rating per reference chart PCN: 12-455960-38)	1	1	1	1	1	1	1	1	1	1	1	N/A	1 or 2

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION
DC#1987 Record #268

Precision Geosynthetic Laboratories

ISO 9001 - 2000

TABLE 7.

MATERIAL PROPERTIES

CLIENT: ADVANCED TERRA TESTING

PROJECT: Present Landfill Design / Proj# 2617-02

Date Received: **10/5/2004**
Date Reported: **10/8/2004**
Client Sample ID: **R#104123258 L#CRG812060**
Material Description: **60 mil LLDPE Geomembrane**

QC'd By: ME
PGL Job No.: **G041219**
PGL Control No.: **5681**

		SPECIMENS												
		1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Proj. Specs.
METHOD	**DESCRIPTION**													
ASTM D1505	Density (grams/ cm.3)	0.9322	0.9322	0.9322								0.9322	0.0000	0.92 min.
ASTM D1603	Carbon Black Content (percent)	2.31	2.28									2.30	0.03	2%
ASTM D5596	Carbon Black Dispersion (category rating per reference chart PCN: 12-455960-38)	1	1	1	1	1	1	1	1	1	1	1	N/A	1 or 2

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION
DC#1987 Record #268

Precision Geosynthetic Laboratories

ISO 9001 - 2000

TA[illegible]3.

MATERIAL PROPERTIES

CLIENT: ADVANCED TERRA TESTING

PROJECT: Present Landfill Design / Proj# 2617-02

Date Received: **10/5/2004**
Date Reported: **10/8/2004**
Client Sample ID: **R#104123267 L#CRG812060**
Material Description: **60 mil LLDPE Geomembrane**

QC'd By: ME
PGL Job No.: **G041219**
PGL Control No.: **5677**

		SPECIMENS												
		1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Proj. Specs.
METHOD	**DESCRIPTION**													
ASTM D1505	Density (grams/ cm.3)	0.9320	0.9320	0.9320								0.9320	0.0000	0.92 min.
ASTM D1603	Carbon Black Content (percent)	2.39	2.43									2.41	0.03	2%
ASTM D5596	Carbon Black Dispersion (category rating per reference chart PCN: 12-455960-38)	1	1	1	1	1	1	1	1	1	1	1	N/A	1 or 2

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION
DC#1987 Record #268

Precision Geosynthetic Laboratories

ISO 9001 - 2000

TABLE 6.

MATERIAL PROPERTIES

CLIENT: ADVANCED TERRA TESTING

PROJECT: Present Landfill Design / Proj# 2617-02

Date Received: **10/5/2004**
Date Reported: **10/8/2004**
Client Sample ID: **R#104123274 L#CRH810060**
Material Description: **60 mil LLDPE Geomembrane**

QC'd By: me
PGL Job No.: **G041219**
PGL Control No.: **5680**

		SPECIMENS												
		1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Proj. Specs.
METHOD	**DESCRIPTION**													
ASTM D1505	Density (grams/ cm.3)	0.9317	0.9317	0.9317								0.9317	0.0000	0.92 min.
ASTM D1603	Carbon Black Content (percent)	2.33	2.34									2.34	0.01	2%
ASTM D5596	Carbon Black Dispersion (category rating per reference chart PCN: 12-455960-38)	1	1	1	1	1	1	1	1	1	1	1	N/A	1 or 2

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION
DC#196... Record #268

Precision Geosynthetic Laboratories

ISO 9001 - 2000

TA 4.

MATERIAL PROPERTIES

CLIENT: ADVANCED TERRA TESTING

PROJECT: Present Landfill Design / Proj# 2617-02

Date Received: **10/5/2004**
Date Reported: **10/8/2004**
Client Sample ID: **R#104123282 L#CRH810060**
Material Description: **60 mil LLDPE Geomembrane**

QC'd By: me
PGL Job No.: **G041219**
PGL Control No.: **5678**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Proj. Specs.
ASTM D1505	Density (grams/ cm.3)	0.9329	0.9329	0.9329								0.9329	0.0000	0.92 min.
ASTM D1603	Carbon Black Content (percent)	2.43	2.41									2.42	0.01	2%
ASTM D5596	Carbon Black Dispersion (category rating per reference chart PCN: 12-455960-38)	1	1	1	1	1	1	1	1	1	1	1	N/A	1 or 2

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION
DC#1987 Record #268

Precision Geosynthetic Laboratories

ISO 9001 - 2000

TABLE 5.

MATERIAL PROPERTIES

CLIENT: ADVANCED TERRA TESTING

PROJECT: Present Landfill Design / Proj# 2617-02

Date Received: **10/5/2004**
Date Reported: **10/8/2004**
Client Sample ID: **R#104123289 L#CRH810060**
Material Description: **60 mil LLDPE Geomembrane**

QC'd By: me
PGL Job No.: **G041219**
PGL Control No.: **5679**

		SPECIMENS												
		1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Proj. Specs.
METHOD	**DESCRIPTION**													
ASTM D1505	Density (grams/ cm.3)	0.9310	0.9310	0.9310								0.9310	0.0000	0.92 min.
ASTM D1603	Carbon Black Content (percent)	2.29	2.35									2.32	0.05	2%
ASTM D5596	Carbon Black Dispersion (category rating per reference chart PCN: 12-455960-38)	1	1	1	1	1	1	1	1	1	1	1	N/A	1 or 2

MD - M[illegible] DIRECTION
TD - T[illegible]RSE DIRECTION
DC#1987 Record #268

Precision Geosynthetic Laboratories

ISO 9001 - 2000

TA. 1.

MATERIAL PROPERTIES

CLIENT: ADVANCED TERRA TESTING

PROJECT: Present Landfill Design / Proj# 2617-02

Date Received: **10/5/2004**
Date Reported: **10/8/2004**
Client Sample ID: **R#104123296 L#CRH810060**
Material Description: **60 mil LLDPE Geomembrane**

QC'd By: ME
PGL Job No.: **G041219**
PGL Control No.: **5675**

		SPECIMENS												
		1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Proj. Specs.
METHOD	**DESCRIPTION**													
ASTM D1505	Density (grams/ cm.3)	0.9322	0.9322	0.9322								0.9322	0.0000	0.92 min.
ASTM D1603	Carbon Black Content (percent)	2.36	2.36									2.36	0.00	2%
ASTM D5596	Carbon Black Dispersion (category rating per reference chart PCN: 12-455960-38)	1	1	1	1	1	1	1	1	1	1	1	N/A	1 or 2

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION
DC#1987 Record #268

Precision Geosynthetic Laboratories

ISO 9001 - 2000

TABLE 2.

MATERIAL PROPERTIES

CLIENT: ADVANCED TERRA TESTING

PROJECT: Present Landfill Design / Proj# 2617-02

Date Received: **10/5/2004**
Date Reported: **10/8/2004**
Client Sample ID: **R#104123303 L#CRH810060**
Material Description: **60 mil LLDPE Geomembrane**

QC'd By: ME
PGL Job No.: **G041219**
PGL Control No.: **5676**

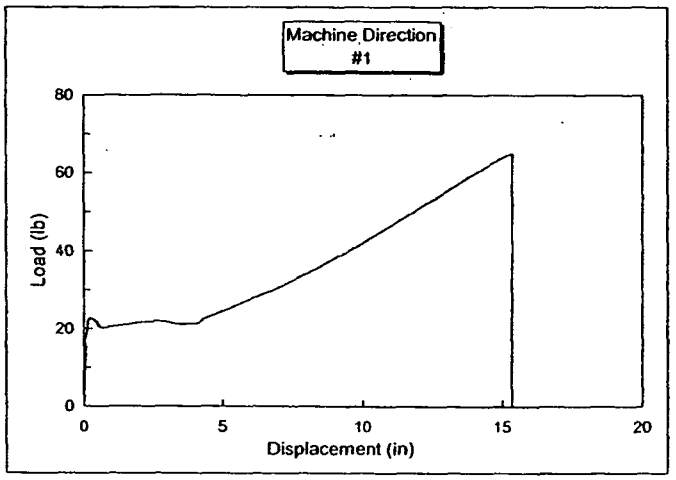
		SPECIMENS												
		1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Proj. Specs.
METHOD	**DESCRIPTION**													
ASTM D1505	Density (grams/ cm.3)													
		0.9317	0.9317	0.9317								0.9317	0.0000	0.92 min.
ASTM D1603	Carbon Black Content (percent)													
		2.37	2.34									2.36	0.02	2%
ASTM D5596	Carbon Black Dispersion (category rating per reference chart PCN: 12-455960-38)													
		1	1	1	1	1	1	1	1	1	1	1	N/A	1 or 2

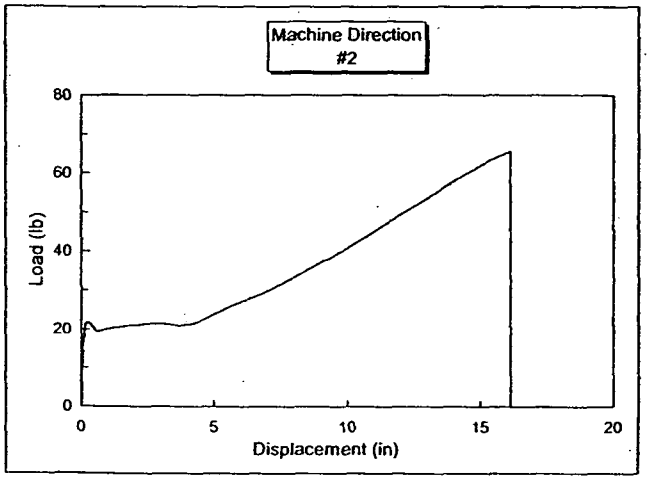
MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION
DC#198... Record #268

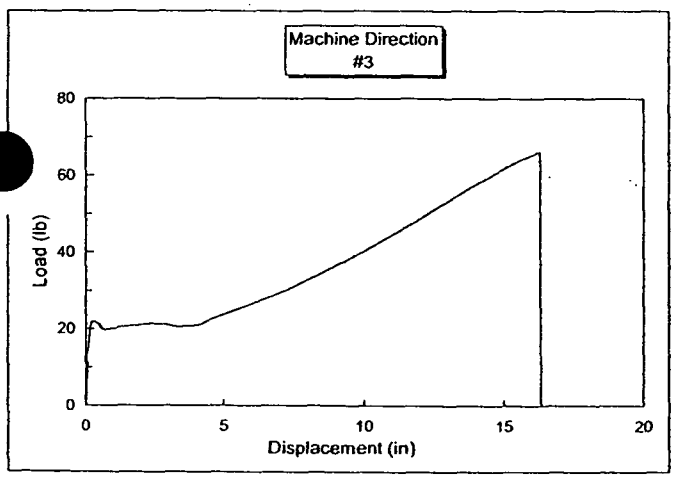
Precision Geosynthetic Laboratories

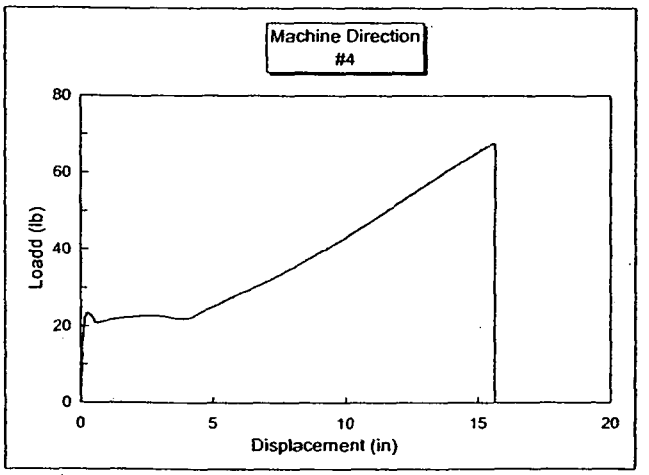
ISO 9001 - 2000

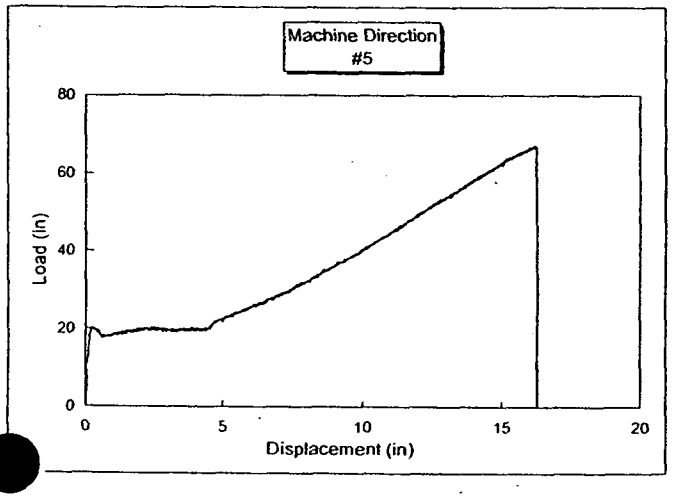
Client:	Tetra Tech - RMC	Test Type:	ASTM D 6693 Type IV
Job No.:	2617-02	Material Type:	60 mil Smooth LLDPE
Location:	Present Landfil-RFETS, Golden, CO	Date Tested:	10-25-04
Sample:	Roll #101110562	Tested By:	JTR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
		Grip Seperation:	2.5"











Machine Direction

	Load at Break (lb/in width)	Elongation at Break (%)	Load at Yield (lb/in width)	Elongation at Yield (%)
Specimen #1	283.8	766.5	99.5	18.6
Specimen #2	283.8	806.8	94.5	18.0
Specimen #3	286.6	813.4	95.5	21.2
Specimen #4	294.8	781.6	102.3	18.0
Specimen #5	292.1	809.2	88.1	17.1
Average	**288.2**	**795.5**	**96.0**	**18.6**
Std. Deviation	**4.5**	**18.3**	**4.8**	**1.4**

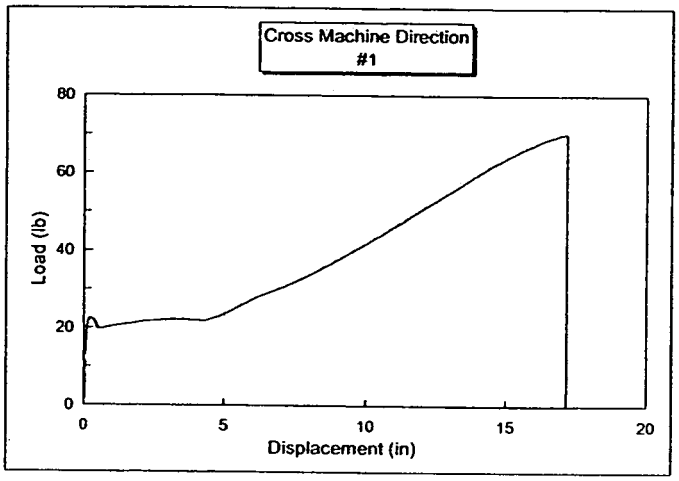
Filename: TTNT0562

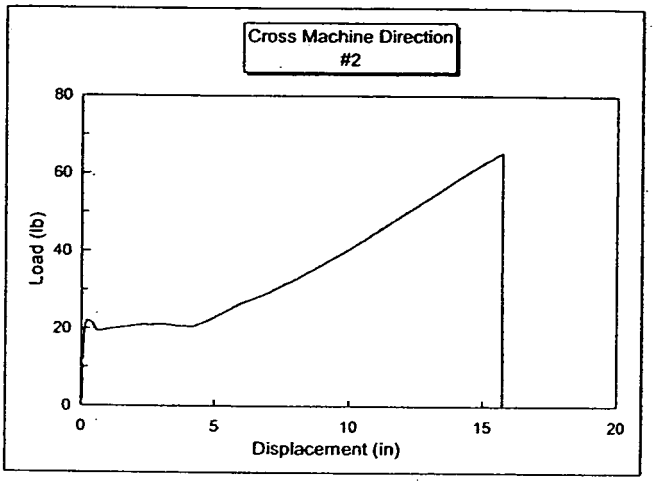
Raw Data File: TTATPM2, TTATPM3.TXT

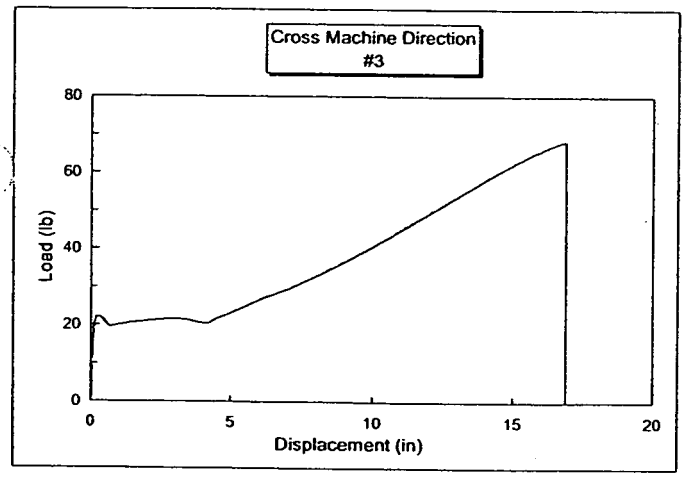
Checked By: JTR Date: 10/27/04

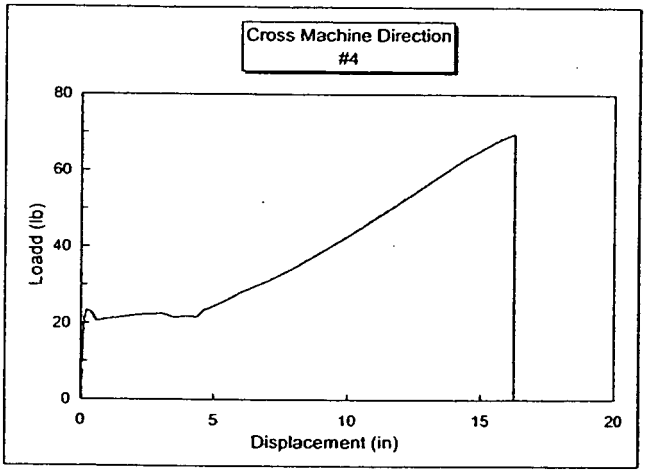
Advanced Terra Testing, Inc.

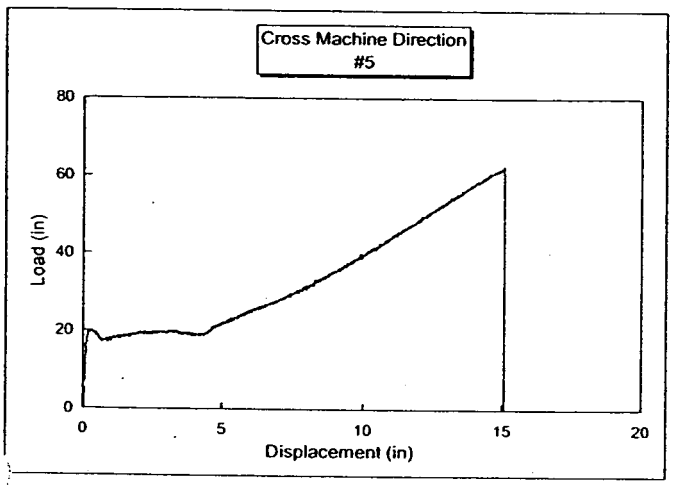
Client:	Tetra Tech - RMC	Test Type:	ASTM D 6693 Type IV
Job No.:	2617-02	Material Type:	60 mil Smooth LLDPE
Location:	Present Landfil-RFETS, Golden, CO	Date Tested:	10-25-04
Sample:	Roll #101110562	Tested By:	JTR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
		Grip Seperation:	2.5"











Cross Machine Direction

	Load at Break (lb/in width)	Elongation at Break (%)	Load at Yield (lb/in width)	Elongation at Yield (%)
Specimen #1	302.1	856.5	96.9	15.4
Specimen #2	280.7	786.7	94.7	18.3
Specimen #3	294.1	842.9	95.7	14.5
Specimen #4	299.4	812.4	100.5	17.1
Specimen #5	271.0	752.7	87.5	23.5
Average	**289.4**	**810.2**	**95.1**	**17.8**
Std. Deviation	**11.8**	**37.6**	**4.3**	**3.2**

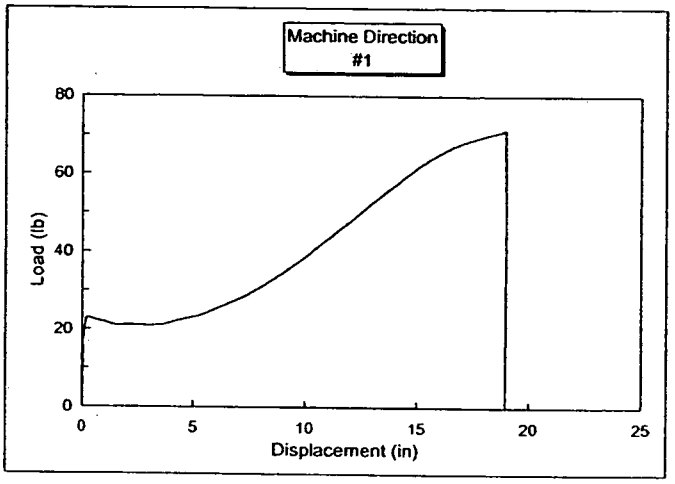
Filename: TTNTC562

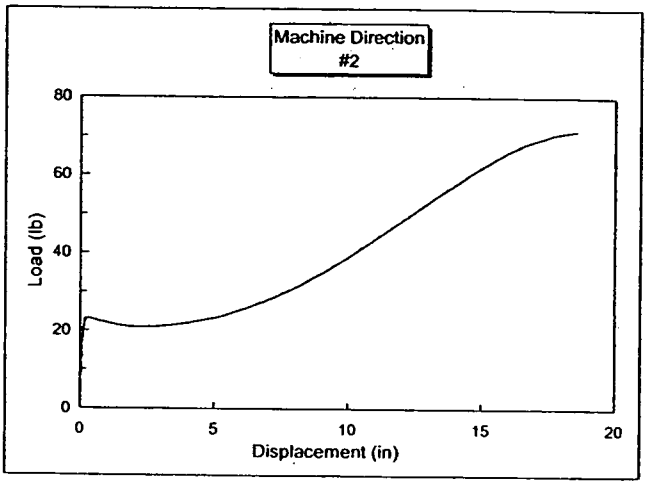
Raw Data File: TTATPC2, TTATPC3.TXT

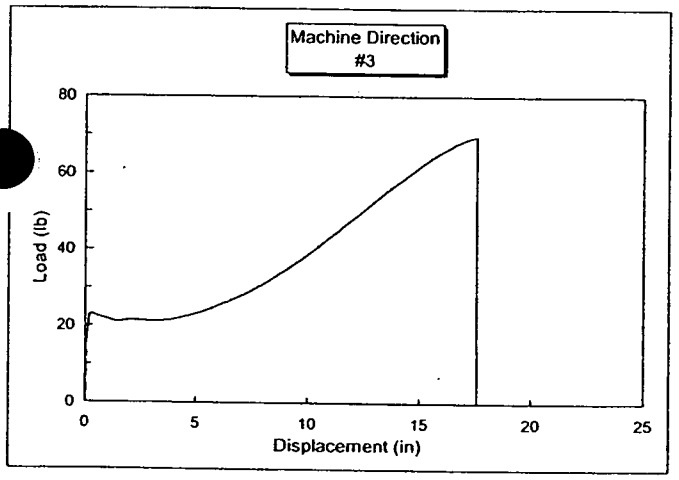
Checked By: JTR Date: 10/27/04

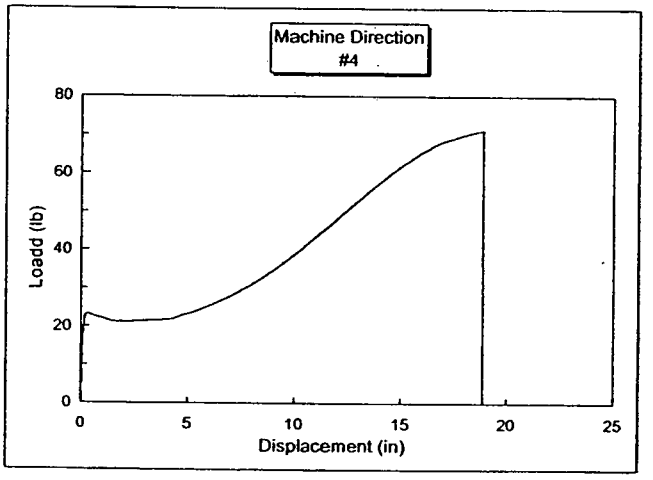
Advanced Terra Testing, Inc.

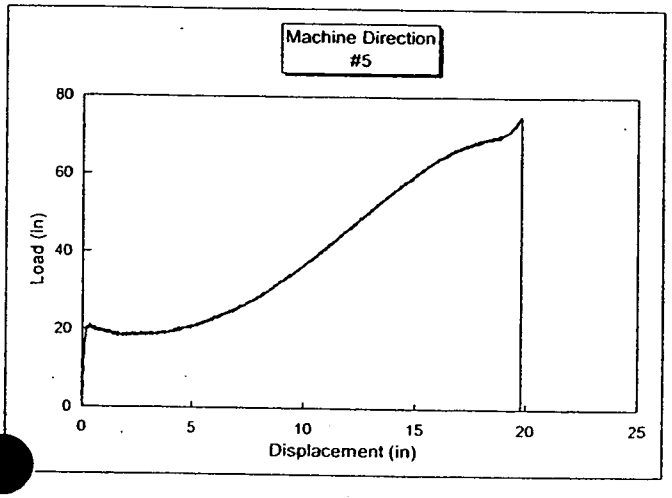
Client:	Tetra Tech - RMC	Test Type:	ASTM D 6693 Type IV
Job No.:	2617-02	Material Type:	60 mil Smooth LLDPE, LLD060A000
Location:	Present Landfil-RFETS, Golden, CO	Date Tested:	10-03-04
Sample:	Roll #104123231, Resin #CRG812060	Tested By:	SR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
		Grip Seperation:	2.5"











Machine Direction

	Load at Break (lb/in width)	Elongation at Break (%)	Load at Yield (lb/in width)	Elongation at Yield (%)
Specimen #1	300.8	948.1	97.3	23.0
Specimen #2	301.6	936.9	97.6	23.0
Specimen #3	290.1	878.2	96.1	21.8
Specimen #4	298.1	941.9	97.1	23.0
Specimen #5	314.4	989.1	88.8	27.6
Average	**301.0**	**938.8**	**95.4**	**23.7**
Std. Deviation	**7.9**	**35.5**	**3.3**	**2.0**

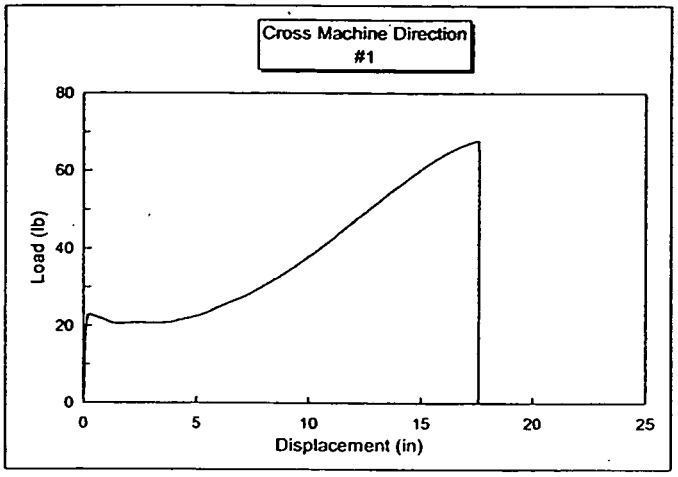
Filename: TTNT3231

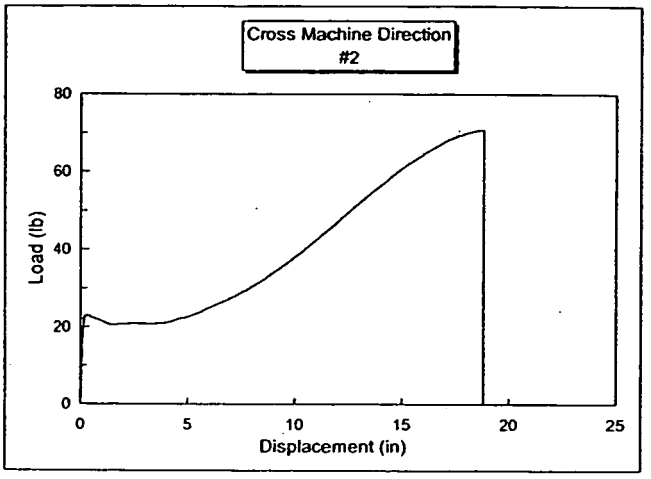
Raw Data File: TT8TPM2, TT8TPM3.TXT

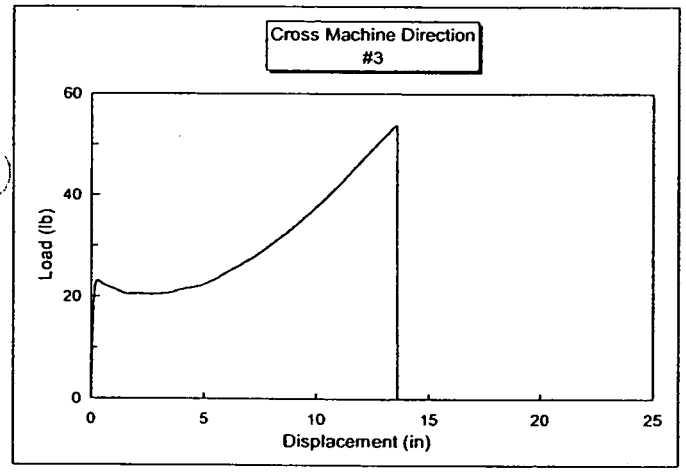
Checked By: JTR Date: 10/07/04

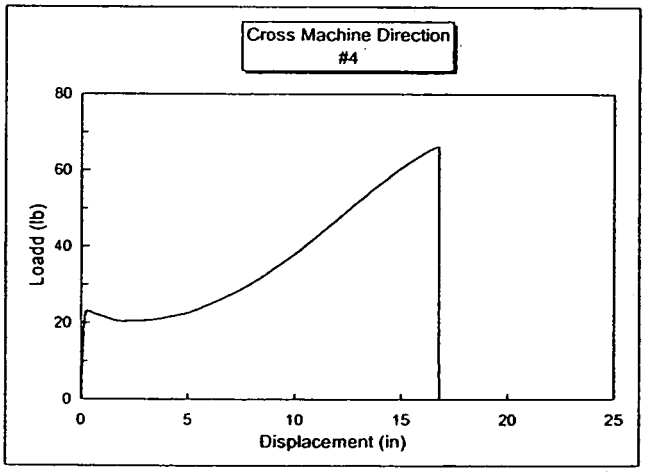
Advanced Terra Testing, Inc.

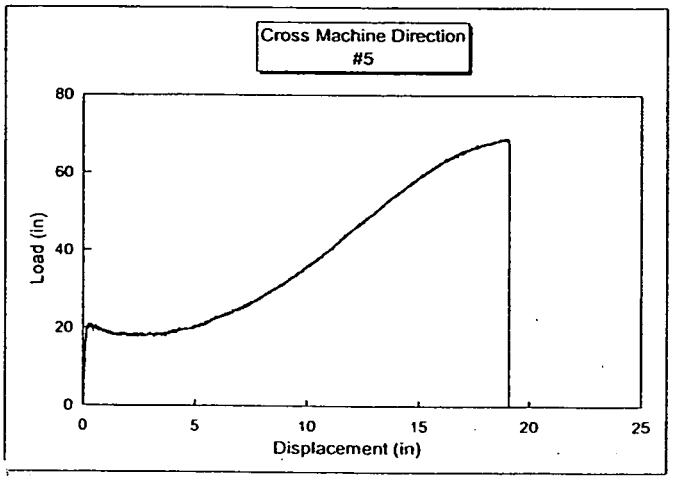
Client:	Tetra Tech - RMC	Test Type:	ASTM D 6693 Type IV
Job No.:	2617-02	Material Type:	60 mil Smooth LLDPE, LLD060A000
Location:	Present Landfil-RFETS, Golden, CO	Date Tested:	10-03-04
Sample:	Roll #104123231, Resin #CRG812060	Tested By:	SR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
		Grip Seperation:	2.5"











Cross Machine Direction

	Load at Break (lb/in width)	Elongation at Break (%)	Load at Yield (lb/in width)	Elongation at Yield (%)
Specimen #1	279.3	878.8	94.6	20.9
Specimen #2	295.2	938.3	95.8	23.3
Specimen #3	223.5	678.1	95.9	22.4
Specimen #4	279.0	839.6	97.6	25.6
Specimen #5	286.8	945.3	87.3	20.9
Average	**272.8**	**856.0**	**94.3**	**22.6**
Std. Deviation	**25.3**	**97.1**	**3.6**	**1.7**

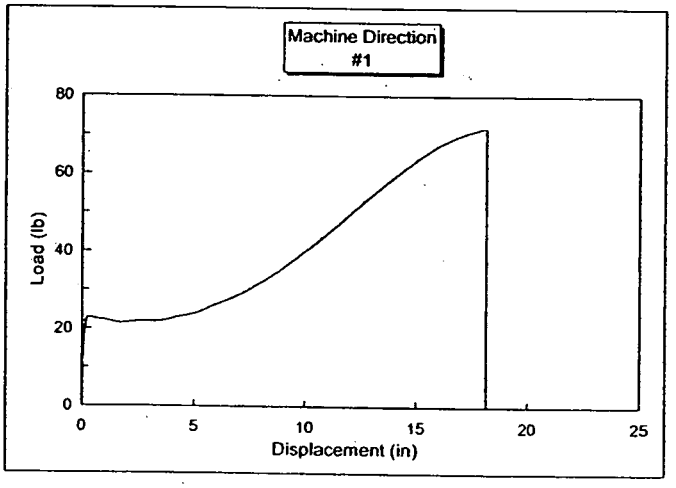
Filename: TTNTC231

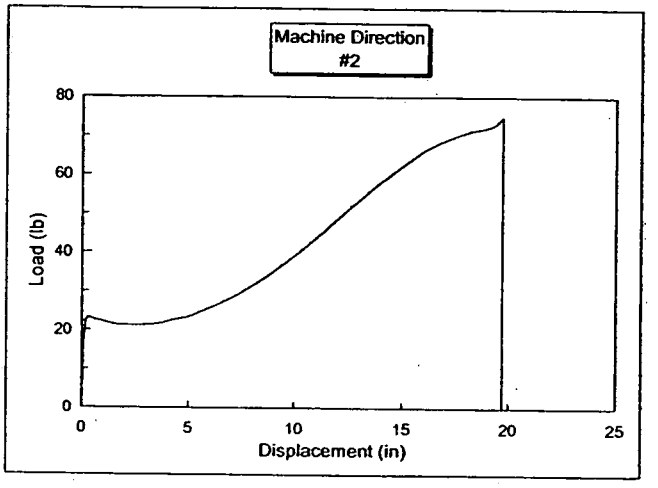
Raw Data File: TT8TPC2, TT8TPC3.TXT

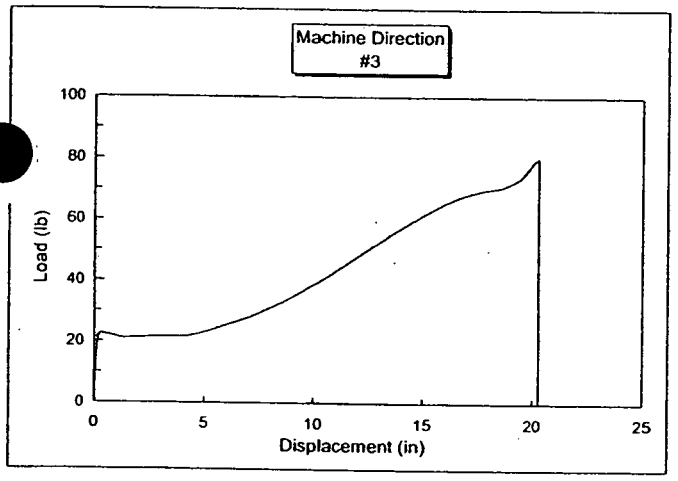
Checked By: JTR Date: 10/27/04

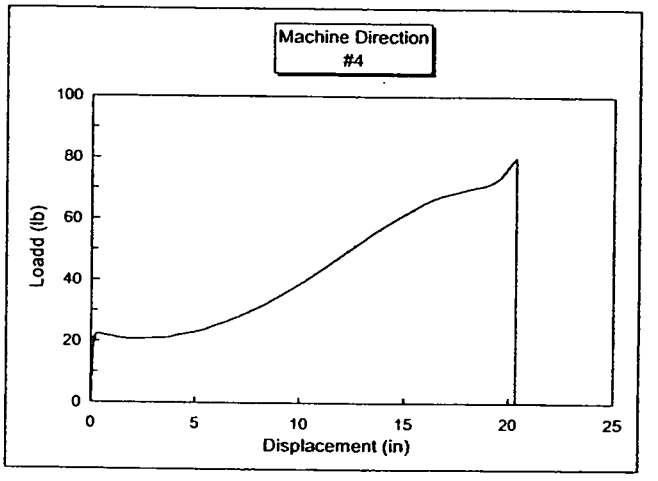
Advanced Terra Testing, Inc.

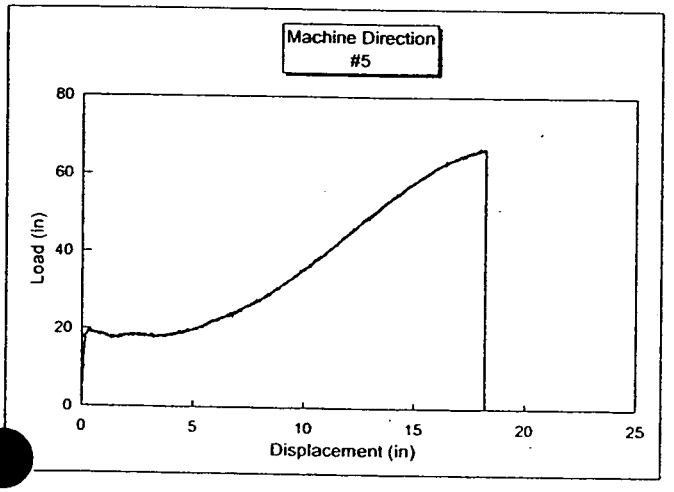
Client:	Tetra Tech - RMC	Test Type:	ASTM D 6693 Type IV
Job No.:	2617-02	Material Type:	60 mil Smooth LLDPE, LLD060A000
Location:	Present Landfil-RFETS, Golden, CO	Date Tested:	10-04-04
Sample:	Roll #104123238, Resin #CRG812060	Tested By:	SR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
		Grip Seperation:	2.5"











Machine Direction

	Load at Break (lb/in width)	Elongation at Break (%)	Load at Yield (lb/in width)	Elongation at Yield (%)
Specimen #1	299.6	906.3	95.5	21.8
Specimen #2	310.8	986.1	96.4	22.1
Specimen #3	336.4	1014.4	94.9	23.0
Specimen #4	333.2	1016.5	93.8	27.0
Specimen #5	276.6	899.9	81.3	30.2
Average	**311.3**	**964.6**	**92.4**	**24.8**
Std. Deviation	**22.2**	**51.4**	**5.6**	**3.3**

Filename: TTNT3238

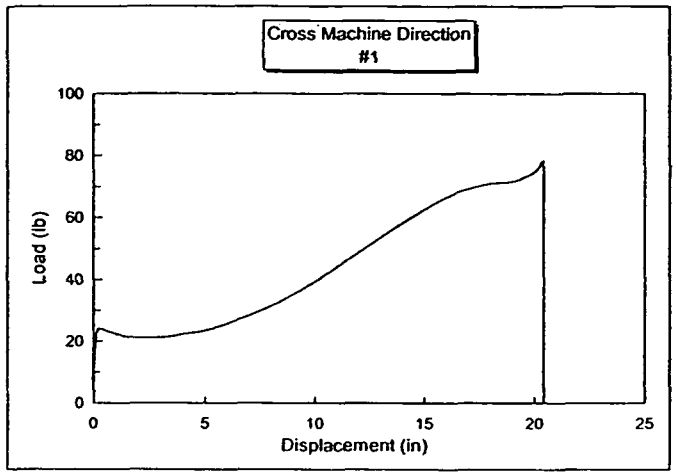
Raw Data File: TT9TPC2, TT9TPC3.TXT

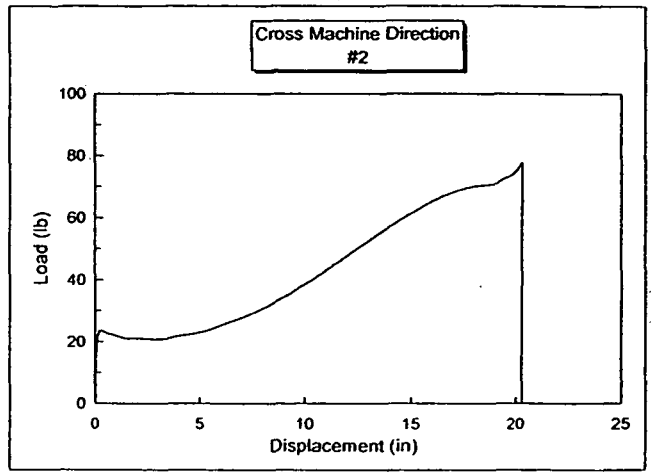
Checked By: JTR

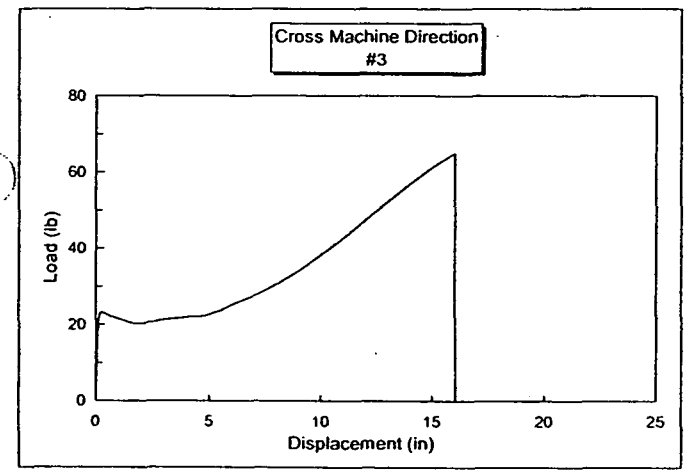
Date: 10/27/04

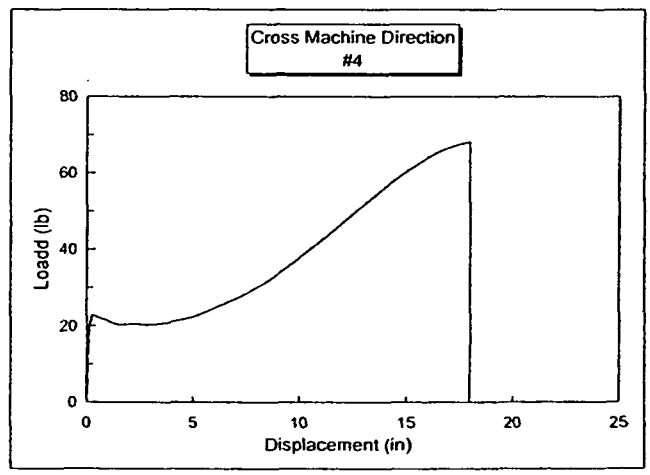
Advanced Terra Testing, Inc.

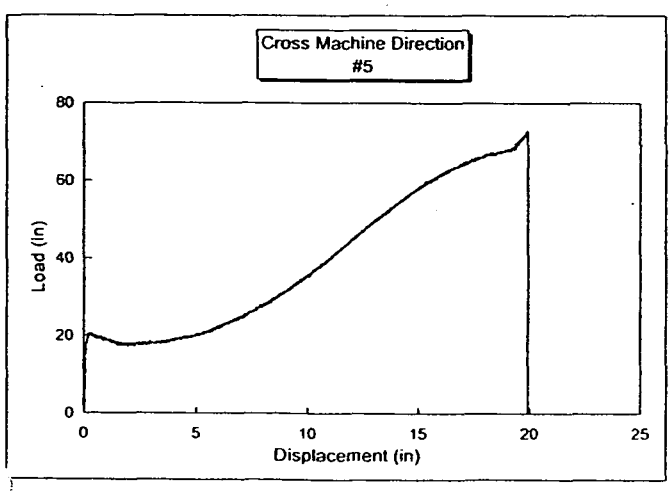
Client:	Tetra Tech - RMC	Test Type:	ASTM D 6693 Type IV
Job No.:	2617-02	Material Type:	60 mil Smooth LLDPE, LLD060A000
Location:	Present Landfil-RFETS, Golden, CO	Date Tested:	10-04-04
Sample:	Roll #104123238, Resin #CRG812060	Tested By:	SR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
		Grip Seperation:	2.5"











Cross Machine Direction

	Load at Break (lb/in width)	Elongation at Break (%)	Load at Yield (lb/in width)	Elongation at Yield (%)
Specimen #1	324.4	1021.6	100.1	18.6
Specimen #2	324.5	1016.3	98.4	19.2
Specimen #3	267.3	800.5	95.7	20.1
Specimen #4	283.8	899.7	95.1	21.8
Specimen #5	303.1	996.6	85.9	28.8
Average	**300.6**	**947.0**	**95.0**	**21.7**
Std. Deviation	**22.5**	**85.5**	**4.9**	**3.7**

Filename: TTNTC238

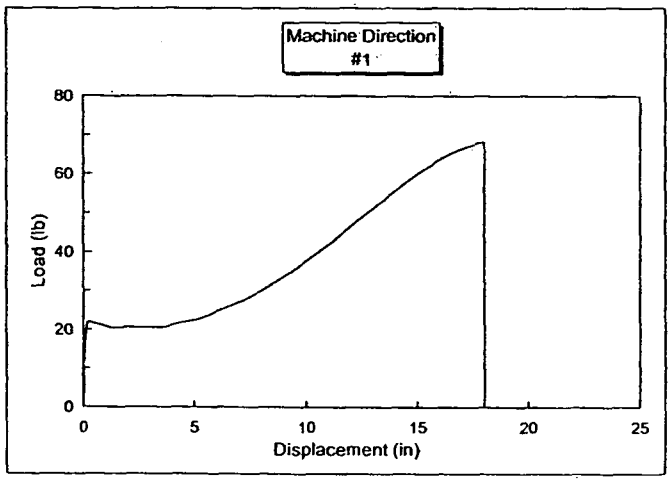
Raw Data File: TT10TPC2, TT10TPC3.TXT

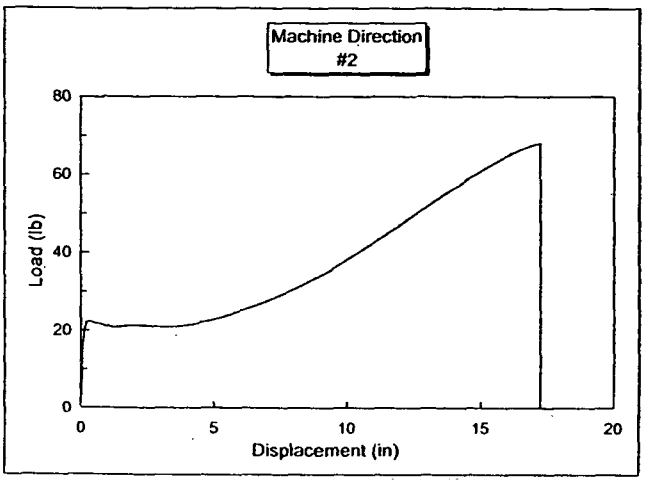
Checked By: JTR

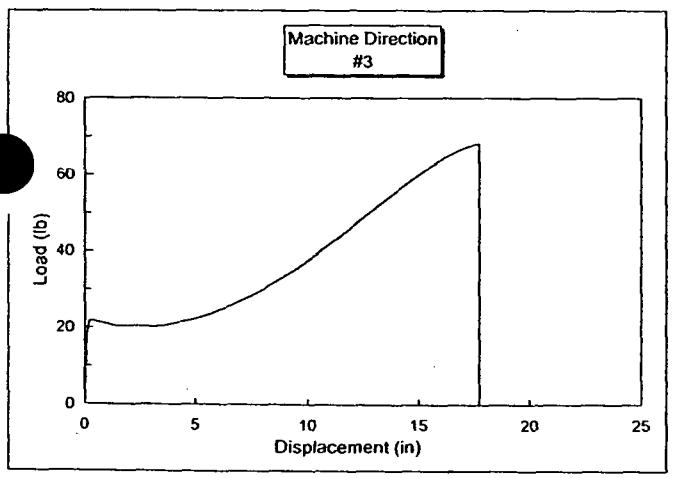
Date: 10/27/04

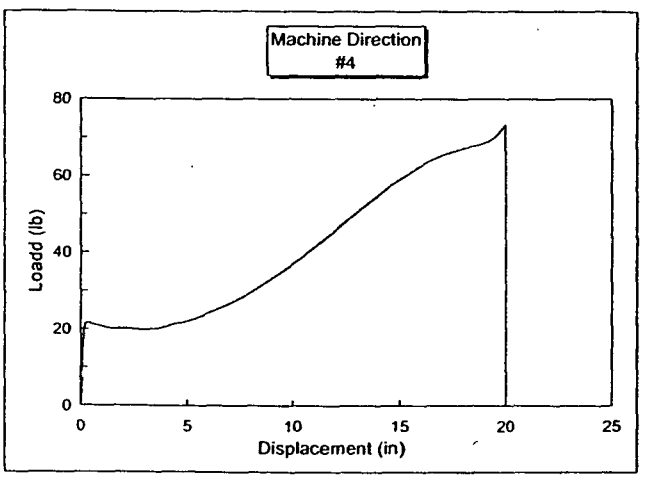
Advanced Terra Testing, Inc.

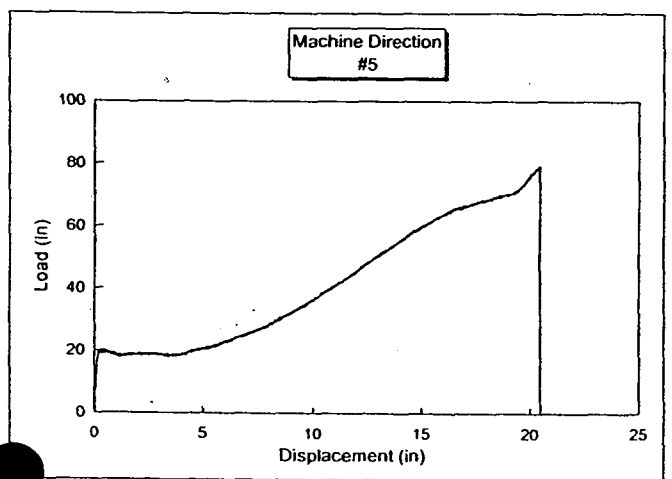
Client:	Tetra Tech - RMC	Test Type:	ASTM D 6693 Type IV
Job No.:	2617-02	Material Type:	60 mil Smooth LLDPE, LLD060A000
Location:	Present Landfil-RFETS, Golden, CO	Date Tested:	10-04-04
Sample:	Roll #104123245, Resin #CRG812060	Tested By:	SR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
		Grip Seperation:	2.5"











Machine Direction

	Load at Break (lb/in width)	Elongation at Break (%)	Load at Yield (lb/in width)	Elongation at Yield (%)
Specimen #1	281.7	899.0	90.7	23.0
Specimen #2	282.0	861.2	92.8	23.8
Specimen #3	285.3	885.4	91.9	23.3
Specimen #4	306.5	999.9	90.5	22.1
Specimen #5	329.1	1022.9	83.9	32.6
Average	**296.9**	**933.7**	**89.9**	**24.9**
Std. Deviation	**18.5**	**65.0**	**3.2**	**3.9**

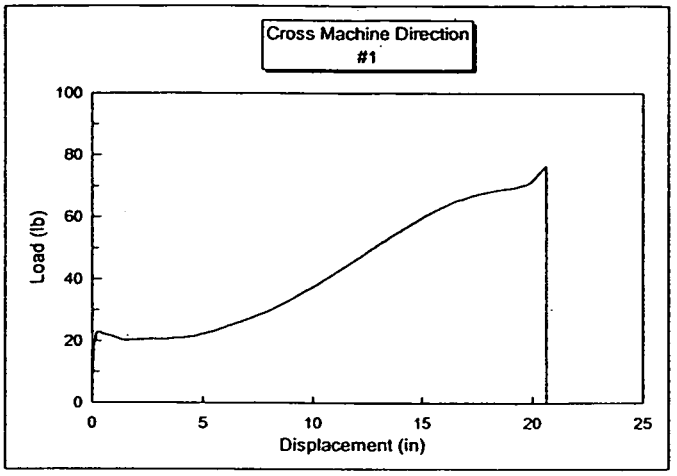
Filename: TTNT3245

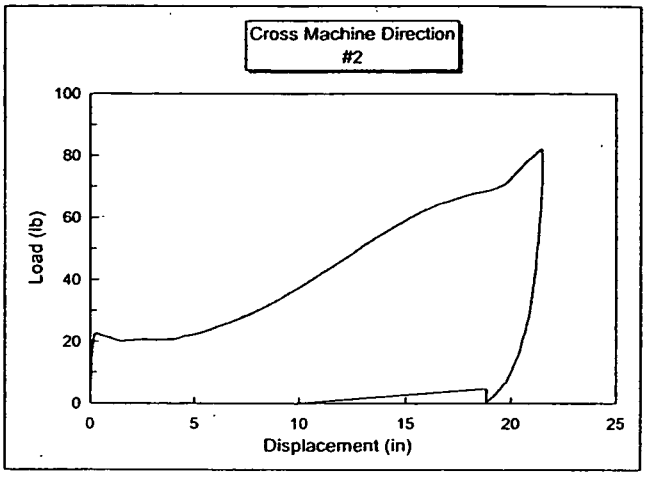
Raw Data File: TT9TPM2, TT9TPM3.TXT

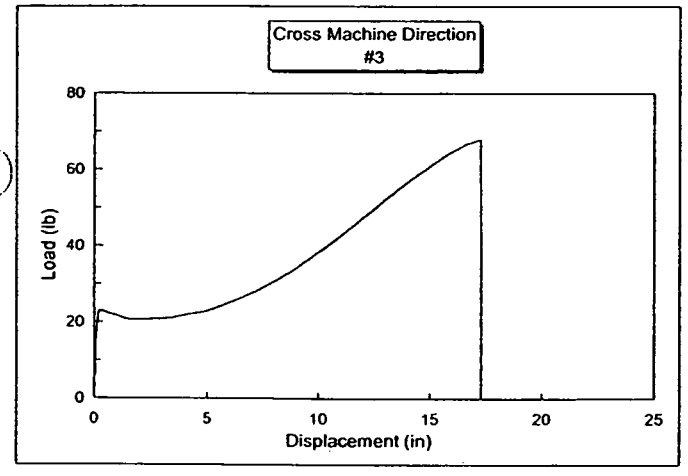
Checked By: JTA Date: 10/27/04

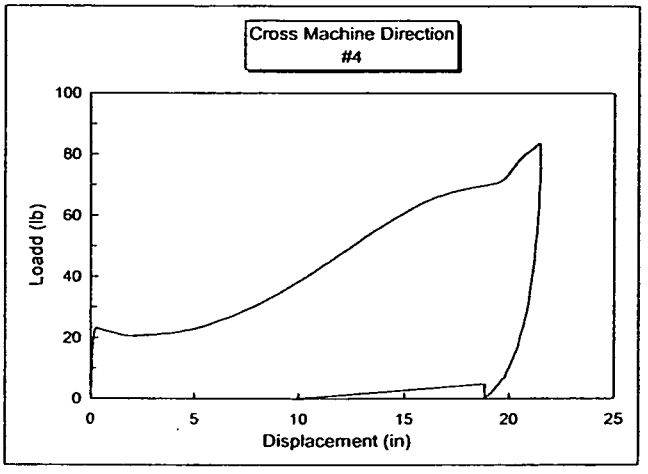
Advanced Terra Testing, Inc.

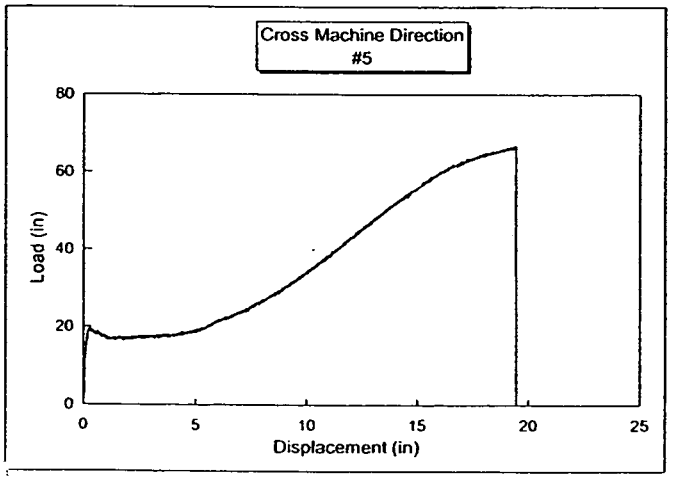
Client:	Tetra Tech - RMC	Test Type:	ASTM D 6693 Type IV
Job No.:	2617-02	Material Type:	60 mil Smooth LLDPE, LLD060A000
Location:	Present Landfil-RFETS, Golden, CO	Date Tested:	10-04-04
Sample:	Roll #104123245, Resin #CRG812060	Tested By:	SR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
		Grip Seperation:	2.5"











Cross Machine Direction

	Load at Break (lb/in width)	Elongation at Break (%)	Load at Yield (lb/in width)	Elongation at Yield (%)
Specimen #1	318.9	1031.0	95.9	19.5
Specimen #2	341.1	1073.9	94.3	22.1
Specimen #3	281.6	862.9	96.1	24.1
Specimen #4	348.4	1073.9	96.9	23.5
Specimen #5	279.8	971.3	82.0	23.3
Average	**314.0**	**1002.6**	**93.0**	**22.5**
Std. Deviation	**28.8**	**79.4**	**5.6**	**1.6**

Filename: TTNT3245

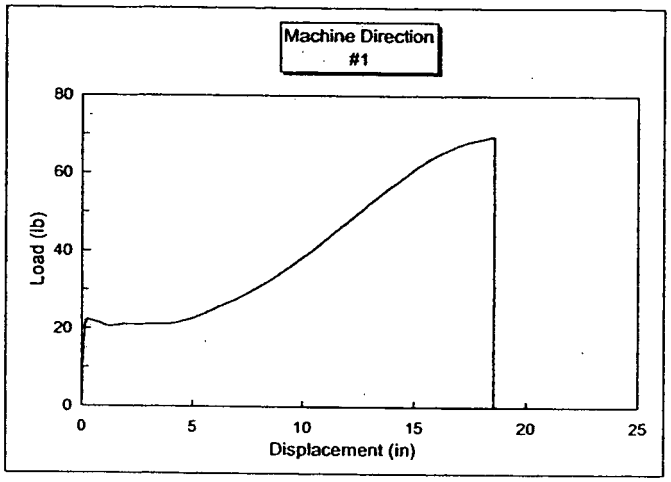
Raw Data File: TT9TPM2, TT9TPM3.TXT

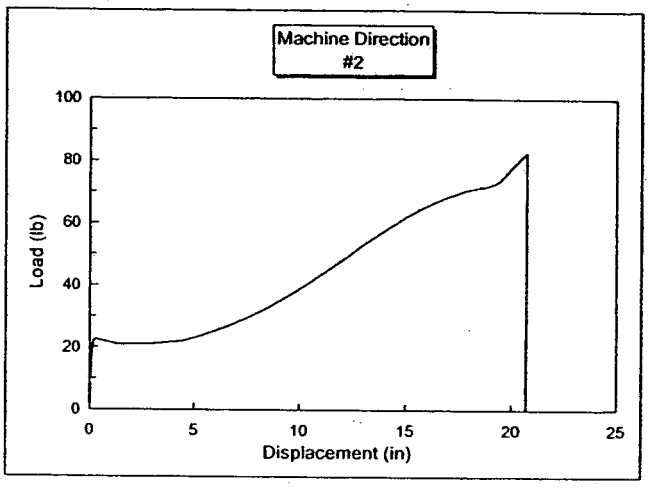
Checked By: JTR

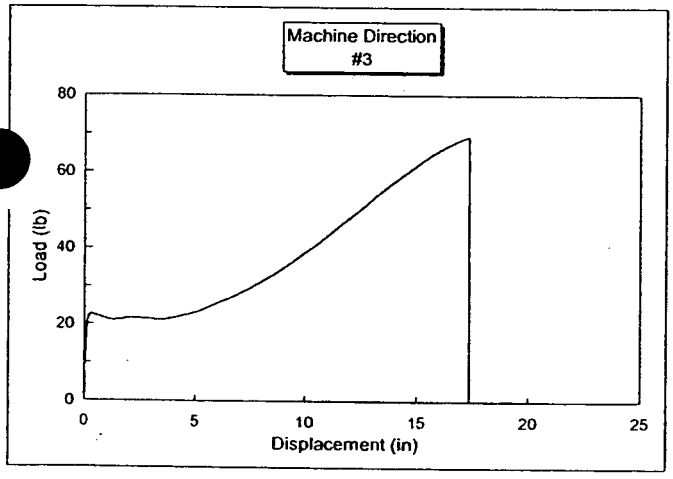
Date: 10/27/04

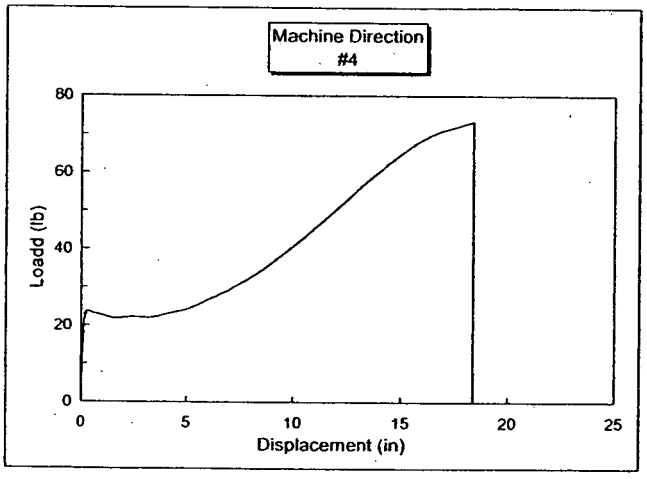
Advanced Terra Testing, Inc.

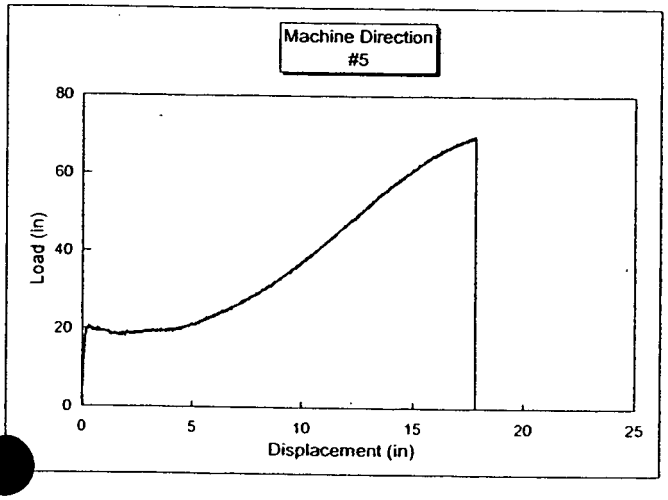
Client:	Tetra Tech - RMC	Test Type:	ASTM D 6693 Type IV
Job No.:	2617-02	Material Type:	60 mil Smooth LLDPE, LLD060A000
Location:	Present Landfil-RFETS, Golden, CO	Date Tested:	10-04-04
Sample:	Roll #104123251, Resin #CRG812060	Tested By:	SR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
		Grip Seperation:	2.5"











Machine Direction

	Load at Break (lb/in width)	Elongation at Break (%)	Load at Yield (lb/in width)	Elongation at Yield (%)
Specimen #1	288.9	926.9	92.8	21.5
Specimen #2	342.6	1035.9	93.9	24.4
Specimen #3	286.6	867.2	93.9	23.3
Specimen #4	304.1	918.8	98.3	24.1
Specimen #5	291.4	891.0	86.4	24.4
Average	**302.7**	**928.0**	**93.1**	**23.5**
Std. Deviation	**20.8**	**58.0**	**3.8**	**1.1**

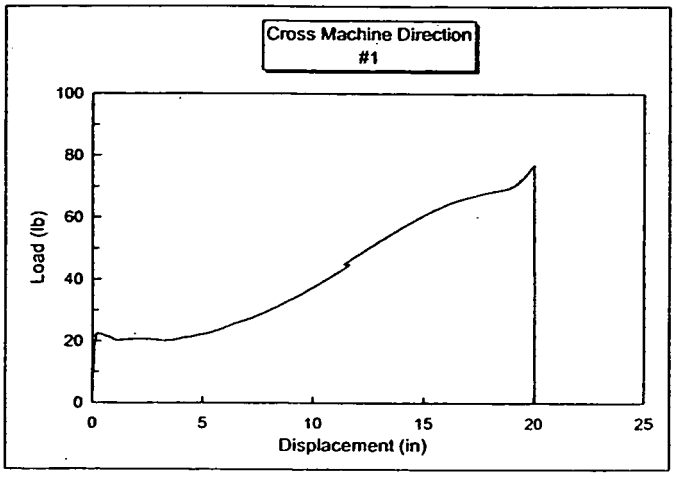
Filename: TTNT3251

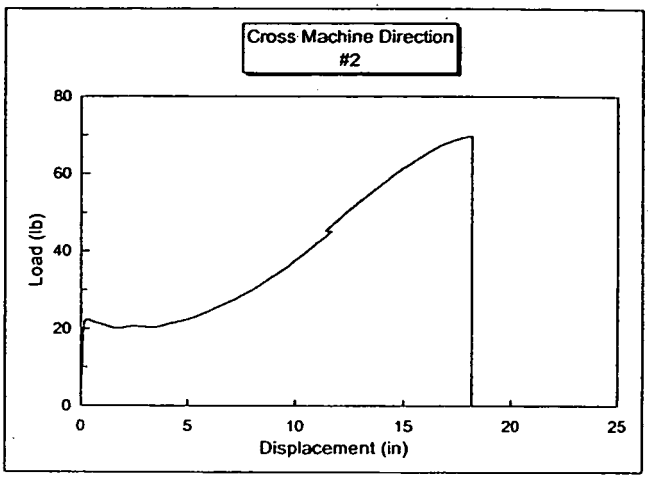
Raw Data File: TT11TPM2, TT11TPM3.TXT

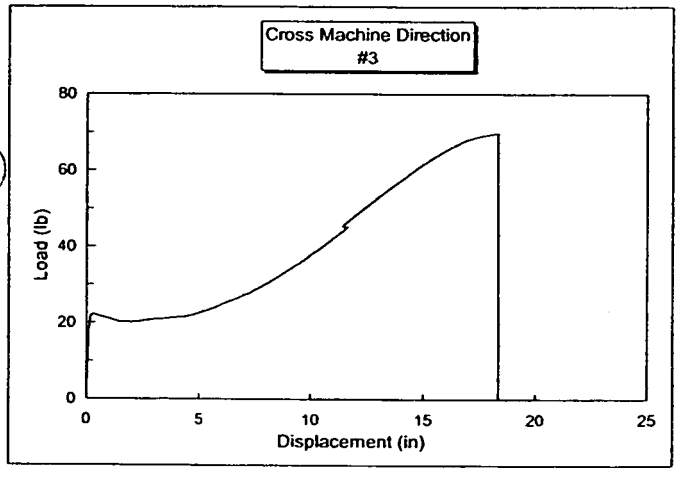
Checked By: JTR Date: 10/27/04

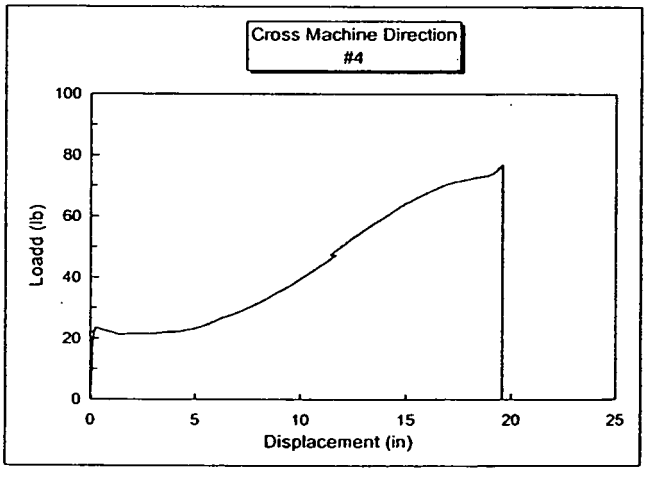
Advanced Terra Testing, Inc.

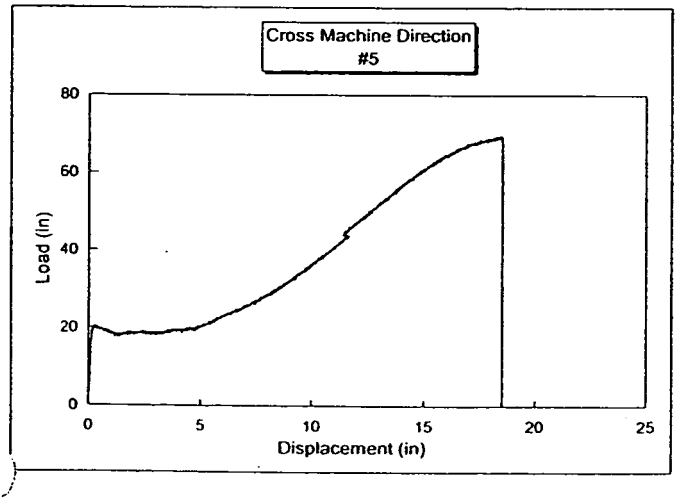
Client:	Tetra Tech - RMC	Test Type:	ASTM D 6693 Type IV
Job No.:	2617-02	Material Type:	60 mil Smooth LLDPE, LLD060A000
Location:	Present Landfil-RFETS, Golden, CO	Date Tested:	10-04-04
Sample:	Roll #104123251, Resin #CRG812060	Tested By:	SR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
		Grip Seperation:	2.5"











Cross Machine Direction

	Load at Break (lb/in width)	Elongation at Break (%)	Load at Yield (lb/in width)	Elongation at Yield (%)
Specimen #1	320.8	1000.4	93.4	18.9
Specimen #2	291.8	906.3	93.4	22.1
Specimen #3	289.2	909.0	92.6	24.1
Specimen #4	320.6	978.5	97.7	22.1
Specimen #5	288.9	924.5	84.7	24.1
Average	**302.3**	**943.7**	**92.4**	**22.3**
Std. Deviation	**15.1**	**38.5**	**4.2**	**1.9**

Filename: TTNTC251

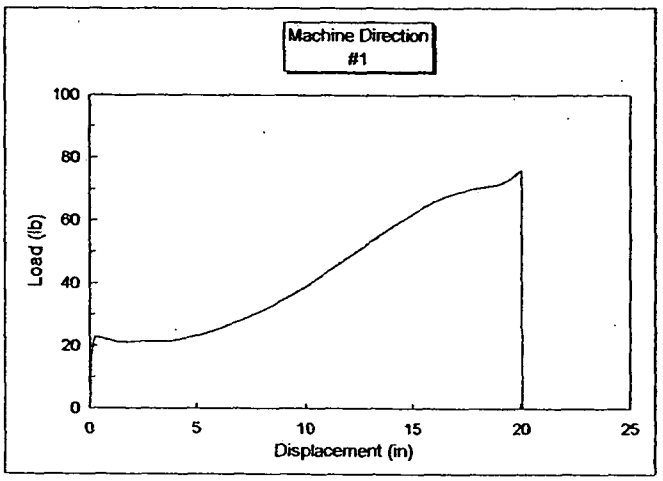
Raw Data File: TT11TPC2, TT11TPC3.TXT

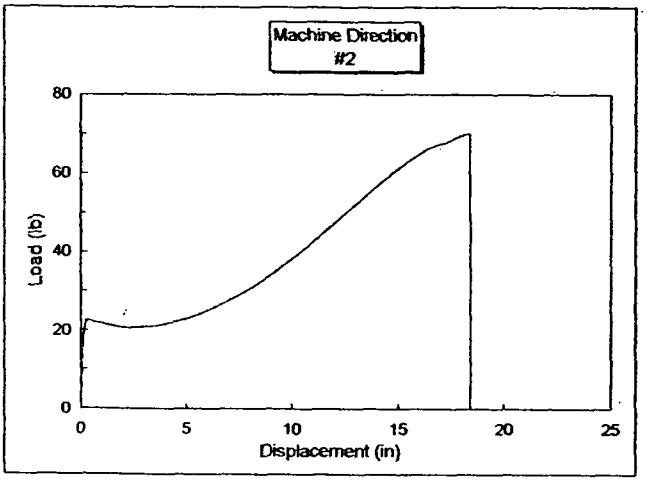
Checked By: JTR

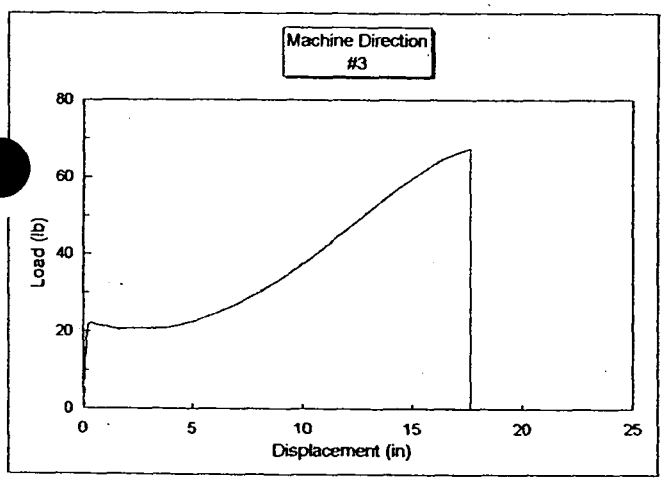
Date: 10/27/04

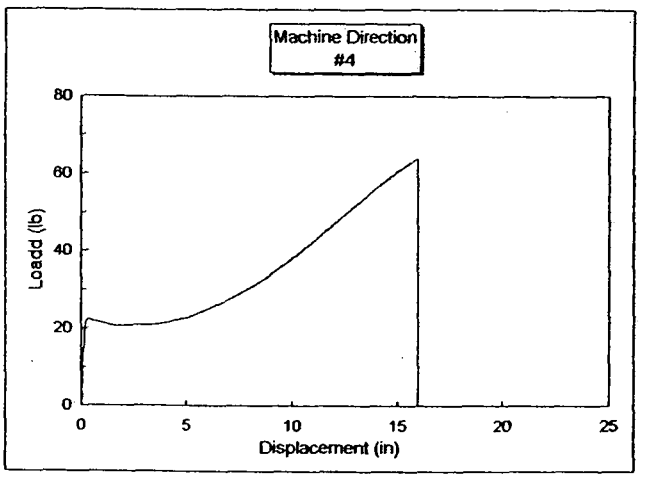
Advanced Terra Testing, Inc.

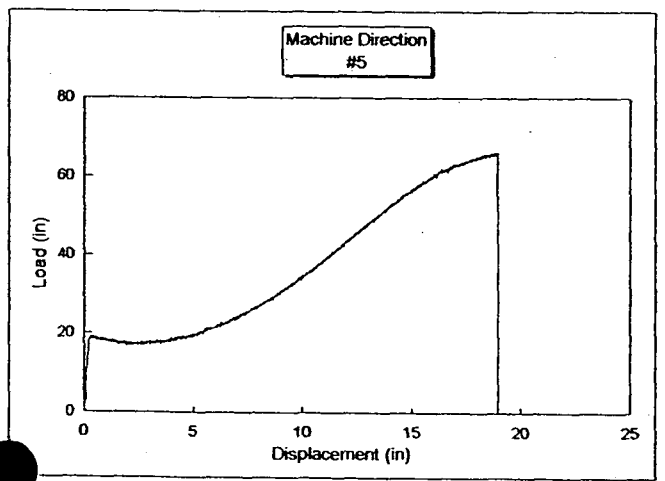
Client:	Tetra Tech - RMC	Test Type:	ASTM D 6693 Type IV
Job No.:	2617-02	Material Type:	60 mil Smooth LLDPE, LLD060A000
Location:	Present Landfil-RFETS, Golden, CO	Date Tested:	10-03-04
Sample:	Roll #104123258, Resin #CRG812060	Tested By:	SR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
		Grip Seperation:	2.5"











Machine Direction

	Load at Break (lb/in width)	Elongation at Break (%)	Load at Yield (lb/in width)	Elongation at Yield (%)
Specimen #1	312.3	1000.4	93.8	22.1
Specimen #2	289.4	916.5	93.1	24.4
Specimen #3	276.8	880.6	91.4	23.8
Specimen #4	264.0	796.0	92.4	21.5
Specimen #5	274.1	944.7	79.5	30.8
Average	**283.3**	**907.7**	**90.1**	**24.5**
Std. Deviation	**16.6**	**68.2**	**5.3**	**3.3**

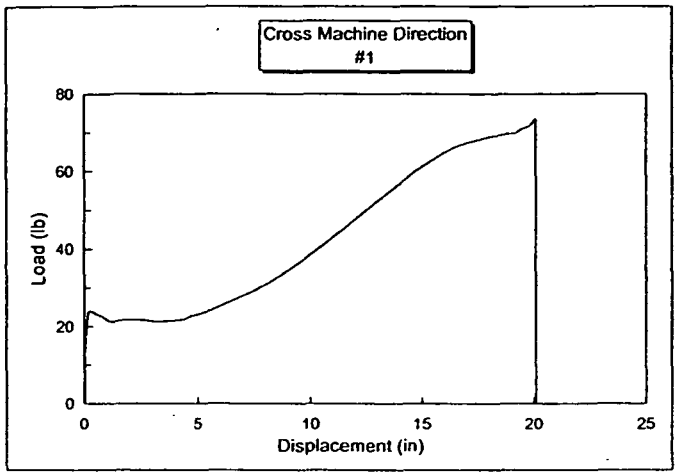
Filename: TTNT3258

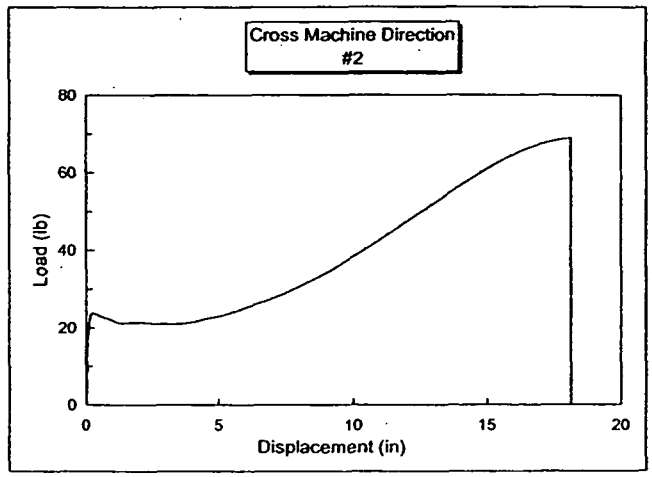
Raw Data File: TT7TPM2, TT7TPM3.TXT

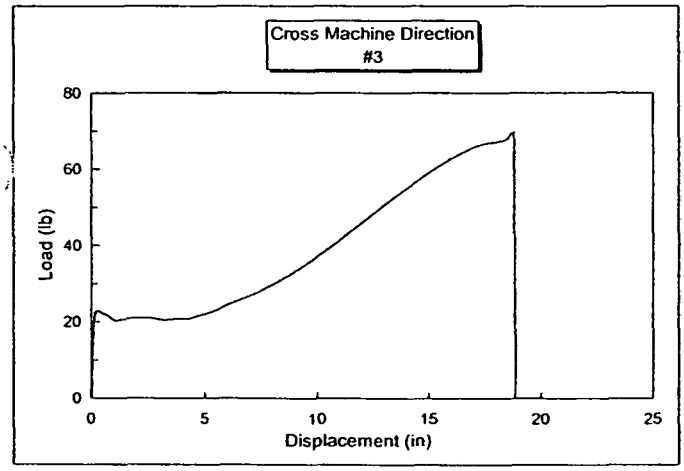
Checked By: JTP Date: 10/27/04

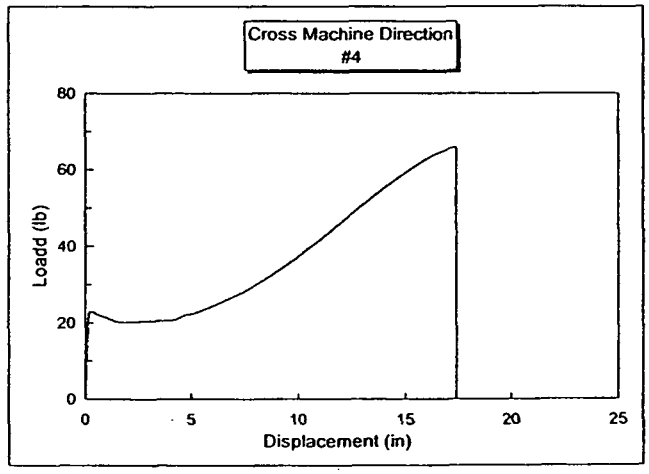
Advanced Terra Testing, Inc.

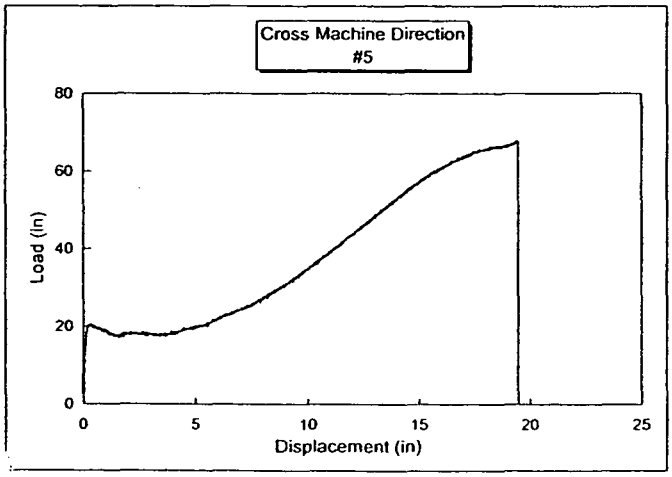
Client:	Tetra Tech - RMC	Test Type:	ASTM D 6693 Type IV
Job No.:	2617-02	Material Type:	60 mil Smooth LLDPE, LLD060A000
Location:	Present Landfil-RFETS, Golden, CO	Date Tested:	10-03-04
Sample:	Roll #104123258, Resin #CRG812060	Tested By:	SR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
		Grip Seperation:	2.5"











Cross Machine Direction

	Load at Break (lb/in width)	Elongation at Break (%)	Load at Yield (lb/in width)	Elongation at Yield (%)
Specimen #1	302.4	1004.0	98.2	20.9
Specimen #2	285.3	901.0	98.3	21.2
Specimen #3	287.5	938.8	94.5	22.1
Specimen #4	273.7	868.2	95.4	18.9
Specimen #5	278.4	969.6	84.1	29.7
Average	**285.4**	**936.3**	**94.1**	**22.6**
Std. Deviation	**9.8**	**48.1**	**5.2**	**3.7**

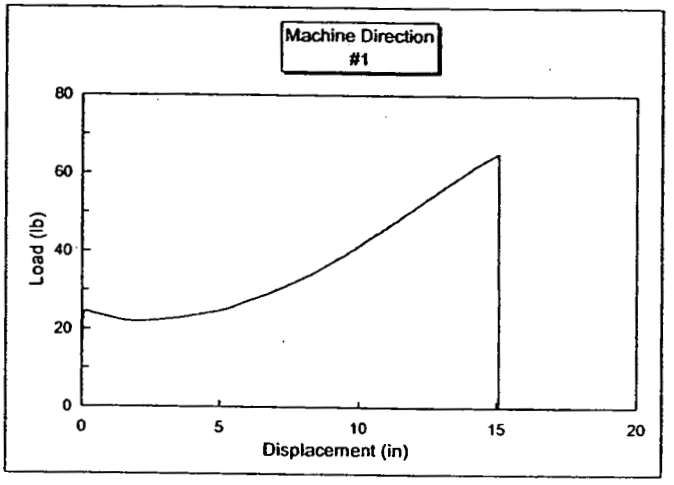
Filename: TTNTC258

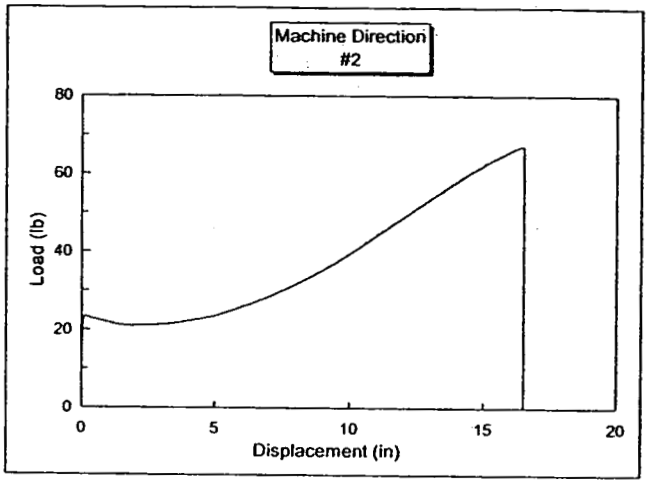
Raw Data File: TT7TPC2, TT7TPC3.TXT

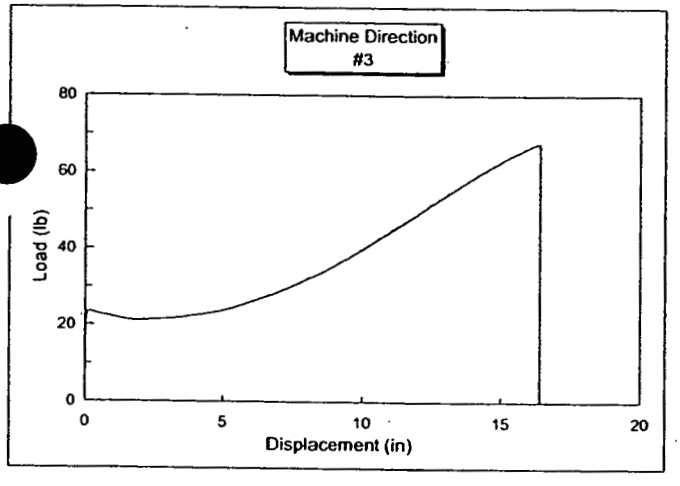
Checked By: JTR Date: 10/27/04

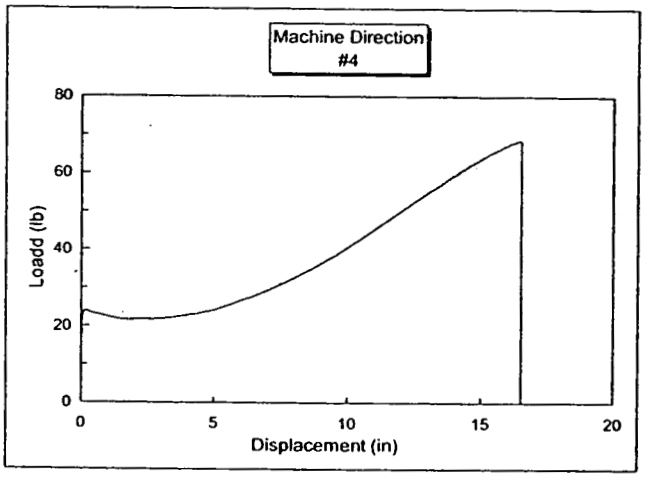
Advanced Terra Testing, Inc.

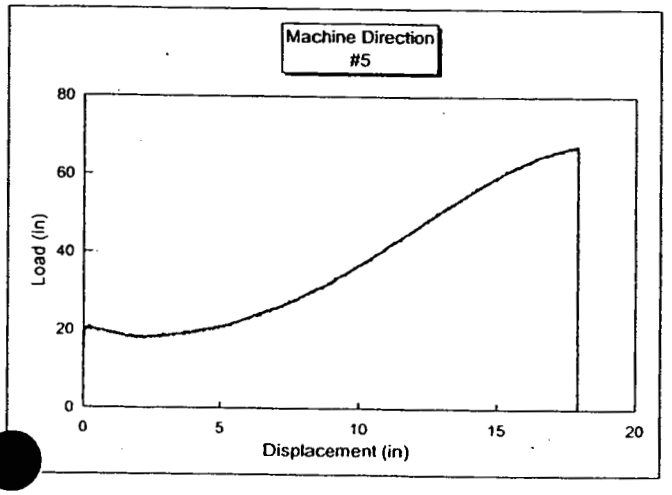
Client:	Tetra Tech - RMC	Test Type:	ASTM D 6693 Type IV
Job No.:	2617-02	Material Type:	60 mil Smooth LLDPE, LLD060A000
Location:	Present Landfil-RFETS, Golden, CO	Date Tested:	10-03-04
Sample:	Roll #104123267, Resin #CRG812060	Tested By:	SR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
		Grip Seperation:	2.5"











Machine Direction

	Load at Break (lb/in width)	Elongation at Break (%)	Load at Yield (lb/in width)	Elongation at Yield (%)
Specimen #1	265.6	751.0	100.0	11.0
Specimen #2	272.3	820.7	94.8	9.6
Specimen #3	276.2	817.7	96.4	14.0
Specimen #4	282.3	820.7	98.6	11.6
Specimen #5	276.6	896.1	85.7	16.6
Average	**274.6**	**821.3**	**95.1**	**12.6**
Std. Deviation	**5.5**	**45.9**	**5.0**	**2.4**

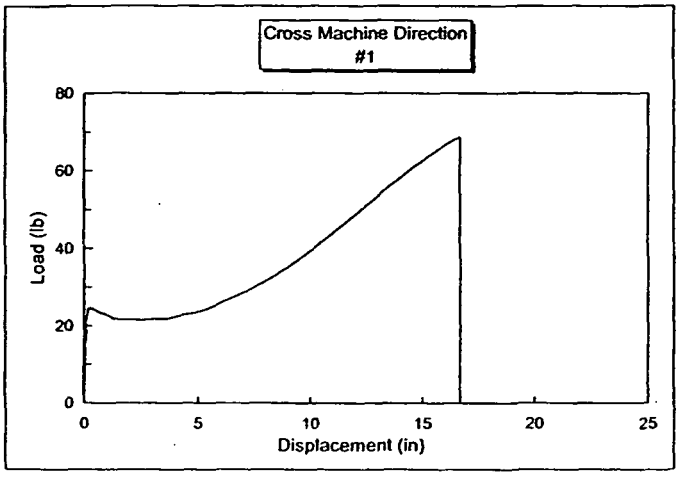
Filename: TTNT3267

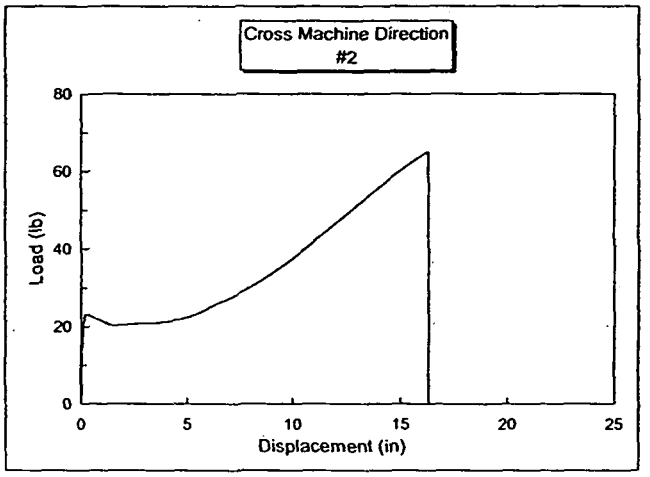
Raw Data File: TT3TPM2, TT3TPM3.TXT

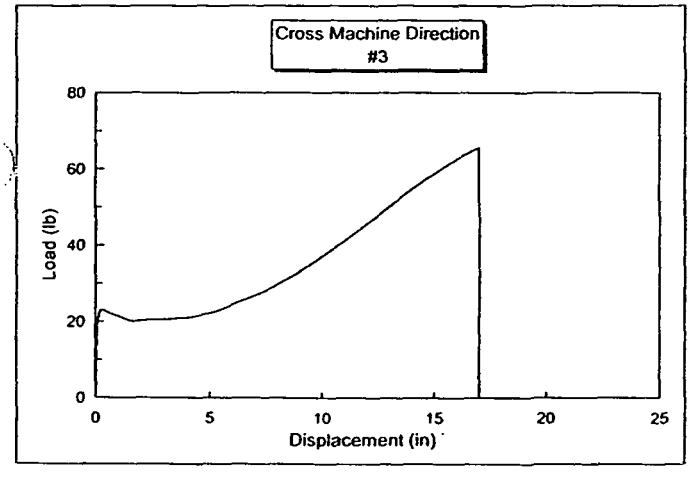
Checked By: JTR Date: 10/19/04

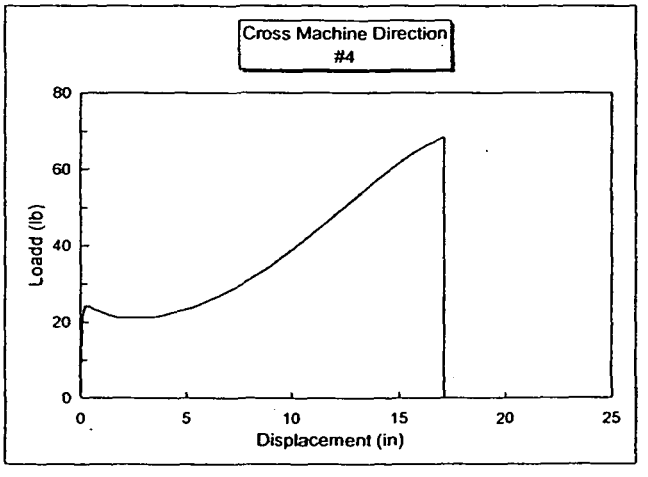
Advanced Terra Testing, Inc.

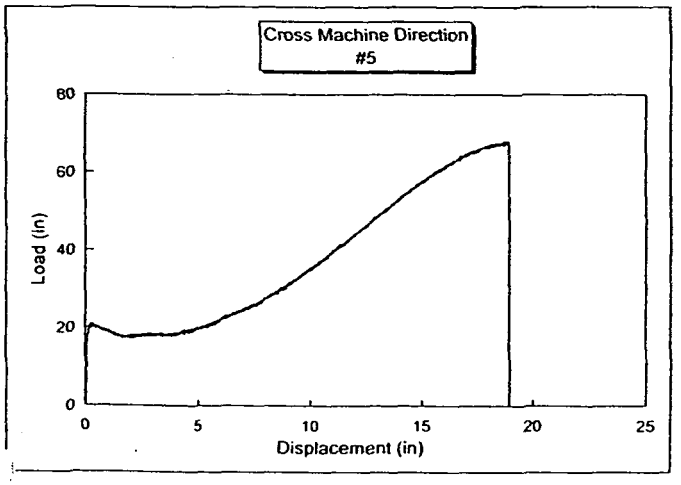
Client:	Tetra Tech - RMC	Test Type:	ASTM D 6693 Type IV
Job No.:	2617-02	Material Type:	60 mil Smooth LLDPE, LLD060A000
Location:	Present Landfil-RFETS, Golden, CO	Date Tested:	10-03-04
Sample:	Roll #104123267, Resin #CRG812060	Tested By:	SR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
		Grip Seperation:	2.5"











Cross Machine Direction

	Load at Break (lb/in width)	Elongation at Break (%)	Load at Yield (lb/in width)	Elongation at Yield (%)
Specimen #1	278.2	833.6	100.1	20.9
Specimen #2	263.6	814.9	94.2	18.0
Specimen #3	267.8	851.4	94.3	20.9
Specimen #4	280.1	852.1	99.8	21.5
Specimen #5	278.3	946.0	86.1	20.9
Average	**273.6**	**859.6**	**94.9**	**20.5**
Std. Deviation	**6.6**	**45.3**	**5.1**	**1.2**

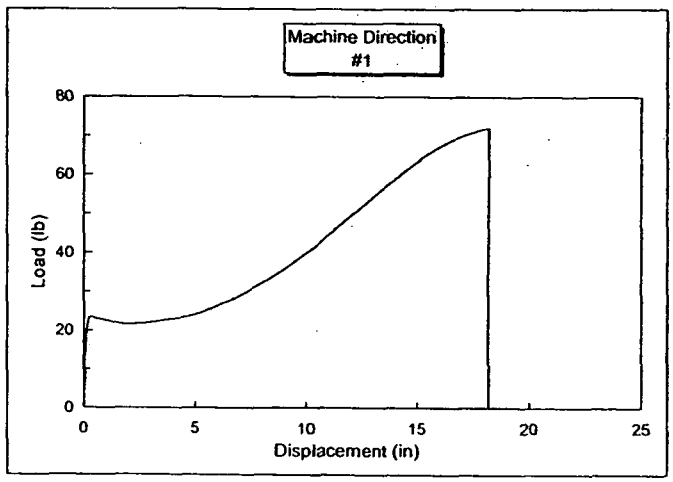
Filename: TTNTC267

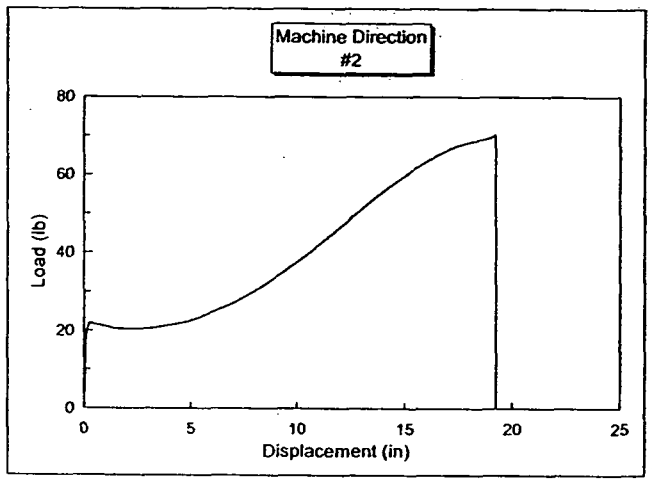
Raw Data File: TT3TPC2, TT3TPC3.TXT

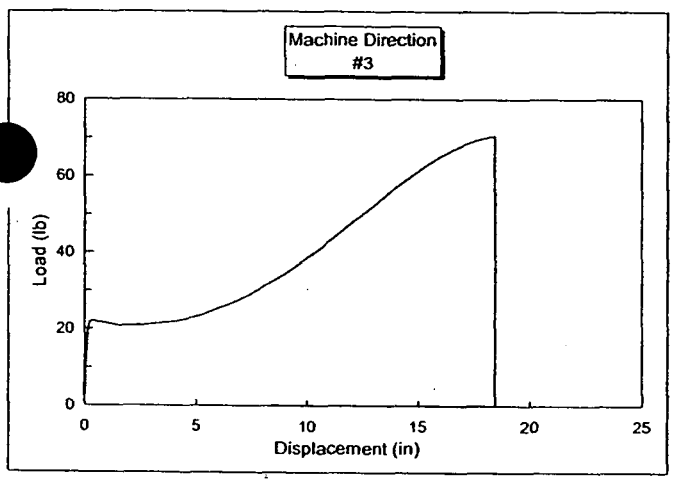
Checked By: JTR Date: 10/19/04

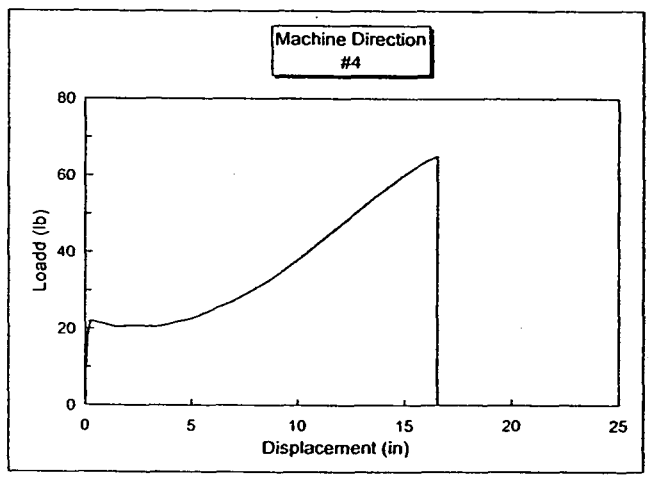
Advanced Terra Testing, Inc.

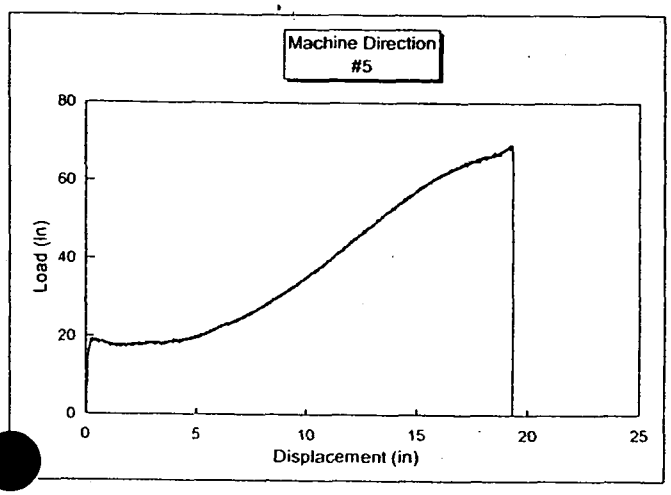
Client:	Tetra Tech - RMC	Test Type:	ASTM D 6693 Type IV
Job No.:	2617-02	Material Type:	60 mil Smooth LLDPE, LLD060A000
Location:	Present Landfil-RFETS, Golden, CO	Date Tested:	10-03-04
Sample:	Roll #104123274, Resin #CRH810060	Tested By:	SR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
		Grip Seperation:	2.5"











Machine Direction

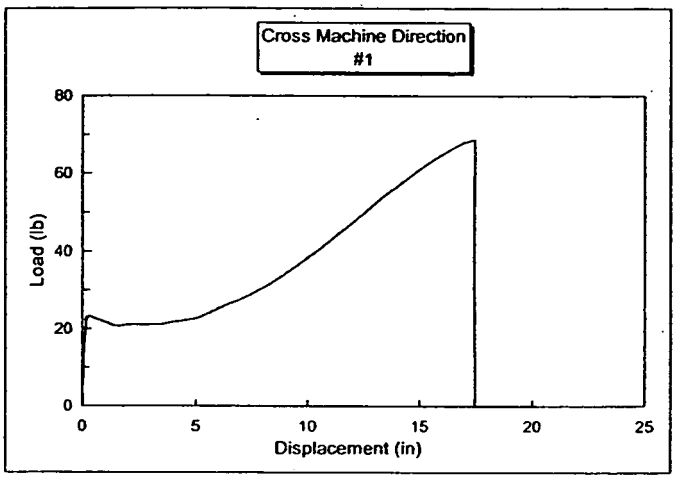
	Load at Break (lb/in width)	Elongation at Break (%)	Load at Yield (lb/in width)	Elongation at Yield (%)
Specimen #1	294.6	906.0	95.5	23.8
Specimen #2	289.9	961.3	89.8	23.3
Specimen #3	289.2	920.5	90.3	25.9
Specimen #4	264.8	826.4	89.1	25.6
Specimen #5	283.3	961.7	78.3	22.4
Average	**284.4**	**915.2**	**88.6**	**24.2**
Std. Deviation	**10.4**	**49.6**	**5.6**	**1.3**

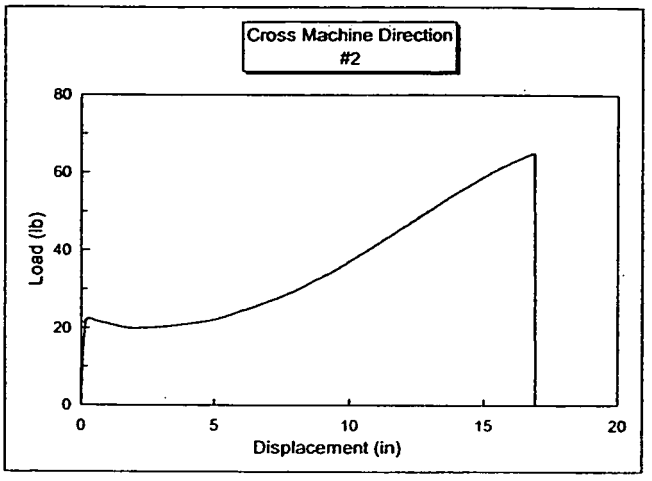
Filename: TTNT3274
Raw Data File: TT6TPM2, TT6TPM3.TXT

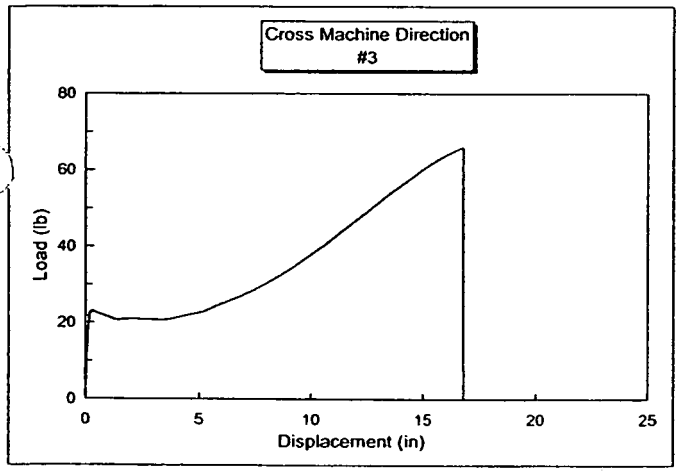
Checked By: JR Date: 10/19/04

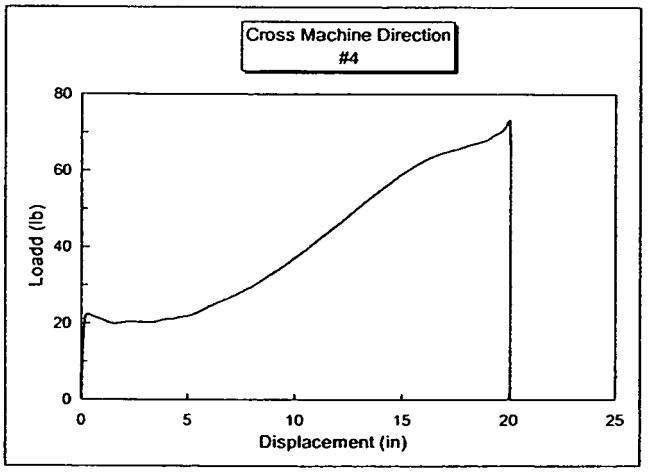
Advanced Terra Testing, Inc.

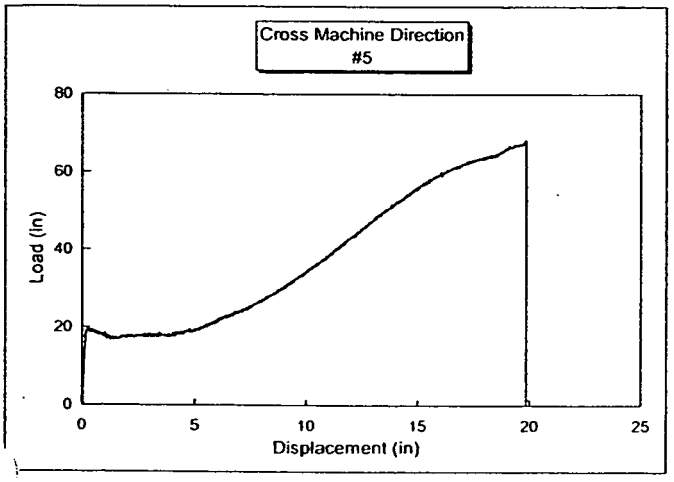
Client:	Tetra Tech - RMC	Test Type:	ASTM D 6693 Type IV
Job No.:	2617-02	Material Type:	60 mil Smooth LLDPE, LLD060A000
Location:	Present Landfil-RFETS, Golden, CO	Date Tested:	10-03-04
Sample:	Roll #104123274, Resin #CRH810060	Tested By:	SR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
		Grip Seperation:	2.5"











Cross Machine Direction

	Load at Break (lb/in width)	Elongation at Break (%)	Load at Yield (lb/in width)	Elongation at Yield (%)
Specimen #1	281.5	871.6	95.7	24.7
Specimen #2	265.9	839.6	92.1	21.2
Specimen #3	270.9	839.5	95.1	25.0
Specimen #4	300.0	1001.4	92.3	22.7
Specimen #5	279.6	991.2	80.2	19.2
Average	**279.6**	**908.6**	**91.1**	**22.6**
Std. Deviation	**11.7**	**72.6**	**5.6**	**2.2**

Filename: TTNTC274

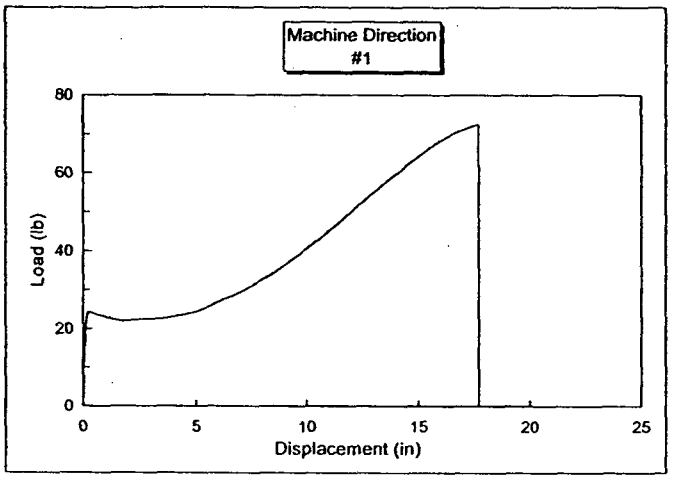
Raw Data File: TT6TPC2, TT6TPC3.TXT

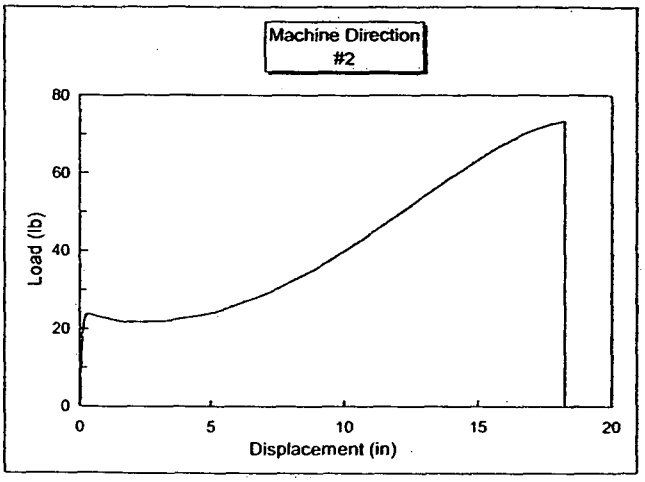
Checked By: JTR

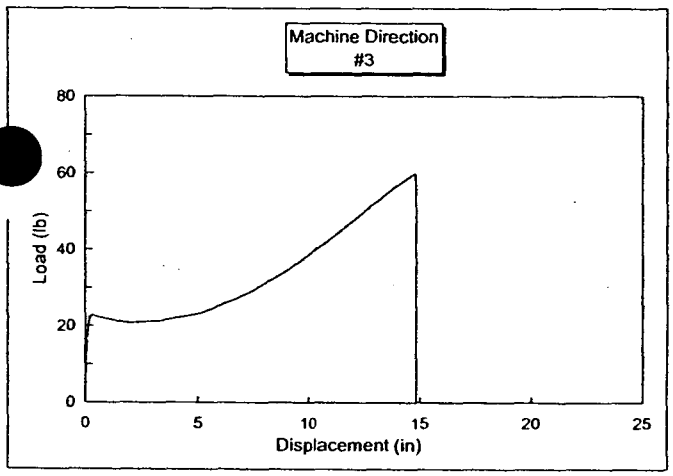
Date: 10/19/04

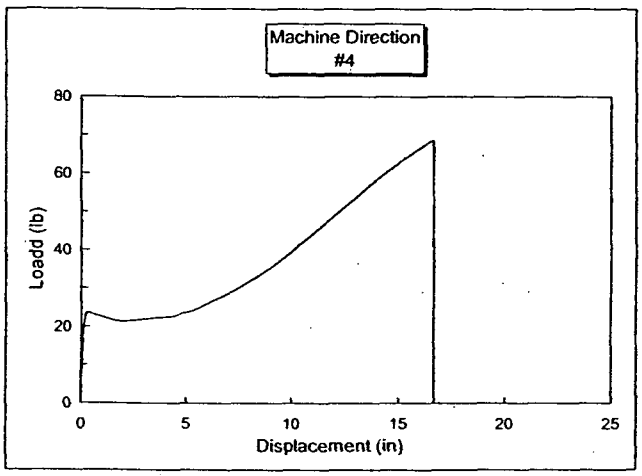
Advanced Terra Testing, Inc.

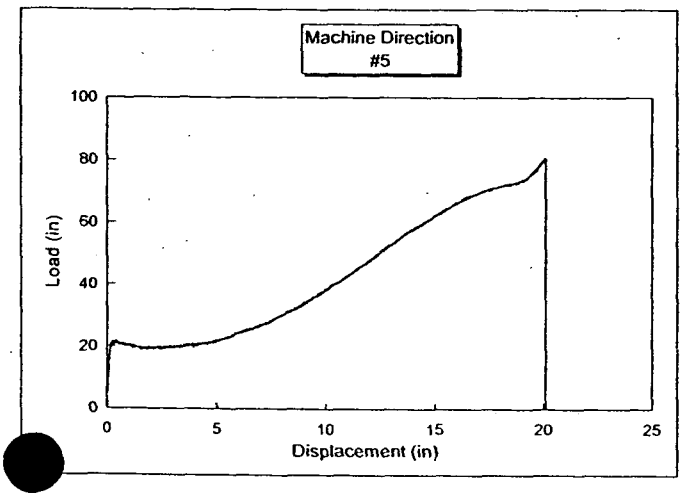
Client:	Tetra Tech - RMC	Test Type:	ASTM D 6693 Type IV
Job No.:	2617-02	Material Type:	60 mil Smooth LLDPE, LLD060A000
Location:	Present Landfil-RFETS, Golden, CO	Date Tested:	10-03-04
Sample:	Roll #104123282, Resin #CRH810060	Tested By:	SR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
		Grip Seperation:	2.5"











Machine Direction

	Load at Break (lb/in width)	Elongation at Break (%)	Load at Yield (lb/in width)	Elongation at Yield (%)
Specimen #1	298.4	881.6	99.6	21.2
Specimen #2	301.6	910.1	97.8	23.8
Specimen #3	246.6	738.9	93.6	22.7
Specimen #4	280.8	832.5	96.7	25.9
Specimen #5	330.8	1002.9	89.4	33.1
Average	**291.6**	**873.2**	**95.4**	**25.3**
Std. Deviation	**27.7**	**87.1**	**3.6**	**4.2**

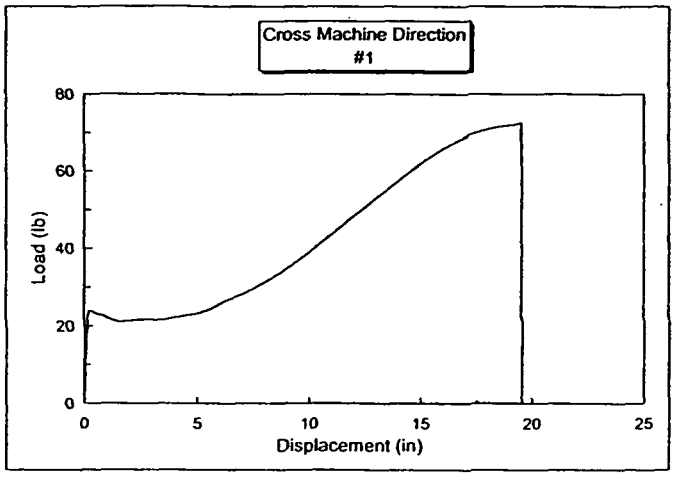
Filename: TTNT3282

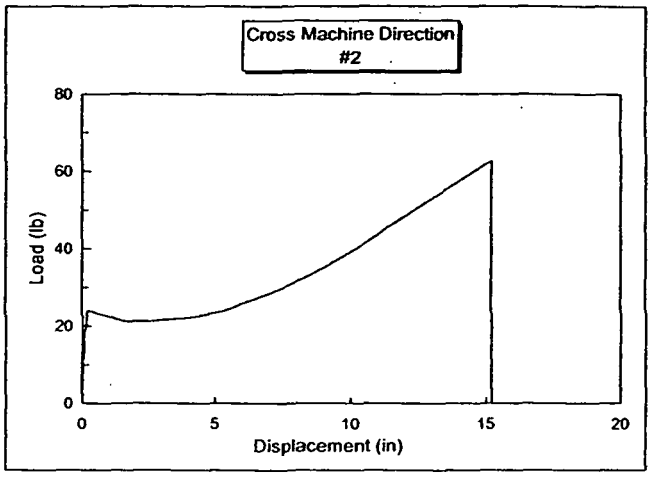
Raw Data File: TT4TPM2, TT4TPM3.TXT

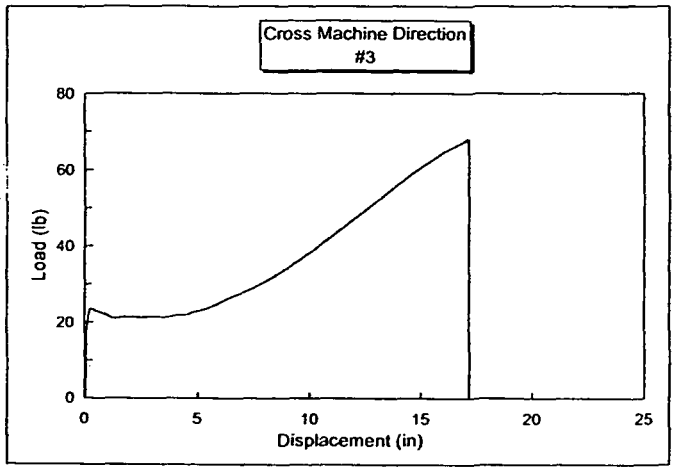
Checked By: JTR Date: 10/27/04

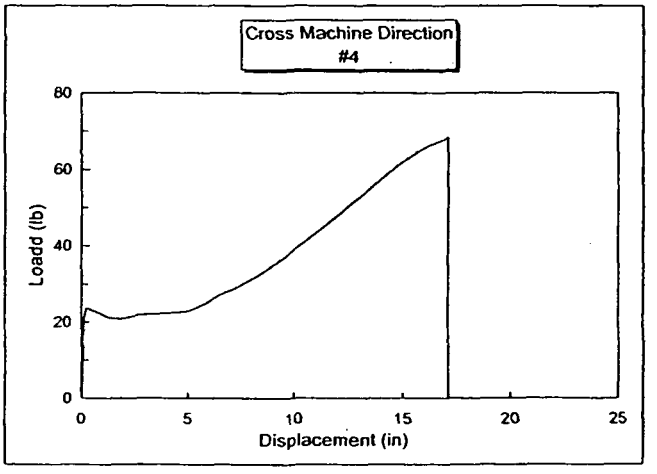
Advanced Terra Testing, Inc.

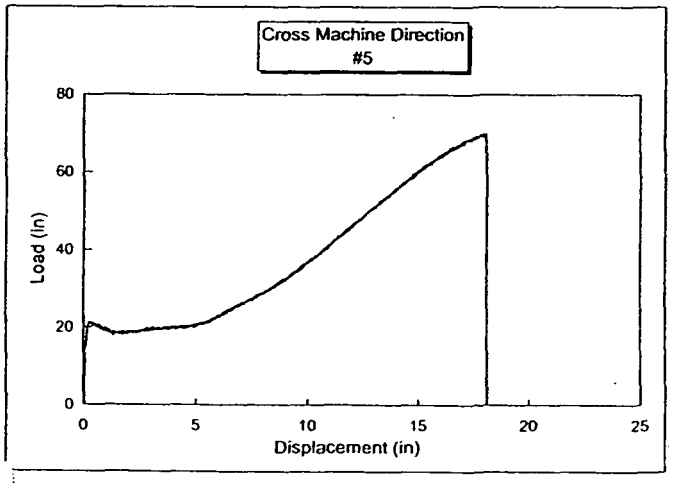
Client:	Tetra Tech - RMC	Test Type:	ASTM D 6693 Type IV
Job No.:	2617-02	Material Type:	60 mil Smooth LLDPE, LLD060A000
Location:	Present Landfil-RFETS, Golden, CO	Date Tested:	10-03-04
Sample:	Roll #104123282, Resin #CRH810060	Tested By:	SR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
		Grip Seperation:	2.5"











Cross Machine Direction

	Load at Break (lb/in width)	Elongation at Break (%)	Load at Yield (lb/in width)	Elongation at Yield (%)
Specimen #1	296.1	975.9	97.6	21.2
Specimen #2	255.0	758.8	98.0	20.1
Specimen #3	279.1	857.4	95.9	21.5
Specimen #4	280.1	853.6	96.8	18.3
Specimen #5	286.8	904.1	87.4	20.3
Average	**279.4**	**869.9**	**95.2**	**20.3**
Std. Deviation	**13.6**	**70.9**	**3.9**	**1.1**

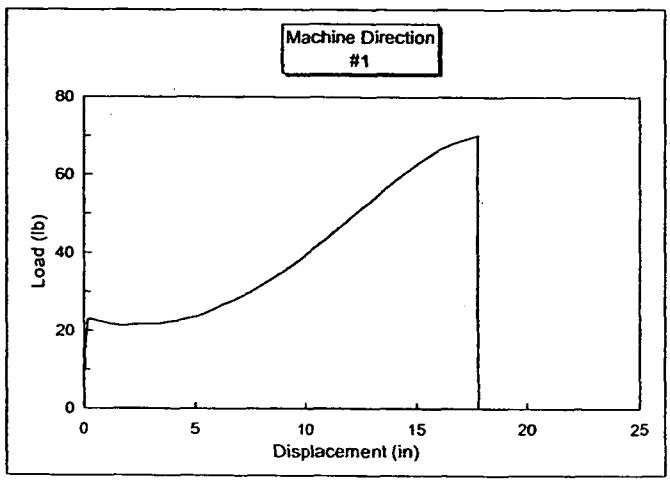
Filename: TTNTC282

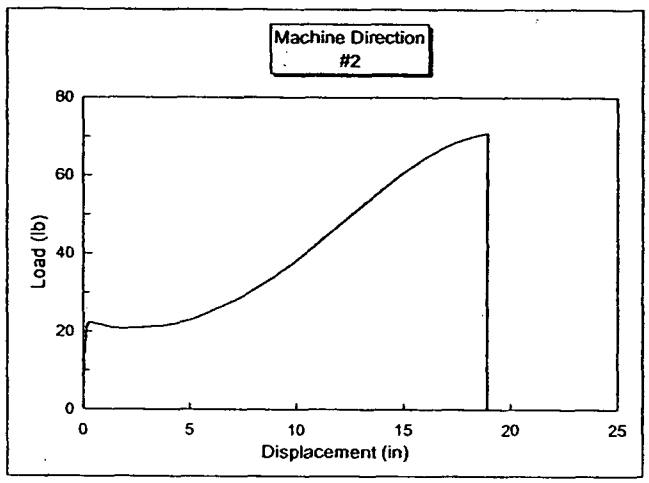
Raw Data File: TT4TPC2, TT4TPC3.TXT

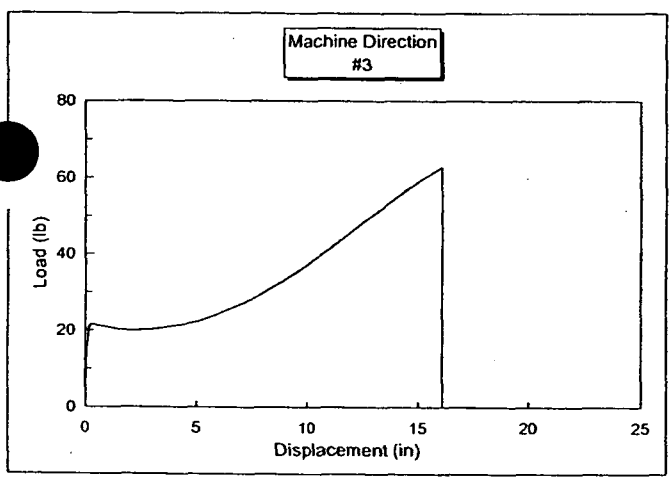
Checked By: JTR Date: 10/27/04

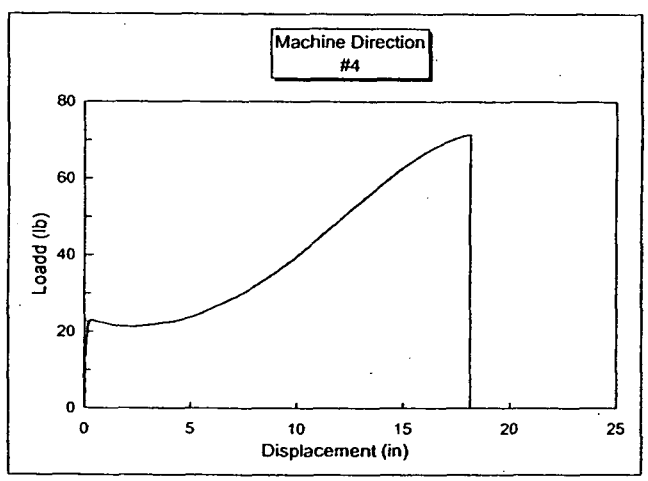
Advanced Terra Testing, Inc.

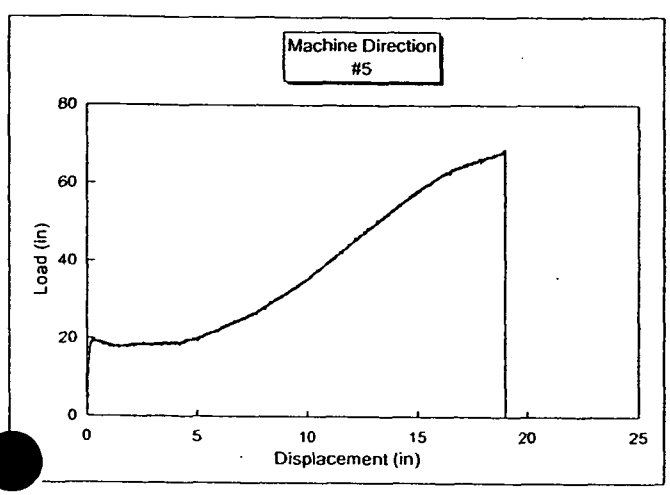
Client:	Tetra Tech - RMC	Test Type:	ASTM D 6693 Type IV
Job No.:	2617-02	Material Type:	60 mil Smooth LLDPE, LLD060A000
Location:	Present Landfil-RFETS, Golden, CO	Date Tested:	10-03-04
Sample:	Roll #104123289, Resin #CRH810060	Tested By:	SR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
		Grip Seperation:	2.5"











Machine Direction

	Load at Break (lb/in width)	Elongation at Break (%)	Load at Yield (lb/in width)	Elongation at Yield (%)
Specimen #1	286.7	888.4	94.1	22.4
Specimen #2	290.5	944.5	91.4	21.8
Specimen #3	256.4	805.8	88.2	24.1
Specimen #4	292.2	905.8	93.7	25.3
Specimen #5	281.1	949.0	80.5	23.0
Average	**281.4**	**898.7**	**89.6**	**23.3**
Std. Deviation	**13.1**	**51.8**	**5.0**	**1.3**

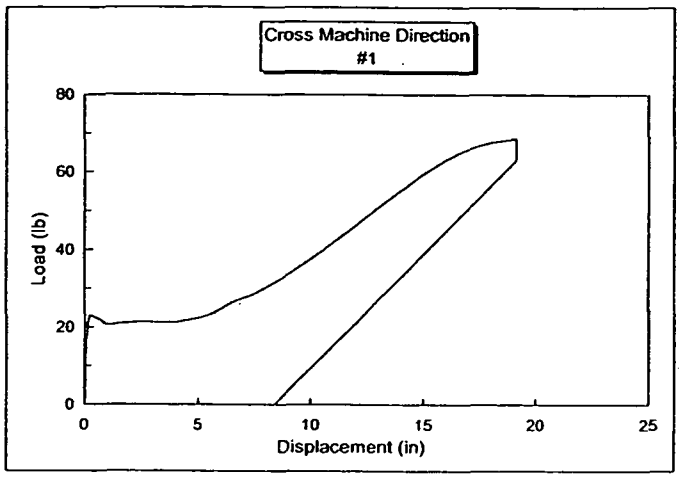
Filename: TTNT3289

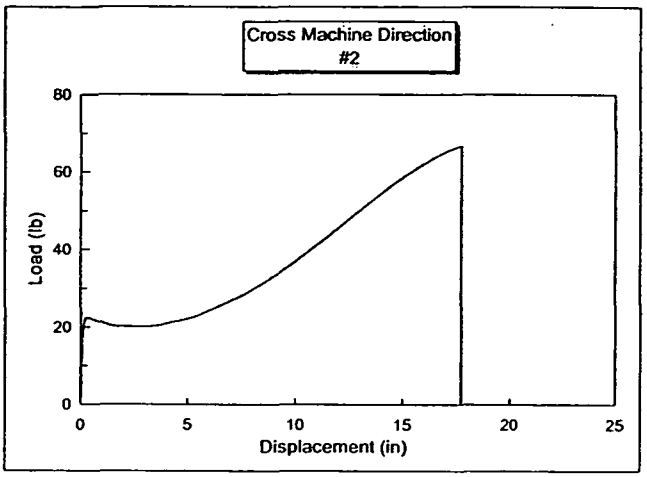
Raw Data File: TT5TPM2, TT5TPM3.TXT

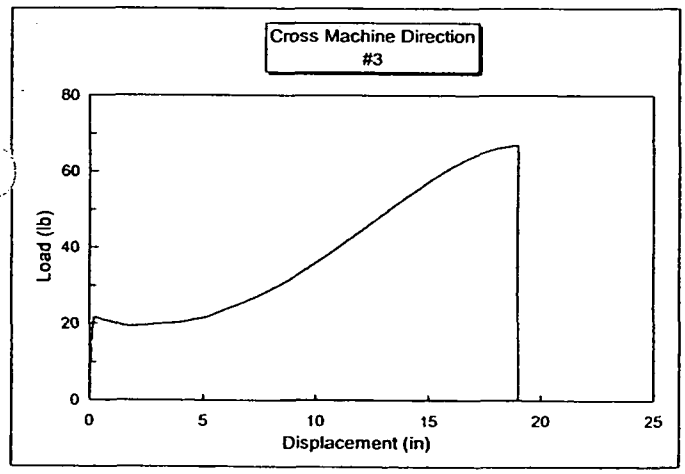
Checked By: JTR Date: 10/19/04

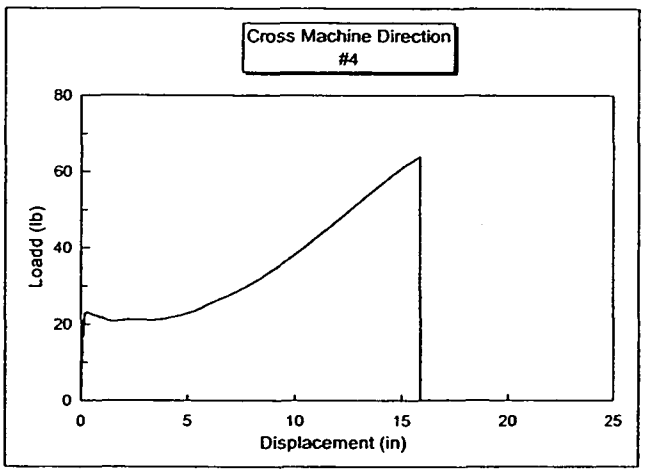
Advanced Terra Testing, Inc.

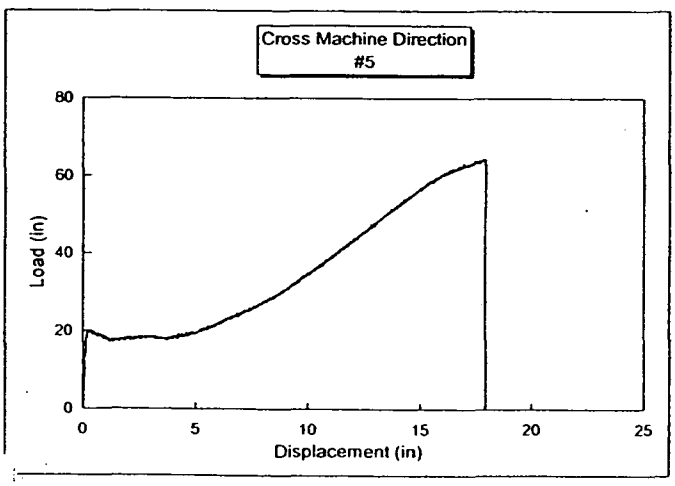
Client:	Tetra Tech - RMC	Test Type:	ASTM D 6693 Type IV
Job No.:	2617-02	Material Type:	60 mil Smooth LLDPE, LLD060A000
Location:	Present Landfil-RFETS, Golden, CO	Date Tested:	10-03-04
Sample:	Roll #104123289, Resin #CRH810060	Tested By:	SR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
		Grip Seperation:	2.5"











Cross Machine Direction

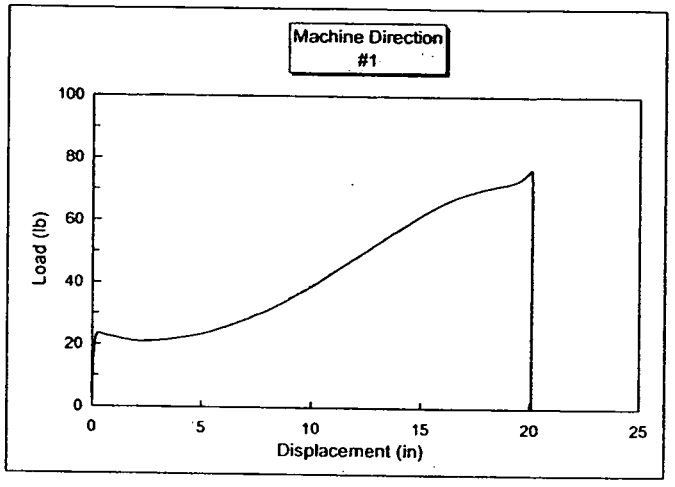
	Load at Break (lb/in width)	Elongation at Break (%)	Load at Yield (lb/in width)	Elongation at Yield (%)
Specimen #1	280.8	949.6	93.5	20.6
Specimen #2	270.4	885.6	90.9	18.6
Specimen #3	272.5	948.5	87.8	23.5
Specimen #4	261.7	793.5	94.4	20.1
Specimen #5	264.3	894.8	82.5	27.0
Average	**269.9**	**894.4**	**89.8**	**22.0**
Std. Deviation	**6.7**	**57.0**	**4.3**	**3.0**

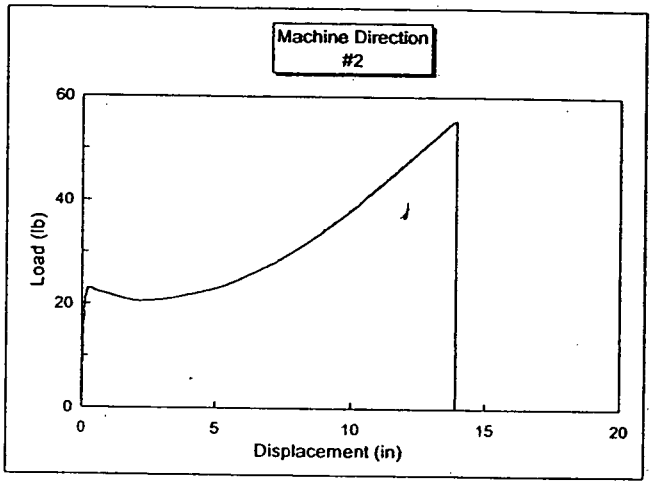
Filename: TTNTC289
Raw Data File: TT5TPC2, TT5TPC3.TXT

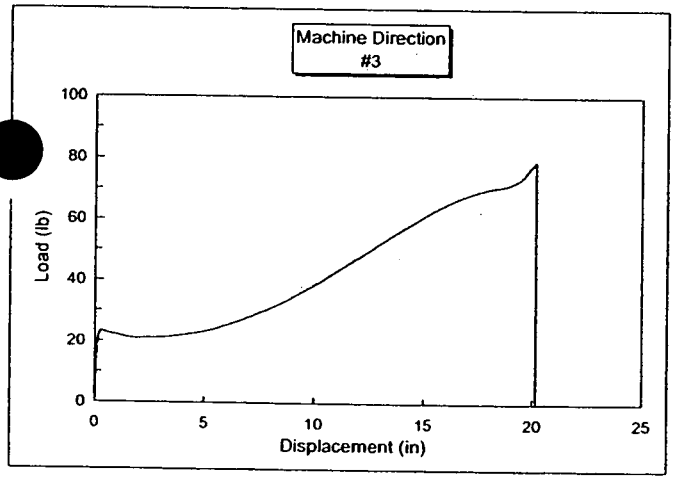
Checked By: JTR Date: 10/19/04

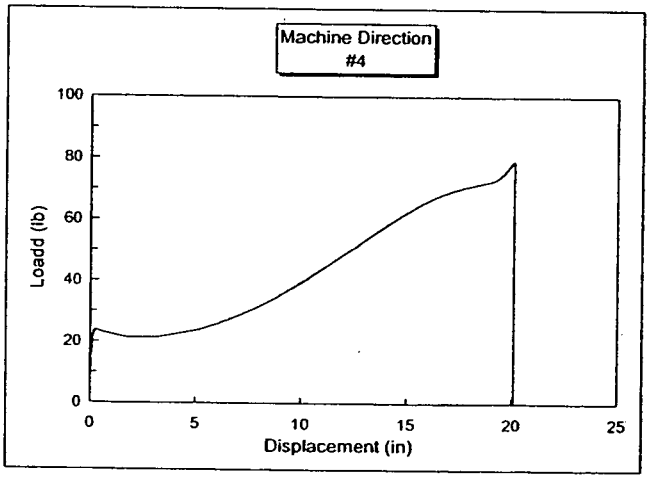
Advanced Terra Testing, Inc.

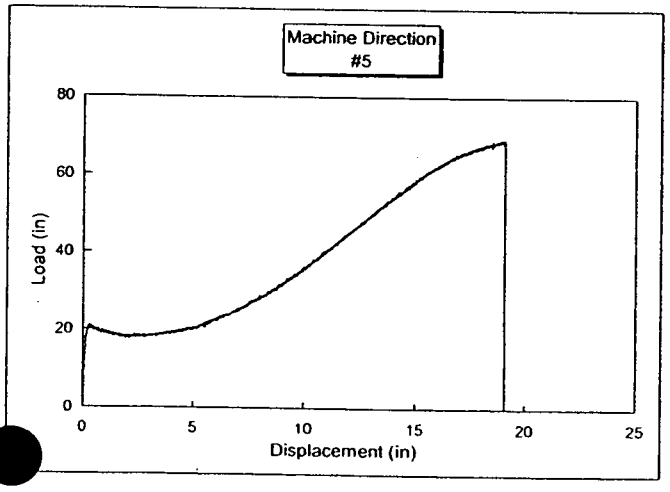
Client:	Tetra Tech - RMC	Test Type:	ASTM D 6693 Type IV
Job No.:	2617-02	Material Type:	60 mil Smooth LLDPE, LLD060A000
Location:	Present Landfil-RFETS, Golden, CO	Date Tested:	10-03-04
Sample:	Roll #104123296, Resin #CRH810060	Tested By:	SR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
		Grip Seperation:	2.5"











Machine Direction

	Load at Break (lb/in width)	Elongation at Break (%)	Load at Yield (lb/in width)	Elongation at Yield (%)
Specimen #1	312.6	1003.8	96.4	21.5
Specimen #2	226.2	695.1	94.3	26.2
Specimen #3	320.4	1007.6	94.3	21.5
Specimen #4	322.8	1005.5	96.6	20.6
Specimen #5	282.9	952.3	86.4	24.4
Average	**293.0**	**932.9**	**93.6**	**22.8**
Std. Deviation	**36.3**	**120.7**	**3.7**	**2.1**

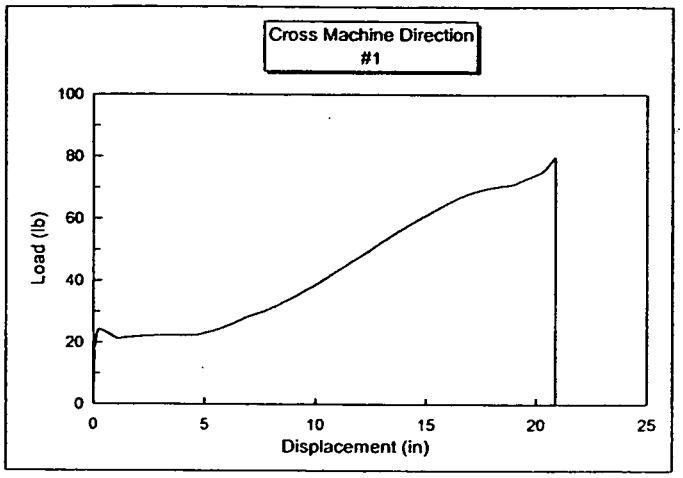
Filename: TTNT3296

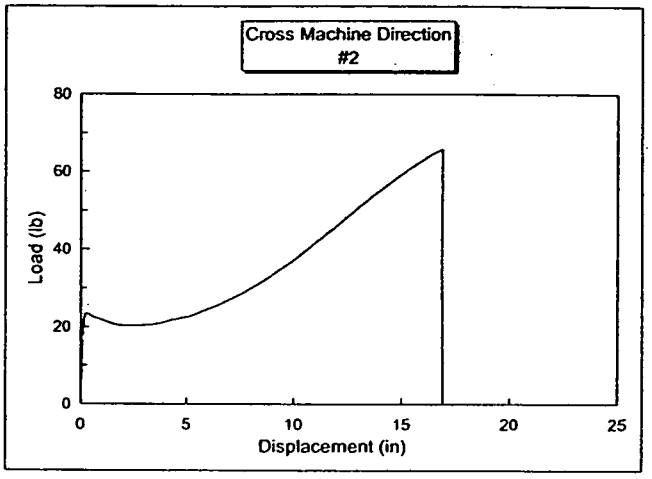
Raw Data File: TT1TPM2, TT1TPM3.TXT

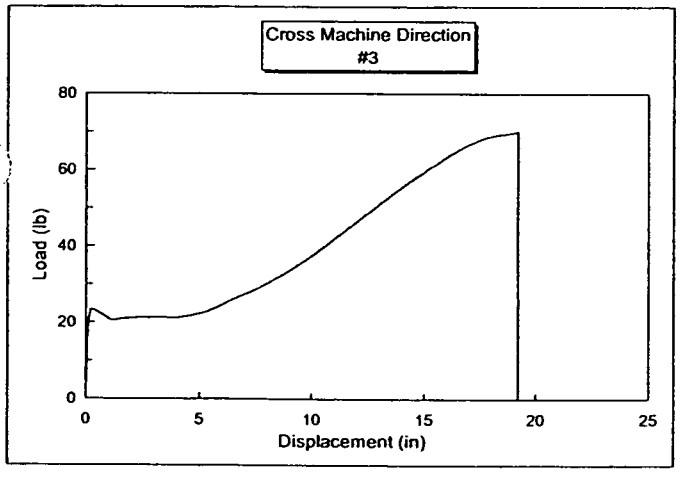
Checked By: JTR Date: 10/19/04

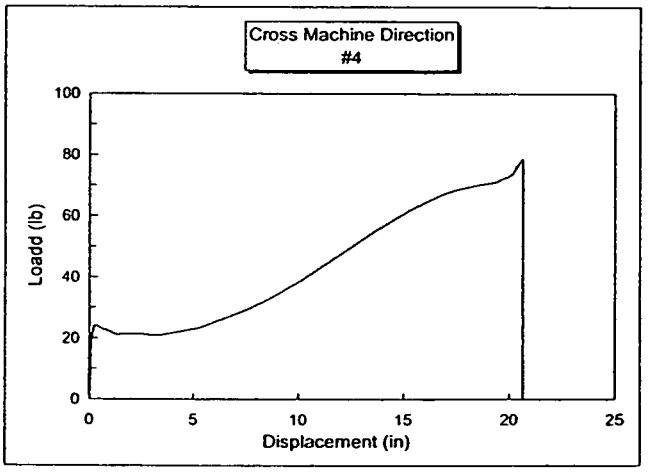
Advanced Terra Testing, Inc.

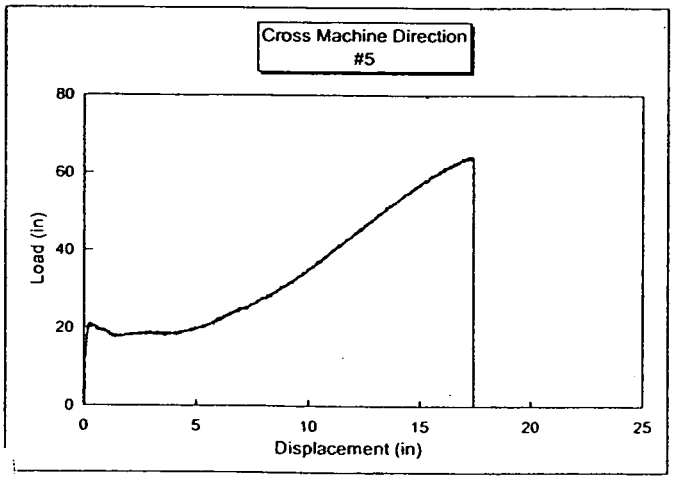
Client:	Tetra Tech - RMC	Test Type:	ASTM D 6693 Type IV
Job No.:	2617-02	Material Type:	60 mil Smooth LLDPE, LLD060A000
Location:	Present Landfil-RFETS, Golden, CO	Date Tested:	10-03-04
Sample:	Roll #104123296, Resin #CRH810060	Tested By:	SR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
		Grip Seperation:	2.5"











Cross Machine Direction

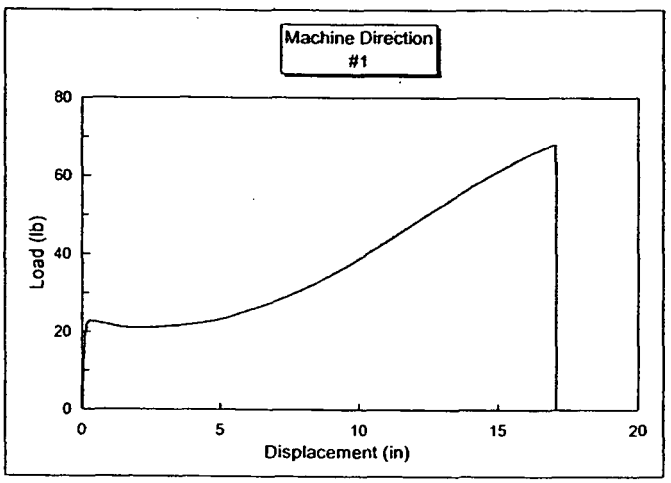
	Load at Break (lb/in width)	Elongation at Break (%)	Load at Yield (lb/in width)	Elongation at Yield (%)
Specimen #1	324.0	1044.1	98.7	21.5
Specimen #2	266.5	843.6	94.9	22.7
Specimen #3	284.1	958.1	95.3	23.8
Specimen #4	319.0	1031.4	98.2	22.7
Specimen #5	261.1	862.1	85.8	23.8
Average	**290.9**	**947.9**	**94.6**	**22.9**
Std. Deviation	**26.1**	**83.1**	**4.6**	**0.9**

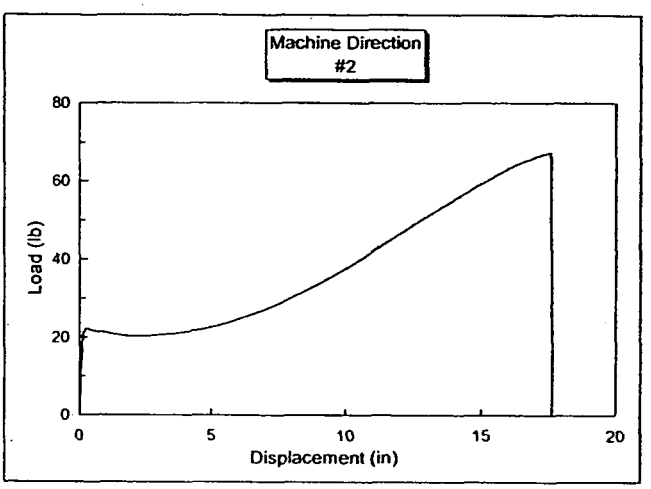
Filename: TTNTC296
Raw Data File: TT1TPC2, TT1TPC3.TXT

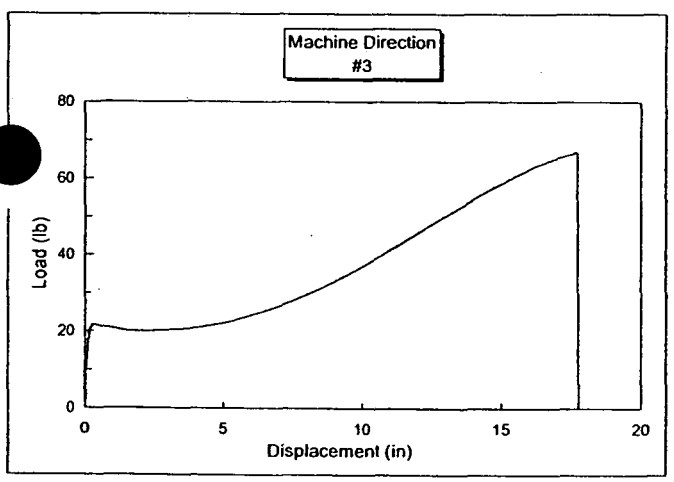
Checked By: JTR Date: 10/17/04

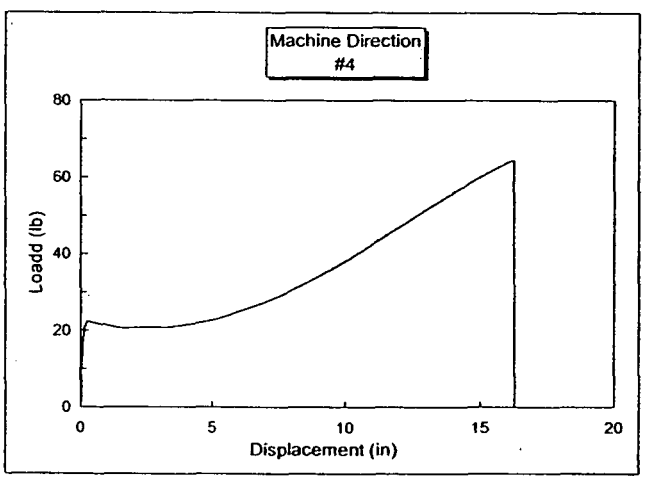
Advanced Terra Testing, Inc.

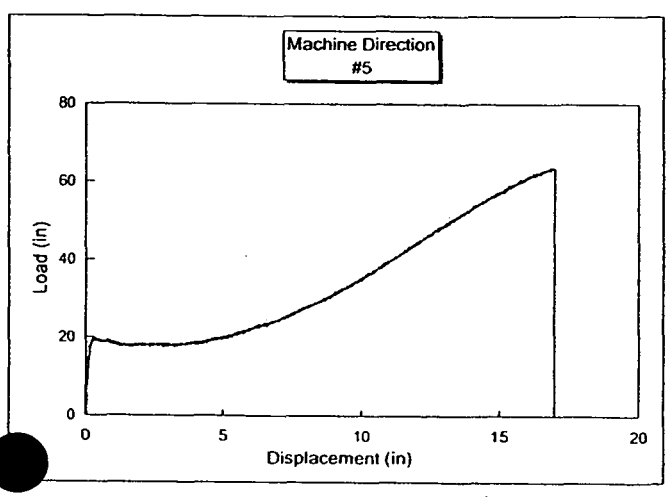
Client:	Tetra Tech - RMC	Test Type:	ASTM D 6693 Type IV
Job No.:	2617-02	Material Type:	60 mil Smooth LLDPE, LLD060A000
Location:	Present Landfil-RFETS, Golden, CO	Date Tested:	10-03-04
Sample:	Roll #104123303, Resin #CRH810060	Tested By:	SR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
		Grip Seperation:	2.5"











Machine Direction

	Load at Break (lb/in width)	Elongation at Break (%)	Load at Yield (lb/in width)	Elongation at Yield (%)
Specimen #1	280.7	850.6	94.5	18.6
Specimen #2	277.2	880.3	91.2	24.1
Specimen #3	273.8	883.1	89.1	19.8
Specimen #4	263.9	811.5	91.8	23.5
Specimen #5	263.3	845.9	81.5	26.7
Average	**271.8**	**854.3**	**89.6**	**22.6**
Std. Deviation	**7.0**	**26.2**	**4.4**	**3.0**

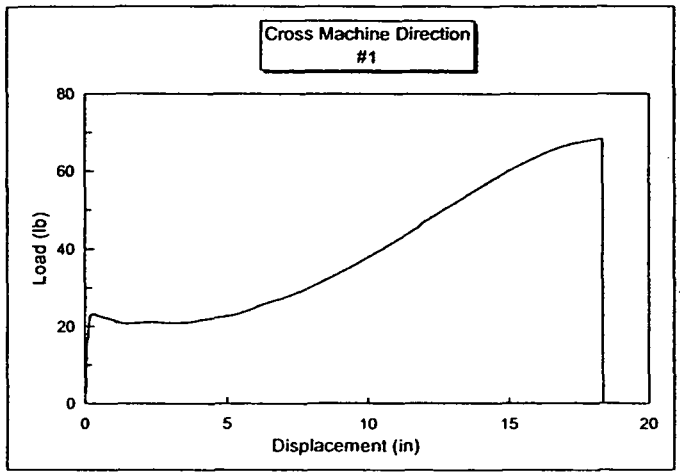
Filename: TTNT3303

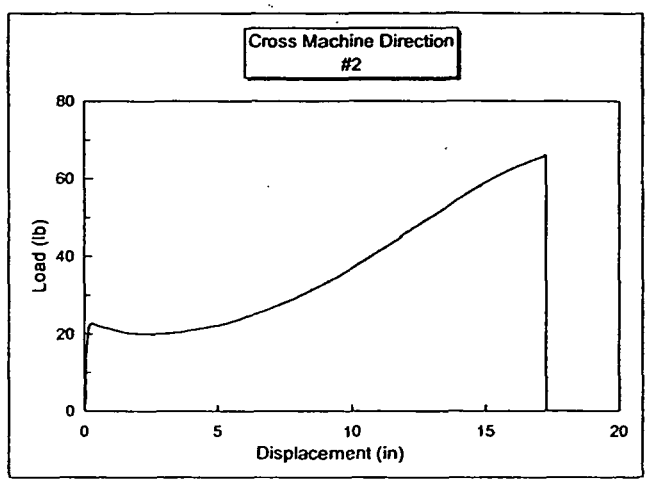
Raw Data File: TT2TPM2, TT2TPM3.TXT

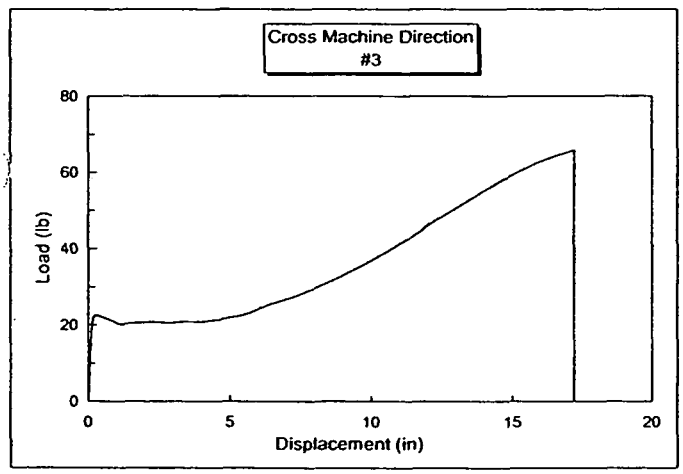
Checked By: JTR Date: 10/19/04

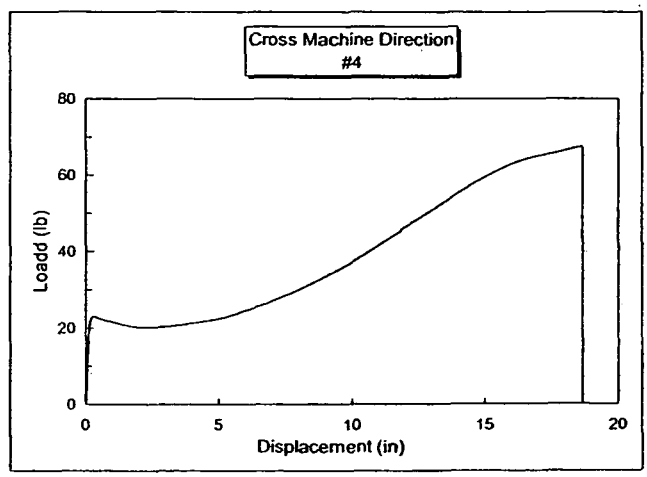
Advanced Terra Testing, Inc.

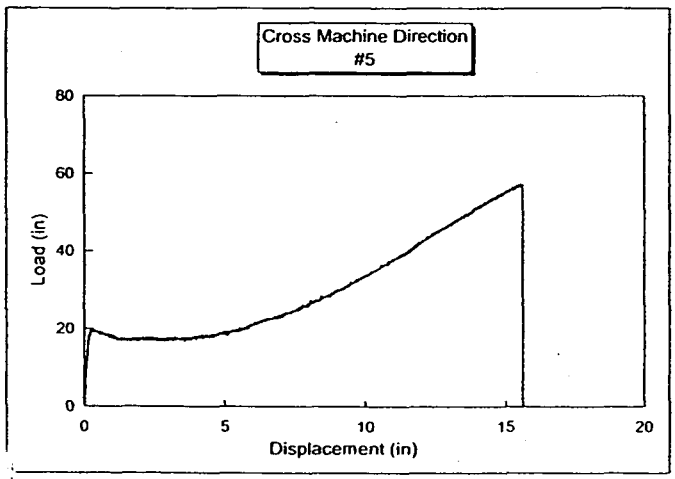
Client:	Tetra Tech - RMC	Test Type:	ASTM D 6693 Type IV
Job No.:	2617-02	Material Type:	60 mil Smooth LLDPE, LLD060A000
Location:	Present Landfil-RFETS, Golden, CO	Date Tested:	10-03-04
Sample:	Roll #104123303, Resin #CRH810060	Tested By:	SR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
		Grip Seperation:	2.5"











Cross Machine Direction

	Load at Break (lb/in width)	Elongation at Break (%)	Load at Yield (lb/in width)	Elongation at Yield (%)
Specimen #1	280.8	911.6	95.3	20.4
Specimen #2	269.9	859.9	92.7	21.2
Specimen #3	268.7	857.4	92.4	20.4
Specimen #4	275.7	929.0	94.0	26.2
Specimen #5	234.4	778.4	80.8	23.5
Average	**265.9**	**867.3**	**91.0**	**22.3**
Std. Deviation	**16.3**	**52.6**	**5.2**	**2.2**

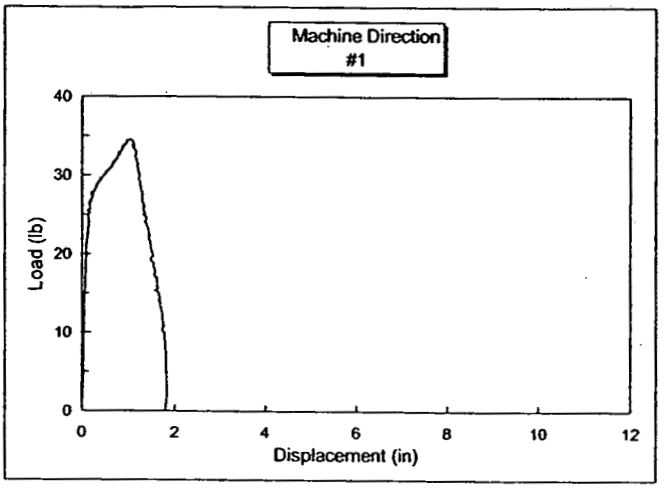
Filename: TTNTC303

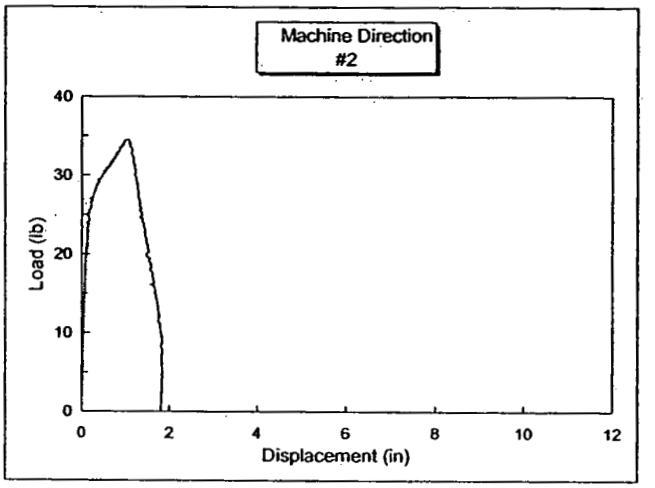
Raw Data File: TT2TPC2, TT2TPC3.TXT

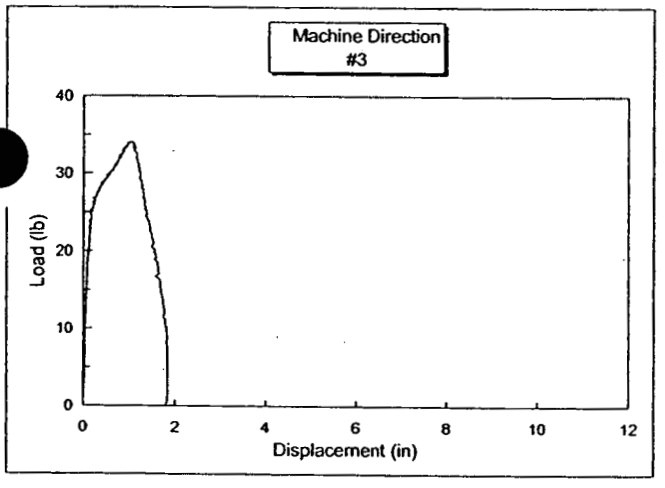
Checked By: JTR Date: 10/19/04

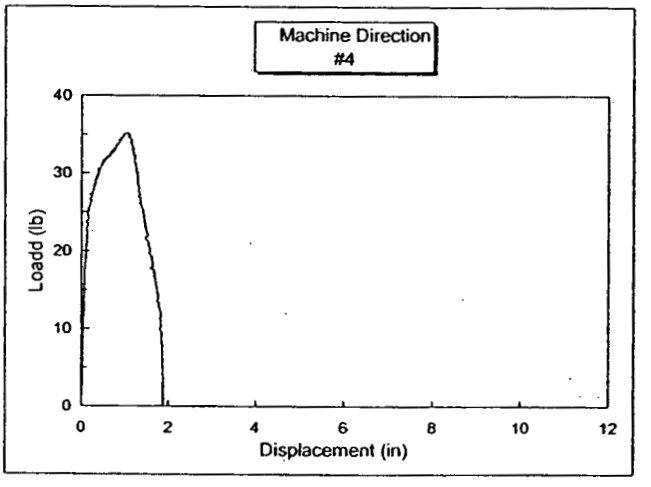
Advanced Terra Testing, Inc.

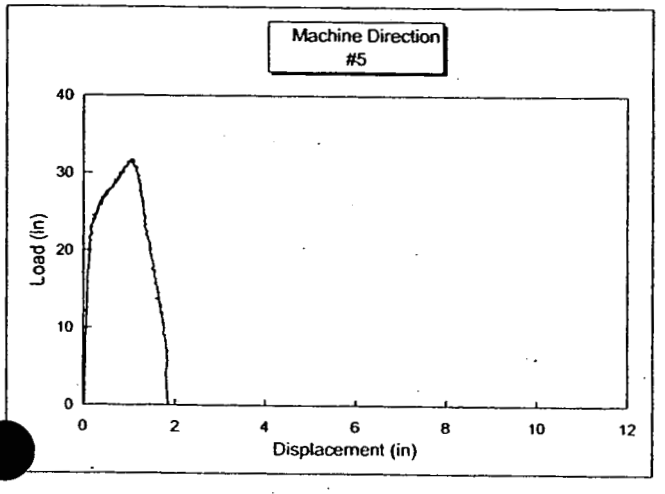
Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-02	Material Type:	60 mil LLDPE
Location:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	10-25-04
Roll No.:	101110562	Resin Lot No.:	
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:		Grip Seperation:	1.0"

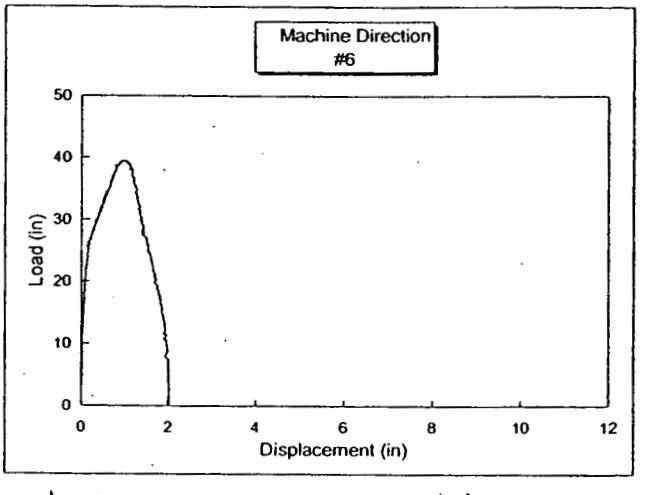










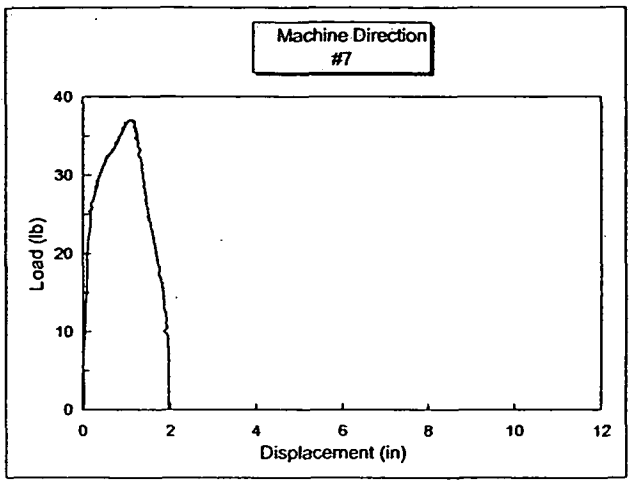


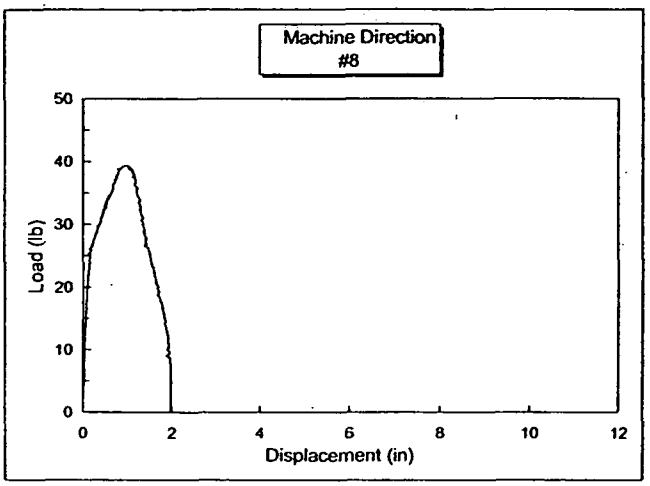
Filename: TTTR0562 Checked By: JTR Date: 10/27/04

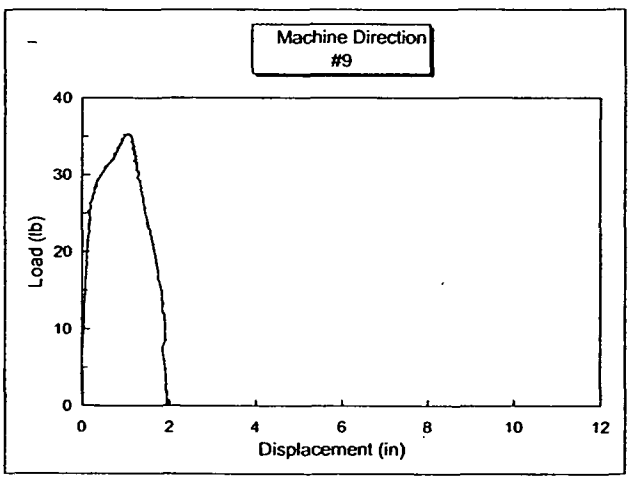
Raw Data File: TTATRM2, TTATRM3, TTATRM12, TTATRM13.TXT

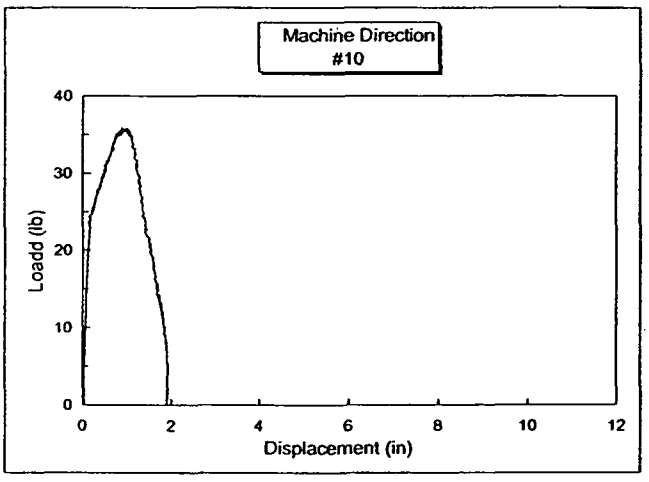
Advanced Terra Testing, Inc.

Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-02	Material Type:	60 mil LLDPE
Location:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	10-25-04
Roll Number:	101110562	Resin Lot No.:	
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:		Grip Seperation:	1.0"









Machine Direction

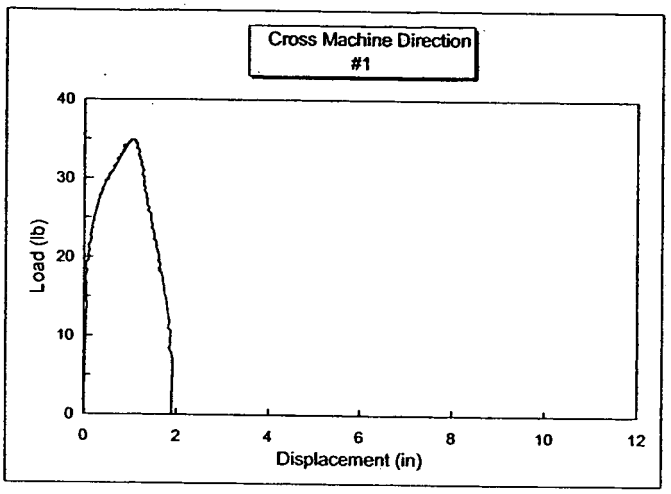
	Load at Break (lb/in width)		Load at Break (lb/in width)
Specimen #1	34.6	Specimen #6	39.5
Specimen #2	34.6	Specimen #7	37.2
Specimen #3	34.1	Specimen #8	39.4
Specimen #4	35.2	Specimen #9	35.4
Specimen #5	31.8	Specimen #10	36.0
Average	35.8		
Std. Deviation	2.3		

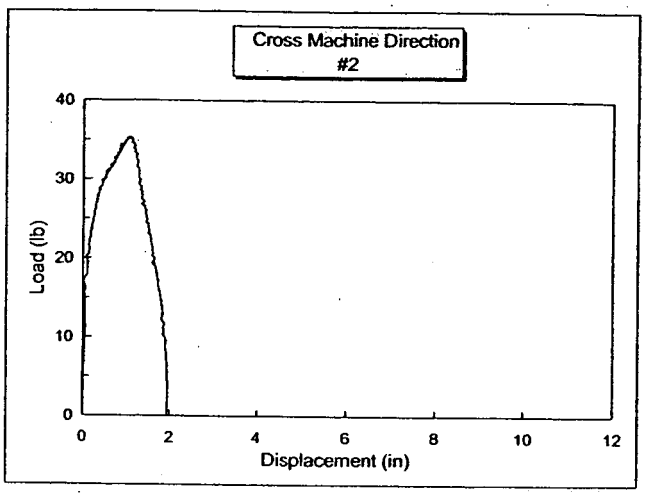
Filename: TTTR0562 Checked By: JTR Date: 10/27/04

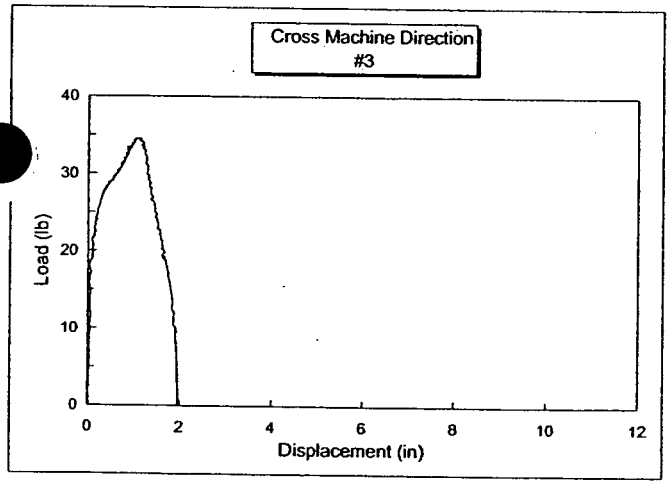
Raw Data File: TTATRM2, TTATRM3, TTATRM12, TTATRM13.TXT

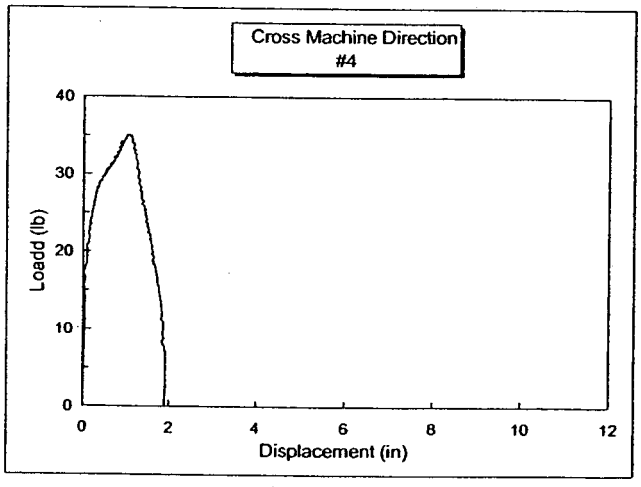
Advanced Terra Testing, Inc.

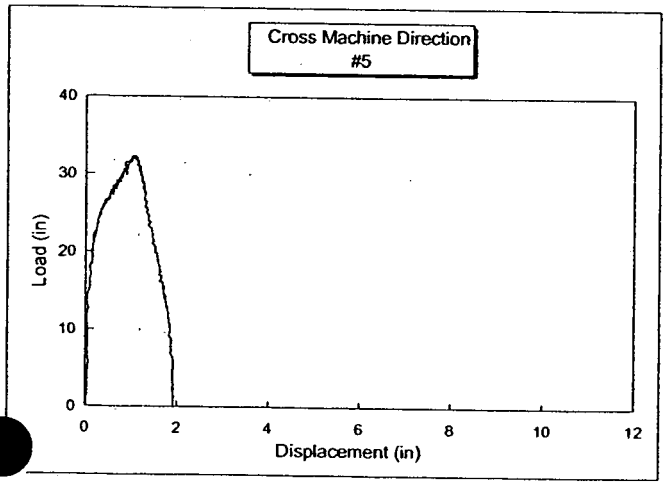
Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-02	Material Type:	60 mil LLDPE
Location:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	10-25-04
Roll No.:	101110562	Resin Lot No.:	
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:		Grip Seperation:	1.0"

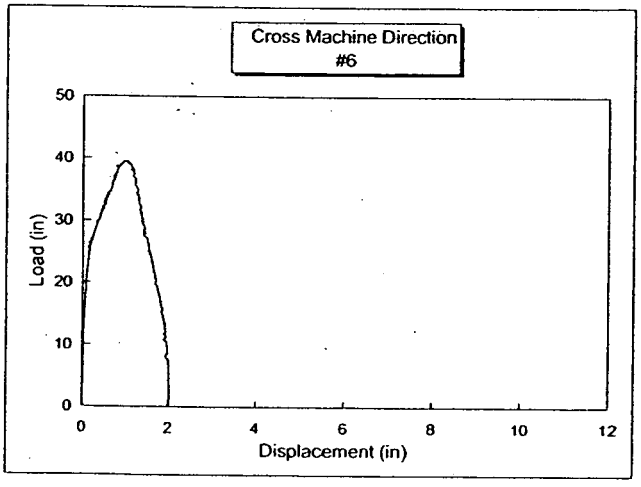












Filename: TTTRC562

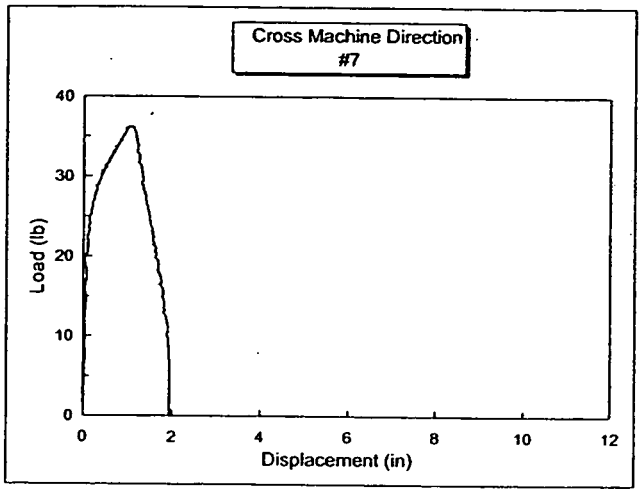
Raw Data File: TTATRC2, TTATRC3, TTATRC12, TTATRC13.TXT

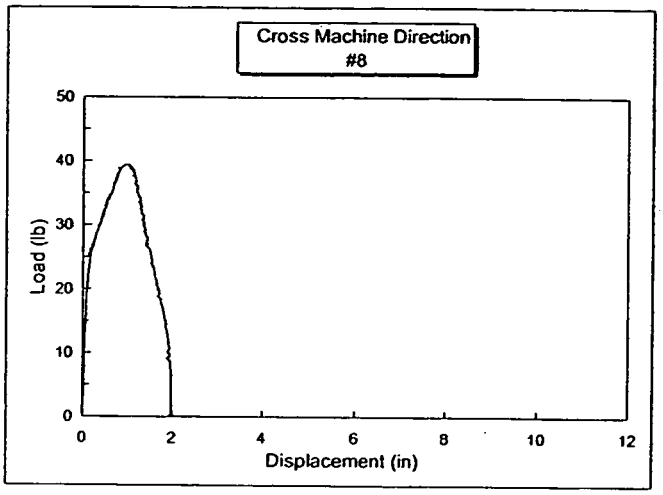
Checked By: JTR

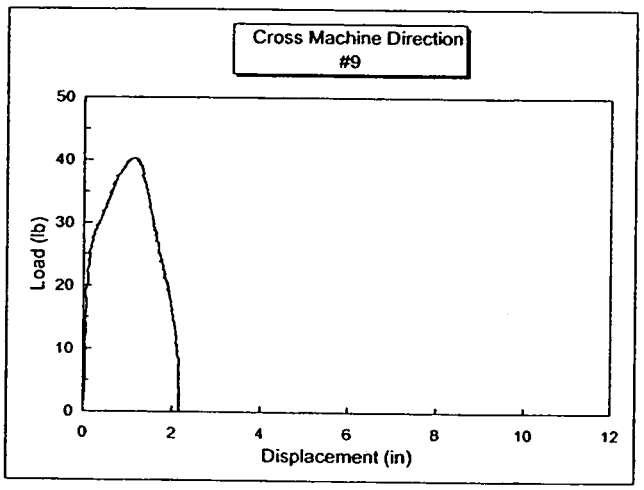
Date: 10/27/04

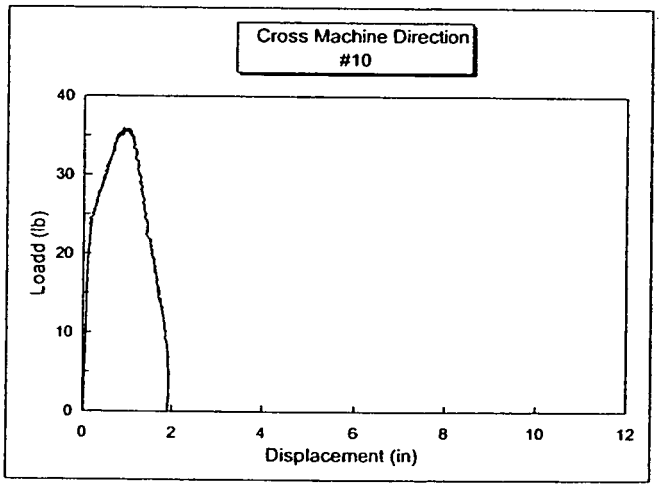
Advanced Terra Testing, Inc.

Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-02	Material Type:	60 mil LLDPE
Location:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	10-25-04
Roll Number:	101110562	Resin Lot No.:	
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:		Grip Seperation:	1.0"









Cross Machine Direction

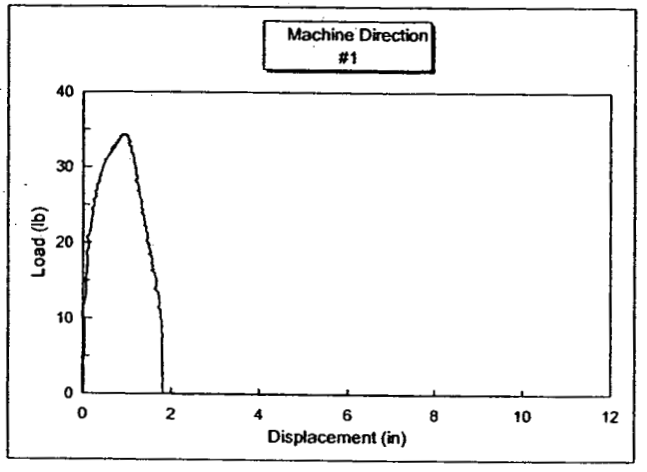
	Load at Break (lb/in width)		Load at Break (lb/in width)
Specimen #1	34.9	Specimen #6	39.5
Specimen #2	35.3	Specimen #7	36.3
Specimen #3	34.6	Specimen #8	39.4
Specimen #4	35.1	Specimen #9	40.3
Specimen #5	32.3	Specimen #10	36.0
Average	36.4		
Std. Deviation	2.4		

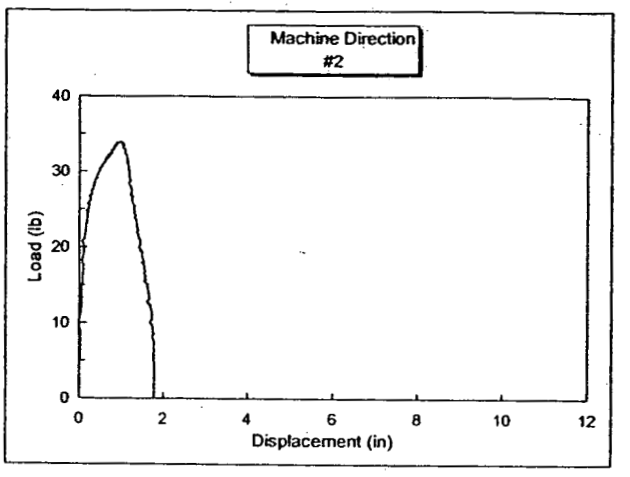
Filename: TTTRC562 Checked By: JTR Date: 10/27/04

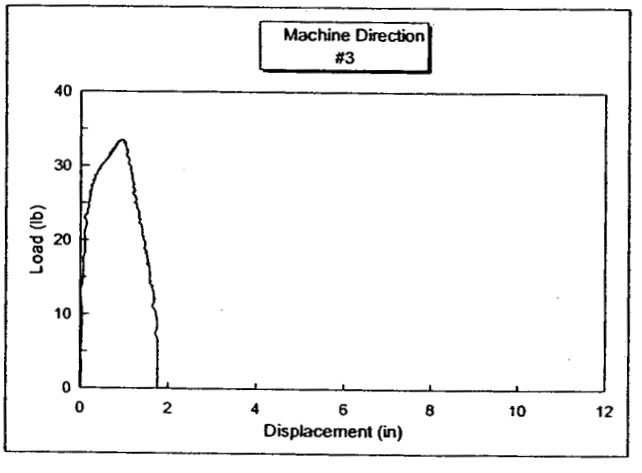
Raw Data File: TTATRC2, TTATRC3, TTATRC12, TTATRC13.TXT

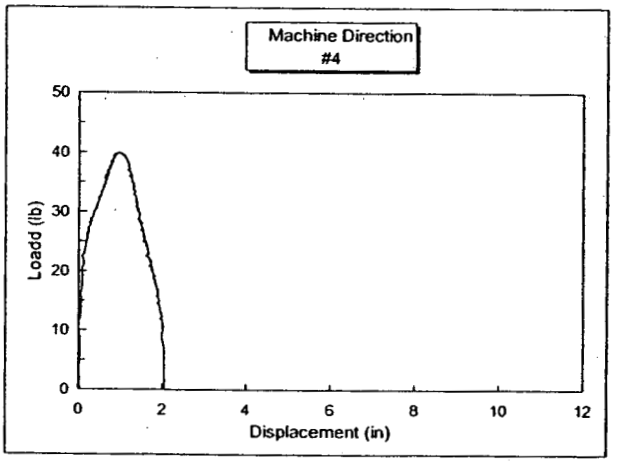
Advanced Terra Testing, Inc.

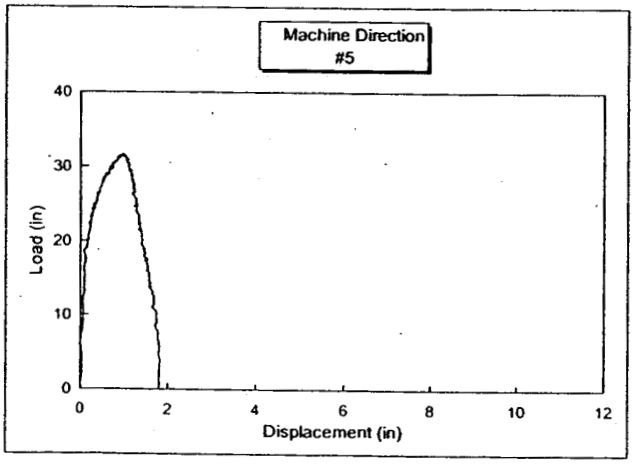
Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-02	Material Type:	60 mil LLDPE
Location:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	10-05-04 JTR
Roll No.:	104123231	Resin Lot No.:	CRG812060
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	LLD060A00	Grip Seperation:	1.0"

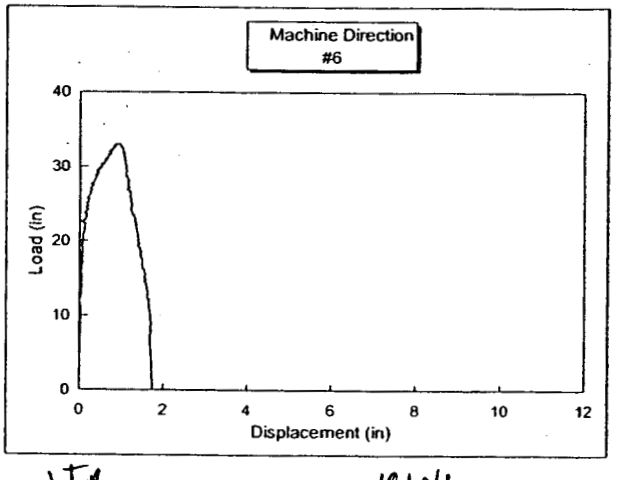










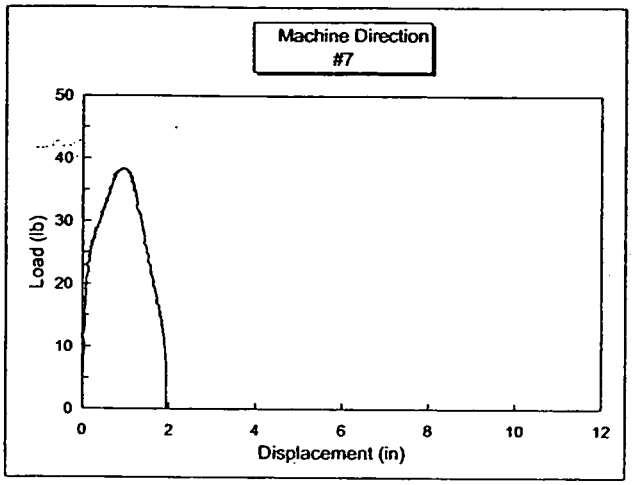


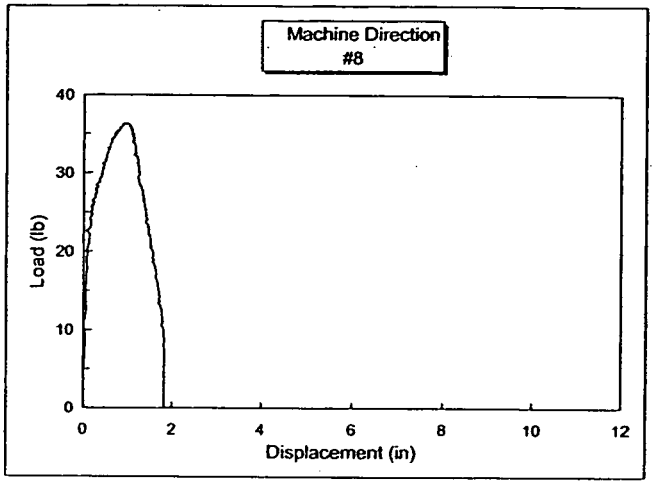
Filename: TTTR3231 Checked By: JTR Date: 10/8/04

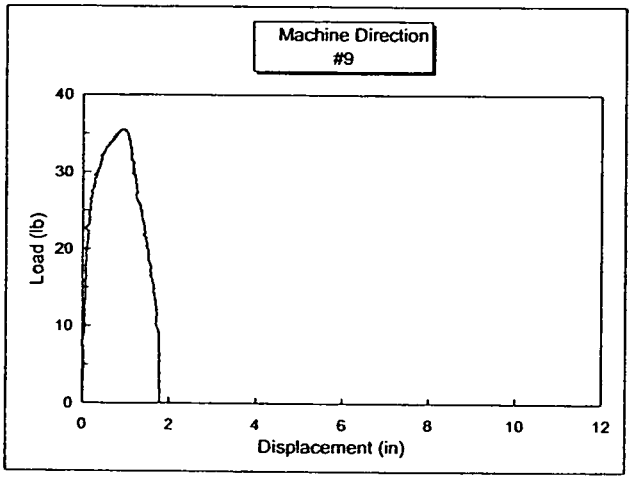
Raw Data File: TT8TRM2, TT8TRM3, TT8TRM12, TT8TRM13.TXT

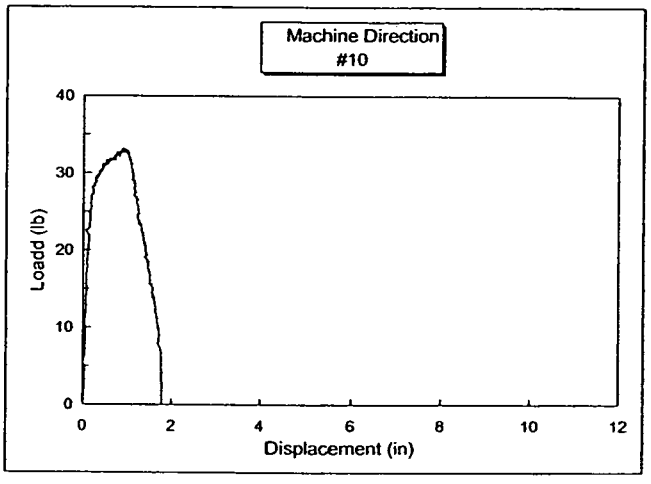
Advanced Terra Testing, Inc.

Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-02	Material Type:	60 mil LLDPE
Location:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	10-05-04 JTR
Roll Number:	104123231	Resin Lot No.:	CRG812060
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	LLD060A00	Grip Seperation:	1.0"









Machine Direction

	Load at Break (lb/in width)		Load at Break (lb/in width)
Specimen #1	34.4	Specimen #6	33.1
Specimen #2	34.0	Specimen #7	38.4
Specimen #3	33.5	Specimen #8	36.3
Specimen #4	39.9	Specimen #9	35.5
Specimen #5	31.8	Specimen #10	33.2

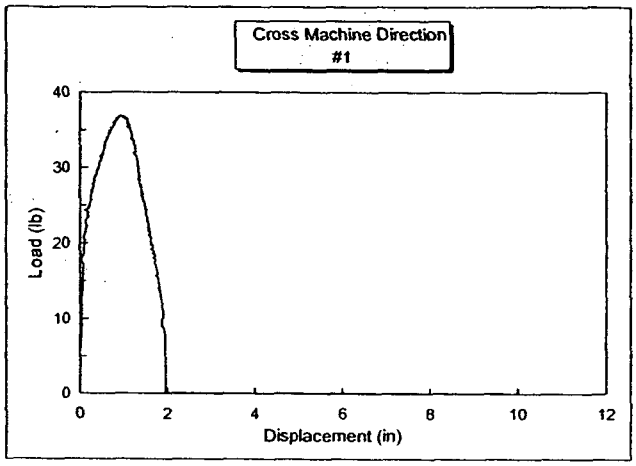
Average	35.0
Std. Deviation	2.4

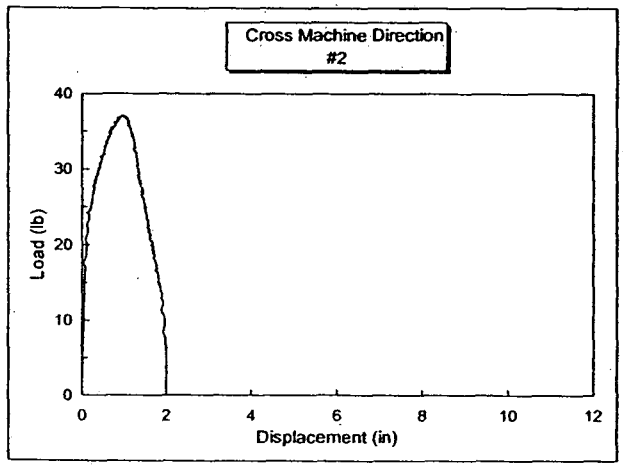
Filename: TTTR3231 Checked By: JTR Date: 10/8/04

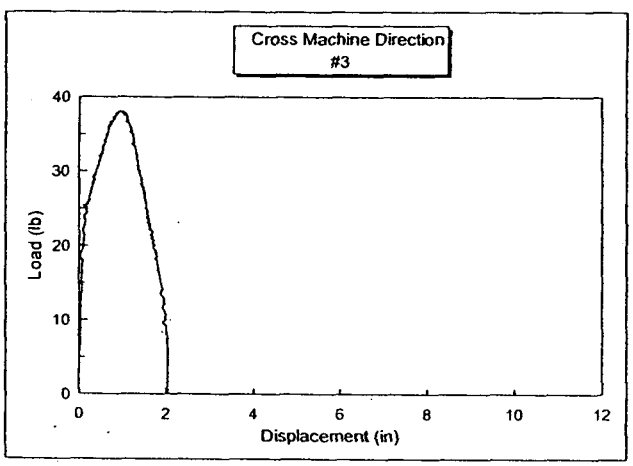
Raw Data File: TT8TRM2, TT8TRM3, TT8TRM12, TT8TRM13.TXT

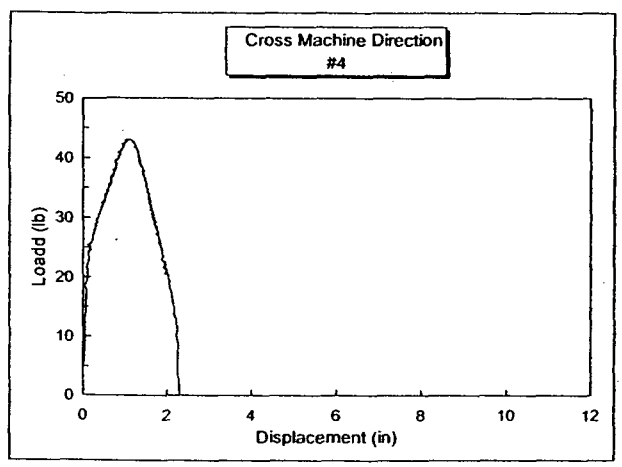
Advanced Terra Testing, Inc.

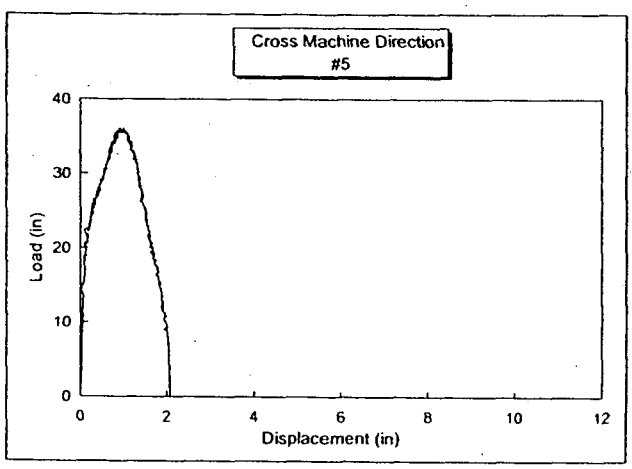
Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-02	Material Type:	60 mil LLDPE
Location:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	10-05-04 JTR
Roll No.:	104123231	Resin Lot No.:	CRG812060
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	LLD060A00	Grip Seperation:	1.0"

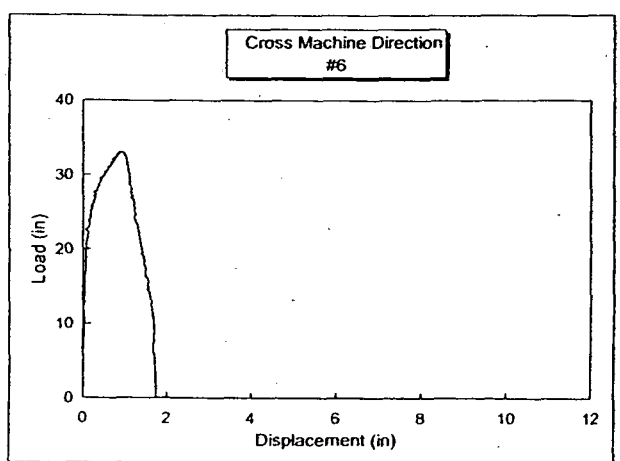












Filename: TTTR323C

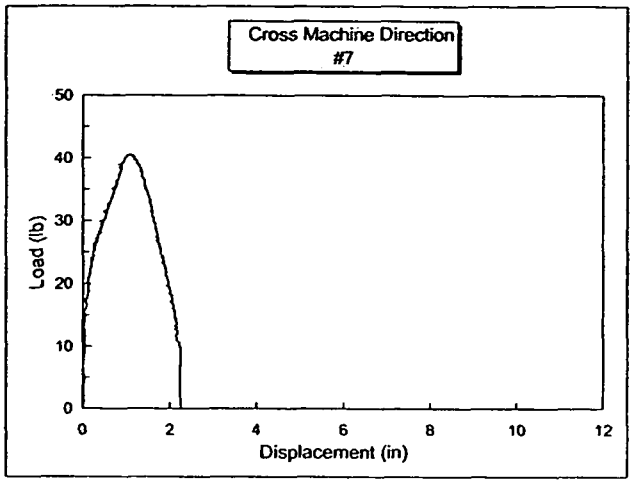
Raw Data File: TT8TRC2, TT8TRC3, TT8TRC12, TT8TRC13.TXT

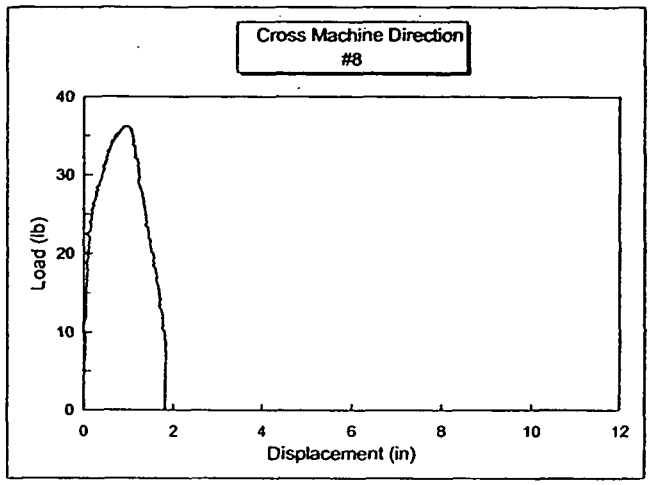
Checked By: JTR

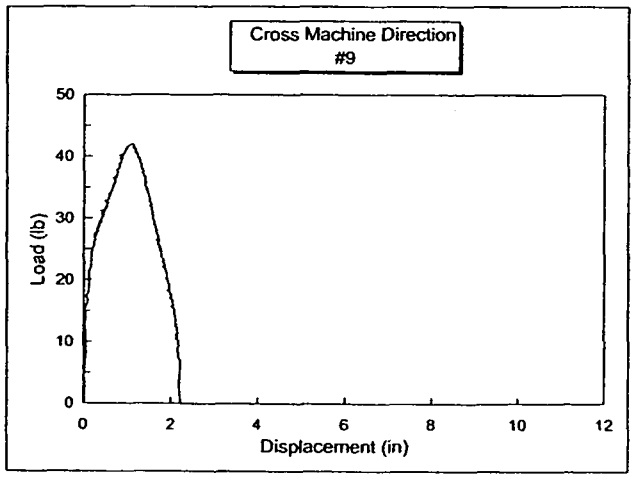
Date: 10/8/04

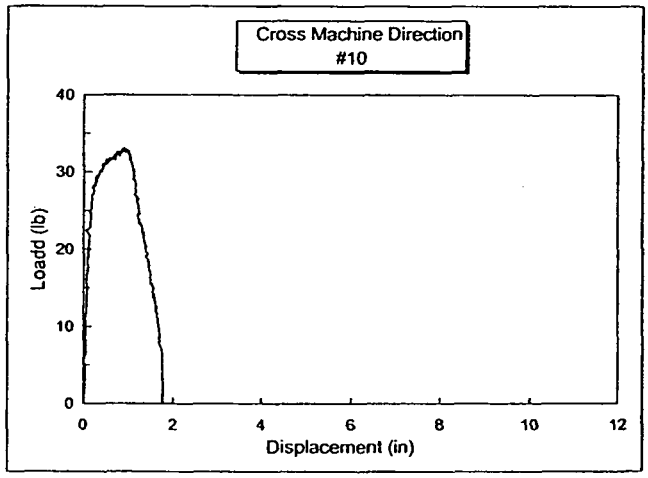
Advanced Terra Testing, Inc.

Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-02	Material Type:	60 mil LLDPE
Location:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	10-05-04 JTR
Roll Number:	104123231	Resin Lot No.:	CRG812060
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	LLD060A00	Grip Seperation:	1.0"









Cross Machine Direction

	Load at Break (lb/in width)		Load at Break (lb/in width)
Specimen #1	36.9	Specimen #6	33.1
Specimen #2	37.1	Specimen #7	40.7
Specimen #3	38.0	Specimen #8	36.3
Specimen #4	43.1	Specimen #9	42.1
Specimen #5	36.1	Specimen #10	33.2

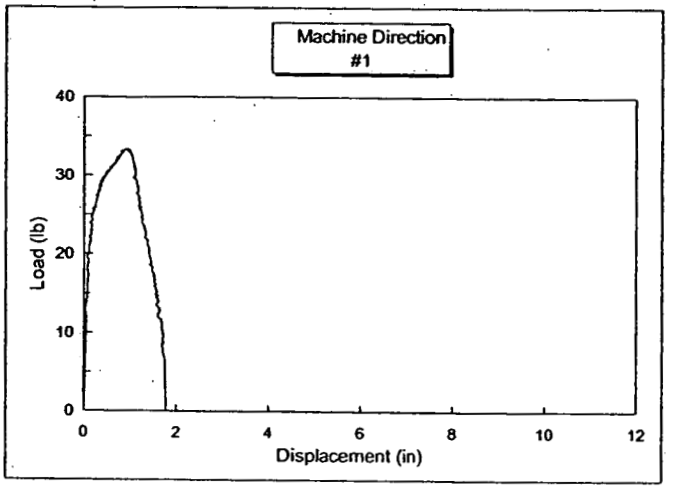
Average	37.6
Std. Deviation	3.2

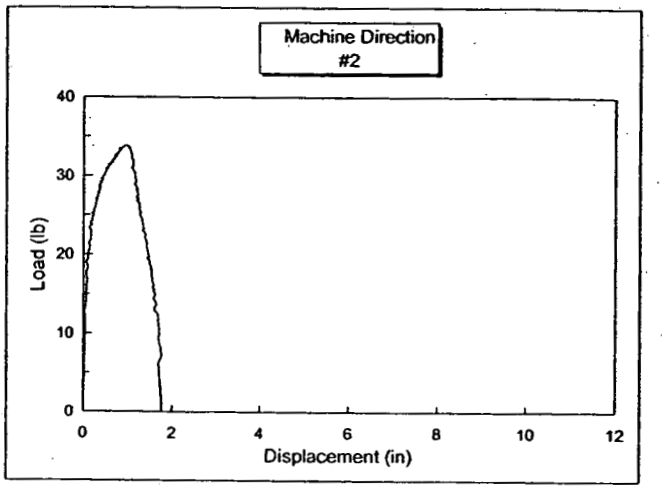
Filename: TTTR323C Checked By: JTR Date: 10/8/04

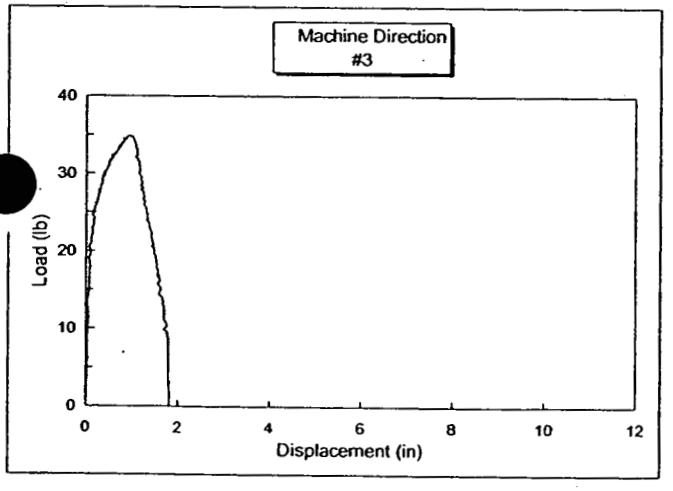
Raw Data File: TT8TRC2, TT8TRC3, TT8TRC12, TT8TRC13.TXT

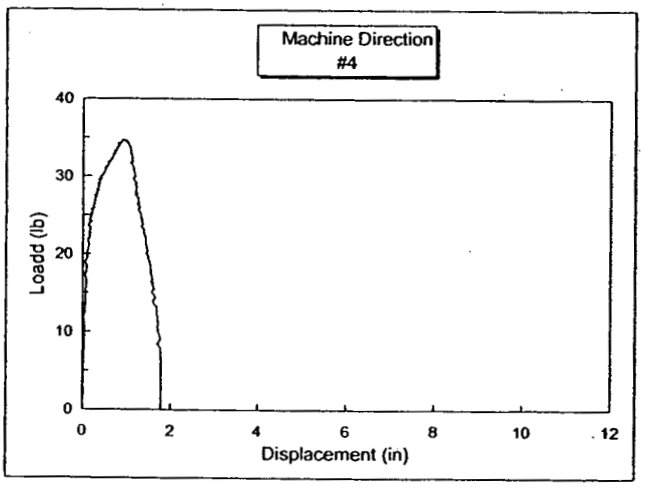
Advanced Terra Testing, Inc.

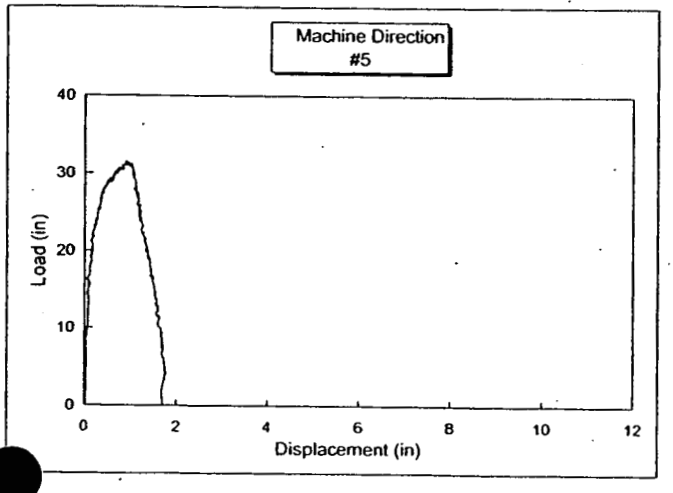
Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-02	Material Type:	60 mil LLDPE
Location:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	10-05,07-04 JTR/SR
Roll No.:	104123238	Resin Lot No.:	CRG812060
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	LLD060A00	Grip Seperation:	1.0"

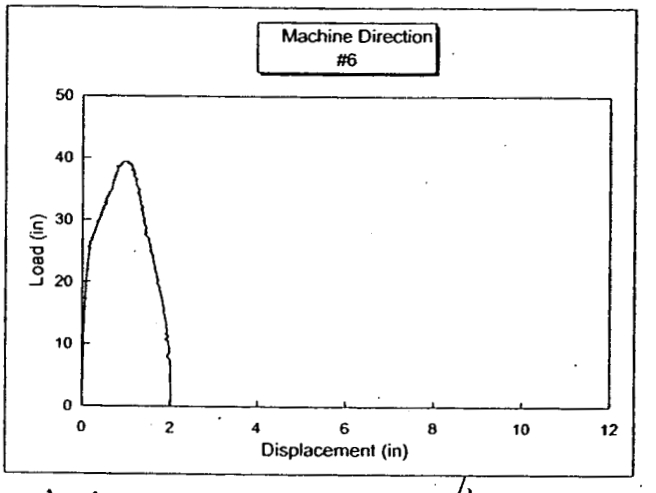










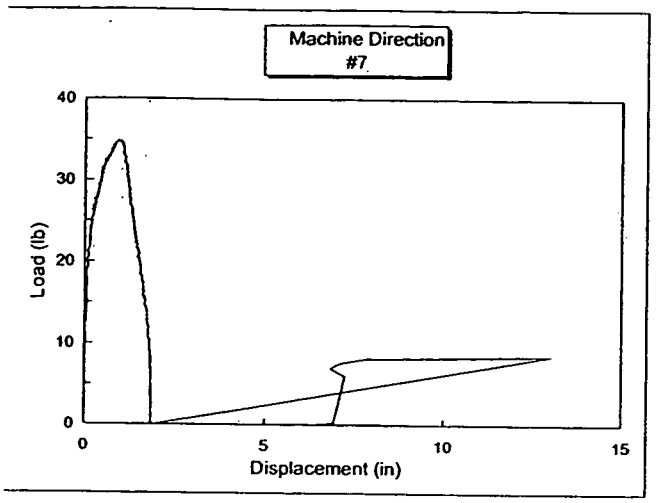


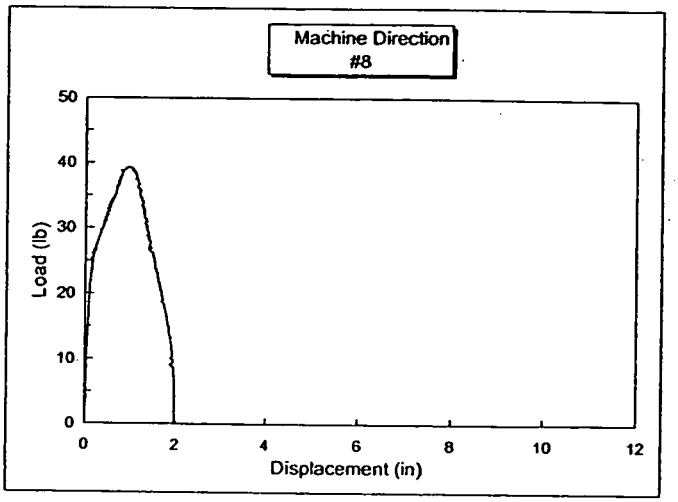
Filename: TTTR3238 Checked By: JTR Date: 10/8/04

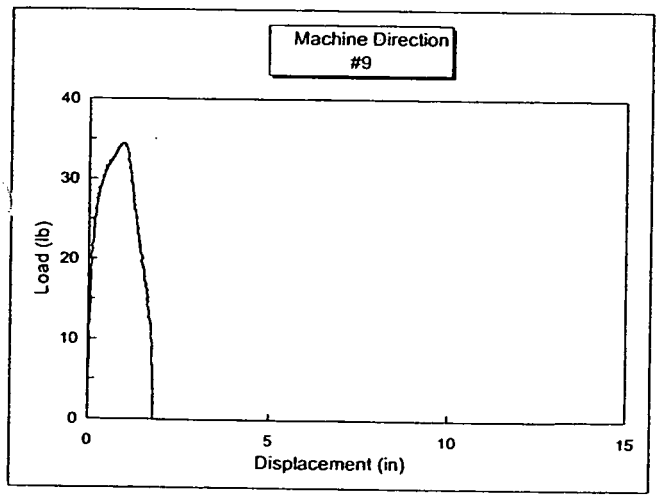
Raw Data File: TT10TRM2, TT10TRM3, TT10TRM12, TTATRM13.TXT

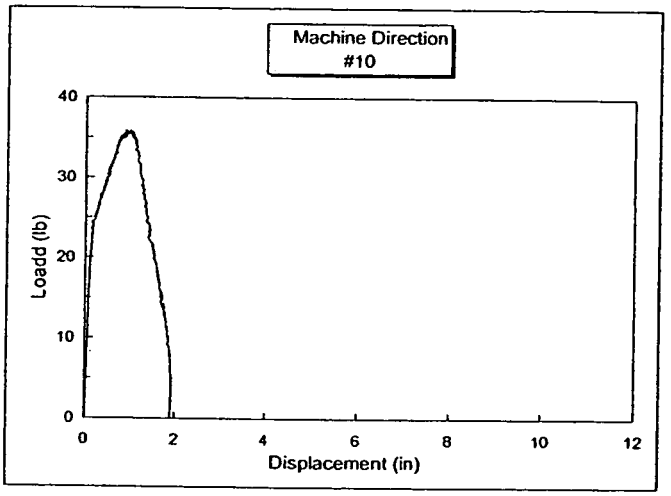
Advanced Terra Testing, Inc.

Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-02	Material Type:	60 mil LLDPE
Location:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	10-05,07-04 JTR/SR
Roll Number:	104123238	Resin Lot No.:	CRG812060
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	LLD060A00	Grip Seperation:	1.0"









Machine Direction

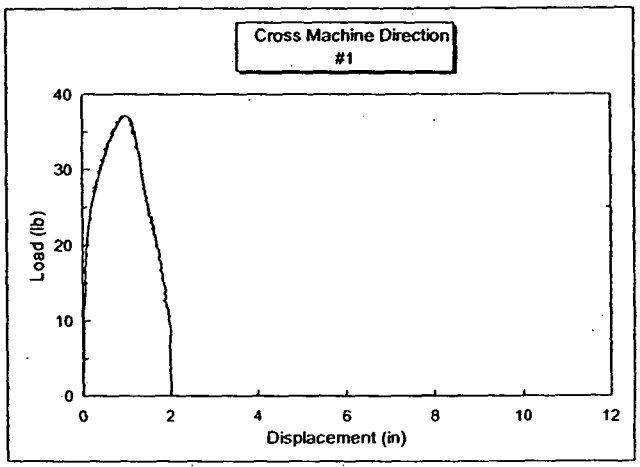
	Load at Break (lb/in width)		Load at Break (lb/in width)
Specimen #1	33.4	Specimen #6	39.5
Specimen #2	33.9	Specimen #7	34.9
Specimen #3	34.9	Specimen #8	39.4
Specimen #4	34.8	Specimen #9	34.5
Specimen #5	31.6	Specimen #10	36.0
Average	35.3		
Std. Deviation	2.4		

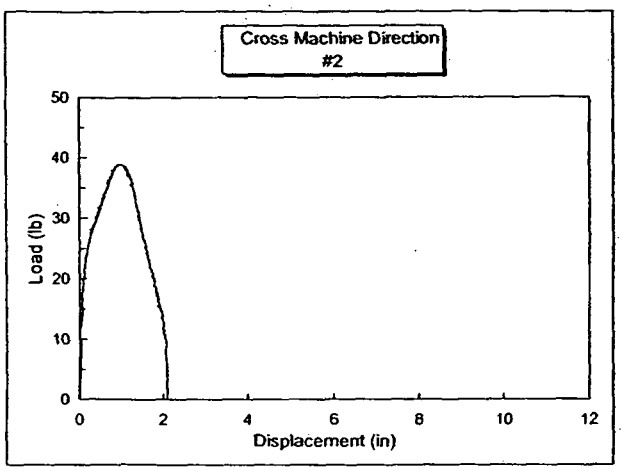
Filename: TTTR3238 Checked By: JTR Date: 10/8/04

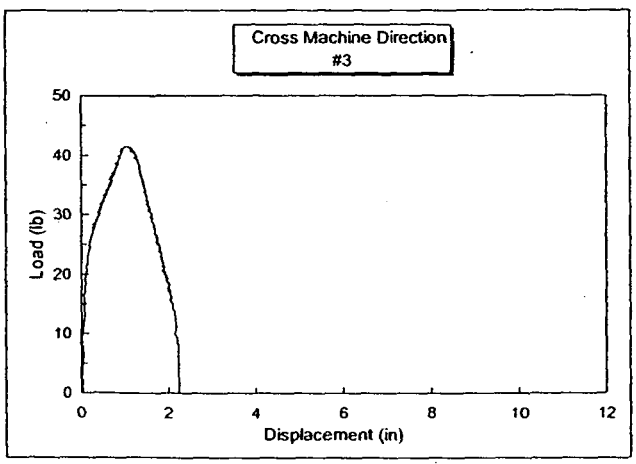
Raw Data File: TT10TRM2, TT10TRM3, TT10TRM12, TTATRM13.TXT

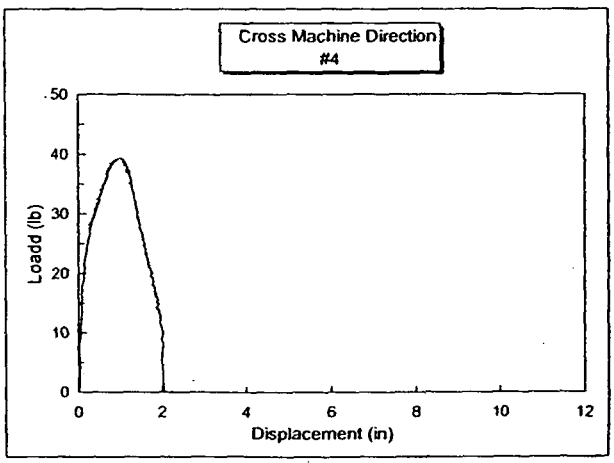
Advanced Terra Testing, Inc.

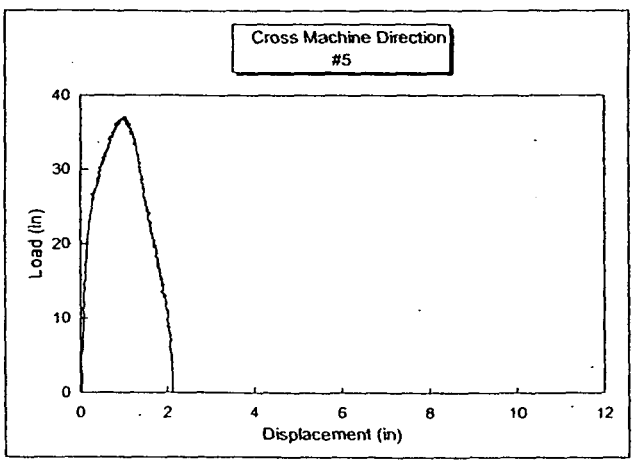
Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-02	Material Type:	60 mil LLDPE
Location:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	10-05,07-04 JTR/SR
Roll No.:	104123238	Resin Lot No.:	CRG812060
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	LLD060A00	Grip Seperation:	1.0"

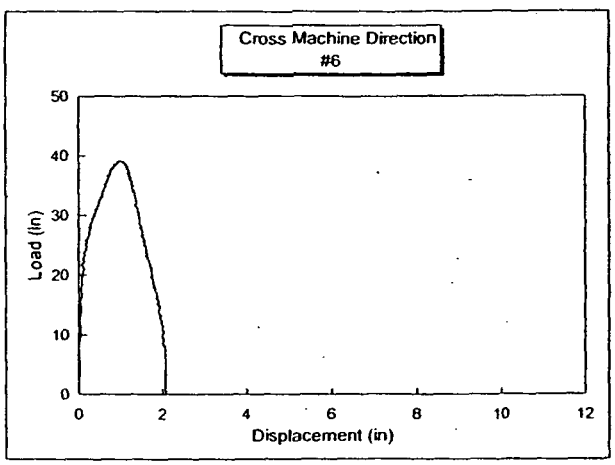










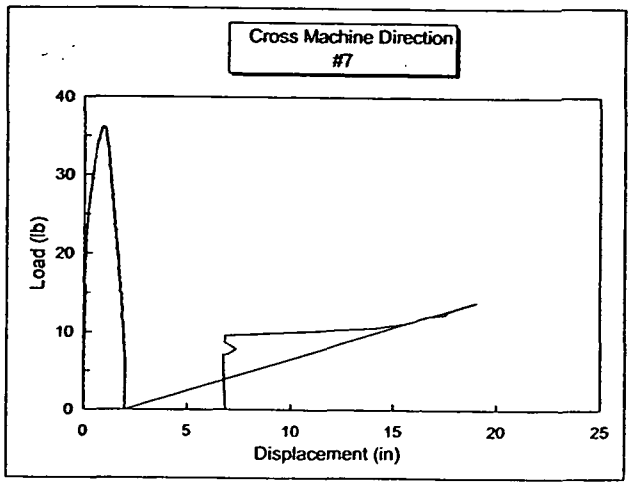


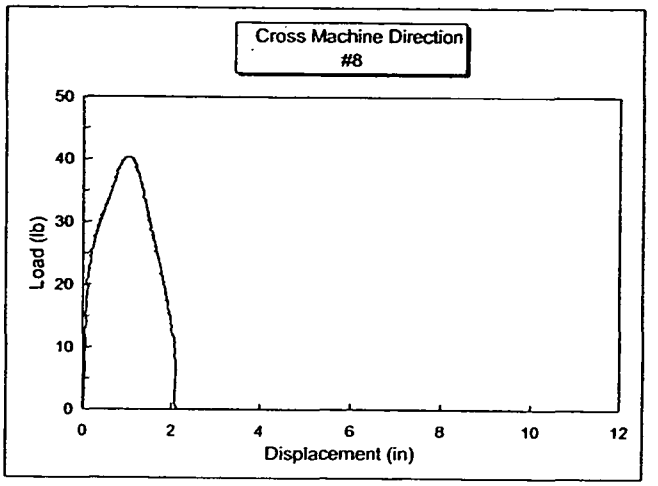
Filename: TTTRC32 Checked By: JTR Date: 10/8/04

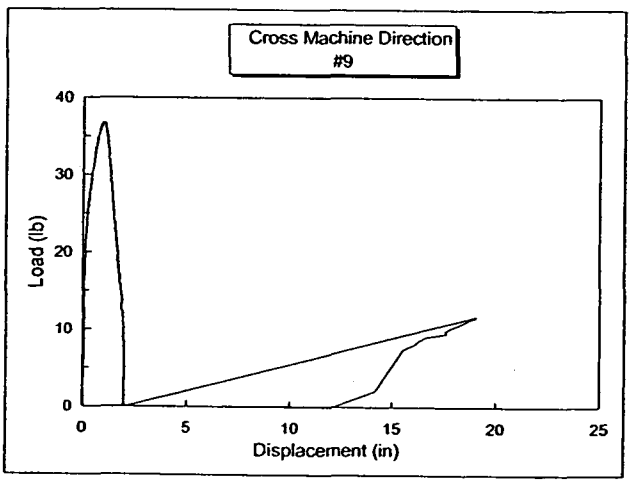
Raw Data File: TT10TRC2, TT10TRC3, TT10TRC12, TTATRC13.TXT

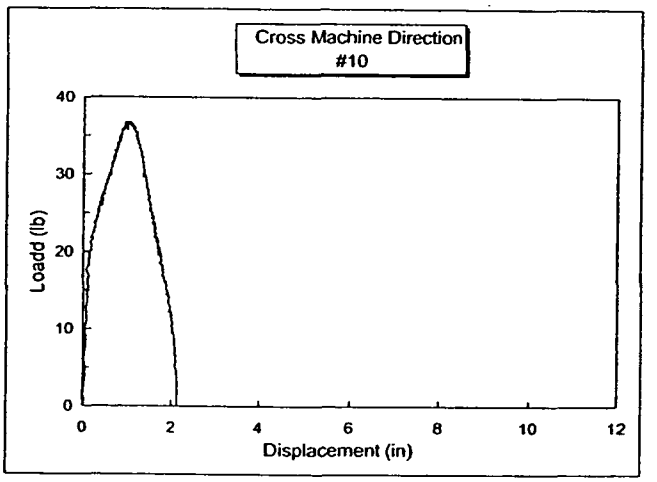
Advanced Terra Testing, Inc.

Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-02	Material Type:	60 mil LLDPE
Location:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	10-05,07-04 JTR/SR
Roll Number:	104123238	Resin Lot No.:	CRG812060
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	LLD060A00	Grip Seperation:	1.0"









Cross Machine Direction

	Load at Break (lb/in width)		Load at Break (lb/in width)
Specimen #1	37.2	Specimen #6	39.2
Specimen #2	39.0	Specimen #7	36.2
Specimen #3	41.6	Specimen #8	40.4
Specimen #4	39.3	Specimen #9	36.8
Specimen #5	37.2	Specimen #10	36.8

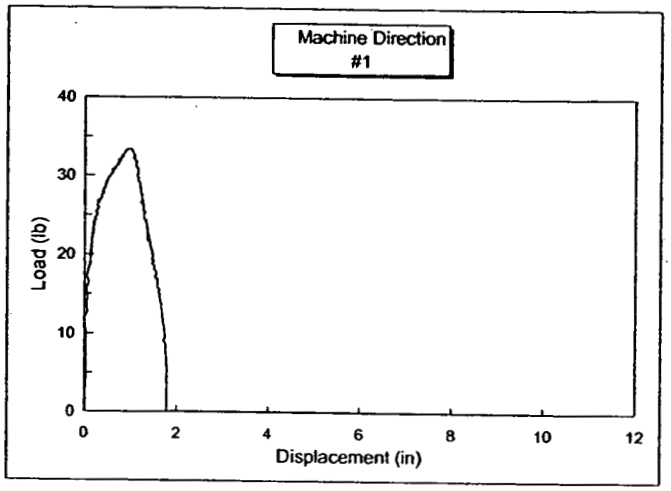
Average	38.4
Std. Deviation	1.7

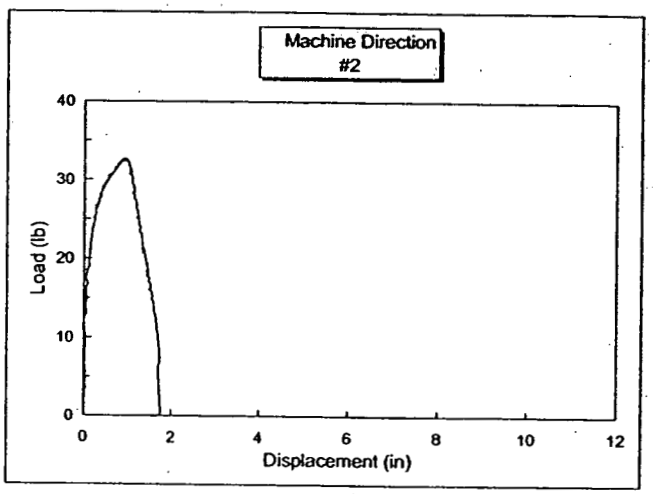
Filename: TTTRC32 Checked By: JTR Date: 10/8/08

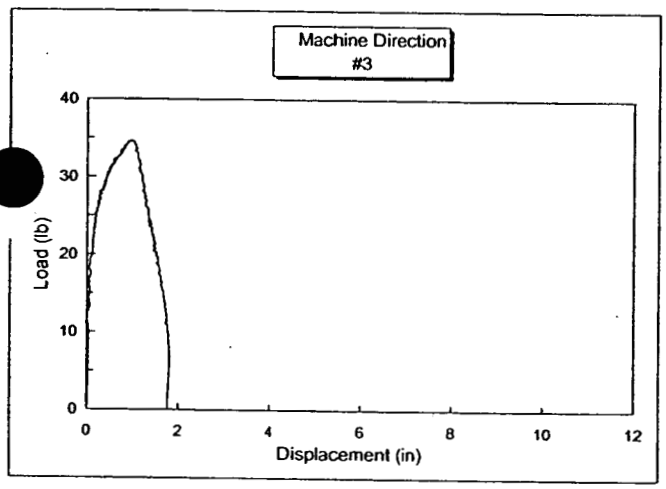
Raw Data File: TT10TRC2, TT10TRC3, TT10TRC12, TTATRC13.TXT

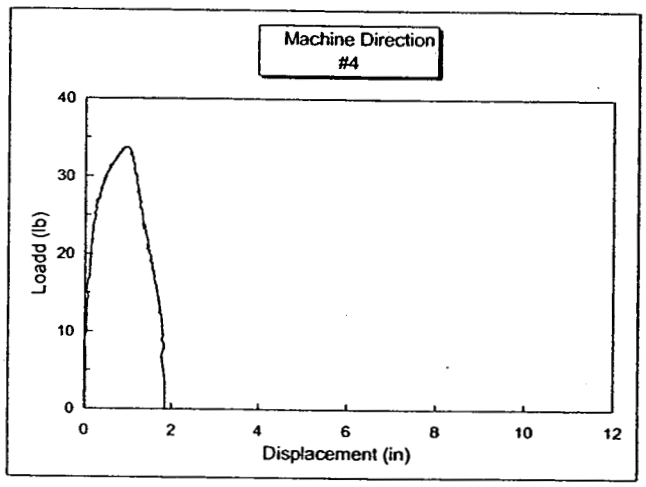
Advanced Terra Testing, Inc.

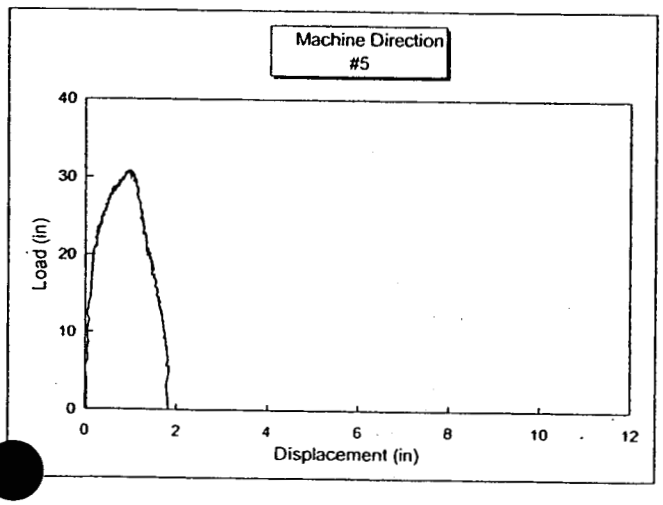
Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-02	Material Type:	60 mil LLDPE
ocation:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	10-05-04 JTR
l No.:	104123245	Resin Lot No.:	CRG812060
est Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	LLD060A00	Grip Seperation:	1.0"

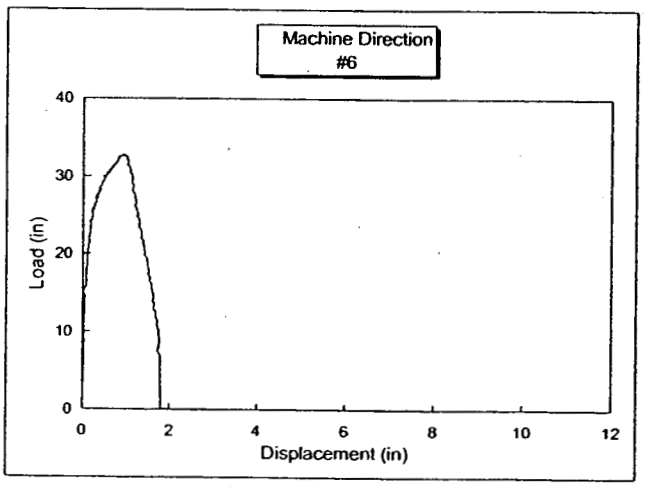










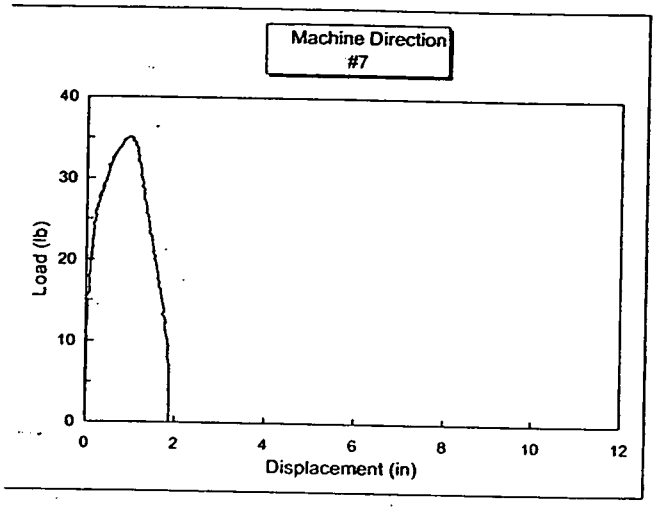


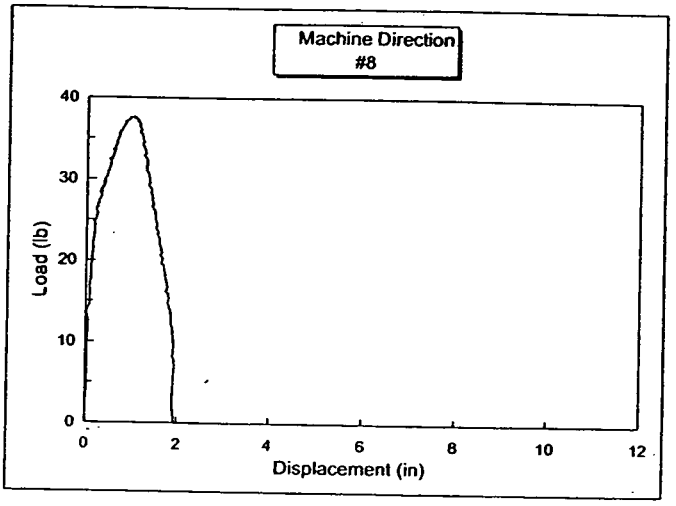
ename:	TTTR3245	Checked By:	JTR
Raw Data File:	TT9TRM2, TT9TRM3, TT9TRM12, TT9TRM13.TXT	Date:	10/8/04

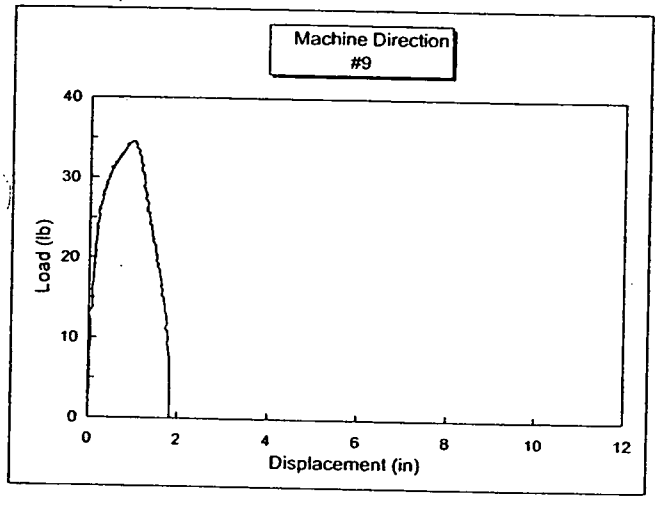
Advanced Terra Testing, Inc.

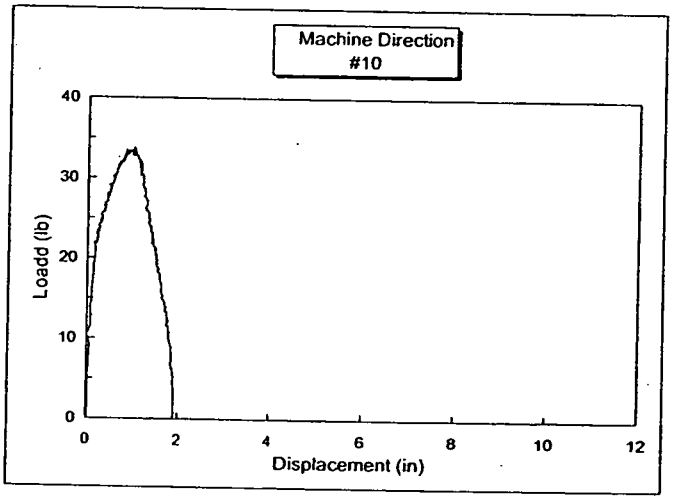
Client:	Tetra Tech - RMC
Job No.:	2617-02
Location:	Present Landfill Design-RFETS, Golden, CO
Roll Number:	104123245
Test Device:	Five Station
Load Cells:	500 lb.
Product Code:	LLD060A00

Test Type:	ASTM D 1004 Method C
Material Type:	60 mil LLDPE
Date Tested:	10-05-04 JTR
Resin Lot No.:	CRG812060
Data Entered By:	SR
Displacement Rate:	2 in/min
Grip Seperation:	1.0"









Machine Direction

	Load at Break (lb/in width)
Specimen #1	33.5
Specimen #2	32.7
Specimen #3	34.7
Specimen #4	33.8
Specimen #5	30.8
Specimen #6	32.8
Specimen #7	35.2
Specimen #8	37.7
Specimen #9	34.6
Specimen #10	33.9
Average	34.0
Std. Deviation	1.7

Filename: TTTR3245

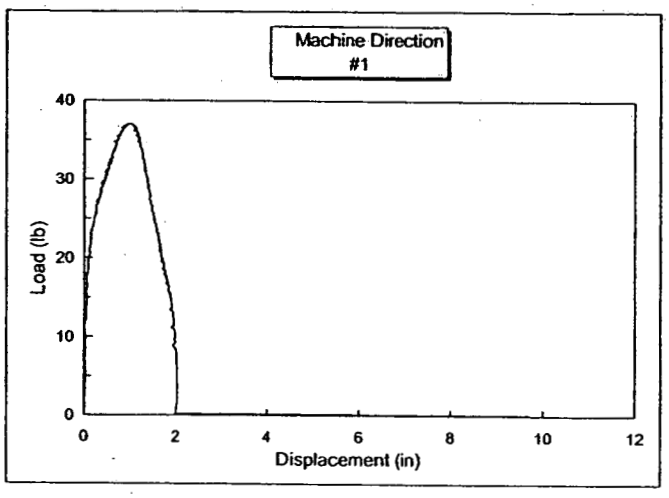
Raw Data File: TT9TRM2, TT9TRM3, TT9TRM12, TT9TRM13.TXT

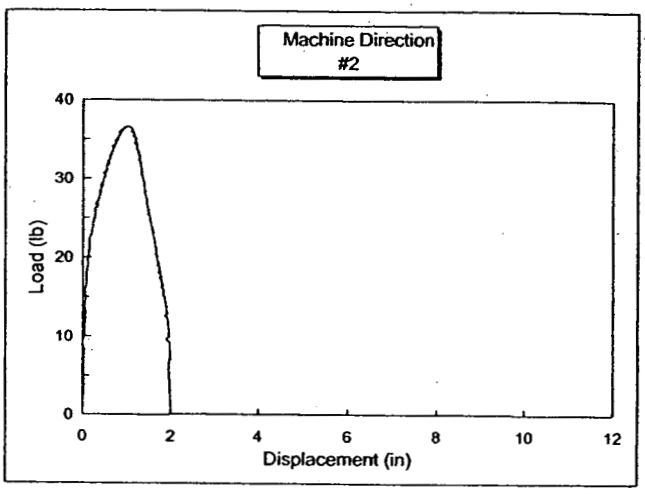
Checked By: JTR

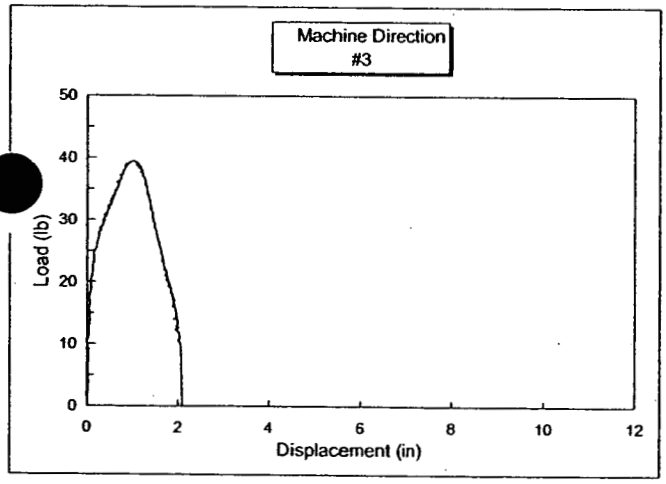
Date: 10/8/04

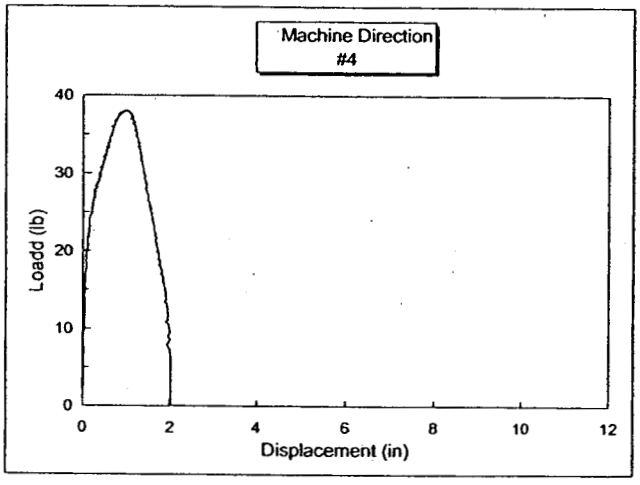
Advanced Terra Testing, Inc.

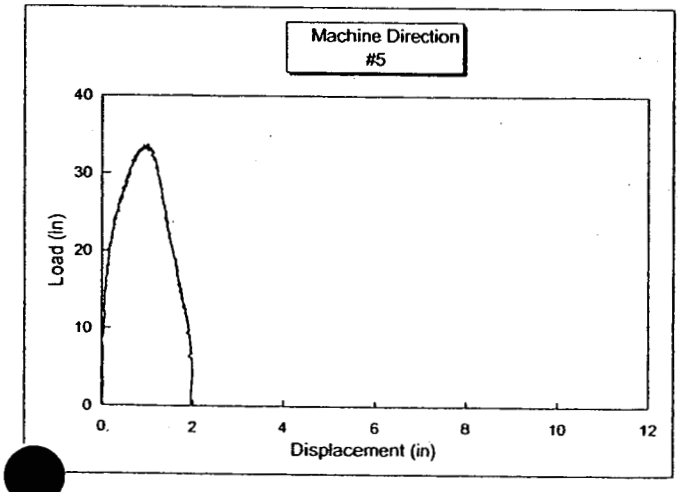
Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-02	Material Type:	60 mil LLDPE
Location:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	10-05-04 JTR
Roll No.:	104123245	Resin Lot No.:	CRG812060
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	LLD060A00	Grip Seperation:	1.0"

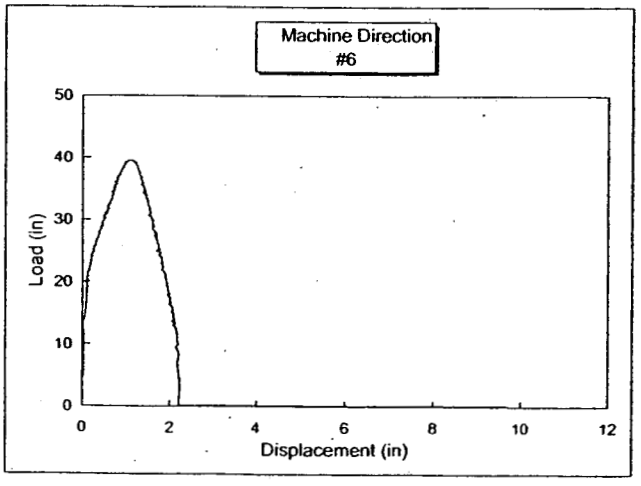










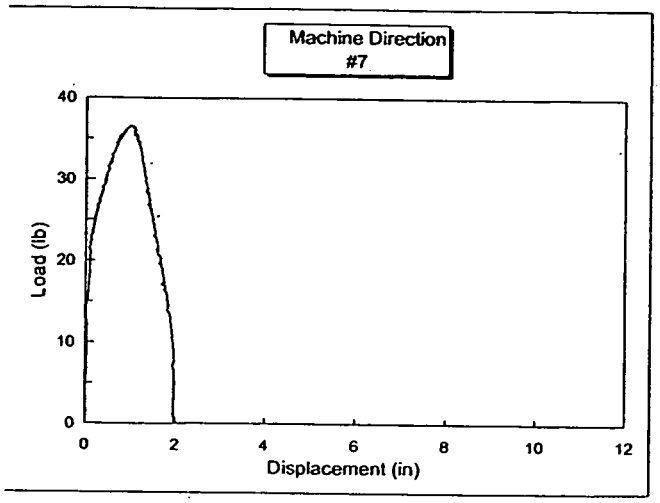


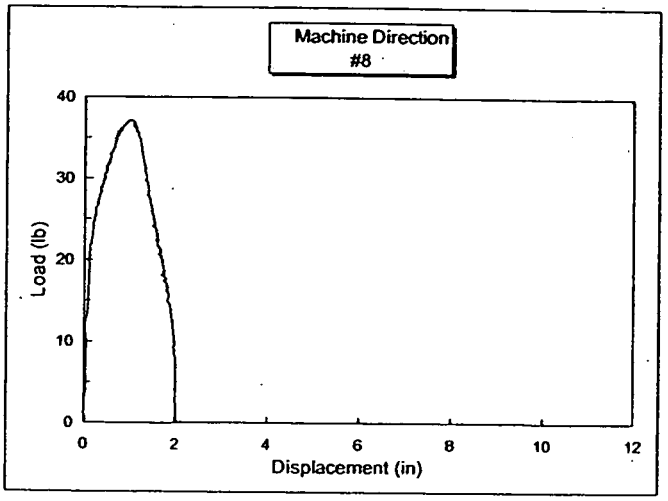
Filename: TTTR324C Checked By: JTR Date: 10/8/04

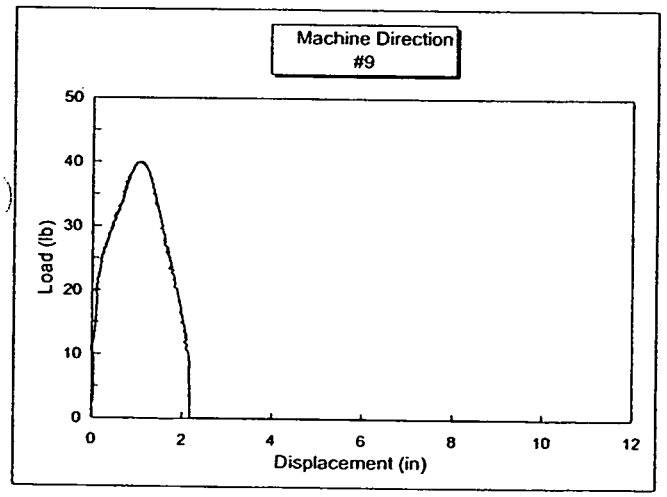
Raw Data File: TT9TRC2, TT9TRC3, TT9TRC12, TT9TRC13.TXT

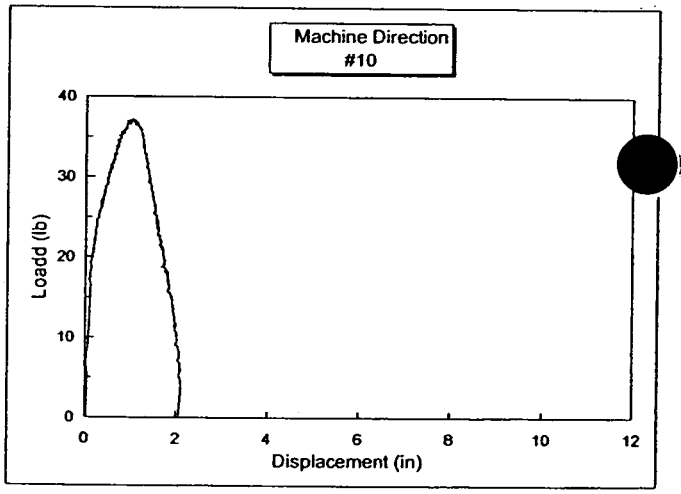
Advanced Terra Testing, Inc.

Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-02	Material Type:	60 mil LLDPE
Location:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	10-05-04 JTR
Roll Number:	104123245	Resin Lot No.:	CRG812060
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	LLD060A00	Grip Seperation:	1.0"









Machine Direction

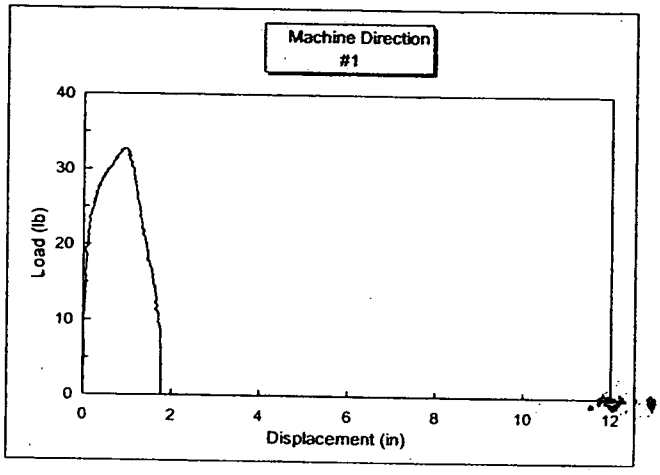
	Load at Break (lb/in width)		Load at Break (lb/in width)
Specimen #1	37.0	Specimen #6	39.5
Specimen #2	36.6	Specimen #7	36.6
Specimen #3	39.4	Specimen #8	37.1
Specimen #4	38.0	Specimen #9	40.0
Specimen #5	33.7	Specimen #10	37.2
Average	37.5		
Std. Deviation	1.8		

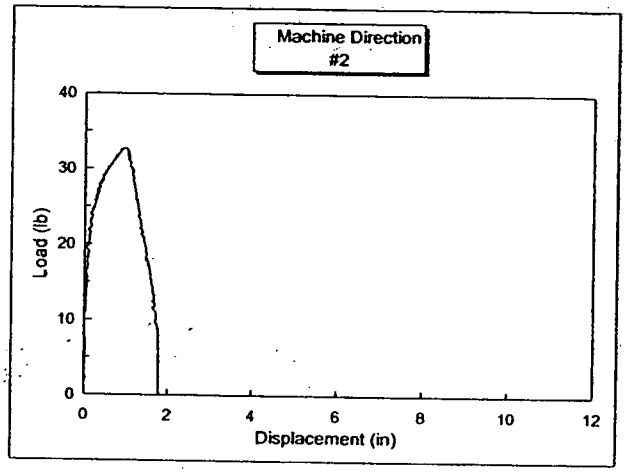
Filename: TTTR324C Checked By: JTR Date: 10/8/04

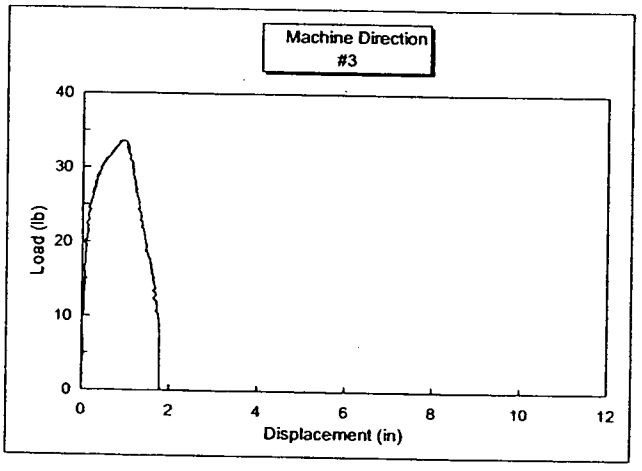
Raw Data File: TT9TRC2, TT9TRC3, TT9TRC12, TT9TRC13.TXT

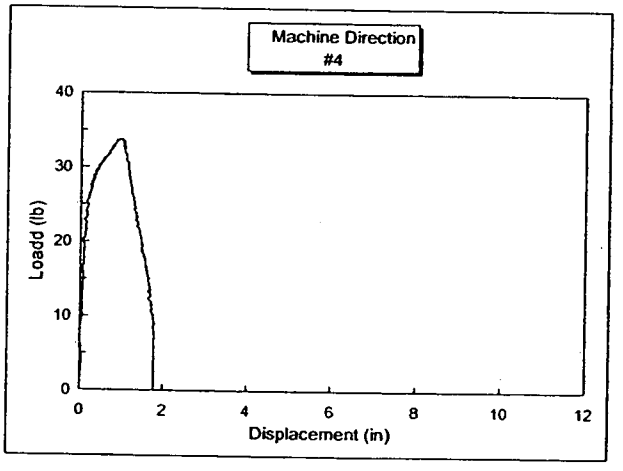
Advanced Terra Testing, Inc.

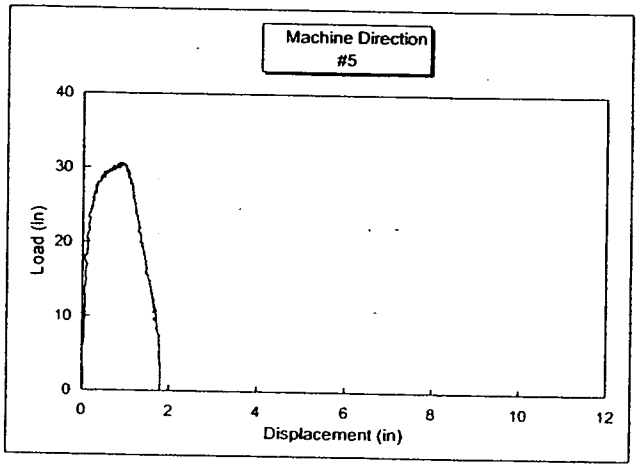
Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-02	Material Type:	60 mil LLDPE
Location:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	10-05,07-04 JTR/SR
Roll No.:	104123251	Resin Lot No.:	CRG812060
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	LLD060A00	Grip Seperation:	1.0"

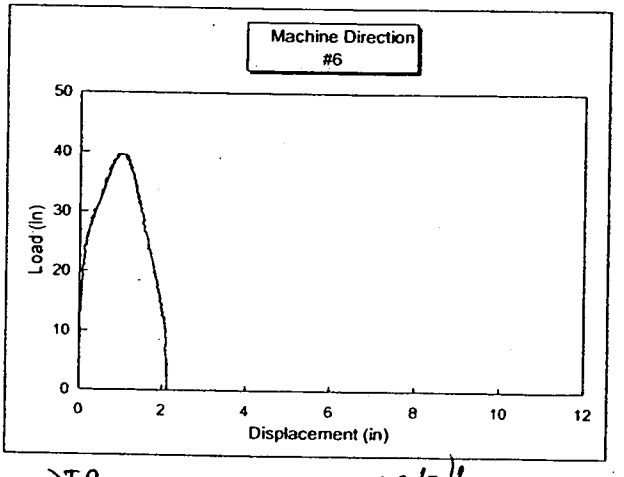












Filename: TTTR3251

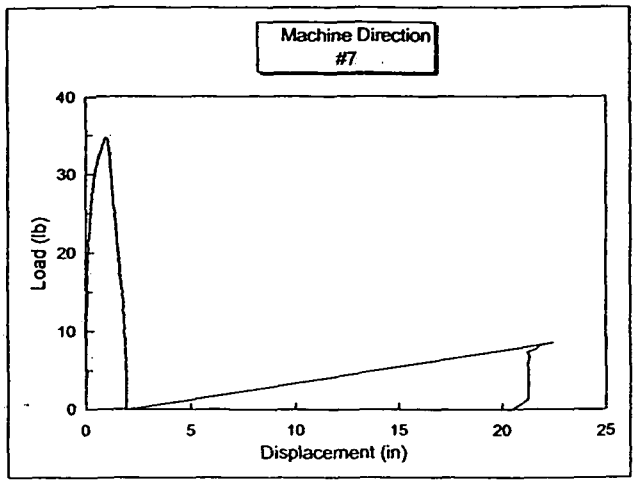
Raw Data File: TT11TRM2, TT11TRM3, TT11TRM12, TTBTRM13.TXT

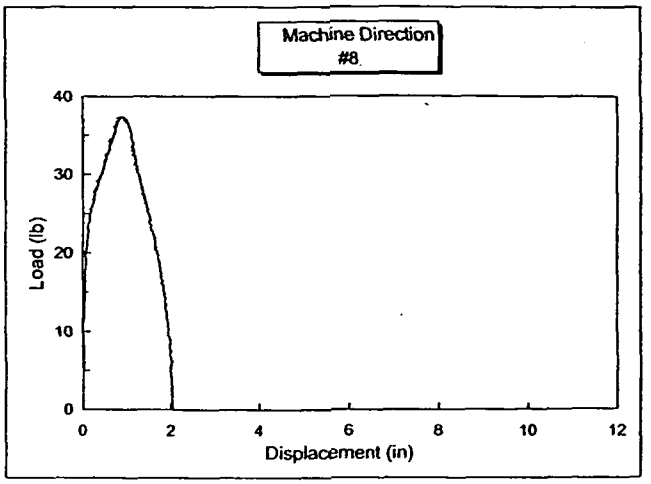
Checked By: JTR

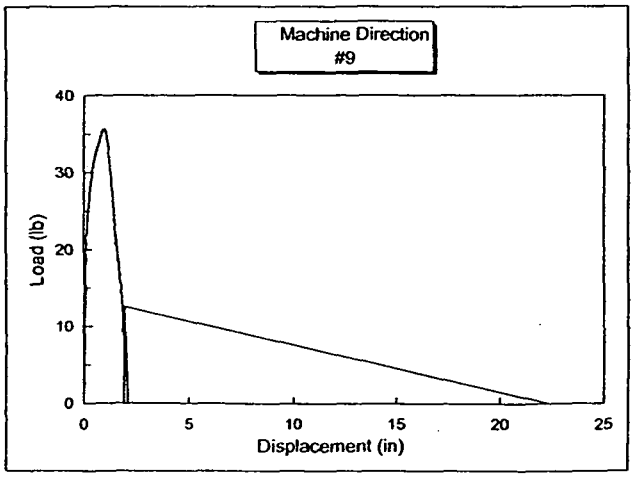
Date: 10/8/04

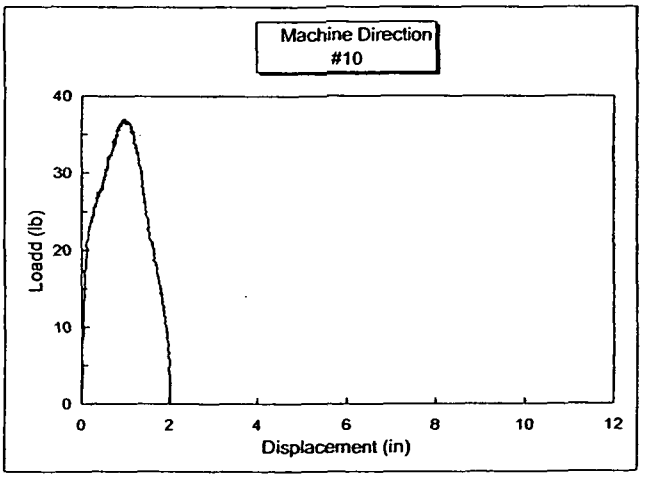
Advanced Terra Testing, Inc.

Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-02	Material Type:	60 mil LLDPE
Location:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	10-05,07-04 JTR/SR
Roll Number:	104123251	Resin Lot No.:	CRG812060
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	LLD060A00	Grip Seperation:	1.0"









Machine Direction

	Load at Break (lb/in width)		Load at Break (lb/in width)
Specimen #1	32.7	Specimen #6	39.6
Specimen #2	32.7	Specimen #7	34.8
Specimen #3	33.6	Specimen #8	37.5
Specimen #4	33.8	Specimen #9	35.8
Specimen #5	30.6	Specimen #10	37.2

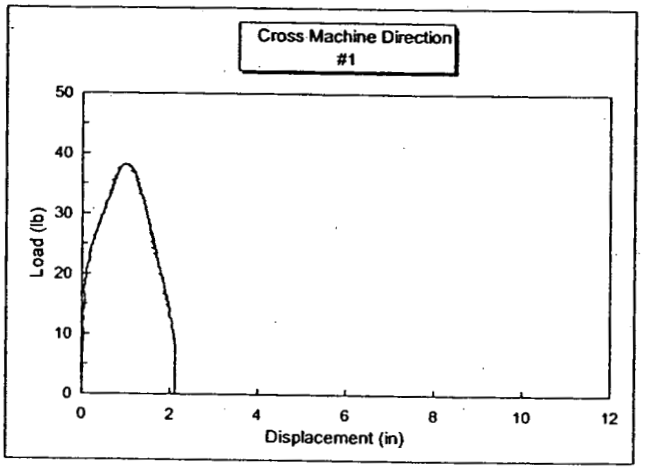
Average	34.8
Std. Deviation	2.6

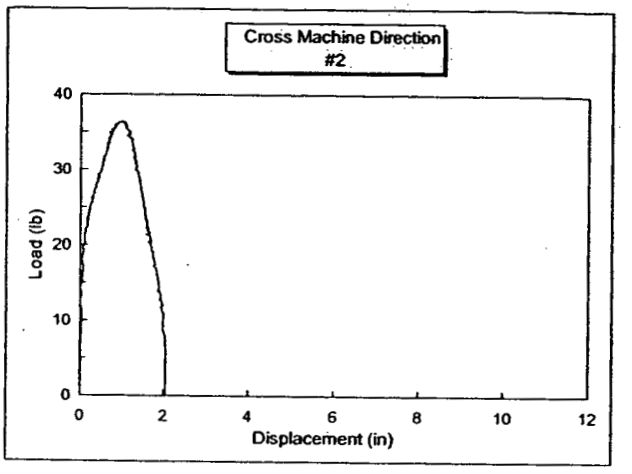
Filename: TTTR3251 Checked By: JTR Date: 10/8/04

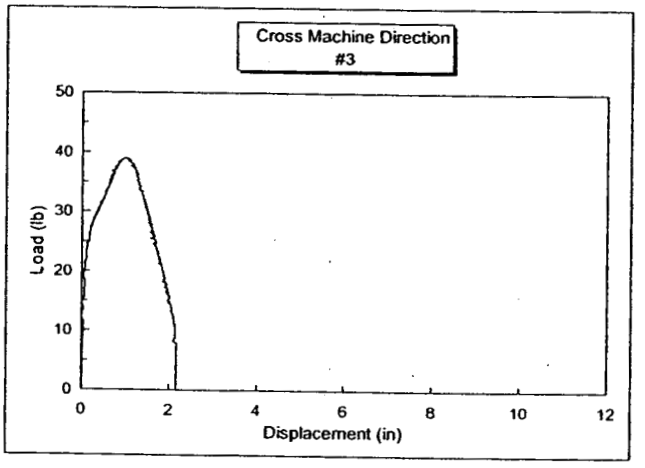
Raw Data File: TT11TRM2, TT11TRM3, TT11TRM12, TTBTRM13.TXT

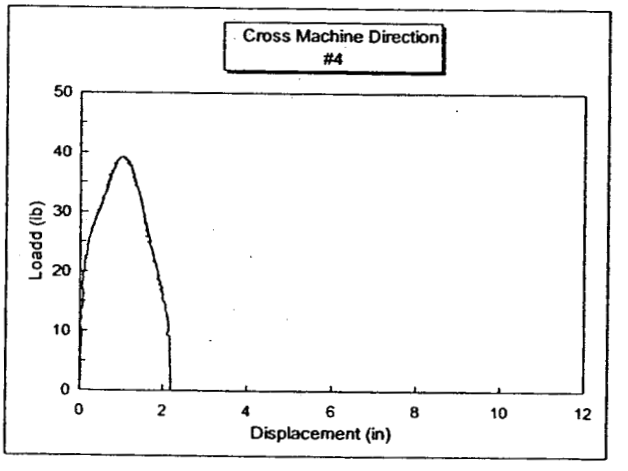
Advanced Terra Testing, Inc.

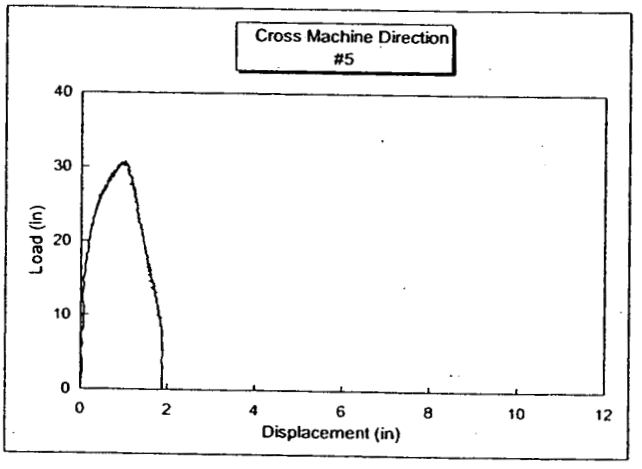
Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-02	Material Type:	60 mil LLDPE
Location:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	10-05,07-04 JTR/SR
Roll No.:	104123251	Resin Lot No.:	CRG812060
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	LLD060A00	Grip Seperation:	1.0"

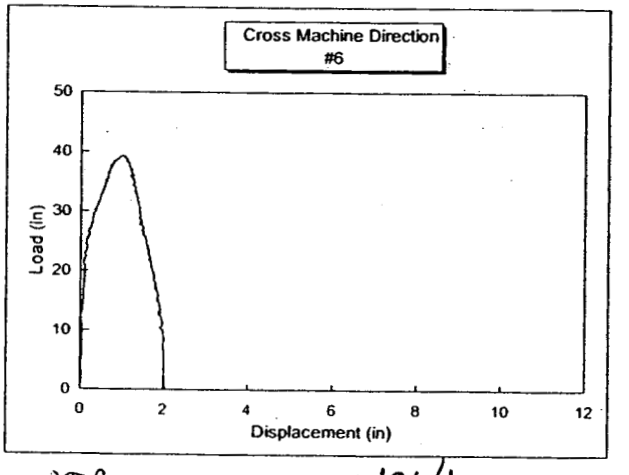












Filename: TTTRC325

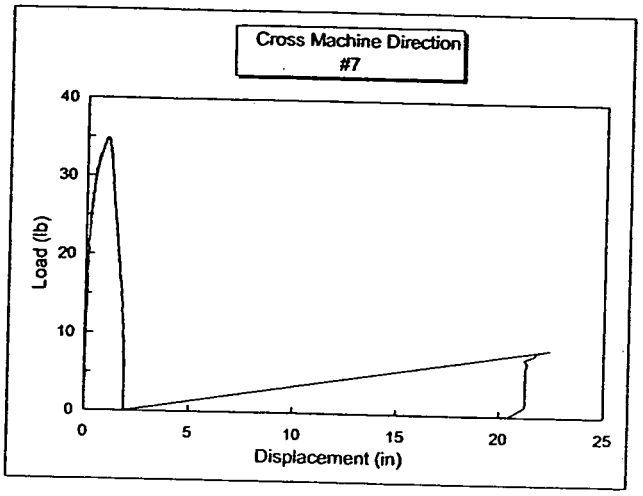
Raw Data File: TT11TRC2, TT11TRC3, TT11TRC12, TTBTRC13.TXT

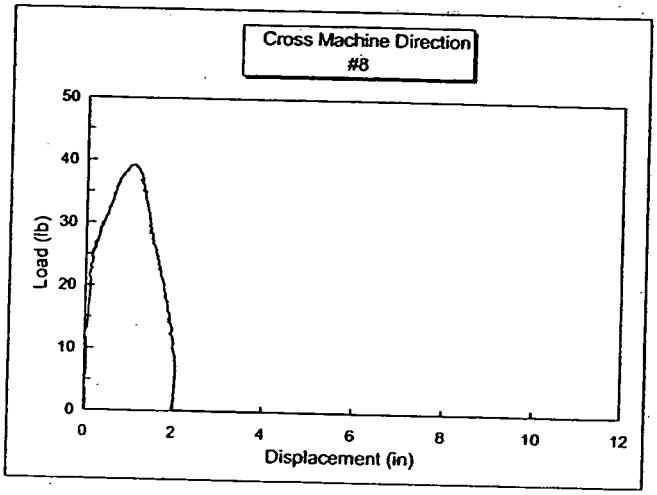
Checked By: JTR

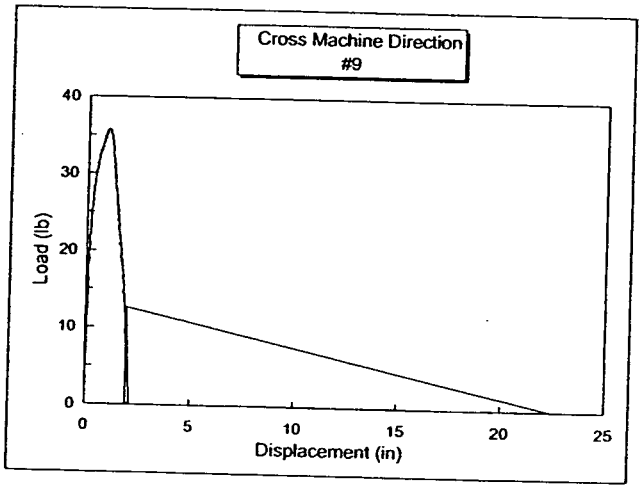
Date: 10/8/04

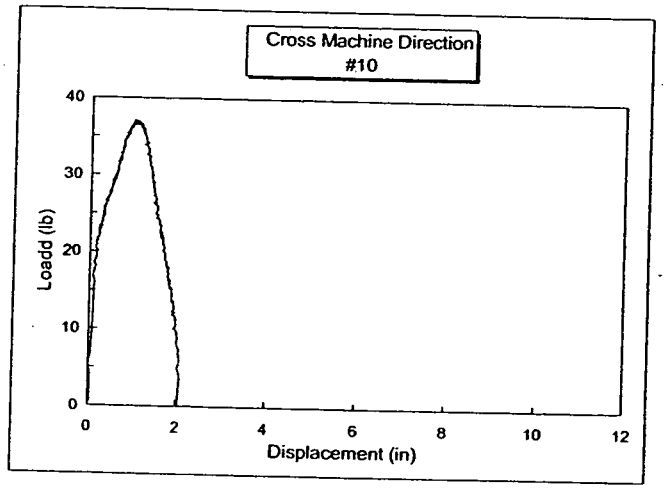
Advanced Terra Testing, Inc.

Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-02	Material Type:	60 mil LLDPE
Location:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	10-05,07-04 JTR/SR
Roll Number:	104123251	Resin Lot No.:	CRG812060
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	LLD060A00	Grip Seperation:	1.0"









Cross Machine Direction

	Load at Break (lb/in width)
Specimen #1	38.2
Specimen #2	36.4
Specimen #3	39.0
Specimen #4	39.2
Specimen #5	30.8
Specimen #6	39.3
Specimen #7	34.8
Specimen #8	39.3
Specimen #9	35.8
Specimen #10	37.1
Average	37.0
Std. Deviation	2.6

Filename: TTTRC325

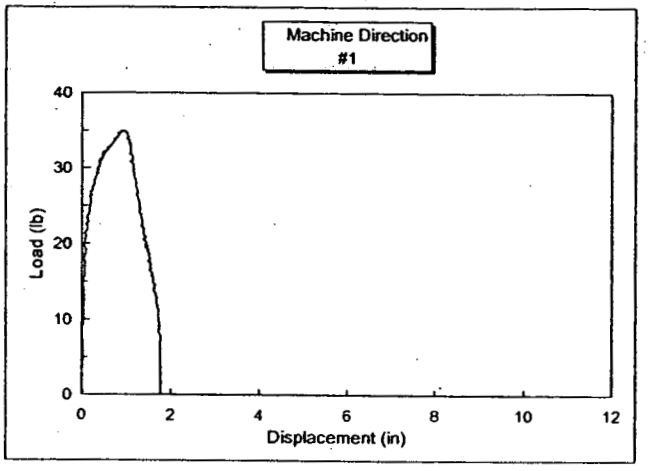
Raw Data File: TT11TRC2, TT11TRC3, TT11TRC12, TTBTRC13.TXT

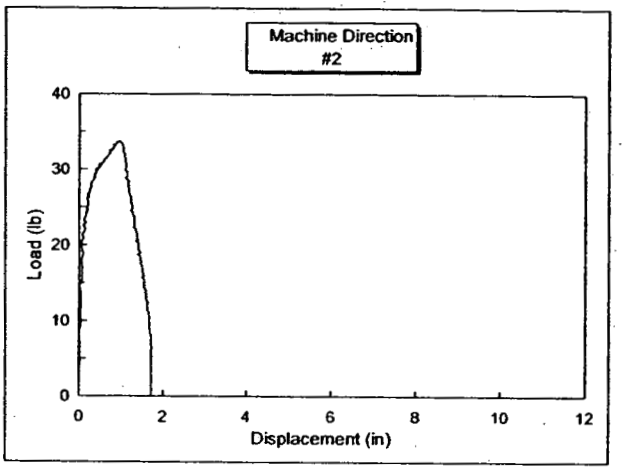
Checked By: JTR

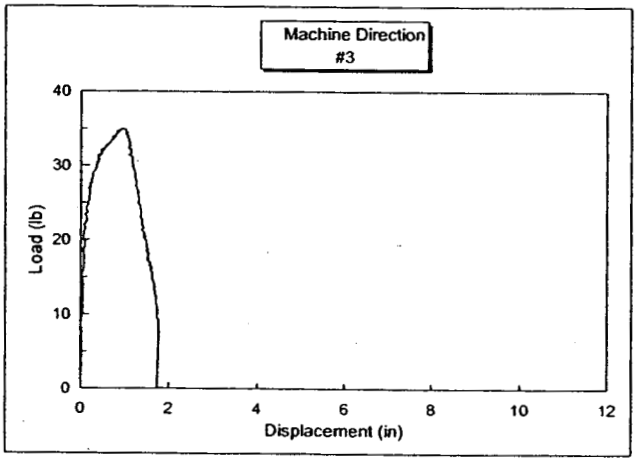
Date: 10/18/04

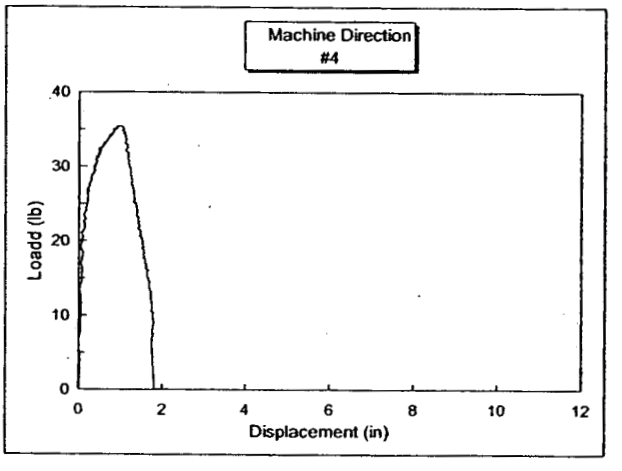
Advanced Terra Testing, Inc.

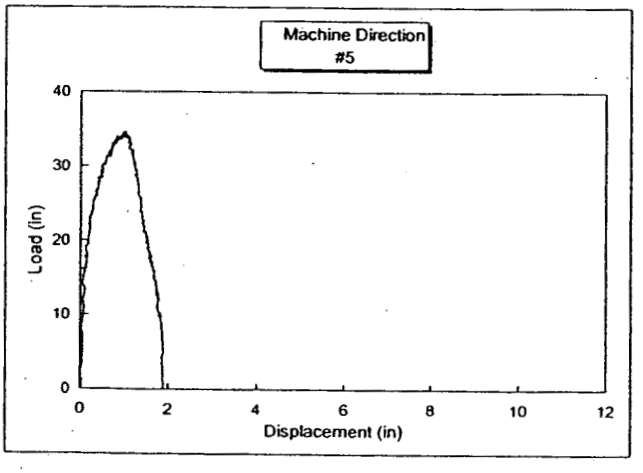
Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-02	Material Type:	60 mil LLDPE
Location:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	10-05-04 JTR
Roll No.:	104123258	Resin Lot No.:	CRG812060
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	LLD060A00	Grip Seperation:	1.0"

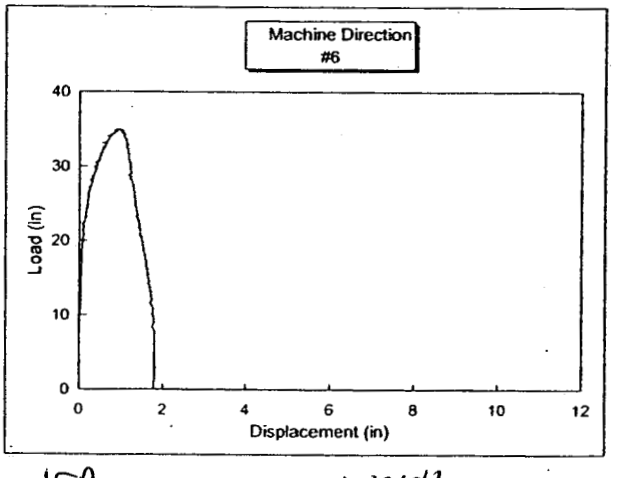










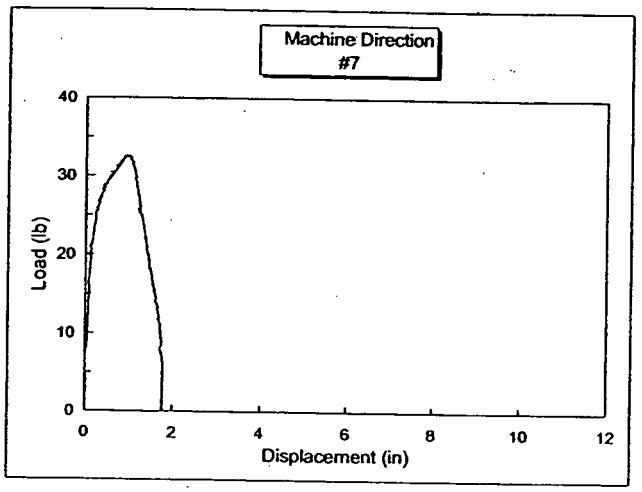


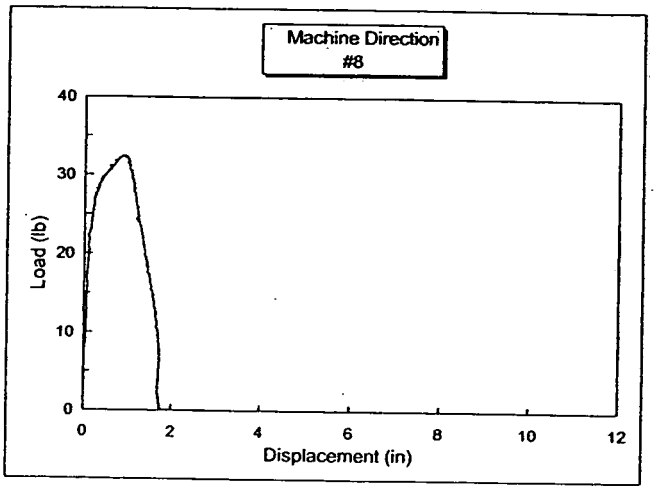
Filename: TTTR3258 Checked By: STR Date: 10/31/04

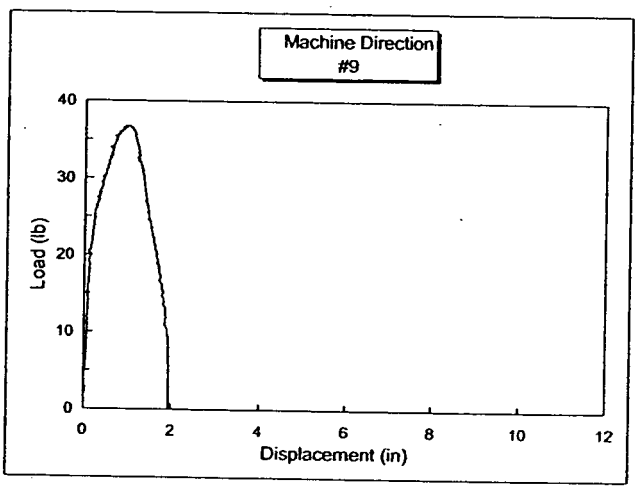
Raw Data File: TT7TRM2, TT7TRM3, TT7TRM12, TT7TRM13.TXT

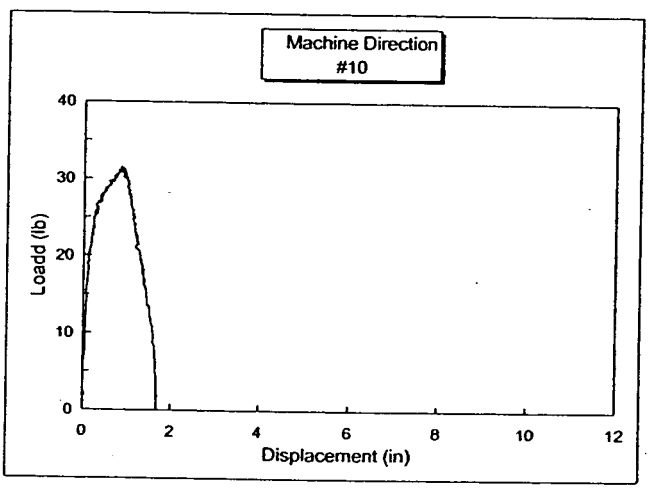
Advanced Terra Testing, Inc.

Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-02	Material Type:	60 mil LLDPE
Location:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	10-05-04 JTR
Roll Number:	104123258	Resin Lot No.:	CRG812060
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	LLD060A00	Grip Seperation:	1.0"









Machine Direction

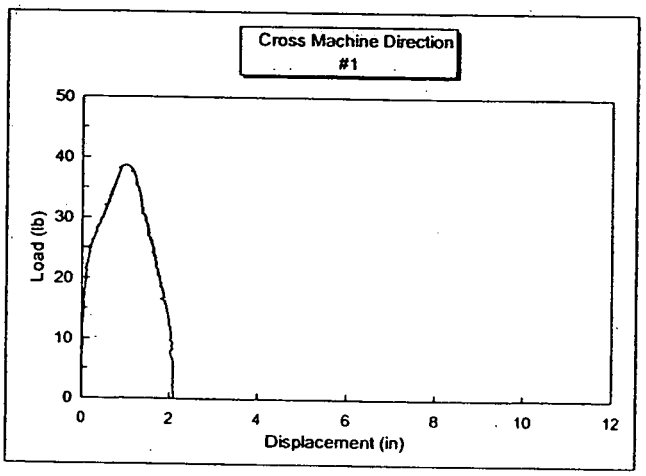
	Load at Break (lb/in width)
Specimen #1	34.9
Specimen #2	33.7
Specimen #3	34.9
Specimen #4	35.4
Specimen #5	34.6
Specimen #6	34.9
Specimen #7	32.6
Specimen #8	32.5
Specimen #9	36.7
Specimen #10	31.5
Average	34.2
Std. Deviation	1.5

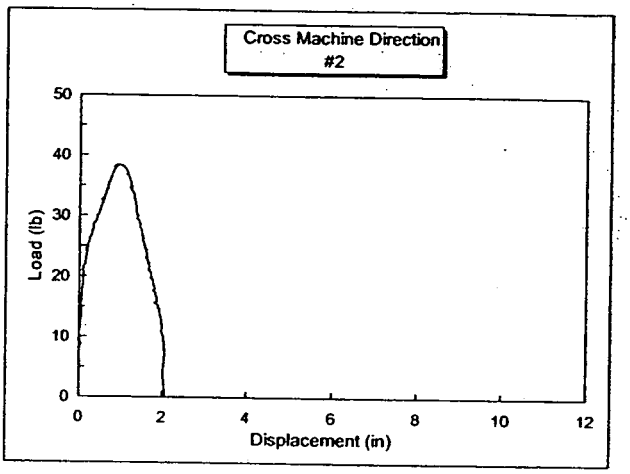
Filename: TTTR3258 Checked By: JTR Date: 10/8/04

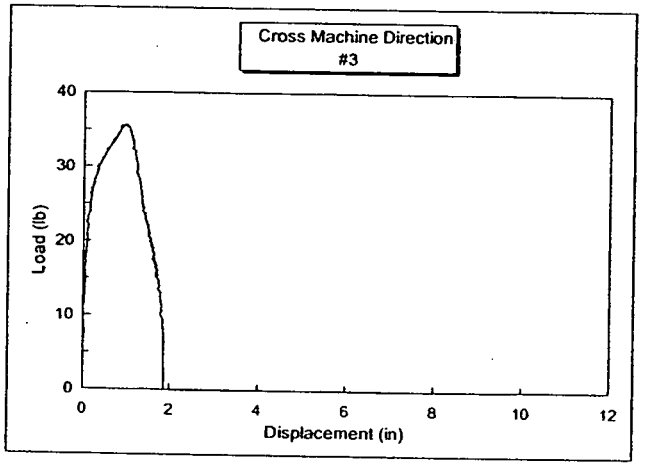
Raw Data File: TT7TRM2, TT7TRM3, TT7TRM12, TT7TRM13.TXT

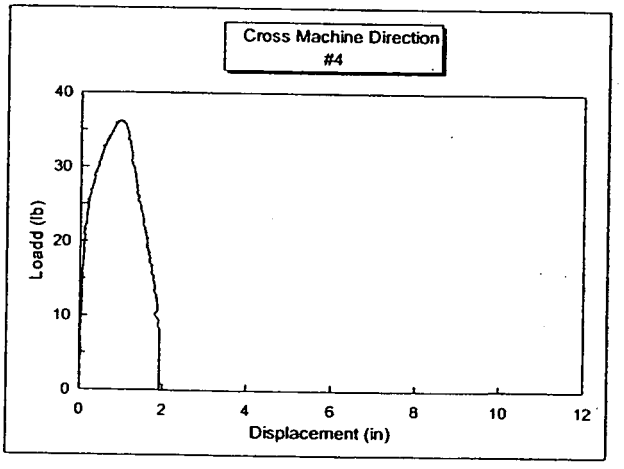
Advanced Terra Testing, Inc.

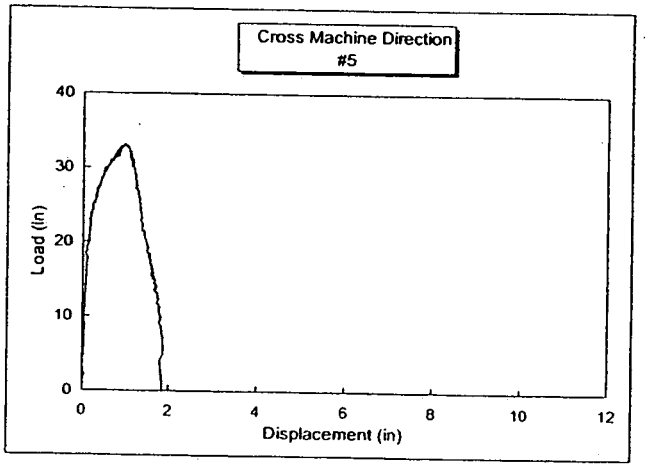
Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-02	Material Type:	60 mil LLDPE
Location:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	10-05-04 JTR
Roll No.:	104123258	Resin Lot No.:	CRG812060
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	LLD060A00	Grip Seperation:	1.0"

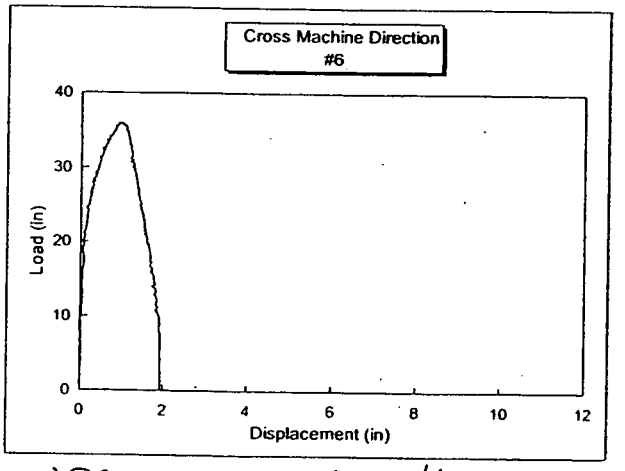












Filename: TTTR325C

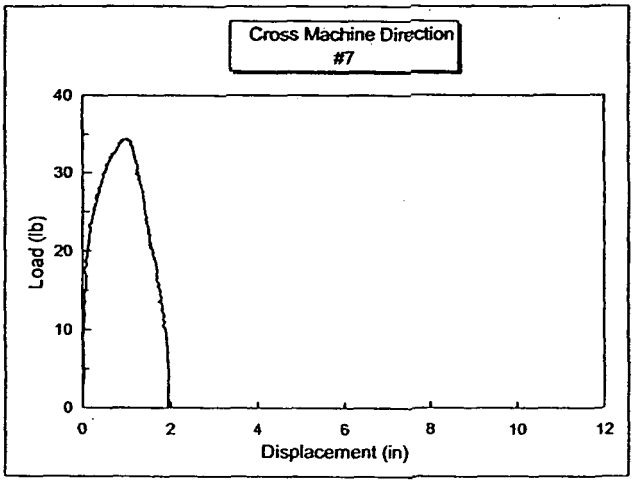
Raw Data File: TT7TRC2, TT7TRC3, TT7TRC12, TT7TRC13.TXT

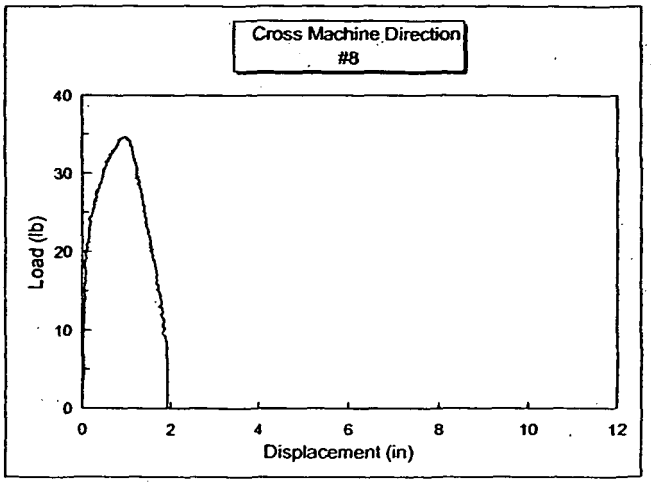
Checked By: JTR

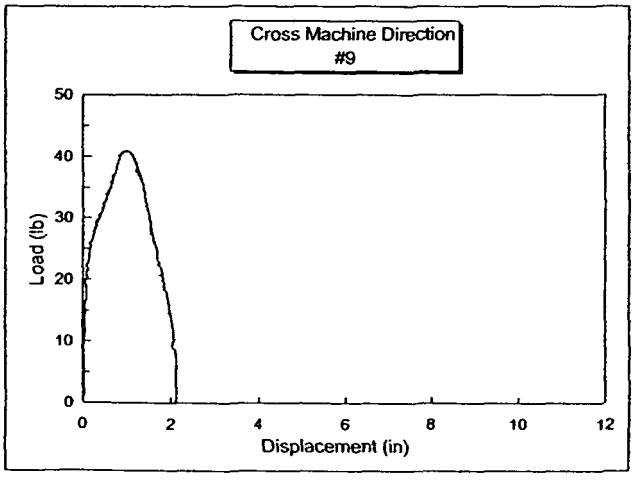
Date: 10/8/04

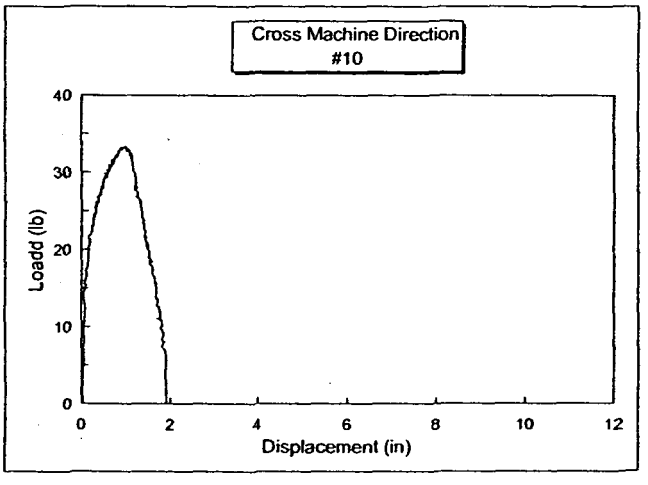
Advanced Terra Testing, Inc.

Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-02	Material Type:	60 mil LLDPE
Location:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	10-05-04 JTR
Roll Number:	104123258	Resin Lot No.:	CRG812060
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	LLD060A00	Grip Seperation:	1.0"









Cross Machine Direction

	Load at Break (lb/in width)		Load at Break (lb/in width)
Specimen #1	38.7	Specimen #6	36.1
Specimen #2	38.6	Specimen #7	34.5
Specimen #3	35.7	Specimen #8	34.6
Specimen #4	36.3	Specimen #9	40.9
Specimen #5	33.3	Specimen #10	33.4

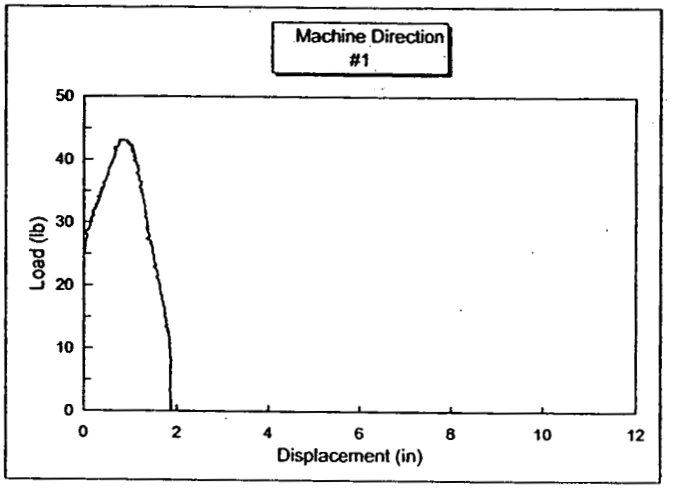
Average	36.2
Std. Deviation	2.4

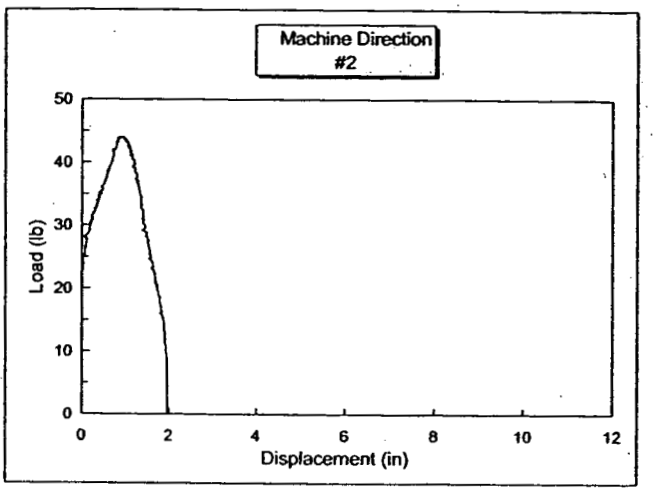
Filename: TTTR325C Checked By: JTR Date: 10/8/04

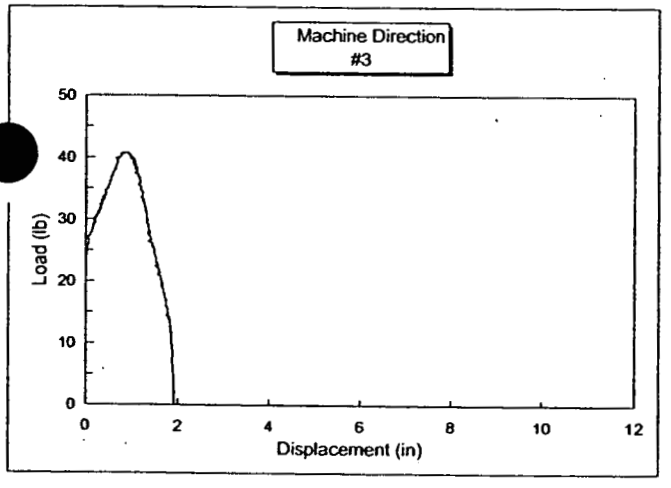
Raw Data File: TT7TRC2, TT7TRC3, TT7TRC12, TT7TRC13.TXT

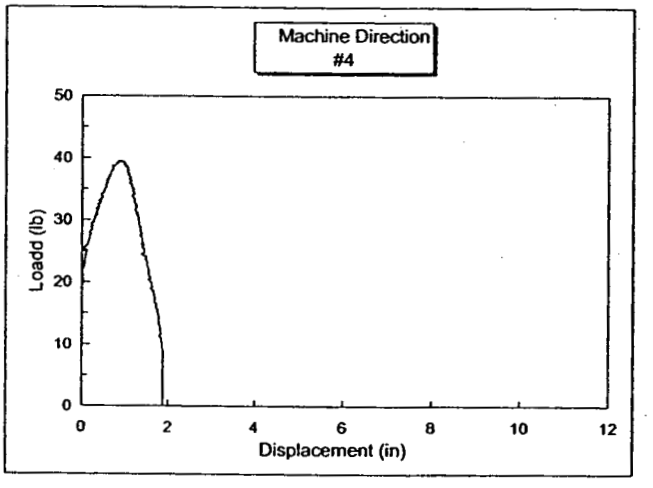
Advanced Terra Testing, Inc.

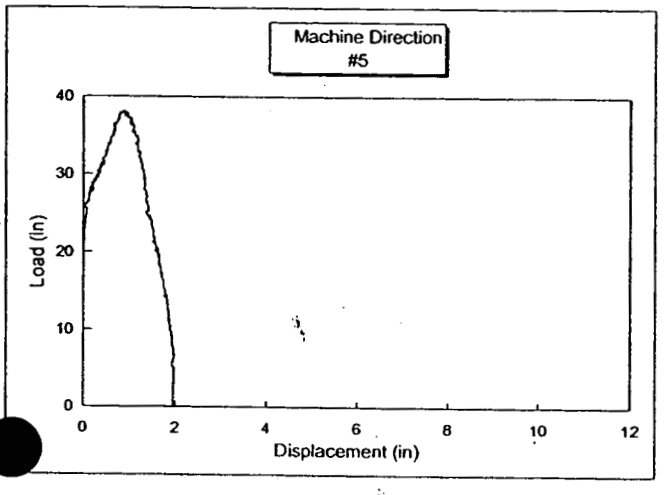
Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-02	Material Type:	60 mil LLDPE
Location:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	10-04-04 JTR
Roll No.:	104123267	Resin Lot No.:	CRG812060
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	LLD060A00	Grip Seperation:	1.0"

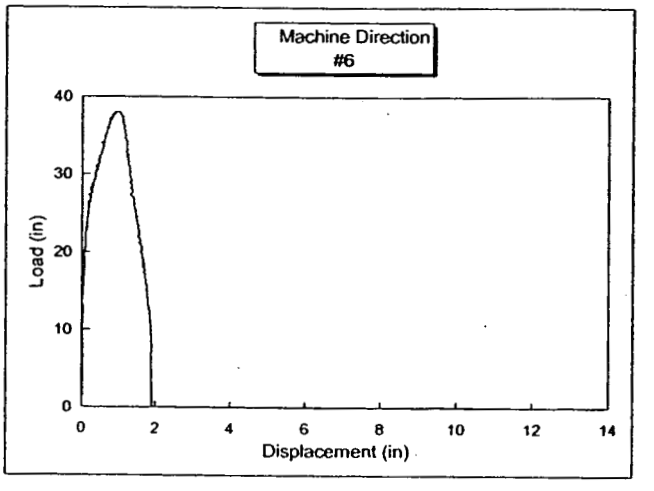










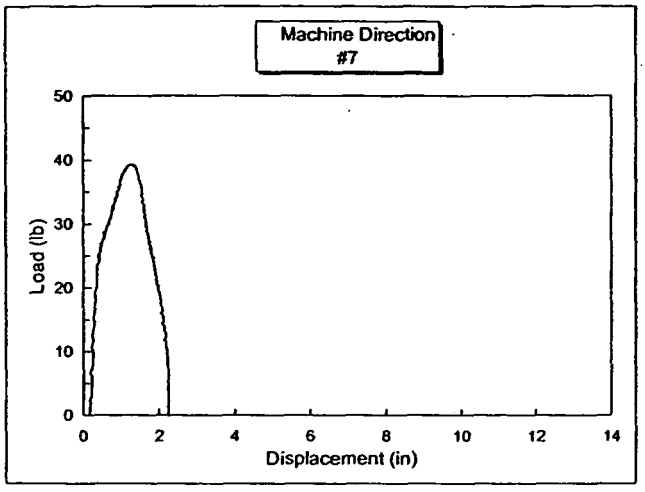


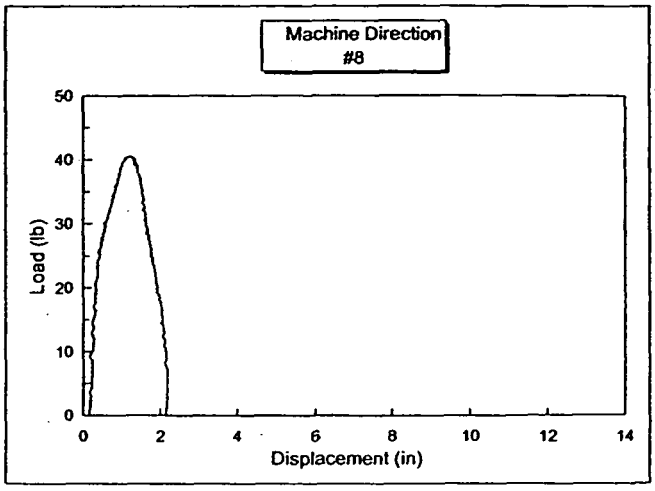
Filename: TTTR3267 Checked By: JTR Date: 10/5/04

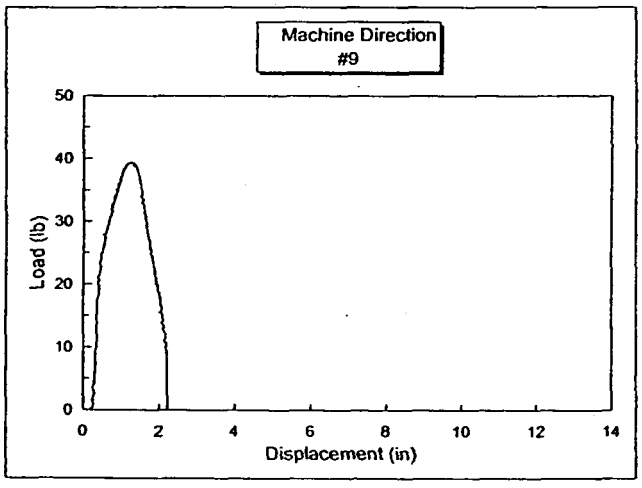
Raw Data File: TT3TRM2, TT3TRM3, TT3TRM12, TT3TRM13.TXT

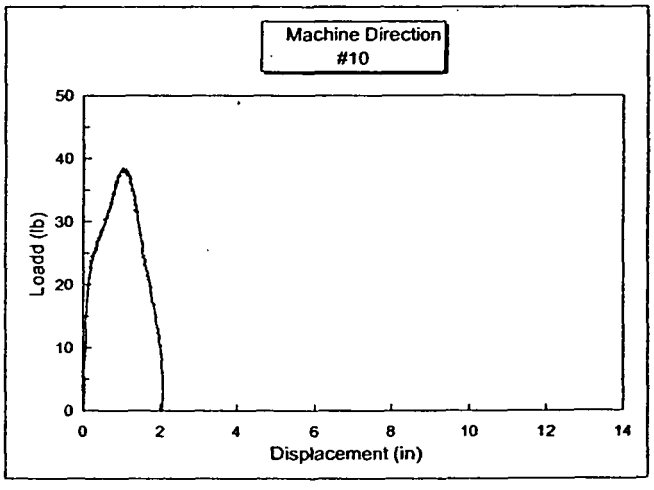
Advanced Terra Testing, Inc.

Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-02	Material Type:	60 mil LLDPE
Location:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	10-04-04 JTR
Roll Number:	104123267	Resin Lot No.:	CRG812060
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	LLD060A00	Grip Seperation:	1.0"









Machine Direction

	Load at Break (lb/in width)		Load at Break (lb/in width)
Specimen #1	43.2	Specimen #6	38.1
Specimen #2	44.1	Specimen #7	39.4
Specimen #3	40.8	Specimen #8	40.7
Specimen #4	39.5	Specimen #9	39.5
Specimen #5	38.1	Specimen #10	38.7

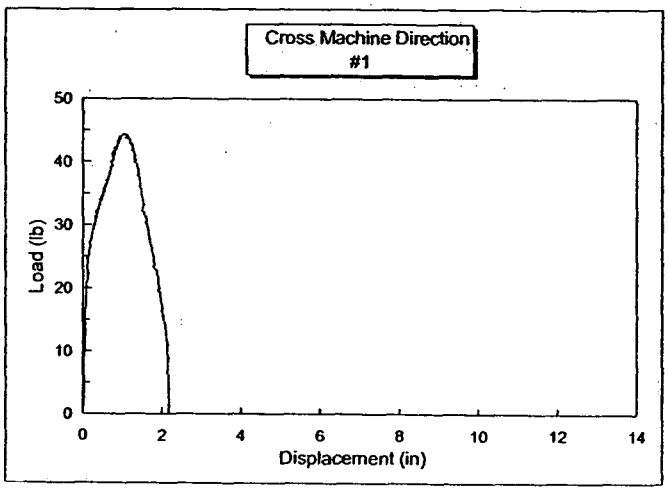
Average	40.2
Std. Deviation	1.9

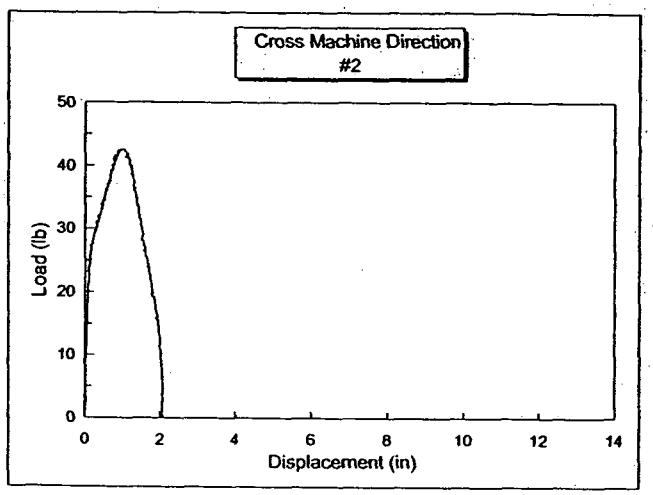
Filename: TTTR3267 Checked By: Date: 10/5/04

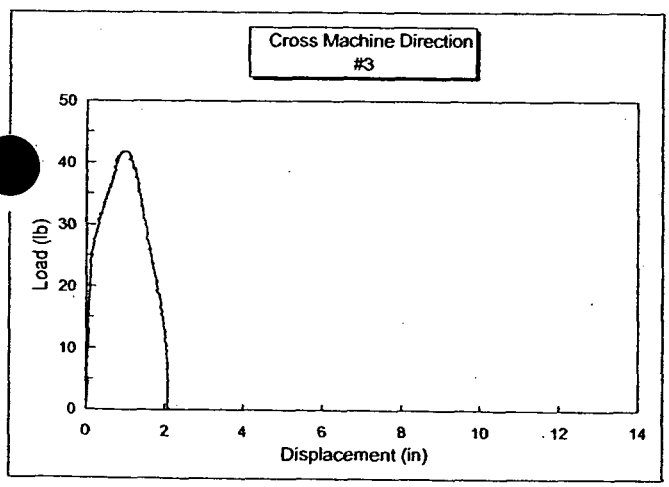
Raw Data File: TT3TRM2, TT3TRM3, TT3TRM12, TT3TRM13.TXT

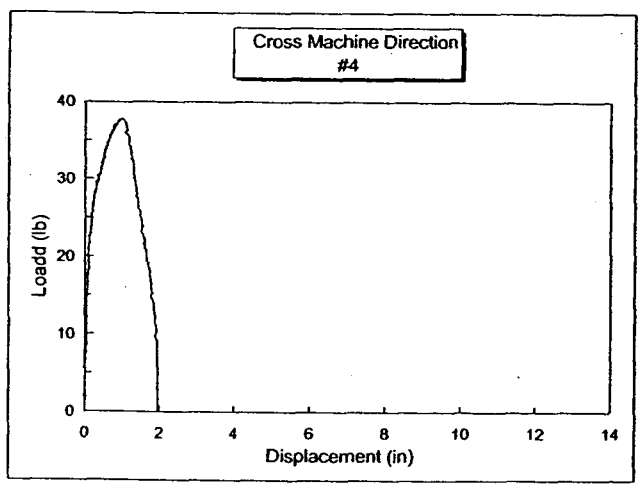
Advanced Terra Testing, Inc.

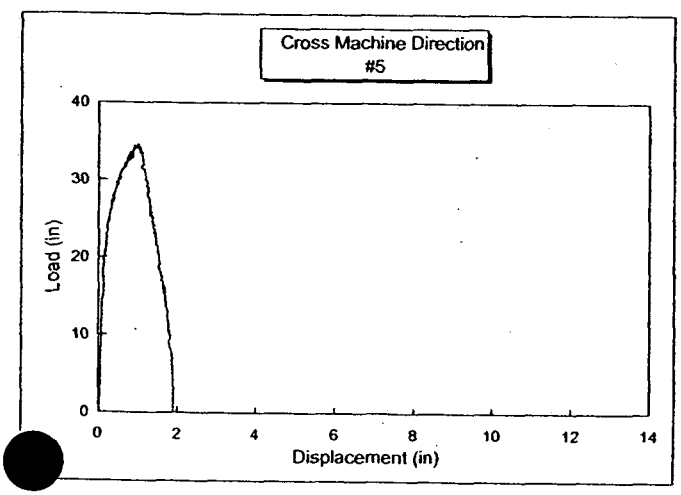
Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-02	Material Type:	60 mil LLDPE
Location:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	10-04-04 JTR
Roll No.:	104123267	Resin Lot No.:	CRG812060
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	LLD060A00	Grip Seperation:	1.0"

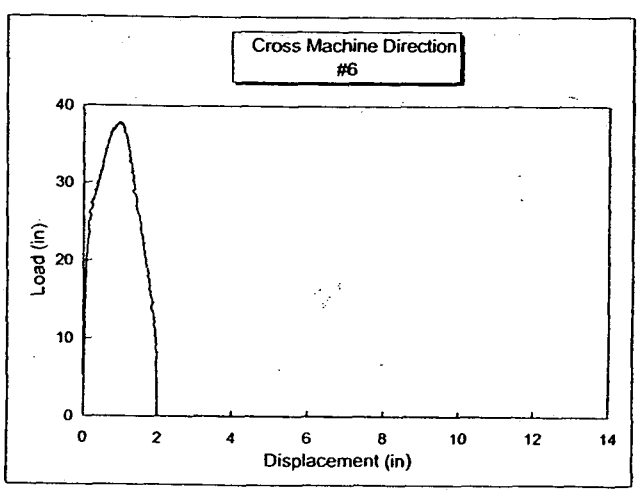












Filename: TTTR326C

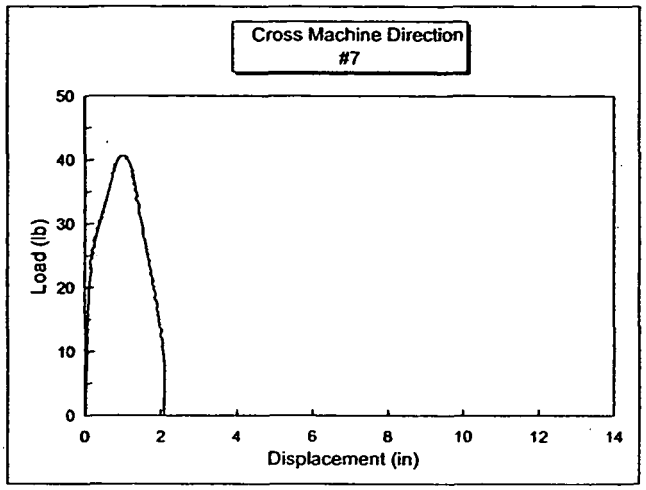
Raw Data File: TT3TRC2, TT3TRC3, TT3TRC12, TT3TRC13.TXT

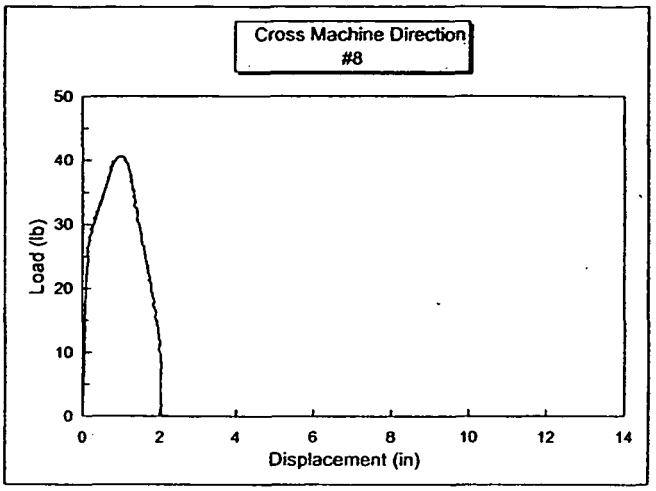
Checked By: JTR

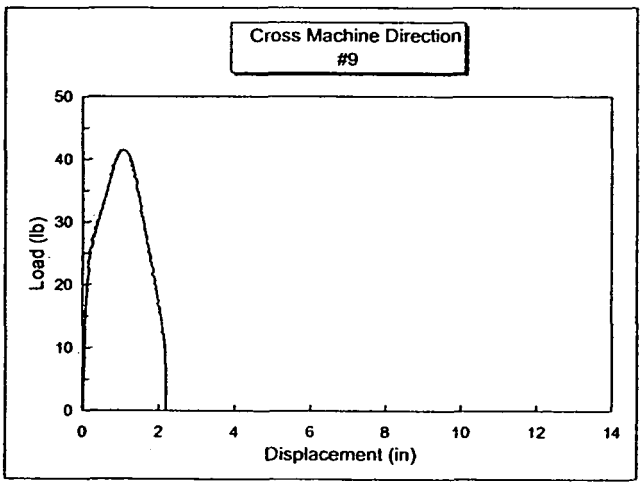
Date: 10/6/04

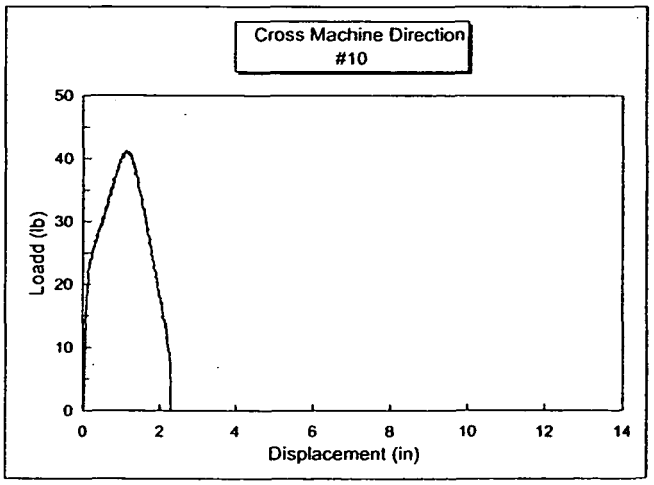
Advanced Terra Testing, Inc.

Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-02	Material Type:	60 mil LLDPE
Location:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	10-04-04 JTR
Roll Number:	104123267	Resin Lot No.:	CRG812060
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	LLD060A00	Grip Seperation:	1.0"









Cross Machine Direction

	Load at Break (lb/in width)		Load at Break (lb/in width)
Specimen #1	44.3	Specimen #6	37.7
Specimen #2	42.5	Specimen #7	40.7
Specimen #3	41.7	Specimen #8	40.8
Specimen #4	37.7	Specimen #9	41.6
Specimen #5	34.6	Specimen #10	41.3

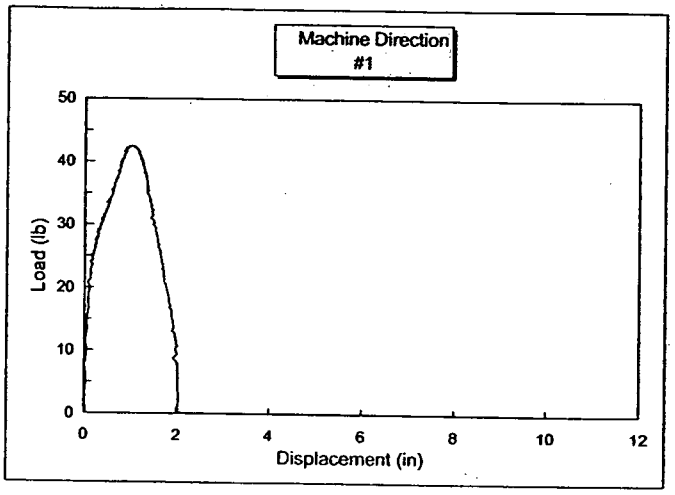
Average	40.3
Std. Deviation	2.7

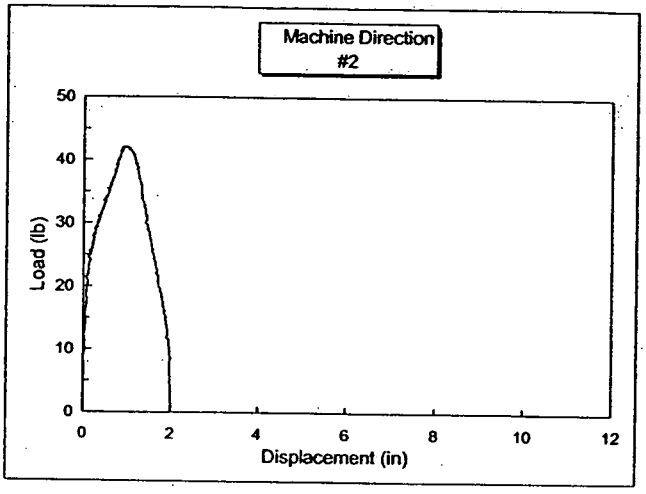
Filename: TTTR326C Checked By: JFL Date: 10/8/04

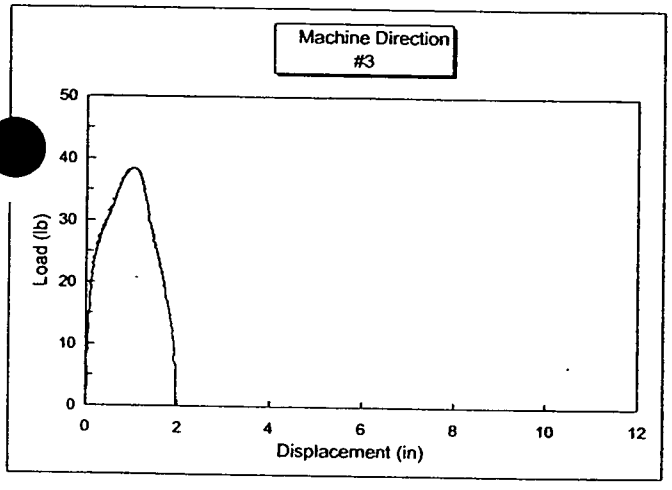
Raw Data File: TT3TRC2, TT3TRC3, TT3TRC12, TT3TRC13.TXT

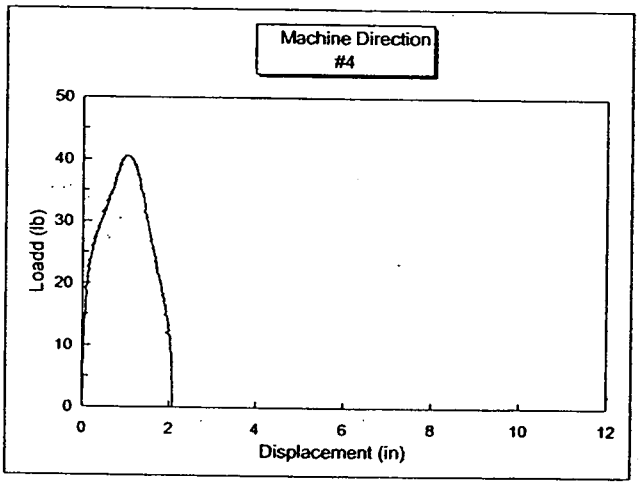
Advanced Terra Testing, Inc.

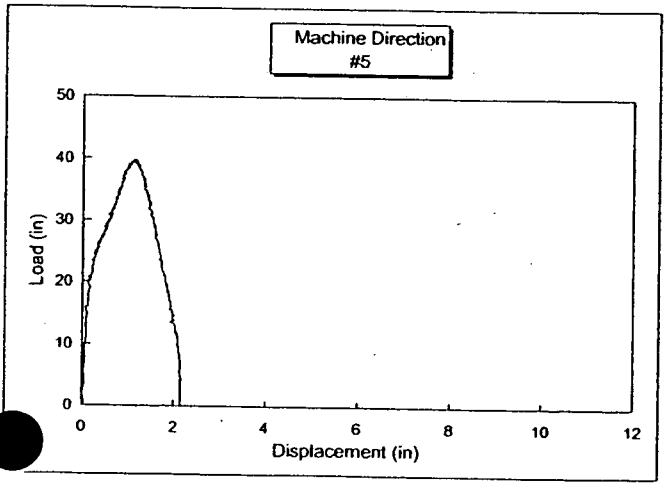
Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-02	Material Type:	60 mil LLDPE
Location:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	10-05-04 JTR
Roll No.:	104123274	Resin Lot No.:	CRH810060
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	LLD060A00	Grip Seperation:	1.0"

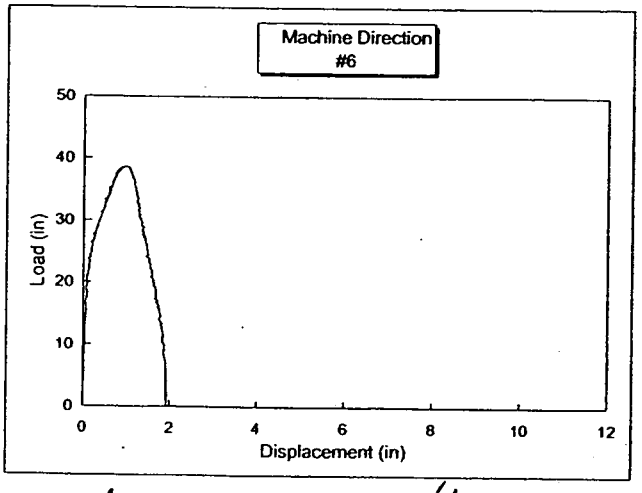












Filename: TTTR3274

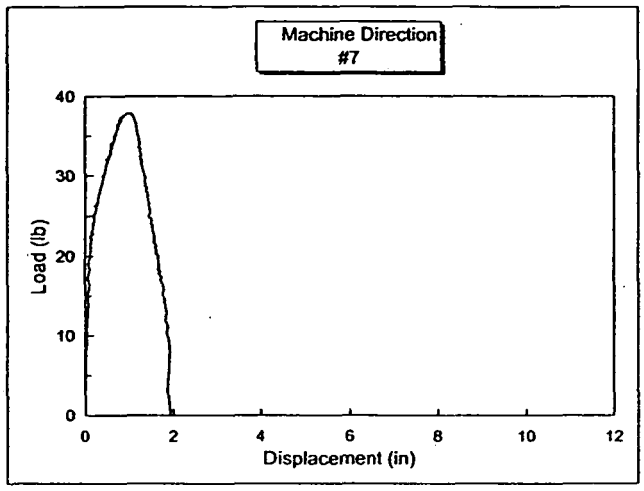
Raw Data File: TT6TRM2, TT6TRM3, TT6TRM12, TT6TRM13.TXT

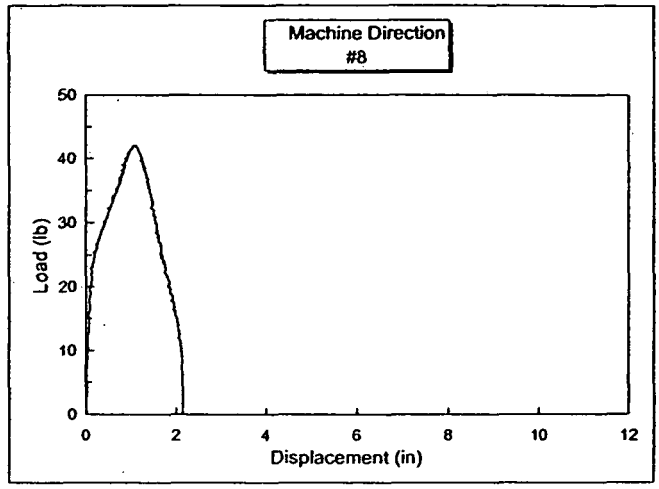
Checked By: JTR

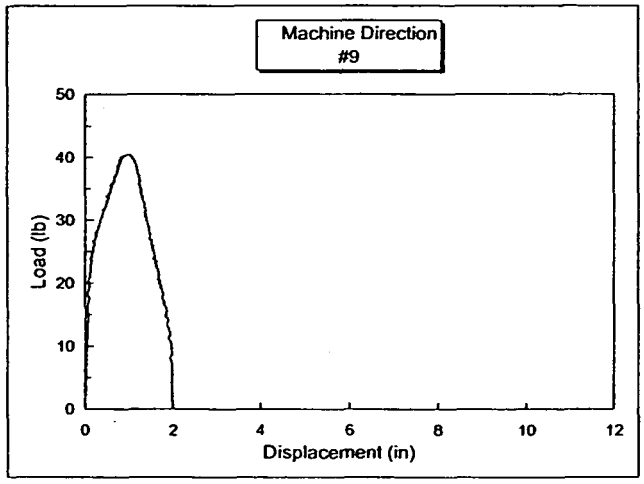
Date: 10/6/04

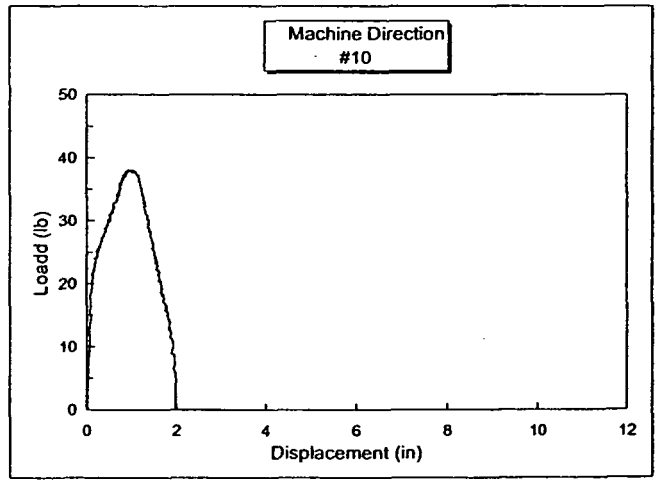
Advanced Terra Testing, Inc.

Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-02	Material Type:	60 mil LLDPE
Location:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	10-05-04 JTR
Roll Number:	104123274	Resin Lot No.:	CRH810060
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	LLD060A00	Grip Seperation:	1.0"









Machine Direction

	Load at Break (lb/in width)		Load at Break (lb/in width)
Specimen #1	42.5	Specimen #6	38.6
Specimen #2	42.1	Specimen #7	37.9
Specimen #3	38.4	Specimen #8	42.2
Specimen #4	40.6	Specimen #9	40.4
Specimen #5	39.8	Specimen #10	38.2

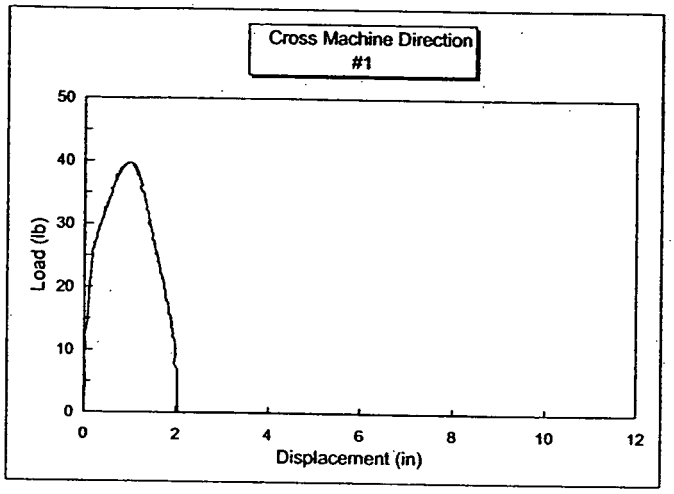
Average	40.1
Std. Deviation	1.7

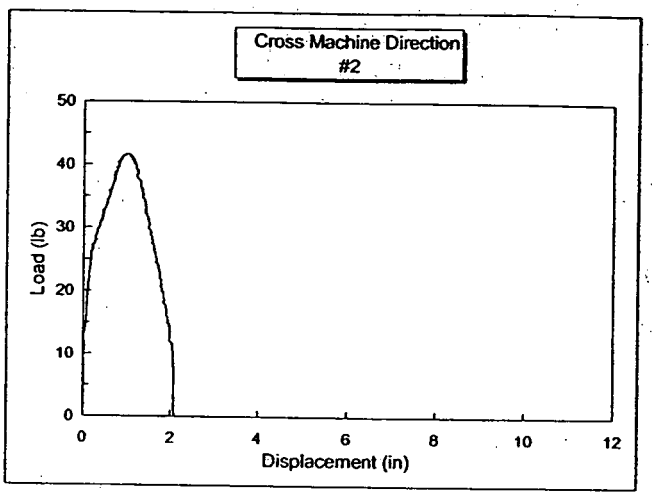
Filename: TTTR3274 Checked By: JTR Date: 10/8/04

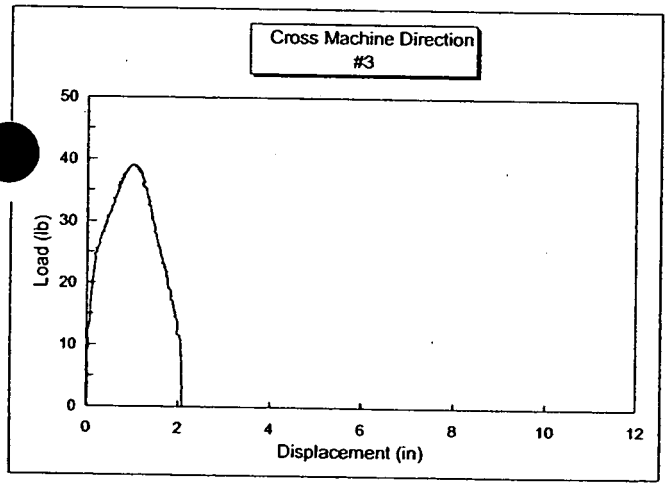
Raw Data File: TT6TRM2, TT6TRM3, TT6TRM12, TT6TRM13.TXT

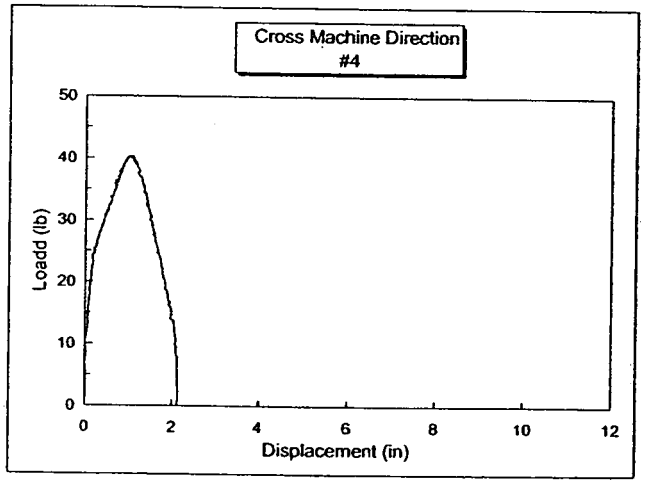
Advanced Terra Testing, Inc.

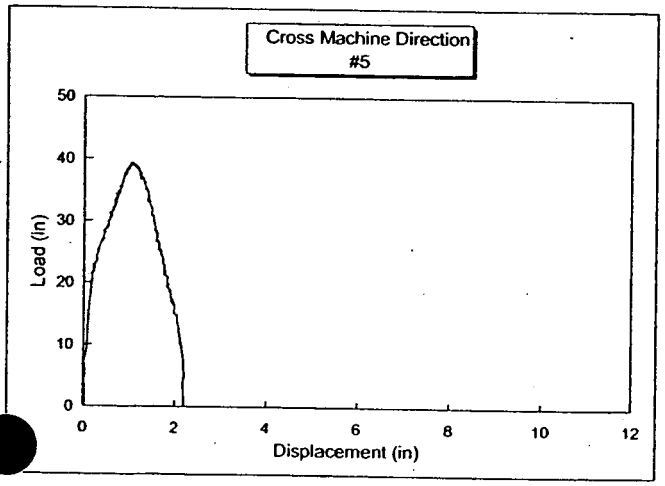
Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-02	Material Type:	60 mil LLDPE
Location:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	10-05-04 JTR
Roll No.:	104123274	Resin Lot No.:	CRH810060
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	LLD060A00	Grip Seperation:	1.0"

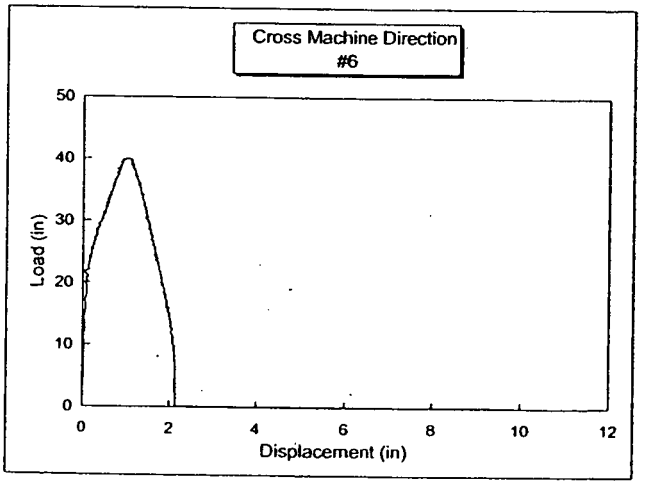












Filename: TTTR327C

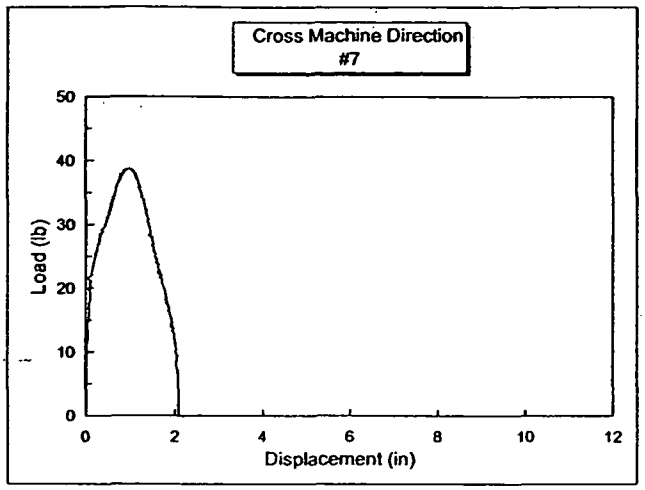
Raw Data File: TT6TRC2, TT6TRC3, TT6TRC12, TT6TRC13.TXT

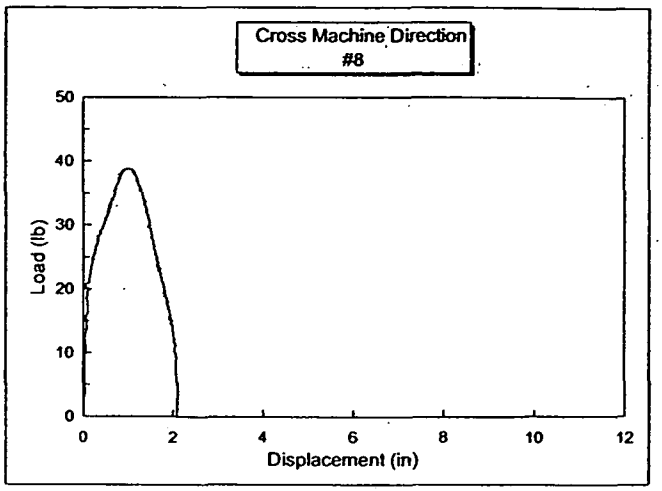
Checked By: JTR

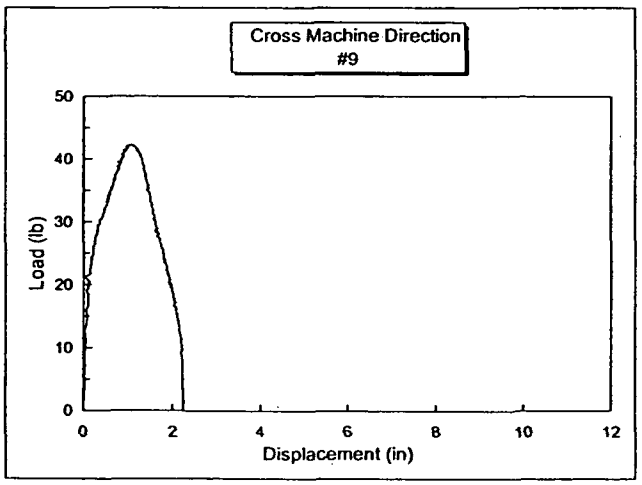
Date: 10/8/04

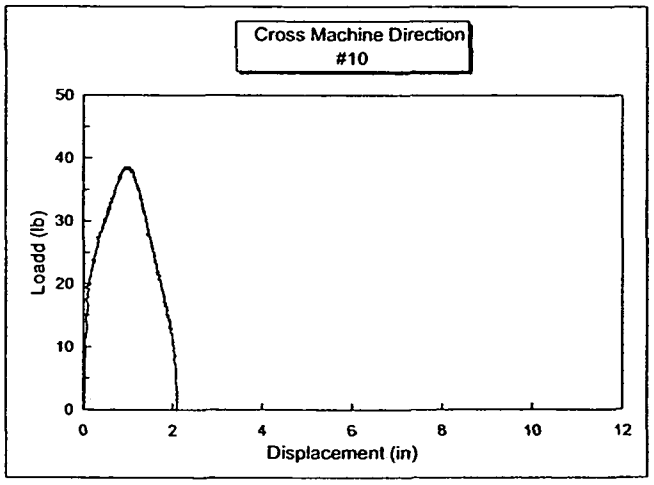
Advanced Terra Testing, Inc.

Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-02	Material Type:	60 mil LLDPE
Location:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	10-05-04 JTR
Roll Number:	104123274	Resin Lot No.:	CRH810060
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	LLD060A00	Grip Seperation:	1.0"









Cross Machine Direction

	Load at Break (lb/in width)		Load at Break (lb/in width)
Specimen #1	39.7	Specimen #6	39.9
Specimen #2	41.7	Specimen #7	38.8
Specimen #3	39.0	Specimen #8	38.9
Specimen #4	40.3	Specimen #9	42.4
Specimen #5	39.3	Specimen #10	38.8

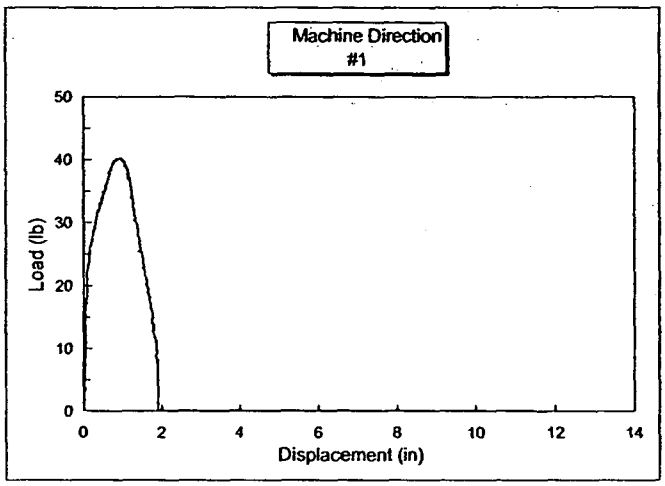
Average	39.9
Std. Deviation	1.2

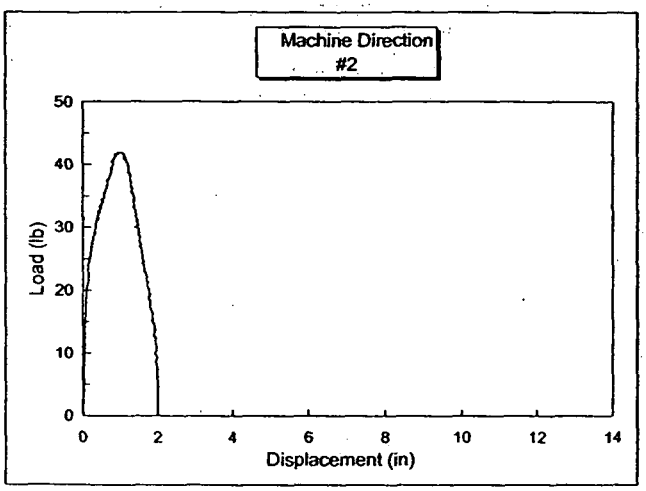
Filename: TTTR327C Checked By: JTR Date: 10/8/04

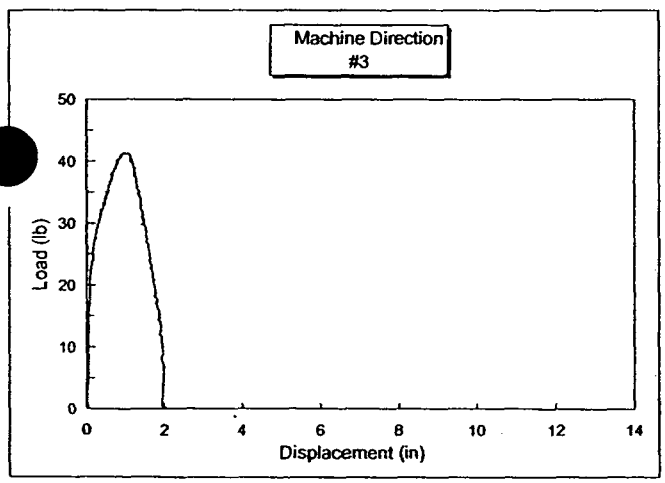
Raw Data File: TT6TRC2, TT6TRC3, TT6TRC12, TT6TRC13.TXT

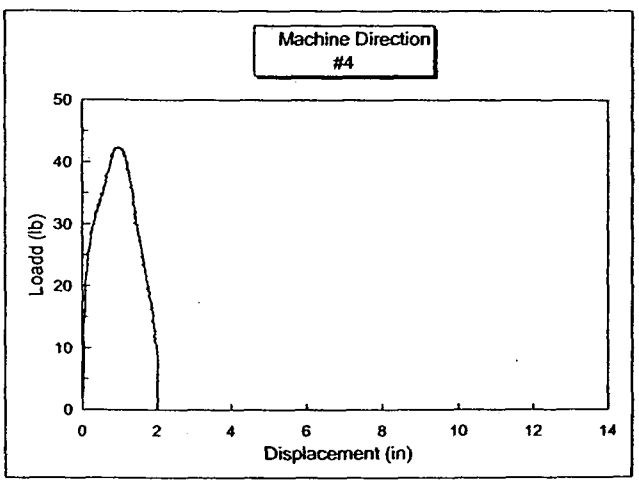
Advanced Terra Testing, Inc.

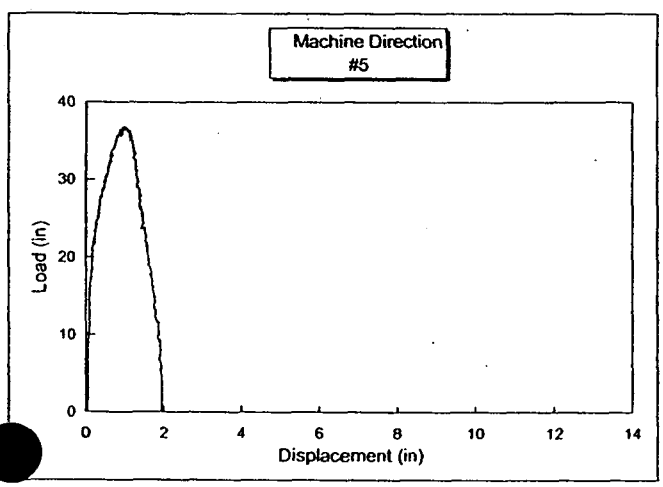
Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-02	Material Type:	60 mil LLDPE
Location:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	10-04-04 JTR
Roll No.:	104123282	Resin Lot No.:	CRH810060
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	LLD060A00	Grip Seperation:	1.0"

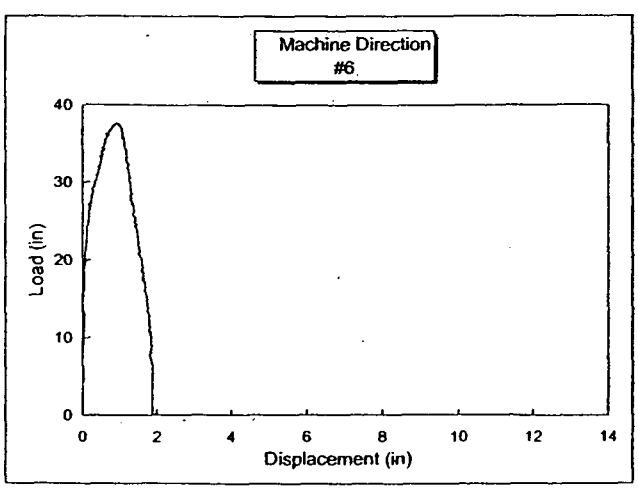










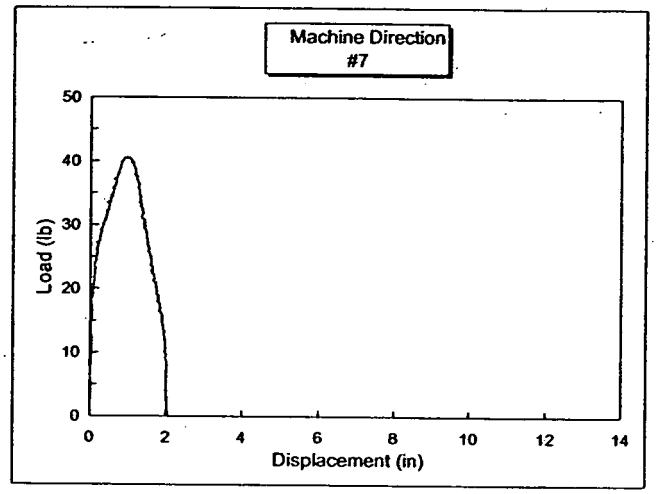


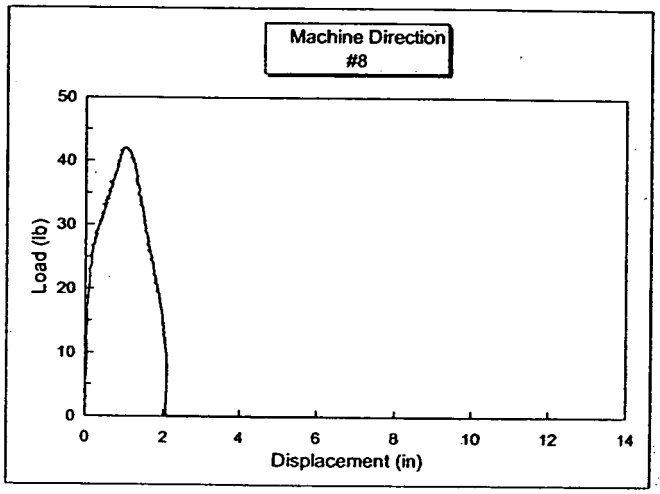
Filename: TTTR3282 Checked By: JTR Date: 10/8/04

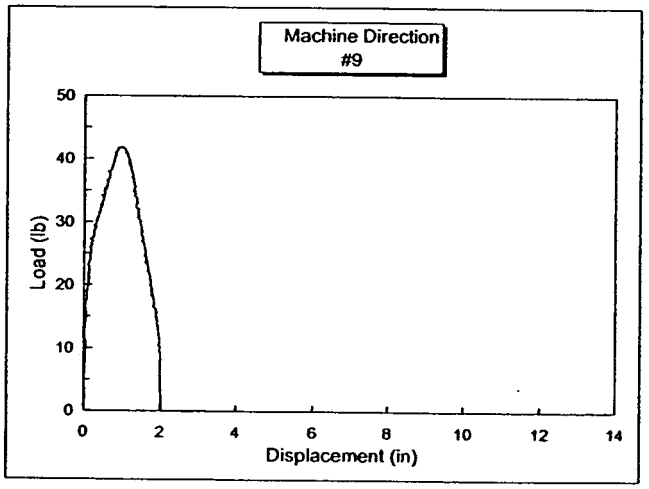
Raw Data File: TT4TRM2, TT4TRM3, TT4TRM12, TT4TRM13.TXT

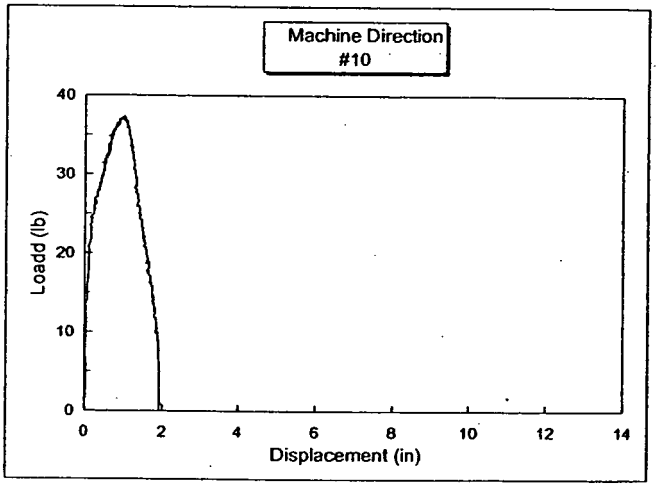
Advanced Terra Testing, Inc.

Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-02	Material Type:	60 mil LLDPE
Location:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	10-04-04 JTR
Roll Number:	104123282	Resin Lot No.:	CRH810060
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	LLD060A00	Grip Seperation:	1.0"









Machine Direction

	Load at Break (lb/in width)		Load at Break (lb/in width)
Specimen #1	40.1	Specimen #6	37.5
Specimen #2	41.9	Specimen #7	40.6
Specimen #3	41.3	Specimen #8	42.2
Specimen #4	42.2	Specimen #9	41.9
Specimen #5	36.8	Specimen #10	37.5

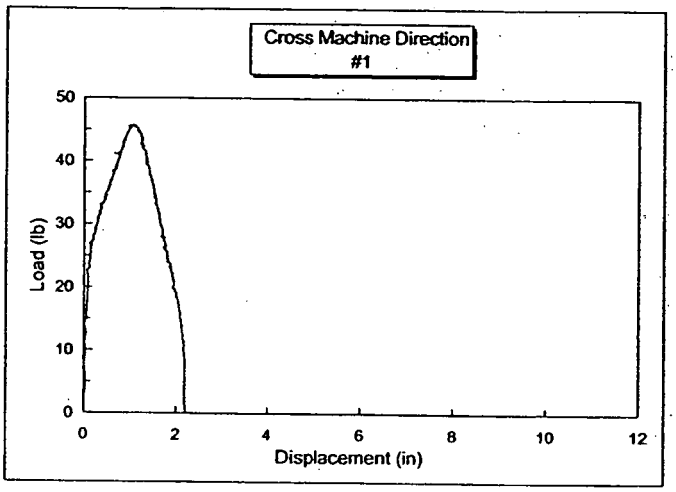
Average	40.2
Std. Deviation	2.0

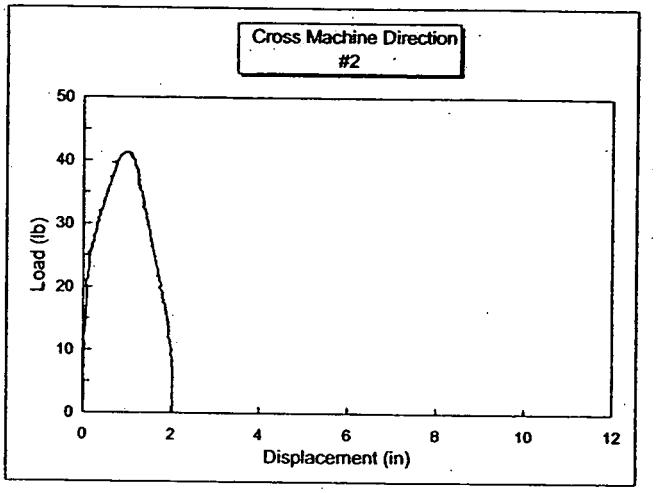
Filename: TTTR3282 Checked By: JTR Date: 10/8/04

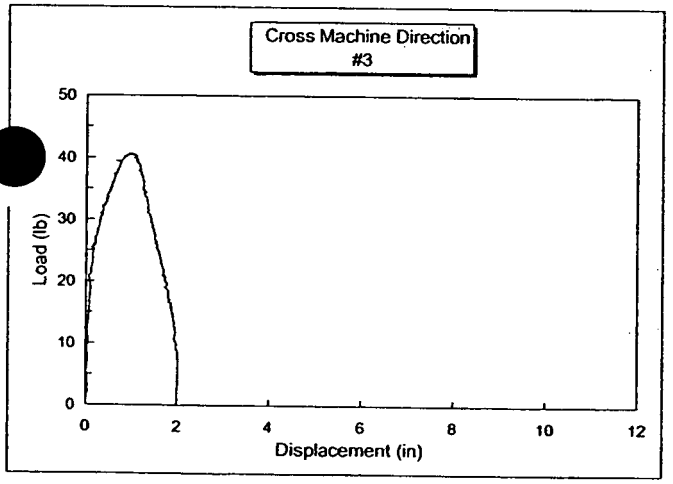
Raw Data File: TT4TRM2, TT4TRM3, TT4TRM12, TT4TRM13.TXT

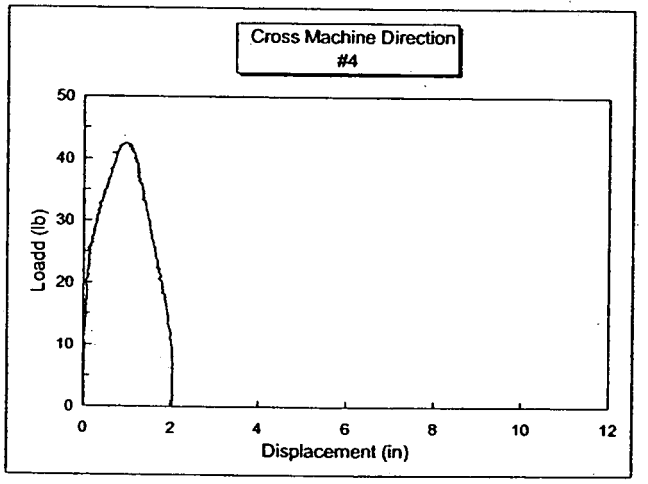
Advanced Terra Testing, Inc.

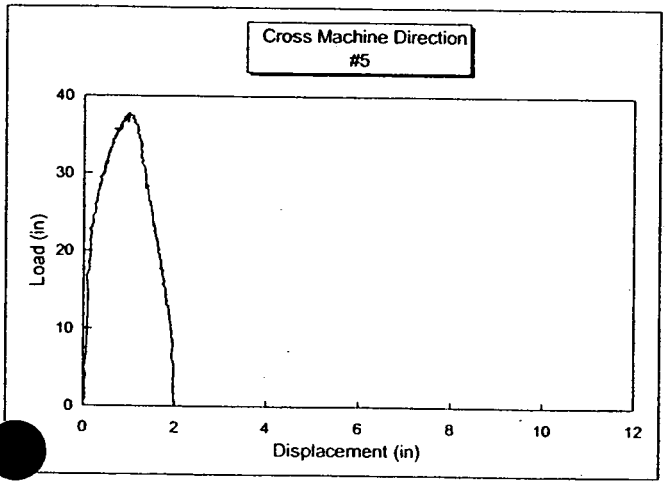
Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-02	Material Type:	60 mil LLDPE
[redacted]ation:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	10-04-04 JTR
[redacted]oll No.:	104123282	Resin Lot No.:	CRH810060
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	LLD060A00	Grip Seperation:	1.0"

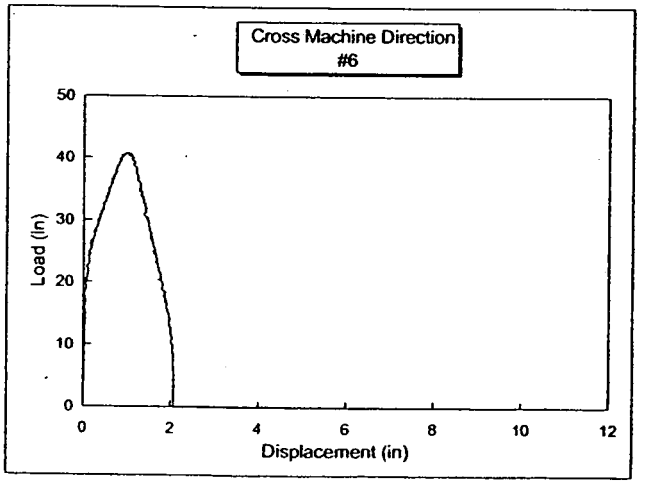












Filename: TTTR328C

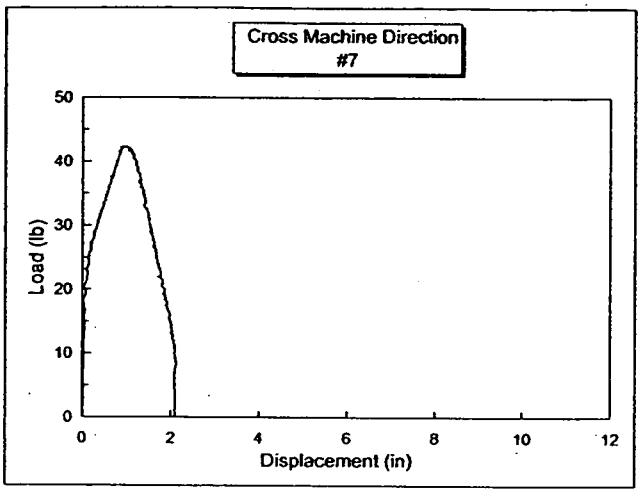
Raw Data File: TT4TRC2, TT4TRC3, TT4TRC12, TT4TRC13.TXT

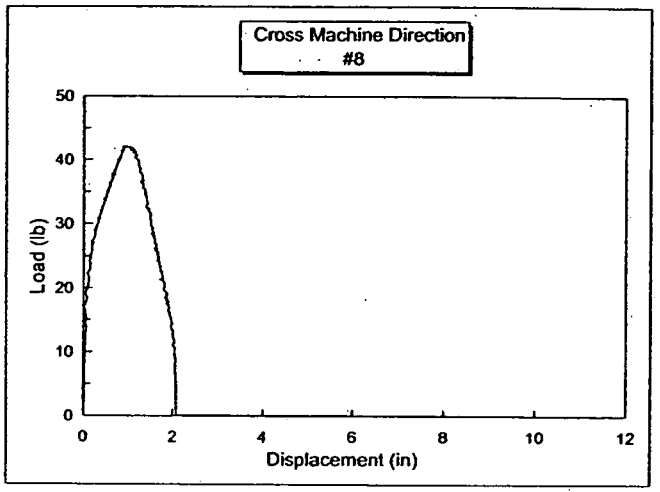
Checked By: JTR

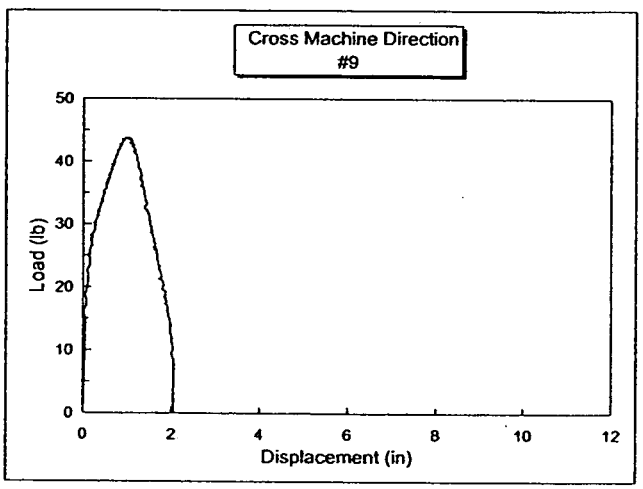
Date: 10/6/04

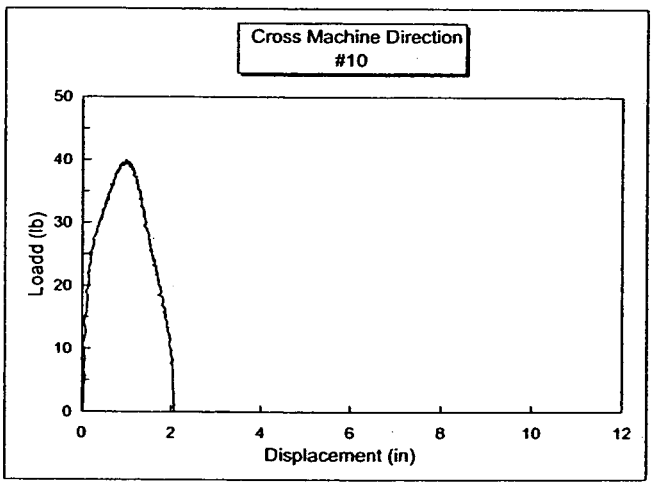
Advanced Terra Testing, Inc.

Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-02	Material Type:	60 mil LLDPE
Location:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	10-04-04 JTR
Roll Number:	104123282	Resin Lot No.:	CRH810060
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	LLD060A00	Grip Seperation:	1.0"









Cross Machine Direction

	Load at Break (lb/in width)		Load at Break (lb/in width)
Specimen #1	45.8	Specimen #6	40.8
Specimen #2	41.5	Specimen #7	42.3
Specimen #3	40.7	Specimen #8	42.1
Specimen #4	42.6	Specimen #9	43.7
Specimen #5	37.8	Specimen #10	40.0

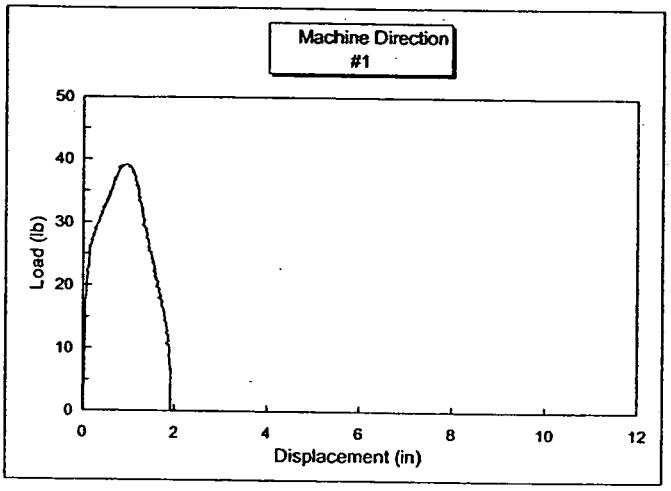
Average	41.7
Std. Deviation	2.0

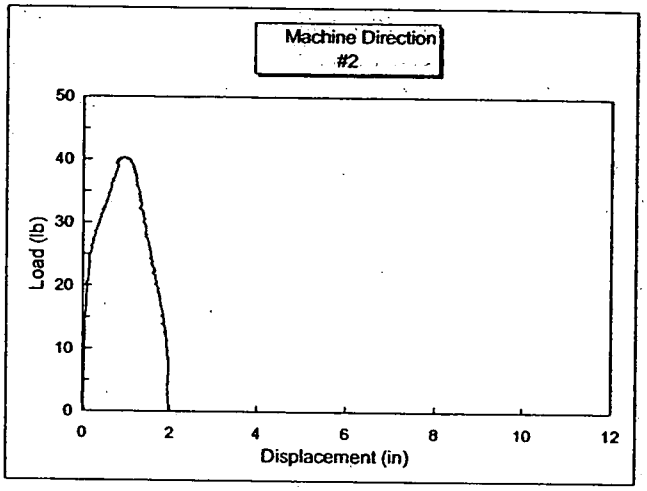
Filename: TTTR328C Checked By: JTR Date: 10/8/04

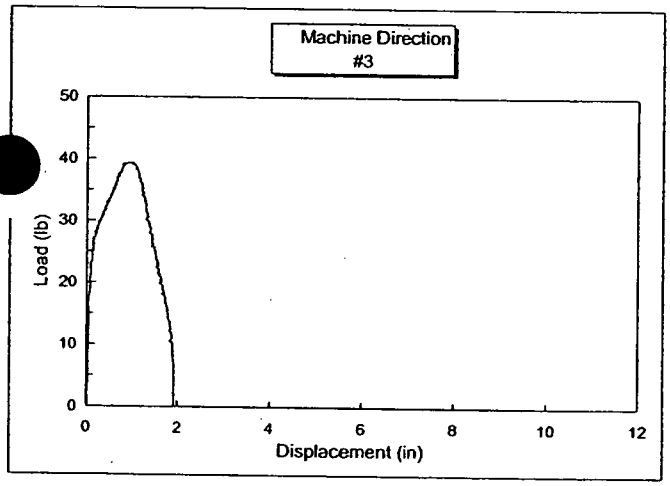
Raw Data File: TT4TRC2, TT4TRC3, TT4TRC12, TT4TRC13.TXT

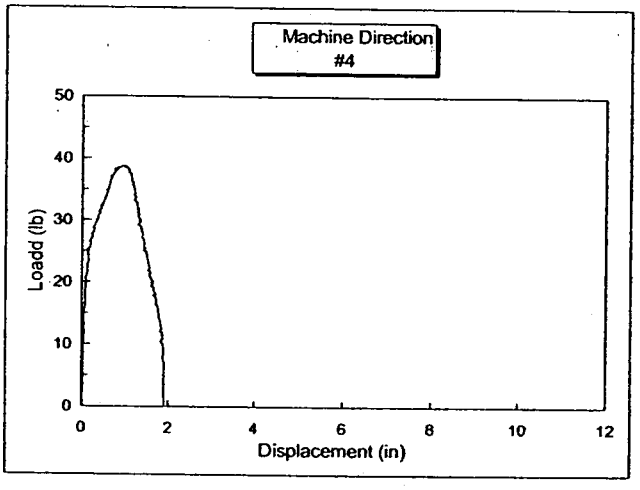
Advanced Terra Testing, Inc.

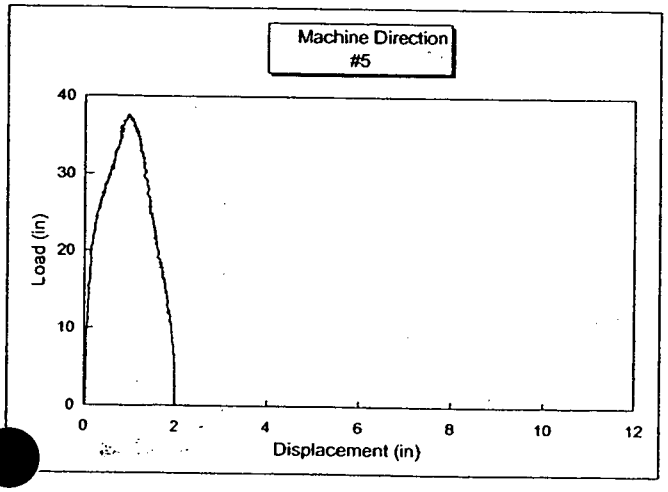
Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-02	Material Type:	60 mil LLDPE
Location:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	10-05-04 JTR
Roll No.:	104123289	Resin Lot No.:	CRH810060
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	LLD060A00	Grip Seperation:	1.0"

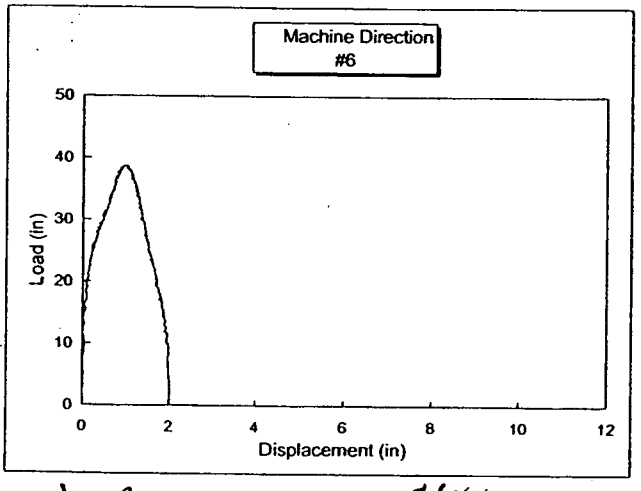












Filename: TTTR3289

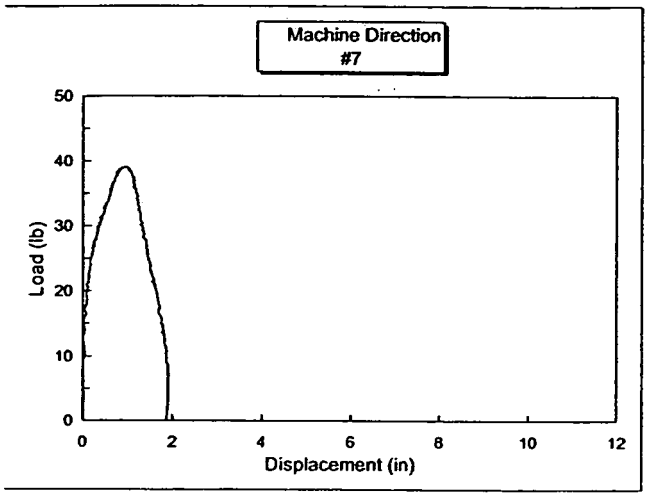
Raw Data File: TT5TRM2, TT5TRM3, TT5TRM12, TT5TRM13.TXT

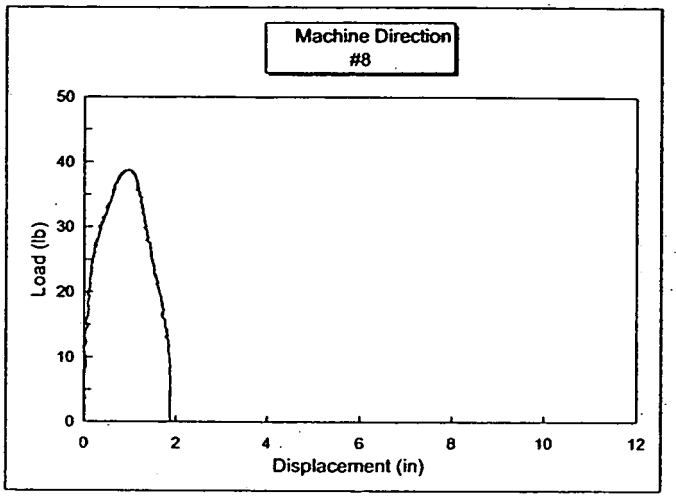
Checked By: JTR

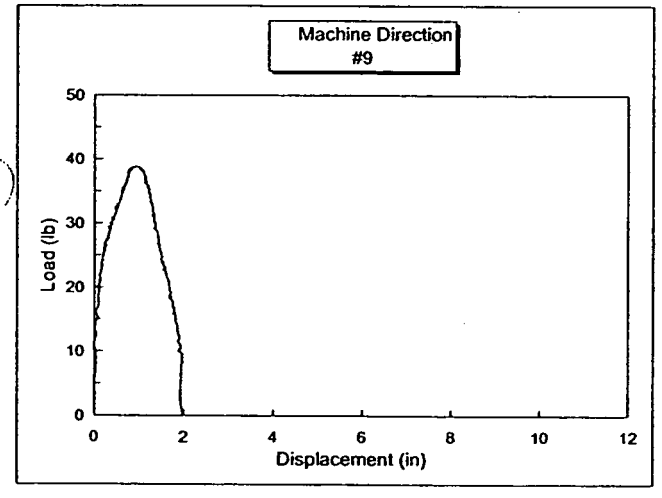
Date: 10/8/04

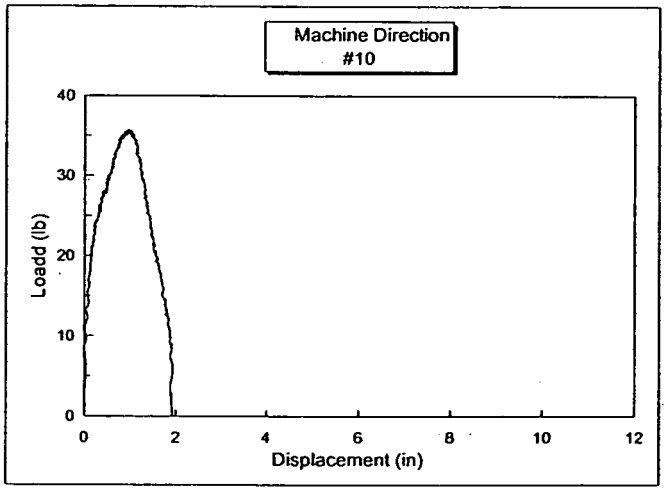
Advanced Terra Testing, Inc.

Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-02	Material Type:	60 mil LLDPE
Location:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	10-05-04 JTR
Roll Number:	104123289	Resin Lot No.:	CRH810060
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	LLD060A00	Grip Seperation:	1.0"









Machine Direction

	Load at Break (lb/in width)		Load at Break (lb/in width)
Specimen #1	39.2	Specimen #6	38.7
Specimen #2	40.4	Specimen #7	39.0
Specimen #3	39.3	Specimen #8	38.7
Specimen #4	38.8	Specimen #9	38.8
Specimen #5	37.6	Specimen #10	35.8
Average	38.6		
Std. Deviation	1.1		

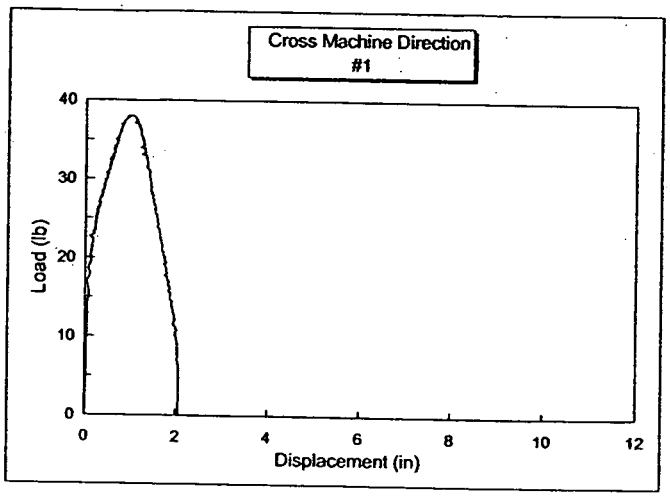
Filename: TTTR3289 Checked By: JTR Date: 10/8/04

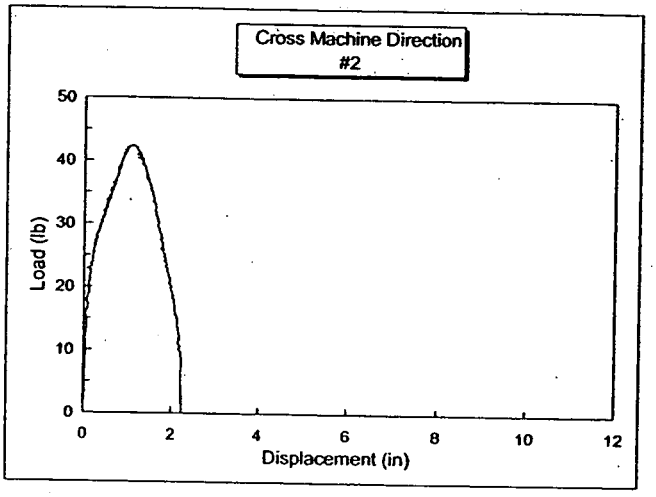
Raw Data File: TT5TRM2, TT5TRM3, TT5TRM12, TT5TRM13.TXT

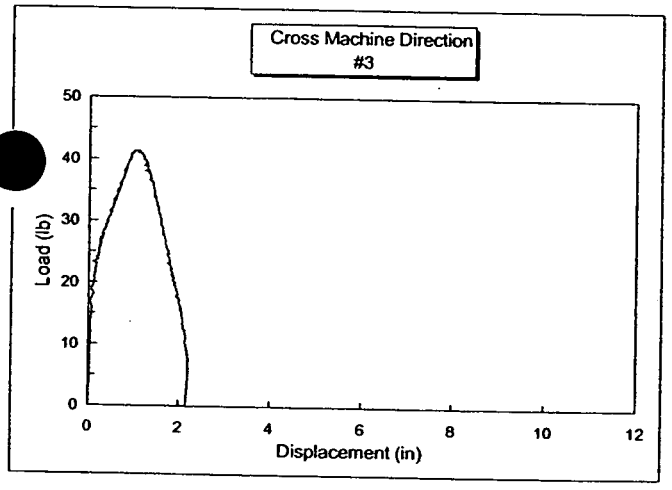
Advanced Terra Testing, Inc.

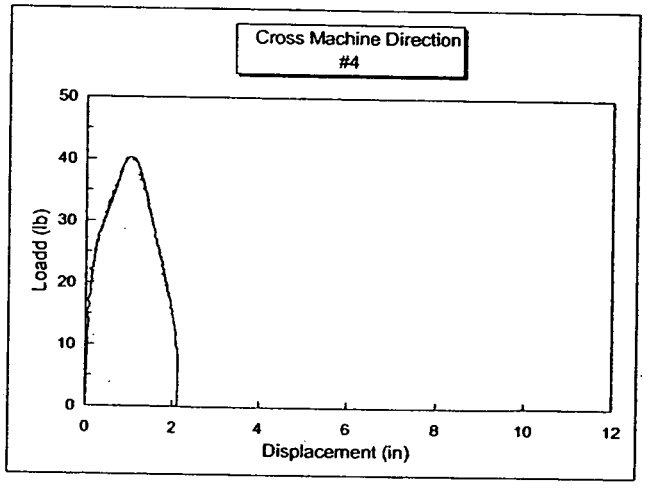
Client:	Tetra Tech - RMC
Job No.:	2617-02
Location:	Present Landfill Design-RFETS, Golden, CO
Roll No.:	104123289
Test Device:	Five Station
Load Cells:	500 lb.
Product Code:	LLD060A00

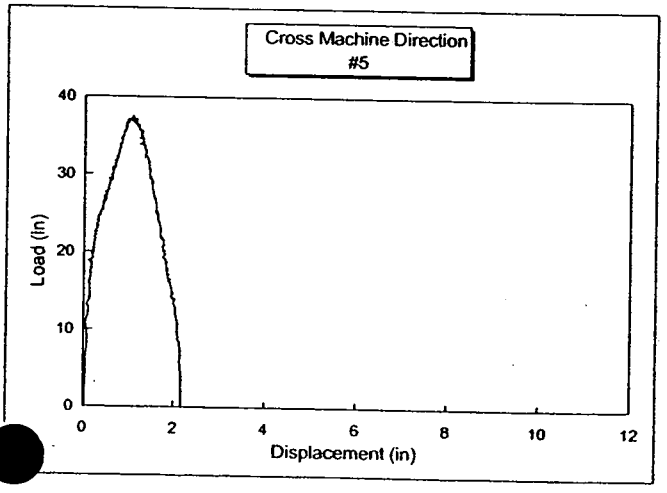
Test Type:	ASTM D 1004 Method C
Material Type:	60 mil LLDPE
Date Tested:	10-05-04 JTR
Resin Lot No.:	CRH810060
Data Entered By:	SR
Displacement Rate:	2 in/min
Grip Seperation:	1.0"

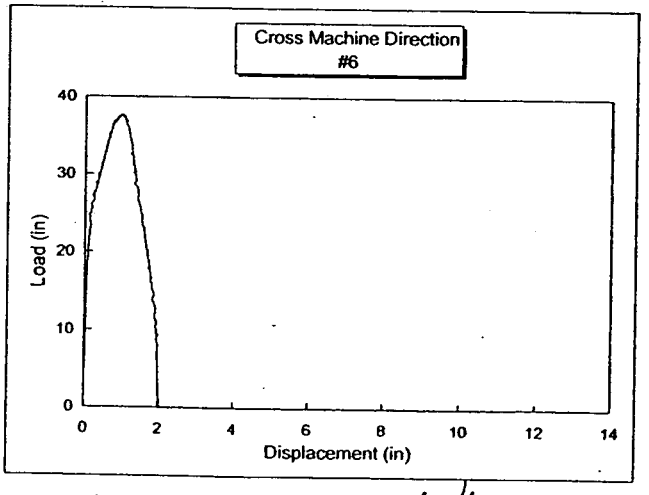












Filename: TTTRC328

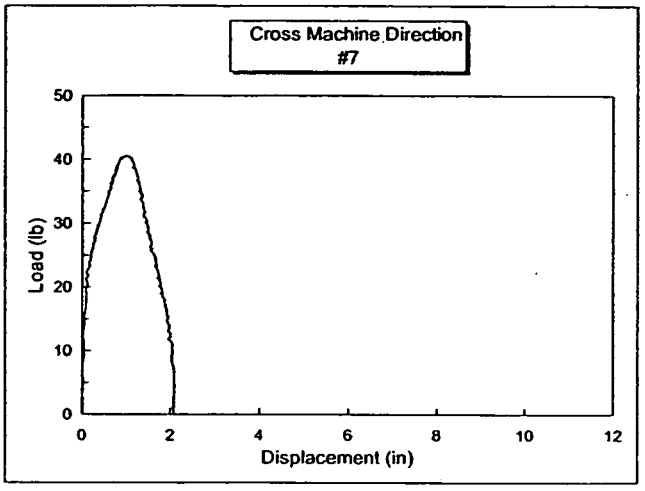
Raw Data File: TT5TRC2, TT5TRC3, TT5TRC12, TT5TRC13.TXT

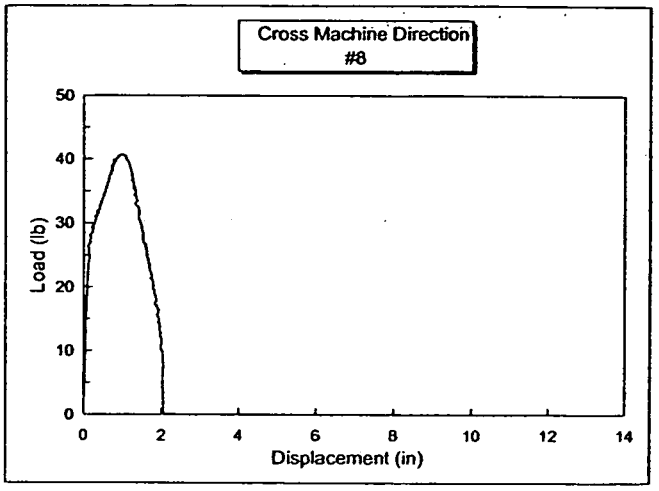
Checked By: JTR

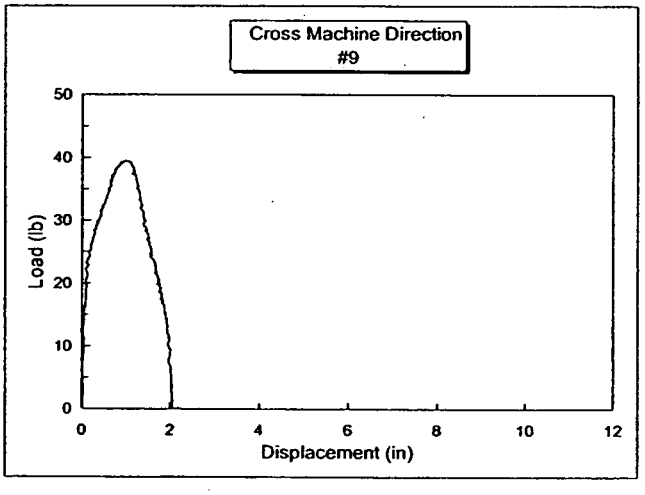
Date: 10/6/04

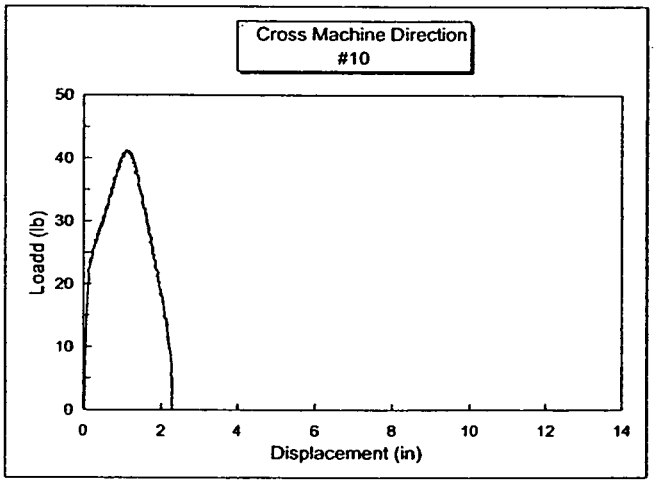
Advanced Terra Testing, Inc.

Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-02	Material Type:	60 mil LLDPE
Location:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	10-05-04 JTR
Roll Number:	104123289	Resin Lot No.:	CRH810060
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	LLD060A00	Grip Seperation:	1.0"









Cross Machine Direction

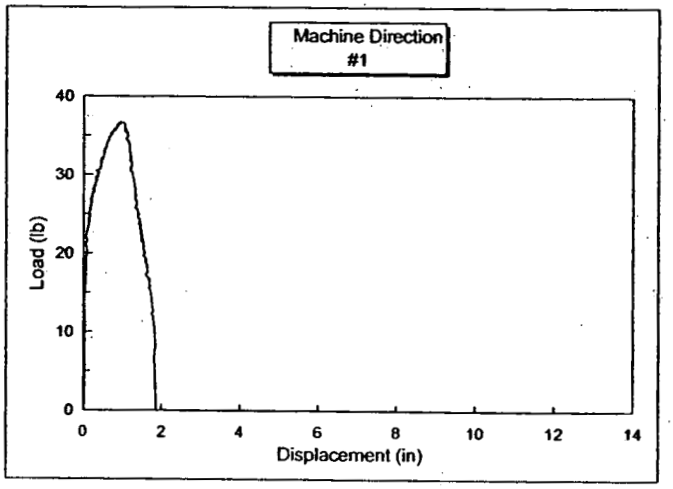
	Load at Break (lb/in width)		Load at Break (lb/in width)
Specimen #1	38.1	Specimen #6	37.7
Specimen #2	42.5	Specimen #7	40.5
Specimen #3	41.4	Specimen #8	40.8
Specimen #4	40.3	Specimen #9	39.5
Specimen #5	37.6	Specimen #10	41.3
Average	40.0		
Std. Deviation	1.6		

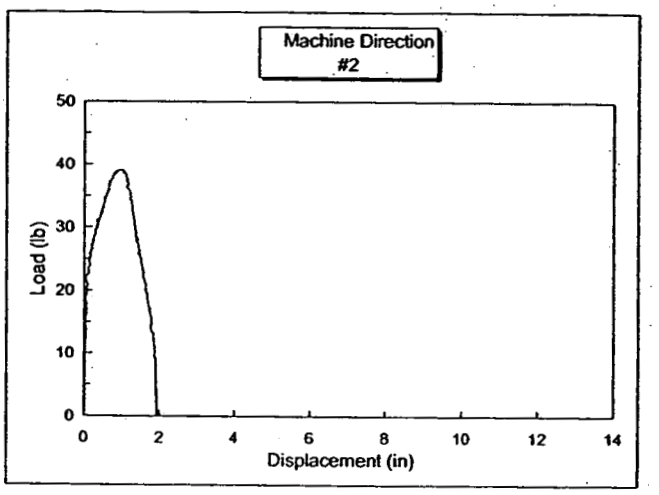
Filename: TTTRC328 Checked By: JTR Date: 10/8/04

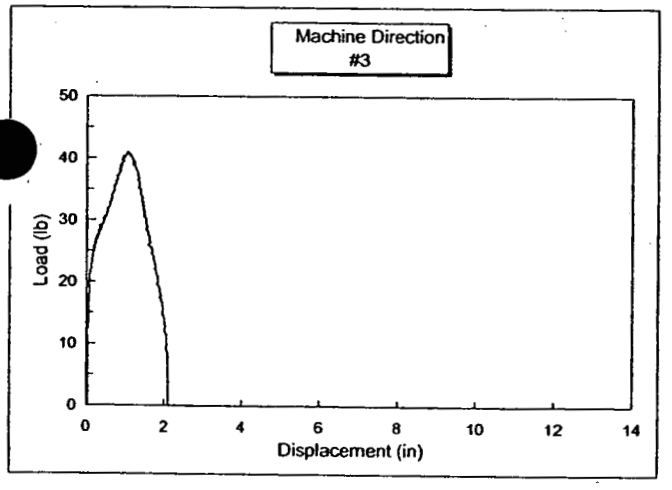
Raw Data File: TT5TRC2, TT5TRC3, TT5TRC12, TT5TRC13.TXT

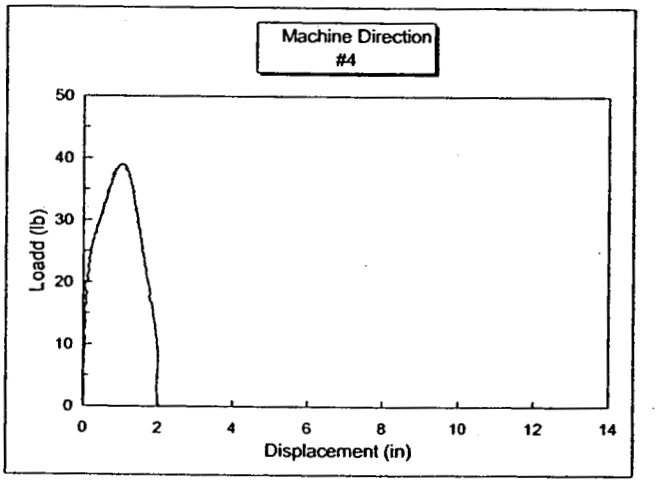
Advanced Terra Testing, Inc.

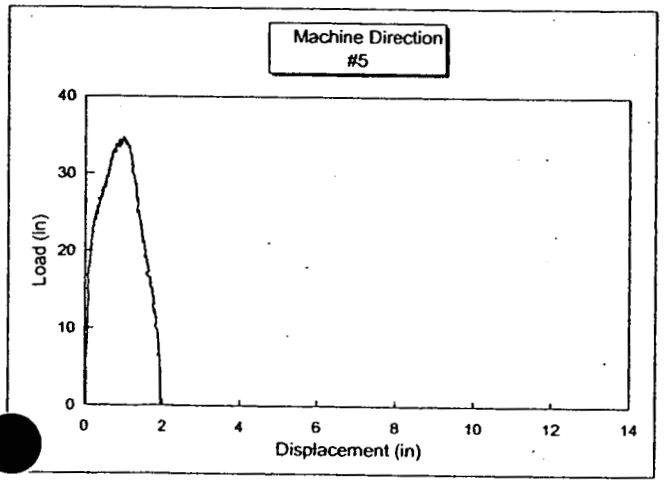
Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-02	Material Type:	60 mil LLDPE
Location:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	10-04-04 SKL
Roll No.:	104123296	Resin Lot No.:	CRH810060
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	LLD060A00	Grip Seperation:	1.0"

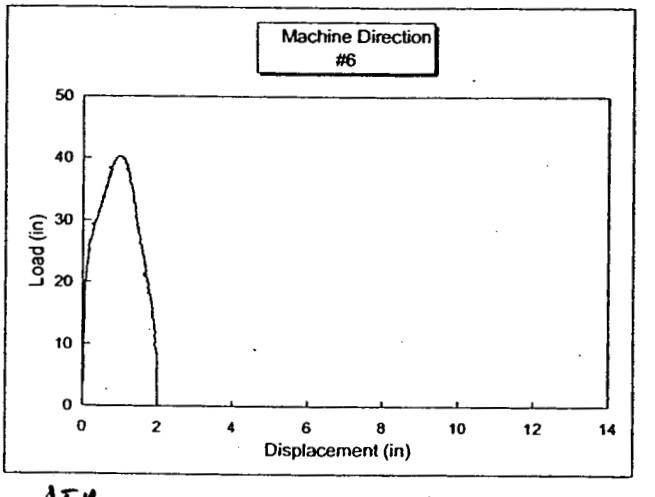












Filename: TTTR3296

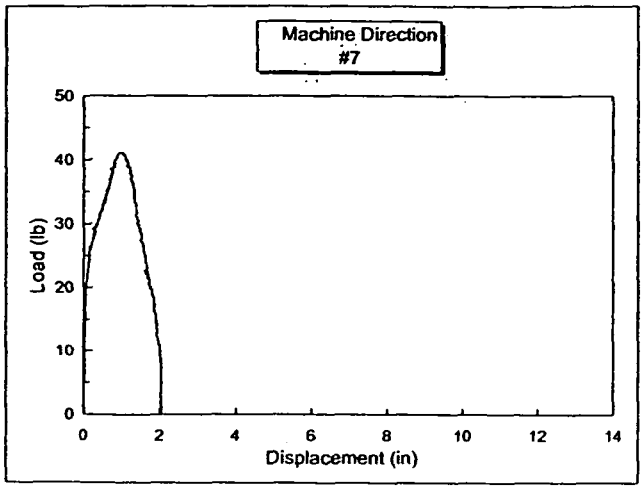
Raw Data File: TT2TRM2, TT2TRM3, TT2TRM12, TT2TRM13.TXT

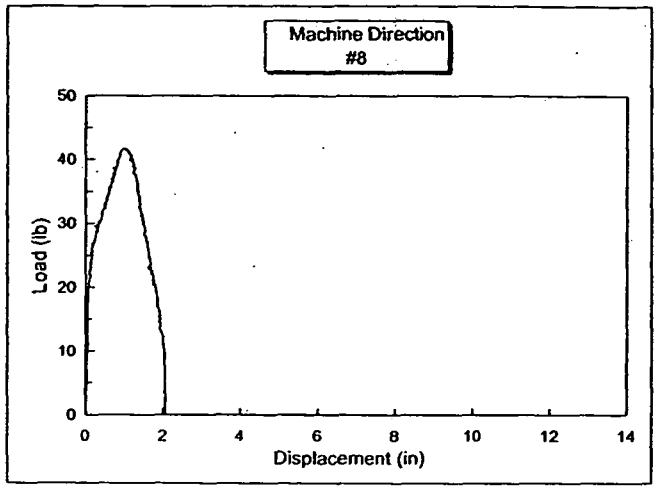
Checked By: JTR

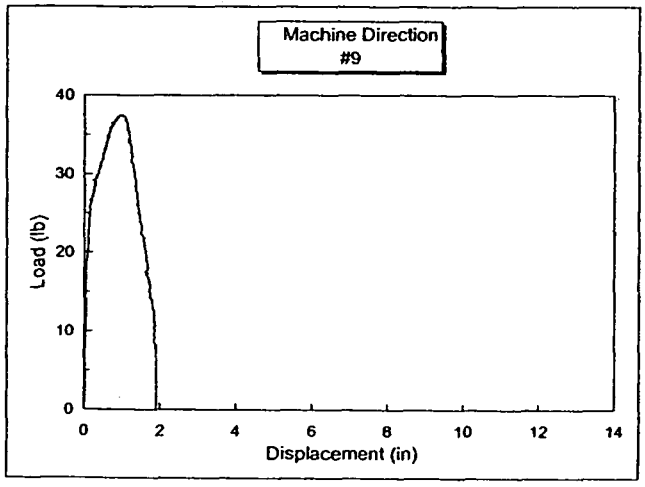
Date: 10/8/04

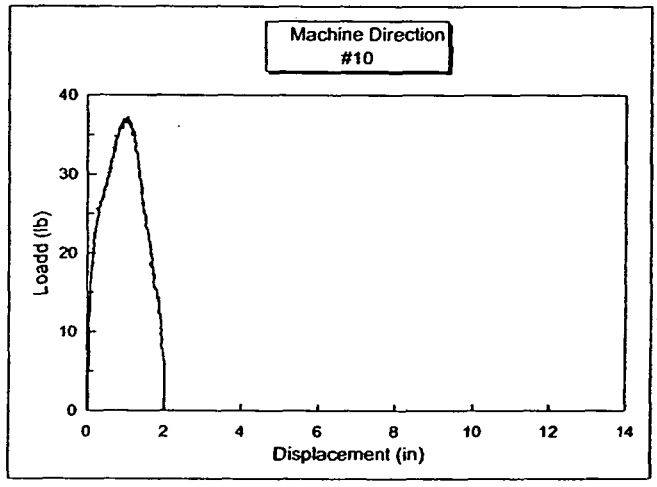
Advanced Terra Testing, Inc.

Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-02	Material Type:	60 mil LLDPE
Location:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	10-04-04 SKL
Roll Number:	104123296	Resin Lot No.:	CRH810060
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	LLD060A00	Grip Seperation:	1.0"









Machine Direction

	Load at Break (lb/in width)		Load at Break (lb/in width)
Specimen #1	36.7	Specimen #6	40.3
Specimen #2	39.1	Specimen #7	41.1
Specimen #3	41.0	Specimen #8	41.7
Specimen #4	39.1	Specimen #9	37.5
Specimen #5	34.7	Specimen #10	37.3

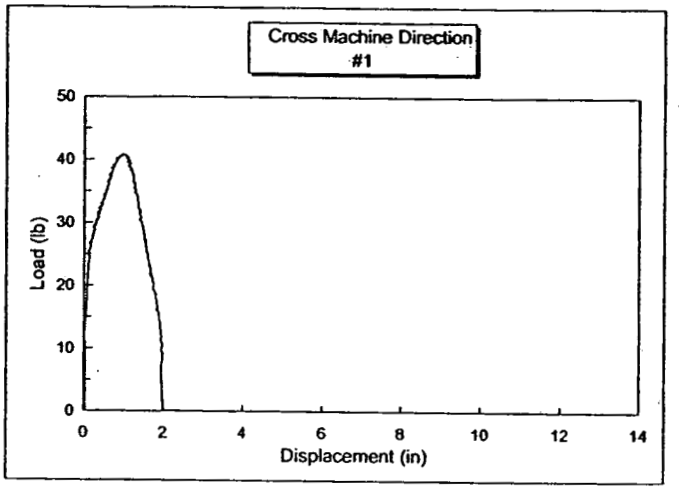
Average	38.8
Std. Deviation	2.1

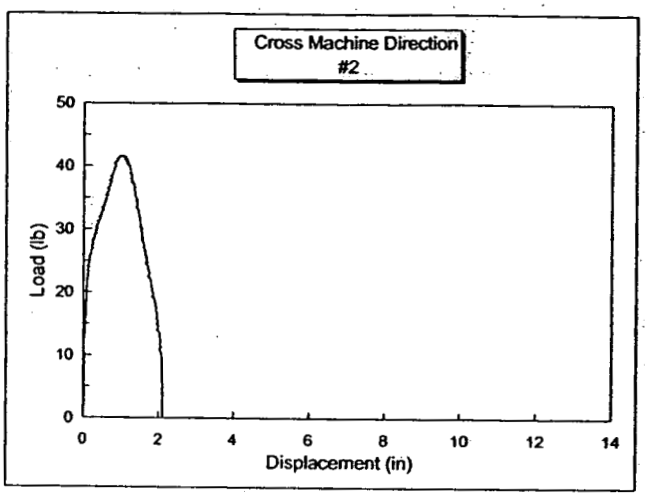
Filename: TTTR3296 Checked By: JTR Date: 10/8/04

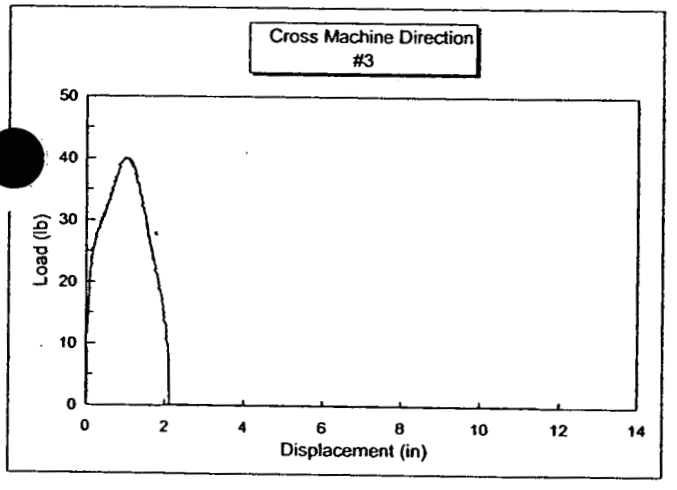
Raw Data File: TT2TRM2, TT2TRM3, TT2TRM12, TT2TRM13.TXT

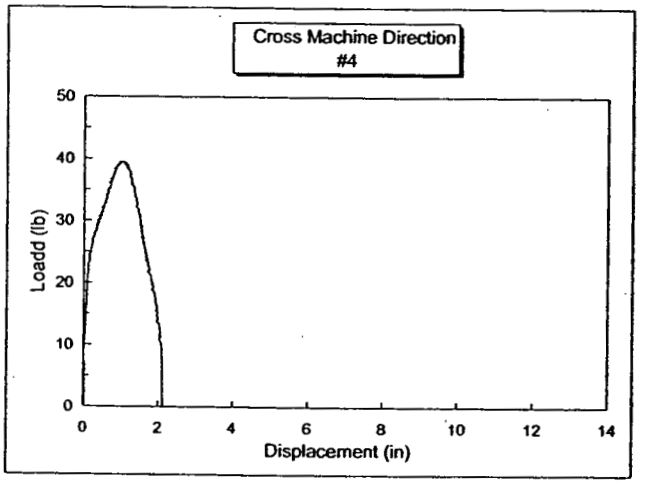
Advanced Terra Testing, Inc.

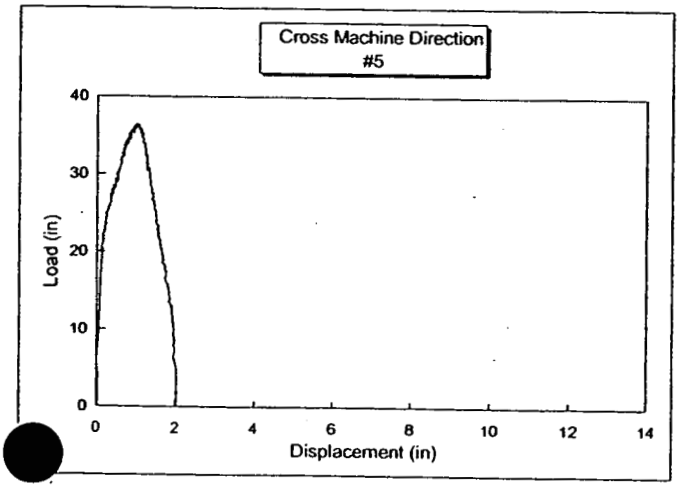
Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-02	Material Type:	60 mil LLDPE
Location:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	10-04-04 SKL
Roll No.:	104123296	Resin Lot No.:	CRH810060
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	LLD060A00	Grip Seperation:	1.0"

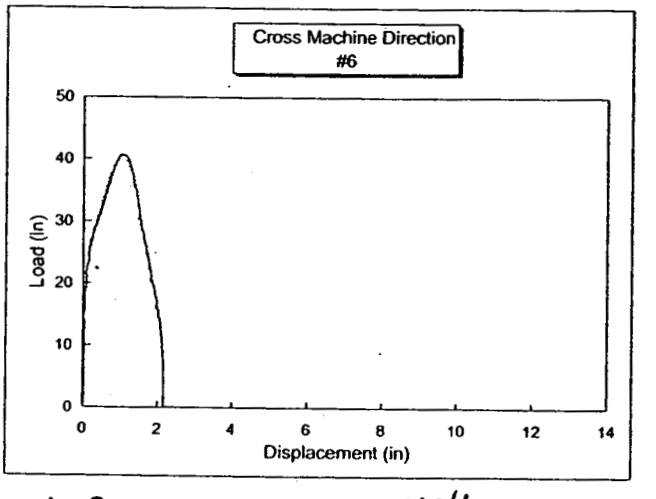












Filename: TTTR329C

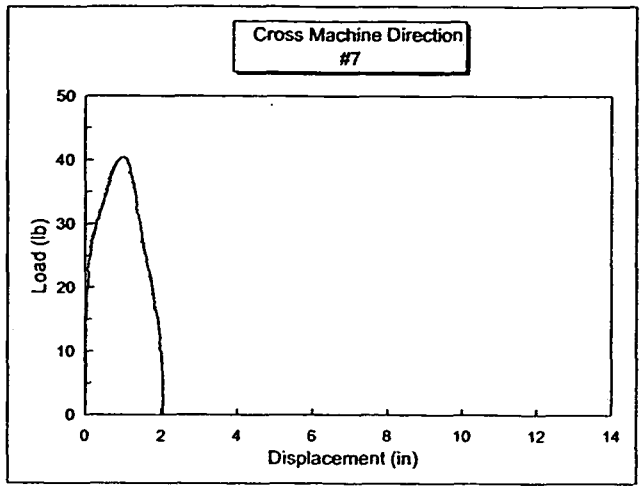
Raw Data File: TT2TRC2, TT2TRC3, TT2TRC12, TT2TRC13.TXT

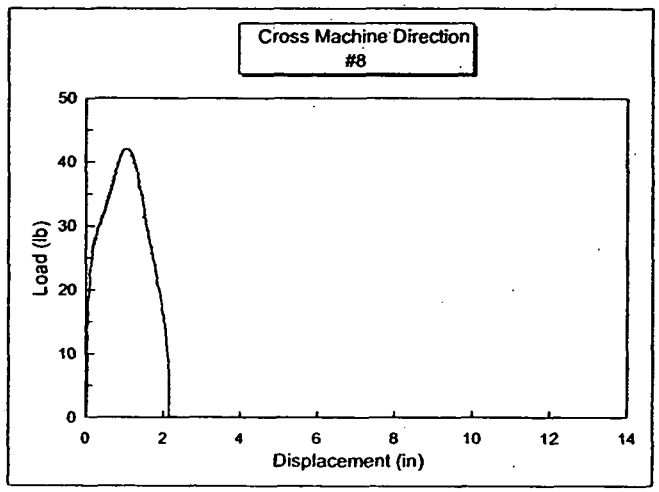
Checked By: JTR

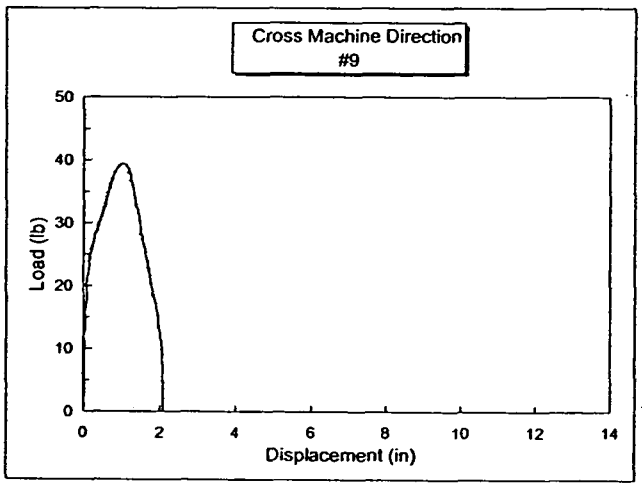
Date: 10/8/04

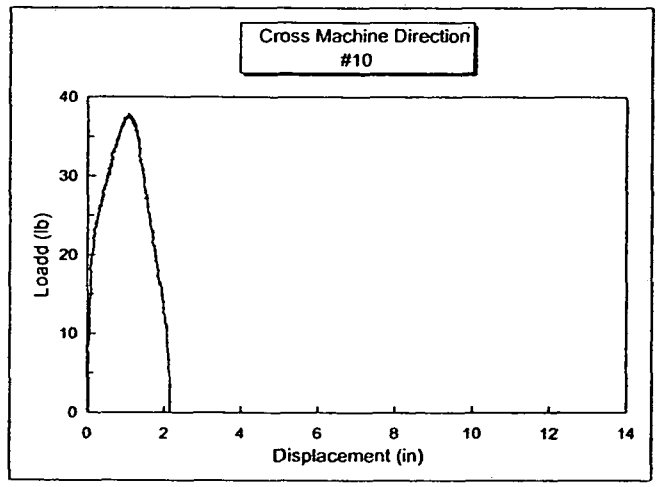
Advanced Terra Testing, Inc.

Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-02	Material Type:	60 mil LLDPE
Location:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	10-04-04 SKL
Roll Number:	104123296	Resin Lot No.:	CRH810060
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	LLD060A00	Grip Seperation:	1.0"









Cross Machine Direction

	Load at Break (lb/in width)		Load at Break (lb/in width)
Specimen #1	40.8	Specimen #6	40.6
Specimen #2	41.6	Specimen #7	40.4
Specimen #3	39.9	Specimen #8	42.1
Specimen #4	39.4	Specimen #9	39.4
Specimen #5	36.4	Specimen #10	37.9

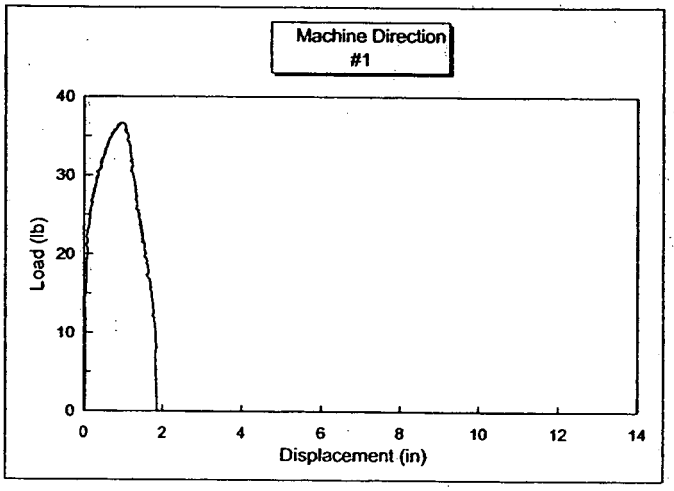
Average	39.9
Std. Deviation	1.6

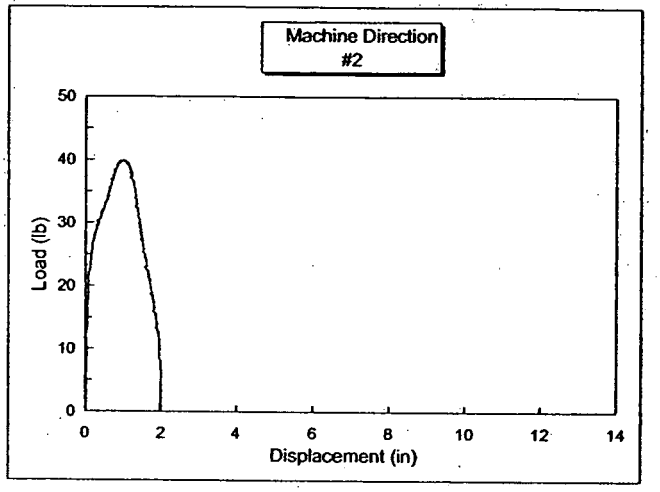
Filename: TTTR329C Checked By: JTR Date: 10/8/04

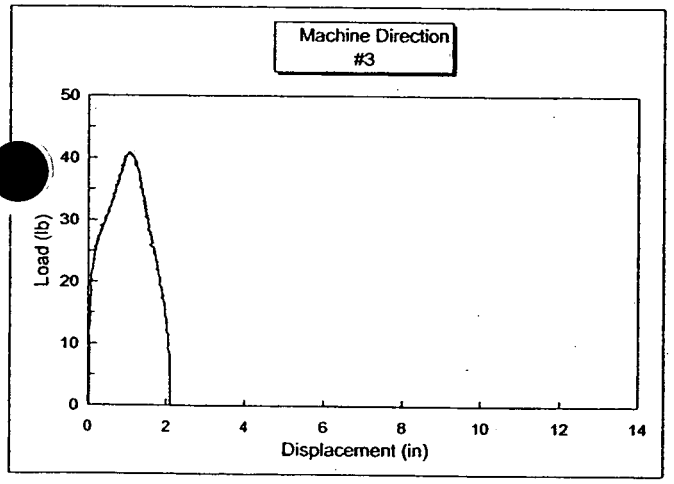
Raw Data File: TT2TRC2, TT2TRC3, TT2TRC12, TT2TRC13.TXT

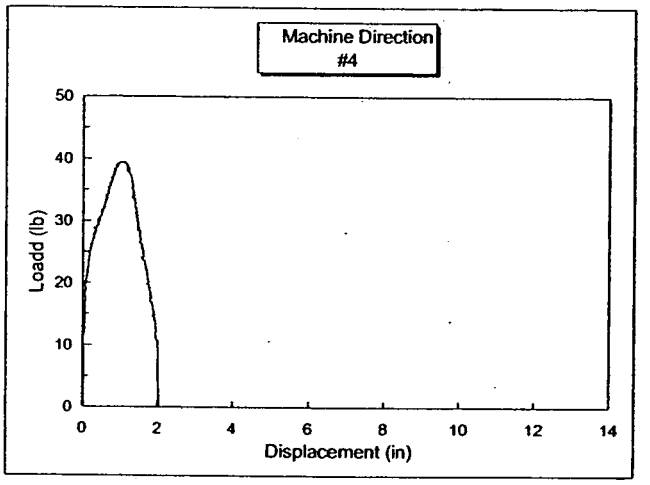
Advanced Terra Testing, Inc.

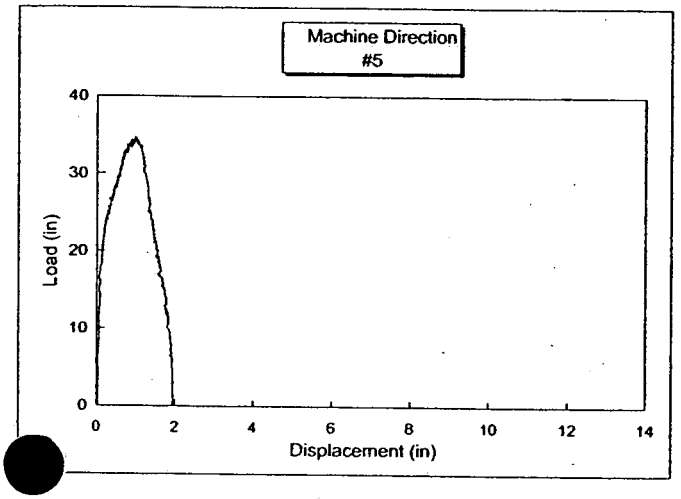
Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-02	Material Type:	60 mil LLDPE
[illegible]ation:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	10-04-04 SKL
[illegible]l No.:	104123303	Resin Lot No.:	CRH810060
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	LLD060A00	Grip Seperation:	1.0"

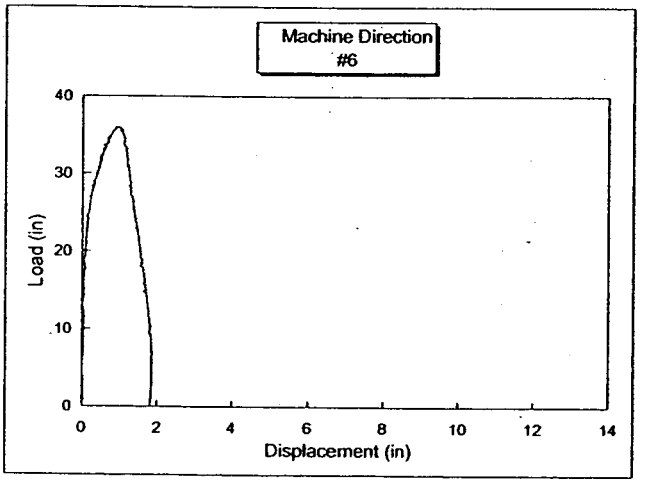










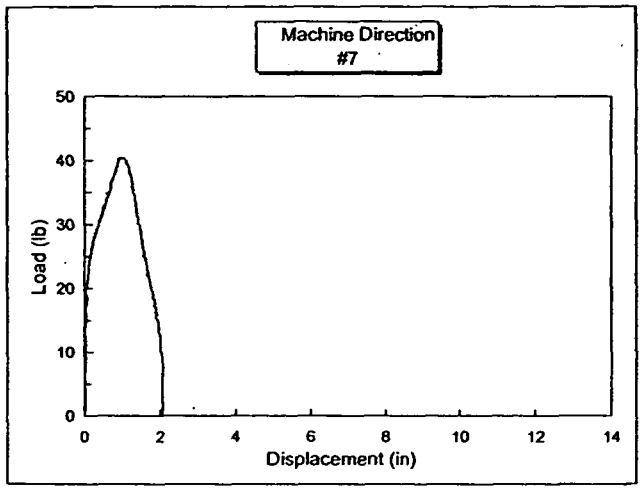


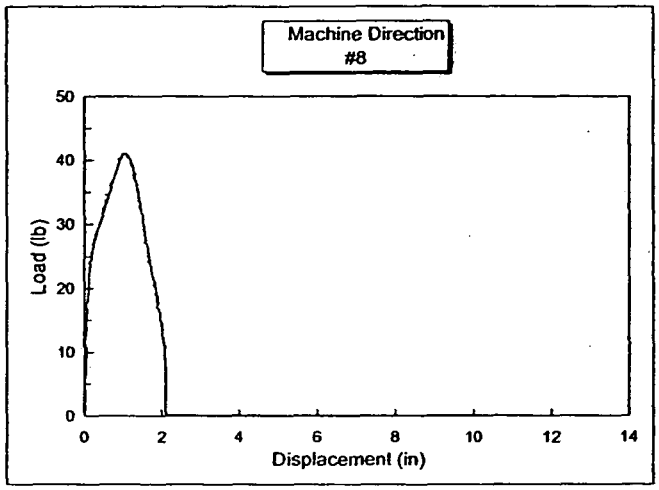
Filename: TTTR3303 Checked By: JTR Date: 10/8/04

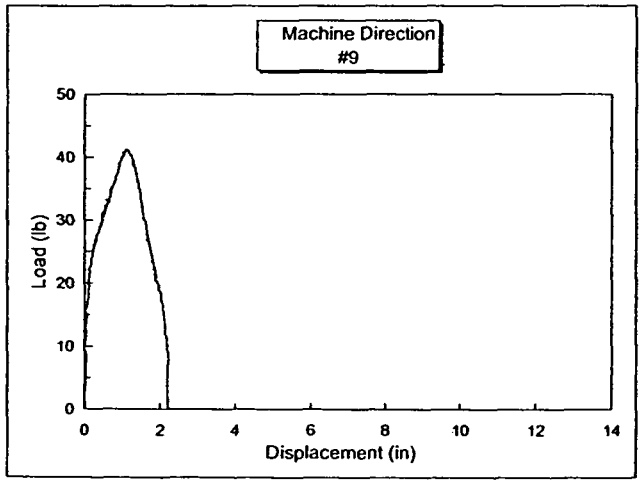
Raw Data File: TT1TRM2, TT1TRM3, TT1TRM12, TT1TRM13.TXT

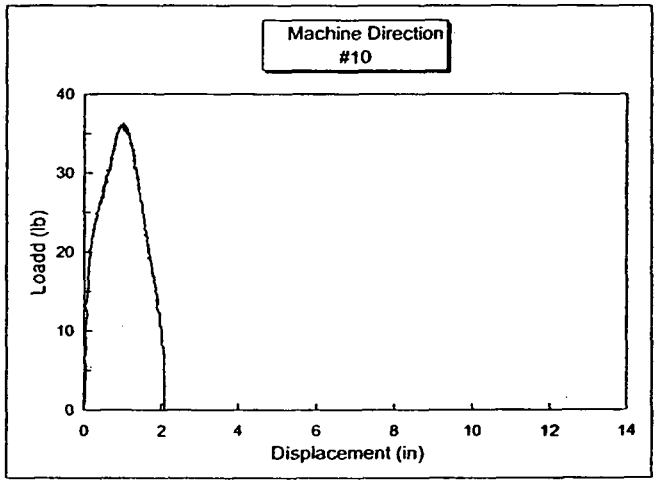
Advanced Terra Testing, Inc.

Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-02	Material Type:	60 mil LLDPE
Location:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	10-04-04 SKL
Roll Number:	104123303	Resin Lot No.:	CRH810060
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	LLD060A00	Grip Seperation:	1.0"









Machine Direction

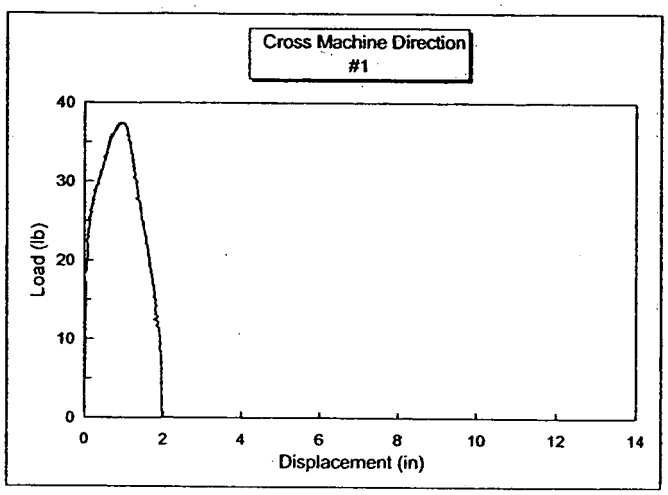
	Load at Break (lb/in width)		Load at Break (lb/in width)
Specimen #1	36.7	Specimen #6	36.0
Specimen #2	39.9	Specimen #7	40.4
Specimen #3	41.0	Specimen #8	41.1
Specimen #4	39.5	Specimen #9	41.3
Specimen #5	34.7	Specimen #10	36.4
Average	38.7		
Std. Deviation	2.3		

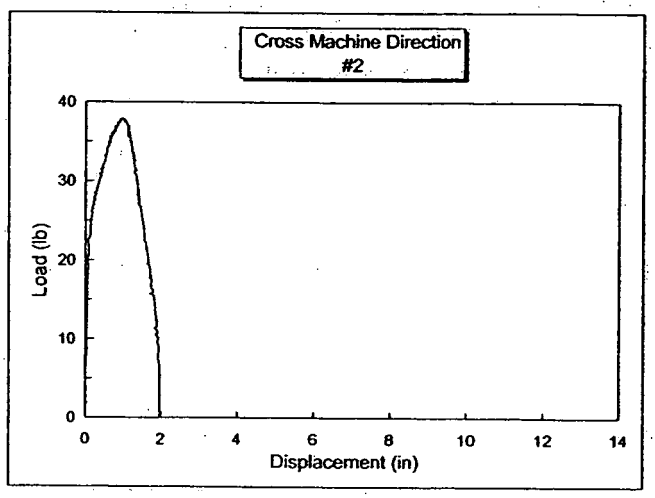
Filename: TTTR3303 Checked By: JTR Date: 10/8/04

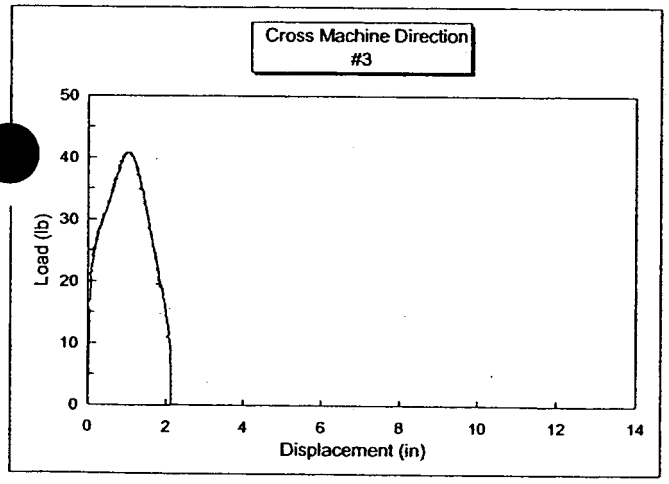
Raw Data File: TT1TRM2, TT1TRM3, TT1TRM12, TT1TRM13.TXT

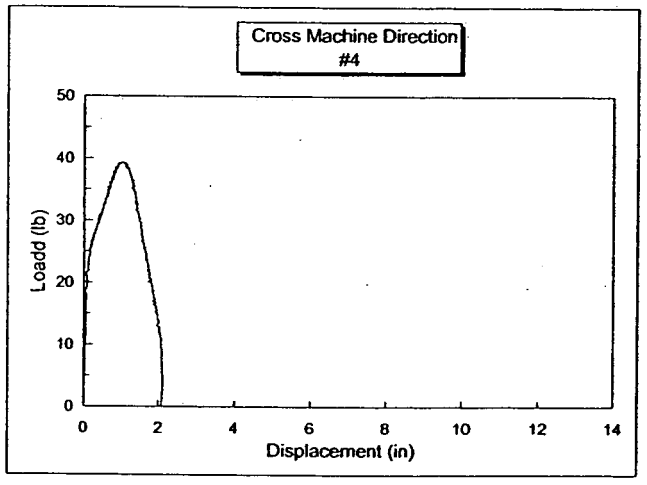
Advanced Terra Testing, Inc.

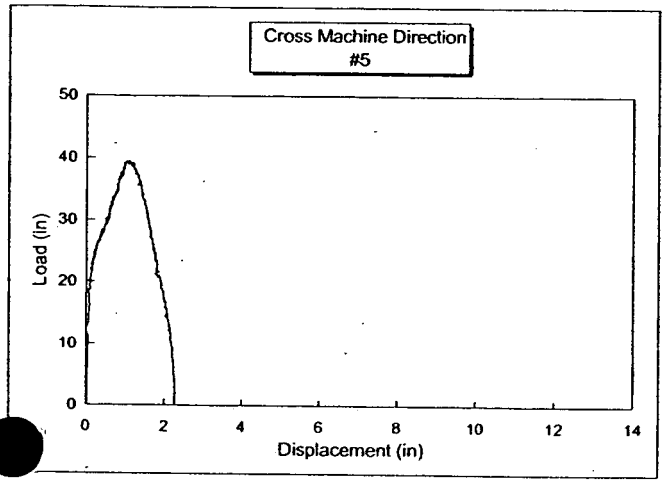
Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-02	Material Type:	60 mil LLDPE
Location:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	10-04-04 SKL
Roll No.:	104123303	Resin Lot No.:	CRH810060
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	LLD060A00	Grip Seperation:	1.0"

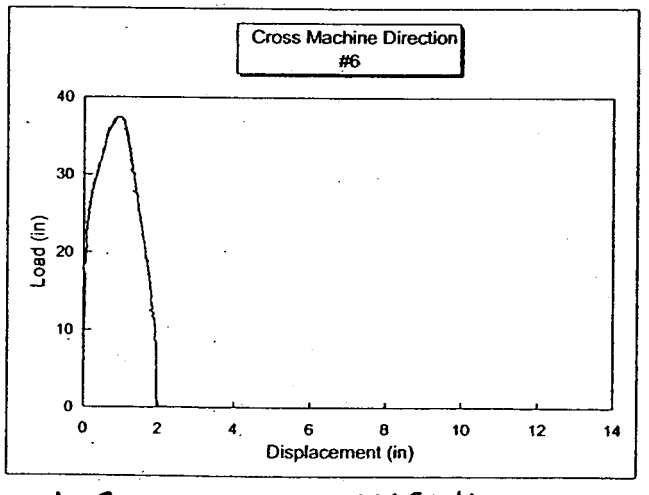












Filename: TTTR330C

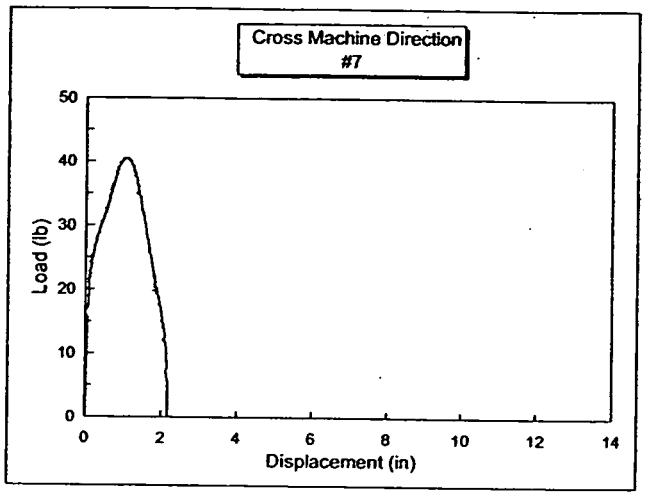
Raw Data File: TT1TRC2, TT1TRC3, TT1TRC12, TT1TRC13.TXT

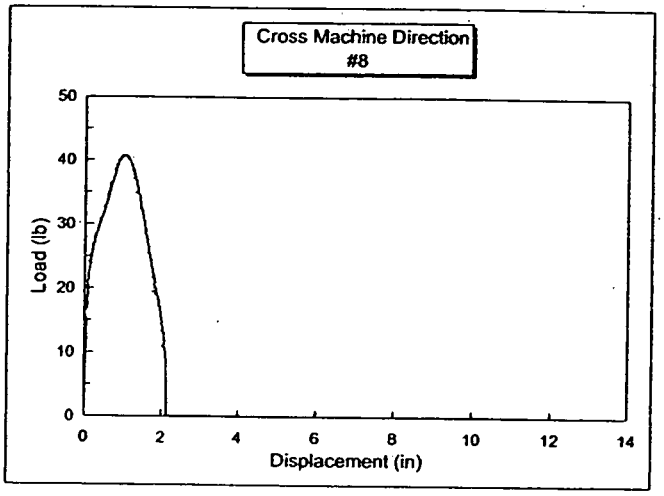
Checked By: JTL

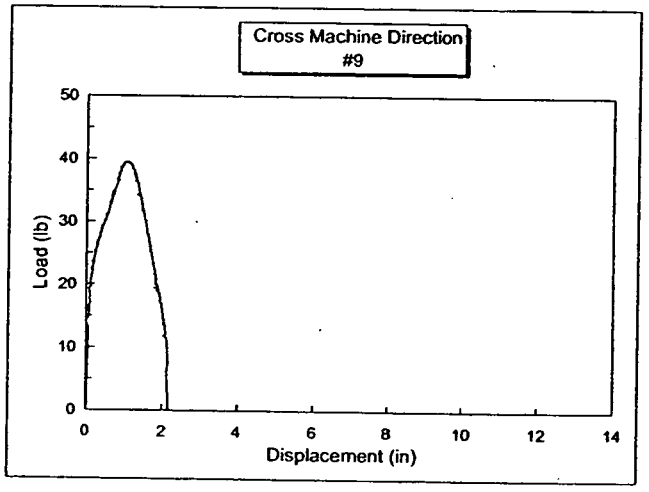
Date: 10/8/04

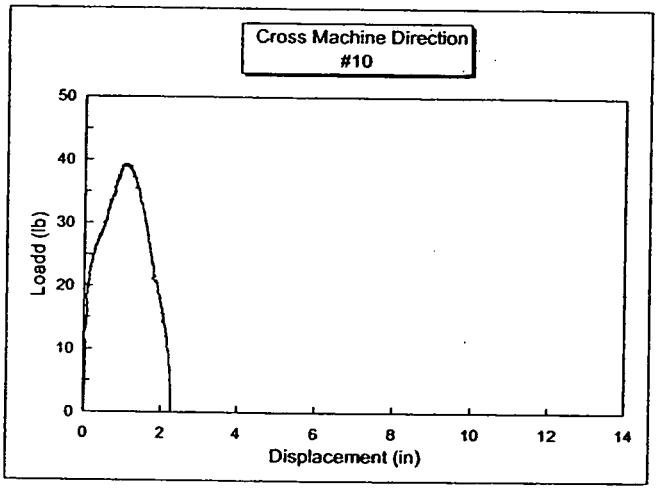
Advanced Terra Testing, Inc.

Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-02	Material Type:	60 mil LLDPE
Location:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	10-04-04 SKL
Roll Number:	104123303	Resin Lot No.:	CRH810060
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	LLD060A00	Grip Seperation:	1.0"









Cross Machine Direction

	Load at Break (lb/in width)
Specimen #1	37.4
Specimen #2	37.9
Specimen #3	40.8
Specimen #4	39.3
Specimen #5	39.4
Specimen #6	37.4
Specimen #7	40.5
Specimen #8	40.8
Specimen #9	39.5
Specimen #10	39.4
Average	39.2
Std. Deviation	1.2

Filename: TTTR330C Checked By: JTL Date: 10/19/04

Raw Data File: TT1TRC2, TT1TRC3, TT1TRC12, TT1TRC13.TXT

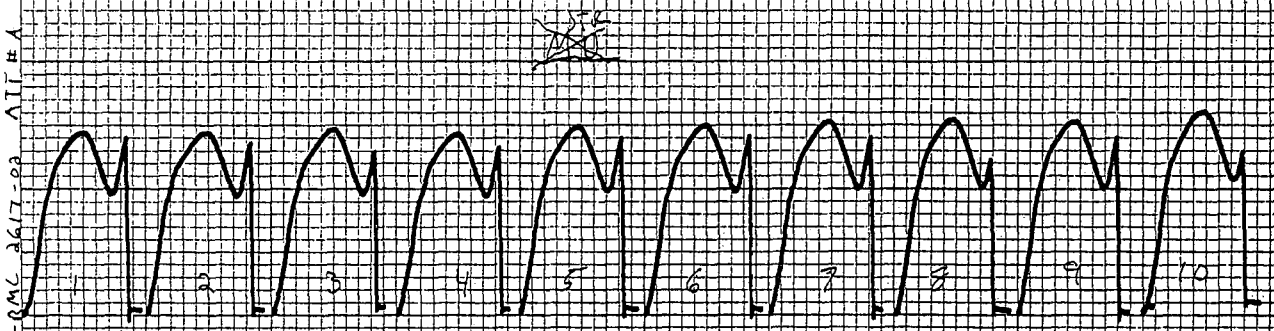
Advanced Terra Testing, Inc.

10-26-04 JTR
Chatillon Loading System
1 Kip Capacity Load Cell
2617-02

Tetra Tech-RMC
Present Landfill Design-RFETS, Golden, CO
Roll #101110562
Puncture Resistance, 60 MIL LLDPE
ASTM D 4833

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN
DISPLACEMENT RATE = 12"/MIN

Specimen Number	Load (lbs)
1	109.8
2	109.8
3	112.8
4	109.0
5	114.3
6	114.3
7	115.8
8	118.1
9	115.8
10	123.4
Average	114.3
Std. Dev.	4.4



Tetra Tech-RMC 2617-02 ATT # A K-Punct. D-4833 X = 1.5"/in Y = 75.7#/in JTR 10/26/04

Data Checked By: JTR Date: 10/27/04
Filename: K:/TT2617/TTRP0562.lwp

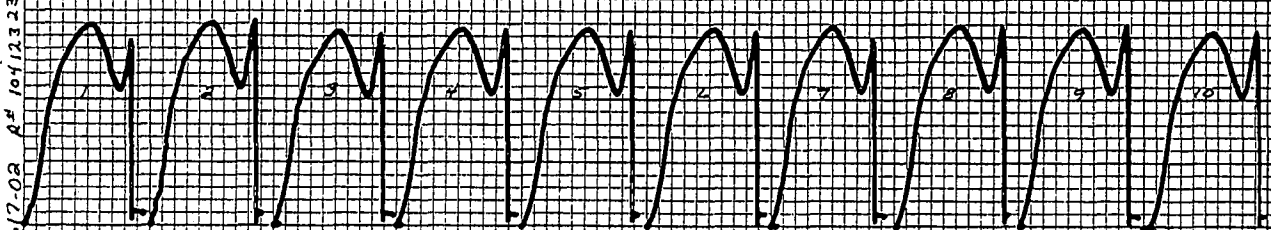
ADVANCED TERRA TESTING, Inc

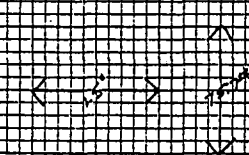
10-04-04 BKL
Chatillon Loading System
1 Kip Capacity Load Cell
2617-02

Tetra Tech-RMC
Present Landfill Design-RFETS, Golden, CO
Roll #104123231, Resin Lot #CRG812060, Product Code: LLD060A000
Puncture Resistance, 60 MIL LLDPE
ASTM D 4833

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN
DISPLACEMENT RATE = 12"/MIN

Specimen Number	Load (lbs)
1	121.1
2	122.6
3	115.8
4	118.8
5	118.8
6	118.8
7	121.1
8	121.1
9	121.1
10	117.3
Average	119.7
Std. Dev.	2.1





ATT#8 R.Punct.D-4833 12/min
Tetra Tech-RMC 2617-02 R# 104123231 Res lot # CRG812060 L# LLD060A000 X=1.5"/in Y=75.7 lbs/in 10-4-04 BKL

Data Checked By: JTR Date: 10/13/04
Filename: K:/TT2617/TTRP3231.lwp

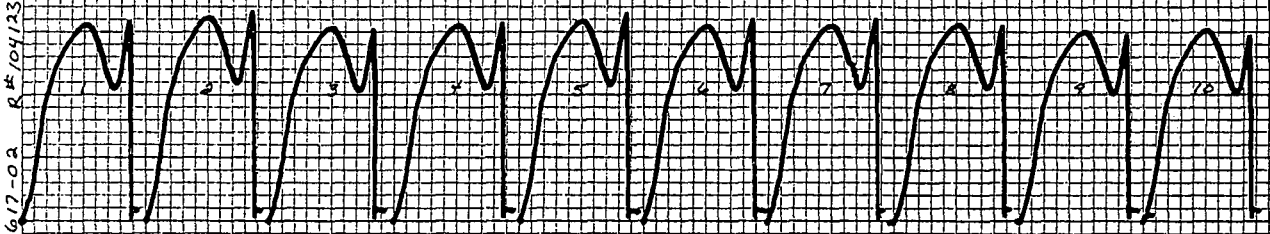
ADVANCED TERRA TESTING, Inc

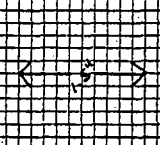
10-04-04 BKL
Chatillon Loading System
1 Kip Capacity Load Cell
2617-02

Tetra Tech-RMC
Present Landfill Design-RFETS, Golden, CO
Roll #104123238, Resin Lot #CRG812060, Product Code: LLD060A000
Puncture Resistance, 60 MIL LLDPE
ASTM D 4833

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN
DISPLACEMENT RATE = 12"/MIN

Specimen Number	Load (lbs)
1	121.1
2	127.2
3	115.8
4	119.6
5	125.7
6	121.9
7	121.9
8	119.6
9	114.3
10	115.7
Average	120.2
Std. Dev.	4.3





10-4-04 BKL
ATT #10 ASTM D-4833 12"/min
Tetra Tech - RMC 2617-02 Roll #104123238 Resin Lot # CRG812060 LLD060A000 X=1.5"/in Y=75.7lbs/in

Data Checked By: JTR Date: 10/13/04
Filename: K:/TT2617/TTRP3238.lwp

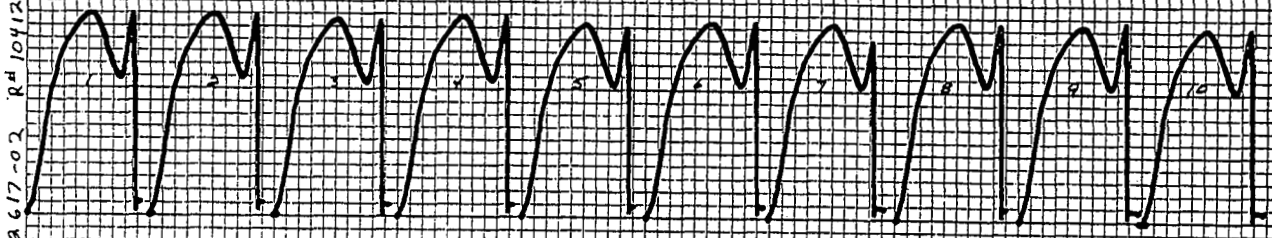
ADVANCED TERRA TESTING, Inc

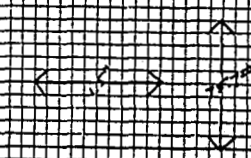
10-04-04 BKL
Chatillon Loading System
1 Kip Capacity Load Cell
2617-02

Tetra Tech-RMC
Present Landfill Design-RFETS, Golden, CO
Roll #104123245, Resin Lot #CRG812060, Product Code: LLD060A000
Puncture Resistance, 60 MIL LLDPE
ASTM D 4833

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN
DISPLACEMENT RATE = 12"/MIN

Specimen Number	Load (lbs)
1	121.1
2	121.1
3	118.8
4	121.1
5	115.8
6	117.3
7	116.6
8	119.6
9	119.6
10	115.8
Average	118.7
Std. Dev.	2.2





ATT#9 R. Punc D-4833, 12"/min
Tetra Tech-RMC 2617-02 R# 104123245 Res lot# CRG812060 L# LLD060A000 X=1.5"/in Y=75.7#/in
10-4-04 BKL

Data Checked By: JTR Date: 10-18-04
Filename: K:/TT2617/TTRP3245.lwp

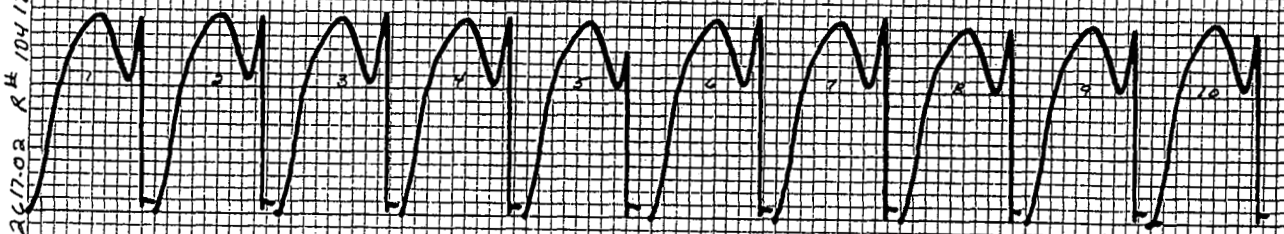
ADVANCED TERRA TESTING, Inc

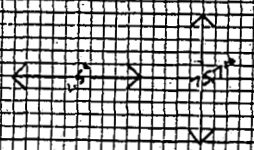
10-04-04 BKL
Chatillon Loading System
1 Kip Capacity Load Cell
2617-02

Tetra Tech-RMC
Present Landfill Design-RFETS, Golden, CO
Roll #104123251, Resin Lot #CRG812060, Product Code: LLD060A000
Puncture Resistance, 60 MIL LLDPE
ASTM D 4833

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN
DISPLACEMENT RATE = 12"/MIN

Specimen Number	Load (lbs)
1	118.8
2	119.6
3	121.1
4	118.8
5	115.8
6	121.1
7	120.4
8	115.1
9	118.1
10	119.6
Average	118.8
Std. Dev.	2.0





Data Checked By: JTR Date: 10/13/04
Filename: K:/TT2617/TTRP3251.lwp

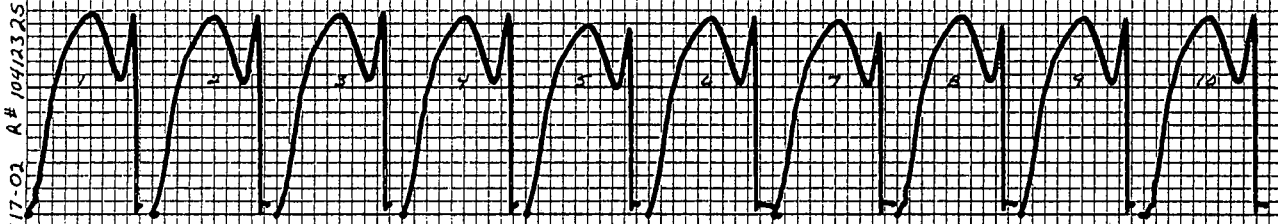
ADVANCED TERRA TESTING, Inc

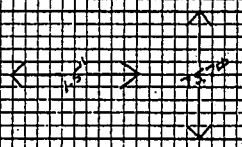
10-04-04 BKL
Chatillon Loading System
1 Kip Capacity Load Cell
2617-02

Tetra Tech-RMC
Present Landfill Design-RFETS, Golden, CO
Roll#104123258, Resin Lot #CRG812060, Product Code: LLD060A000
Puncture Resistance, 60 MIL LLDPE
ASTM D 4833

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN
DISPLACEMENT RATE = 12"/MIN

Specimen Number	Load (lbs)
1	121.1
2	118.8
3	121.1
4	119.6
5	113.6
6	118.8
7	115.1
8	118.8
9	117.3
10	119.6
Average	118.4
Std. Dev.	2.4





10-4-04 BKL
LLD060A000 X = 1.5"/in Y = 75.7 lb/in
Res. lot# CRG812060
A# 104123258
2617-02
R. Punc. D-4833 12"/min
ATTN: Tetra Tech-RMC

Data Checked By: JTR Date: 10/13/04
Filename: K:/TT2617/TTRP3258.lwp

ADVANCED TERRA TESTING, Inc

10-03-04 SR

Chatillon Loading System

1 Kip Capacity Load Cell

2617-02

Tetra Tech-RMC

Present Landfill Design-RFETS, Golden, CO

Roll #104123267, Resin Lot #CRG812060, Product Code: LLD060A000

Puncture Resistance, 60 MIL LLDPE

ASTM D 4833

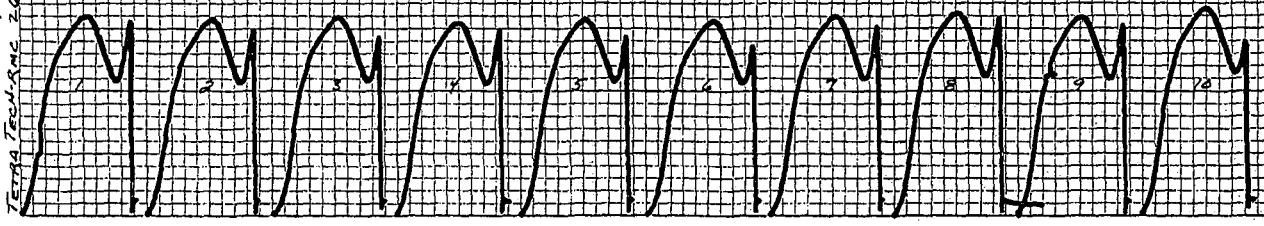
Data Entered By: SR

SCALES X = 1.5"/IN

Y = 75.7#/IN

DISPLACEMENT RATE = 12"/MIN

Specimen Number	Load (lbs)
1	121.9
2	120.4
3	121.1
4	117.3
5	120.4
6	119.6
7	121.9
8	122.6
9	121.9
10	127.2
Average	121.4
Std. Dev.	2.5



R#104123267 R.L.# CRG812060 P.C.= LLD060A000
TETRA TECH-RMC 2617-02 R.Proc: 0-Y833 12"/MIN X=1.5"/IN Y= 75.7#/IN 10-03-04 SR Attach =

Data Checked By: JTP Date: 10/3/04

Filename: K:/TT2617/TTRP3267.lwp

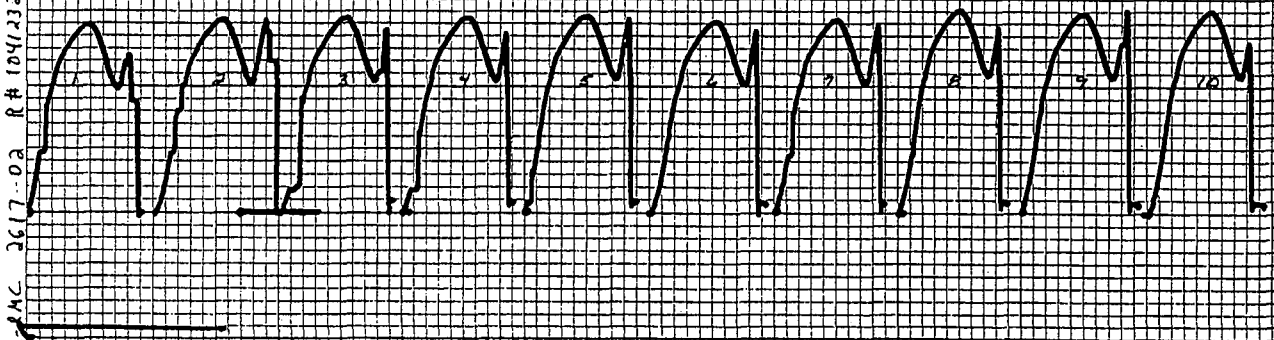
ADVANCED TERRA TESTING, inc

10-04-04 BKL/JTR
Chatillon Loading System
1 Kip Capacity Load Cell
2617-02

Tetra Tech-RMC
Present Landfill Design-RFETS, Golden, CO
Roll #104123274, Resin Lot #CRH810060, Product Code: LLD060A000
Puncture Resistance, 60 MIL LLDPE
ASTM D 4833

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN
DISPLACEMENT RATE = 12"/MIN

Specimen Number	Load (lbs)
1	113.6
2	115.8
3	118.1
4	117.3
5	119.6
6	115.1
7	115.8
8	123.4
9	122.6
10	121.9
Average	118.3
Std. Dev.	3.4



Data Checked By: JTR Date: 10/13/04
Filename: K:/TT2617/TTRP3274.lwp

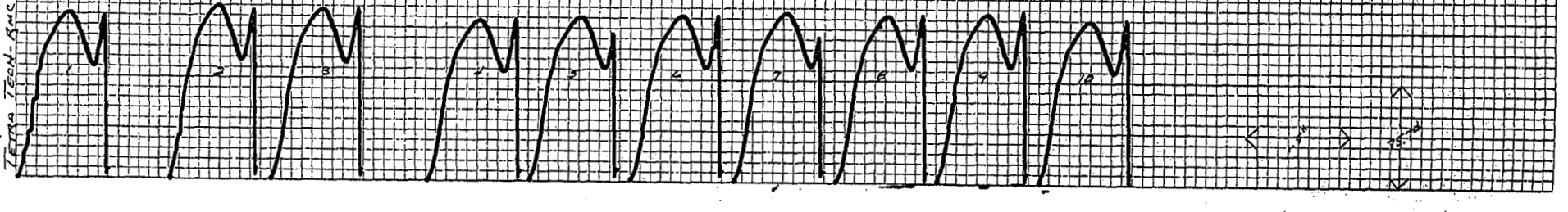
ADVANCED TERRA TESTING, Inc

10-03-04 SR
Chatillon Loading System
1 Kip Capacity Load Cell
2617-02

Tetra Tech-RMC
Present Landfill Design-RFETS, Golden, CO
Roll #104123282, Resin Lot #CRH810060, Product Code: LLD060A000
Puncture Resistance, 60 MIL LLDPE
ASTM D 4833

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN
DISPLACEMENT RATE = 12"/MIN

Specimen Number	Load (lbs)
1	122.6
2	129.4
3	127.9
4	120.4
5	122.6
6	123.4
7	126.4
8	125.7
9	127.9
10	121.9
Average	124.8
Std. Dev.	3.0



Rd 104123282, R.L.# CRH810060 P.C. = LLD060A000
Tetra Tech-RMC 2617-02 R.PWC. D-4833 12"/MIN X=1.5"/IN Y=75.7#/IN 10-03-04 SR Att #1

Data Checked By: JTR Date: 10/13/04
Filename: K:/TT2617/TTRP3282.lwp

ADVANCED TERRA TESTING, Inc

10-03-04 SR

Chatillon Loading System

1 Kip Capacity Load Cell

2617-02

Tetra Tech-RMC

Present Landfill Design-RFETS, Golden, CO

Roll #1041232289, Resin Lot #CRH810060, Product Code: LLD060A000

Puncture Resistance, 60 MIL LLDPE

ASTM D 4833

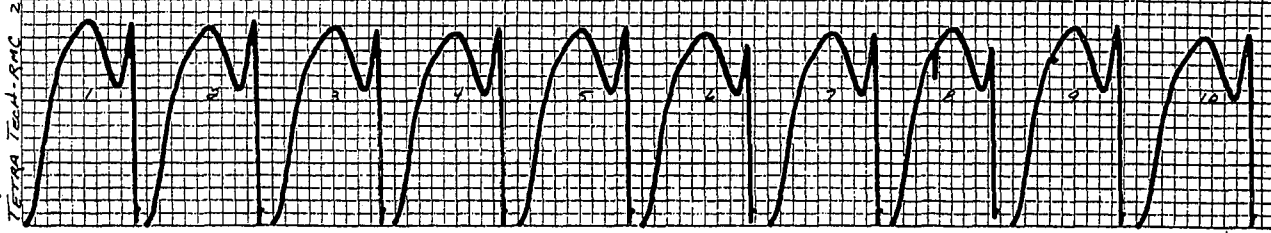
Data Entered By: SR

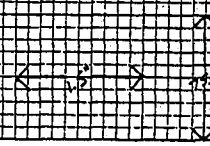
SCALES X = 1.5"/IN

Y = 75.7#/IN

DISPLACEMENT RATE = 12"/MIN

Specimen Number	Load (lbs)
1	123.4
2	122.6
3	121.1
4	119.6
5	121.1
6	116.6
7	117.3
8	121.1
9	121.9
10	117.3
Average	120.2
Std. Dev.	2.4





RL 1041232289 R.L.# CRH810060 P.C.= LLD060A000
Terra Tech-RMC 2617-02 R.Rmc. D-4833 12"/MIN 12.5"/IN Y=75.7#/IN 10-03-04 SR Arm #'S=

Data Checked By: JTR Date: 10-18-04

Filename: K:/TT2617/TTRP3289.lwp

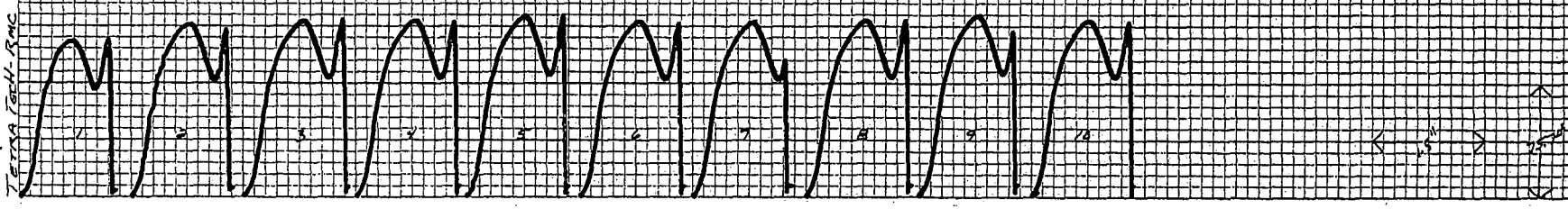
ADVANCED TERRA TESTING, Inc

10-03-04 SR
Chatillon Loading System
1 Kip Capacity Load Cell
2617-02

Tetra Tech-RMC
Present Landfill Design-RFETS, Golden, CO
Roll #104123296, Resin Lot #CRH810060, Product Code: LLD060A000
Puncture Resistance, 60 MIL LLDPE
ASTM D 4833

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN
DISPLACEMENT RATE = 12"/MIN

Specimen Number	Load (lbs)
1	112.8
2	115.1
3	119.6
4	118.8
5	121.9
6	118.1
7	118.1
8	118.8
9	121.9
10	118.9
Average	118.4
Std. Dev.	2.8



Data Checked By: JTR Date: 10/13/04
Filename: K:/TT2617/TTRP3296.lwp

ADVANCED TERRA TESTING, Inc

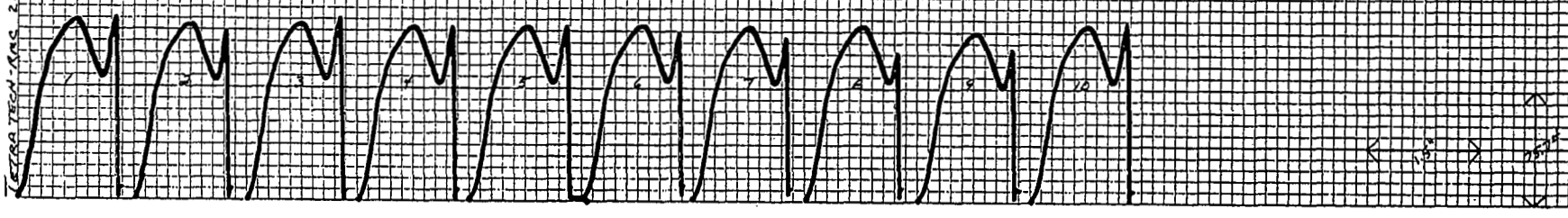
10-03-04 SR
Chatillon Loading System
1 Kip Capacity Load Cell
2617-02

Tetra Tech-RMC
Present Landfill Design-RFETS, Golden, CO
Roll #104123303, Resin Lot #CRH810060, Product Code: LLD060A000
Puncture Resistance, 60 MIL LLDPE
ASTM D 4833

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN
DISPLACEMENT RATE = 12"/MIN

Specimen Number	Load (lbs)
1	121.9
2	118.1
3	121.9
4	116.6
5	117.3
6	118.1
7	116.7
8	116.7
9	113.6
10	119.6
Average	118.1
Std. Dev.	2.5

R#104123303 R.L.#CRH810060 P.C.=LLD060A000
TETRA TECH-RMC 2617-02 R. Punc. D-4833 12"/min X=1.5"/in Y=75.7#/in 10-03-04 SR Att#2=



Data Checked By: JTR Date: 10/13/04
Filename: K:/TT2617/TTRP3303.lwp

ADVANCED TERRA TECHNO, Inc

Determination of Adhesion and Bond Strength of Geocomposites

GRI GC7

CLIENT: Tetra Tech-RMC

JOB NO.: 2617-02

PROJECT: Present Landfill-RFETS, Golden, CO

DATE: 10-18-04 SKL

TEXDRAIN 200 DS8
Lot #C2-8-2-04-1917-200, Date Sampled: 09-17-04, Shift: 4

Specimen	MD lbs/in width
1	7.6
2	1.3
3	1.5
4	2.0
5	2.0
Average	**2.9**
Std. Dev.	**2.7**

DATA ENTERED BY: SR

DATE: 10/23/2004

DATA CHECKED BY: JTR

DATE: 10/25/04

FILENAME: TTAD1917

ADVANCED TERRA TESTING, INC

Determination of Adhesion and Bond Strength of Geocomposites

GRI GC7

CLIENT: Tetra Tech-RMC

JOB NO.: 2617-02

PROJECT: Present Landfill-RFETS, Golden, CO

DATE: 10-18-04 SKL

TEXDRAIN 200 DS8
Lot #C2-8-2-04-1948-200, Date Sampled: 09-18-04, Shift: 2

Specimen	MD lbs/in width
1	4.9
2	1.5
3	1.7
4	1.6
5	1.6
Average	**2.3**
Std. Dev.	**1.5**

DATA ENTERED BY: SR
DATA CHECKED BY: JTR
FILENAME: TTAD1948

DATE: 10/23/2004
DATE: 10/25/04

ADVANCED TERRA TESTING, INC

Determination of Adhesion and Bond Strength of Geocomposites

GRI GC7

CLIENT: Tetra Tech-RMC

JOB NO.: 2617-02

PROJECT: Present Landfill-RFETS, Golden, CO

DATE: 10-18-04 JTR

TEXDRAIN 200 DS8
Lot #C2-8-2-04-2015-200, Date Sampled: 09-19-04, Shift: 2

Specimen	MD lbs/in width
1	1.1
2	5.0
3	1.1
4	1.1
5	3.5
Average	**2.4**
Std. Dev.	**1.8**

DATA ENTERED BY: SR

DATE: 10/23/2004

DATA CHECKED BY: JTR

DATE: 10/25/04

FILENAME: TTAD2015

ADVANCED TERRA TESTING, INC

Determination of Adhesion and Bond Strength of Geocomposites

GRI GC7

CLIENT: Tetra Tech-RMC

JOB NO.: 2617-02

PROJECT: Present Landfill-RFETS, Golden, CO

DATE: 10-18-04 SKL

TEXDRAIN 200 DS8
Lot #C2-8-2-04-2048-200, Date Sampled: 09-18-04, Shift: 4

Specimen	MD lbs/in width
1	3.4
2	5.9
3	1.5
4	3.0
5	1.2
Average	**3.0**
Std. Dev.	**1.9**

DATA ENTERED BY: SR

DATA CHECKED BY: JTR

FILENAME: TTAD2048

DATE: 10/23/2004

DATE: 10/25/04

ADVANCED TERRA TESTING, INC

Determination of Adhesion and Bond Strength of Geocomposites

GRI GC7

CLIENT: Tetra Tech-RMC

JOB NO.: 2617-02

PROJECT: Present Landfill-RFETS, Golden, CO

DATE: 10-18-04 SKL

TEXDRAIN 200 DS8
Lot #C2-8-2-04-2111-200, Date Sampled: 09-20-04, Shift: 4

Specimen	MD lbs/in width
1	4.3
2	5.6
3	6.7
4	1.2
5	1.7
Average	**3.9**
Std. Dev.	**2.4**

DATA ENTERED BY: SR

DATA CHECKED BY: JTR

FILENAME: TTAD2111

DATE: 10/23/2004

DATE: 10/25/04

ADVANCED TERRA TESTING, INC

Determination of Adhesion and Bond Strength of Geocomposites

GRI GC7

CLIENT: Tetra Tech-RMC JOB NO.: 2617-02

PROJECT: Present Landfill-RFETS, Golden, CO DATE: 10-18-04 SKL

TEXDRAIN 200 DS8
Lot #C2-8-2-04-2160-200, Date Sampled: 09-21-04, Shift: 3

Specimen	MD lbs/in width
1	2.1
2	1.1
3	2.7
4	1.7
5	2.6
Average	**2.0**
Std. Dev.	**0.7**

DATA ENTERED BY: SR DATE: 10/23/2004
DATA CHECKED BY: JTR DATE: 10/25/04
FILENAME: TTAD2160

ADVANCED TERRA TESTING, INC

Determination of Adhesion and Bond Strength of Geocomposites

GRI GC7

CLIENT: Tetra Tech-RMC

JOB NO.: 2617-02

PROJECT: Present Landfill-RFETS, Golden, CO

DATE: 10-18-04 SKL

TEXDRAIN 200 DS8
Lot #C2-8-2-04-2196-200, Date Sampled: 09-22-04, Shift: 3

Specimen	MD lbs/in width
1	2.1
2	1.4
3	1.5
4	2.5
5	6.6
Average	**2.8**
Std. Dev.	**2.2**

DATA ENTERED BY: SR

DATA CHECKED BY: JTR

FILENAME: TTAD2196

DATE: 10/23/2004

DATE: 10/25/04

ADVANCED TERRA TESTING, INC

Determination of Adhesion and Bond Strength of Geocomposites
GRI GC7

CLIENT: Tetra Tech-RMC

JOB NO.: 2617-02

PROJECT: Present Landfill-RFETS, Golden, CO

DATE: 10-19-04 SKL

TEXDRAIN 200 DS8
Lot #C2-8-2-04-2266-200, Date Sampled: 09-23-04, Shift: 3

Specimen	MD lbs/in width
1	2.2
2	4.4
3	2.5
4	1.4
5	2.5
Average	**2.6**
Std. Dev.	**1.1**

DATA ENTERED BY: SR
DATA CHECKED BY: JJR
FILENAME: TTAD2266

DATE: 10/23/2004
DATE: 10/25/04

ADVANCED TERRA TESTING, INC

Determination of Adhesion and Bond Strength of Geocomposites

GRI GC7

CLIENT: Tetra Tech-RMC

JOB NO.: 2617-02

PROJECT: Present Landfill-RFETS, Golden, CO

DATE: 10-18-04 SKL

TEXDRAIN 200 DS8
Lot #C2-8-2-04-2301-200, Date Sampled: 09-24-04, Shift: 3

Specimen	MD lbs/in width
1	3.5
2	5.3
3	1.5
4	1.3
5	1.7
Average	**2.7**
Std. Dev.	**1.7**

DATA ENTERED BY: SR

DATA CHECKED BY: JDK

FILENAME: TTAD2301

DATE: 10/23/2004

DATE: 10/25/04

ADVANCED TERRA TESTING, INC

Determination of Adhesion and Bond Strength of Geocomposites

GRI GC7

CLIENT: Tetra Tech-RMC

JOB NO.: 2617-02

PROJECT: Present Landfill-RFETS, Golden, CO

DATE: 10-19-04 SKL

TEXDRAIN 200 DS8
No Identification

Specimen	MD lbs/in width
1	3.0
2	3.5
3	5.0
4	2.1
5	1.5
Average	**3.0**
Std. Dev.	**1.4**

DATA ENTERED BY: SR

DATA CHECKED BY: JTR

FILENAME: TTADNOID

DATE: 10/23/2004

DATE: 10/25/04

ADVANCED TERRA TESTING, INC

Determination of Adhesion and Bond Strength of Geocomposites

GRI GC7

CLIENT: Tetra Tech-RMC

JOB NO.: 2617-02

PROJECT: Present Landfill-RFETS, Golden, CO

DATE: 10-18-04 SKL

TEXDRAIN 200 DS8
2230

Specimen	MD lbs/in width
1	2.1
2	3.5
3	2.6
4	3.4
5	3.4
Average	**3.0**
Std. Dev.	**0.6**

DATA ENTERED BY: SR
DATA CHECKED BY: JTR
FILENAME: TTAD2230

DATE: 10/25/2004
DATE: 10/25/04

ADVANCED TERRA TESTING, INC

10-22-04 JTR

Chatillon Loading System

1 Kip Capacity Load Cell

2617-02

Tetra Tech - RMC

Present Landfill Design - RREETS, Golden, CO

Roll #C2-8-2-04-1917-200, Date Sampled: 09-17-04, Shift 4

CETCO TEXDRAIN 200 DS8 (Geonet Only)

Tensile Strength

ASTM D 5035/Modified

Specimen Size 2" x 6"

Data Entered By: SR

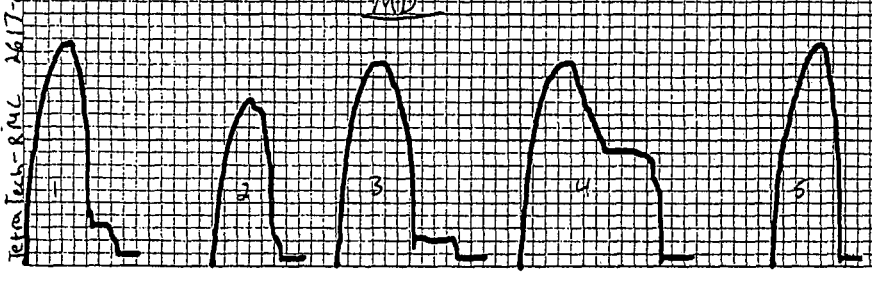
SCALES X = 1.5"/IN

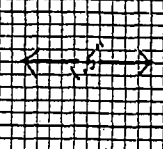
Y = 75.7#/IN

DISPLACEMENT RATE = 12"/MIN

GRIP SEPARATION = 3.0"

Specimen	MD Load (lbs/in width)
1	67.8
2	50.7
3	61.7
4	61.7
5	67.4
Average	61.9
Std. Dev.	6.9





ATT #6 Tetra Tech-RMC 2617-02 D5035 Tensile Strength (2-8-2-04-1917-200 9/17/04 X=1.5"/in Y=75.7#/in JTR 10/22/04

Data Checked By: JTR Date: 10/25/04

Filename: K:/TT2617/TTTS1917.lwp

ADVANCED TERRA TESTING, Inc

10-22-04 JTR

Chatillon Loading System

1 Kip Capacity Load Cell

2617-02

Tetra Tech - RMC

Present Landfill Design - RFETS, Golden, CO

Roll #C2-8-2-04-1948-200, Date Sampled: 09-18-04, Shift 2

CETCO TEXDRAIN 200 DS8 (Geonet Only)

Tensile Strength

ASTM D 5035/Modified

Specimen Size 2" x 6"

Data Entered By: SR

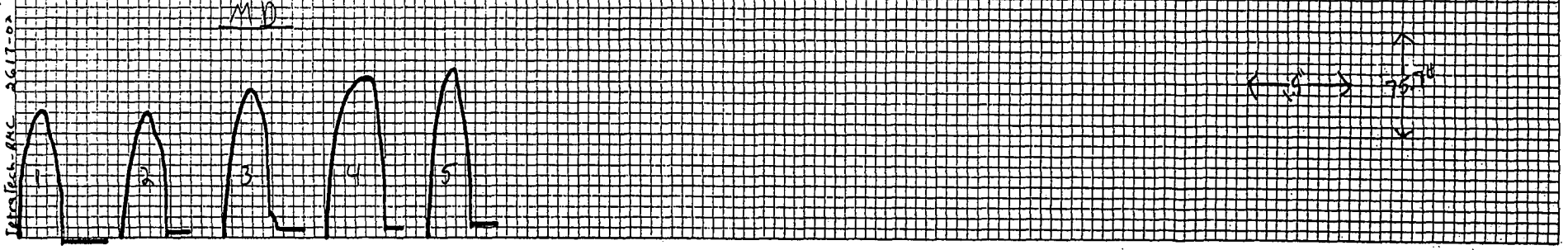
SCALES X = 1.5"/IN

Y = 75.7#/IN

DISPLACEMENT RATE = 12"/MIN

GRIP SEPARATION = 3.0"

Specimen	MD Load (lbs/in width)
1	46.6
2	46.2
3	54.1
4	58.7
5	61.7
Average	53.5
Std. Dev.	7.0



Data Checked By: JTR Date: 10/27/04

Filename: K:/TT2617/TTTS1948.lwp

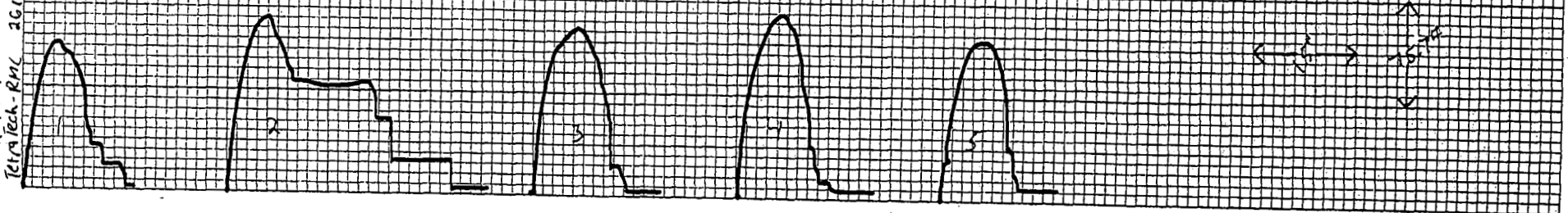
ADVANCED TERRA TESTING, Inc

10-22-04 JTR
Chatillon Loading System
1 Kip Capacity Load Cell
2617-02

Tetra Tech - RMC
Present Landfill Design - REETS, Golden, CO
Roll #C2-8-2-04-2015-200, Date Sampled: 09-19-04, Shift 2
CETCO TEXDRAIN 200 DS8 (Geonet Only)
Tensile Strength
ASTM D 5035/Modified
Specimen Size 2" x 6"

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN
DISPLACEMENT RATE = 12"/MIN
GRIP SEPARATION = 3.0"

Specimen	MD Load (lbs/in width)
1	54.9
2	65.1
3	62.4
4	68.1
5	59.0
Average	61.8
Std. Dev.	5.2



ATT#1 Tetra Tech-RMC 2617-02 D Tensile Strength D5035 Lot C2-8-2-04-2015-200 9/19/04 X=1.5"/in Y=75.7#/in 5 Shift #2 JTR 10/22/04

Data Checked By: JTR Date: 10/27/04
Filename: K:/TT2617/TTTS2015.lwp

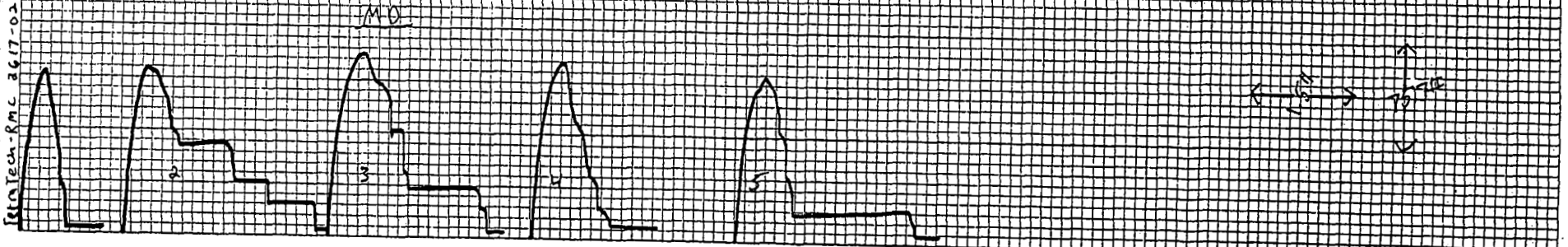
ADVANCED TERRA TESTING, inc

10-22-04.ITR
Chatillon Loading System
1 Kip Capacity Load Cell
2617-02

Tetra Tech - RMC
Present Landfill Design - RFETS, Golden, CO
Roll #C2-8-2-04-2048-200, Date Sampled: 09-19-04, Shift 4
CETCO TEXDRAIN 200 DS8 (Geonet Only)
Tensile Strength
ASTM D 5035/Modified
Specimen Size 2" x 6"

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN
DISPLACEMENT RATE = 12"/MIN
GRIP SEPARATION = 3.0"

Specimen	MD Load (lbs/in width)
1	59.0
2	60.6
3	66.2
4	64.0
5	60.2
Average	62.0
Std. Dev.	3.0



ITR 10/22/04 Shift #4 Y=75.7#/in X=1.5"/in 9/19/04 LH C2-8-2-04-2048-200 D-5035 Tensile Strength Tetra-Rmc 2617-02 ATT #5

Data Checked By: JTR Date: 10/25/04
Filename: K:/TT2617/TTTS2048.lwp

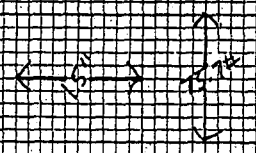
ADVANCED TERRA TESTING, Inc

10-22-04 JTR
Chatillon Loading System
1 Kip Capacity Load Cell
2617-02

Tetra Tech - RMC
Present Landfill Design - RFETS, Golden, CO
Roll #C2-8-2 -04-2160-200, Date Sampled: 09-21-04, Shift 3
CETCO TEXDRAIN 200 DS8 (Geonet Only)
Tensile Strength
ASTM D 5035/Modified
Specimen Size 2" x 6"

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN
DISPLACEMENT RATE = 12"/MIN
GRIP SEPARATION = 3.0"

Specimen	MD Load (lbs/in width)
1	43.9
2	52.2
3	57.2
4	44.7
5	55.6
Average	50.7
Std. Dev.	6.1



Data Checked By: JTR Date: 10/25/04
Filename: K:/TT2617/TTTS2160.lwp

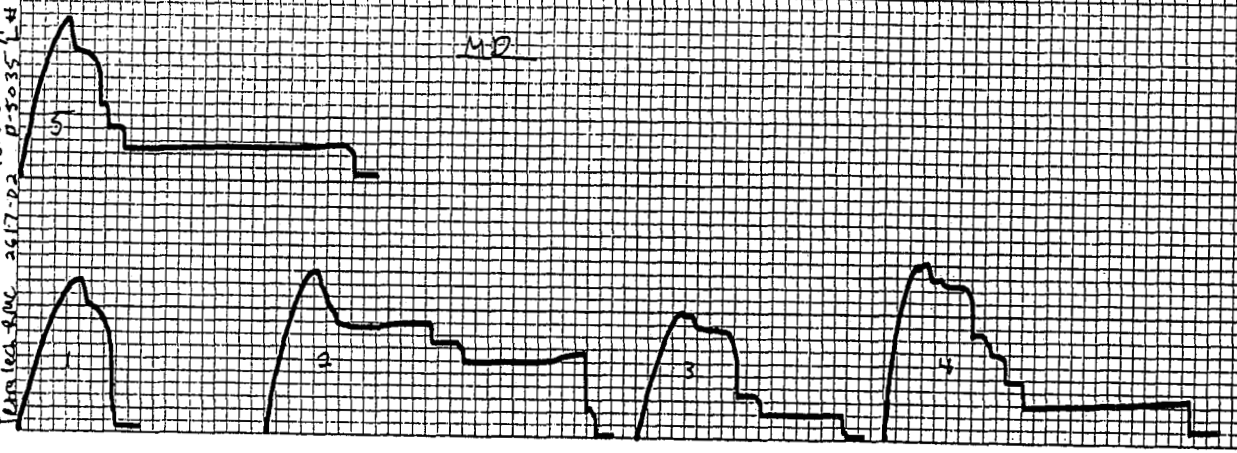
ADVANCED TERRA TESTING, Inc

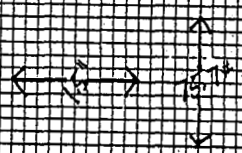
10-23-04 JTR
Chatillon Loading System
1 Kip Capacity Load Cell
2617-02

Tetra Tech - RMC
Present Landfill Design - RFETS, Golden, CO
Roll #C2-8-2-04-2196-200, Date Sampled: 09-22-04, Shift 3
CETCO TEXDRAIN 200 DS8 (Geonet Only)
Tensile Strength
ASTM D 5035/Modified
Specimen Size 2" x 6"

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN
DISPLACEMENT RATE = 12"/MIN
GRIP SEPARATION = 3.0"

Specimen	MD Load (lbs/in width)
1	46.5
2	50.0
3	38.2
4	54.1
5	48.4
Average	47.4
Std. Dev.	5.9





Data Checked By: JTR Date: 10/25/04
Filename: K:/TT2617/TTTS2196.lwp

ADVANCED TERRA TESTING, Inc

10-22-04 JTR

Chatillon Loading System

1 Kip Capacity Load Cell

2617-02

Tetra Tech - RMC

Present Landfill Design - RFETS, Golden, CO

Roll #C2-8-2 -04-2111-200, Date Sampled: 09-20-04, Shift 4

CETCO TEXDRAIN 200 DS8 (Geonet Only)

Tensile Strength

ASTM D 5035/Modified

Specimen Size 2" x 6"

Data Entered By: SR

SCALES X = 1.5"/IN

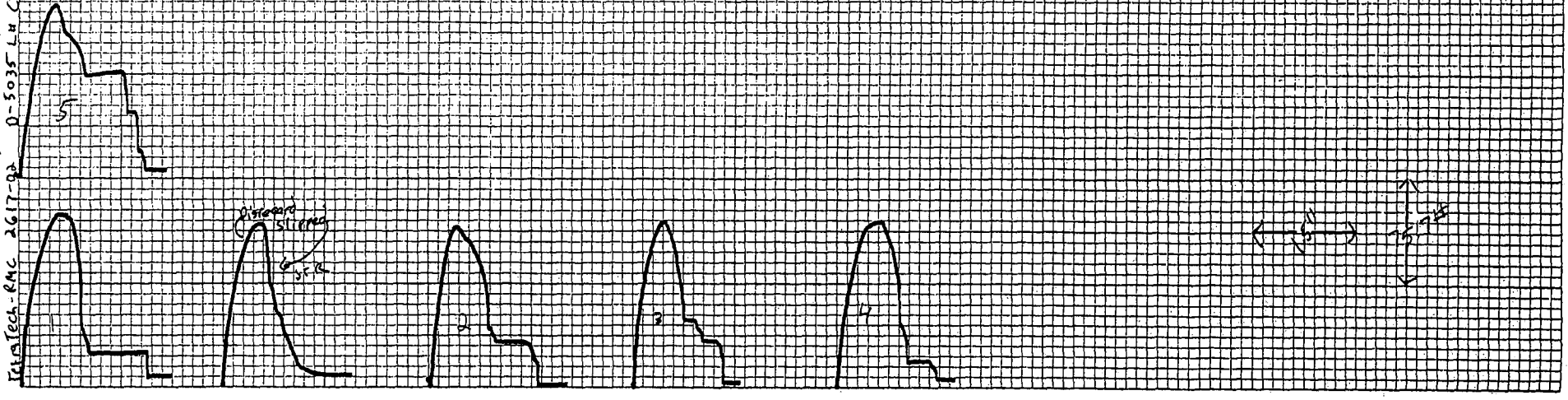
Y = 75.7#/IN

DISPLACEMENT RATE = 12"/MIN

GRIP SEPARATION = 3.0"

Specimen	MD Load (lbs/in width)
1	63.6
2	58.3
3	60.6
4	60.6
5	63.6
Average	61.3
Std. Dev.	2.3

MD



Data Checked By: JTR Date: 10/25/04

Filename: K:/TT2617/TTTS2111.lwp

ADVANCED TERRA TESTING, Inc

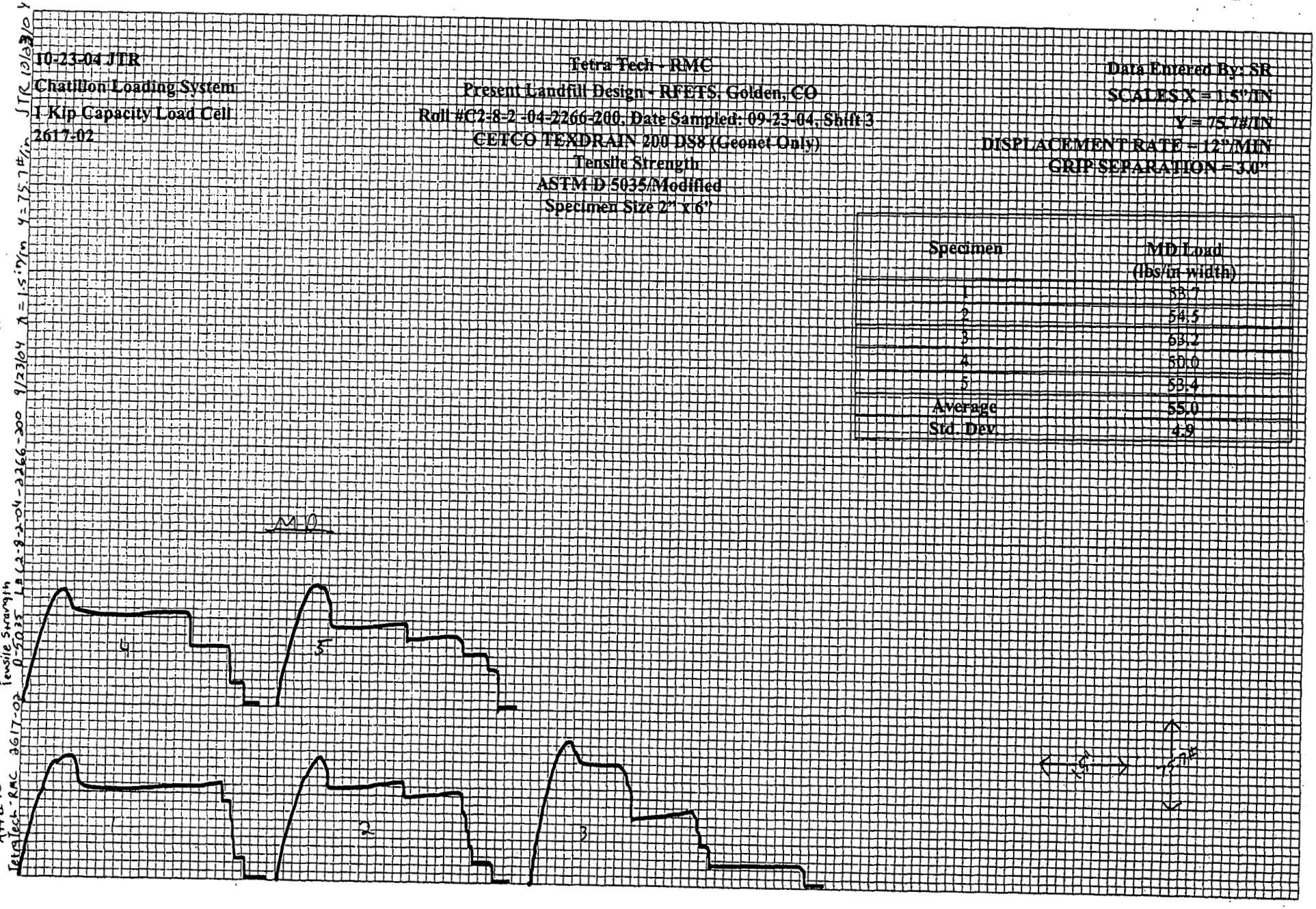
ATT #4 TetraTech-RMC 2617-02 Tensile Strength D-5035 LW C2-8-2-04-2111-200 9/20/04 X=1.5"/in Y=75.7#/in JTR 10/22/04 Shift #4

10-23-04 JTR
Chatillon Loading System
1 Kip Capacity Load Cell
2617-02

Tetra Tech - RMC
Present Landfill Design - RFETS, Golden, CO
Roll #C2-8-2-04-2266-200, Date Sampled: 09-23-04, Shift 3
CETCO TEXDRAIN 200 DS8 (Geonet Only)
Tensile Strength
ASTM D 5035/Modified
Specimen Size 2" x 6"

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN
DISPLACEMENT RATE = 12"/MIN
GRIP SEPARATION = 3.0"

Specimen	MD Load (lbs/in width)
1	58.7
2	54.5
3	63.2
4	50.0
5	53.4
Average	55.0
Std. Dev.	4.9



Data Checked By: JTR Date: 10/25/04
Filename: K:/TT2617/TTTS2266.lwp

ADVANCED TERRA TESTING, Inc

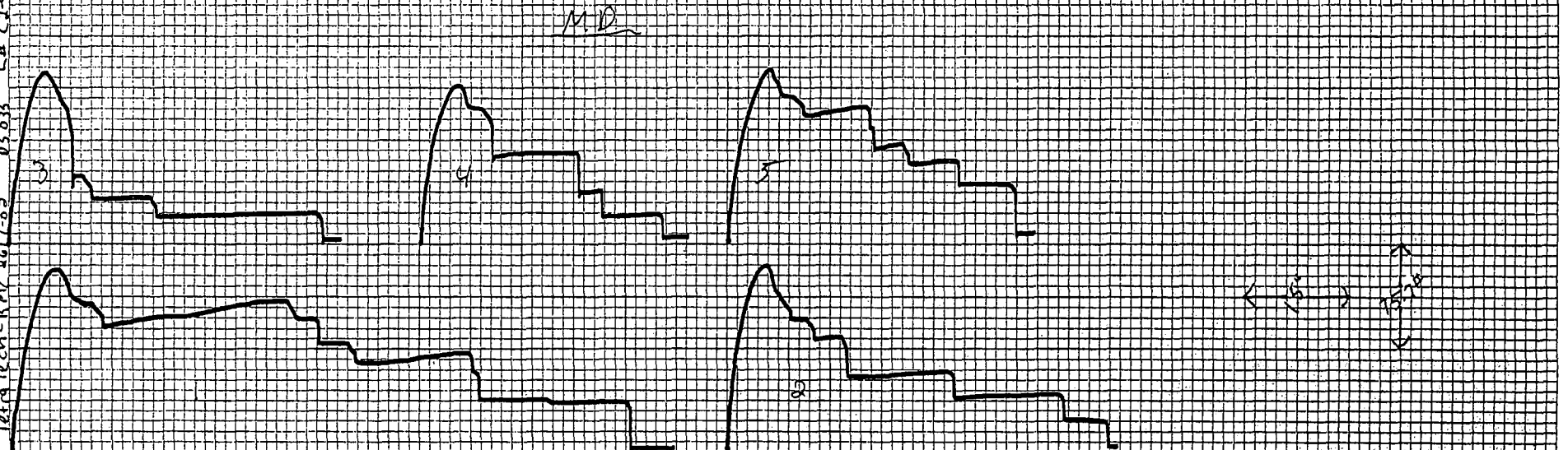
10-22-04 JTR

Chatillon Loading System
1 Kip Capacity Load Cell
2617-02

Tetra Tech - RMC
Present Landfill Design - RFETS, Golden, CO
Roll #C2-8-2 -04-2301-200, Date Sampled: 09-24-04, Shift 3
CETCO TEXDRAIN 200 DS8 (Geonet Only)
Tensile Strength
ASTM D 5035/Modified
Specimen Size 2" x 6"

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN
DISPLACEMENT RATE = 12"/MIN
GRIP SEPARATION = 3.0"

Specimen	MD Load (lbs/in width)
1	67.0
2	68.5
3	62.8
4	57.9
5	64.0
Average	64.0
Std. Dev.	4.1



Data Checked By: JTR Date: 10/27/04
Filename: K:/TT2617/TTTS2301.lwp

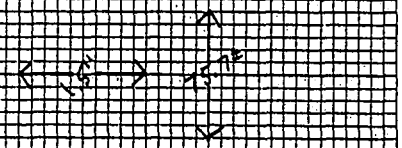
ADVANCED TERRA TESTING, Inc

10-22-04 JTR
Chatillon Loading System
1 Kip Capacity Load Cell
2617-02

Tetra Tech - RMC
Present Landfill Design - RFETS, Golden, CO
No Identification
CETCO TEXDRAIN 200 DS8 (Geonet Only)
Tensile Strength
ASTM D 5035/Modified
Specimen Size 2" x 6"

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN
DISPLACEMENT RATE = 12"/MIN
GRIP SEPARATION = 3.0"

Specimen	MD Load (lbs/in width)
1	46.2
2	65.5
3	45.8
4	56.0
5	51.1
Average	52.9
Std. Dev.	8.2



ATT # 9
Tetra Tech - RMC 2617-02 Tensile Strength D-5035 No identification x=1.5"/in y=75.7 #/in JTR 10/28/04

Data Checked By: JTR Date: 10/28/04
Filename: K:/TT2617/TTTSNOID.lwp

ADVANCED TERRA TESTING, Inc

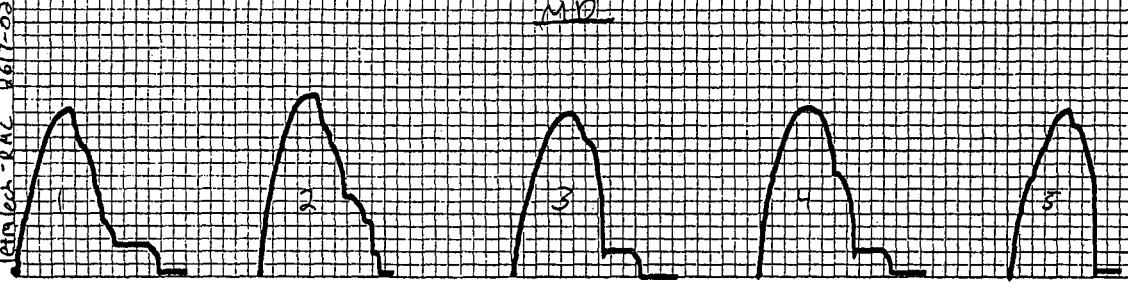
10-22-04 JTR
Chatillon Loading System
1 Kip Capacity Load Cell
2617-02

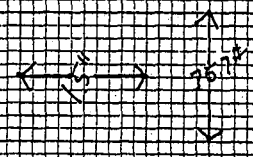
Tetra Tech - RMC
Present Landfill Design - RFETS, Golden, CO
#2230
CETCO TEXDRAIN 200 DS8 (Geonet Only)
Tensile Strength
ASTM D 5035/Modified
Specimen Size 2" x 6"

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN
DISPLACEMENT RATE = 12"/MIN
GRIP SEPARATION = 3.0"

Specimen	MD Load (lbs/in width)
1	50.7
2	54.9
3	49.6
4	51.5
5	50.3
Average	51.4
Std. Dev.	2.1

10/22/04 JTR Y=75.7#/in X=1.5"/in R# 2230 Tensile Strength D5035 2617-02 TerraTech - RMC ATT #8





Data Checked By: JTR Date: 10/25/04
Filename: K:/TT2617/TTTS2230.lwp

ADVANCED TERRA TESTING, inc

THICKNESS
ASTM D 5199
(IN.)

CLIENT: Tetra Tech-RMC

JOB NO.: 2617-02

PROJECT: Present Landfill-RFETS, Golden, CO

DATE: 10-21-04 SKL

TEXDRAIN 200 DS8
Lot #C2-8-2-04-1917-200, Date Sampled: 09-17-04, Shift: 4, Geonet

1	0.2156	**2**	0.2201	**3**	0.2207	**4**	0.2282	**5**	0.2228
	0.2148		0.2199		0.2292		0.2216		0.2278
	0.2163		0.2213		0.2190		0.2231		0.2245
	0.2154		0.2212		0.2283		0.2232		0.2226
	0.2186		0.2219		0.2229		0.2245		0.2246
Average	0.2161	**Average**	0.2209	**Average**	0.2240	**Average**	0.2241	**Average**	0.2245
								AVERAGE FOR 5 SPECIMENS	**0.2219**

DATA ENTERED BY: SR
DATA CHECKED BY: JTR
FILENAME: TTTH1917

DATE: 10/23/2004
DATE: 10/25/04

ADVANCED TERRA TESTING, INC.

THICKNESS
ASTM D 5199
(IN.)

CLIENT: Tetra Tech-RMC JOB NO.: 2617-02

PROJECT: Present Landfill-RFETS, Golden, CO DATE: 10-21-04 JTR

TEXDRAIN 200 DS8
Lot #C2-8-2-04-1948-200, Date Sampled: 09-18-04, Shift: 2, Geonet

1	0.2115	**2**	0.2188	**3**	0.2150	**4**	0.2152	**5**	0.2119
	0.2113		0.2165		0.2142		0.2146		0.2122
	0.2123		0.2136		0.2155		0.2175		0.2153
	0.2112		0.2142		0.2128		0.2169		0.2103
	0.2115		0.2196		0.2122		0.2159		0.2114
Average	0.2116	**Average**	0.2165	**Average**	0.2139	**Average**	0.2160	**Average**	0.2122
								AVERAGE FOR 5 SPECIMENS	**0.2141**

DATA ENTERED BY: SR DATE: 10/23/2004
DATA CHECKED BY: JTR DATE: 10/25/04
FILENAME: TTTH1948

ADVANCED TERRA TESTING, INC.

THICKNESS
ASTM D 5199
(IN.)

CLIENT: Tetra Tech-RMC

JOB NO.: 2617-02

PROJECT: Present Landfill-RFETS, Golden, CO

DATE: 10-21-04 JTR

TEXDRAIN 200 DS8
Lot #C2-8-2-04-2015-200, Date Sampled: 09-09-04, Shift: 2, Geonet

1	0.2180	**2**	0.2165	**3**	0.2191	**4**	0.2167	**5**	0.2148
	0.2163		0.2149		0.2122		0.2137		0.2144
	0.2188		0.2129		0.2089		0.2151		0.2140
	0.2191		0.2145		0.2149		0.2167		0.2107
	0.2192		0.2133		0.2176		0.2153		0.2127
Average	0.2183	**Average**	0.2144	**Average**	0.2145	**Average**	0.2155	**Average**	0.2133

AVERAGE FOR 5 SPECIMENS **0.2152**

DATA ENTERED BY: SR
DATA CHECKED BY: JTR
FILENAME: TTTH2015

DATE: 10/23/2004
DATE: 10/25/04

ADVANCED TERRA TESTING, INC.

THICKNESS
ASTM D 5199
(IN.)

CLIENT: Tetra Tech-RMC

JOB NO.: 2617-02

PROJECT: Present Landfill-RFETS; Golden, CO

DATE: 10-21-04 SKL

TEXDRAIN 200 DS8
Lot #C2-8-2-04-2048-200, Date Sampled: 09-19-04, Shift: 4, Geonet

1	0.2213	**2**	0.2176	**3**	0.2214	**4**	0.2164	**5**	0.2169
	0.2124		0.2164		0.2205		0.2470		0.2117
	0.2094		0.2169		0.2162		0.2193		0.2100
	0.2183		0.2216		0.2201		0.2176		0.2102
	0.2234		0.2211		0.2178		0.2262		0.2137
Average	0.2170	**Average**	0.2187	**Average**	0.2192	**Average**	0.2253	**Average**	0.2125
								AVERAGE FOR 5 SPECIMENS	**0.2185**

DATA ENTERED BY: SR
DATA CHECKED BY: JTR
FILENAME: TTTH2048

DATE: 10/23/2004
DATE: 10/25/04

ADVANCED TERRA TESTING, INC.

THICKNESS
ASTM D 5199
(IN.)

CLIENT: Tetra Tech-RMC

JOB NO.: 2617-02

PROJECT: Present Landfill-RFETS, Golden, CO

DATE: 10-21-04 SKL

TEXDRAIN 200 DS8
Lot #C2-8-2-04-2111-200, Date Sampled: 09-20-04, Shift: 4, Geonet

1	0.2210	2	0.2140	3	0.2189	4	0.2219	5	0.2162
	0.2209		0.2152		0.2213		0.2221		0.2132
	0.2173		0.2154		0.2205		0.2189		0.2172
	0.2222		0.2178		0.2183		0.2231		0.2131
	0.2197		0.2147		0.2166		0.2215		0.2139
Average	0.2202	Average	0.2154	Average	0.2191	Average	0.2215	Average	0.2147
								AVERAGE FOR 5 SPECIMENS	0.2182

DATA ENTERED BY: SR
DATA CHECKED BY: JTK
FILENAME: TTTH2111

DATE: 10/23/2004
DATE: 10/25/04

ADVANCED TERRA TESTING, INC.

THICKNESS
ASTM D 5199
(IN.)

CLIENT: Tetra Tech-RMC

JOB NO.: 2617-02

PROJECT: Present Landfill-RFETS, Golden, CO

DATE: 10-21-04 SKL

TEXDRAIN 200 DS8
Lot #C2-8-2-04-2160-200, Date Sampled: 09-21-04, Shift: 3, Geonet

1	0.2157	**2**	0.2152	**3**	0.2139	**4**	0.2145	**5**	0.2149
	0.2159		0.2174		0.2099		0.2135		0.2160
	0.2162		0.2156		0.2121		0.2136		0.2232
	0.2172		0.2166		0.2136		0.2219		0.2248
	0.2152		0.2139		0.2140		0.2165		0.2162
Average	0.2160	**Average**	0.2157	**Average**	0.2127	**Average**	0.2160	**Average**	0.2190
								AVERAGE FOR 5 SPECIMENS	**0.2159**

DATA ENTERED BY: SR
DATA CHECKED BY: JTR
FILENAME: TTTH2160

DATE: 10/23/2004
DATE: 10/25/04

ADVANCED TERRA TESTING, INC.

THICKNESS
ASTM D 5199
(IN.)

CLIENT: Tetra Tech-RMC

JOB NO.: 2617-02

PROJECT: Present Landfill-RFETS, Golden, CO

DATE: 10-22-04 JTR

TEXDRAIN 200 DS8
Lot #C2-8-2-04-2196-200, Date Sampled: 09-22-04, Shift: 3, Geonet

1	0.2241	2	0.2231	3	0.2228	4	0.2263	5	0.2244
	0.2217		0.2205		0.2218		0.2225		0.2222
	0.2270		0.2222		0.2214		0.2237		0.2252
	0.2259		0.2211		0.2222		0.2224		0.2241
	0.2202		0.2229		0.2226		0.2254		0.2215
Average	0.2238	Average	0.2220	Average	0.2222	Average	0.2241	Average	0.2235
							AVERAGE FOR 5 SPECIMENS		0.2231

DATA ENTERED BY: SR
DATA CHECKED BY: STR
FILENAME: TTTH2196

DATE: 10/23/2004
DATE: 10/25/04

ADVANCED TERRA TESTING, INC.

THICKNESS
ASTM D 5199
(IN.)

CLIENT: Tetra Tech-RMC

JOB NO.: 2617-02

PROJECT: Present Landfill-RFETS, Golden, CO

DATE: 10-21-04 JTR

TEXDRAIN 200 DS8
Lot #C2-8-2-04-2266-200, Date Sampled: 09-23-04, Shift: 3, Geonet

1	0.2279	2	0.2229	3	0.2202	4	0.2235	5	0.2240
	0.2302		0.2202		0.2205		0.2239		0.2228
	0.2257		0.2245		0.2233		0.2224		0.2221
	0.2292		0.2269		0.2224		0.2245		0.2227
	0.2288		0.2266		0.2227		0.2249		0.2245
Average	0.2284	Average	0.2242	Average	0.2218	Average	0.2238	Average	0.2232
								AVERAGE FOR 5 SPECIMENS	0.2243

DATA ENTERED BY: SR
DATA CHECKED BY: JTR
FILENAME: TTTH2266

DATE: 10/23/2004
DATE: 10/25/04

ADVANCED TERRA TESTING, INC.

THICKNESS
ASTM D 5199
(IN.)

CLIENT: Tetra Tech-RMC

JOB NO.: 2617-02

PROJECT: Present Landfill-RFETS, Golden, CO

DATE: 10-21-04 JTR

TEXDRAIN 200 DS8
Lot #C2-8-2-04-2301-200, Date Sampled: 09-24-04, Shift: 3, Geonet

1	0.2180	2	0.2139	3	0.2182	4	0.2208	5	0.2250
	0.2190		0.2186		0.2221		0.2228		0.2234
	0.2176		0.2154		0.2249		0.2172		0.2233
	0.2172		0.2179		0.2213		0.2123		0.2229
	0.2186		0.2194		0.2142		0.2148		0.2225
Average	0.2181	Average	0.2170	Average	0.2201	Average	0.2176	Average	0.2234
								AVERAGE FOR 5 SPECIMENS	0.2193

DATA ENTERED BY: SR
DATA CHECKED BY: JTR
FILENAME: TTTH2301

DATE: 10/23/2004
DATE: 10/25/04

ADVANCED TERRA TESTING, INC.

THICKNESS
ASTM D 5199
(IN.)

CLIENT: Tetra Tech-RMC

JOB NO.: 2617-02

PROJECT: Present Landfill-RFETS, Golden, CO

DATE: 10-21-04 SKL

TEXDRAIN 200 DS8
No Identification

1	0.2229	**2**	0.2182	**3**	0.2268	**4**	0.2242	**5**	0.2257
	0.2206		0.2161		0.2109		0.2143		0.2209
	0.2252		0.2188		0.2152		0.2178		0.2241
	0.2258		0.2203		0.2173		0.2173		0.2178
	0.2211		0.2162		0.2186		0.2197		0.2192
Average	0.2231	**Average**	0.2179	**Average**	0.2178	**Average**	0.2187	**Average**	0.2215
								AVERAGE FOR 5 SPECIMENS	**0.2198**

DATA ENTERED BY: SR
DATA CHECKED BY: JTR
FILENAME: TTTHNOID

DATE: 10/23/2004
DATE: 10/25/04

ADVANCED TERRA TESTING, INC.

THICKNESS
ASTM D 5199
(IN.)

CLIENT: Tetra Tech-RMC

JOB NO.: 2617-02

PROJECT: Present Landfill-RFETS, Golden, CO

DATE: 10-21-04 SKL

TEXDRAIN 200 DS8
2230

1	0.2243	**2**	0.2278	**3**	0.2287	**4**	0.2268	**5**	0.2326
	0.2235		0.2282		0.2311		0.2298		0.2364
	0.2258		0.2286		0.2336		0.2309		0.2294
	0.2251		0.2274		0.2358		0.2302		0.2297
	0.2282		0.2327		0.2321		0.2256		0.2337
Average	0.2254	**Average**	0.2289	**Average**	0.2323	**Average**	0.2287	**Average**	0.2324
								AVERAGE FOR 5 SPECIMENS	**0.2295**

DATA ENTERED BY: SR
DATA CHECKED BY: JTR
FILENAME: TTTH2230

DATE: 10/25/2004
DATE: 10/25/04

ADVANCED TERRA TESTING, INC.

THICKNESS
ASTM D 5199
(IN.)

CLIENT: Tetra Tech-RMC

JOB NO.: 2617-02

PROJECT: Present Landfill-RFETS, Golden, CO

DATE: 10-21-04 SKL

TEXDRAIN 200 DS8
Lot #C2-8-2-04-1917-200, Date Sampled: 09-17-04, Shift: 4, Geonet

1	0.2156	**2**	0.2201	**3**	0.2207	**4**	0.2282	**5**	0.2228
	0.2148		0.2199		0.2292		0.2216		0.2278
	0.2163		0.2213		0.2190		0.2231		0.2245
	0.2154		0.2212		0.2283		0.2232		0.2226
	0.2186		0.2219		0.2229		0.2245		0.2246
Average	0.2161	**Average**	0.2209	**Average**	0.2240	**Average**	0.2241	**Average**	0.2245
								AVERAGE FOR 5 SPECIMENS	**0.2219**

DATA ENTERED BY: SR
DATA CHECKED BY: JCR
FILENAME: TTTH1917

DATE: 10/23/2004
DATE: 10/26/04

ADVANCED TERRA TESTING, INC.

THICKNESS
ASTM D 5199
(IN.)

CLIENT: Tetra Tech-RMC

JOB NO.: 2617-02

PROJECT: Present Landfill-RFETS, Golden, CO

DATE: 10-21-04 JTR

TEXDRAIN 200 DS8
Lot #C2-8-2-04-1948-200, Date Sampled: 09-18-04, Shift: 2, Geonet

1	0.2115	**2**	0.2188	**3**	0.2150	**4**	0.2152	**5**	0.2119
	0.2113		0.2165		0.2142		0.2146		0.2122
	0.2123		0.2136		0.2155		0.2175		0.2153
	0.2112		0.2142		0.2128		0.2169		0.2103
	0.2115		0.2196		0.2122		0.2159		0.2114
Average	0.2116	**Average**	0.2165	**Average**	0.2139	**Average**	0.2160	**Average**	0.2122
								AVERAGE FOR 5 SPECIMENS	**0.2141**

DATA ENTERED BY: SR
DATA CHECKED BY: JTR
FILENAME: TTTH1948

DATE: 10/23/2004
DATE: 10/25/04

ADVANCED TERRA TESTING, INC.

THICKNESS
ASTM D 5199
(IN.)

CLIENT: Tetra Tech-RMC

JOB NO.: 2617-02

PROJECT: Present Landfill-RFETS, Golden, CO

DATE: 10-21-04 JTR

TEXDRAIN 200 DS8
Lot #C2-8-2-04-2015-200, Date Sampled: 09-09-04, Shift: 2, Geonet

1	0.2180	2	0.2165	3	0.2191	4	0.2167	5	0.2148
	0.2163		0.2149		0.2122		0.2137		0.2144
	0.2188		0.2129		0.2089		0.2151		0.2140
	0.2191		0.2145		0.2149		0.2167		0.2107
	0.2192		0.2133		0.2176		0.2153		0.2127
Average	0.2183	Average	0.2144	Average	0.2145	Average	0.2155	Average	0.2133
								AVERAGE FOR 5 SPECIMENS	0.2152

DATA ENTERED BY: SR
DATA CHECKED BY: JTR
FILENAME: TTTH2015

DATE: 10/23/2004
DATE: 10/25/04

ADVANCED TERRA TESTING, INC.

THICKNESS
ASTM D 5199
(IN.)

CLIENT: Tetra Tech-RMC

JOB NO.: 2617-02

PROJECT: Present Landfill-RFETS, Golden, CO

DATE: 10-21-04 SKL

TEXDRAIN 200 DS8
Lot #C2-8-2-04-2048-200, Date Sampled: 09-19-04, Shift: 4, Geonet

1	0.2213	**2**	0.2176	**3**	0.2214	**4**	0.2164	**5**	0.2169
	0.2124		0.2164		0.2205		0.2470		0.2117
	0.2094		0.2169		0.2162		0.2193		0.2100
	0.2183		0.2216		0.2201		0.2176		0.2102
	0.2234		0.2211		0.2178		0.2262		0.2137
Average	0.2170	**Average**	0.2187	**Average**	0.2192	**Average**	0.2253	**Average**	0.2125
								AVERAGE FOR 5 SPECIMENS	**0.2185**

DATA ENTERED BY: SR
DATA CHECKED BY: JTR
FILENAME: TTTH2048

DATE: 10/23/2004
DATE: 10/25/04

ADVANCED TERRA TESTING, INC.

THICKNESS
ASTM D 5199
(IN.)

CLIENT: Tetra Tech-RMC

JOB NO.: 2617-02

PROJECT: Present Landfill-RFETS, Golden, CO

DATE: 10-21-04 SKL

TEXDRAIN 200 DS8
Lot #C2-8-2-04-2111-200, Date Sampled: 09-20-04, Shift: 4, Geonet

1	0.2210	2	0.2140	3	0.2189	4	0.2219	5	0.2162
	0.2209		0.2152		0.2213		0.2221		0.2132
	0.2173		0.2154		0.2205		0.2189		0.2172
	0.2222		0.2178		0.2183		0.2231		0.2131
	0.2197		0.2147		0.2166		0.2215		0.2139
Average	0.2202	Average	0.2154	Average	0.2191	Average	0.2215	Average	0.2147
								AVERAGE FOR 5 SPECIMENS	0.2182

DATA ENTERED BY: SR
DATA CHECKED BY: JTK
FILENAME: TTTH2111

DATE: 10/23/2004
DATE: 10/25/04

ADVANCED TERRA TESTING, INC.

THICKNESS
ASTM D 5199
(IN.)

CLIENT: Tetra Tech-RMC

JOB NO.: 2617-02

PROJECT: Present Landfill-RFETS, Golden, CO

DATE: 10-21-04 SKL

TEXDRAIN 200 DS8
Lot #C2-8-2-04-2160-200, Date Sampled: 09-21-04, Shift: 3, Geonet

1	0.2157	**2**	0.2152	**3**	0.2139	**4**	0.2145	**5**	0.2149
	0.2159		0.2174		0.2099		0.2135		0.2160
	0.2162		0.2156		0.2121		0.2136		0.2232
	0.2172		0.2166		0.2136		0.2219		0.2248
	0.2152		0.2139		0.2140		0.2165		0.2162
Average	0.2160	**Average**	0.2157	**Average**	0.2127	**Average**	0.2160	**Average**	0.2190
								AVERAGE FOR 5 SPECIMENS	**0.2159**

DATA ENTERED BY: SR
DATA CHECKED BY: JTR
FILENAME: TTTH2160

DATE: 10/23/2004
DATE: 10/23/04

ADVANCED TERRA TESTING, INC.

THICKNESS
ASTM D 5199
(IN.)

CLIENT: Tetra Tech-RMC

JOB NO.: 2617-02

PROJECT: Present Landfill-RFETS, Golden, CO

DATE: 10-22-04 JTR

TEXDRAIN 200 DS8
Lot #C2-8-2-04-2196-200, Date Sampled: 09-22-04, Shift: 3, Geonet

1	0.2241	2	0.2231	3	0.2228	4	0.2263	5	0.2244
	0.2217		0.2205		0.2218		0.2225		0.2222
	0.2270		0.2222		0.2214		0.2237		0.2252
	0.2259		0.2211		0.2222		0.2224		0.2241
	0.2202		0.2229		0.2226		0.2254		0.2215
Average	0.2238	Average	0.2220	Average	0.2222	Average	0.2241	Average	0.2235
							AVERAGE FOR 5 SPECIMENS		0.2231

DATA ENTERED BY: SR
DATA CHECKED BY: STR
FILENAME: TTTH2196

DATE: 10/23/2004
DATE: 10/25/04

ADVANCED TERRA TESTING, INC.

THICKNESS
ASTM D 5199
(IN.)

CLIENT: Tetra Tech-RMC

JOB NO.: 2617-02

PROJECT: Present Landfill-RFETS, Golden, CO

DATE: 10-21-04 JTR

TEXDRAIN 200 DS8
Lot #C2-8-2-04-2266-200, Date Sampled: 09-23-04, Shift: 3, Geonet

1	0.2279	**2**	0.2229	**3**	0.2202	**4**	0.2235	**5**	0.2240
	0.2302		0.2202		0.2205		0.2239		0.2228
	0.2257		0.2245		0.2233		0.2224		0.2221
	0.2292		0.2269		0.2224		0.2245		0.2227
	0.2288		0.2266		0.2227		0.2249		0.2245
Average	0.2284	**Average**	0.2242	**Average**	0.2218	**Average**	0.2238	**Average**	0.2232
								AVERAGE FOR 5 SPECIMENS	**0.2243**

DATA ENTERED BY: SR
DATA CHECKED BY: JTR
FILENAME: TTTH2266

DATE: 10/23/2004
DATE: 10/25/04

ADVANCED TERRA TESTING, INC.

THICKNESS
ASTM D 5199
(IN.)

CLIENT: Tetra Tech-RMC

JOB NO.: 2617-02

PROJECT: Present Landfill-RFETS, Golden, CO

DATE: 10-21-04 JTR

TEXDRAIN 200 DS8
Lot #C2-8-2-04-2301-200, Date Sampled: 09-24-04, Shift: 3, Geonet

1	0.2180	**2**	0.2139	**3**	0.2182	**4**	0.2208	**5**	0.2250
	0.2190		0.2186		0.2221		0.2228		0.2234
	0.2176		0.2154		0.2249		0.2172		0.2233
	0.2172		0.2179		0.2213		0.2123		0.2229
	0.2186		0.2194		0.2142		0.2148		0.2225
Average	0.2181	**Average**	0.2170	**Average**	0.2201	**Average**	0.2176	**Average**	0.2234
								AVERAGE FOR 5 SPECIMENS	**0.2193**

DATA ENTERED BY: SR
DATA CHECKED BY: JTR
FILENAME: TTTH2301

DATE: 10/23/2004
DATE: 10/25/04

ADVANCED TERRA TESTING, INC.

THICKNESS
ASTM D 5199
(IN.)

CLIENT: Tetra Tech-RMC

JOB NO.: 2617-02

PROJECT: Present Landfill-RFETS, Golden, CO

DATE: 10-21-04 SKL

TEXDRAIN 200 DS8
No Identification

1	0.2229	**2**	0.2182	**3**	0.2268	**4**	0.2242	**5**	0.2257
	0.2206		0.2161		0.2109		0.2143		0.2209
	0.2252		0.2188		0.2152		0.2178		0.2241
	0.2258		0.2203		0.2173		0.2173		0.2178
	0.2211		0.2162		0.2186		0.2197		0.2192
Average	0.2231	**Average**	0.2179	**Average**	0.2178	**Average**	0.2187	**Average**	0.2215
								AVERAGE FOR 5 SPECIMENS	**0.2198**

DATA ENTERED BY: SR
DATA CHECKED BY: JTR
FILENAME: TTTHNOID

DATE: 10/23/2004
DATE: 10/25/04

ADVANCED TERRA TESTING, INC.

THICKNESS
ASTM D 5199
(IN.)

CLIENT: Tetra Tech-RMC

JOB NO.: 2617-02

PROJECT: Present Landfill-RFETS, Golden, CO

DATE: 10-21-04 SKL

TEXDRAIN 200 DS8
2230

1	0.2243	**2**	0.2278	**3**	0.2287	**4**	0.2268	**5**	0.2326
	0.2235		0.2282		0.2311		0.2298		0.2364
	0.2258		0.2286		0.2336		0.2309		0.2294
	0.2251		0.2274		0.2358		0.2302		0.2297
	0.2282		0.2327		0.2321		0.2256		0.2337
Average	0.2254	**Average**	0.2289	**Average**	0.2323	**Average**	0.2287	**Average**	0.2324
							AVERAGE FOR 5 SPECIMENS		**0.2295**

DATA ENTERED BY: SR
DATA CHECKED BY: JTR
FILENAME: TTTH2230

DATE: 10/25/2004
DATE: 10/25/04

ADVANCED TERRA TESTING, INC.

ISO 9001 - 2000

Precision Geosynthetic Laboratories

October 19, 2004

Sharon Roberts
Advanced Terra Testing
833 Parfet Street
Lakewood, CO 80215

Dear Ms. Roberts: RE: Present Landfill Design / Proj # 2617-02

Thank you for consulting Precision Geosynthetic Laboratories for your material testing needs.

Enclosed is the ***final*** laboratory report for the testing of eleven (11) Double Sided Geocomposite samples received October 12, 2004.

It should be noted that the test specimen and test sample used for this report was believed to be representative of the material produced under the designation herein stated. However, these results are indicative of only the specimens that were actually tested. The testing herein is based upon accepted industry practice as well as the test method listed. Precision Geosynthetic Laboratories neither accepts responsibility for nor makes claims to the final use and purpose of the material.

By accepting the data and results represented on this report, Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims arising out of the use of this data to the cost for the respective test(s) represented in this report, and Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liability in excess of the aforementioned limit.

The test data and all associated project information shall be held in confidence, not to be reproduced except in full and disclosed to other parties with the authorization of Client.

It is a company policy to keep the physical records of each job for 2 years since the receipt of the samples and keep the electronic file for 7 years. ***Failed seam samples are kept for 7 years; good seam samples are disposed after 2 weeks and conformance samples are disposed after 1 month.*** Should you need us to keep them longer, please advise us in writing.

If you have any questions or if we may be of further service, please do not hesitate to call at 800-522-4599.

Sincerely,

PRECISION GEOSYNTHETIC LABORATORIES

Maria Espitia
Quality Assurance

Cora B. Queja
Vice President

Enclosure: (Job No. G041248)

1160 North Gilbert Street, Anaheim, CA. 92801, Tel# 714-520-9631, Fax# 714-520-9637
DC#2000 Record#281

ISO 9001 - 2000

Precision Geosynthetic Laboratories

CLIENT: Advanced Terra Testing
PROJECT: Present Landfill Design / Proj # 2617-02

VERIFICATION OF MATERIAL PROPERTIES
(PGL Job No. G041248)

MATERIAL DESCRIPTION: Double Sided Geocomposite

SAMPLE(S) SENT BY: Advanced Terra Testing

DATE RECEIVED: October 12, 2004 **DATE REPORTED:** October 19, 2004

SAMPLE IDENTIFICATIONS:

SAMPLE ID	PRECISION CONTROL NUMBER
ATT #1 L#C2-8-2-04-2015-200	5809
ATT #2 L#C2-8-2-04-2301-200	5810
ATT #3 L#C2-8-2-04-1948-200	5811
ATT #4 L#C2-8-2-04-2111-200	5812
ATT #5 L#C2-8-2-04-2048-200	5813
ATT #6 L#C2-8-2-04-1917-200	5814
ATT #7 L#C2-8-2-04-2160-200	5815
ATT #8 R#2230	5816
ATT #9 No ID	5817
ATT #10 L#C2-8-2-04-2266-200	5818
ATT #11 L#C2-8-2-04-2196-200	5819

TESTS REQUIRED:

TEST METHOD	DESCRIPTION
ASTM D1505	Density
ASTM D1603	Carbon Content
ASTM D4716	Transmissivity

TEST CONDITIONS: The samples were conditioned for a minimum one hour in the laboratory at 22 ± 2°C (71.6 ± 3.6°F) and at 60 ± 10% relative humidity prior to test.

TEST RESULTS:

The test results are summarized in Table(s) 1 to 11. The units in which the data are reported are included on these tables.

PRECISION GEOSYNTHETIC LABORATORIES

GAI-LAP
Initials: MC #: 013
Date: 10/19/04

Maria Espiritu
Quality Assurance

Cora B. Queja
Vice President

1160 North Gilbert Street, Anaheim, CA. 92801, Tel# 714-520-9631, Fax# 714-520-9637

TABLE 6.

MATERIAL PROPERTIES

CLIENT: ADVANCED TERRA TESTING
PROJECT: Present Landfill Design

Date Received : **10/12/2004**
Date Reported: **10/19/2004**
Client Sample ID : **ATT #6 L#C2-8-2-04-1917-200**
Material Description: **Double Sided Geocomposite**

QC'd by: ME
PGL Job No. : **G041248**
PGL Control No. : **5814**

METHOD DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Proj. Specs.
GEONET COMPONENT:													
ASTM D1505 Density (grams/ cm.^{3})	0.9570	0.9570	0.9570								0.9570	0.0000	0.94
ASTM D1603 Carbon Black Content (percent)	2.51	2.62									2.56	0.08	2.00
GEOCOMPOSITE:													
ASTM D4716 Transmissivity *Tested at Normal Pressure : 209 psf, Gradient: 0.1 , Seating Time: 1 hrs*													
Temperature of Test Water: 20.5 °F Specimen Size: 12" x 12"													
Transmissivity (m.^{2}/ sec.)													
MD	1.88E-03	2.01E-03									1.95E-03	8.92E-05	
Transmissivity (gal./ min./ ft.)													
MD	9.09	9.70									9.40	0.43	
Flow Rate (gal./ min)													
MD	0.92	0.98									0.95	0.04	0.19

Geosynthetics arranged as follows:

Plate _____
Geocomposite XXXXXX
Plate _____

Thickness : 344.5 ***mils (Before)***
Thickness : 338 ***mils (After)***

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION
DC#1984 Record#265

Precision Geosynthetic Laboratories

ISO 9001 - 2000

TABLE 3.

MATERIAL PROPERTIES

CLIENT: ADVANCED TERRA TESTING

PROJECT: Present Landfill Design

Date Received : **10/12/2004**
Date Reported: **10/19/2004**
Client Sample ID : **ATT #3 L#C2-8-2-04-1948-200**
Material Description: **Double Sided Geocomposite**

QC'd by: ME
PGL Job No. : **G041248**
PGL Control No. : **5811**

METHOD DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Proj. Specs.
GEONET COMPONENT:													
ASTM D1505 Density (grams/ cm.^{3})	0.9591	0.9591	0.9591								0.9591	0.0000	0.94
ASTM D1603 Carbon Black Content (percent)	2.48	2.52									2.50	0.03	2.00
GEOCOMPOSITE:													
ASTM D4716 Transmissivity *Tested at Normal Pressure : 15,000 psf, Gradient: 1.0 , Seating Time: 1 hr*													
Temperature of Test Water: 20.5 °F Specimen Size: 12" x 12"													
Transmissivity (m.^{2}/ sec.)													
MD	1.60E-04	1.44E-04									1.52E-04	1.17E-05	
Transmissivity (gal./ min./ ft.)													
MD	0.77	0.69									0.73	0.06	
Flow Rate (gal./ min)													
MD	0.78	0.70									0.74	0.06	0.19

Geosynthetics arranged as follows:

Plate _____
Geocomposite XXXXXX
Plate _____

Thickness : 348.5 ***mils (Before)***
Thickness : 279 ***mils (After)***

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION
DC#19[illegible] Record#265

Precision Geosynthetic Laboratories

ISO 9001 - 2000

TABLE 1.

MATERIAL PROPERTIES

CLIENT: ADVANCED TERRA TESTING
PROJECT: Present Landfill Design

Date Received : **10/12/2004**
Date Reported: **10/19/2004**
Client Sample ID : **ATT #1 L#C2-8-2-04-2015-200**
Material Description: **Double Sided Geocomposite**

QC'd by: ME
PGL Job No. : **G041248**
PGL Control No. : **5809**

METHOD DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Proj. Specs.
GEONET COMPONENT:													
ASTM D1505 Density (grams/ cm.^{3})	0.9565	0.9565	0.9565								0.9565	0.0000	0.94
ASTM D1603 Carbon Black Content (percent)	2.66	2.73									2.69	0.05	2.00
GEOCOMPOSITE:													
ASTM D4716 Transmissivity *Tested at Normal Pressure : 15,000 psf, Gradient: 1.0 , Seating Time: 1 hr*													
Temperature of Test Water: 20.5 °F Specimen Size: 12" x 12"													
Transmissivity (m.^{2}/ sec.)													
MD	1.31E-04	1.39E-04									1.35E-04	5.65E-06	
Transmissivity (gal./ min./ ft.)													
MD	0.63	0.67									0.65	0.03	
Flow Rate (gal./ min)													
MD	0.64	0.68									0.66	0.03	0.19

Geosynthetics arranged as follows:

Plate _____
Geocomposite XXXXXX
Plate _____

Thickness : 341 ***mils (Before)***
Thickness : 267 ***mils (After)***

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION
DC#1984 Record#265

Precision Geosynthetic Laboratories

ISO 9001 - 2000

TABLE 5.

MATERIAL PROPERTIES

CLIENT: ADVANCED TERRA TESTING

PROJECT: Present Landfill Design

Date Received : **10/12/2004**
Date Reported: **10/19/2004**
Client Sample ID : **ATT #5 L#C2-8-2-04-2048-200**
Material Description: **Double Sided Geocomposite**

QC'd by: MG
PGL Job No. : **G041248**
PGL Control No. : **5813**

METHOD DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Proj. Specs.
GEONET COMPONENT:													
ASTM D1505 Density (grams/ cm.^{3})	0.9591	0.9591	0.9591								0.9591	0.0000	0.94
ASTM D1603 Carbon Black Content (percent)	2.61	2.70									2.65	0.06	2.00
GEOCOMPOSITE:													
ASTM D4716 Transmissivity *Tested at Normal Pressure : 15,000 psf, Gradient: 1.0 , Seating Time: 1 hr*													
Temperature of Test Water: 20.5 °F Specimen Size: 12" x 12"													
Transmissivity (m.^{2}/ sec.)													
MD	1.35E-04	1.44E-04									1.40E-04	6.30E-06	
Transmissivity (gal./ min./ ft.)													
MD	0.65	0.70									0.68	0.03	
Flow Rate (gal./ min)													
MD	0.66	0.71									0.68	0.03	0.19

Geosynthetics arranged as follows:

Plate _____
Geocomposite XXXXXX
Plate _____

Thickness : 342.5 ***mils (Before)***
Thickness : 272 ***mils (After)***

MD - MA[illegible] DIRECTION
TD - T[illegible]RSE DIRECTION
DC#1954 Record#265

Precision Geosynthetic Laboratories

ISO 9001 - 2000
GAI-LAP

TABLE 4.

MATERIAL PROPERTIES

CLIENT: ADVANCED TERRA TESTING

PROJECT: Present Landfill Design

Date Received : **10/12/2004**
Date Reported: **10/19/2004**
Client Sample ID : **ATT #4 L#C2-8-2-04-2111-200**
Material Description: **Double Sided Geocomposite**

QC'd by: ME
PGL Job No. : **G041248**
PGL Control No. : **5812**

METHOD DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Proj. Specs.
GEONET COMPONENT:													
ASTM D1505 Density (grams/ cm.^{3})	0.9575	0.9575	0.9575								0.9575	0.0000	0.94
ASTM D1603 Carbon Black Content (percent)	2.65	2.72									2.68	0.05	2.00
GEOCOMPOSITE:													
ASTM D4716 Transmissivity *Tested at Normal Pressure : 209 psf, Gradient: 0.1 , Seating Time: 1 hrs*													
Temperature of Test Water: 20.7 °F Specimen Size: 12" x 12"													
Transmissivity (m.^{2}/ sec.)													
MD	2.22E-03	2.13E-03									2.18E-03	6.89E-05	
Transmissivity (gal./ min./ ft.)													
MD	10.75	10.28									10.51	0.33	
Flow Rate (gal./ min)													
MD	1.09	1.05									1.07	0.03	0.19

Geosynthetics arranged as follows:

Plate _____
Geocomposite XXXXXX
Plate _____

Thickness : 356.5 ***mils (Before)***
Thickness : 349.5 ***mils (After)***

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION
DC#1984 Record#265

Precision Geosynthetic Laboratories

ISO 9001 - 2000

TABLE 7.

MATERIAL PROPERTIES

CLIENT: ADVANCED TERRA TESTING
PROJECT: Present Landfill Design

Date Received : **10/12/2004**
Date Reported: **10/19/2004**
Client Sample ID : **ATT #7 L#C2-8-2-04-2160-200**
Material Description: **Double Sided Geocomposite**

QC'd by: ME
PGL Job No. : **G041248**
PGL Control No. : **5815**

METHOD DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Proj. Specs.
GEONET COMPONENT:													
ASTM D1505 Density (grams/ cm.^{3})	0.9583	0.9583	0.9583								0.9583	0.0000	0.94
ASTM D1603 Carbon Black Content (percent)	2.23	2.28									2.26	0.03	2.00
GEOCOMPOSITE:													
ASTM D4716 Transmissivity *Tested at Normal Pressure : 15,000 psf, Gradient: 1.0 , Seating Time: 1 hr*													
Temperature of Test Water: 20.5 ^{0}F Specimen Size: 12" x 12"													
Transmissivity (m.^{2}/ sec.)													
MD	1.58E-04	1.53E-04									1.55E-04	3.02E-06	
Transmissivity (gal./ min./ ft.)													
MD	0.76	0.74									0.75	0.01	
Flow Rate (gal./ min)													
MD	0.77	0.75									0.76	0.01	0.19

Geosynthetics arranged as follows:

Plate _____
Geocomposite XXXXXX
Plate _____

Thickness : 347 ***mils (Before)***
Thickness : 274.5 ***mils (After)***

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION
DC#1984 Record#265

Precision Geosynthetic Laboratories

ISO 9001 - 2000

TABLE 11.

MATERIAL PROPERTIES

CLIENT: ADVANCED TERRA TESTING

PROJECT: Present Landfill Design

Date Received : **10/12/2004**
Date Reported: **10/19/2004**
Client Sample ID : **ATT #11 L#C2-8-2-04-2196-200**
Material Description: **Double Sided Geocomposite**

QC'd by: ME
PGL Job No. : **G041248**
PGL Control No. : **5819**

METHOD DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Proj. Specs.
GEONET COMPONENT:													
ASTM D1505 Density (grams/ cm.^{3})	0.9588	0.9588	0.9588								0.9588	0.0000	0.94
ASTM D1603 Carbon Black Content (percent)	2.05	2.05									2.05	0.00	2.00
GEOCOMPOSITE:													
ASTM D4716 Transmissivity *Tested at Normal Pressure : 15,000 psf, Gradient: 1.0 , Seating Time: 1 hr*													
Temperature of Test Water: 20.5 ^{0}F Specimen Size: 12" x 12"													
Transmissivity (m.^{2}/ sec.)													
MD	1.60E-04	1.46E-04									1.53E-04	1.03E-05	
Transmissivity (gal./ min./ ft.)													
MD	0.77	0.70									0.74	0.05	
Flow Rate (gal./ min)													
MD	0.78	0.71									0.75	0.05	0.19

Geosynthetics arranged as follows:

Plate _____
Geocomposite XXXXXX
Plate _____

Thickness : 345 ***mils (Before)***
Thickness : 272.5 ***mils (After)***

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION
DC#1984 Record#265

Precision Geosynthetic Laboratories

ISO 9001 - 2000

TABLE 10.

MATERIAL PROPERTIES

CLIENT: ADVANCED TERRA TESTING
PROJECT: Present Landfill Design

Date Received : **10/12/2004**
Date Reported: **10/19/2004**
Client Sample ID : **ATT #10 L#C2-8-2-04-2266-200**
Material Description: **Double Sided Geocomposite**

QC'd by: ME
PGL Job No. : **G041248**
PGL Control No. : **5818**

METHOD DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Proj. Specs.
GEONET COMPONENT:													
ASTM D1505 Density (grams/ cm.^{3})	0.9565	0.9565	0.9565								0.9565	0.0000	0.94
ASTM D1603 Carbon Black Content (percent)	2.68	2.73									2.70	0.04	2.00
GEOCOMPOSITE:													
ASTM D4716 Transmissivity *Tested at Normal Pressure : 209 psf, Gradient: 0.1 , Seating Time: 1 hrs*													
Temperature of Test Water: 20.5 °F Specimen Size: 12" x 12"													
Transmissivity (m.^{2}/ sec.)													
MD	2.10E-03	2.01E-03									2.05E-03	6.79E-05	
Transmissivity (gal./ min./ ft.)													
MD	10.15	9.69									9.92	0.33	
Flow Rate (gal./ min)													
MD	1.03	0.98									1.00	0.03	0.19

Geosynthetics arranged as follows:

Plate _____
Geocomposite XXXXXX
Plate _____

Thickness : 350 ***mils (Before)***
Thickness : 344.5 ***mils (After)***

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION
DC#1986 Record#265

Precision Geosynthetic Laboratories

ISO 9001 - 2000
GAI-LAP

TABLE 2.

MATERIAL PROPERTIES

CLIENT: ADVANCED TERRA TESTING
PROJECT: Present Landfill Design

Date Received : **10/12/2004**
Date Reported: **10/19/2004**
Client Sample ID : **ATT #2 L#C2-8-2-04-2301-200**
Material Description: **Double Sided Geocomposite**

QC'd by: ME
PGL Job No. : **G041248**
PGL Control No. : **5810**

METHOD DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Proj. Specs.
GEONET COMPONENT:													
ASTM D1505 Density (grams/ cm.^{3})	0.9573	0.9573	0.9575								0.9573	0.0002	0.94
ASTM D1603 Carbon Black Content (percent)	2.62	2.58									2.60	0.02	2.00
GEOCOMPOSITE:													
ASTM D4716 Transmissivity *Tested at Normal Pressure : 209 psf, Gradient: 0.1 , Seating Time: 1 hrs*													
Temperature of Test Water: 20.7 °F Specimen Size: 12" x 12"													
Transmissivity (m.^{2}/ sec.)													
MD	1.97E-03	1.88E-03									1.92E-03	6.23E-05	
Transmissivity (gal./ min./ ft.)													
MD	9.49	9.07									9.28	0.30	
Flow Rate (gal./ min)													
MD	0.97	0.92									0.94	0.03	0.19

Geosynthetics arranged as follows:

Plate _____
Geocomposite XXXXXX
Plate _____

Thickness : 347.5 ***mils (Before)***
Thickness : 341 ***mils (After)***

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION
DC#1984 Record#265

Precision Geosynthetic Laboratories

ISO 9001 - 2000

TABLE 9.

MATERIAL PROPERTIES

CLIENT: ADVANCED TERRA TESTING
PROJECT: Present Landfill Design

Date Received : **10/12/2004**
Date Reported: **10/19/2004**
Client Sample ID : **ATT #9 No ID**
Material Description: **Double Sided Geocomposite**

QC'd by: ME
PGL Job No. : **G041248**
PGL Control No. : **5817**

METHOD DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Proj. Specs.
GEONET COMPONENT:													
ASTM D1505 Density (grams/ cm.^{3})	0.9575	0.9575	0.9575								0.9575	0.0000	0.94
ASTM D1603 Carbon Black Content (percent)	2.57	2.59									2.58	0.01	2.00
GEOCOMPOSITE:													
ASTM D4716 Transmissivity	*Tested at Normal Pressure : 15,000 psf, Gradient: 1.0 , Seating Time: 1 hr*												
	Temperature of Test Water: 20.5 °F Specimen Size: 12" x 12"												
Transmissivity (m.^{2}/ sec.)													
MD	1.38E-04	1.44E-04									1.41E-04	4.31E-06	
Transmissivity (gal./ min./ ft.)													
MD	0.66	0.69									0.68	0.02	
Flow Rate (gal./ min)													
MD	0.67	0.70									0.69	0.02	0.19

Geosynthetics arranged as follows:

Plate _____
Geocomposite XXXXXX
Plate _____

Thickness : 340 ***mils (Before)***
Thickness : 269.5 ***mils (After)***

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION
DC#198 Record#265

Precision Geosynthetic Laboratories

ISO 9001 - 2000

TABLE 8.

MATERIAL PROPERTIES

CLIENT: ADVANCED TERRA TESTING
PROJECT: Present Landfill Design

Date Received : **10/12/2004**
Date Reported: **10/19/2004**
Client Sample ID : **ATT #8 R#2230**
Material Description: **Double Sided Geocomposite**

QC'd by: ME
PGL Job No. : **G041248**
PGL Control No. : **5816**

METHOD DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Proj. Specs.
GEONET COMPONENT:													
ASTM D1505 Density (grams/ cm.^{3})	0.9586	0.9586	0.9586								0.9586	0.0000	0.94
ASTM D1603 Carbon Black Content (percent)	2.70	2.57									2.64	0.09	2.00
GEOCOMPOSITE:													
ASTM D4716 Transmissivity	*Tested at Normal Pressure : 209 psf, Gradient: 0.1 , Seating Time: 1 hrs*												
	Temperature of Test Water: 20.5 °F Specimen Size: 12" x 12"												
Transmissivity (m.^{2}/ sec.)													
MD	1.98E-03	2.19E-03									2.09E-03	1.49E-04	
Transmissivity (gal./ min./ ft.)													
MD	9.57	10.59									10.08	0.72	
Flow Rate (gal./ min)													
MD	0.97	1.07									1.02	0.07	0.19

Geosynthetics arranged as follows:

Plate _____
Geocomposite XXXXXX
Plate _____

Thickness : 351.5 ***mils (Before)***
Thickness : 345 ***mils (After)***

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION
DC#1984 Record#265

Precision Geosynthetic Laboratories

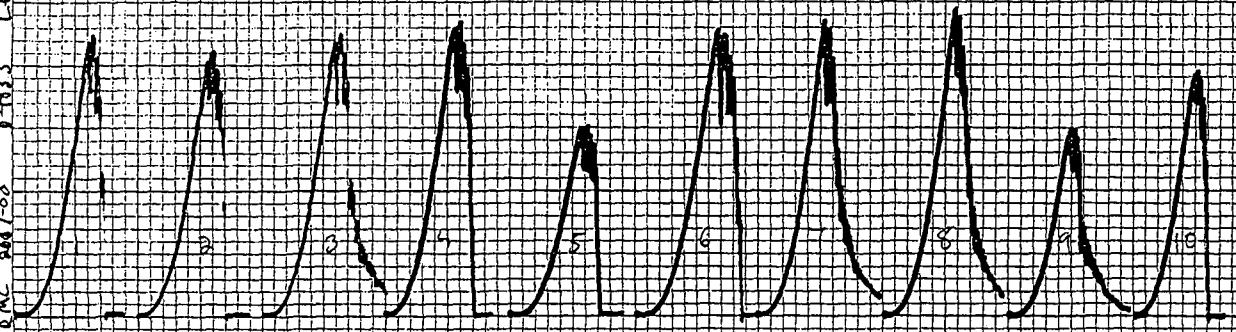
ISO 9001 - 2000

10-15-04 JTR
Chatillon Loading System
1 Kip Capacity Load Cell
2617-02

Tetra Tech-RMC
Present Landfill Design-RFETS, Golden, CO
Shift 4; Lot #C2-8-2-04-1917-200, Date Sampled 09-17-04
Puncture Resistance, Geo Composite, TexDrain 200 DS8 (Geotextile Only) DISPLACEMENT RATE = 12"/MIN
ASTM D 4833

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN

Specimen Number	Load (lbs)
1	171.1
2	161.2
3	171.8
4	177.9
5	114.3
6	174.1
7	179.4
8	186.2
9	113.6
10	149.1
Average	159.9
Std. Dev.	26.3



Tetra Tech - RMC 2617-02 Puncture Strength D 4833 LM C2-8-2-04-1917-200 9/17/04 X=1.5"/in Y=75.7#/in JTR 10/15/04 Shift 4

ATT #6

Data Checked By: JTR Date: 10/18/04
Filename: K:/TT2617/TTRP1917.lwp

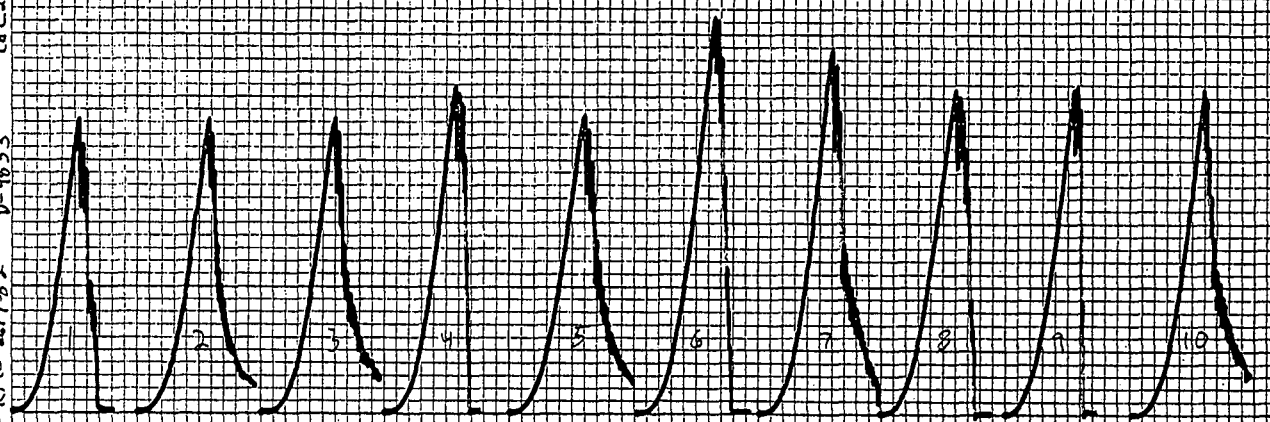
ADVANCED TERRA TESTING, Inc

10-15-04 JTR
Chatillon Loading System
1 Kip Capacity Load Cell
2617-02

Tetra Tech-RMC
Present Landfill Design-RFETS, Golden, CO
Shift 2, Lot #C2-8-2-04-1948-200, Date Sampled 09-18-04
Puncture Resistance, Geo Composite, TexDrain 200 DS8 (Geotextile Only) DISPLACEMENT RATE = 12"/MIN
ASTM D 4833

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN

Specimen Number	Load (lbs)
1	175.6
2	175.6
3	176.4
4	196.1
5	180.2
6	236.9
7	218.8
8	195.3
9	197.6
10	195.3
Average	194.8
Std. Dev.	20.1



Data Checked By: JTK Date: 10/18/04
Filename: K:/TT2617/TTRP1948.lwp

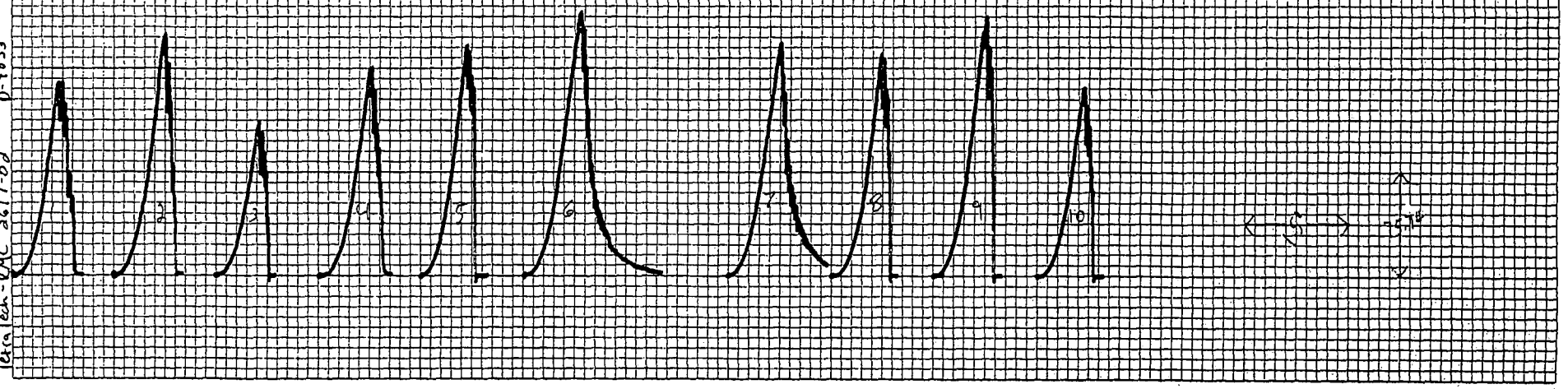
ADVANCED TERRA TESTING, Inc

10-15-04 JTR
Chatillon Loading System
1 Kip Capacity Load Cell
2617-02

Tetra Tech-RMC
Present Landfill Design-RFETS, Golden, CO
Shift 2, Lot #C2-8-2-04-2015-200, Date Sampled 09-19-04
Puncture Resistance, Geo Composite, TexDrain 200 DS8 (Geotextile Only) DISPLACEMENT RATE = 12"/MIN
ASTM D 4833

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN

Specimen Number	Load (lbs)
1	143.1
2	177.1
3	113.6
4	152.9
5	168.1
6	193.8
7	171.8
8	162.0
9	190.0
10	137.0
Average	160.9
Std. Dev.	24.8



Data Checked By: JTR Date: 10/18/04
Filename: K:/TT2617/TTRP2015.lwp

ADVANCED TERRA TESTING, Inc

10-15-04 JTR

Chatillon Loading System

1 Kip Capacity Load Cell

2617-02

Tetra Tech-RMC

Present Landfill Design-RFETS, Golden, CO

Shift 4, Lot #C2-8-2-04-2048-200, Date Sampled 09-19-04

Puncture Resistance, Geo Composite, TexDrain 200 DS8 (Geotextile Only) DISPLACEMENT RATE = 12"/MIN

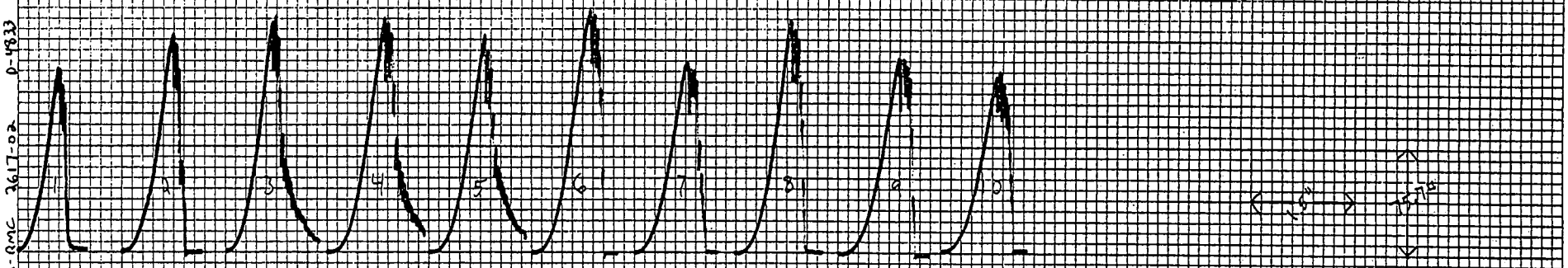
ASTM D 4833

Data Entered By: SR

SCALES X = 1.5"/IN

Y = 75.7#/IN

Specimen Number	Load (lbs)
1	131.0
2	155.9
3	169.6
4	167.3
5	155.2
6	173.4
7	36.3
8	166.5
9	138.5
10	129.4
Average	152.3
Std. Dev.	17.1



JTR 10/18/04 Shift 4 X=1.5"/in Y=75.7#/in 9/19/04 L#C2-8-2-04-dots-200 D-4833 Puncture Strength 2617-02 TetraTech-RMC ATTAS

Data Checked By: JTR Date: 10/18/04

Filename: K:/TT2617/TTRP2048.lwp

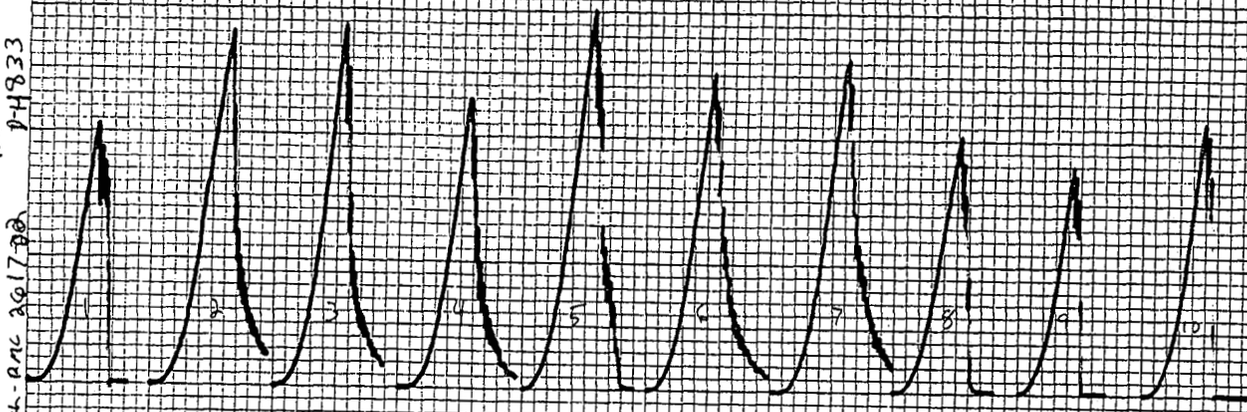
ADVANCED TERRA TESTING, Inc

10-15-04 JTR
Chatillon Loading System
1 Kip Capacity Load Cell
2617-02

Tetra Tech-RMC
Present Landfill Design-RFETS, Golden, CO
Shift 4, Lot #C2-8-2-04-2111-200, Date Sampled 09-20-04
Puncture Resistance, Geo Composite, TexDrain 200 DS8 (Geotextile Only) DISPLACEMENT RATE = 12"/MIN
ASTM D 4833

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN

Specimen Number	Load (lbs)
1	157.5
2	214.2
3	218.0
4	174.9
5	228.6
6	190.8
7	200.6
8	152.9
9	137.0
10	164.3
Average	183.9
Std. Dev.	31.1



Data Checked By: JTR Date: 10/18/04
Filename: K:/TT2617/TTRP2111.lwp

ADVANCED TERRA TESTING, Inc

10-15-04 JTR

Chatillon Loading System

1 Kip Capacity Load Cell

2617-02

Tetra Tech-RMC

Present Landfill Design-RFETS, Golden, CO

Shift 3, Lot #C2-8-2-04-2160-200, Date Sampled 09-21-04

Puncture Resistance, Geo Composite, TexDrain 200 DS8 (Geotextile Only) DISPLACEMENT RATE = 12"/MIN

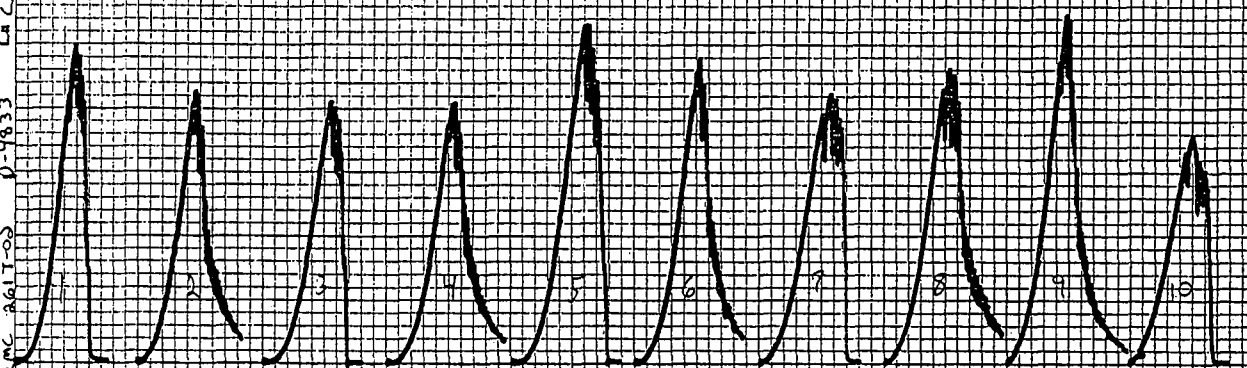
ASTM D 4833

Data Entered By: SR

SCALES X = 1.5"/IN

Y = 75.7#/IN

Specimen Number	Load (lbs)
1	189.3
2	162.0
3	156.7
4	155.9
5	202.1
6	182.4
7	161.2
8	175.6
9	207.4
10	135.5
Average	172.8
Std. Dev.	22.6



Data Checked By: JTR Date: 10/18/04

Filename: K:/TT2617/TTRP2160.lwp

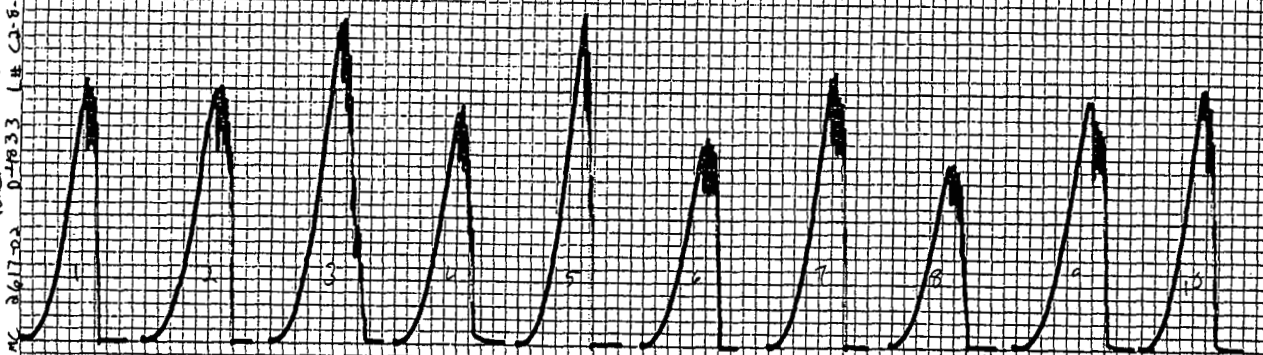
ADVANCED TERRA TESTING, Inc

10-15-04 JTR
Chatillon Loading System
1 Kip Capacity Load Cell
2617-02

Tetra Tech-RMC
Present Landfill Design-RFETS, Golden, CO
Shift 3, Lot #C2-8-2-04-2196-200, Date Sampled 09-22-04
Puncture Resistance, Geo Composite, TexDrain 200 DS8 (Geotextile Only) DISPLACEMENT RATE = 12"/MIN
ASTM D 4833

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN

Specimen Number	Load (lbs)
1	157.5
2	152.9
3	193.0
4	143.1
5	198.3
6	124.9
7	165.0
8	111.3
9	149.1
10	156.7
Average	155.2
Std. Dev.	26.7



ATT #11
Tetra Tech-RMC 2617-02 Puncture Strength D-4833 Lot# C2-8-2-04-2196-200 9/22/04 X=1.5"/in Y=75.7#/in JTR 10/15/04 Shift 3

Data Checked By: JTR Date: 10/18/04
Filename: K:/TT2617/TTRP2196.lwp

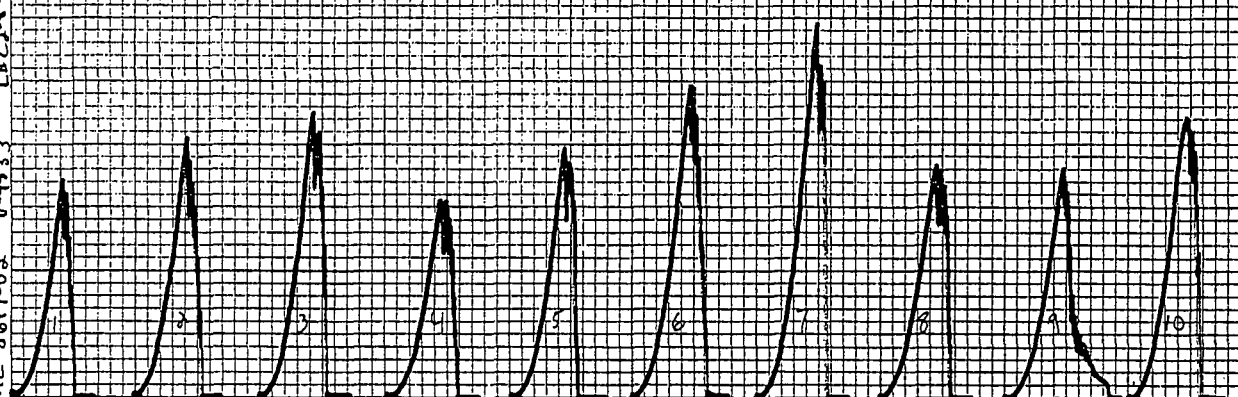
ADVANCED TERRA TESTING, inc

10-15-04 JTR
Chatillon Loading System
1 Kip Capacity Load Cell
2617-02

Tetra Tech-RMC
Present Landfill Design-RFETS, Golden, CO
Shift 3, Lot #C2-8-2-04-2266-200, Date Sampled 09-23-04
Puncture Resistance, Geo Composite, TexDrain 200 DS8 (Geotextile Only) DISPLACEMENT RATE = 12"/MIN
ASTM D 4833

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN

Specimen Number	Load (lbs)
1	130.2
2	156.7
3	171.8
4	118.8
5	149.9
6	187.7
7	224.8
8	139.3
9	137.8
10	168.8
Average	158.6
Std. Dev.	31.2



Data Checked By: JTR Date: 10/18/04
Filename: K:/TT2617/TTRP2266.lwp

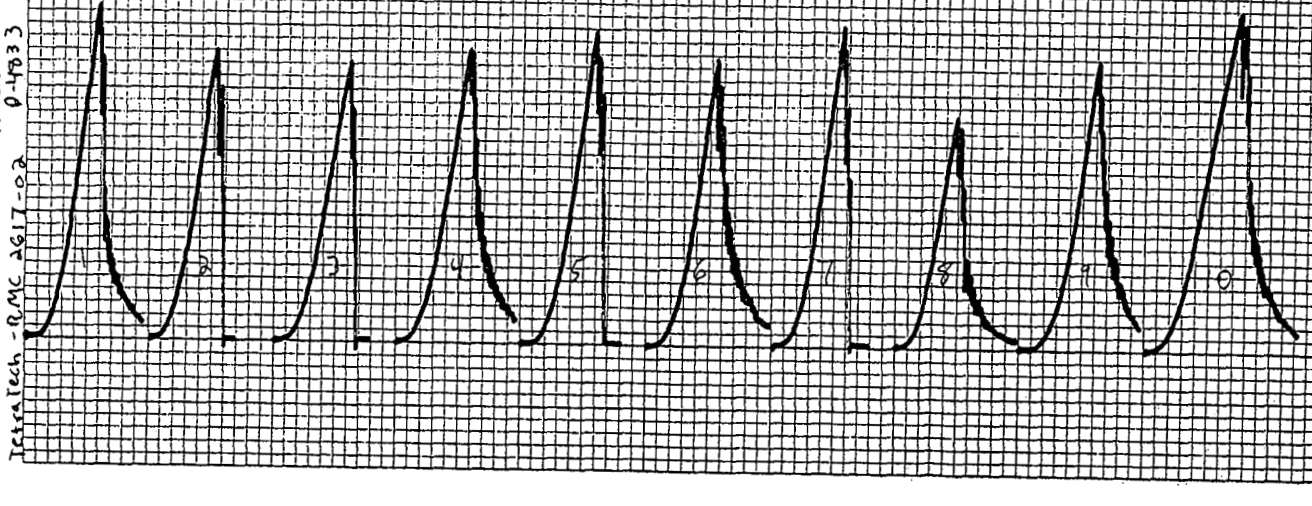
ADVANCED TERRA TESTING, Inc

10-15-04 JTR
Chatillon Loading System
1 Kip Capacity Load Cell
2617-02

Tetra Tech-RMC
Present Landfill Design-RFETS, Golden, CO
Shift 3, Lot#C2-8-2-04-2301-200, Date Sampled 09-24-04
Puncture Resistance, Geo Composite, TexDrain 200 DS8 (Geotextile Only) DISPLACEMENT RATE = 12"/MIN
ASTM D 4833

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN

Specimen Number	Load (lbs)
1	201.4
2	174.9
3	168.8
4	176.4
5	188.5
6	172.6
7	193.0
8	138.5
9	174.1
10	204.4
Average	179.3
Std. Dev.	19.0



Data Checked By: JTR Date: 10/15/04
Filename: K:/TT2617/TTRP2301.lwp

ADVANCED TERRA TESTING, inc

10-15-04 JTR

Chatillon Loading System

1 Kip Capacity Load Cell

2617-02

Tetra Tech-RMC

Present Landfill Design-RFETS, Golden, CO

No Identification

Puncture Resistance, Geo Composite, TexDrain 200 DS8 (Geotextile Only) DISPLACEMENT RATE = 12"/MIN

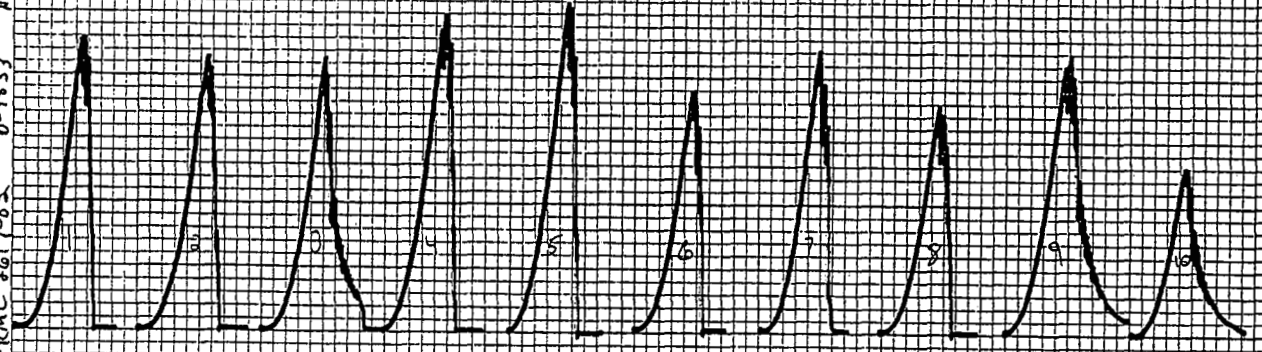
ASTM D 4833

Data Entered By: SR

SCALES X = 1.5"/IN

Y = 75.7#/IN

Specimen Number	Load (lbs)
1	174.1
2	163.5
3	162.8
4	188.5
5	196.8
6	143.8
7	168.1
8	135.5
9	166.5
10	99.2
Average	159.9
Std. Dev.	28.0



10/15/04 JTR

X = 1.5"/in Y = 75.7#/in

No identification

Puncture Strength D-4833

Tetratech-RMC 2617-02

ATT#9

Data Checked By: JTR Date: 10/18/04

Filename: K:/TT2617/TTRPNOID.lwp

ADVANCED TERRA TESTING, Inc

10-15-04 JTR

Chatillon Loading System

1 Klp Capacity Load Cell

2617-02

Tetra Tech-RMC

Present Landfill Design-RFETS, Golden, CO

2230

Puncture Resistance, Geo Composite, TexDrain 200 DS8 (Geotextile Only) DISPLACEMENT RATE = 12"/MIN

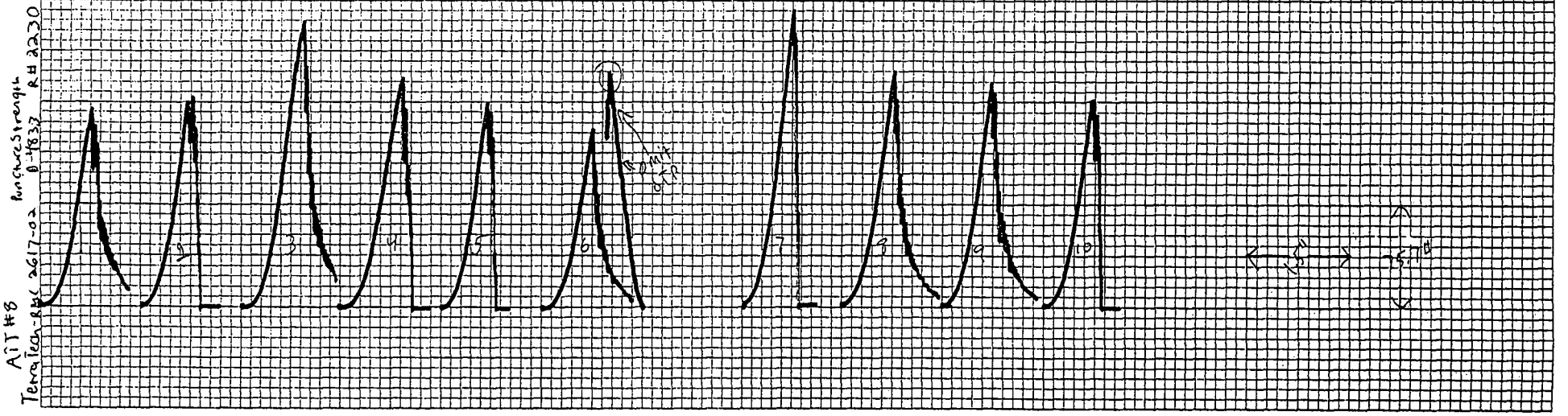
ASTM D 4833

Data Entered By: SR

SCALES X = 1.5"/IN

Y = 75.7#/IN

Specimen Number	Load (lbs)
1	147.6
2	155.9
3	211.2
4	169.6
5	150.6
6	131.7
7	221.0
8	174.9
9	166.5
10	152.9
Average	168.2
Std. Dev.	28.2



Data Checked By: JTR Date: 10/19/04

Filename: K:/TT2617/TTRP2230.lwp

ADVANCED TERRA TESTING, inc

MASS/UNIT AREA (GEOTEXTILE)
ASTM D 5261

CLIENT: Tetra Tech-RMC **JOB NO.:** 2617-02
PROJECT/LOCATION Present Landfill Design-RFETS, Golden, CO

LOT NO.	C2-8-2-04-1917-200	C2-8-2-04-1917-200	C2-8-2-04-1917-200	C2-8-2-04-1917-200	C2-8-2-04-1917-200
SHIFT	4	4	4	4	4
DATE SAMPLED	09-17-04	09-17-04	09-17-04	09-17-04	09-17-04
SAMPLE NO.	1	2	3	4	5
DATE TESTED	10-15-04 JTR	10-15-04 JTR	10-15-04 JTR	10-15-04 JTR	10-15-04 JTR
ROLL IDENTIFICATION	TEXDRAIN 200 DS8	TEXDRAIN 200 DS8	TEXDRAIN 200 DS8	TEXDRAIN 200 DS8	TEXDRAIN 200 DS8
MASS/UNIT AREA DETERMINATIONS					
Sample Length (in)	7.960	8.020	8.000	8.050	8.000
Sample Width (in)	3.980	4.000	4.030	4.010	4.000
Sample Area (cm^2)	204.39	206.97	208.00	208.26	206.45
Mass/Unit Area (gms/m^2)	330.2	347.9	469.2	403.3	345.8
Mass of Sample (gms)	6.75	7.20	9.76	8.40	7.14

Average Mass/Unit Area (5 Samples) (gms/m^2) **379.3**
Average Mass/Unit Area (5 Samples) (oz/yd^2) **11.2**

Data entered by: SR Date: 10/18/2004
Data checked by: JTR Date: 10/18/04
FileName: TTMA1917

ADVANCED TERRA TESTING, INC.

MASS/UNIT AREA (GEOTEXTILE)
ASTM D 5261

CLIENT: Tetra Tech-RMC **JOB NO.:** 2617-02
PROJECT/LOCATION Present Landfill Design-RFETS, Golden, CO

LOT NO.	C2-8-2-04-1948-200	C2-8-2-04-1948-200	C2-8-2-04-1948-200	C2-8-2-04-1948-200	C2-8-2-04-1948-200
SHIFT	2	2	2	2	2
DATE SAMPLED	09-18-04	09-18-04	09-18-04	09-18-04	09-18-04
SAMPLE NO.	1	2	3	4	5
DATE TESTED	10-15-04 JTR	10-15-04 JTR	10-15-04 JTR	10-15-04 JTR	10-15-04 JTR
ROLL IDENTIFICATION	TEXDRAIN 200 DS8	TEXDRAIN 200 DS8	TEXDRAIN 200 DS8	TEXDRAIN 200 DS8	TEXDRAIN 200 DS8
MASS/UNIT AREA DETERMINATIONS					
Sample Length (in)	8.010	8.000	8.000	8.000	8.010
Sample Width (in)	4.000	4.000	4.000	4.000	3.990
Sample Area (cm^2)	206.71	206.45	206.45	206.45	206.19
Mass/Unit Area (gms/m^2)	353.2	363.3	397.7	402.5	440.4
Mass of Sample (gms)	7.30	7.50	8.21	8.31	9.08

Average Mass/Unit Area (5 Samples) (gms/m^2) 391.4
Average Mass/Unit Area (5 Samples) (oz/yd^2) 11.5

Data entered by: SR Date: 10/15/2004
Data checked by: JTR Date: 10/16/04
FileName: TTMA1948

ADVANCED TERRA TESTING, INC.

MASS/UNIT AREA (GEOTEXTILE)
ASTM D 5261

CLIENT: Tetra Tech-RMC **JOB NO.:** 2617-02
PROJECT/LOCATION Present Landfill Design-RFETS, Golden, CO

LOT NO.	C2-8-2-04-2015-200	C2-8-2-04-2015-200	C2-8-2-04-2015-200	C2-8-2-04-2015-200	C2-8-2-04-2015-200
SHIFT	2	2	2	2	2
DATE SAMPLED	09-19-04	09-19-04	09-19-04	09-19-04	09-19-04
SAMPLE NO.	1	2	3	4	5
DATE TESTED	10-15-04 JTR	10-15-04 JTR	10-15-04 JTR	10-15-04 JTR	10-15-04 JTR
ROLL IDENTIFICATION	TEXDRAIN 200 DS8	TEXDRAIN 200 DS8	TEXDRAIN 200 DS8	TEXDRAIN 200 DS8	TEXDRAIN 200 DS8
MASS/UNIT AREA DETERMINATIONS					
Sample Length (in)	7.980	7.970	7.980	7.960	8.000
Sample Width (in)	4.000	4.000	3.960	4.010	4.000
Sample Area (cm^2)	205.94	205.68	203.88	205.93	206.45
Mass/Unit Area (gms/m^2)	339.9	287.3	390.4	396.2	369.6
Mass of Sample (gms)	7.00	5.91	7.96	8.16	7.63

Average Mass/Unit Area (5 Samples) (gms/m^2) **356.7**
Average Mass/Unit Area (5 Samples) (oz/yd^2) **10.5**

Data entered by:
Data checked by: JTR
FileName:

SR
Date: 10/6/04
TTMA2015

Date: 10/15/2004

ADVANCED TERRA TESTING, INC.

MASS/UNIT AREA (GEOTEXTILE)
ASTM D 5261

CLIENT: Tetra Tech-RMC **JOB NO.:** 2617-02
PROJECT/LOCATION Present Landfill Design-RFETS, Golden, CO

LOT NO.	C2-8-2-04-2048-200	C2-8-2-04-2048-200	C2-8-2-04-2048-200	C2-8-2-04-2048-200	C2-8-2-04-2048-200
SHIFT	4	4	4	4	4
DATE SAMPLED	09-19-04	09-19-04	09-19-04	09-19-04	09-19-04
SAMPLE NO.	1	2	3	4	5
DATE TESTED	10-15-04 JTR	10-15-04 JTR	10-15-04 JTR	10-15-04 JTR	10-15-04 JTR
ROLL IDENTIFICATION	TEXDRAIN 200 DS8	TEXDRAIN 200 DS8	TEXDRAIN 200 DS8	TEXDRAIN 200 DS8	TEXDRAIN 200 DS8
MASS/UNIT AREA DETERMINATIONS					
Sample Length (in)	8.000	8.000	8.020	8.020	8.030
Sample Width (in)	4.000	4.030	4.070	4.000	4.010
Sample Area (cm^2)	206.45	208.00	210.59	206.97	207.74
Mass/Unit Area (gms/m^2)	352.6	346.6	414.6	390.4	372.6
Mass of Sample (gms)	7.28	7.21	8.73	8.08	7.74

Average Mass/Unit Area (5 Samples) (gms/m^2) **375.4**
Average Mass/Unit Area (5 Samples) (oz/yd^2) **11.1**

Data entered by: SR Date: 10/15/2004
Data checked by: JTR Date: 10/16/04
FileName: TTMA2048

ADVANCED TERRA TESTING, INC.

MASS/UNIT AREA (GEOTEXTILE)
ASTM D 5261

CLIENT: Tetra Tech-RMC **JOB NO.:** 2617-02
PROJECT/LOCATION Present Landfill Design-RFETS, Golden, CO

LOT NO.	C2-8-2-04-2111-200	C2-8-2-04-2111-200	C2-8-2-04-2111-200	C2-8-2-04-2111-200	C2-8-2-04-2111-200
SHIFT	4	4	4	4	4
DATE SAMPLED	09-20-04	09-20-04	09-20-04	09-20-04	09-20-04
SAMPLE NO.	1	2	3	4	5
DATE TESTED	10-15-04 JTR	10-15-04 JTR	10-15-04 JTR	10-15-04 JTR	10-15-04 JTR
ROLL IDENTIFICATION	TEXDRAIN 200 DS8	TEXDRAIN 200 DS8	TEXDRAIN 200 DS8	TEXDRAIN 200 DS8	TEXDRAIN 200 DS8
MASS/UNIT AREA DETERMINATIONS					
Sample Length (in)	8.000	8.010	8.000	8.000	7.990
Sample Width (in)	4.000	4.030	4.000	4.000	3.980
Sample Area (cm^2)	206.45	208.26	206.45	206.45	205.16
Mass/Unit Area (gms/m^2)	383.1	340.4	323.1	410.3	357.8
Mass of Sample (gms)	7.91	7.09	6.67	8.47	7.34

Average Mass/Unit Area (5 Samples) (gms/m^2) **362.9**
Average Mass/Unit Area (5 Samples) (oz/yd^2) **10.7**

Data entered by: SR Date: 10/15/2004
Data checked by: JTR Date: 10/6/04
FileName: TTMA2111

ADVANCED TERRA TESTING, INC.

MASS/UNIT AREA (GEOTEXTILE)
ASTM D 5261

CLIENT: Tetra Tech-RMC **JOB NO.:** 2617-02
PROJECT/LOCATION Present Landfill Design-RFETS, Golden, CO

LOT NO.	C2-8-2-04-2160-200	C2-8-2-04-2160-200	C2-8-2-04-2160-200	C2-8-2-04-2160-200	C2-8-2-04-2160-200
SHIFT	3	3	3	3	3
DATE SAMPLED	09-21-04	09-21-04	09-21-04	09-21-04	09-21-04
SAMPLE NO.	1	2	3	4	5
DATE TESTED	10-15-04 JTR	10-15-04 JTR	10-15-04 JTR	10-15-04 JTR	10-15-04 JTR
ROLL IDENTIFICATION	TEXDRAIN 200 DS8	TEXDRAIN 200 DS8	TEXDRAIN 200 DS8	TEXDRAIN 200 DS8	TEXDRAIN 200 DS8
MASS/UNIT AREA DETERMINATIONS					
Sample Length (in)	8.000	8.000	7.950	7.980	7.990
Sample Width (in)	4.000	3.930	3.980	3.950	3.990
Sample Area (cm^2)	206.45	202.84	204.14	203.36	205.68
Mass/Unit Area (gms/m^2)	487.3	364.8	373.3	322.6	323.8
Mass of Sample (gms)	10.06	7.40	7.62	6.56	6.66

Average Mass/Unit Area (5 Samples) (gms/m^2) **374.4**
Average Mass/Unit Area (5 Samples) (oz/yd^2) **11.0**

Data entered by: SR Date: 10/15/2004
Data checked by: JTR Date: 10/16/04
FileName: TTMA2160

ADVANCED TERRA TESTING, INC.

MASS/UNIT AREA (GEOTEXTILE)
ASTM D 5261

CLIENT: Tetra Tech-RMC **JOB NO.:** 2617-02
PROJECT/LOCATION Present Landfill Design-RFETS, Golden, CO

LOT NO.	C2-8-2-04-2196-200	C2-8-2-04-2196-200	C2-8-2-04-2196-200	C2-8-2-04-2196-200	C2-8-2-04-2196-200
SHIFT	3	3	3	3	3
DATE SAMPLED	09-22-04	09-22-04	09-22-04	09-22-04	09-22-04
SAMPLE NO.	1	2	3	4	5
DATE TESTED	10-15-04 JTR	10-15-04 JTR	10-15-04 JTR	10-15-04 JTR	10-15-04 JTR
ROLL IDENTIFICATION	TEXDRAIN 200 DS8	TEXDRAIN 200 DS8	TEXDRAIN 200 DS8	TEXDRAIN 200 DS8	TEXDRAIN 200 DS8
MASS/UNIT AREA DETERMINATIONS					
Sample Length (in)	7.960	8.000	7.920	7.900	8.020
Sample Width (in)	4.000	3.960	3.990	4.000	4.000
Sample Area (cm²)	205.42	204.39	203.88	203.87	206.97
Mass/Unit Area (gms/m²)	319.8	388.0	368.4	333.1	388.0
Mass of Sample (gms)	6.57	7.93	7.51	6.79	8.03

Average Mass/Unit Area (5 Samples) (gms/m²) **359.4**
Average Mass/Unit Area (5 Samples) (oz/yd²) **10.6**

Data entered by: SR Date: 10/15/2004
Data checked by: JTR Date: 10/16/04
FileName: TTMA2196

ADVANCED TERRA TESTING, INC.

MASS/UNIT AREA (GEOTEXTILE)
ASTM D 5261

CLIENT: Tetra Tech-RMC **JOB NO.:** 2617-02
PROJECT/LOCATION Present Landfill Design-RFETS, Golden, CO

LOT NO.	C2-8-2-04-2266-200	C2-8-2-04-2266-200	C2-8-2-04-2266-200	C2-8-2-04-2266-200	C2-8-2-04-2266-200
SHIFT	3	3	3	3	3
DATE SAMPLED	09-23-04	09-23-04	09-23-04	09-23-04	09-23-04
SAMPLE NO.	1	2	3	4	5
DATE TESTED	10-15-04 JTR	10-15-04 JTR	10-15-04 JTR	10-15-04 JTR	10-15-04 JTR
ROLL IDENTIFICATION	TEXDRAIN 200 DS8	TEXDRAIN 200 DS8	TEXDRAIN 200 DS8	TEXDRAIN 200 DS8	TEXDRAIN 200 DS8
MASS/UNIT AREA DETERMINATIONS					
Sample Length (in)	7.970	8.000	8.030	8.020	8.000
Sample Width (in)	4.000	4.000	4.030	4.000	4.000
Sample Area (cm^2)	205.68	206.45	208.78	206.97	206.45
Mass/Unit Area (gms/m^2)	329.6	362.8	402.3	368.7	370.5
Mass of Sample (gms)	6.78	7.49	8.40	7.63	7.65

Average Mass/Unit Area (5 Samples) (gms/m^2) **366.8**
Average Mass/Unit Area (5 Samples) (oz/yd^2) **10.8**

Data entered by:
Data checked by: JTR
FileName:

SR
Date: 10/18/04
TTMA2266

Date: 10/18/2004

ADVANCED TERRA TESTING, INC.

MASS/UNIT AREA (GEOTEXTILE)
ASTM D 5261

CLIENT: Tetra Tech-RMC **JOB NO.:** 2617-02
PROJECT/LOCATION Present Landfill Design-RFETS, Golden, CO

LOT NO.	C2-8-2-04-2301-200	C2-8-2-04-2301-200	C2-8-2-04-2301-200	C2-8-2-04-2301-200	C2-8-2-04-2301-200
SHIFT	3	3	3	3	3
DATE SAMPLED	09-24-04	09-24-04	09-24-04	09-24-04	09-24-04
SAMPLE NO.	1	2	3	4	5
DATE TESTED	10-15-04 JTR	10-15-04 JTR	10-15-04 JTR	10-15-04 JTR	10-15-04 JTR
ROLL IDENTIFICATION	TEXDRAIN 200 DS8	TEXDRAIN 200 DS8	TEXDRAIN 200 DS8	TEXDRAIN 200 DS8	TEXDRAIN 200 DS8
MASS/UNIT AREA DETERMINATIONS					
Sample Length (in)	8.000	8.000	7.960	7.980	8.000
Sample Width (in)	4.030	4.000	4.000	4.000	4.000
Sample Area (cm^2)	208.00	206.45	205.42	205.94	206.45
Mass/Unit Area (gms/m^2)	408.7	387.5	349.5	326.3	365.2
Mass of Sample (gms)	8.50	8.00	7.18	6.72	7.54

Average Mass/Unit Area (5 Samples) (gms/m^2) 367.4
Average Mass/Unit Area (5 Samples) (oz/yd^2) 10.8

Data entered by: SR Date: 10/15/2004
Data checked by: STR Date: 10/16/04
FileName: TTMA2301

ADVANCED TERRA TESTING, INC.

MASS/UNIT AREA (GEOTEXTILE)
ASTM D 5261

CLIENT: Tetra Tech-RMC **JOB NO.:** 2617-02
PROJECT/LOCATION Present Landfill Design-RFETS, Golden, CO

LOT NO.	No Identification	No Identification	No Identification	No Identification	No Identification
SHIFT					
DATE SAMPLED					
SAMPLE NO.	1	2	3	4	5
DATE TESTED	10-15-04 JTR	10-15-04 JTR	10-15-04 JTR	10-15-04 JTR	10-15-04 JTR
ROLL IDENTIFICATION	TEXDRAIN 200 DS8	TEXDRAIN 200 DS8	TEXDRAIN 200 DS8	TEXDRAIN 200 DS8	TEXDRAIN 200 DS8
MASS/UNIT AREA DETERMINATIONS					
Sample Length (in)	8.000	8.000	8.000	7.900	8.000
Sample Width (in)	3.960	3.950	4.040	3.980	4.000
Sample Area (cm^2)	204.39	203.87	208.52	202.85	206.45
Mass/Unit Area (gms/m^2)	367.4	354.6	396.6	379.1	270.8
Mass of Sample (gms)	7.51	7.23	8.27	7.69	5.59

Average Mass/Unit Area (5 Samples) (gms/m^2) **353.7**
Average Mass/Unit Area (5 Samples) (oz/yd^2) **10.4**

Data entered by:
Data checked by: JTR
FileName:

SR
Date: 10/16/04
TTMANOID

Date: 10/15/2004

ADVANCED TERRA TESTING, INC.

MASS/UNIT AREA (GEOTEXTILE)
ASTM D 5261

CLIENT: Tetra Tech-RMC **JOB NO.:** 2617-02
PROJECT/LOCATION Present Landfill Design-RFETS, Golden, CO

LOT NO.	2230	2230	2230	2230	2230
SHIFT					
DATE SAMPLED					
SAMPLE NO.	1	2	3	4	5
DATE TESTED	10-15-04 JTR	10-15-04 JTR	10-15-04 JTR	10-15-04 JTR	10-15-04 JTR
ROLL IDENTIFICATION	TEXDRAIN 200 DS8	TEXDRAIN 200 DS8	TEXDRAIN 200 DS8	TEXDRAIN 200 DS8	TEXDRAIN 200 DS8
MASS/UNIT AREA DETERMINATIONS					
Sample Length (in)	8.000	8.000	8.000	8.000	7.990
Sample Width (in)	3.980	3.980	4.000	4.000	4.020
Sample Area (cm^2)	205.42	205.42	206.45	206.45	207.22
Mass/Unit Area (gms/m^2)	342.7	390.9	327.0	342.9	368.2
Mass of Sample (gms)	7.04	8.03	6.75	7.08	7.63

Average Mass/Unit Area (5 Samples) (gms/m^2) **354.3**
Average Mass/Unit Area (5 Samples) (oz/yd^2) **10.5**

Data entered by: JTR
Data checked by: JTR
FileName: TTMA2230

SR
Date: 10/16/04

Date: 10/15/2004

ADVANCED TERRA TESTING, INC.

ISO 9001 - 2000

Precision Geosynthetic Laboratories

October 20, 2004

Sharon Roberts
Advanced Terra Testing
833 Parfet Street
Lakewood, CO 80215

Dear Ms. Roberts: RE: Present Landfill Design / Proj # 2617-02

Thank you for consulting Precision Geosynthetic Laboratories for your material testing needs.

Enclosed is the ***final*** laboratory report for the testing of eleven (11) Non Woven Geotextile samples received October 15, 2004.

It should be noted that the test specimen and test sample used for this report was believed to be representative of the material produced under the designation herein stated. However, these results are indicative of only the specimens that were actually tested. The testing herein is based upon accepted industry practice as well as the test method listed. Precision Geosynthetic Laboratories neither accepts responsibility for nor makes claims to the final use and purpose of the material.

By accepting the data and results represented on this report, Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims arising out of the use of this data to the cost for the respective test(s) represented in this report, and Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liability in excess of the aforementioned limit.

The test data and all associated project information shall be held in confidence, not to be reproduced except in full and disclosed to other parties with the authorization of Client.

It is a company policy to keep the physical records of each job for 2 years since the receipt of the samples and keep the electronic file for 7 years. ***Failed seam samples are kept for 7 years; good seam samples are disposed after 2 weeks and conformance samples are disposed after 1 month.*** Should you need us to keep them longer, please advise us in writing.

If you have any questions or if we may be of further service, please do not hesitate to call at 800-522-4599.

Sincerely,

PRECISION GEOSYNTHETIC LABORATORIES

Maria Espitia
Quality Assurance

Cora B. Queja
Vice President

Enclosure: (Job No. G041273)

ISO 9001 - 2000

Precision Geosynthetic Laboratories

CLIENT: Advanced Terra Testing
PROJECT: Present Landfill Design / Proj # 2617-02

VERIFICATION OF MATERIAL PROPERTIES
(PGL Job No. G041273)

MATERIAL DESCRIPTION: Non Woven Geotextile

SAMPLE(S) SENT BY: Advanced Terra Testing

DATE RECEIVED: October 15, 2004 **DATE REPORTED:** October 20, 2004

SAMPLE IDENTIFICATIONS:

SAMPLE ID	PRECISION CONTROL NUMBER
ATT#1 L#C2-8-2-04-2015-200	5943
ATT#2 L#C2-8-2-04-2301-200	5944
ATT#3 L#C2-8-2-04-1948-200	5945
ATT#4 L#C2-8-2-04-2111-200	5946
ATT#5 L#C2-8-2-04-2048-200	5947
ATT#6 L#C2-8-2-04-1917-200	5948
ATT#7 L#C2-8-2-04-2160-200	5949
ATT#8 R#2230	5950
ATT#9 No ID	5951
ATT#10 L#C2-8-2-04-2266-200	5952
ATT#11 L#C2-8-2-04-2196-200	5953

TESTS REQUIRED:

TEST METHOD	DESCRIPTION
ASTM D4751	Apparent Opening Size (AOS)

TEST CONDITIONS: The samples were conditioned for a minimum one hour in the laboratory at 22 ± 2°C (71.6 ± 3.6°F) and at 60 ± 10% relative humidity prior to test.

TEST RESULTS:

The test results are summarized in Table 1. The units in which the data are reported are included on this table.

PRECISION GEOSYNTHETIC LABORATORIES

GAI-LAP
Initials: ME #: 013
Date: 10/20/04

Maria Espitia
Quality Assurance

Cora B. Queja
Vice President

1160 North Gilbert Street, Anaheim, CA. 92801, Tel# 714-520-9631, Fax# 714-520-9637
DC#2000 Record#281

TABLE 1.

MATERIAL PROPERTIES

CLIENT: ADVANCED TERRA TESTING

PROJECT: Present Landfill Design / Proj # 2617-02

Date Received: **10/15/2004**
Date Reported: **10/20/2004**
Material Description: **Non Woven Geotextile**

QC'd By: MB
PGL Job No.: **G041273**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Proj. Specs.
Client Sample ID:	**ATT#1 L#C2-8-2-04-2015-200**						**PGL Control No.**		**5943**					
ASTM D4751	Apparent Opening Size (U.S. standard sieve size)													
	Specimens were tested as directed in Test Method D4751. Type of sieve shaker used is W.S. Tyler Rotap.													
		100-140	100-140	100-140	100-140	100-140						100-140	N/A	
ASTM D4751	Apparent Opening Size (mm)													
	Specimens were tested as directed in Test Method D4751. Type of sieve shaker used is W.S. Tyler Rotap.													
		0.146	0.149	0.149	0.144	0.148						0.147	0.002	0.18 (max)
Client Sample ID:	**ATT#2 L#C2-8-2-04-2301-200**						**PGL Control No.**		**5944**					
ASTM D4751	Apparent Opening Size (U.S. standard sieve size)													
	Specimens were tested as directed in Test Method D4751. Type of sieve shaker used is W.S. Tyler Rotap.													
		100-140	100-140	100-140	100-140	100-140						100-140	N/A	
ASTM D4751	Apparent Opening Size (mm)													
	Specimens were tested as directed in Test Method D4751. Type of sieve shaker used is W.S. Tyler Rotap.													
		0.147	0.148	0.149	0.146	0.144						0.147	0.002	0.18 (max)
Client Sample ID:	**ATT#3 L#C2-8-2-04-1948-200**						**PGL Control No.**		**5945**					
ASTM D4751	Apparent Opening Size (U.S. standard sieve size)													
	Specimens were tested as directed in Test Method D4751. Type of sieve shaker used is W.S. Tyler Rotap.													
		100-140	100-140	100-140	100-140	100-140						100-140	N/A	
ASTM D4751	Apparent Opening Size (mm)													
	Specimens were tested as directed in Test Method D4751. Type of sieve shaker used is W.S. Tyler Rotap.													
		0.150	0.149	0.149	0.150	0.150						0.150	0.001	0.18 (max)

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION
DC#1991 Record#272

Precision Geosynthetic Laboratories

TABLE 1.

MATERIAL PROPERTIES

CLIENT: ADVANCED TERRA TESTING

PROJECT: Present Landfill Design / Proj # 2617-02

Date Received: **10/15/2004**
Date Reported: **10/20/2004**
Material Description: **Non Woven Geotextile**

QC'd By: ME
PGL Job No.: **G041273**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Proj. Specs.
Client Sample ID:	**ATT#4 L#C2-8-2-04-2111-200**						**PGL Control No.**		**5946**					
ASTM D4751	Apparent Opening Size (U.S. standard sieve size)													
	Specimens were tested as directed in Test Method D4751. Type of sieve shaker used is W.S. Tyler Rotap.													
		100-140	100-140	100-140	100-140	100-140						100-140	N/A	
ASTM D4751	Apparent Opening Size (mm)													
	Specimens were tested as directed in Test Method D4751. Type of sieve shaker used is W.S. Tyler Rotap.													
		0.150	0.150	0.145	0.146	0.149						0.148	0.002	0.18 (max)
Client Sample ID:	**ATT#5 L#C2-8-2-04-2048-200**						**PGL Control No.**		**5947**					
ASTM D4751	Apparent Opening Size (U.S. standard sieve size)													
	Specimens were tested as directed in Test Method D4751. Type of sieve shaker used is W.S. Tyler Rotap.													
		100-140	100-140	100-140	100-140	100-140						100-140	N/A	
ASTM D4751	Apparent Opening Size (mm)													
	Specimens were tested as directed in Test Method D4751. Type of sieve shaker used is W.S. Tyler Rotap.													
		0.148	0.148	0.146	0.150	0.149						0.148	0.001	0.18 (max)
Client Sample ID:	**ATT#6 L#C2-8-2-04-1917-200**						**PGL Control No.**		**5948**					
ASTM D4751	Apparent Opening Size (U.S. standard sieve size)													
	Specimens were tested as directed in Test Method D4751. Type of sieve shaker used is W.S. Tyler Rotap.													
		100-140	100-140	100-140	100-140	100-140						100-140	N/A	
ASTM D4751	Apparent Opening Size (mm)													
	Specimens were tested as directed in Test Method D4751. Type of sieve shaker used is W.S. Tyler Rotap.													
		0.149	0.150	0.148	0.146	0.143						0.147	0.003	0.18 (max)

MD - MA[illegible] DIRECTION
TD - T[illegible]RSE DIRECTION
DC#19[illegible] Record#272

TABLE 1.

MATERIAL PROPERTIES

CLIENT: ADVANCED TERRA TESTING

PROJECT: Present Landfill Design / Proj # 2617-02

Date Received: **10/15/2004**
Date Reported: **10/20/2004**
Material Description: **Non Woven Geotextile**

QC'd By: ME
PGL Job No.: **G041273**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Proj. Specs.
Client Sample ID:	**ATT#7 L#C2-8-2-04-2160-200**						**PGL Control No.**		**5949**					
ASTM D4751	Apparent Opening Size (U.S. standard sieve size)													
	Specimens were tested as directed in Test Method D4751. Type of sieve shaker used is W.S. Tyler Rotap.													
		100-140	100-140	100-140	100-140	100-140						100-140	N/A	
ASTM D4751	Apparent Opening Size (mm)													
	Specimens were tested as directed in Test Method D4751. Type of sieve shaker used is W.S. Tyler Rotap.													
		0.146	0.149	0.150	0.148	0.145						0.148	0.002	0.18 (max)
Client Sample ID:	**ATT#8 R#2230**						**PGL Control No.**		**5950**					
ASTM D4751	Apparent Opening Size (U.S. standard sieve size)													
	Specimens were tested as directed in Test Method D4751. Type of sieve shaker used is W.S. Tyler Rotap.													
		100-140	100-140	100-140	100-140	100-140						100-140	N/A	
ASTM D4751	Apparent Opening Size (mm)													
	Specimens were tested as directed in Test Method D4751. Type of sieve shaker used is W.S. Tyler Rotap.													
		0.150	0.146	0.142	0.149	0.149						0.147	0.003	0.18 (max)
Client Sample ID:	**ATT#9 No ID**						**PGL Control No.**		**5951**					
ASTM D4751	Apparent Opening Size (U.S. standard sieve size)													
	Specimens were tested as directed in Test Method D4751. Type of sieve shaker used is W.S. Tyler Rotap.													
		100-140	100-140	100-140	100-140	100-140						100-140	N/A	
ASTM D4751	Apparent Opening Size (mm)													
	Specimens were tested as directed in Test Method D4751. Type of sieve shaker used is W.S. Tyler Rotap.													
		0.145	0.145	0.146	0.149	0.143						0.146	0.002	0.18 (max)

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION
DC#1991 Record#272

TABLE 1.

MATERIAL PROPERTIES

CLIENT: ADVANCED TERRA TESTING

PROJECT: Present Landfill Design / Proj # 2617-02

Date Received: **10/15/2004**
Date Reported: **10/20/2004**
Material Description: **Non Woven Geotextile**

QC'd By: MC
PGL Job No.: **G041273**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Proj. Specs.
Client Sample ID:	**ATT#10 L#C2-8-2-04-2266-200**						**PGL Control No.**		**5952**					
ASTM D4751	Apparent Opening Size (U.S. standard sieve size)													
	Specimens were tested as directed in Test Method D4751. Type of sieve shaker used is W.S. Tyler Rotap.													
		100-140	100-140	100-140	100-140	100-140						100-140	N/A	
ASTM D4751	Apparent Opening Size (mm)													
	Specimens were tested as directed in Test Method D4751. Type of sieve shaker used is W.S. Tyler Rotap.													
		0.149	0.149	0.146	0.149	0.144						0.147	0.002	0.18 (max)
Client Sample ID:	**ATT#11 L#C2-8-2-04-2196-200**						**PGL Control No.**		**5953**					
ASTM D4751	Apparent Opening Size (U.S. standard sieve size)													
	Specimens were tested as directed in Test Method D4751. Type of sieve shaker used is W.S. Tyler Rotap.													
		100-140	100-140	100-140	100-140	100-140						100-140	N/A	
ASTM D4751	Apparent Opening Size (mm)													
	Specimens were tested as directed in Test Method D4751. Type of sieve shaker used is W.S. Tyler Rotap.													
		0.150	0.146	0.145	0.149	0.148						0.148	0.002	0.18

MD - MA[illegible] DIRECTION
TD - TI[illegible]RSE DIRECTION
DC#199[illegible]ecord#272

ADVANCED TERRA TESTING, Inc.
ATT
833 Parfet Street • Lakewood, Colorado 80215 • (303) 232-8308 • Fax: (303) 232-1579

Rahe, John -- MFG, Inc.

From: Rahe, John -- MFG, Inc.
Sent: Tuesday, January 25, 2005 4:43 PM
To: 'Robert.Davis@rfets.gov'
Cc: 'josh.valentine@ttrmc.com'
Subject: QA Laboratory Testing of FML Destructive Seams at the PLF

Bob,

The three destructive seam samples (DFP-020, DFP-040 and DFP-060) of the 60-mil LLDPE from the top of the PLF closure (west of the 5980 line) recently delivered to Advanced Terra Testing have been tested. Each of the three samples was tested for shear and peel strength of the seams in accordance with ASTM D 6392 with five specimens of each sample tested. Both seams (A and B) of the double fusion seams were tested for peel strength.

The average seam shear strength was approximately 100.9 pounds per inch, which is approximately 10 percent higher than the specified minimum of 90 lbs/in and the peel strengths of the seams averaged approximately 91 lbs/in, which is approximately 20 percent higher than the minimum specified peel strength of 75 lbs/in. These are in the same general range as the QC tests on field destructive seams.

These tests provide sufficient QA laboratory coverage of the FML field seams installed to date west of the 5980 line.

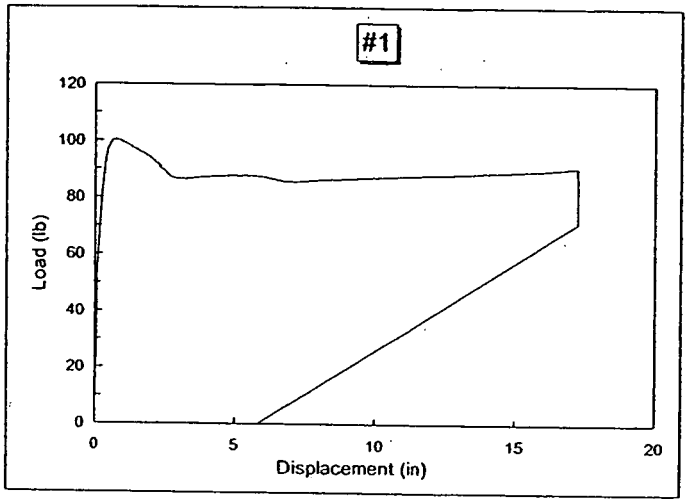
The laboratory QA conformance tests of the new FML, GCL and GDN materials recently delivered to ATT are almost complete and will be reported to you soon. Initial indications are that the material tests are acceptable to this point.

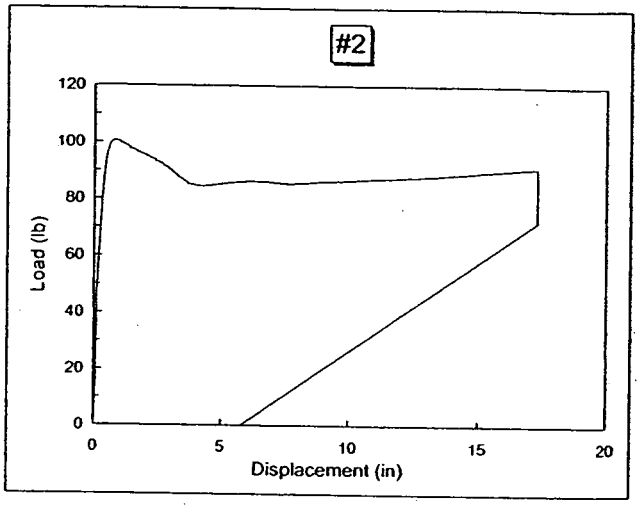
Let me know if you have any questions.

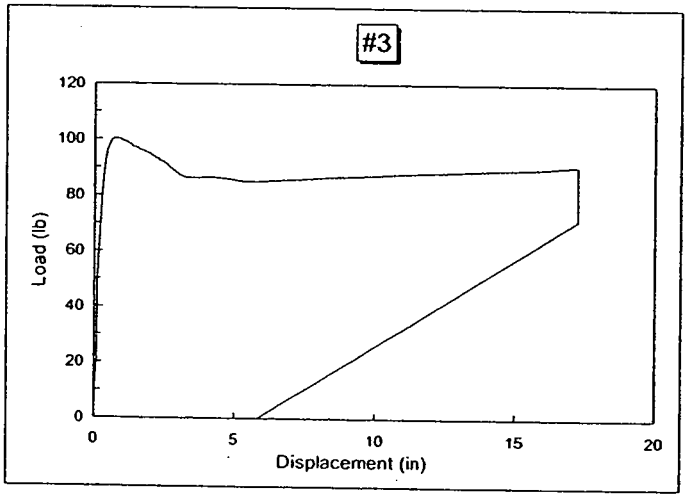
Regards,
John

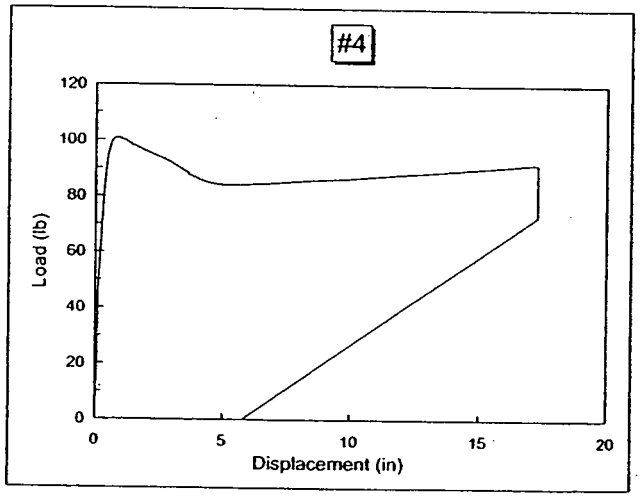
John H. Rahe, P.E.
Tetra Tech/MFG
303-447-0913 (ext. 104)

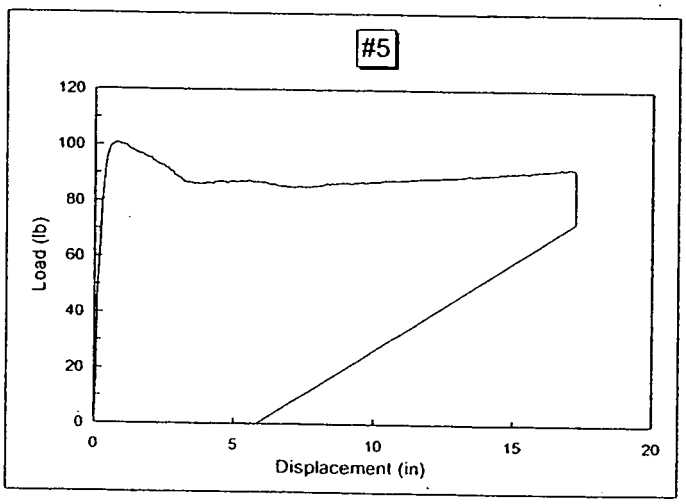
Client:	Tetra Tech-RMC	Test Type:	Seam Shear, ASTM D 6392
Job No.:	2617-03	Material Type:	60 mil LLDPE
Location:	Present Landfill Design - RFETS	Date Tested:	01-17-05
Sample:	DFP-020	Tested By:	JTR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	20 in/min
		Grip Seperation:	6.13"











	Shear Strength (lb/in)	Locus of Break Code	Break Class
Specimen #1	100.4		EXCEEDED MACHINE EXTENSION
Specimen #2	100.6		EXCEEDED MACHINE EXTENSION
Specimen #3	100.5		EXCEEDED MACHINE EXTENSION
Specimen #4	100.9		EXCEEDED MACHINE EXTENSION
Specimen #5	100.9		EXCEEDED MACHINE EXTENSION
Average	**100.7**		
Std. Deviation	**0.2**		

Operator:	DP-5N, MGC
Machine:	M. 0004, BC, 800/9
Panels:	P40, P38
Rolls:	11-18-04
Seam:	130' NSE0S

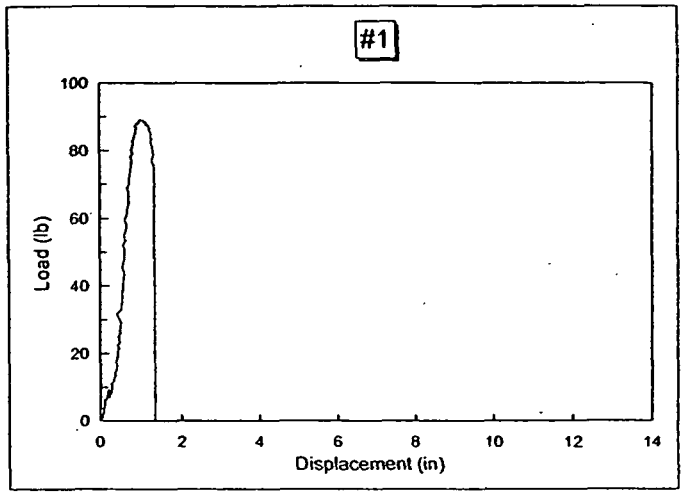
Filename: TTSS38

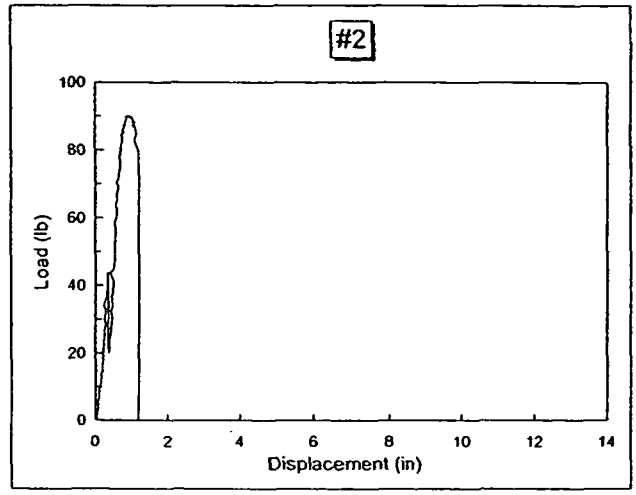
Raw Data File: TTSS382.TXT, TTSS383.TXT

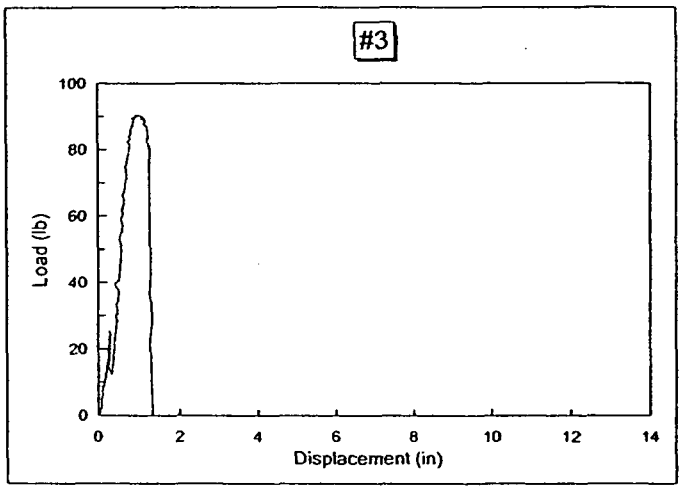
Checked By: STR Date: 1/20/05

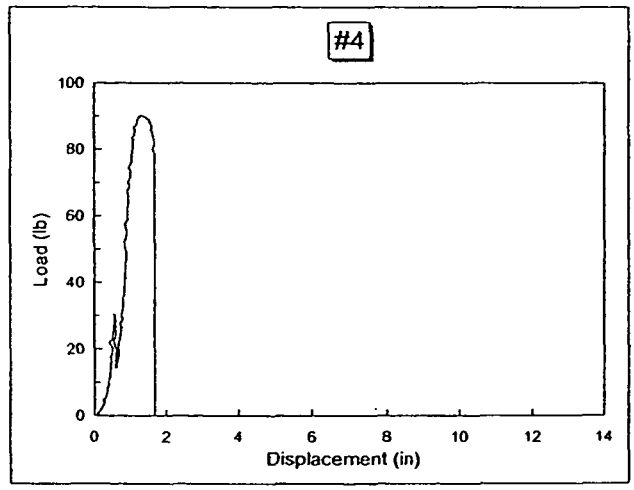
Advanced Terra Testing, Inc.

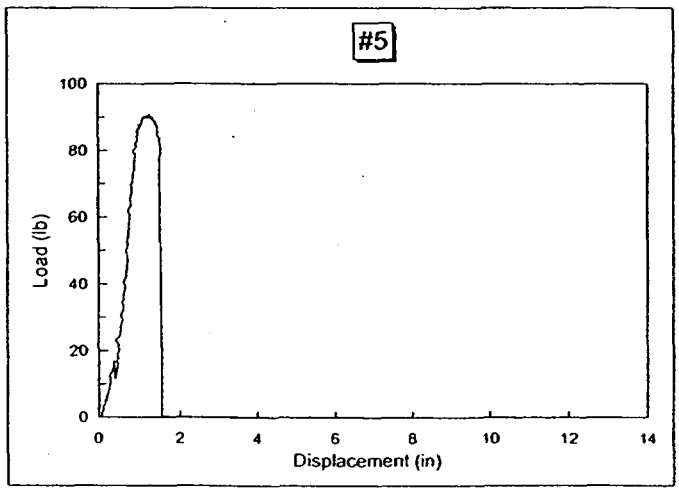
Client:	Tetra Tech-RMC	Test Type:	Peel Adhesion, ASTM D 6392
Job No.:	2617-03	Material Type:	60 mil LLDPE
Location:	Present Landfill Design - RFETS	Date Tested:	01-17-05
Sample:	DFP-020	Tested By:	JTR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2.0 in/min
		Grip Seperation:	1.0 in











	Peel Strength (lb/in)	Locus of Break Code	Break Class
Specimen #1	89.1	SE-1	FTB
Specimen #2	90.2	SE-1	FTB
Specimen #3	90.3	SE-1	FTB
Specimen #4	90.4	SE-1	FTB
Specimen #5	91.1	SE-1	FTB
Average	**90.2**		
Std. Deviation	**0.7**		

Operator:	DP-5N, MGC
Machine:	M. 0004, BC, 800/9
Panels:	P40, P38
Rolls:	11-18-04
Seam:	130' NSE0S
Seam A or B	A

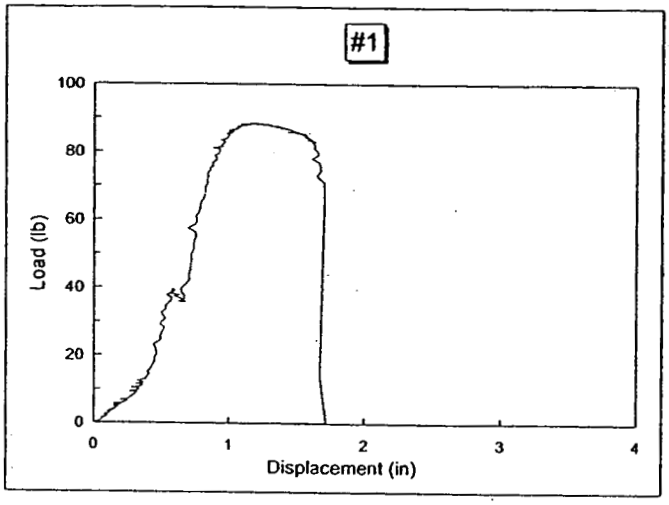
Filename: TTPA38

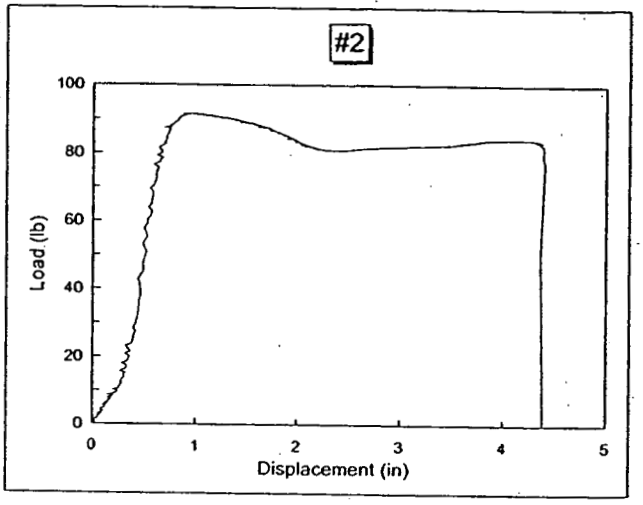
Raw Data File: TTPA38A2.TXT, TTPA38A3.TXT

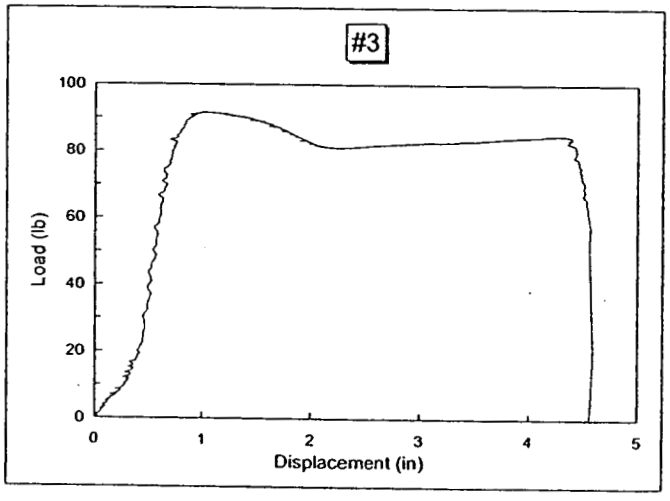
Checked By: JTR Date: 1/20/05

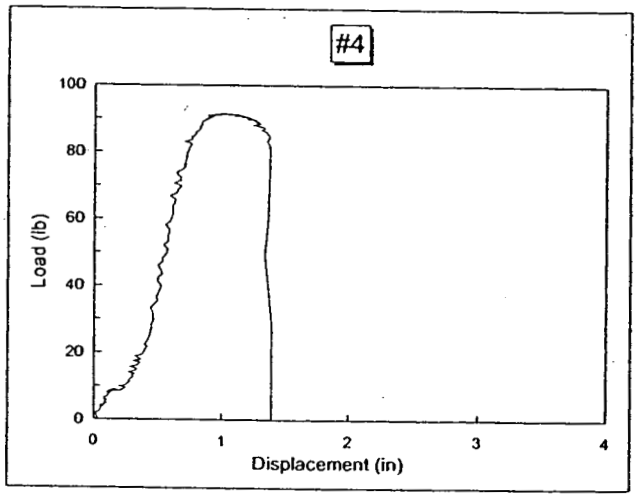
Advanced Terra Testing, Inc.

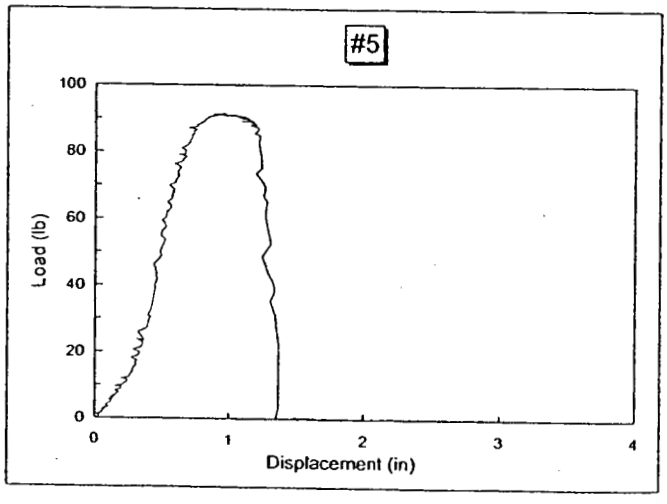
Client:	Tetra Tech-RMC	Test Type:	Peel Adhesion, ASTM D 6392
Job No.:	2617-03	Material Type:	60 mil LLDPE
Location:	Present Landfill Design - RFETS	Date Tested:	01-17-05
Sample:	DFP-020	Tested By:	JTR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2.0 in/min
		Grip Seperation:	1.0 in











	Peel Strength (lb/in)	Locus of Break Code	Break Class
Specimen #1	88.4	SE-1	FTB
Specimen #2	91.5	SE-1	FTB
Specimen #3	91.6	SE-1	FTB
Specimen #4	91.5	SE-1	FTB
Specimen #5	91.7	SE-1	FTB
Average	**90.9**		
Std. Deviation	**1.3**		

Operator:	DP-5N, MGC
Machine:	M. 0004, BC, 800/9
Panels:	P40, P38
Rolls:	11-18-04
Seam:	130' NSE0S
Seam A or B	B

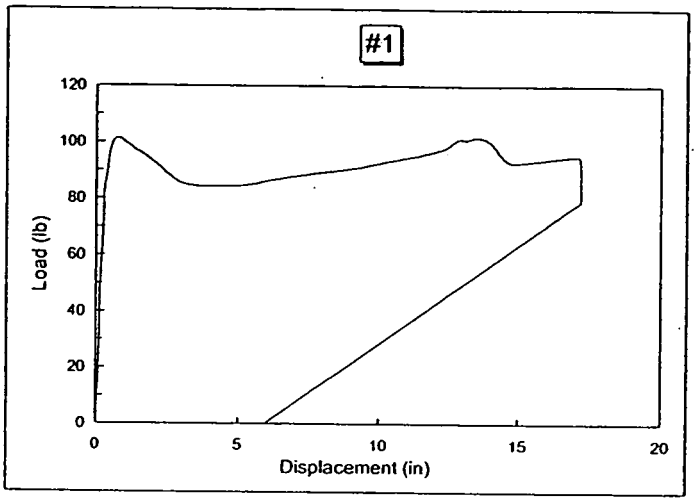
Filename: TTPA38B

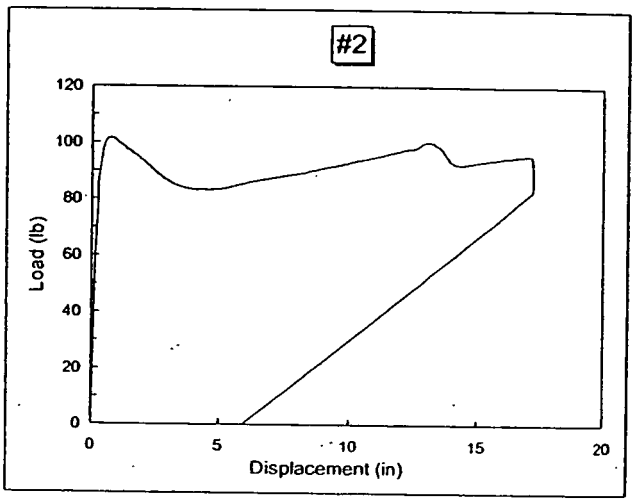
Raw Data File: TTPA38B2.TXT, TTPA38B3.TXT

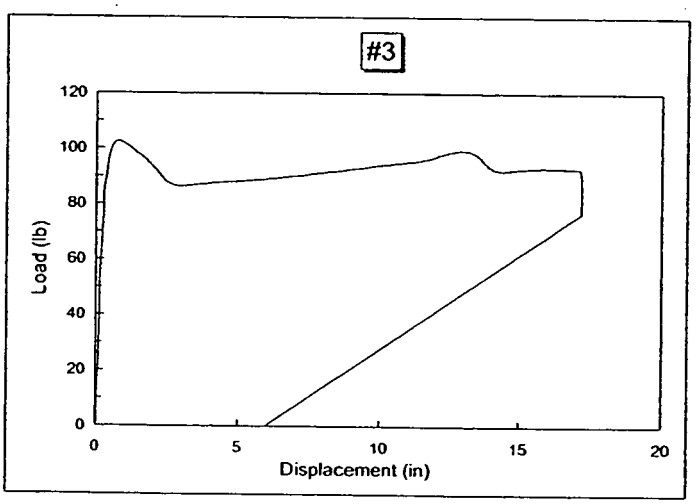
Checked By: JTR Date: 1/20/05

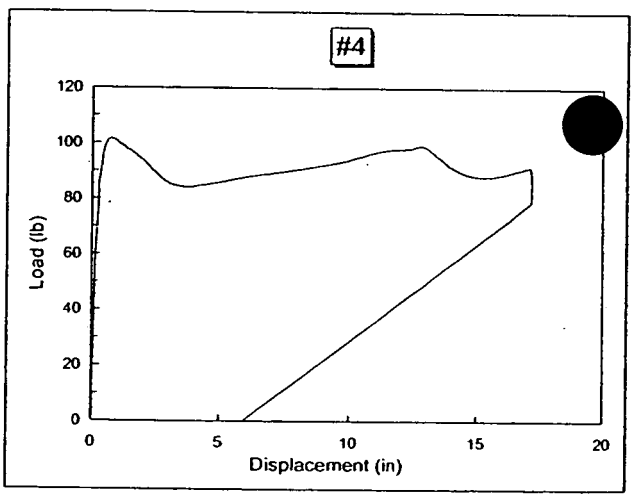
Advanced Terra Testing, Inc.

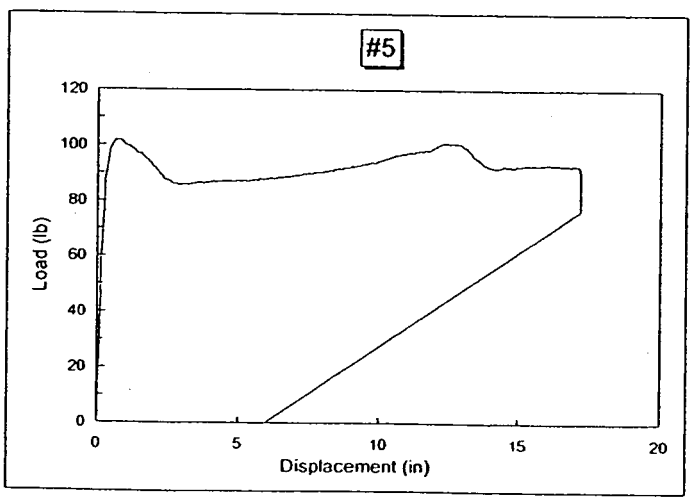
Client:	Tetra Tech-RMC	Test Type:	Seam Shear, ASTM D 6392
Job No.:	2617-03	Material Type:	60 mil LLDPE
Location:	Present Landfill Design - RFETS	Date Tested:	01-17-05
Sample:	DFP-040	Tested By:	JTR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	20 in/min
		Grip Seperation:	6.00"











	Shear Strength (lb/in)	Locus of Break Code	Break Class
Specimen #1	101.5		EXCEEDED MACHINE EXTENSION
Specimen #2	101.5		EXCEEDED MACHINE EXTENSION
Specimen #3	102.4		EXCEEDED MACHINE EXTENSION
Specimen #4	101.4		EXCEEDED MACHINE EXTENSION
Specimen #5	101.8		EXCEEDED MACHINE EXTENSION
Average	**101.7**		
Std. Deviation	**0.4**		

Operator:	JS
Machine:	#0019, 800/9.5
Panels:	P65, P64, QA, DP-9H
Rolls:	12-09-04, 15:10, PRH
Seam:	135° S of NEOS

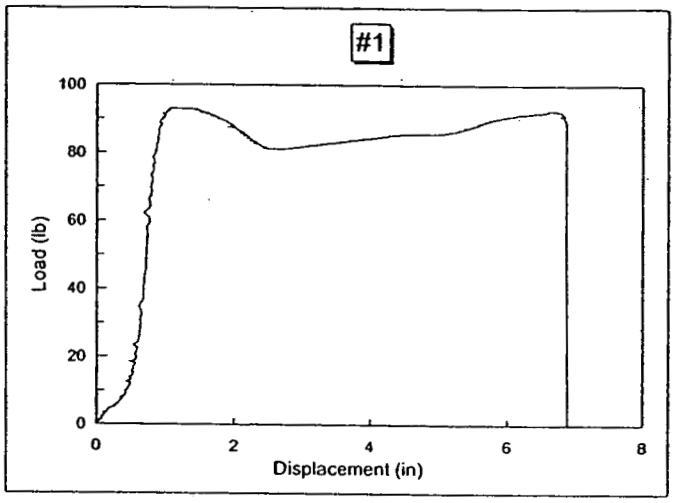
Filename: TTSS65

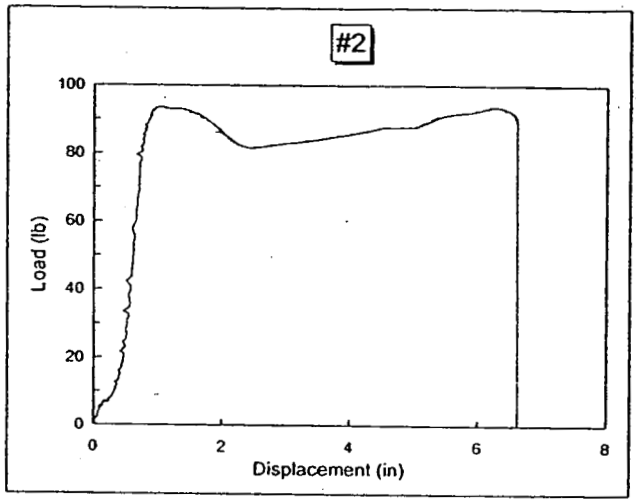
Raw Data File: TTSS962.TXT, TTSS963.TXT

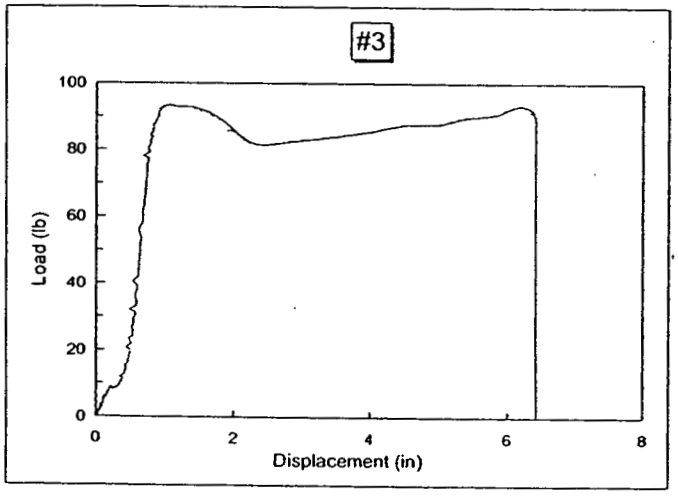
Checked By: JTR Date: 1/20/05

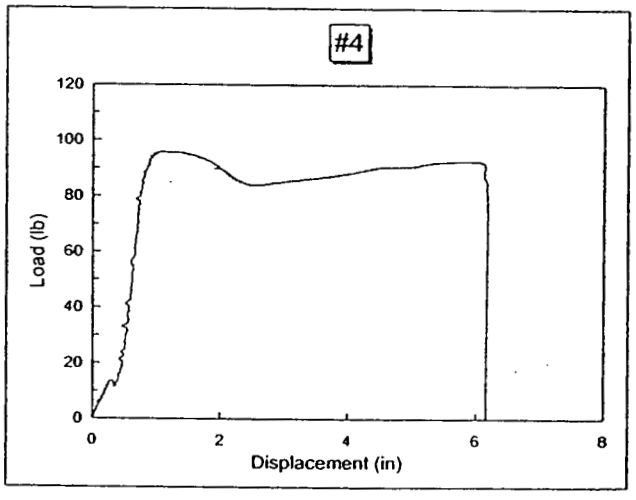
Advanced Terra Testing, Inc.

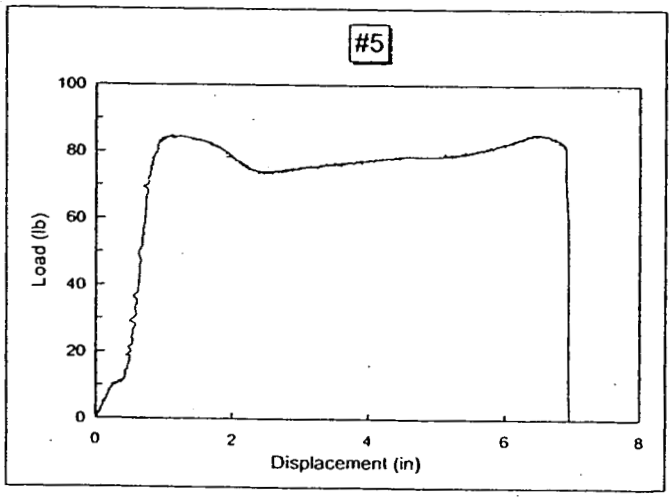
Client:	Tetra Tech-RMC	Test Type:	Peel Adhesion, ASTM D 6392
Job No.:	2617-03	Material Type:	60 mil LLDPE
Location:	Present Landfill Design - RFETS	Date Tested:	01-17-05
Sample:	DFP-040	Tested By:	JTR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2.0 in/min
		Grip Seperation:	1.0 in











	Peel Strength (lb/in)	Locus of Break Code	Break Class
Specimen #1	93.0	SE-1	FTB
Specimen #2	93.6	SE-1	FTB
Specimen #3	93.6	SE-1	FTB
Specimen #4	95.8	SE-1	FTB
Specimen #5	84.8	SE-1	FTB
Average	**92.1**		
Std. Deviation	**3.8**		

Operator:	JS
Machine:	#0019, 800/9.5
Panels:	P65, P64, QA, DP-9H
Rolls:	12-09-04, 15:10, PRH
Seam:	135' S of NEOS
Seam A or B	A

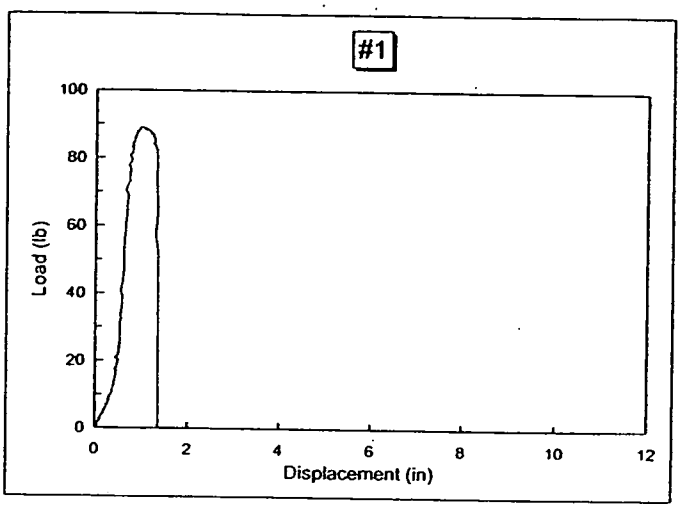
Filename: TTPA65

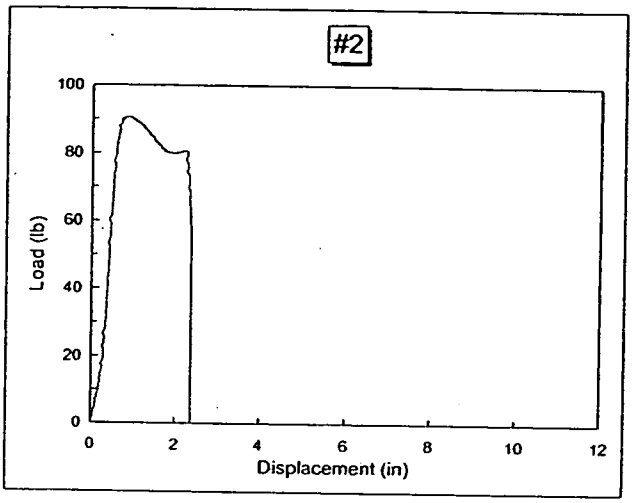
Raw Data File: TTPA65A2.TXT, TTPA65A3.TXT

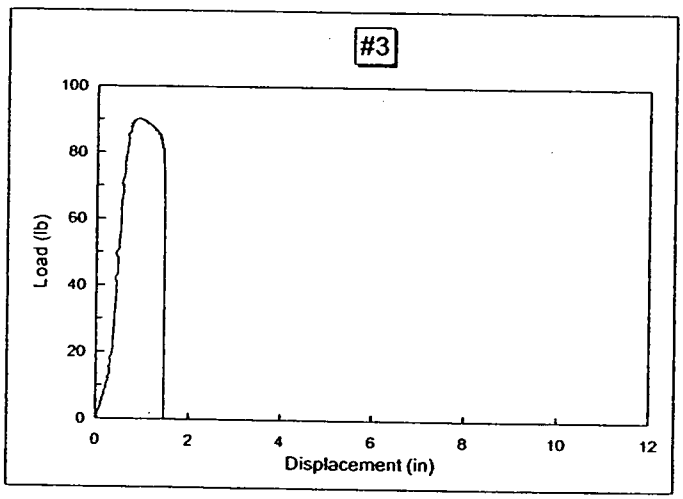
Checked By: JTR Date: 1/20/05

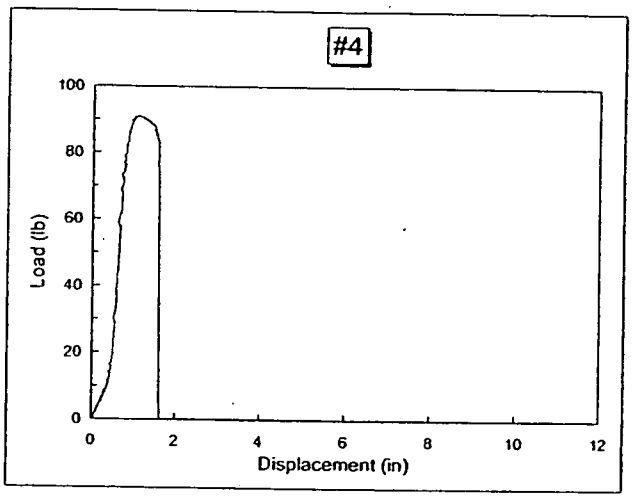
Advanced Terra Testing, Inc.

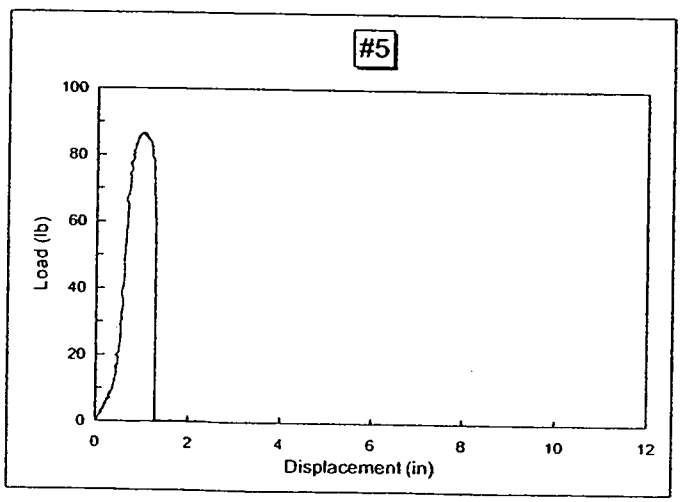
Client:	Tetra Tech-RMC	Test Type:	Peel Adhesion, ASTM D 6392
Job No.:	2617-03	Material Type:	60 mil LLDPE
Location:	Present Landfill Design - RFETS	Date Tested:	01-17-05
Sample:	DFP-040	Tested By:	JTR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2.0 in/min
		Grip Seperation:	1.0 in











	Peel Strength (lb/in)	Locus of Break Code	Break Class
Specimen #1	89.1	SE-1	FTB
Specimen #2	90.6	SE-1	FTB
Specimen #3	90.2	SE-1	FTB
Specimen #4	90.9	SE-1	FTB
Specimen #5	86.9	SE-1	FTB
Average	**89.6**		
Std. Deviation	**1.4**		

Operator:	JS
Machine:	#0019, 800/9.5
Panels:	P65, P64, QA, DP-9H
Rolls:	12-09-04, 15:10, PRH
Seam:	135' S of NEOS
Seam A or B	B

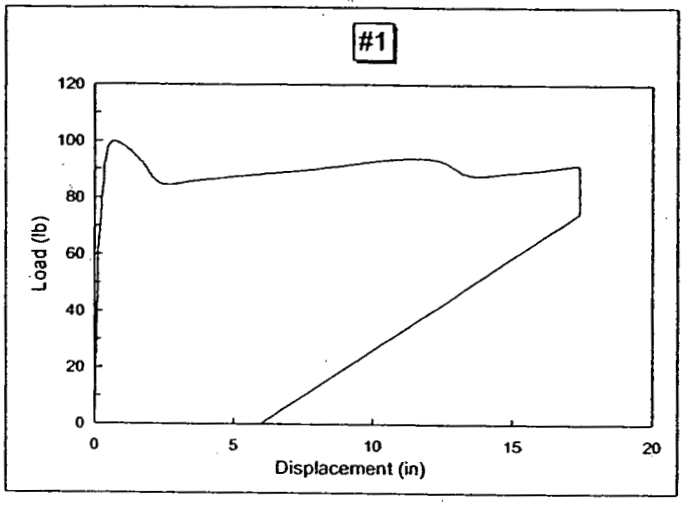
Filename: TTPA65B

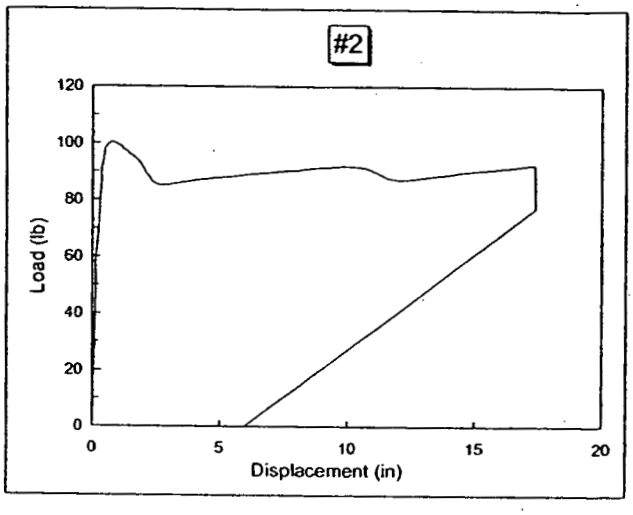
Raw Data File: TTPA65B2.TXT, TTPA65B3.TXT

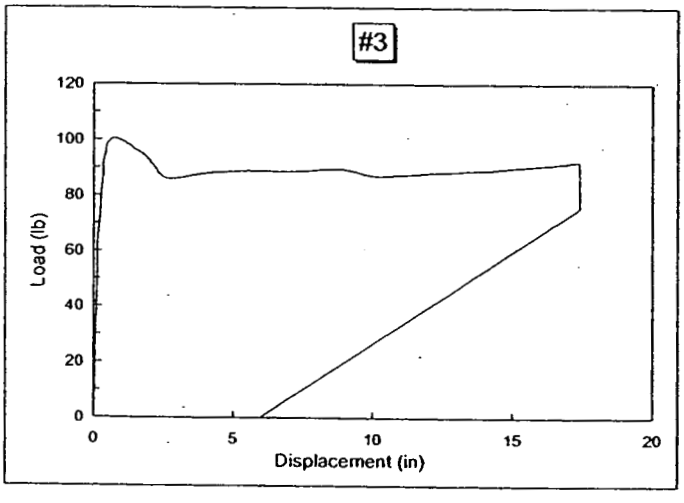
Checked By: JTR Date: 1/20/05

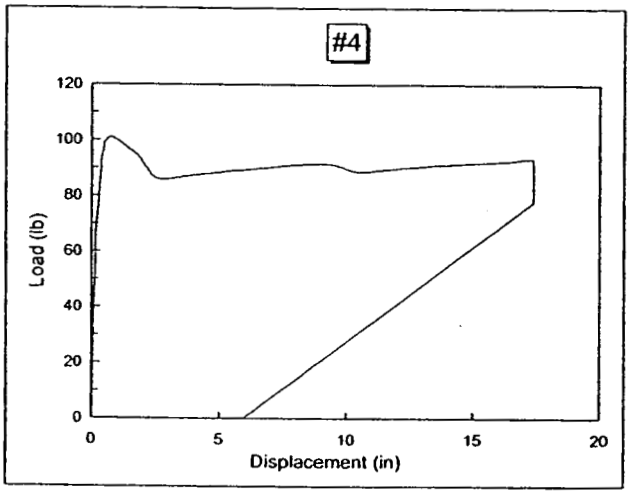
Advanced Terra Testing, Inc.

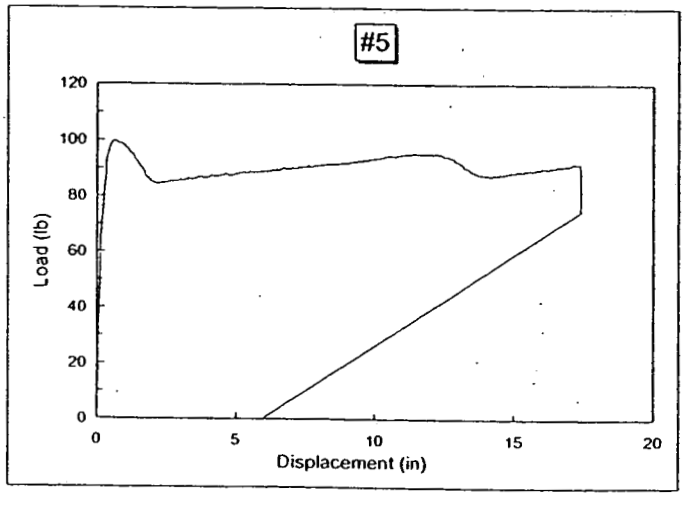
Client:	Tetra Tech-RMC	Test Type:	Seam Shear, ASTM D 6392
Job No.:	2617-03	Material Type:	60 mil LLDPE
Location:	Present Landfill Design - RFETS	Date Tested:	01-17-05
Sample:	DFP-060	Tested By:	JTR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	20 in/min
		Grip Seperation:	6.01"











	Shear Strength (lb/in)	Locus of Break Code	Break Class
Specimen #1	99.9		EXCEEDED MACHINE EXTENSION
Specimen #2	100.4		EXCEEDED MACHINE EXTENSION
Specimen #3	100.5		EXCEEDED MACHINE EXTENSION
Specimen #4	101.0		EXCEEDED MACHINE EXTENSION
Specimen #5	99.7		EXCEEDED MACHINE EXTENSION
Average	**100.3**		
Std. Deviation	**0.5**		

Operator:	JS
Machine:	#0019, 800/10
Panels:	P96, P94
Rolls:	12-19-04, 12:06 PM, PR.14
Seam:	60' S of NEOS

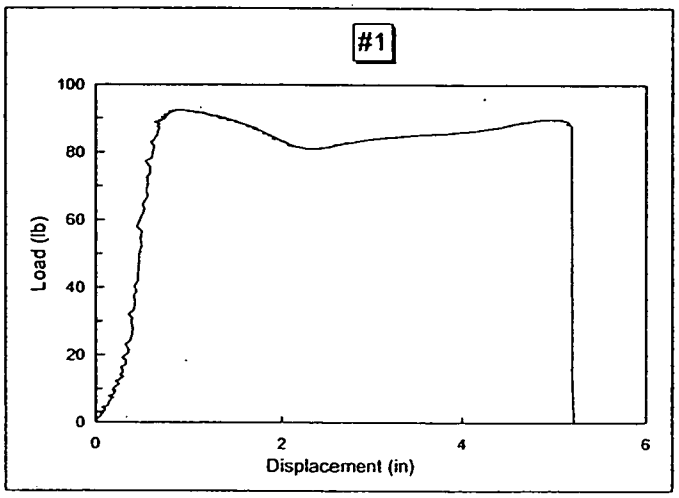
Filename: TTSS96

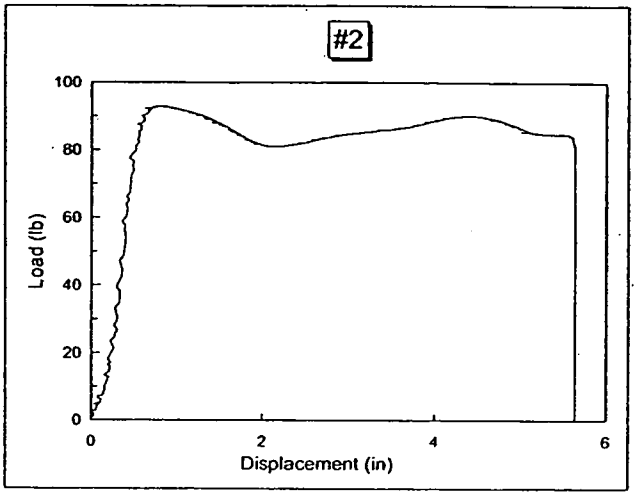
Raw Data File: TTSS962.TXT, TTSS963.TXT

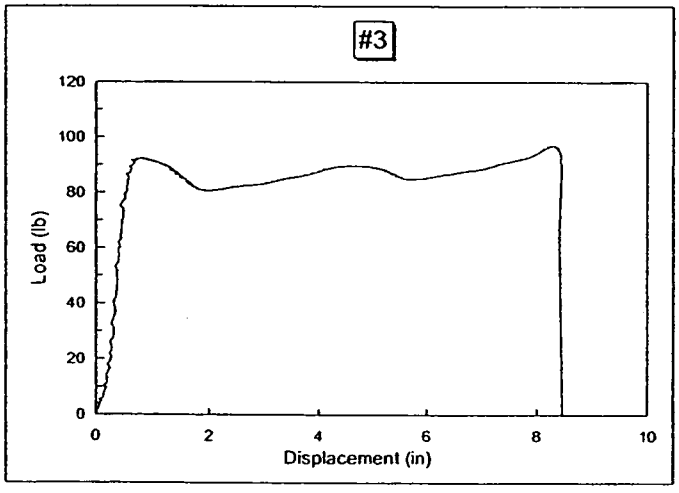
Checked By: JTR Date: 1/20/05

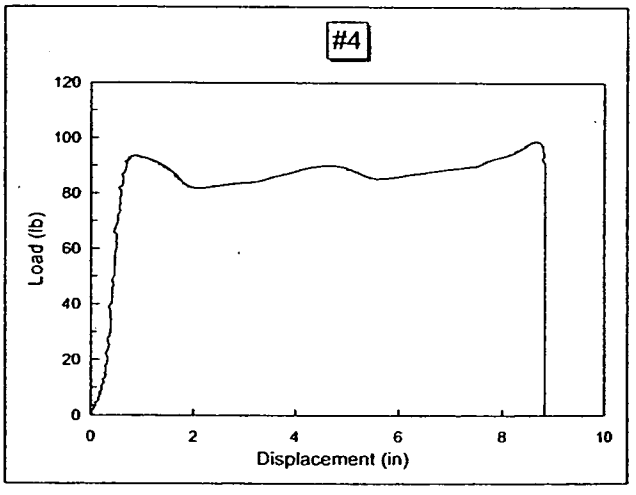
Advanced Terra Testing, Inc.

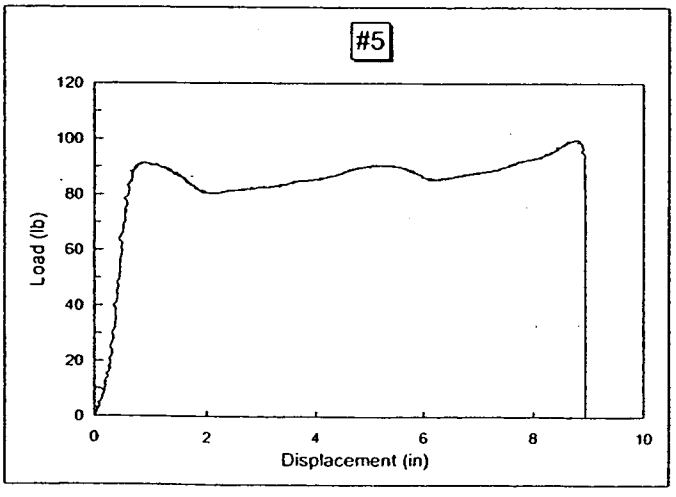
Client:	Tetra Tech-RMC	Test Type:	Peel Adhesion, ASTM D 6392
Job No.:	2617-03	Material Type:	60 mil LLDPE
Location:	Present Landfill Design - RFETS	Date Tested:	01-17-05
Sample:	DFP-060	Tested By:	JTR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2.0 in/min
		Grip Seperation:	1.0 in











	Peel Strength (lb/in)	Locus of Break Code	Break Class
Specimen #1	92.7	SE-1	FTB
Specimen #2	93.0	SE-1	FTB
Specimen #3	92.4	SE-1	FTB
Specimen #4	93.8	SE-1	FTB
Specimen #5	91.7	SE-1	FTB
Average	**92.7**		
Std. Deviation	**0.7**		

Operator:	JS
Machine:	#0019, 800/10
Panels:	P96, P94
Rolls:	12-19-04, 12:06 PM, PR.14
Seam:	60' S of NEOS
Seam A or B	A

Filename: TTPA96

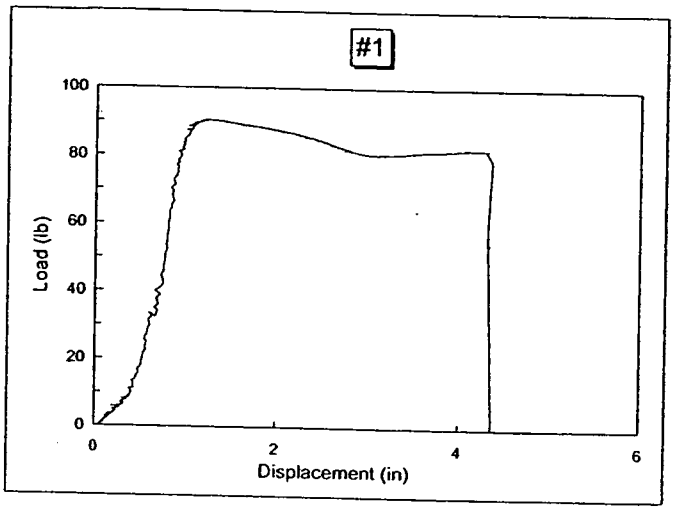
Raw Data File: TTPA96A2.TXT, TTPA96A3.TXT

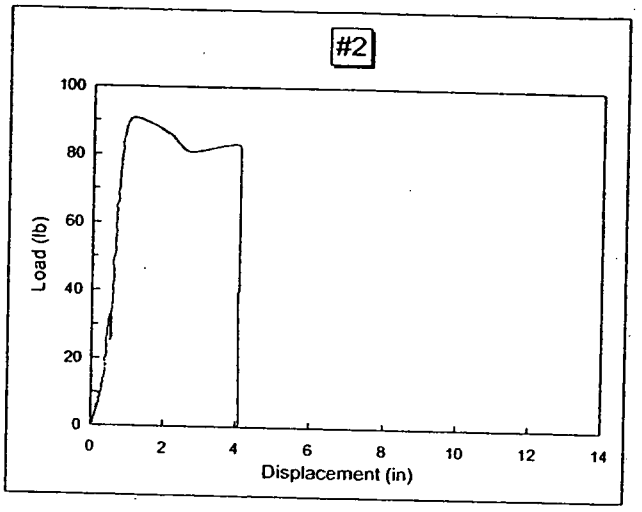
Checked By: JTR Date: 1/20/05

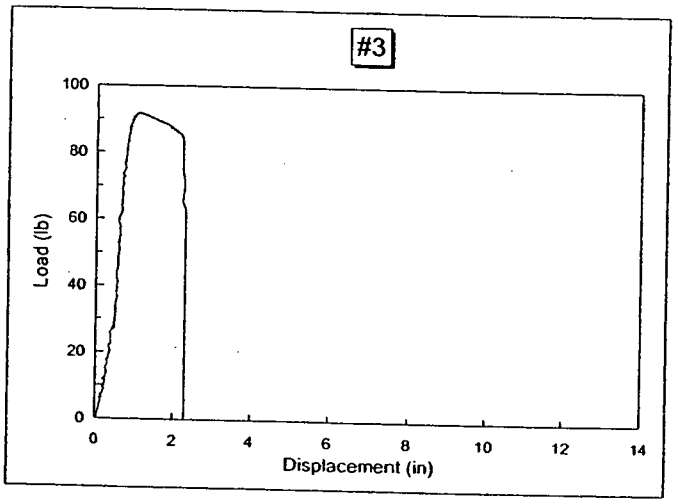
Advanced Terra Testing, Inc.

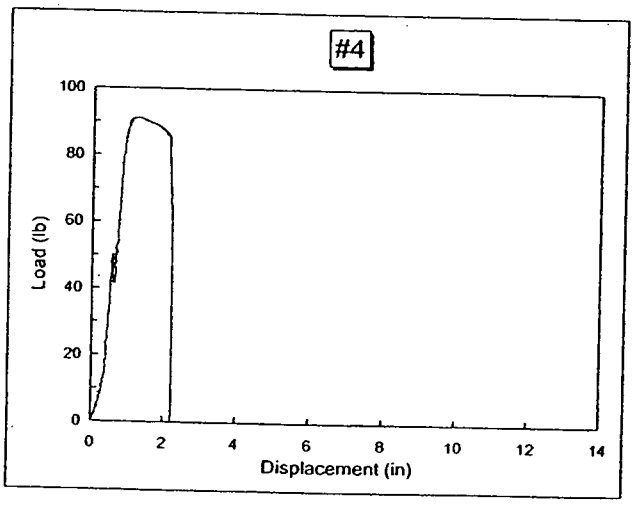
Client:	Tetra Tech-RMC
Job No.:	2617-03
Location:	Present Landfill Design - RFETS
Sample:	DFP-060
Test Device:	Five Station
Load Cells:	500 lb.

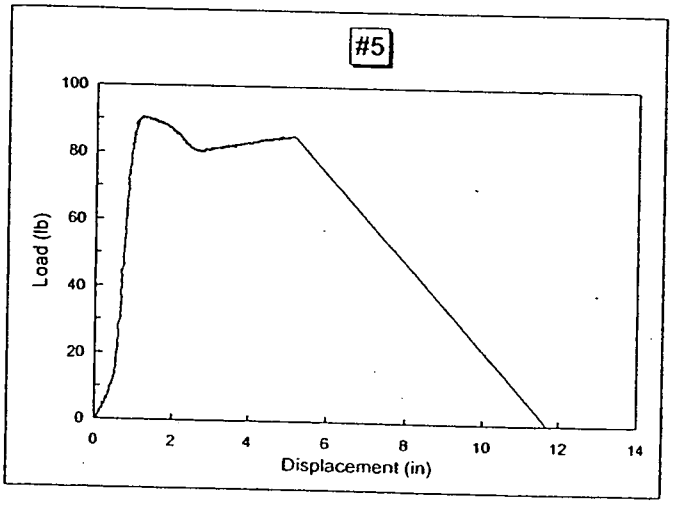
Test Type:	Peel Adhesion, ASTM D 6392
Material Type:	60 mil LLDPE
Date Tested:	01-17-05
Tested By:	JTR
Data Entered By:	SR
Displacement Rate:	2.0 in/min
Grip Seperation:	1.0 in











	Peel Strength (lb/in)	Locus of Break Code	Break Class
Specimen #1	90.5	SE-1	FTB
Specimen #2	90.9	SE-1	FTB
Specimen #3	91.8	SE-1	FTB
Specimen #4	91.3	SE-1	FTB
Specimen #5	90.8	SE-1	FTB
Average	**91.0**		
Std. Deviation	**0.5**		

Operator:	JS
Machine:	#0019, 800/10
Panels:	P96, P94
Rolls:	12-19-04, 12:06 PM, PR.14
Seam:	60' S of NEOS
Seam A or B	B

Filename: TTPA96B

Raw Data File: TTPA96B2.TXT, TTPA96B3.TXT

Checked By: JTR Date: 1/20/05

Advanced Terra Testing, Inc.

ADVANCED TERRA TESTING, Inc.
ATT
833 Parfet Street • Lakewood, Colorado 80215 • (303) 232-8308 • Fax: (303) 232-1579

Mr. Roy Spitzer
Tetra Tech - RMC
1900 S. Sunset Street, Suite 1-F
Longmont, CO 80501

January 31, 2005

RE: Present Landfill Design - RFETS
Golden, CO, and Rocky Flats Present Landfill Closure

Dear Mr. Spitzer,

Thank you for choosing Advanced Terra Testing, Inc. for your geosynthetic testing needs.

Per your request, we have completed the majority of analyses pertinent to the recent testing campaign relative to the above referenced project. Enclosed is an invoice covering progress billing to date. The following tables provide a summary of conformance testing by material type.

60 mil LLDPE (Present Landfill Design - RFETS)

Sample Number	Seam Shear ASTM D 6392 (lb/in)	Peel Adhesion ASTM D 6392	
		Weld A (lb/in)	Weld B (lb/in)
DFP-20	100.7	90.2	90.9
DFP-40	101.7	92.1	89.6
DFP-60	100.3	92.7	91.0

60 mil LLDPE (Rocky Flats Present Closure)

Roll Number	Thickness ASTM D 5199 (in)	Tear Resistance ASTM D 1004/C (lb/in width)		Puncture Resistance ASTM D 4833 (lbs)
		MD	CMD	
104124908	0.0635	34.4	36.0	113.2

60 mil LLDPE (Rocky Flats Present Closure) - ASTM D 6693 Type IV

Roll Number	MD Load @ Break (lbs/in width)	MD Elongation @ Break (%)	MD Load @ Yield (lbs/in width)	MD Elongation @ Yield (%)
104124908	323.8	929.3	94.9	25.7

60 mil LLDPE (Rocky Flats Present Closure) - ASTM D 6693 Type IV

Roll Number	CMD Load @ Break (lbs/in width)	CMD Elongation @ Break (%)	CMD Load @ Yield (lbs/in width)	CMD Elongation @ Yield (%)
104124908	311.4	921.7	96.4	20.6

60 mil LLDPE-T (Present Landfill Design - RFETS)

Roll Number	Thickness ASTM D 5994 (in)	Tear Resistance ASTM D 1004/C (lb/in width)		Puncture Resistance ASTM D 4833 (lbs)
		MD	CMD	
104124720	0.0570	34.0	34.4	106.7
104124728	0.0602	35.8	37.2	114.9
104124733	0.0611	36.1	37.9	116.7

60 mil LLDPE-T (Present Landfill Design - RFETS) - ASTM D 6693 Type IV

Roll Number	MD Load @ Break (lbs/in width)	MD Elongation @ Break (%)	MD Load @ Yield (lbs/in width)	MD Elongation @ Yield (%)
104124720	226.7	624.0	89.8	31.0
104124728	243.1	626.0	96.2	17.4
104124733	244.1	621.9	101.9	20.8

60 mil LLDPE-T (Present Landfill Design - RFETS) - ASTM D 6693 Type IV

Roll Number	CMD Load @ Break (lbs/in width)	CMD Elongation @ Break (%)	CMD Load @ Yield (lbs/in width)	CMD Elongation @ Yield (%)
104124720	199.1	576.7	91.0	18.7
104124728	221.1	590.6	95.8	16.7
104124733	207.0	540.4	101.8	18.5

60 mil LLDPE-T (Present Landfill Design - RFETS) Asperity Height - GRI-GM12, Density - ASTM D 1505, Carbon Black Content - ASTM D 1603, Carbon Black Dispersion - ASTM D 5596

Roll Number	Asperity Height * (mils)		Density ASTM D 1505 (grams/cm³)	Carbon Black Content ASTM D 1603 (%)	Carbon Black Dispersion ASTM D 5596 **
	Side A	Side B			
104124720	38	23	0.9376	2.34	1
104124728	30	24	0.9380	2.39	1
104124733	31	21	0.9383	2.38	1

*Note: * Apparatus: Has a dial indicator that travels at least 2,5 mm (0.1 in), and a depth gauge with contact point that travels up and down with in the setting block with a base dimension of 50 mm x 20 mm (2.0 in x 0.75 in) and a height of 15 mm (0.5 in). The contact point is 3,12 mm (0.125 in) in radius and is tapered to 0.25 mm (0.01 in) in radius. The length of the needle is 16 mm (0.65 in). Sampling: 10 specimens across the roll width in a randomly distributed manner.*
*** Carbon Black Dispersion (category rating per reference chart PCN: 12-455960-38)*

TEXDRAIN 200 D28 (GDN) (Present Landfill Design - RFETS) (Geonet Only)

Roll Number	Tensile Strength ASTM D 5035/MOD. MD Only (lbs/in width)	Density ASTM D 1505 (grams/cm³)	Carbon Black Content ASTM D 1603 (%)
C2-8-2-05-0001-200	70.85	0.9532	2.75
C2-8-2-05-0035-200	62.15	0.9537	2.34

TEXDRAIN 200 D28 (GDN) (Present Landfill Design - RFETS) (Geonet Only)

Roll Number	Thickness ASTM D 5199 (in)
C2-8-2-05-0001-200	0.2207
C2-8-2-05-0035-200	0.2164

TEXDRAIN 200 D28 (GDN) (Present Landfill Design - RFETS) (Geocomposite Only)

Roll Number	Tranmissivity ASTM D 4716			Bond Adhesion GRI GC7 (lbs/in width)
	MD (m^2/sec)	MD (gal/min/ft)	Flow Rate (gal/min)	
C2-8-2-05-0001-200	1.39E-04*	0.67*	0.68*	2.70
C2-8-2-05-0035-200	5.76E-04**	2.78**	0.28**	4.44

*NOTES: * Normal Pressure 15000 psf, Gradient 1.0.*
*** Normal Pressure 209 psf, Gradient 0.1.*

TEXDRAIN 200 D28 (GDN) (Present Landfill Design - RFETS) (Geotextile Only)

Roll Number	Apparent Opening Size ASTM D 4751		Puncture ASTM D 4833 (lbs)	Mass/Unit Area ASTM D 5261	
	(U.S. Standard Sieve Size)	(mm)		(gms/m^2)	(oz/yd^2)
C2-8-2-05-0001-200	100-140	0.143	152.6	390.7	11.5
C2-8-2-05-0035-200	100-140	0.142	167.8	416.1	12.3

CETCO - Bentomat DN GCL - GCL Flux ASTM D 5887 (Present Landfill Design)

Lot & Roll Number	Composite Permeability k (cm/sec)	Composite Index Flux qi (M^3/M^2)/SEC
200503LO, 10	3.5E-09	5.7E-09
200503LO, 55	3.5E-09	4.8E-09

CETCO - Bentomat DN GCL - Mass/Unit Area & Moisture Content (GCL) (Present Landfill Design)

Lot & Roll Number	Composite Moisture Content (%)	Composite Mass/Unit Area (gms/m^2)	Dry Bentonite Mass/Unit Area (gms/m^2)	Mositure Content Bentonite (%)
200503LO, 10	24.17	5372.6	4972.5	26.1
200503LO, 55	27.29	5052.3	4652.3	29.7

CETCO - Bentomat DN GCL - Peel Adhesion - ASTM D 4632/Modified (Present Landfill Design)

Lot & Roll Number	MD Load (lbs)	CDM Load (lbs)
200503LO, 10	45.3	49.8
200503LO, 55	51.9	74.3

CETCO - Bentomat DN GCL - Moisture Content - ASTM D 2216 (Present Landfill Design)

Lot & Roll Number	Moisture Content Bentonite (%)
200503LO, 10	24.9
200503LO, 55	25.1

CETCO - Bentomat DN GCL - Swell Index - ASTM D 5890 (Present Landfill Design)

Lot & Roll Number	Swell Index ($cc/^2$gms)
200503LO, 10	26.5
200503LO, 55	25.0

Currently, there are 2 points of GCL Internal Shear Testing that need to be completed on material that is in house. Additionally, we anticipate that density, carbon black content and carbon black dispersion for an additional roll of 60 mil LLDPE smooth will be transmitted early next week. It is our understanding that an additional roll of GCL will be submitted for conformance testing. We will transmit results for that testing as available. Should you have any questions or require additional information please, feel free to give us call.

Sincerley,

Christopher Wienecke
Laboratory Director/Owner

Sharon Roberts
Geosynthetic Division Manager

K:/TT2617/TTFI105.lwp

Rahe, John -- MFG, Inc.

From: Rahe, John -- MFG, Inc.
Sent: Thursday, February 10, 2005 9:37 AM
To: 'Robert.Davis@rfets.gov'
Cc: 'josh.valentine@ttrmc.com'
Subject: PLF Accelerated Action-Review of QA Laboratory Testing of Geosynthetics for East Face

Bob,

The following provides a review of the Quality Assurance laboratory testing performed for the geosynthetics (GCL, FML-T and GDN) required for the East Face of the PLF Accelerated Action site. The majority of these tests were performed by Advanced Terra Testing (ATT), Lakewood, CO in January and February. Some of the tests (density, carbon black content and dispersion, asperity height, transmissivity and apparent opening size) were performed by Precision Labs, Anaheim, CA. A copy of this QA laboratory report will be delivered to you soon. Additional testing was performed on smooth FML and GCL (Bentomat ST) materials for the remainder of the PLF top closure surface and have been (or will be for GCL) reviewed and reported in separate e-mails.

I GCL - Bentomat DN Test Results

Two samples of GCL (Bentomat DN) were delivered to ATT (Roll 10, Lot #200503LO and Roll 55, Lot #200503LO) and several tests were performed on each sample.

1) Permeability and Composite Index Flux (ASTM D 5887) - the permeability tests indicated an average of 3.5 (10)^-9 cm/sec, which is approximately 30 percent lower than the specification limits of 5 (10)^-9 cm/sec; and the average index flux of approximately 6.9 (10)^-9 cu m/sq m/sec, which is below the QA/QC specification limit of 1(10)^-8 cu m/sq m/sec, both indicating acceptable conditions.

2) Mass per Unit Area (ASTM D 5993) and Moisture Content (GCL Composite; ASTM D 2216) - the mass per unit area tests indicated a minimum dry bentonite mass of 4,652 grams/sq m (95 lbs/sq ft), which is approximately 26 percent higher than the minimum specification requirement of 0.75 lbs/sq ft. The average moisture content of the composite GCL was approximately 25.7 percent which is within the specification limits of 25 to 30 percent. The MQC data from CETCO indicates that the bentonite used to produce the GCL had an initial moisture content of 11.2 percent (12% max. specified) Therefore, the mass per unit area and moisture contents of the GCL materials are acceptable.

3) Peel Adhesion (ASTM D 4632, Modified) - indicated an average minimum peel adhesion strength in the machine direction of 48.6 lbs, and the cross machine direction indicated peel adhesion strengths in excess of the machine direction tests. These peel adhesion strengths are more than three times the minimum required peel strength of 15 lbs.

4) Swell Index (ASTM D 5890) - indicated a minimum swell of 25 cc (or ml)/ 2 grams, which is in excess of the specification minimum of 24 ml/2 gms.

5) Internal Shear Strength (ASTM D 5321 large scale, modified; two tests) - one test was a single point test indicating a shear strength of 845 psf and one test was a three point test indicating a peak internal friction angle of 49.5 degrees and an adhesion of 201 psf. The three point test utilized an older grip set in the direct shear machine and therefore, some slippage may have occurred, particularly with the lowest confining pressure of 200 psf. Nevertheless, using the average field confining pressure of 500 psf, the latter test indicates a shear strength of approximately 786 psf. Therefore, both tests indicate an average composite shear strength over 800 psf, which is approximately 60 percent higher than the specification requirement of 500 psf. Because of the additional needle punched fabric from non-woven geotextile on both sides of the GCL, the Bentomat DN is significantly stronger in internal shear strength than the Bentomat ST.

Therefore, the Bentomat DN tested in the QA laboratory indicates sufficient characteristics to meet or exceed all specification requirements and should provide acceptable GCL for the PLF East Face 4:1 slope.

II 60-Mil LLDPE-T (textured) Geomembrane (FML) Test Results

Three samples of 60-mil LLDPE-T geomembrane ere delivered initially from GSE to ATT and were tested for the following:

1) Thickness (ASTM D 5994-Measuring Core Thickness of Textured Geomembrane), which indicated that one roll (# 104124720) does not meet the specified minimum for the average thickness of 60 mils, and one test indicated a thickness less than the single minimum of 54 mils. Therefore, this roll was rejected for delivery to the site and additional rolls of 60-mil LLDPE-T were delivered to the QA laboratory as discussed below in IIa. The average thickness of the other two rolls in the first delivery (#s 104124728 and --733) indicated an average thickness of 60.6 mils and a single test minimum of 54 mils, which meet specifications.

2) Density (ASTM D 1505), Carbon Black Content (ASTM D 1603) and Carbon Black Dispersion (ASTM D 5596) - the average density of the two good rolls in the first delivery of LLDPE-T was 0.9381 grams/cc, which is in excess of the minimum specification of 0.92 gm/cc, the average carbon black content was 2.38 percent, which is in excess of the minimum specification of 2 percent and the carbon black dispersion tests were all a uniform category 1, which meet specifications.

3) Asperity Height (GRI-GM 12) - the average asperity height of "Side A" for the two good rolls in the first delivery of LLDPE-T was 30 mils with a minimum of 25 and maximum of 36; the average asperity height for "Side B" was 24 mils with a minimum of 21and maximum of 26, which are all at least two times the average specified minimum asperity height of 10 mils.

4) Tensile Strength (ASTM D 6693, Type IV) - the two good rolls in the first delivery indicated an average strength in the cross machine direction of 209 lbs/in at an elongation of 569 percent, which is approximately 58 percent higher than the specification minimum of 132 lbs/in, and the elongation is in excess of the specified minimum of 500 percent. The tensile strength of the material in the machine direction is approximately 10 to 15 percent higher than the cross machine direction, and all tests indicate tensile strengths and elongations in excess of specifications.

5) Tear Strength (ASTM D 1004C) - the two good rolls in the first delivery indicated an average tear strength in the machine
Direction of approximately 36 lbs/in with a standard deviation of 1.2 and a single test minimum of 33 lbs/in width, which meet the specification requirements.

6) Rod Puncture Strength (ASTM D 4833) - the two good rolls in the first delivery indicated an average rod puncture strength of approximately 115.8 lbs with a standard deviation of 3.8, which is well in excess of the specified minimum puncture strength of 73 lbs.

IIa Additional Samples of 60-mil LLDPE-T - Test Results

Because roll #104124720 was rejected as a result of QA testing, and roll #104124721 was reportedly rejected by GSE during MQC testing, the subsequent roll #s104124722 and ---723 were delivered to the QA laboratory for testing. The first roll (#---720) was tested for the specification requirements and was rejected for use in the project as explained above and in a previous e-mail (1/26/05). Because the manufacturer only made sufficient 60-mil LLDPE-T material for the PLF East Face as tested above, and two of these rolls were rejected, additional 60-mil LLDPE-T material that had previously been manufactured for another job (roll #s104123038 and 104122977) were delivered to the QA laboratory for testing. The following summarizes the additional QA testing performed on the additional samples of textured FML delivered to the QA laboratory:

1) Thickness (ASTM D 5594) - the average thickness of roll #104124722 was 63.9 mils and the average thickness of the following roll #---723 was 62.7 mils, which both meet specifications. The average thickness of roll #104123038 was 60.6 mils with a single test minimum of 58.8 mils and the average thickness of roll #104122977 with a single test minimum of 59 mils, which both meet specifications.

2) Density (ASTM D 1505), Carbon Black Content (ASTM D 1603) and Carbon Black Dispersion (ASTM D 5596) - The average density of roll #104124722 was found to be 0.937 grams/cc, the average carbon black content was 2.43 percent and the carbon black dispersion was a uniform category 1, all indicating that specifications are met; the average density of roll #104123038 was 0.938 gm/cc, the average density of roll #104122977 was 0.9347 gm/cc, the average carbon black content of these two rolls was 2.38 percent and the carbon black dispersion was a uniform category 1, which all meet specifications.

3) Asperity Height (GRI-GM 12) - the average asperity heights of "Side A" and "Side B" of roll #104124722 were both 29 mils with a minimum of 21 and maximum of 36 mils, which are well in excess of specifications; the average asperity height of rolls #104122977 and #104123038 were approximately 28.5 mils on both sides with a minimum of 20 and maximum of 39 and a standard deviation of 3 on "Side A" and 4.5 on "Side B". These asperity heights are more uniform between the two sides on these latest samples than materials previously tested (see above) and exceed minimum specifications.

4) Tensile Strength (ASTM D 6693, Type IV) - the average tensile strength of roll #104124722 in the cross machine

direction was 222.9 lbs/in with an elongation at break of at least 545 percent with a single test minimum strength of 204.5 lbs/in, and the machine direction average tensile strength was 253.2 lbs/in, which are in excess of the specified minimum of 132 lbs/in at an elongation at break of at least 500 percent; the average tensile strength of rolls #104123038 and # 104122977 in the cross machine direction was 223.3 lbs/in with an average elongation at break of 583 percent with a single test minimum strength of 179 lbs/in, and the machine direction average tensile strength was 251 lbs/in, which are in excess of the specified minimum strength and elongations at break.

5) Tear Strength (ASTM D 1004, Method C) - the average tear strength in the machine direction of roll #104124722 was 36.1 lbs/in with a standard deviation of 1.3 and a single test minimum of 34.6 lbs/in, and the average cross machine tear strength was 39.2 lbs/in; the average tear strength of rolls #104123038 and #104122977 in the machine direction was 37.1 lbs/in with a single test minimum of 35.7 lbs/in, and there average cross machine tear strength was 38.5 lbs/in, which are all in excess of the specified minimum of 33 lbs/in.

6) Rod Puncture Strength (ASTM D 4833) - the average puncture strength of roll #104124722 was 116.1 lbs with a standard deviation of 3.9 and the average puncture strength of rolls #104123038 and #104122977 was 121.8 lbs with a standard deviation of 3.6, which are all well in excess of the specified minimum puncture strength of 73 lbs.

Therefore, the 60-mil LLDPE-T geomembrane manufactured by GSE from rolls #104124722 through #104124733 (LUT060A000), roll #104122977 and roll #104123038 meet specifications and should be acceptable for use on the PLF East Face 4:1 slope.

III GDN - TexDrain 200 DS8 Test Results

Two samples of TexDrain 200 DS8 GDN were delivered to the QA laboratory and the following tests were performed:

1) Adhesion and Bond Strength of Geocomposite (GRI GC-7) - indicated an average bond adhesion of 2.7 lbs/in width in the machine direction with a standard deviation of 1.07 and a single test minimum of 0.9 lbs/in; the average bond adhesion in the cross machine direction was 4.44 lbs/in with a standard deviation of 1.55. Although one test in the machine direction indicated a bond adhesion less than the specified minimum of 1.0 lb/in, the averages are well above the specification minimum and therefore the GDN material should be acceptable.

2) Tensile Strength (ASTM 5035/Modified), Geonet Only - indicated an average tensile strength in the machine direction of approximately 66.5 lbs/in width with a standard deviation of approximately 2.1, which is approximately 48 percent higher than the specified minimum MD tensile strength of 45 lbs/in width.

3) Thickness (ASTM D 5199), Geonet Only - indicated an average geonet thickness of 218.5 mils with no tests less than the specified minimum thickness of 200 mils.

4) Density (ASTM D 1505) and Carbon Black Content (ASTM D 1603), Geonet Only - indicated an average geonet density of approximately 0.953 grams/cc, which is in excess of the specified minimum density of 0.94 gms/cc, and the average carbon black content of approximately 2.5 percent, which is also in excess of the minimum specification of 2 percent.

5) Transmissivity of Geocomposite (ASTM D 4716) - the minimum transmissivity resulted from the test at a normal pressure of 15,000 psf and a gradient of 1.0, which indicated an average transmissivity of 0.67 gal/min/ft with a standard deviation of 0.02, which is 3.5 times over the minimum specified transmissivity of 0.19 gal/min/ft; the average transmissivity was measured as 2.78 gal/min/ft under a confining pressure of 209 psf and a gradient of 0.1, which indicates transmissivities well in excess of the specified minimum.

6) Puncture Resistance (ASTM D4833), Geotextile Only - indicated an average puncture strength of approximately 160 lbs with a standard deviation of 26 and a single test minimum of 114.3 lbs. Although this single point puncture strength test is less than the specified 120 lbs, the average is approximately 33 percent higher than the specification and therefore the materials should be acceptable.

7) Mass/Unit Area (ASTM D 5261), Geotextile Only - indicated an average mass/unit area of approximately 11.9 oz/sy, which is approximately 48 percent higher than the specified geotextile mass/unit area of 8 oz/sy.

8) Apparent Opening Size (AOS; ASTM D4751), Geotextile Only - indicated that the average AOS was approximately 0.142 mm with a maximum of 0.150 mm, which are below the maximum specification AOS of 0.180 mm.

Therefore, the GDN materials recently tested have geonet, geotextile and geocomposite properties in conformance with specifications and should be adequate for use on the PLF closure.

The QA laboratory testing program indicates that the geosynthetics materials (GCL Bentomat DN, GDN and acceptable rolls of the 60-mil LLDPE-T) meet or exceed project specification requirements. This QA testing program should be sufficient for up to 200,000 square feet of geosynthetics installed on the PLF East Face.

Let me know if you have any questions regarding this QA laboratory summary review.

Regards,
John

John H. Rahe, P.E.
Tetra Tech/MFG
303-447-0913 (ext. 104)

Rahe, John -- MFG, Inc.

From: Rahe, John -- MFG, Inc.
Sent: Thursday, February 03, 2005 11:16 AM
To: 'Robert.Davis@rfets.gov'
Cc: 'josh.valentine@ttrmc.com'
Subject: PLF - Review of QA Testing for Additional 60-mil LLDPE for Completion of PLF Top Area

Bob,

One additional roll of 60-mil LLDPE FML (roll # 104124908, lot # LLD060A000) was recently received by the QA testing laboratory and tested for the requirements listed in the QA/QC Plan.

The average thickness of this roll was 63.5 mils (ASTM D 5199), the average tear strength in the machine direction was 34.4 lbs/in (ASTM D1004, Method C), the average tensile strength was 311 lbs/in at an elongation of 920 percent (ASTM D 6693), the average puncture strength was 113 lbs (ASTM D 4833), the average density was 0.9365 grams/cc (ASTM D 1505), the average carbon black content was 2.4% (ASTM D 1603) and the average carbon black dispersion was category 1 (ASTM D 5596). These all exceed the specified minimum requirements.

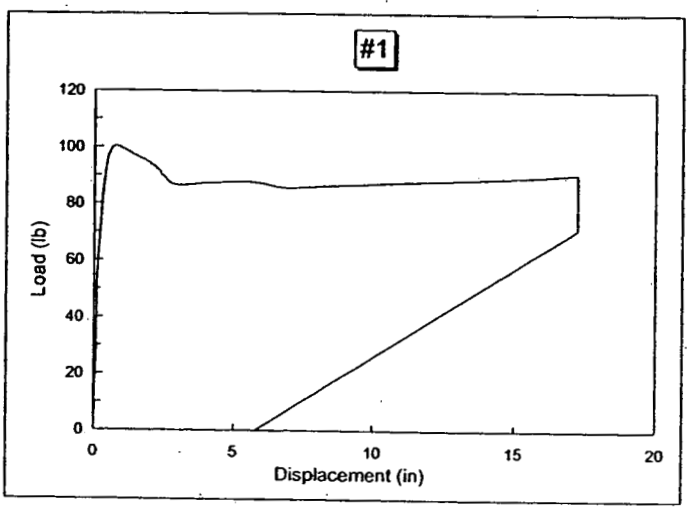
An additional QA sample of the Bentomat ST GCL for the remainder of the PLF top was obtained from materials recently delivered to the site and will be tested in the QA lab soon.

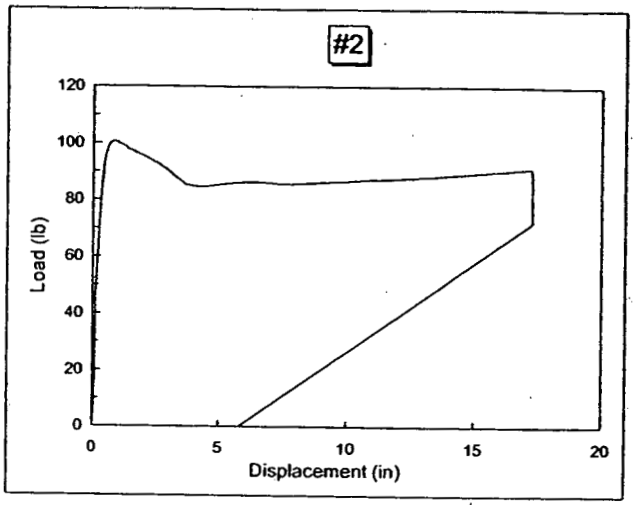
Let me know if you have any questions.

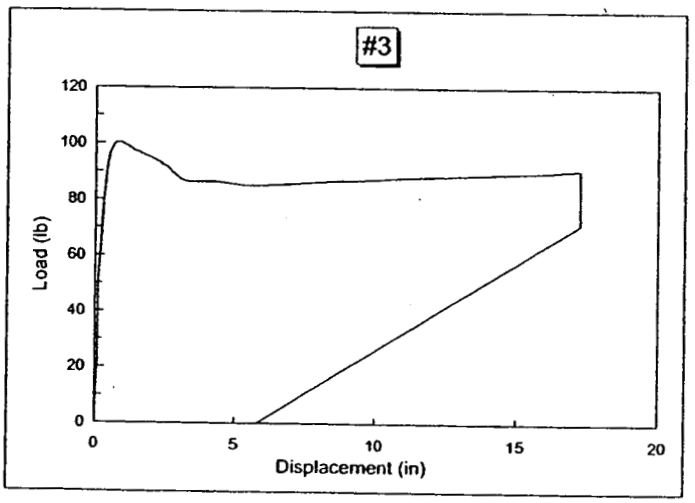
Thanks,
John

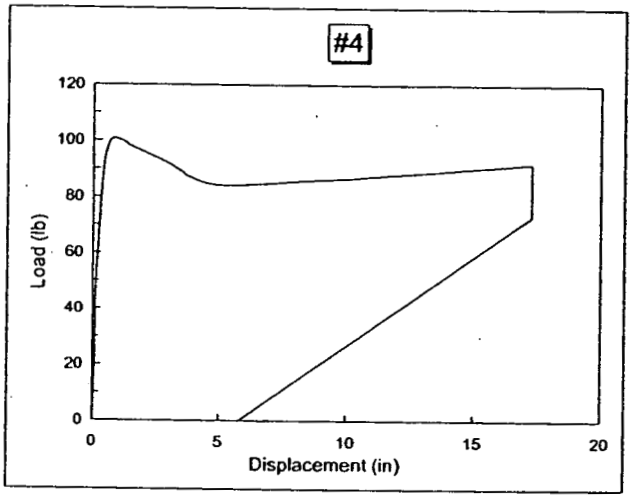
John H. Rahe, P.E.
Tetra Tech/MFG
303-447-0913 (ext. 104)

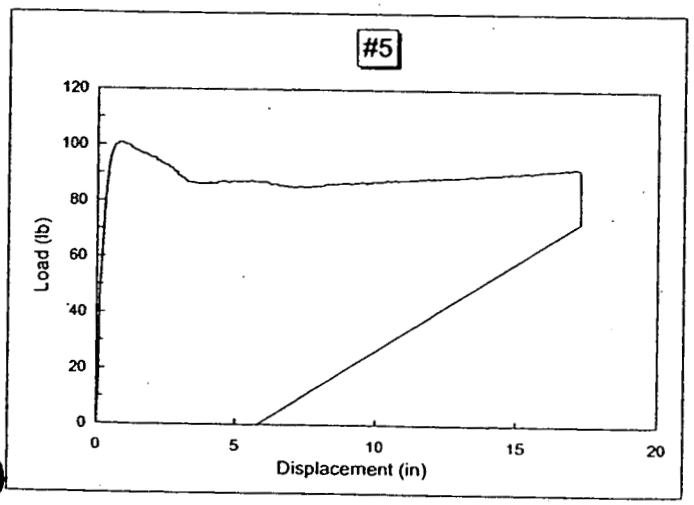
Client:	Tetra Tech-RMC	Test Type:	Seam Shear, ASTM D 6392
Job No.:	2617-03	Material Type:	60 mil LLDPE
Location:	Present Landfill Design - RFETS	Date Tested:	01-17-05
Sample:	DFP-020	Tested By:	JTR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	20 in/min
		Grip Seperation:	6.13"











	Shear Strength (lb/in)	Locus of Break Code	Break Class
Specimen #1	100.4		EXCEEDED MACHINE EXTENSION
Specimen #2	100.6		EXCEEDED MACHINE EXTENSION
Specimen #3	100.5		EXCEEDED MACHINE EXTENSION
Specimen #4	100.9		EXCEEDED MACHINE EXTENSION
Specimen #5	100.9		EXCEEDED MACHINE EXTENSION
Average	**100.7**		
Std. Deviation	**0.2**		

Operator:	DP-5N, MGC
Machine:	M. 0004, BC, 800/9
Panels:	P40, P38
Rolls:	11-18-04
Seam:	130' NSE0S

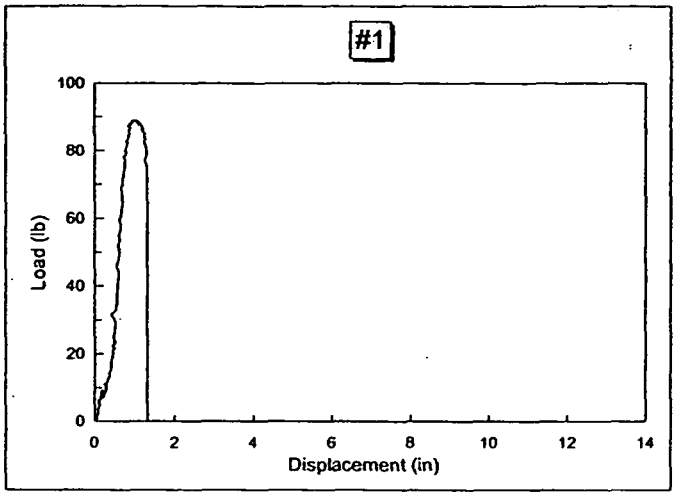
Filename: TTSS38

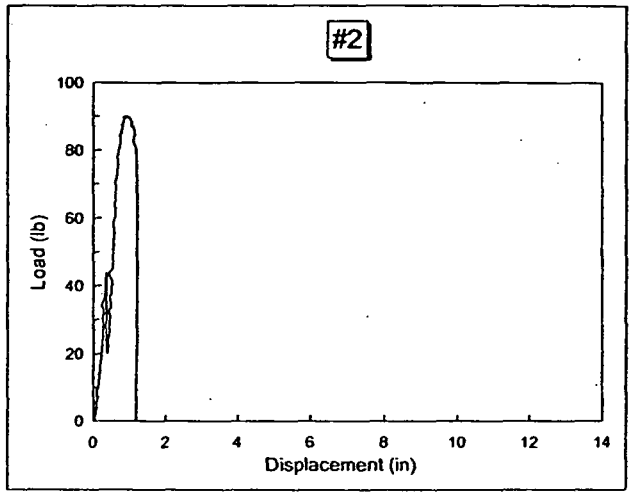
Raw Data File: TTSS382.TXT, TTSS383.TXT

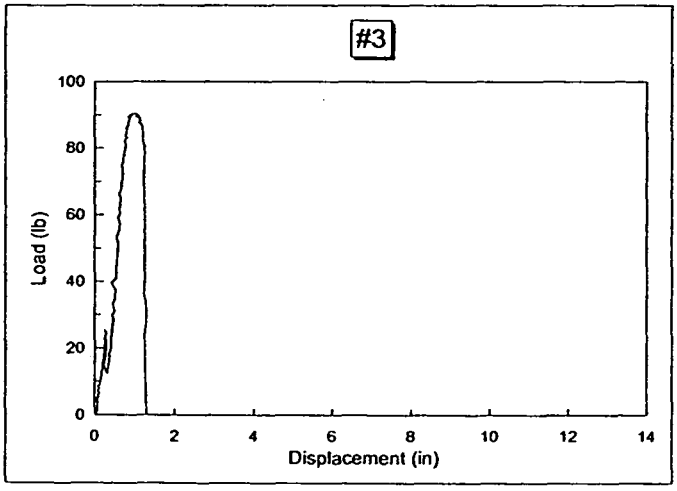
Checked By: JTR Date: 1/20/05

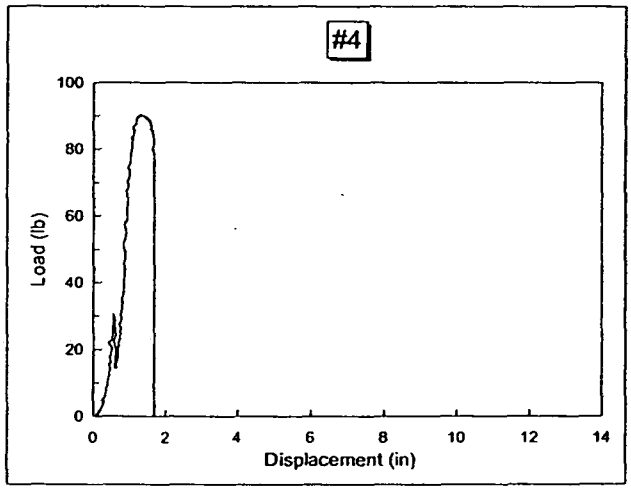
Advanced Terra Testing, Inc.

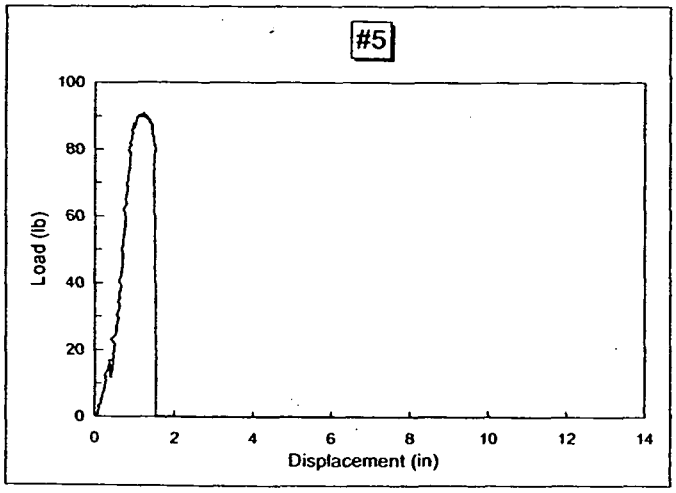
Client:	Tetra Tech-RMC	Test Type:	Peel Adhesion, ASTM D 6392
Job No.:	2617-03	Material Type:	60 mil LLDPE
Location:	Present Landfill Design - RFETS	Date Tested:	01-17-05
Sample:	DFP-020	Tested By:	JTR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2.0 in/min
		Grip Seperation:	1.0 in











	Peel Strength (lb/in)	Locus of Break Code	Break Class
Specimen #1	89.1	SE-1	FTB
Specimen #2	90.2	SE-1	FTB
Specimen #3	90.3	SE-1	FTB
Specimen #4	90.4	SE-1	FTB
Specimen #5	91.1	SE-1	FTB
Average	**90.2**		
Std. Deviation	**0.7**		

Operator:	DP-5N, MGC
Machine:	M. 0004, BC, 800/9
Panels:	P40, P38
Rolls:	11-18-04
Seam:	130' NSE0S
Seam A or B	A

Filename: TTPA38

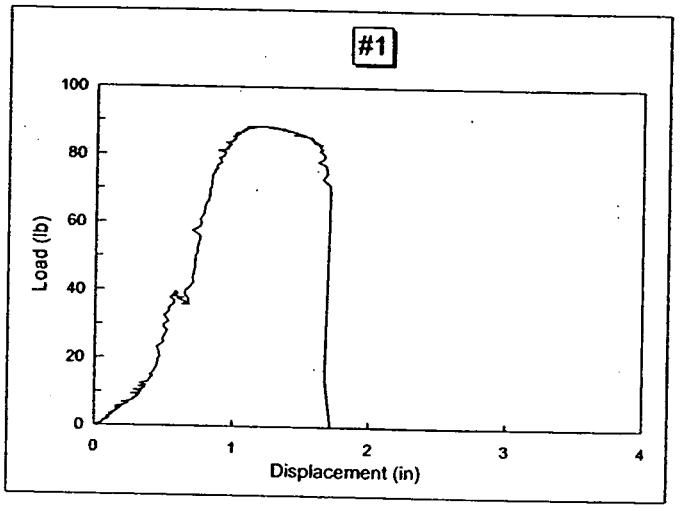
Raw Data File: TTPA38A2.TXT, TTPA38A3.TXT

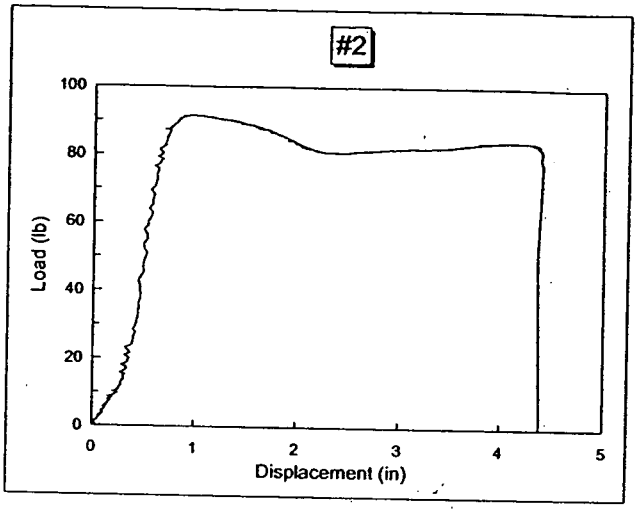
Checked By: JTR Date: 1/20/05

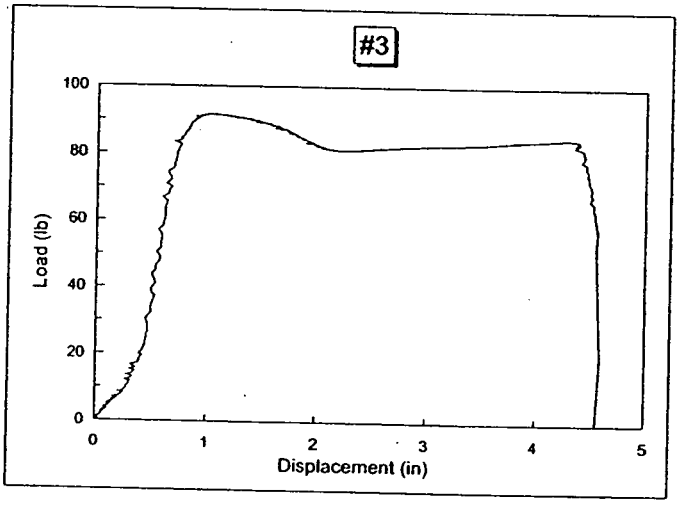
Advanced Terra Testing, Inc.

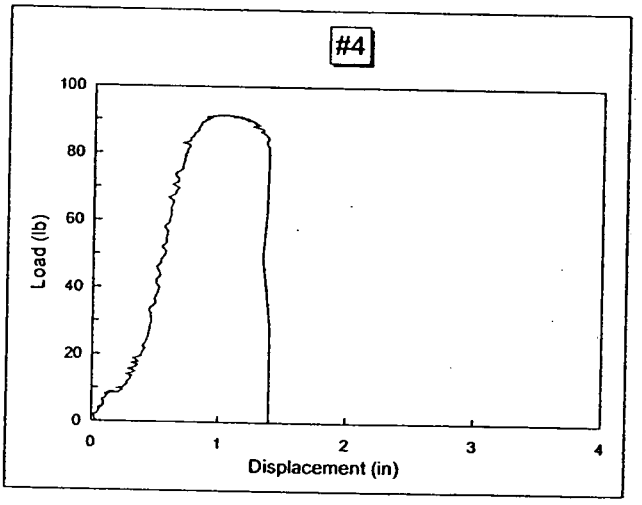
Client:	Tetra Tech-RMC
Job No.:	2617-03
Location:	Present Landfill Design - RFETS
Sample:	DFP-020
Test Device:	Five Station
Load Cells:	500 lb.

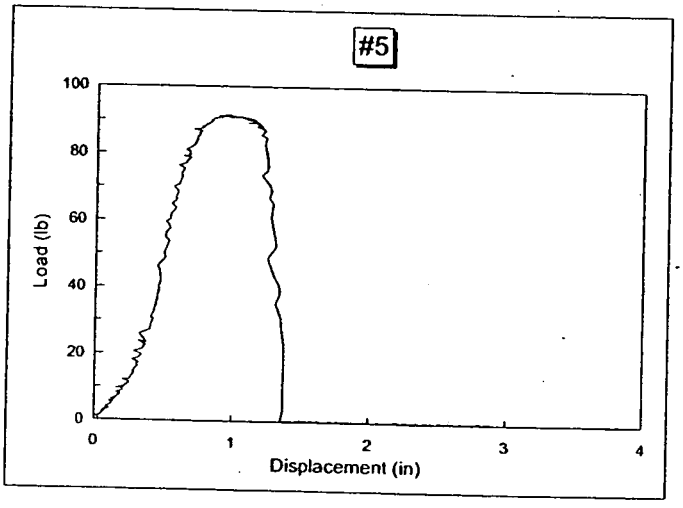
Test Type:	Peel Adhesion, ASTM D 6392
Material Type:	60 mil LLDPE
Date Tested:	01-17-05
Tested By:	JTR
Data Entered By:	SR
Displacement Rate:	2.0 in/min
Grip Seperation:	1.0 in











	Peel Strength (lb/in)	Locus of Break Code	Break Class
Specimen #1	88.4	SE-1	FTB
Specimen #2	91.5	SE-1	FTB
Specimen #3	91.6	SE-1	FTB
Specimen #4	91.5	SE-1	FTB
Specimen #5	91.7	SE-1	FTB
Average	**90.9**		
Std. Deviation	**1.3**		

Operator:	DP-5N, MGC
Machine:	M. 0004, BC, 800/9
Panels:	P40, P38
Rolls:	11-18-04
Seam:	130° NSE0S
Seam A or B	B

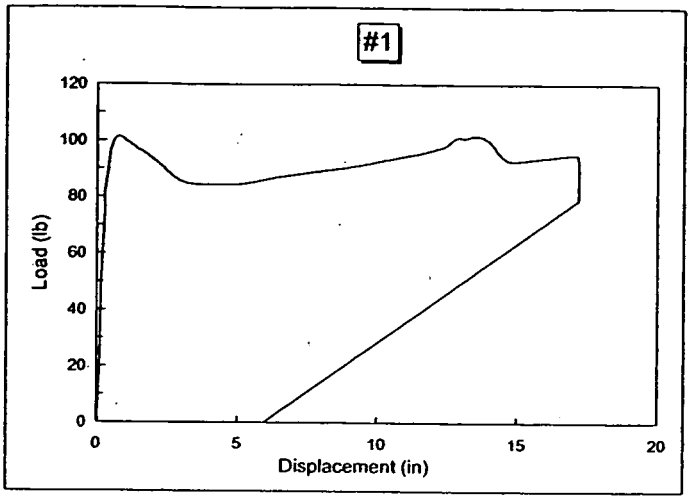
Filename: TTPA38B

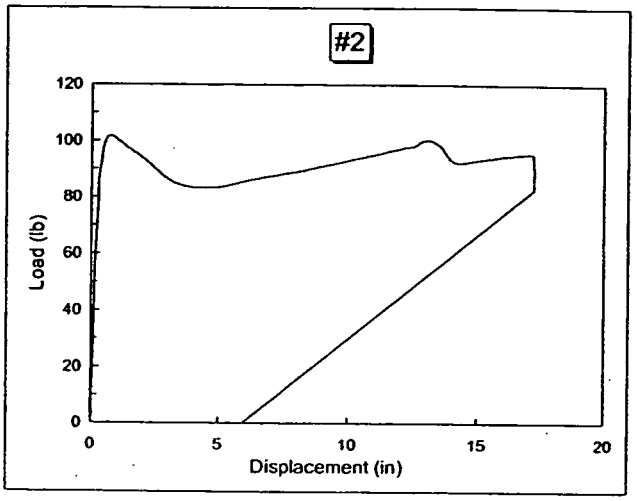
Raw Data File: TTPA38B2.TXT, TTPA38B3.TXT

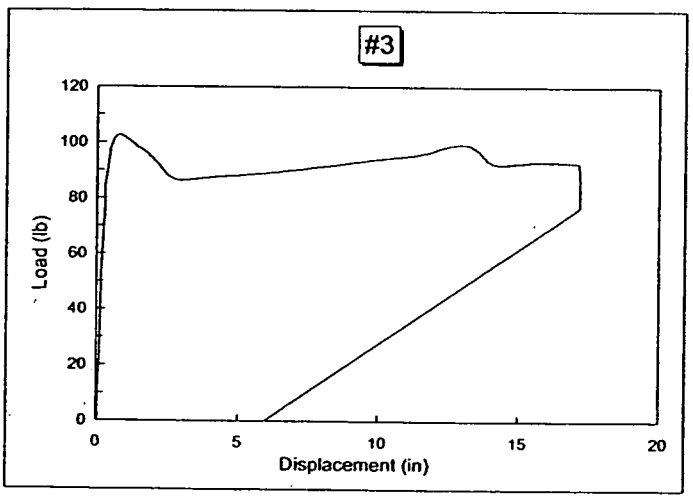
Checked By: JTR Date: 1/20/05

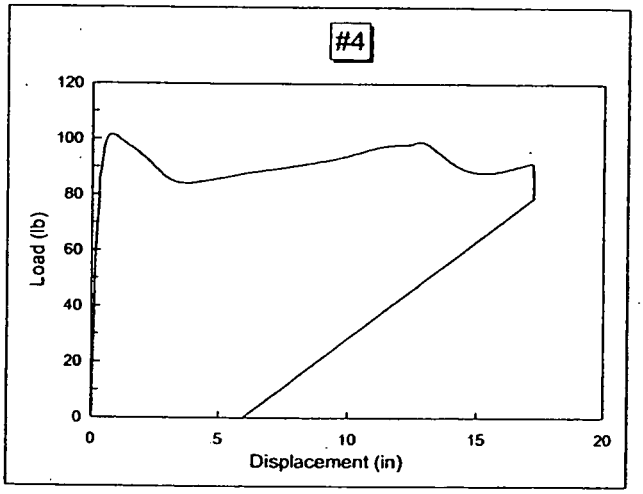
Advanced Terra Testing, Inc.

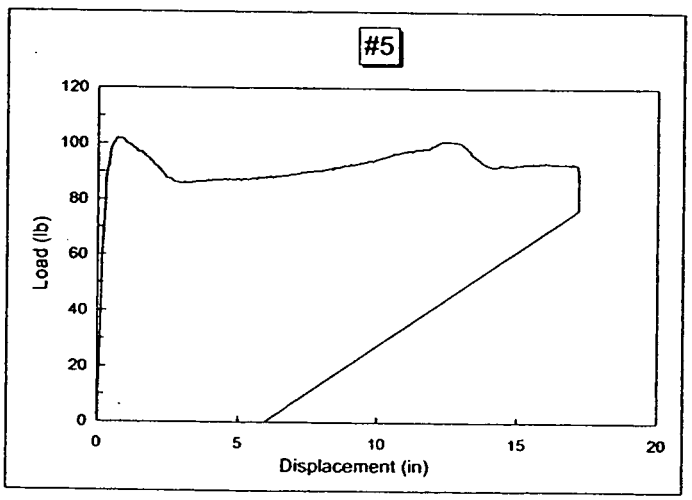
Client:	Tetra Tech-RMC	Test Type:	Seam Shear, ASTM D 6392
Job No.:	2617-03	Material Type:	60 mil LLDPE
Location:	Present Landfill Design - RFETS	Date Tested:	01-17-05
Sample:	DFP-040	Tested By:	JTR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	20 in/min
		Grip Seperation:	6.00"











	Shear Strength (lb/in)	Locus of Break Code	Break Class
Specimen #1	101.5		EXCEEDED MACHINE EXTENSION
Specimen #2	101.5		EXCEEDED MACHINE EXTENSION
Specimen #3	102.4		EXCEEDED MACHINE EXTENSION
Specimen #4	101.4		EXCEEDED MACHINE EXTENSION
Specimen #5	101.8		EXCEEDED MACHINE EXTENSION
Average	**101.7**		
Std. Deviation	**0.4**		

Operator:	JS
Machine:	#0019, 800/9.5
Panels:	P65, P64, QA, DP-9H
Rolls:	12-09-04, 15:10, PRH
Seam:	135' S of NEOS

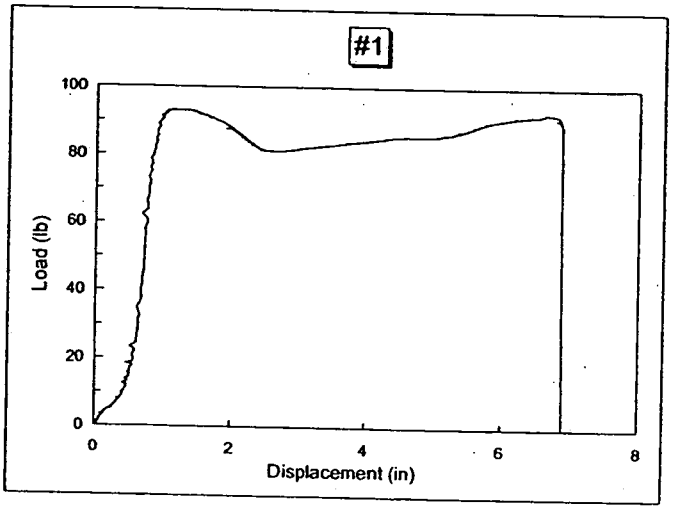
Filename: TTSS65

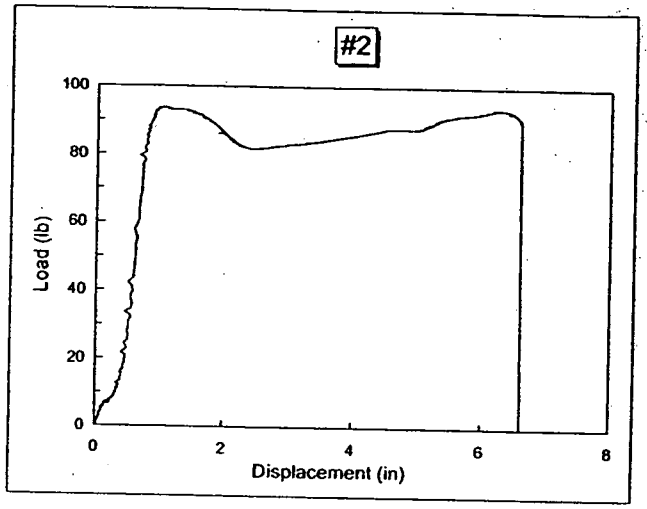
Raw Data File: TTSS962.TXT, TTSS963.TXT

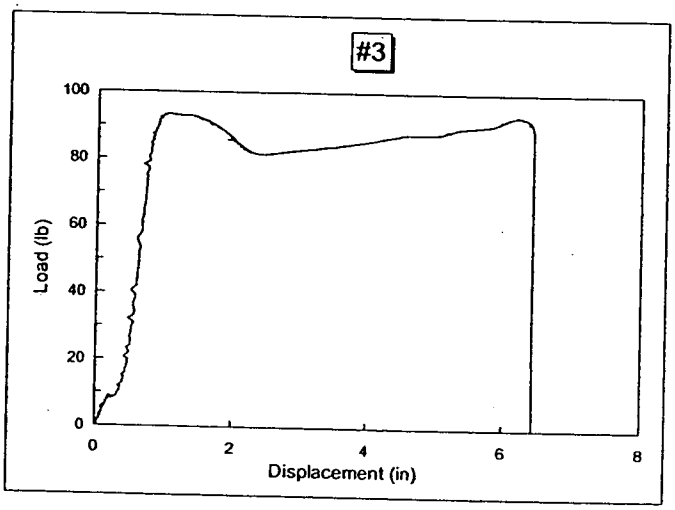
Checked By: JTR Date: 1/20/05

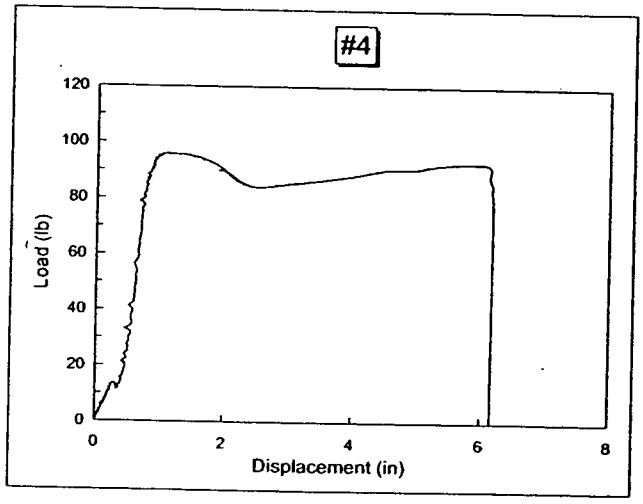
Advanced Terra Testing, Inc.

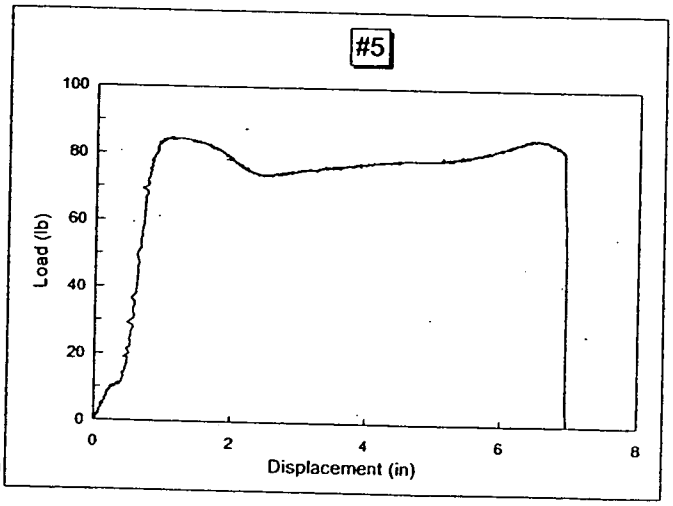
Client:	Tetra Tech-RMC	Test Type:	Peel Adhesion, ASTM D 6392
Job No.:	2617-03	Material Type:	60 mil LLDPE
Location:	Present Landfill Design - RFETS	Date Tested:	01-17-05
Sample:	DFP-040	Tested By:	JTR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2.0 in/min
		Grip Seperation:	1.0 in











	Peel Strength (lb/in)	Locus of Break Code	Break Class
Specimen #1	93.0	SE-1	FTB
Specimen #2	93.6	SE-1	FTB
Specimen #3	93.6	SE-1	FTB
Specimen #4	95.8	SE-1	FTB
Specimen #5	84.8	SE-1	FTB
Average	**92.1**		
Std. Deviation	**3.8**		

Operator:	JS
Machine:	#0019, 800/9.5
Panels:	P65, P64, QA, DP-9H
Rolls:	12-09-04, 15:10, PRH
Seam:	135' S of NEOS
Seam A or B	A

Filename: TTPA65

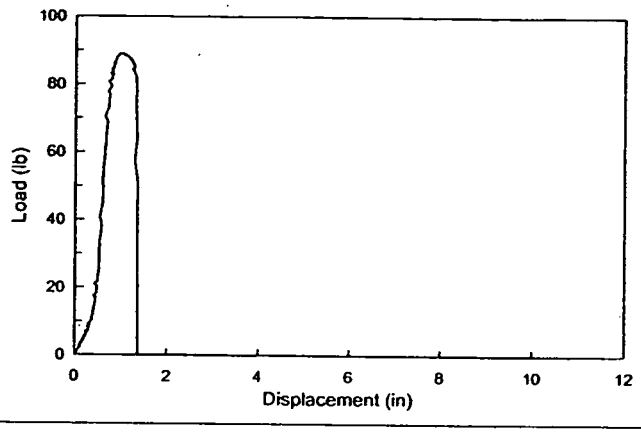
Raw Data File: TTPA65A2.TXT, TTPA65A3.TXT

Checked By: JTR Date: 1/30/05

Advanced Terra Testing, Inc.

Client:	Tetra Tech-RMC	Test Type:	Peel Adhesion, ASTM D 6392
Job No.:	2617-03	Material Type:	60 mil LLDPE
Location:	Present Landfill Design - RFETS	Date Tested:	01-17-05
Sample:	DFP-040	Tested By:	JTR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2.0 in/min
		Grip Seperation:	1.0 in

#1



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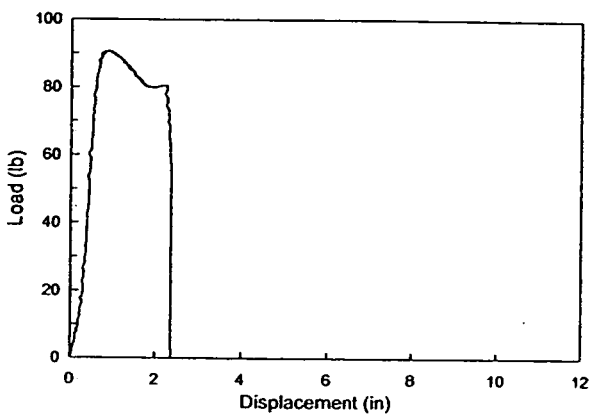

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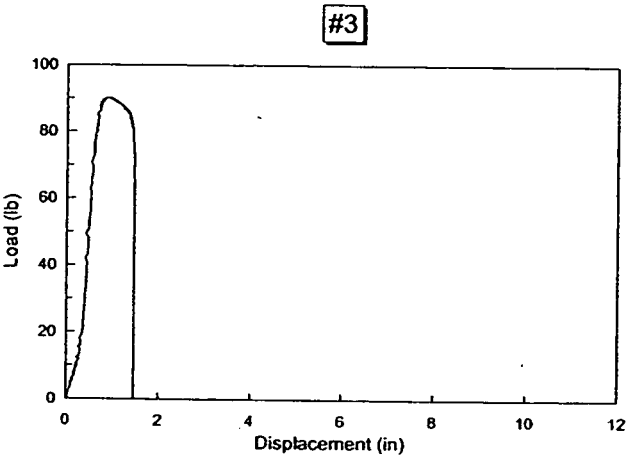

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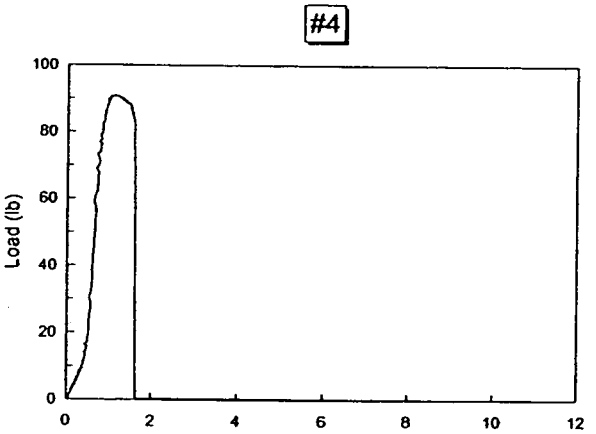

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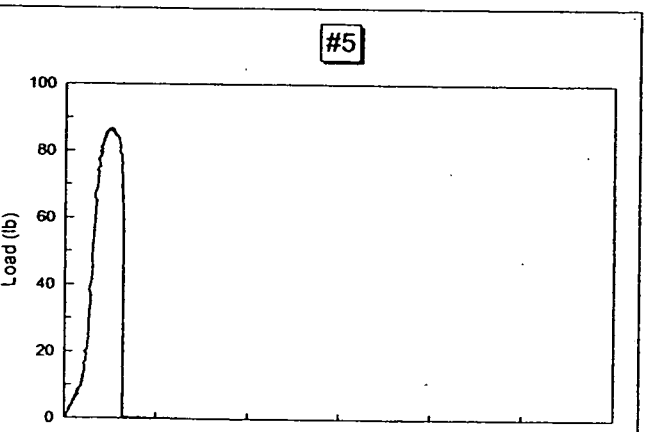


	Peel Strength (lb/in)	Locus of Break Code	Break Class
Specimen #1	89.1	SE-1	FTB
Specimen #2	90.6	SE-1	FTB
Specimen #3	90.2	SE-1	FTB
Specimen #4	90.9	SE-1	FTB
Specimen #5	86.9	SE-1	FTB
Average	**89.6**		
Std. Deviation	**1.4**		

Operator:	JS
Machine:	#0019, 800/9.5
Panels:	P65, P64, QA, DP-9H
Rolls:	12-09-04, 15:10, PRH
Seam:	135' S of NEOS
Seam A or B	B

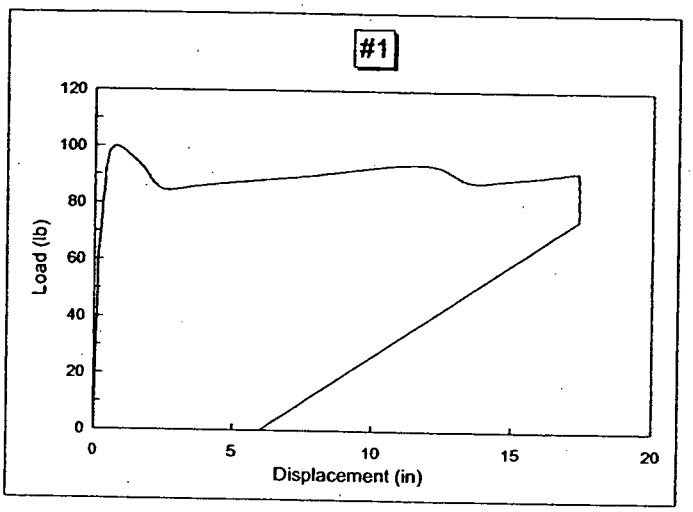
Filename: TTPA65B

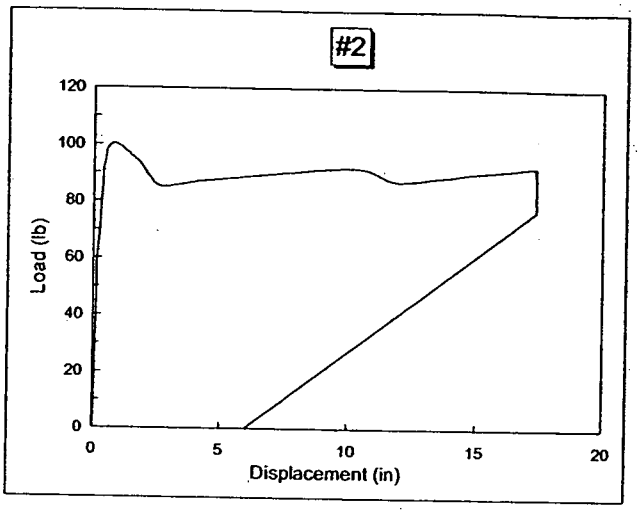
Raw Data File: TTPA65B2.TXT, TTPA65B3.TXT

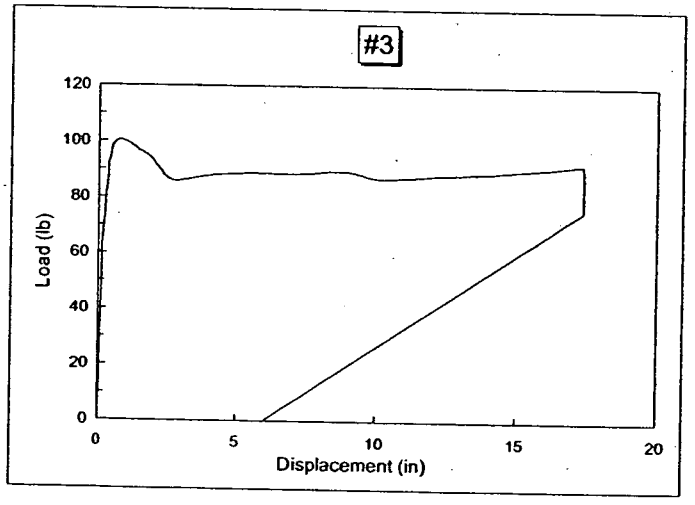
Checked By: JTR Date: 1/20/05

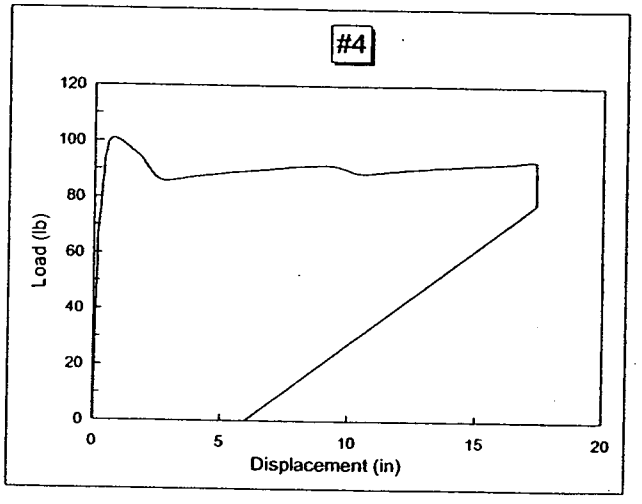
Advanced Terra Testing, Inc.

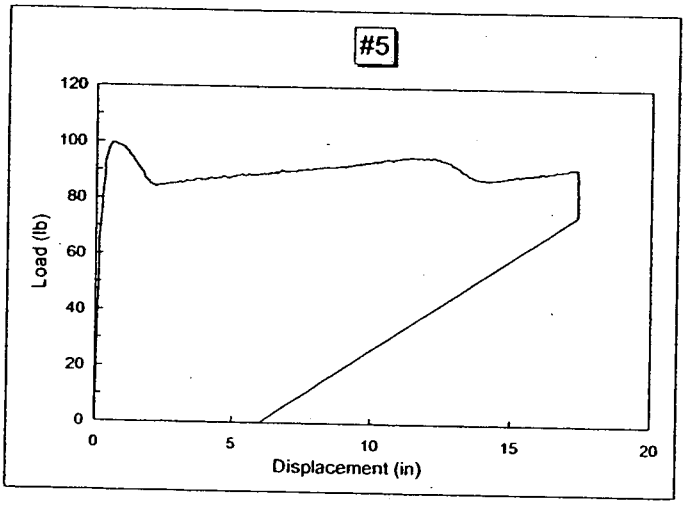
Client:	Tetra Tech-RMC	Test Type:	Seam Shear, ASTM D 6392
Job No.:	2617-03	Material Type:	60 mil LLDPE
Location:	Present Landfill Design - RFETS	Date Tested:	01-17-05
Sample:	DFP-060	Tested By:	JTR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	20 in/min
		Grip Seperation:	6.01"











	Shear Strength (lb/in)	Locus of Break Code	Break Class
Specimen #1	99.9	EXCEEDED MACHINE EXTENSION	
Specimen #2	100.4	EXCEEDED MACHINE EXTENSION	
Specimen #3	100.5	EXCEEDED MACHINE EXTENSION	
Specimen #4	101.0	EXCEEDED MACHINE EXTENSION	
Specimen #5	99.7	EXCEEDED MACHINE EXTENSION	
Average	**100.3**		
Std. Deviation	**0.5**		

Operator:	JS
Machine:	#0019, 800/10
Panels:	P96, P94
Rolls:	12-19-04, 12:06 PM, PR.14
Seam:	60' S of NEOS

Filename: TTSS96

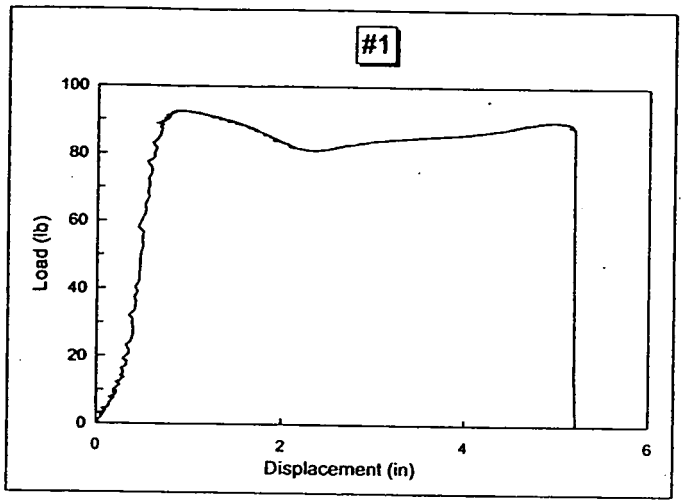
Raw Data File: TTSS962.TXT, TTSS963.TXT

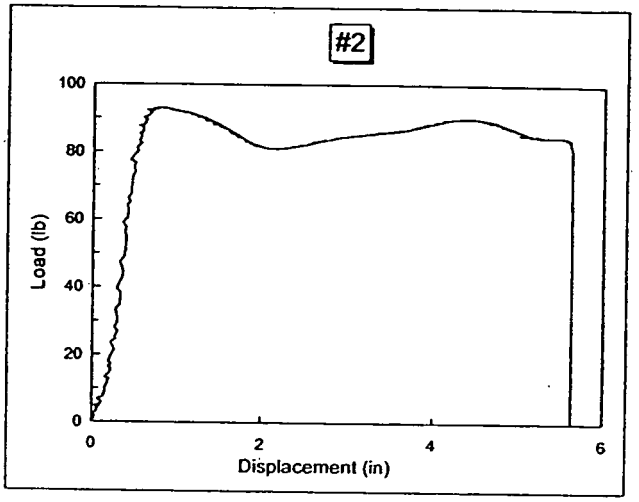
Checked By: JTR Date: 1/20/05

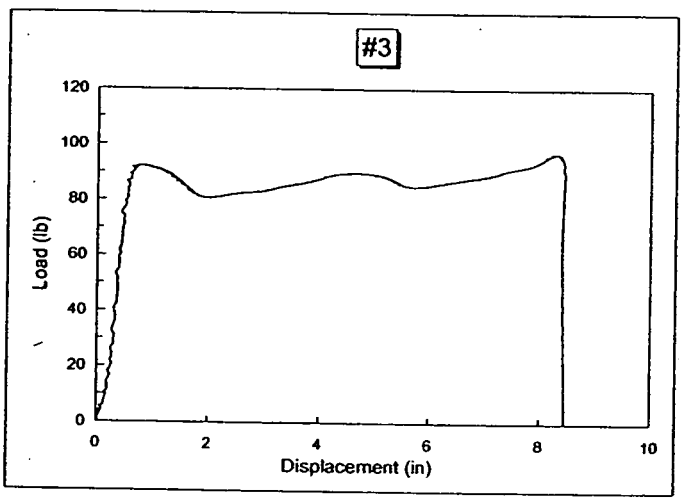
Advanced Terra Testing, Inc.

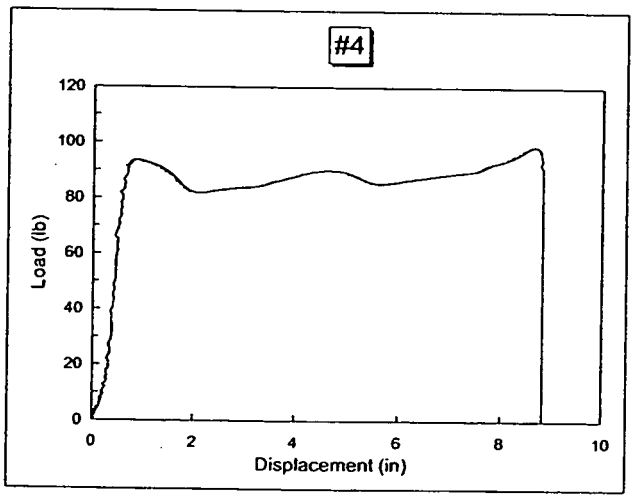
Client:	Tetra Tech-RMC
Job No.:	2617-03
Location:	Present Landfill Design - RFETS
Sample:	DFP-060
Test Device:	Five Station
Load Cells:	500 lb.

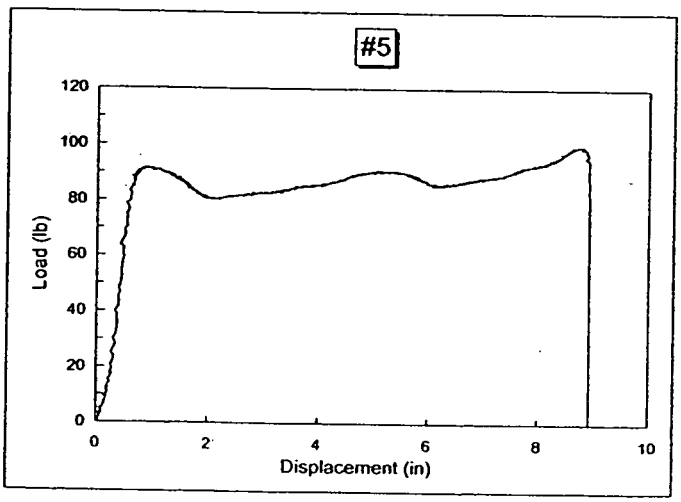
Test Type:	Peel Adhesion, ASTM D 6392
Material Type:	60 mil LLDPE
Date Tested:	01-17-05
Tested By:	JTR
Data Entered By:	SR
Displacement Rate:	2.0 in/min
Grip Seperation:	1.0 in











	Peel Strength (lb/in)	Locus of Break Code	Break Class
Specimen #1	92.7	SE-1	FTB
Specimen #2	93.0	SE-1	FTB
Specimen #3	92.4	SE-1	FTB
Specimen #4	93.8	SE-1	FTB
Specimen #5	91.7	SE-1	FTB
Average	**92.7**		
Std. Deviation	**0.7**		

Operator:	JS
Machine:	#0019, 800/10
Panels:	P96, P94
Rolls:	12-19-04, 12:06 PM, PR.14
Seam:	60' S of NEOS
Seam A or B	A

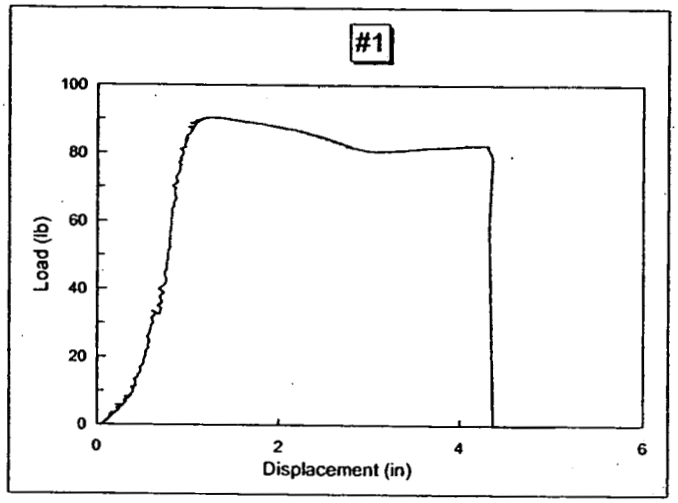
Filename: TTPA96

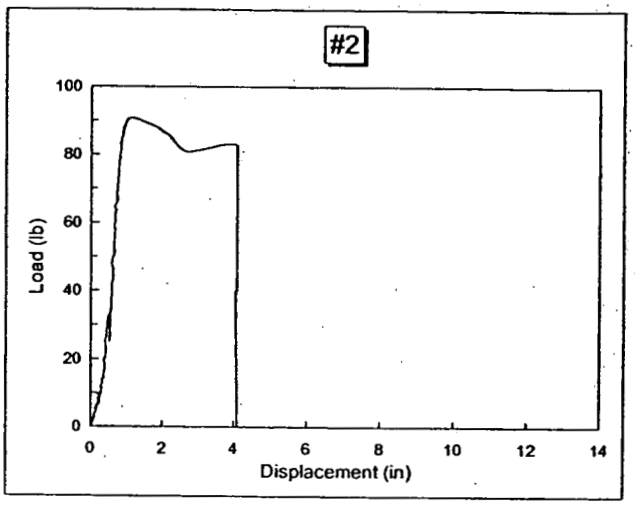
Raw Data File: TTPA96A2.TXT, TTPA96A3.TXT

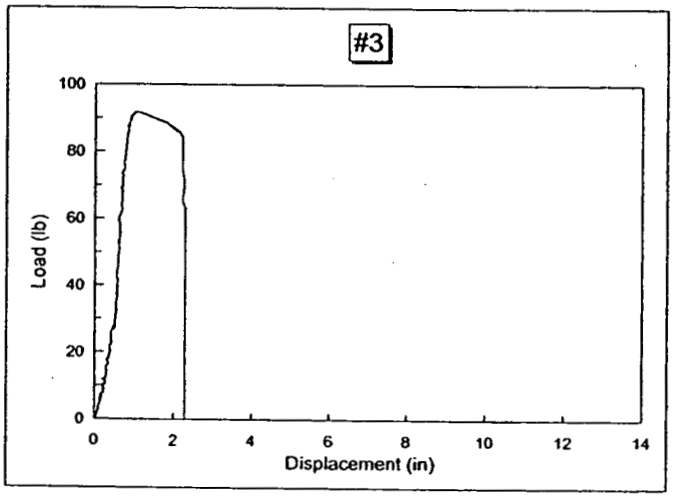
Checked By: JTR Date: 1/20/05

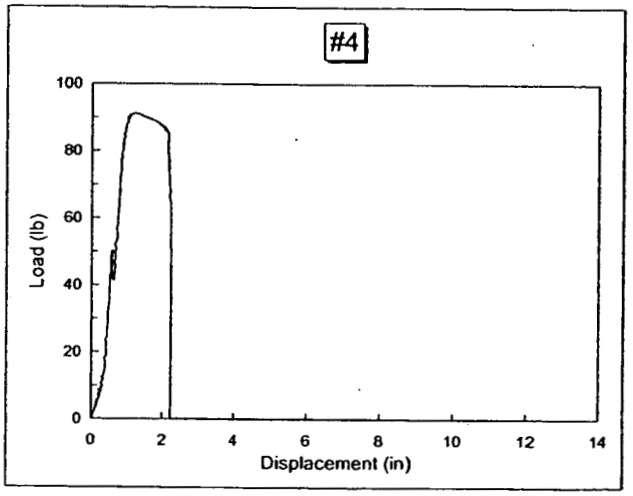
Advanced Terra Testing, Inc.

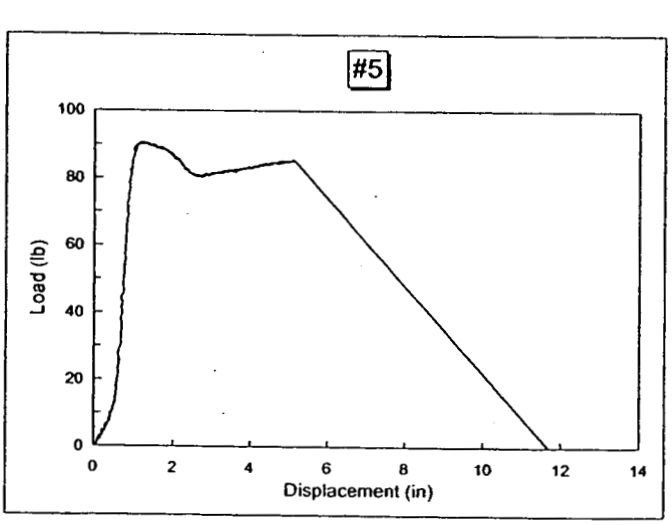
Client:	Tetra Tech-RMC	Test Type:	Peel Adhesion, ASTM D 6392
Job No.:	2617-03	Material Type:	60 mil LLDPE
Location:	Present Landfill Design - RFETS	Date Tested:	01-17-05
Sample:	DFP-060	Tested By:	JTR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2.0 in/min
		Grip Seperation:	1.0 in











	Peel Strength (lb/in)	Locus of Break Code	Break Class
Specimen #1	90.5	SE-1	FTB
Specimen #2	90.9	SE-1	FTB
Specimen #3	91.8	SE-1	FTB
Specimen #4	91.3	SE-1	FTB
Specimen #5	90.8	SE-1	FTB
Average	**91.0**		
Std. Deviation	**0.5**		

Operator:	JS
Machine:	#0019, 800/10
Panels:	P96, P94
Rolls:	12-19-04, 12:06 PM, PR.14
Seam:	60' S of NEOS
Seam A or B	B

Filename: TTPA96B

Raw Data File: TTPA96B2.TXT, TTPA96B3.TXT

Checked By: JTR Date: 1/20/05

Advanced Terra Testing, Inc.

THICKNESS
ASTM D 5199
(IN.)

CLIENT: Tetra Tech-RMC

JOB NO.: 2617-03

PROJECT: Rocky Flats Present Closure

DATE: 01-26-05 JTR

Roll No.: 104124908, Lot No.: LLD060A000
Sample No.: S038576/515122, 60 mil LLDPE

1	0.0630	**2**	0.0682	**3**	0.0647	**4**	0.0633	**5**	0.0608
	0.0628		0.0646		0.0622		0.0641		0.0619
	0.0610		0.0642		0.0617		0.0645		0.0631
	0.0642		0.0625		0.0631		0.0661		0.0628
	0.0638		0.0636		0.0628		0.0652		0.0636
Average	0.0630	**Average**	0.0646	**Average**	0.0629	**Average**	0.0646	**Average**	0.0624
								AVERAGE FOR 5 SPECIMENS	**0.0635**

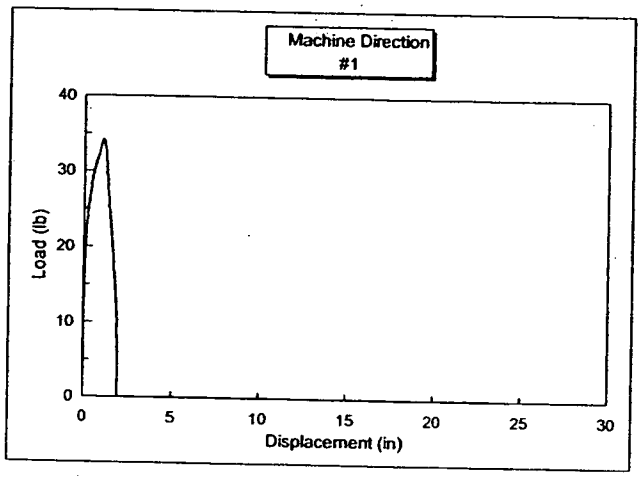
DATA ENTERED BY: SR
DATA CHECKED BY: JTR
FILENAME: TTMA5122

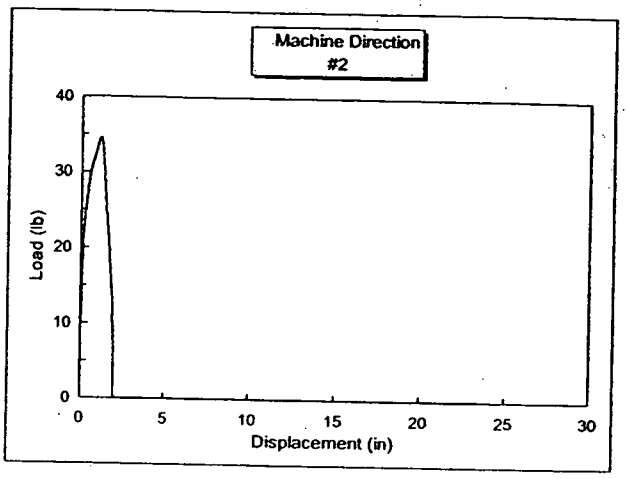
DATE: 01/27/2005
DATE: 1/27/05

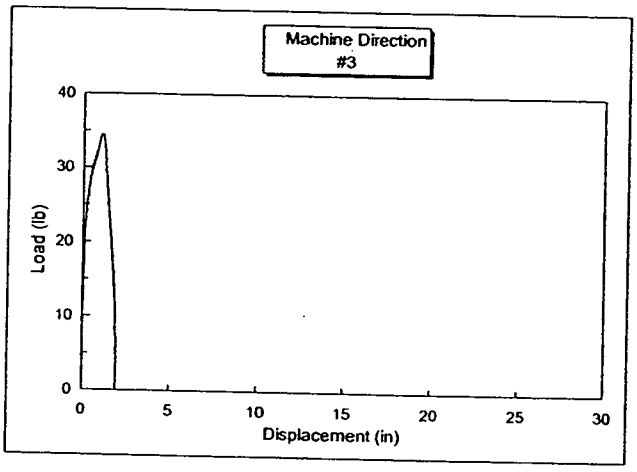
ADVANCED TERRA TESTING, INC.

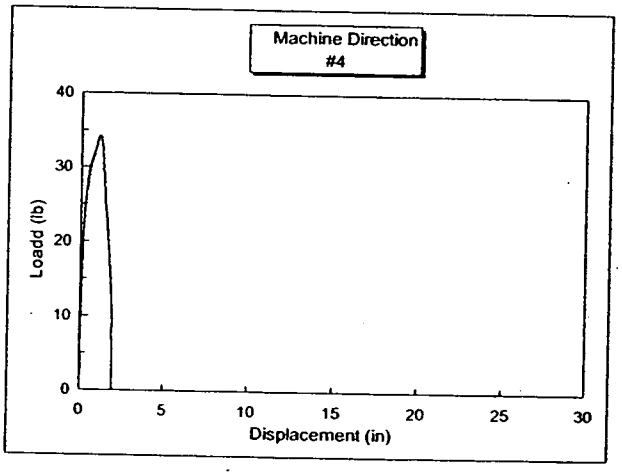
Client:	Tetra Tech - RMC
Job No.:	2617-03
Location:	Rocky Flats Present Closure
Roll No.:	104124908
Test Device:	Five Station
Load Cells:	500 lb.
Product Code:	LLD060A00

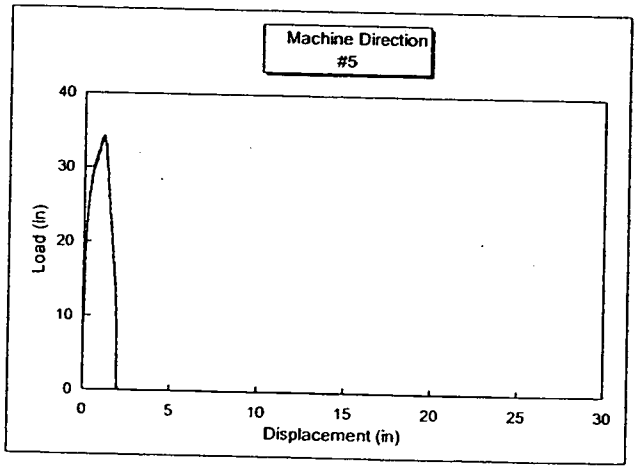
Test Type:	ASTM D 1004 Method C
Material Type:	60 mil LLDPE
Date Tested:	01-26-05 JTR
Sample No.:	SO38576/515122
Data Entered By:	SR
Displacement Rate:	2 in/min
Grip Seperation:	1.0"

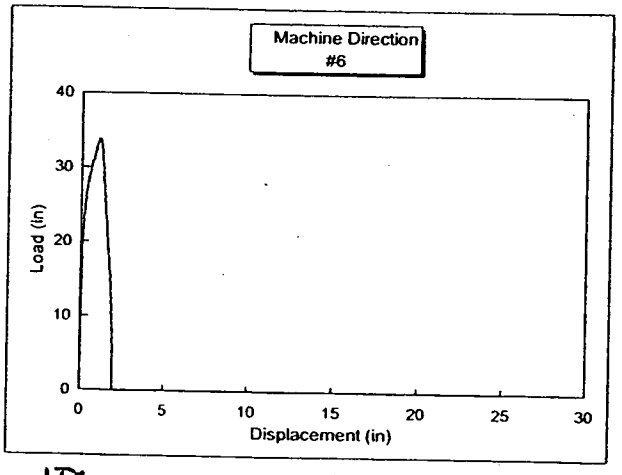












Filename: TTTR4908

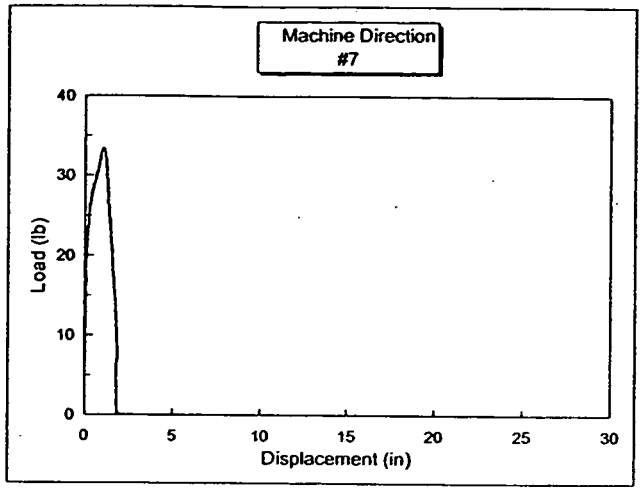
Raw Data File: TTUTRM2, TTUTRM3, TTUTRM12, TTUTRM13.TXT

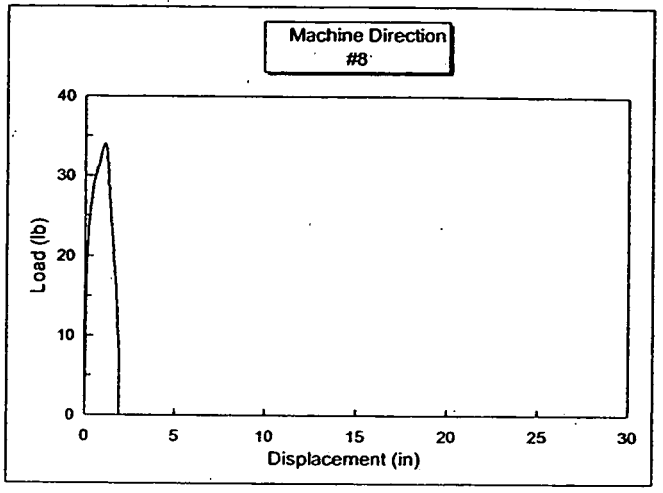
Checked By: JTR

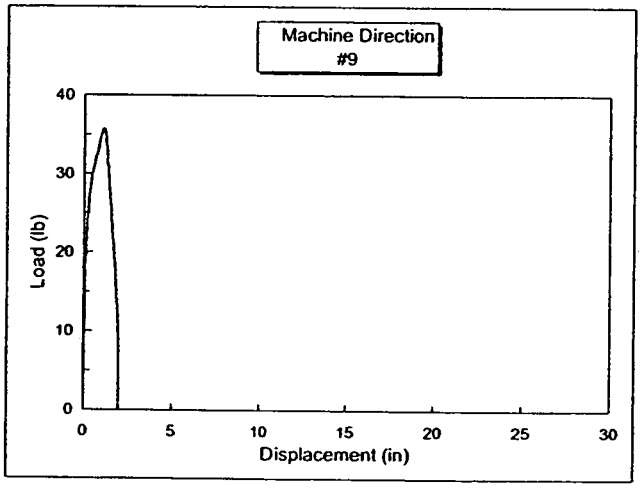
Date: 1/27/05

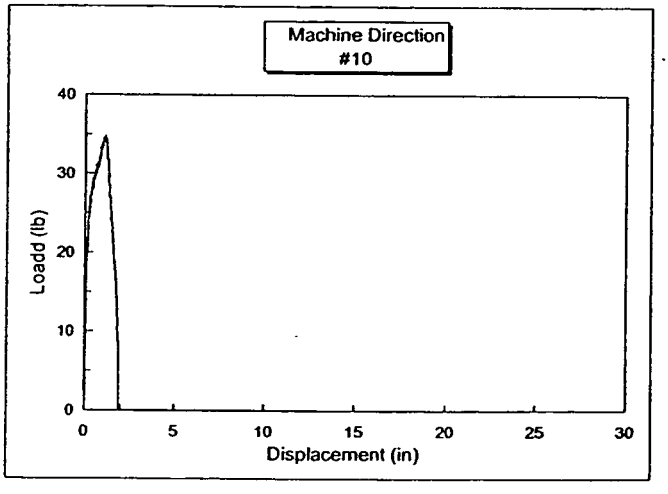
Advanced Terra Testing, Inc.

Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-03	Material Type:	60 mil LLDPE
Location:	Rocky Flats Present Closure	Date Tested:	01-26-05 JTR
Roll Number:	104124908	Sample No.:	SO38576/515122
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	LLD060A00	Grip Seperation:	1.0"









Machine Direction

	Load at Break (lb/in width)		Load at Break (lb/in width)
Specimen #1	34.2	Specimen #6	33.8
Specimen #2	34.6	Specimen #7	33.5
Specimen #3	34.5	Specimen #8	34.1
Specimen #4	34.3	Specimen #9	35.8
Specimen #5	34.3	Specimen #10	34.9

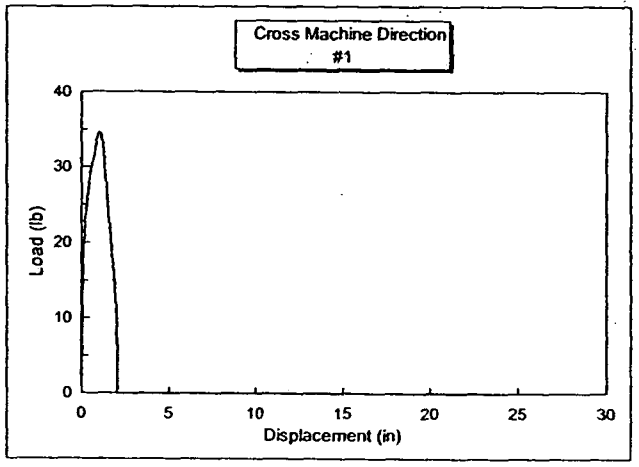
Average	34.4
Std. Deviation	0.6

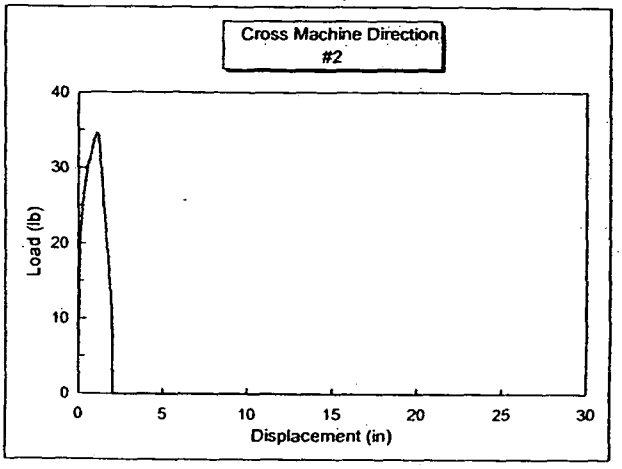
Filename: TTTR4908 Checked By: JTR Date: 1/27/05

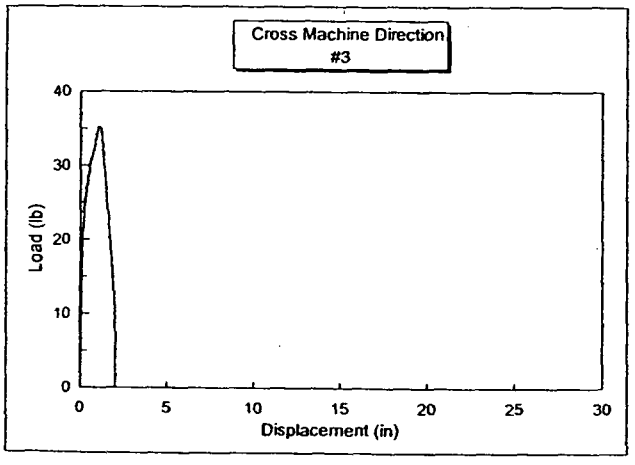
Raw Data File: TTUTRM2, TTUTRM3, TTUTRM12, TTUTRM13.TXT

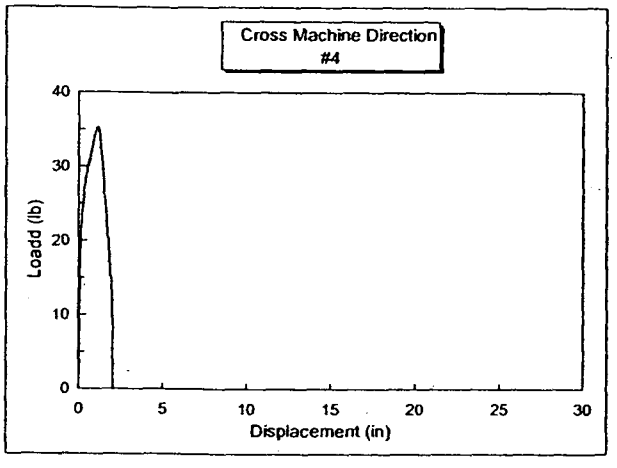
Advanced Terra Testing, Inc.

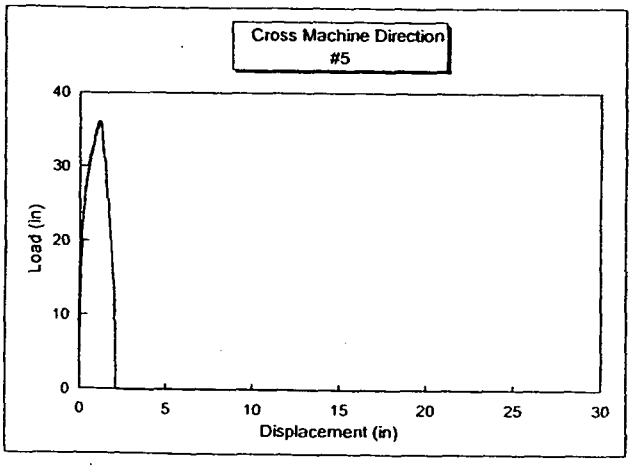
Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-03	Material Type:	60 mil LLDPE
Location:	Rocky Flats Present Closure	Date Tested:	01-26-05 JTR
Roll No.:	104124908	Sample No.:	SO38576/515122
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	LLD060A00	Grip Seperation:	1.0"

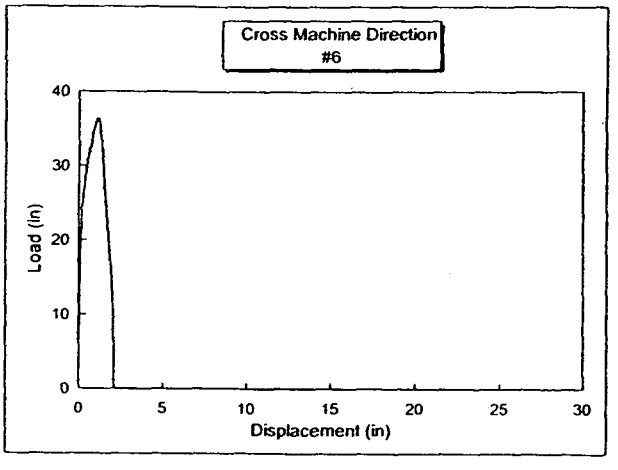










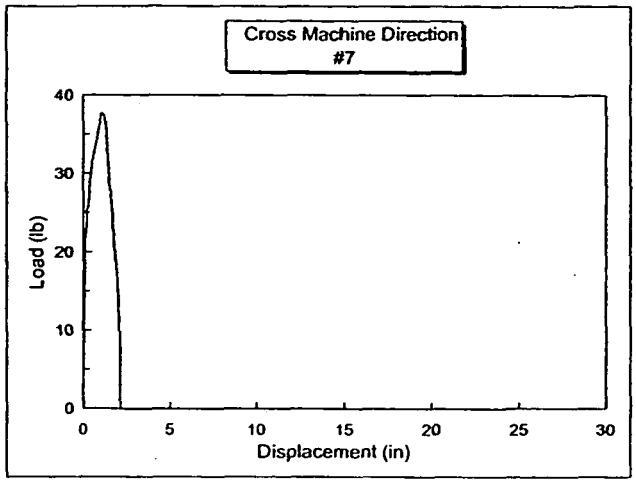


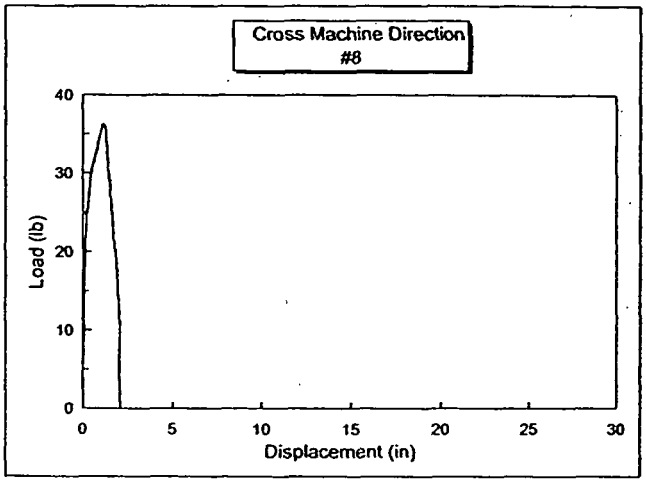
Filename: TTTR490C Checked By: JTR Date: 1/27/05

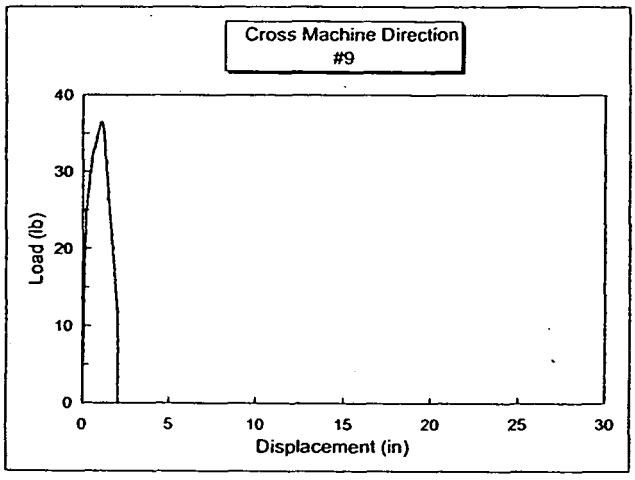
Raw Data File: TTUTRC2, TTUTRC3, TTUTRC12, TTUTRC13.TXT

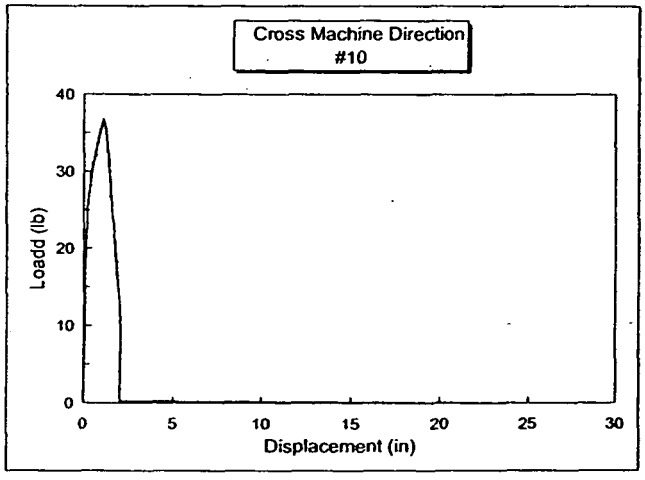
Advanced Terra Testing, Inc.

Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-03	Material Type:	60 mil LLDPE
Location:	Rocky Flats Present Closure	Date Tested:	01-26-05 JTR
Roll Number:	104124908	Sample No.:	SO38576/515122
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	LLD060A00	Grip Seperation:	1.0"









Cross Machine Direction

	Load at Break (lb/in width)		Load at Break (lb/in width)
Specimen #1	34.6	Specimen #6	36.4
Specimen #2	34.6	Specimen #7	37.8
Specimen #3	35.3	Specimen #8	36.3
Specimen #4	35.3	Specimen #9	36.5
Specimen #5	36.3	Specimen #10	36.9
Average	36.0		
Std. Deviation	1.0		

Filename: TTTR490C Checked By: JTR Date: 1/27/05

Raw Data File: TTUTRC2, TTUTRC3, TTUTRC12, TTUTRC13.TXT

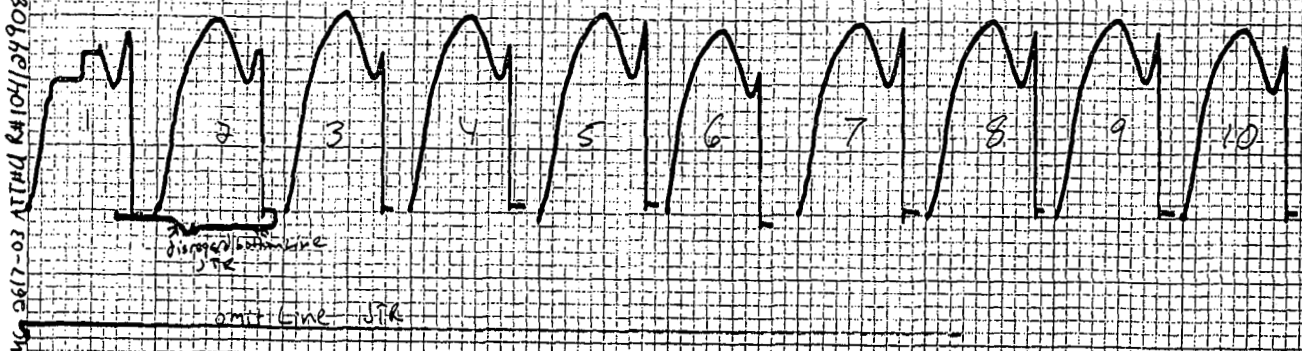
Advanced Terra Testing, Inc.

01-27-05 JTR
Chatillon Loading System
1 Kip Capacity Load Cell
2617-03

Tetra Tech-RMC
Rocky Flats Present Closure
Roll No.: 104124908, Sample No.: S038576151522, Product Code: LLD060A000
Puncture Resistance, 60 MIL LLDPE
ASTM D 4833

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN
DISPLACEMENT RATE = 12"/MIN

Specimen Number	Load (lbs)
1	104.5
2	112.8
3	117.3
4	115.8
5	117.3
6	109.0
7	112.8
8	115.1
9	115.8
10	112.0
Average	113.2
Std. Dev.	4.0



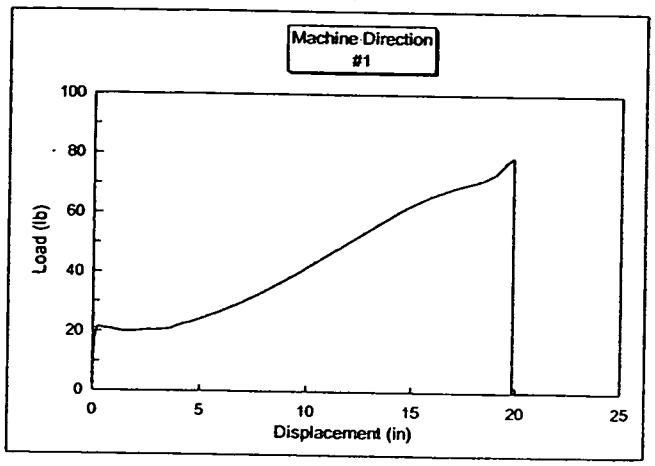
Data Checked By: JTR Date: 1/27/05
Filename: K:/TT2617/TTRP4908.lwp

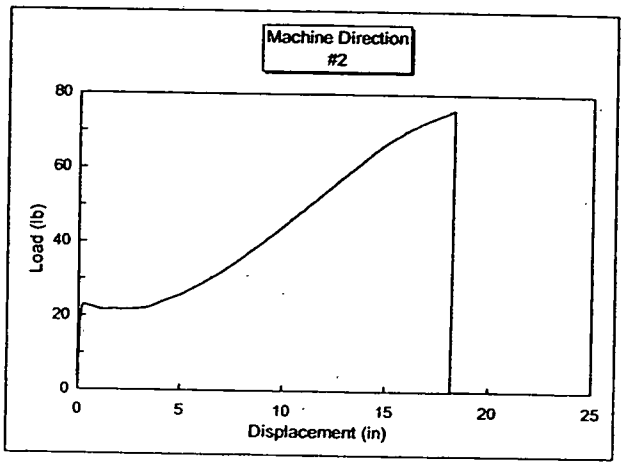
ADVANCED TERRA TESTING, Inc

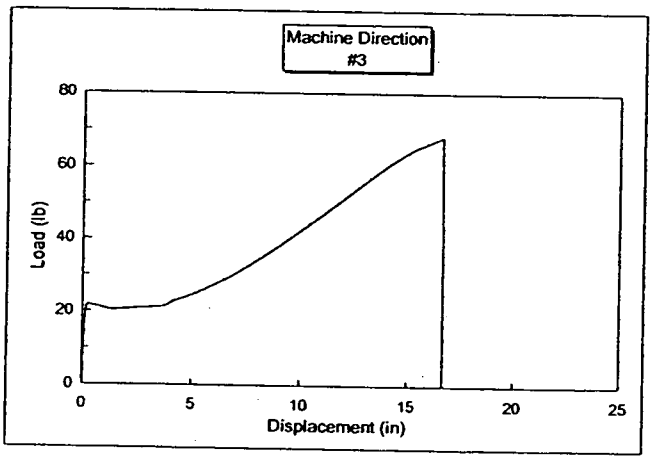
JTR 1/27/05
ASTM D 4833
Tetra Tech-RMC 2617-03 ATTN: R#104124908 LLD060A000 Rocky Flats Present Closure S038576151522 x=1.5"/in y=75.7#/in

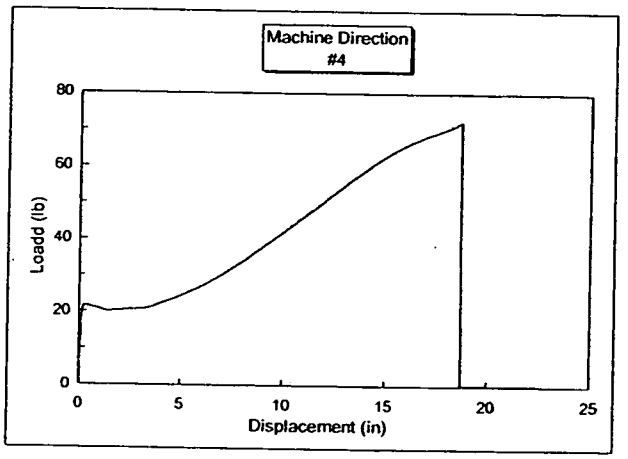
Client:	Tetra Tech - RMC
Job No.:	2617-03
Location:	Rocky Flats Present Closure
Sample:	Roll #104124908, S038576/515122
Test Device:	Five Station
Load Cells:	500 lb.

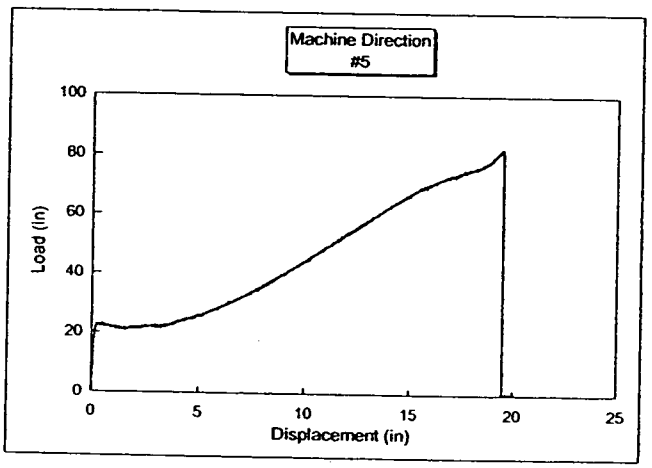
Test Type:	ASTM D 6693 Type IV
Material Type:	60 mil Smooth LLDPE, LLD060A000
Date Tested:	01-26-05
Tested By:	JTR
Data Entered By:	SR
Displacement Rate:	2 in/min
Grip Seperation:	2.5"











Machine Direction

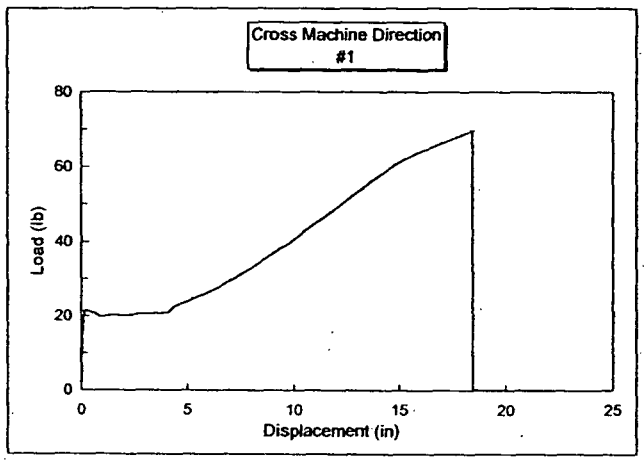
	Load at Break (lb/in width)	Elongation at Break (%)	Load at Yield (lb/in width)	Elongation at Yield (%)
Specimen #1	342.0	992.5	92.7	22.4
Specimen #2	324.7	914.4	98.3	25.0
Specimen #3	292.8	831.5	93.6	22.6
Specimen #4	307.7	934.7	91.8	19.5
Specimen #5	351.9	973.6	98.4	38.9
Average	**323.8**	**929.3**	**94.9**	**25.7**
Std. Deviation	**21.6**	**56.2**	**2.8**	**6.9**

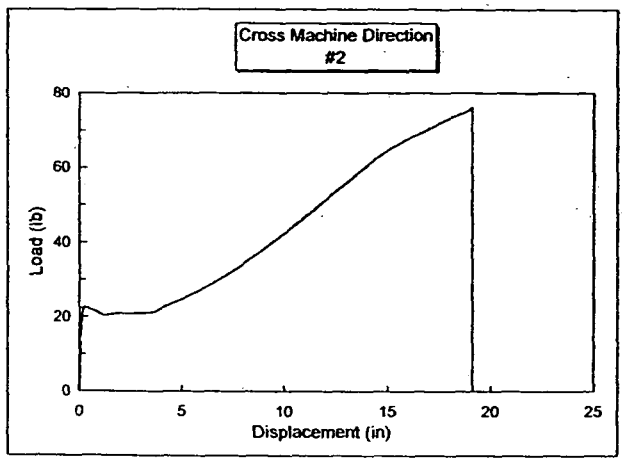
Filename: TTNT4908
Raw Data File: TTUTPM2, TTUTPM3.TXT

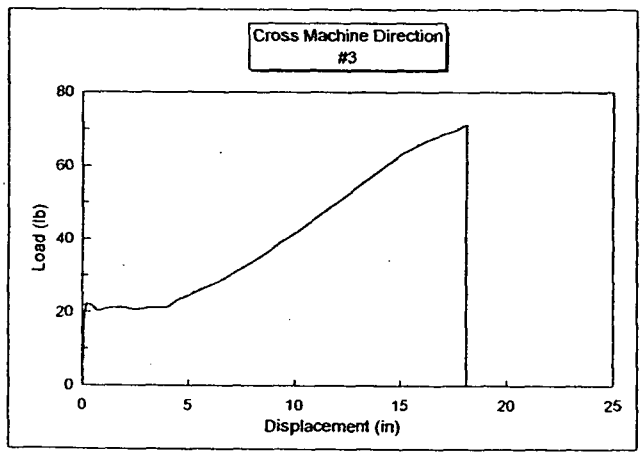
Checked By: JTR Date: 1/27/05

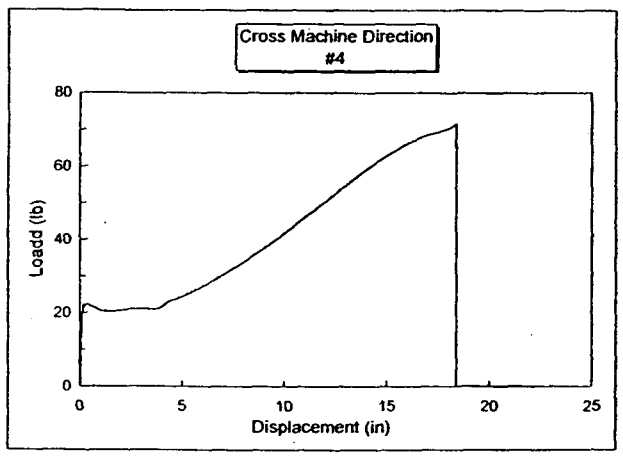
Advanced Terra Testing, Inc.

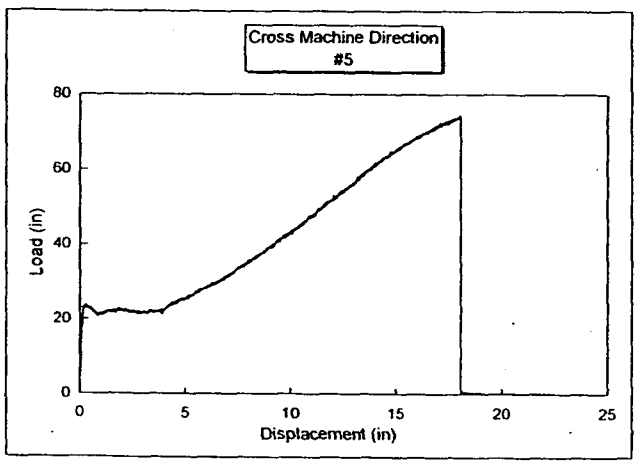
Client:	Tetra Tech - RMC	Test Type:	ASTM D 6693 Type IV
Job No.:	2617-03	Material Type:	60 mil Smooth LLDPE, LLD060A000
Location:	Rocky Flats Present Closure	Date Tested:	01-26-05
Sample:	Roll #104124908, S038576/515122	Tested By:	JTR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
		Grip Seperation:	2.5"











Cross Machine Direction

	Load at Break (lb/in width)	Elongation at Break (%)	Load at Yield (lb/in width)	Elongation at Yield (%)
Specimen #1	300.4	923.5	92.8	19.5
Specimen #2	326.3	955.6	96.9	20.1
Specimen #3	304.6	906.9	94.9	20.6
Specimen #4	305.3	918.6	95.1	21.2
Specimen #5	320.4	904.0	102.2	21.5
Average	**311.4**	**921.7**	**96.4**	**20.6**
Std. Deviation	**10.1**	**18.4**	**3.2**	**0.7**

Filename: TTNT490C

Raw Data File: TTUTPC2, TTUTPC3.TXT

Checked By: JTR Date: 1/27/05

Advanced Terra Testing, Inc.

THICKNESS
ASTM D 5994
(IN.)

CLIENT: Tetra Tech-RMC

JOB NO.: 2617-03

PROJECT: Present Landfill Design-RFETS, Golden CO

DATE: 01-12-05 SKL

Roll Number: 104124720, Product Code: LUTO60A000
60 mil LLDPE-T

1	0.0547	**2**	0.0602	**3**	0.0542	**4**	0.0571	**5**	0.0546
	0.0609		0.0590		0.0559		0.0571		0.0556
	0.0579		0.0610		0.0572		0.0577		0.0526
	0.0586		0.0600		0.0598		0.0563		0.0549
	0.0566		0.0584		0.0552		0.0542		0.0565
Average	0.0577	**Average**	0.0597	**Average**	0.0565	**Average**	0.0565	**Average**	0.0548
								AVERAGE FOR 5 SPECIMENS	**0.0570**

DATA ENTERED BY: SR
DATA CHECKED BY: SKL
FILENAME: TTTH4720

DATE: 01/12/2005
DATE: 1/13/05

ADVANCED TERRA TESTING, INC.

THICKNESS
ASTM D 5994
(IN.)

CLIENT: Tetra Tech-RMC

JOB NO.: 2617-03

PROJECT: Present Landfill Design-RFETS, Golden CO

DATE: 01-12-05 SKL

Roll Number: 104124728, Product Code: LUTO60A000
60 mil LLDPE-T

1	0.0597	**2**	0.0604	**3**	0.0613	**4**	0.0609	**5**	0.0604
	0.0549		0.0613		0.0618		0.0616		0.0606
	0.0610		0.0619		0.0595		0.0604		0.0594
	0.0609		0.0601		0.0615		0.0598		0.0579
	0.0589		0.0605		0.0601		0.0600		0.0610
Average	0.0591	**Average**	0.0608	**Average**	0.0608	**Average**	0.0605	**Average**	0.0598
								AVERAGE FOR 5 SPECIMENS	**0.0602**

DATA ENTERED BY: SR
DATA CHECKED BY: SKL
FILENAME: TTTH4728

DATE: 01/12/2005
DATE: 1/13/05

ADVANCED TERRA TESTING, INC.

THICKNESS
ASTM D 5994
(IN.)

CLIENT: Tetra Tech-RMC

JOB NO.: 2617-03

PROJECT: Present Landfill Design-RFETS, Golden CO

DATE: 01-12-05 SKL

Roll Number: 104124733, Product Code: LUTO60A000
60 mil LLDPE-T

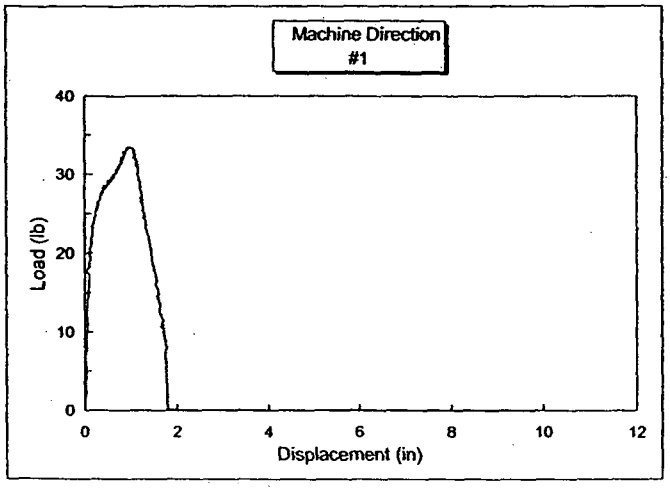
1	0.0558	**2**	0.0672	**3**	0.0598	**4**	0.0598	**5**	0.0570
	0.0608		0.0659		0.0623		0.0587		0.0622
	0.0606		0.0640		0.0618		0.0604		0.0603
	0.0583		0.0647		0.0625		0.0615		0.0593
	0.0582		0.0665		0.0604		0.0596		0.0600
Average	0.0587	**Average**	0.0656	**Average**	0.0613	**Average**	0.0600	**Average**	0.0597
								AVERAGE FOR 5 SPECIMENS	**0.0611**

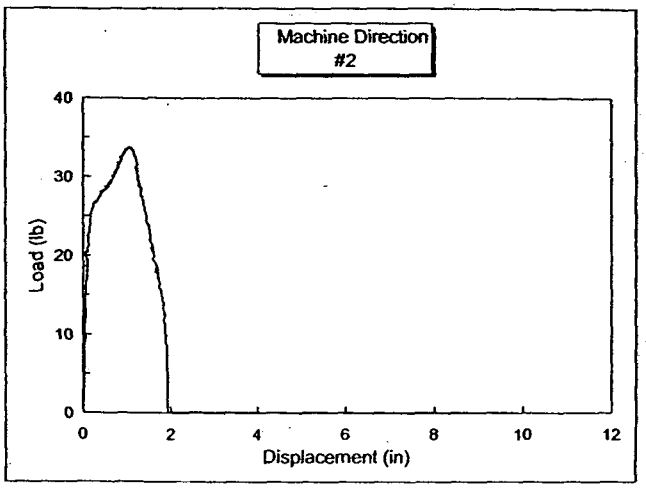
DATA ENTERED BY: SR
DATA CHECKED BY: SR
FILENAME: TTTH4733

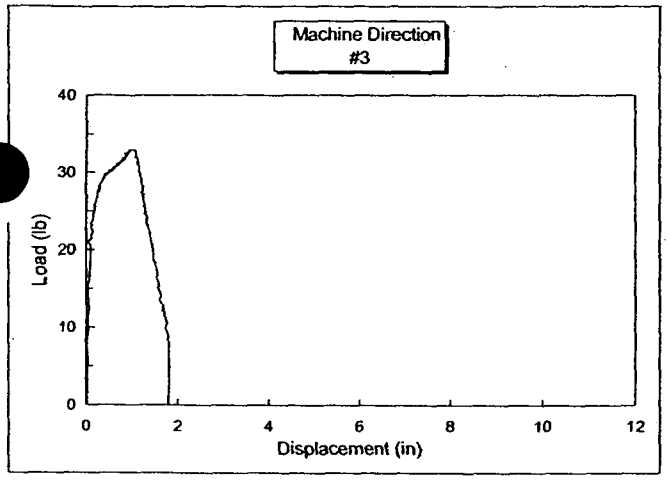
DATE: 01/20/2005
DATE: 1/20/04

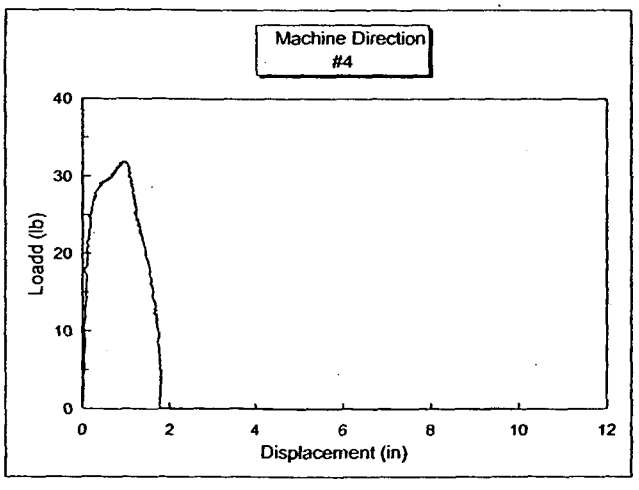
ADVANCED TERRA TESTING, INC.

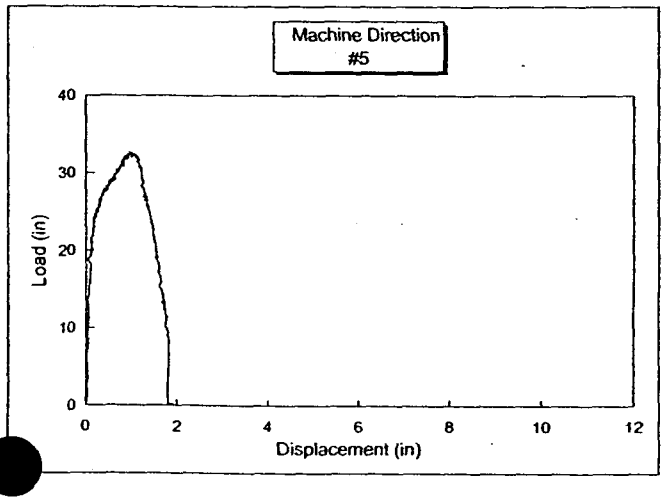
Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-03	Material Type:	60 mil LLDPE-T
Location:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	01-12-05
Sample:	104124720	Tested By:	JTR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	GSE, LUT060A000	Grip Seperation:	1.0"

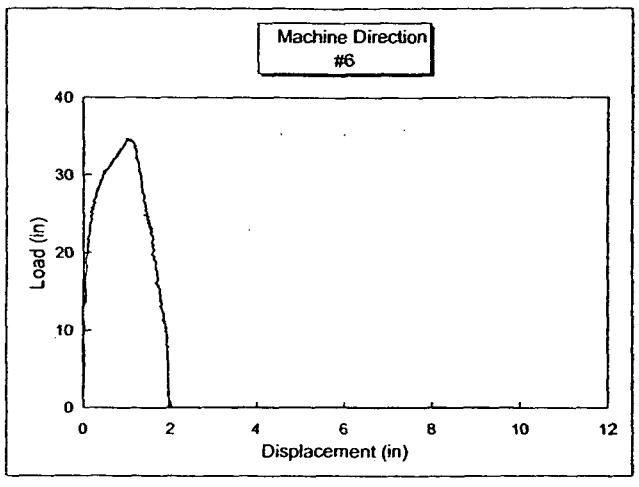










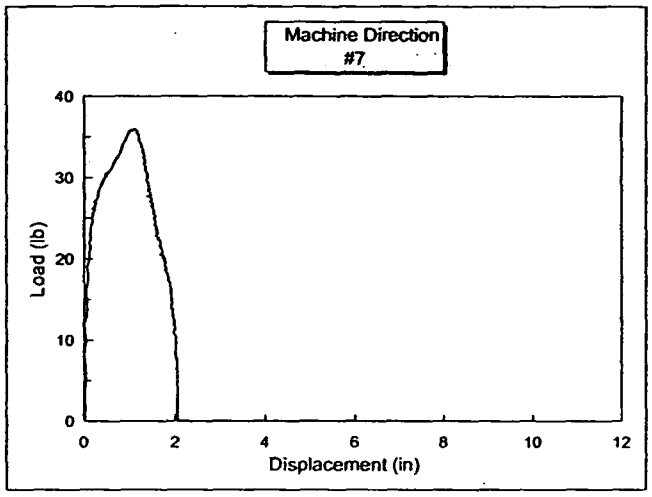


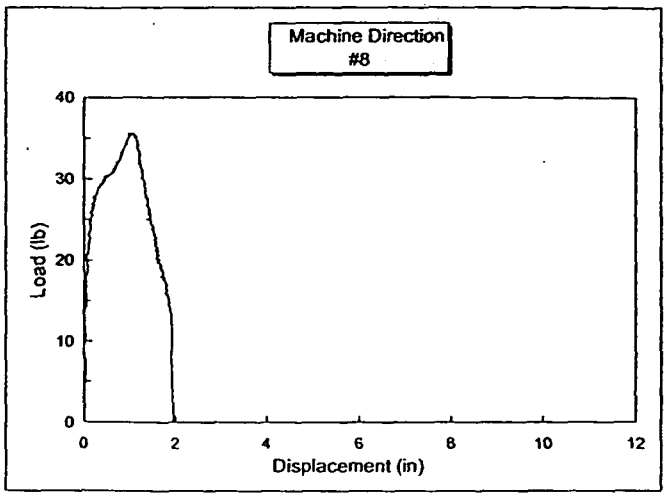
Filename: TTTR4720 Checked By: SLL Date: 1/21/05

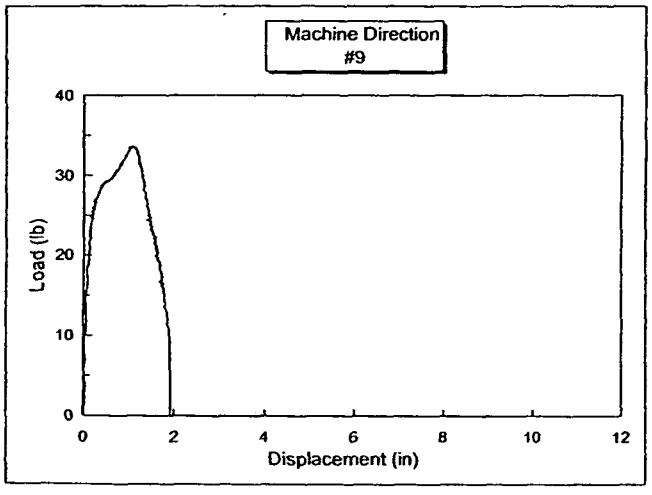
Raw Data File: TTZTRM2, TTZTRM3, TTZTRM12, TTZTRM13.TXT

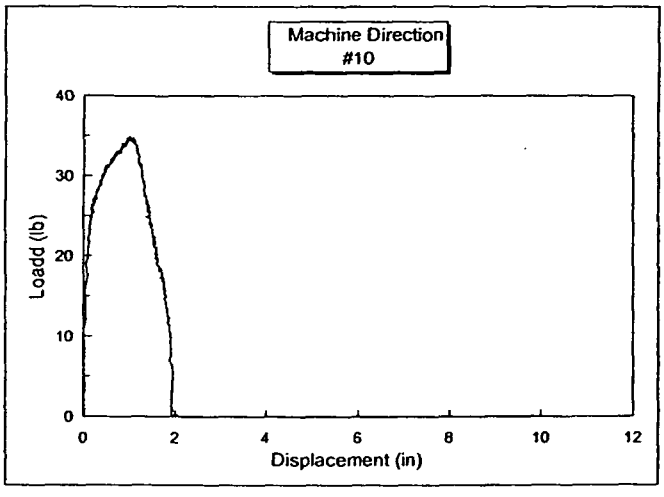
Advanced Terra Testing, Inc.

Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-03	Material Type:	60 mil LLDPE-T
Location:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	01-12-05
Sample:	104124720	Tested By:	JTR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	GSE, LUT060A000	Grip Seperation:	1.0"









Machine Direction

	Load at Break (lb/in width)		Load at Break (lb/in width)
Specimen #1	33.5	Specimen #6	34.6
Specimen #2	33.7	Specimen #7	36.0
Specimen #3	33.0	Specimen #8	35.6
Specimen #4	31.9	Specimen #9	33.6
Specimen #5	32.8	Specimen #10	35.0

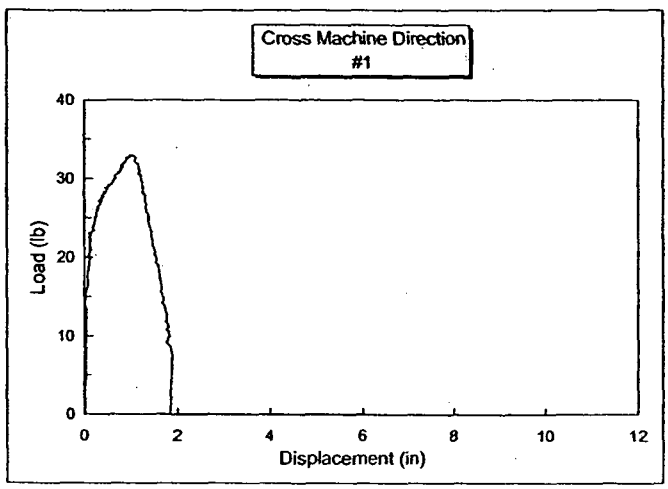
Average	**34.0**
Std. Deviation	**1.2**

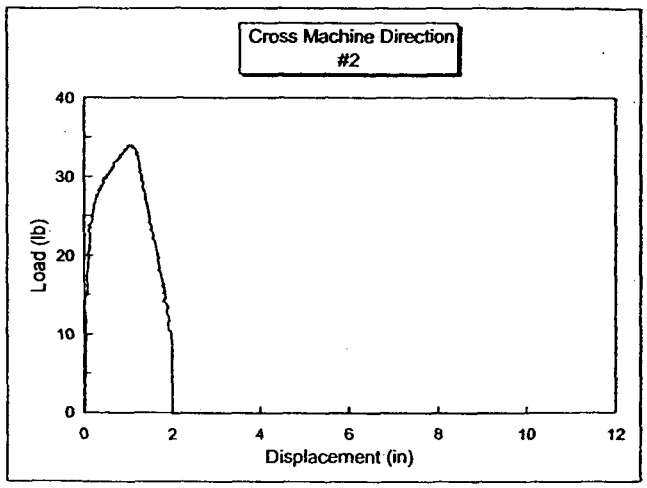
Filename: TTTR4720 Checked By: SHL Date: 1/21/05

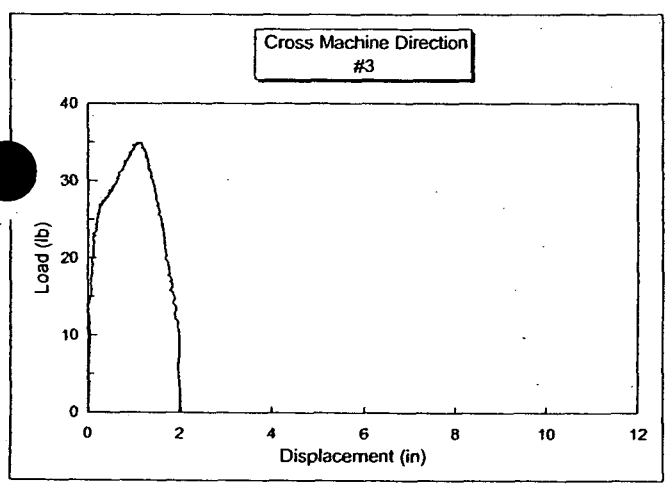
Raw Data File: TTZTRM2, TTZTRM3, TTZTRM12, TTZTRM13.TXT

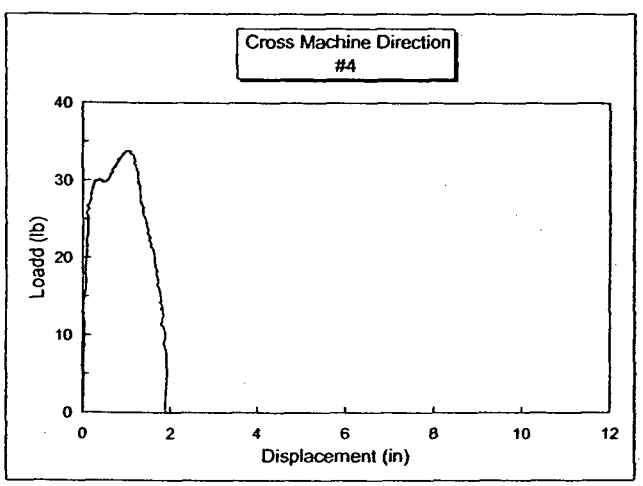
Advanced Terra Testing, Inc.

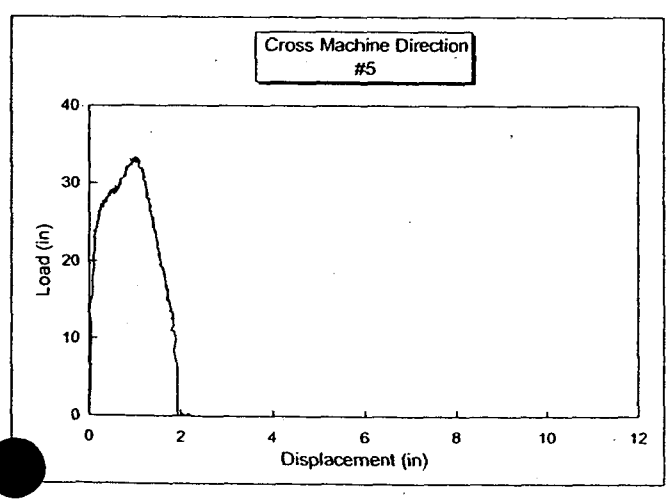
Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-03	Material Type:	60 mil LLDPE-T
Location:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	01-12-05
Sample:	104124720	Tested By:	JTR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	GSE, LUT060A000	Grip Seperation:	1.0"

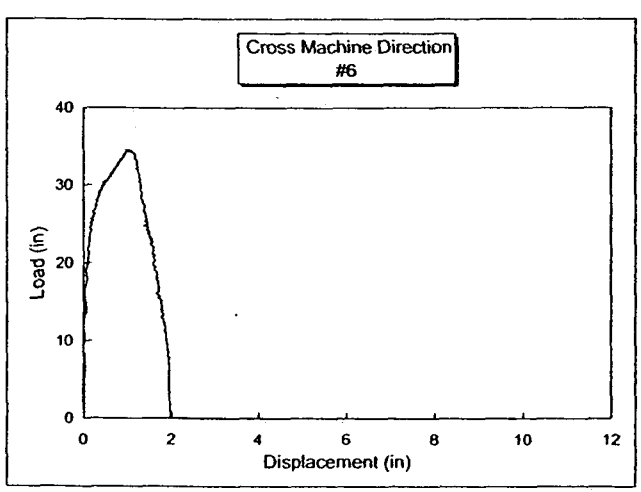










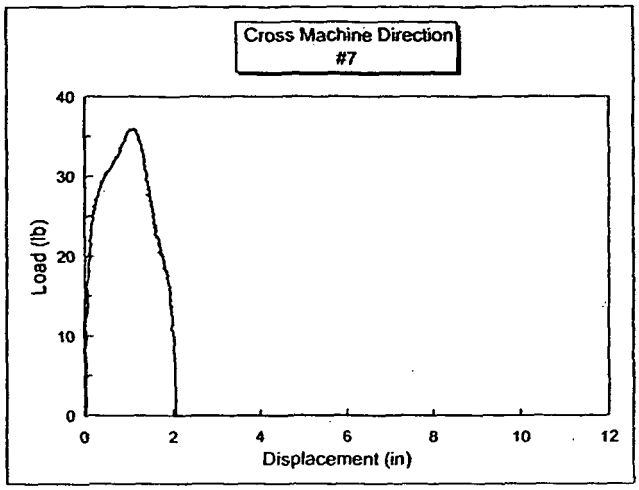


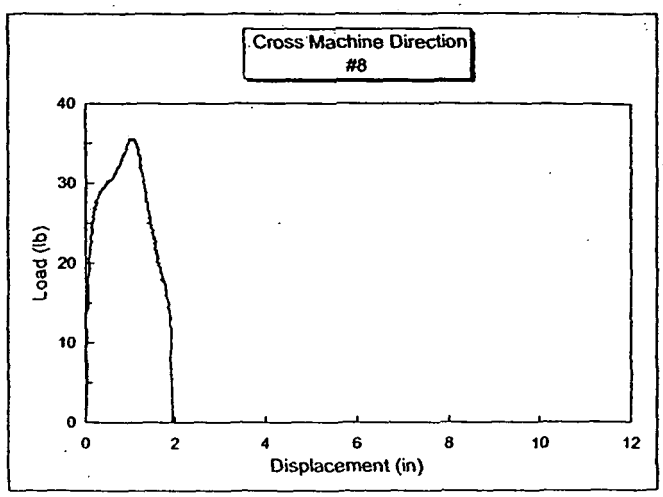
Filename: TTTR472C Checked By: SR Date: 1/21/05

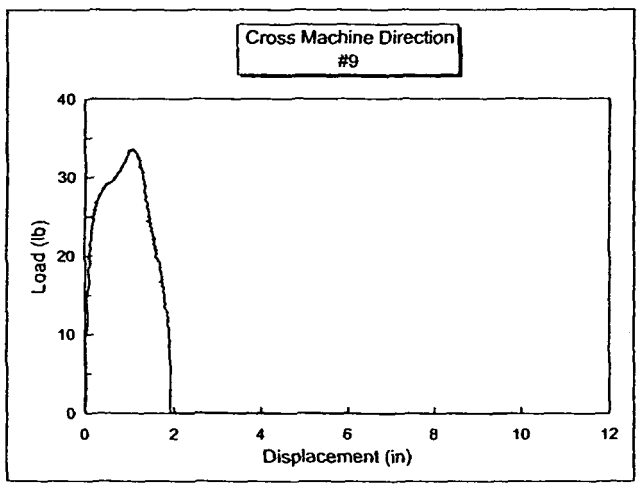
Raw Data File: TTZTRC2, TTZTRC3, TTZTRC12, TTZTRC13.TXT

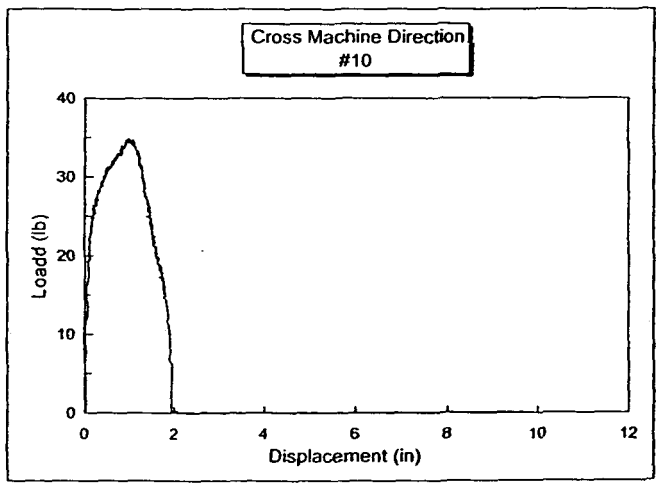
Advanced Terra Testing, Inc.

Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-03	Material Type:	60 mil LLDPE-T
Location:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	01-12-05
Sample:	104124720	Tested By:	JTR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	GSE, LUT060A000	Grip Seperation:	1.0"









Cross Machine Direction

	Load at Break (lb/in width)		Load at Break (lb/in width)
Specimen #1	33.1	Specimen #6	34.6
Specimen #2	34.1	Specimen #7	36.0
Specimen #3	35.0	Specimen #8	35.6
Specimen #4	33.9	Specimen #9	33.6
Specimen #5	33.5	Specimen #10	35.0

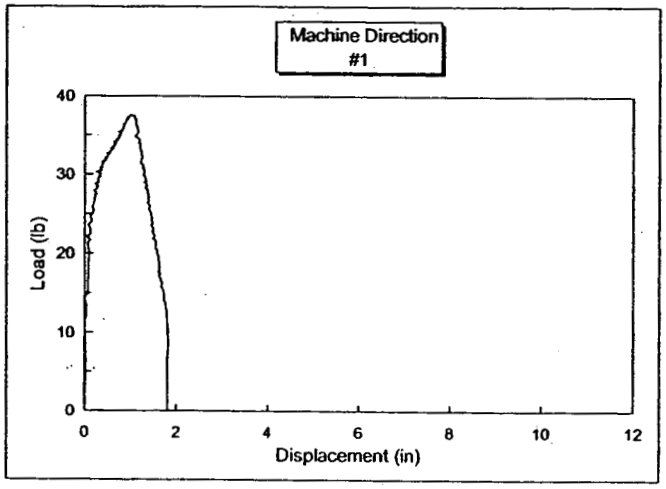
Average	**34.4**
Std. Deviation	**0.9**

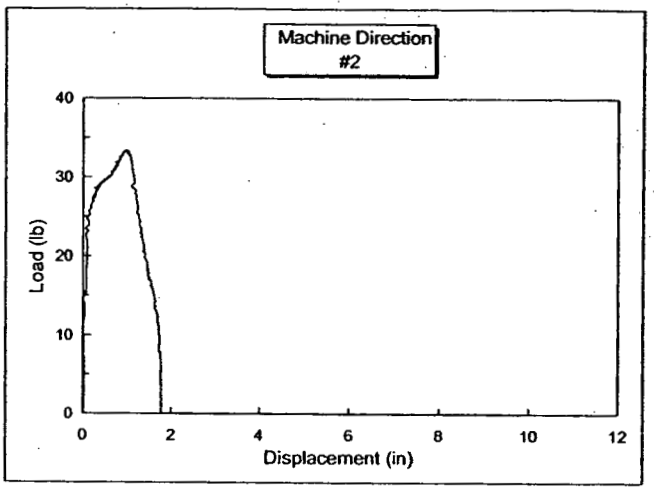
Filename: TTTR472C Checked By: shl Date: 1/21/05

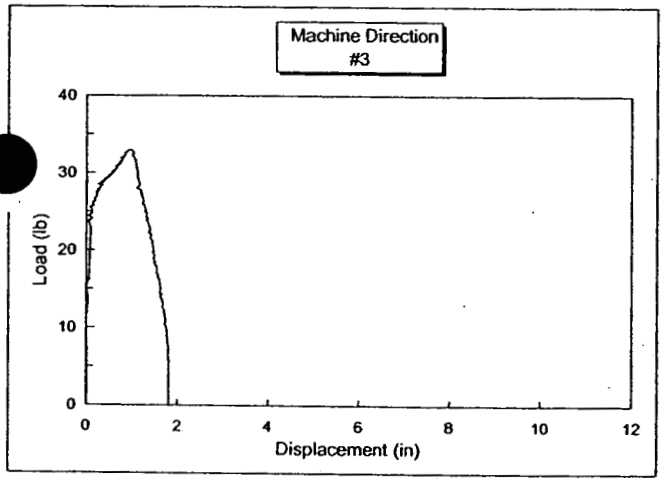
Raw Data File: TTZTRC2, TTZTRC3, TTZTRC12, TTZTRC13.TXT

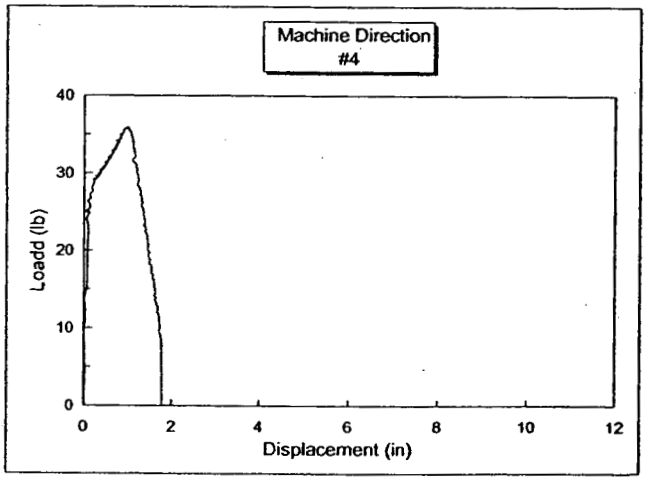
Advanced Terra Testing, Inc.

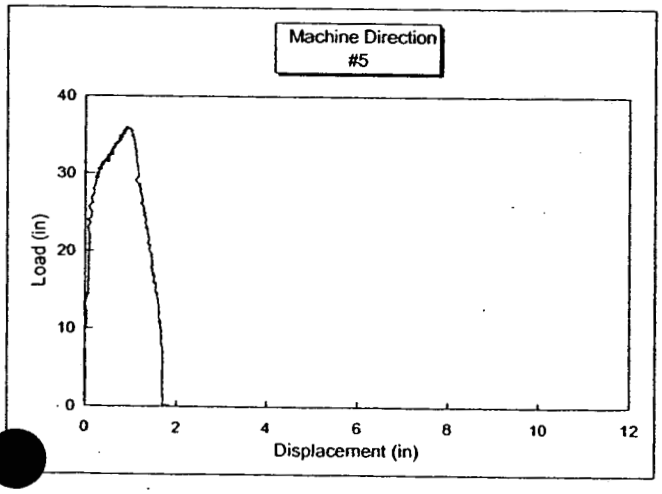
Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-03	Material Type:	60 mil LLDPE-T
Location:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	01-13-05
Sample:	104124728	Tested By:	JTR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	GSE, LUT060A000	Grip Seperation:	1.0"

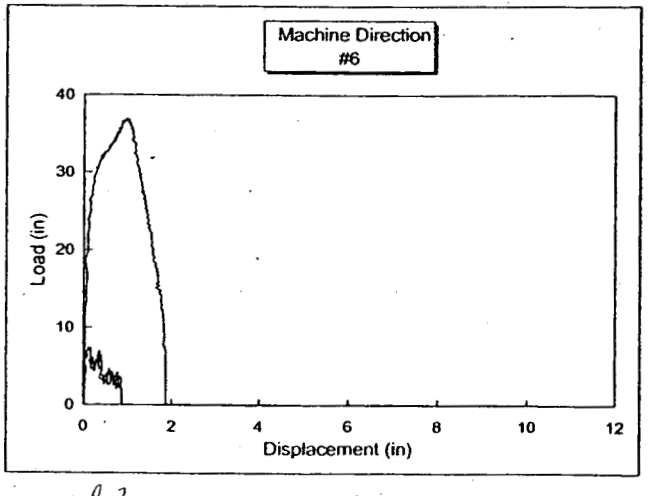












Filename: TTTR4728

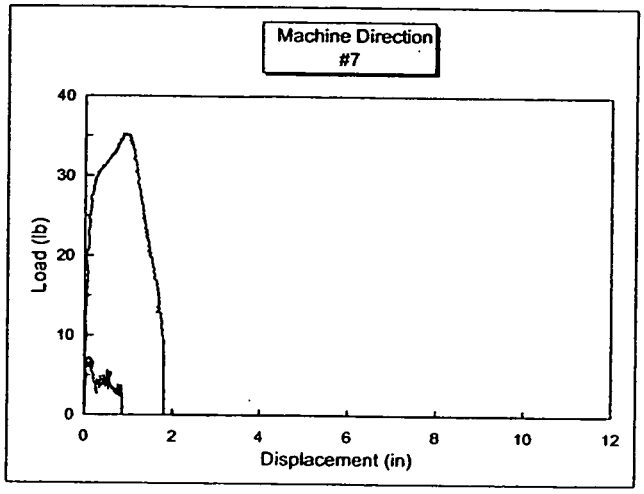
Raw Data File: TTXTRM2, TTXTRM3, TTXTRM12, TTXTRM13.TXT

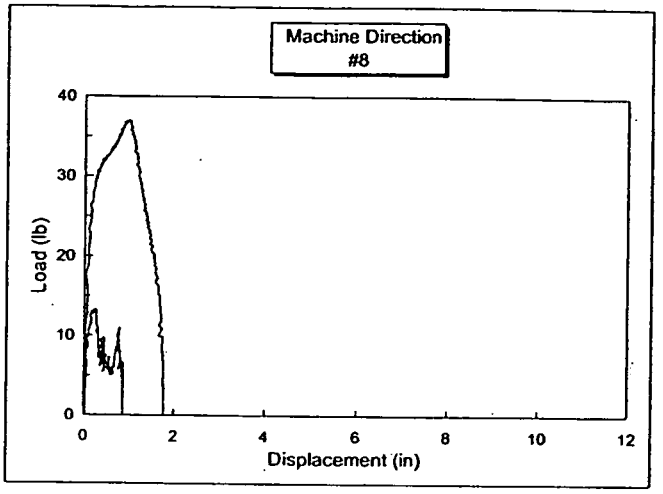
Checked By: SR

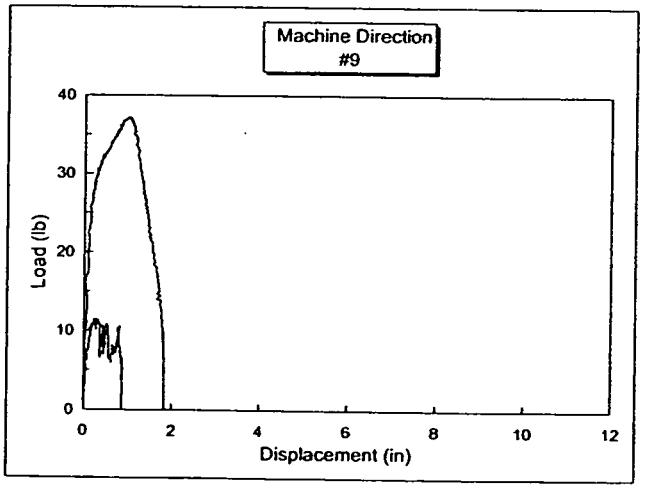
Date: 1/21/05

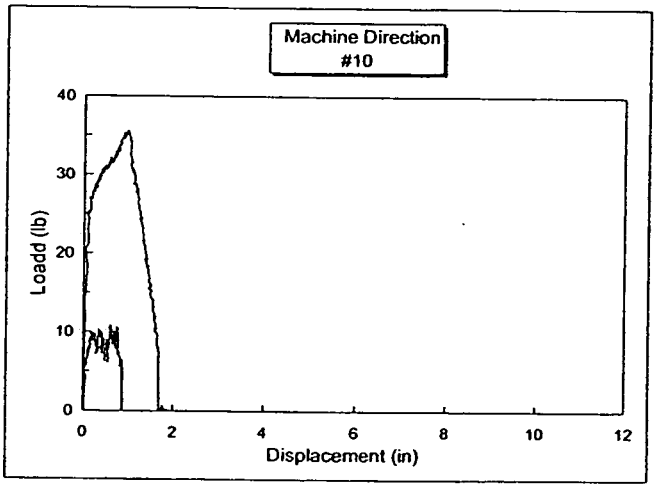
Advanced Terra Testing, Inc.

Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-03	Material Type:	60 mil LLDPE-T
Location:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	01-13-05
Sample:	104124728	Tested By:	JTR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	GSE, LUT060A000	Grip Seperation:	1.0"









Machine Direction

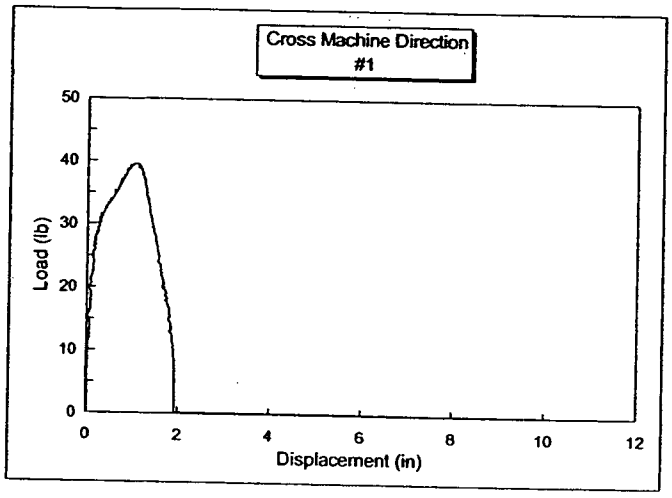
	Load at Break (lb/in width)
Specimen #1	37.6
Specimen #2	33.4
Specimen #3	33.0
Specimen #4	35.9
Specimen #5	36.1
Specimen #6	36.9
Specimen #7	35.3
Specimen #8	37.0
Specimen #9	37.2
Specimen #10	35.6
Average	**35.8**
Std. Deviation	**1.5**

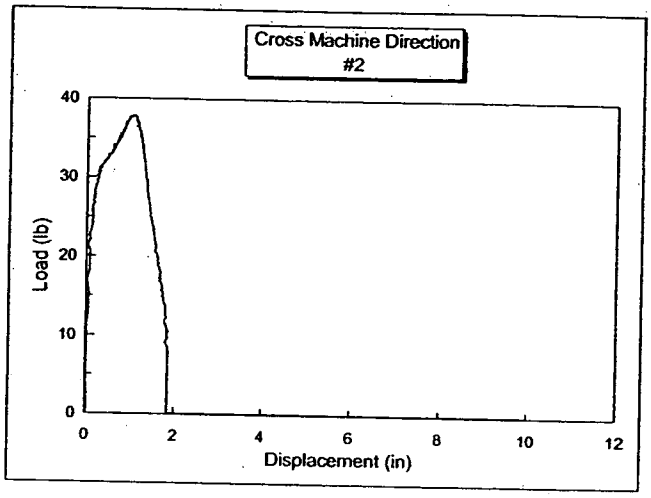
Filename: TTTR4728 Checked By: SRL Date: 1/21/05

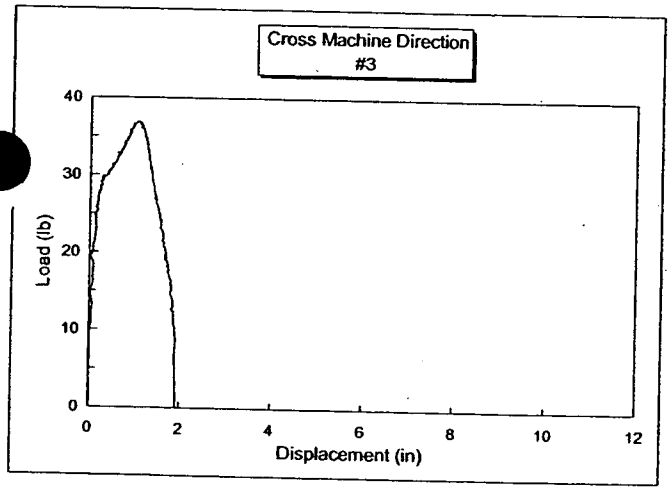
Raw Data File: TTXTRM2, TTXTRM3, TTXTRM12, TTXTRM13.TXT

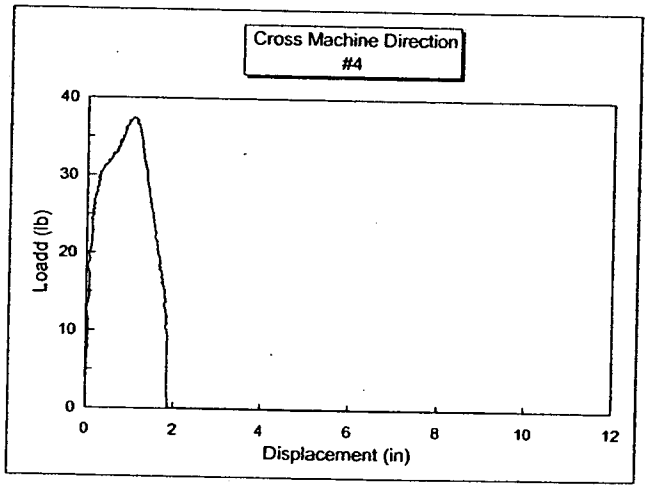
Advanced Terra Testing, Inc.

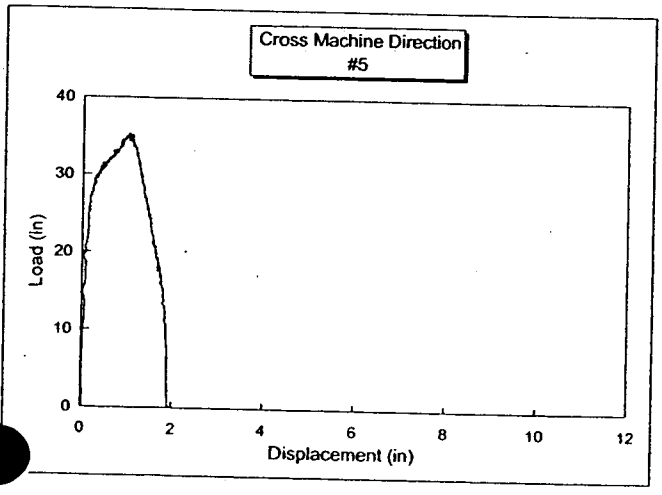
Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-03	Material Type:	60 mil LLDPE-T
Location:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	01-13-05
Sample:	104124728	Tested By:	JTR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	GSE, LUT060A000	Grip Seperation:	1.0"

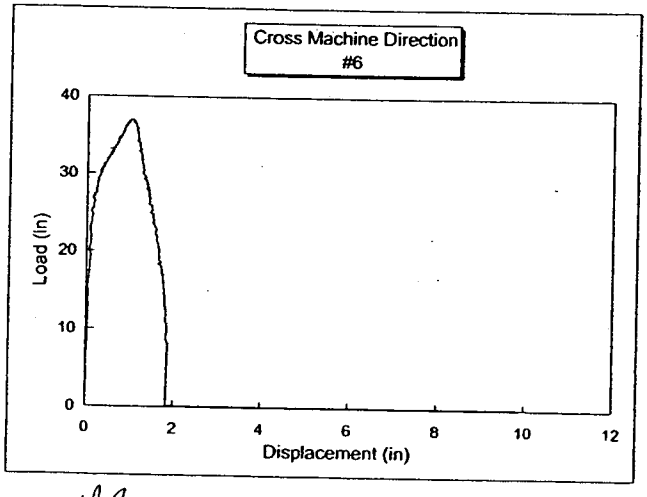












Filename: TTTR728C

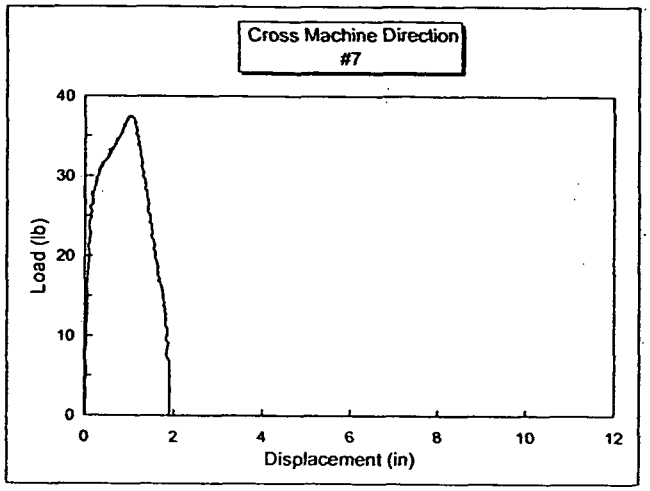
Raw Data File: TTXTRC2, TTXTRC3, TTXTRC12, TTXTRC13.TXT

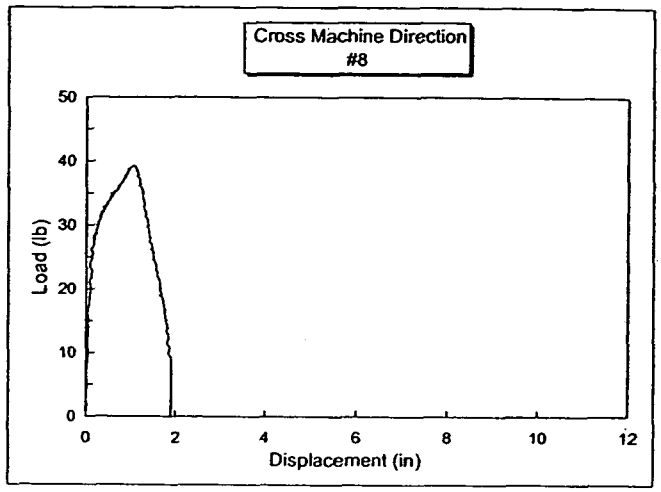
Checked By: SLL

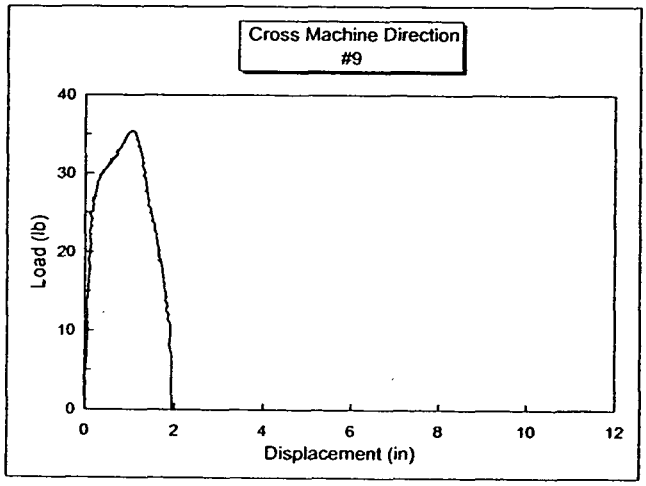
Date: 1/21/05

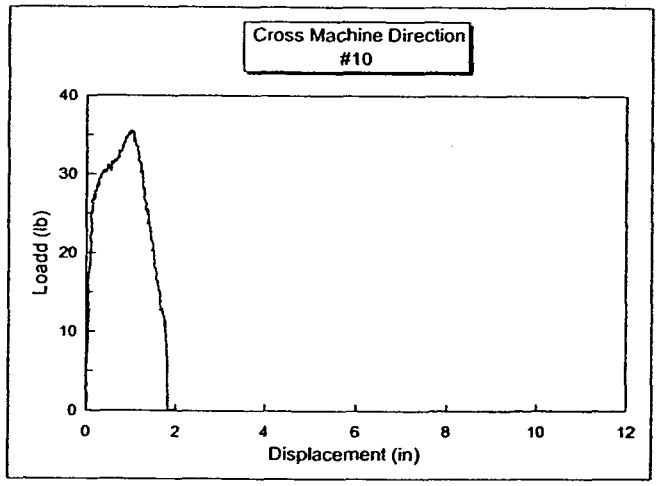
Advanced Terra Testing, Inc.

Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-03	Material Type:	60 mil LLDPE-T
Location:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	01-13-05
Sample:	104124728	Tested By:	JTR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	GSE, LUT060A000	Grip Seperation:	1.0"









Cross Machine Direction

	Load at Break (lb/in width)		Load at Break (lb/in width)
Specimen #1	39.6	Specimen #6	36.9
Specimen #2	37.9	Specimen #7	37.6
Specimen #3	36.9	Specimen #8	39.3
Specimen #4	37.4	Specimen #9	35.5
Specimen #5	35.3	Specimen #10	35.6

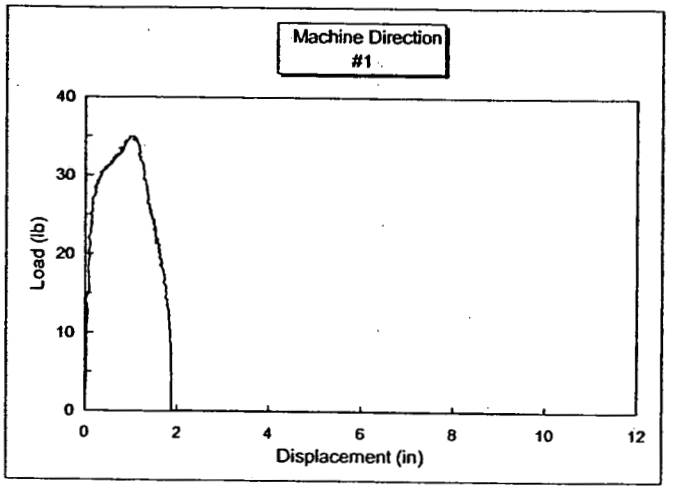
Average	**37.2**
Std. Deviation	**1.4**

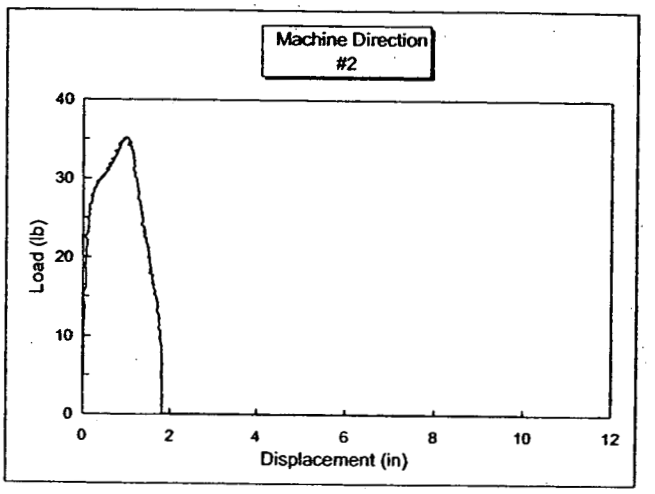
Filename: TTTR728C Checked By: skl Date: 1/21/05

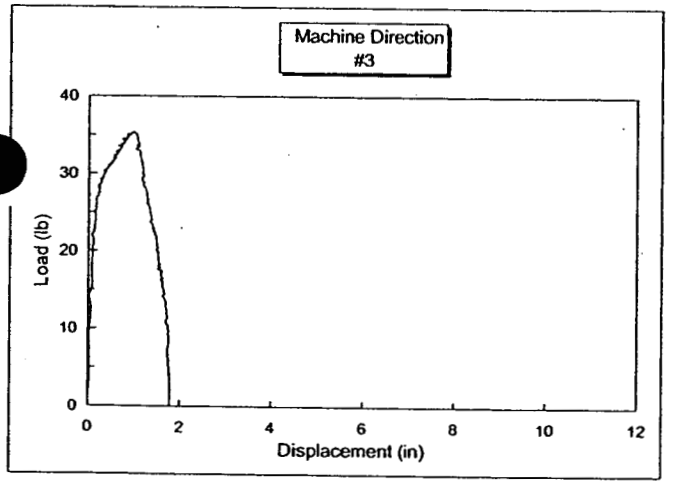
Raw Data File: TTXTRC2, TTXTRC3, TTXTRC12, TTXTRC13.TXT

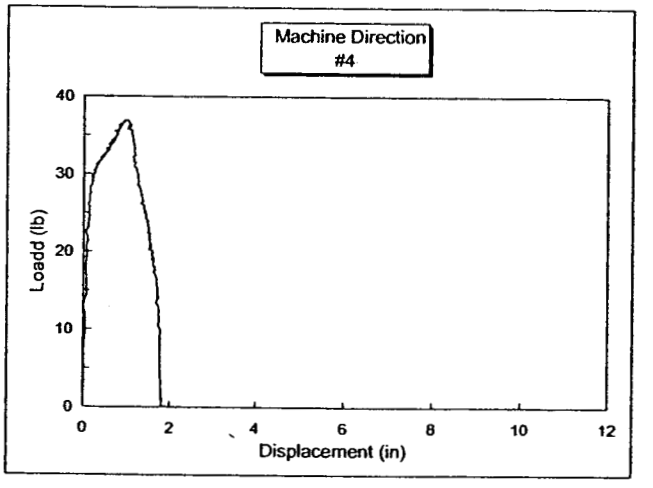
Advanced Terra Testing, Inc.

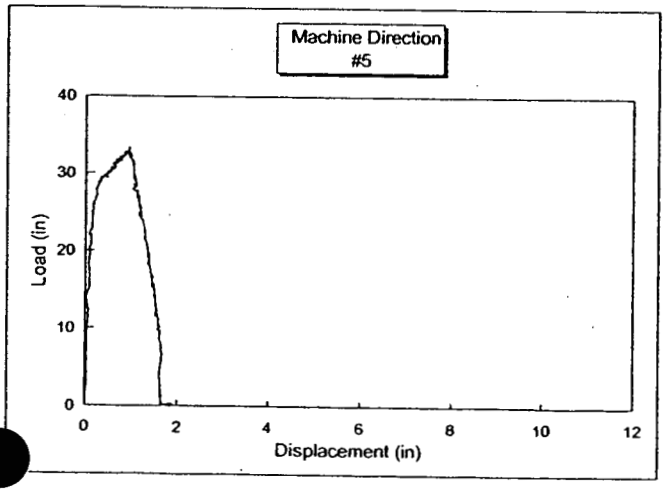
Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-03	Material Type:	60 mil LLDPE-T
Location:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	01-12-05
Sample:	104124733	Tested By:	JTR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	GSE, LUT060A000	Grip Seperation:	1.0"

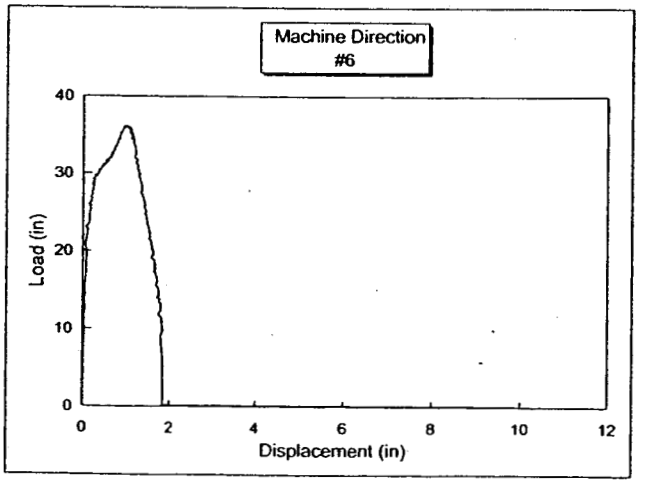












Filename: TTTR4733

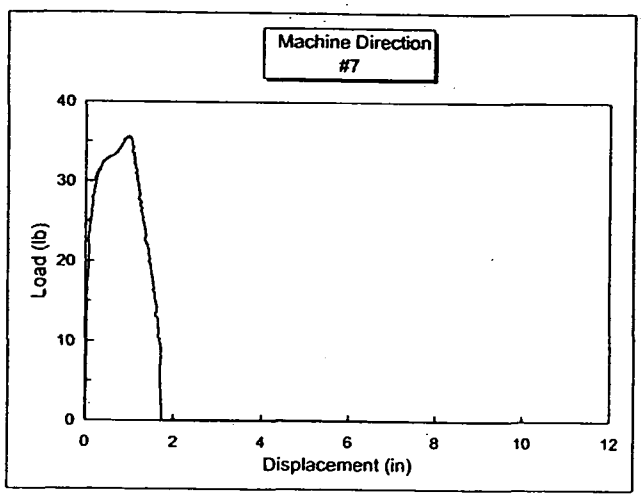
Checked By: SLL

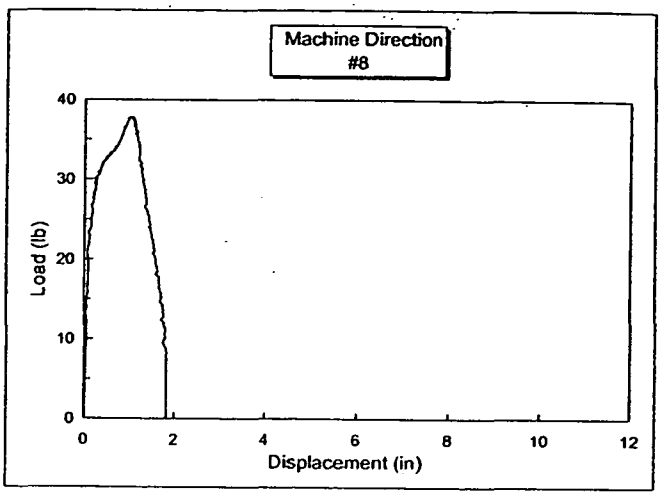
Date: 1/21/05

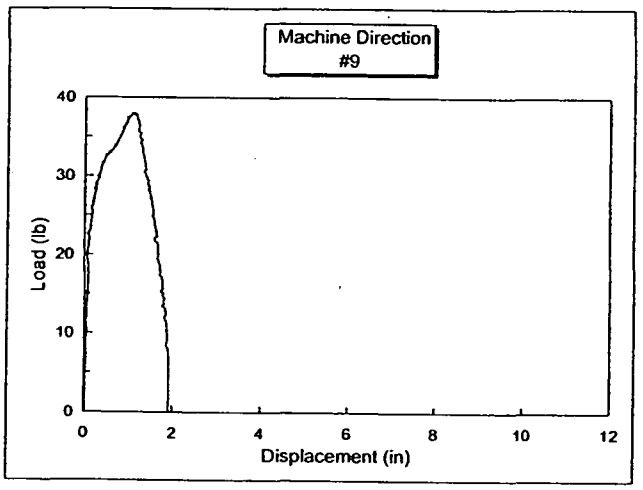
Raw Data File: TTYTRM2, TTYTRM3, TTYTRM12, TTYTRM13.TXT

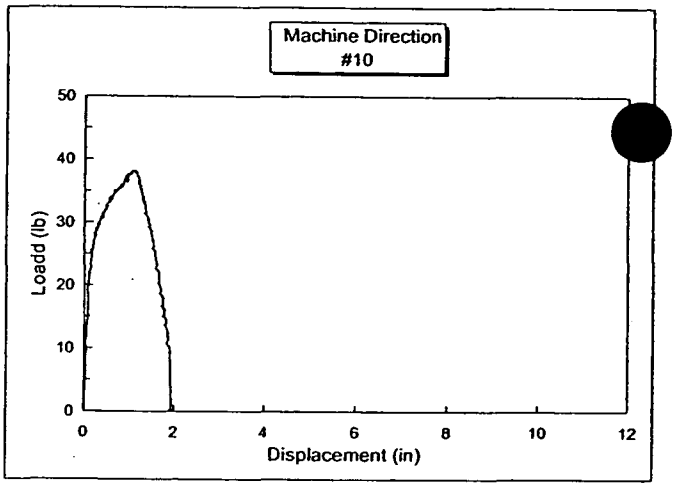
Advanced Terra Testing, Inc.

Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-03	Material Type:	60 mil LLDPE-T
Location:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	01-12-05
Sample:	104124733	Tested By:	JTR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	GSE, LUT060A000	Grip Seperation:	1.0"









Machine Direction

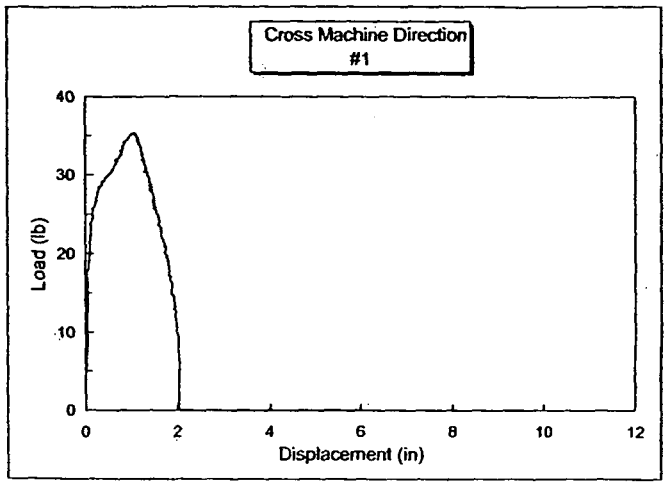
	Load at Break (lb/in width)		Load at Break (lb/in width)
Specimen #1	34.9	Specimen #6	36.0
Specimen #2	35.1	Specimen #7	35.7
Specimen #3	35.2	Specimen #8	37.9
Specimen #4	36.8	Specimen #9	38.1
Specimen #5	33.3	Specimen #10	38.2
Average	**36.1**		
Std. Deviation	**1.5**		

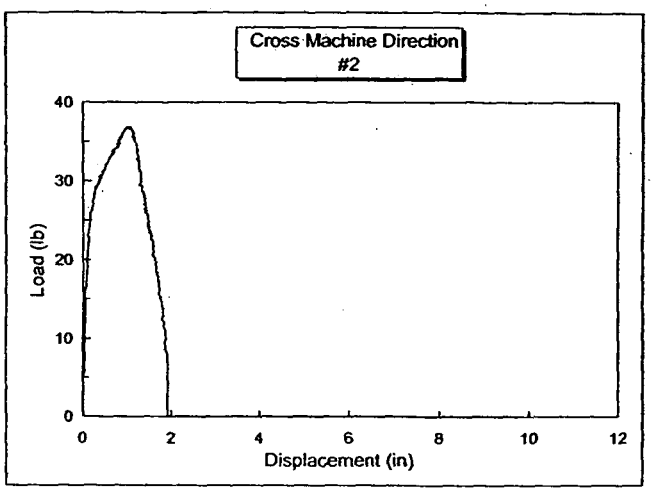
Filename: TTTR4733 Checked By: SHL Date: 1/21/05

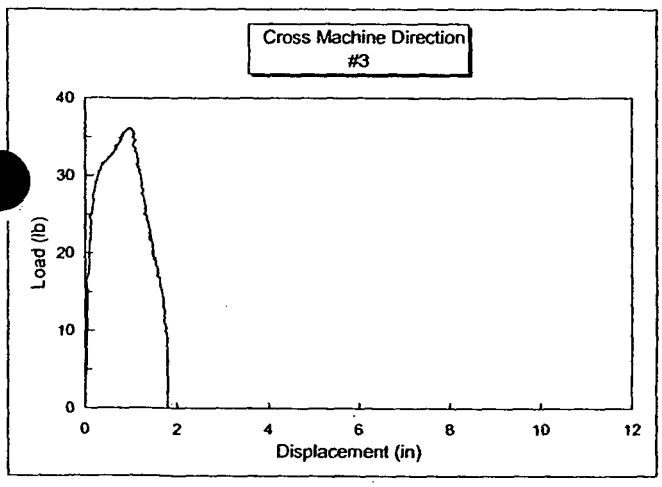
Raw Data File: TTYTRM2, TTYTRM3, TTYTRM12, TTYTRM13.TXT

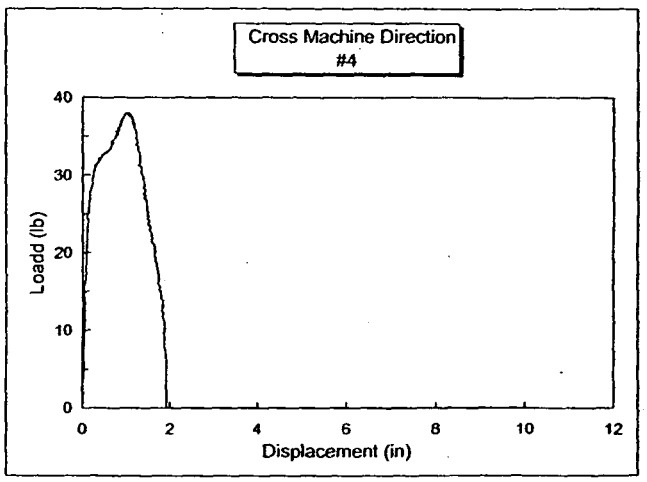
Advanced Terra Testing, Inc.

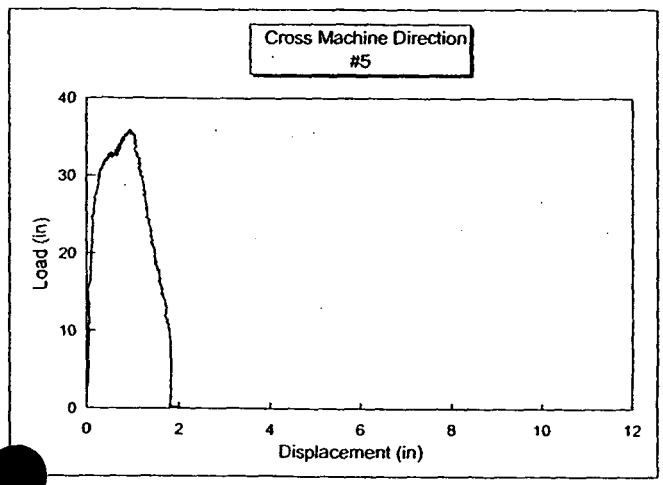
Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-03	Material Type:	60 mil LLDPE-T
Location:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	01-12-05
Sample:	104124733	Tested By:	JTR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	GSE, LUT060A000	Grip Seperation:	1.0"

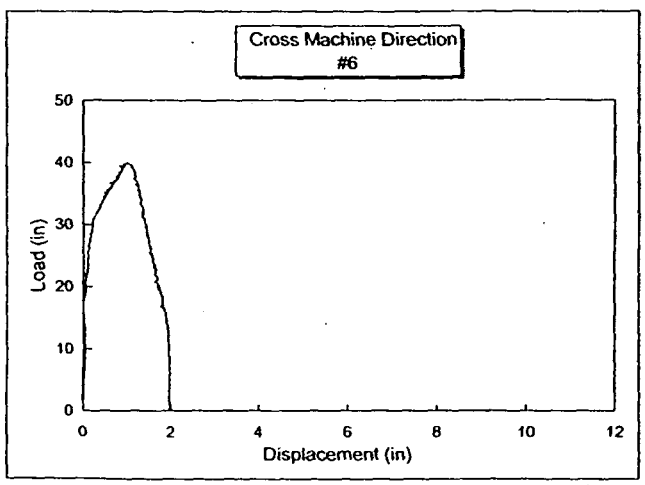










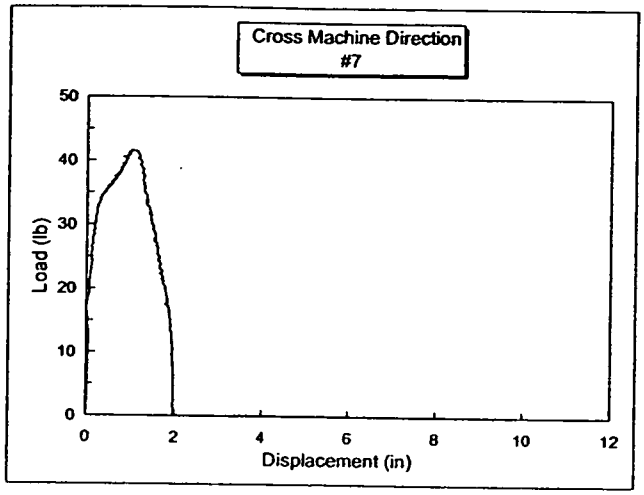


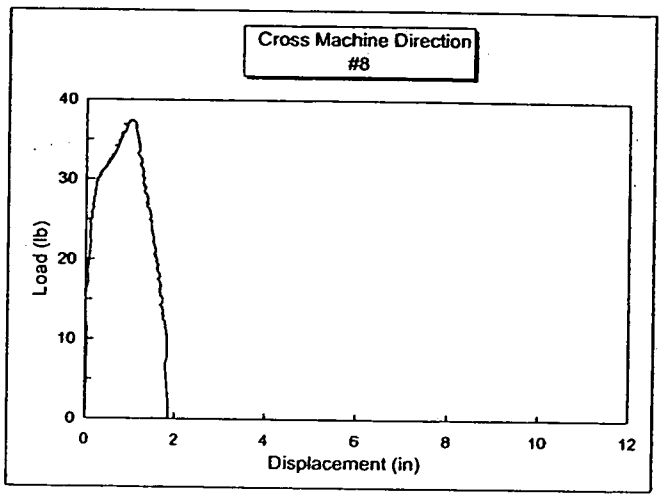
Filename: TTTR473C Checked By: SRL Date: 1/21/05

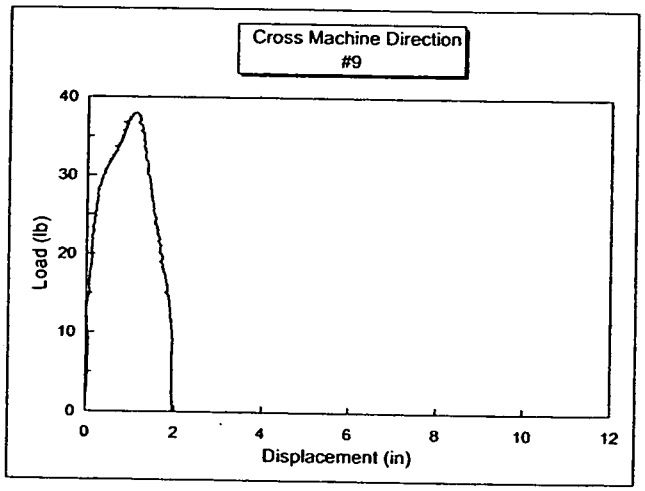
Raw Data File: TTYTRC2, TTYTRC3, TTYTRC12, TTYTRC13.TXT

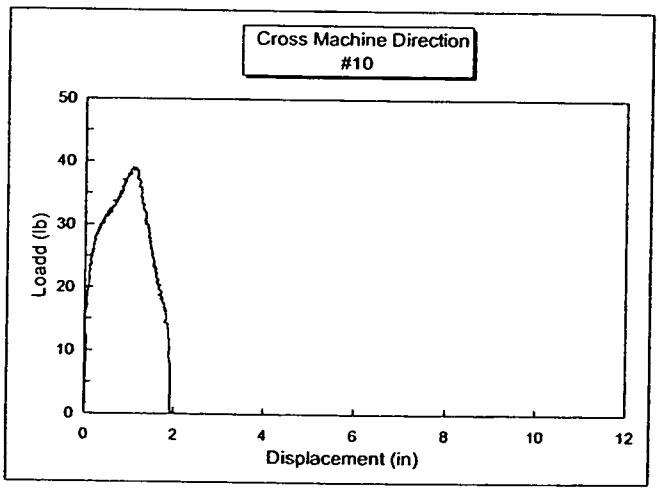
Advanced Terra Testing, Inc.

Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-03	Material Type:	60 mil LLDPE-T
Location:	Present Landfill Design-RFETS, Golden, CO	Date Tested:	01-12-05
Sample:	104124733	Tested By:	JTR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	GSE, LUT060A000	Grip Seperation:	1.0"









Cross Machine Direction

	Load at Break (lb/in width)
Specimen #1	35.4
Specimen #2	36.9
Specimen #3	36.2
Specimen #4	38.0
Specimen #5	36.0
Specimen #6	39.9
Specimen #7	41.6
Specimen #8	37.4
Specimen #9	38.0
Specimen #10	39.1
Average	**37.9**
Std. Deviation	**1.8**

Filename: TTTR473C

Raw Data File: TTYTRC2, TTYTRC3, TTYTRC12, TTYTRC13.TXT

Checked By: SHL

Date: 1/21/05

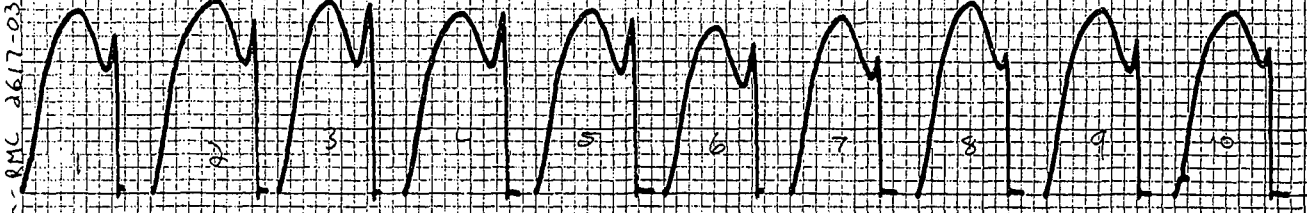
Advanced Terra Testing, Inc.

01-12-05 JTR
Chatillon Loading System
1 Kip Capacity Load Cell
2617-03

Tetra Tech-RMC
Present Landfill Design-RFETS, Golden, CO
Roll No.: 104124720, Product Code LUT060A000
Puncture Resistance, 60 mil LLDPE-T
ASTM D 4833

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN
DISPLACEMENT RATE = 12"/MIN

Specimen Number	Load (lbs)
1	106.7
2	112.8
3	112.0
4	104.5
5	106.7
6	96.9
7	103.7
8	111.3
9	106.7
10	106.0
Average	106.7
Std. Dev.	4.7



Tetra Tech - RMC 2617-03 Roll 104124720 LUT060A000 X=1.5"/in, Y=75.7#/in JTR 1-12-05

ATT #2

Data Checked By: JTR Date: 1/21/05
Filename: K:/TT2617/TTRP4720.lwp

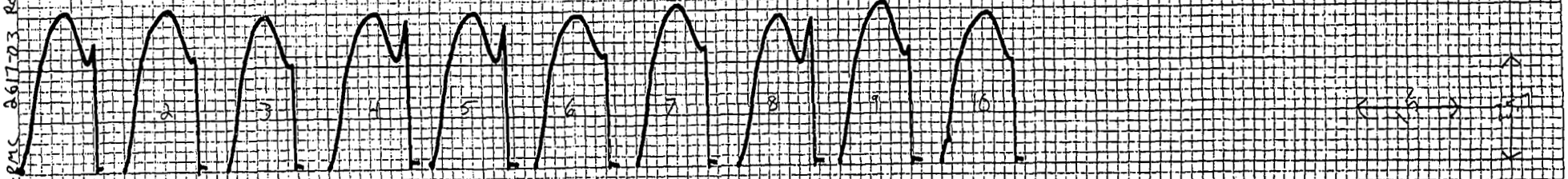
ADVANCED TERRA TESTING, Inc

01-12-05 JTR
Chatillon Loading System
1 Kip Capacity Load Cell
2617-03

Tetra Tech-RMC
Present Landfill Design-RFETS, Golden, CO
Roll No.: 104124728, Product Code LUT060A000
Puncture Resistance, 60 mil LLDPE-T
ASTM D 4833

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN
DISPLACEMENT RATE = 12"/MIN

Specimen Number	Load (lbs)
1	117.3
2	117.3
3	112.8
4	114.3
5	114.3
6	112.0
7	118.8
8	110.5
9	119.6
10	112.0
Average	114.9
Std. Dev.	3.2



Tetra Tech-RMC 2617-03 Roll # 104124728 LUT060A000 X=1.5"/in Y=75.7#/in

Data Checked By: JTR Date: 1/21/05
Filename: K:/TT2617/TTRP4728.lwp

ADVANCED TERRA TESTING, inc

01-12-05 JTR

Chatillon Loading System

1 Kip Capacity Load Cell

2617-03

Tetra Tech-RMC

Present Landfill Design-RFETS, Golden, CO

Roll No.: 104124733, Product Code LUT060A000

Puncture Resistance, 60 mil LLDPE-T

ASTM D 4833

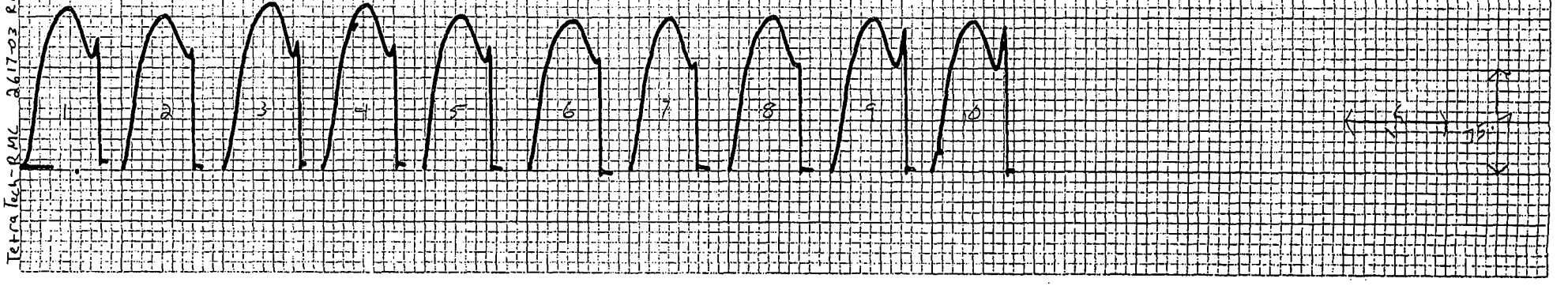
Data Entered By: SR

SCALES X = 1.5"/IN

Y = 75.7#/IN

DISPLACEMENT RATE = 12"/MIN

Specimen Number	Load (lbs)
1	121.1
2	115.1
3	124.1
4	123.4
5	116.1
6	112.8
7	114.3
8	115.1
9	114.3
10	112.0
Average	116.7
Std. Dev.	4.4



ASTM D4833 ATT# Y

Tetra Tech-RMC 2617-03 Roll# 104124733 LUT060A000 x=1.5#/in y=75.7# JTR

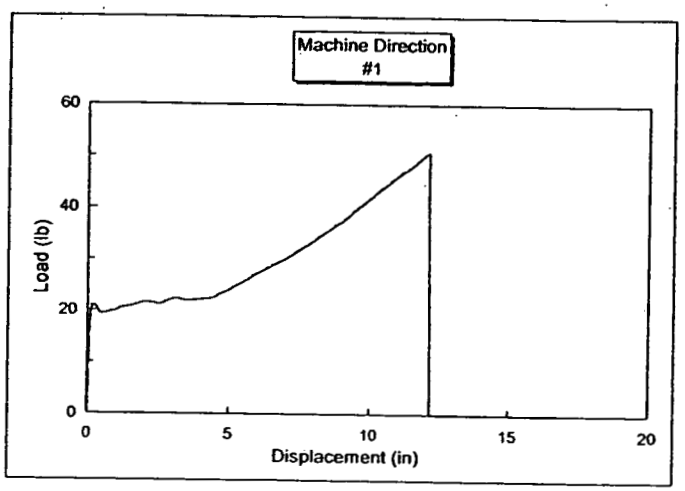
Data Checked By: JTR Date: 1/21/05

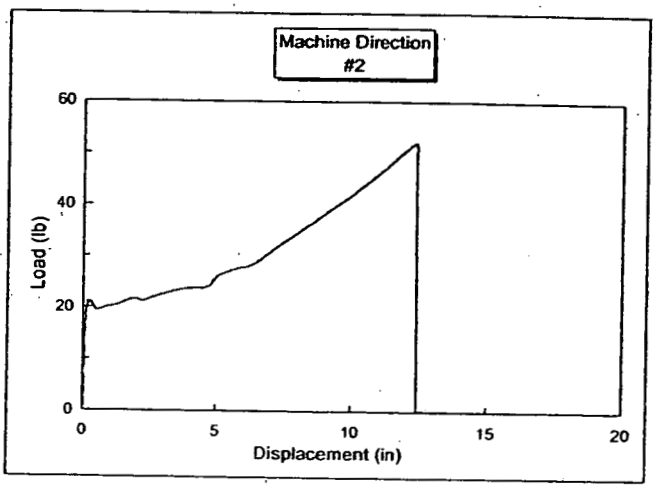
Filename: K:/TT2617/TTRP4733.lwp

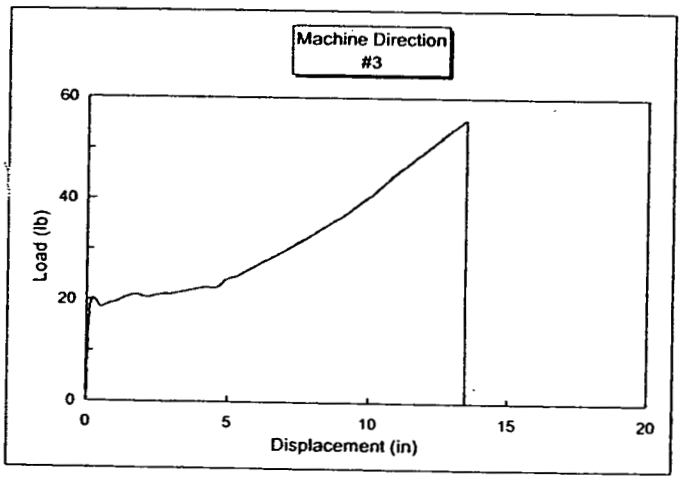
ADVANCED TERRA TESTING, Inc

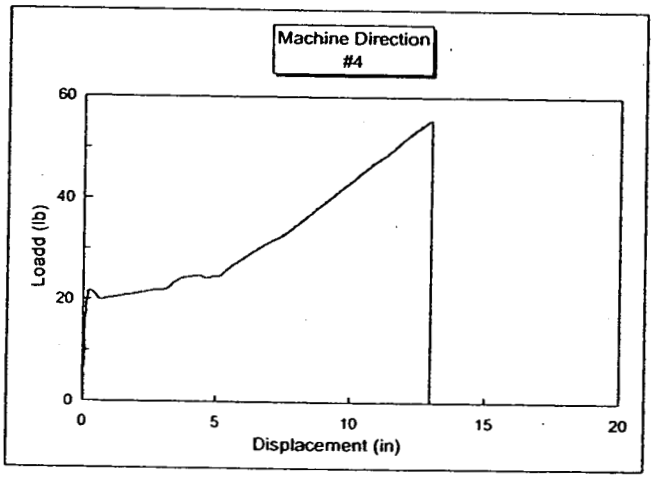
Client:	Tetra Tech - RMC
Job No.:	2617-03
Location:	Present Landfill-RFETS, Golden, CO
Sample:	Roll #104124720
Test Device:	Five Station
Load Cells:	500 lb.

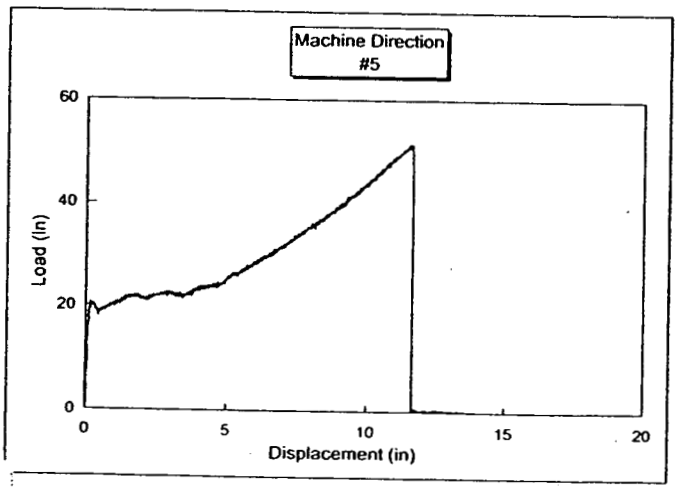
Test Type:	ASTM D 6693 Type IV
Material Type:	60 mil Smooth LLDPE-T, LUT060A000
Date Tested:	01-12-05
Tested By:	SKL
Data Entered By:	SR
Displacement Rate:	2 in/min
Grip Seperation:	2.5"











Machine Direction

	Load at Break (lb/in width)	Elongation at Break (%)	Load at Yield (lb/in width)	Elongation at Yield (%)
Specimen #1	216.2	605.8	89.7	16.0
Specimen #2	222.2	616.1	90.5	16.5
Specimen #3	237.0	673.0	86.1	16.3
Specimen #4	237.6	647.7	93.0	16.5
Specimen #5	220.4	577.6	89.4	89.8
Average	**226.7**	**624.0**	**89.8**	**31.0**
Std. Deviation	**8.9**	**33.2**	**2.2**	**29.4**

Filename: TTNT4720

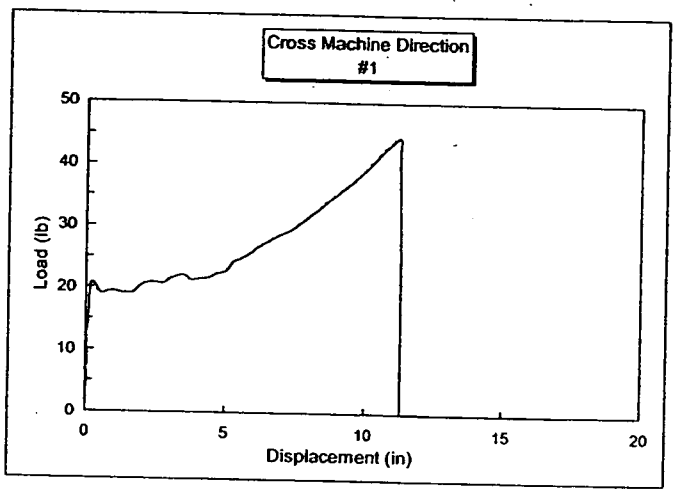
Raw Data File: TTZTPM2, TTZTPM3.TXT

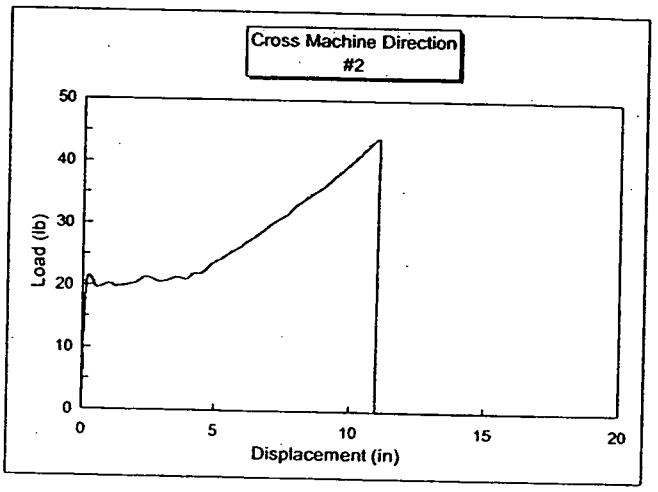
Checked By: SKL Date: 1/21/05

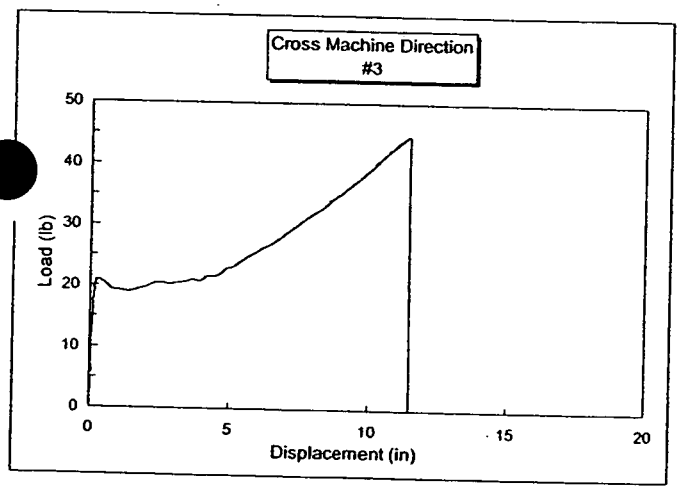
Advanced Terra Testing, Inc.

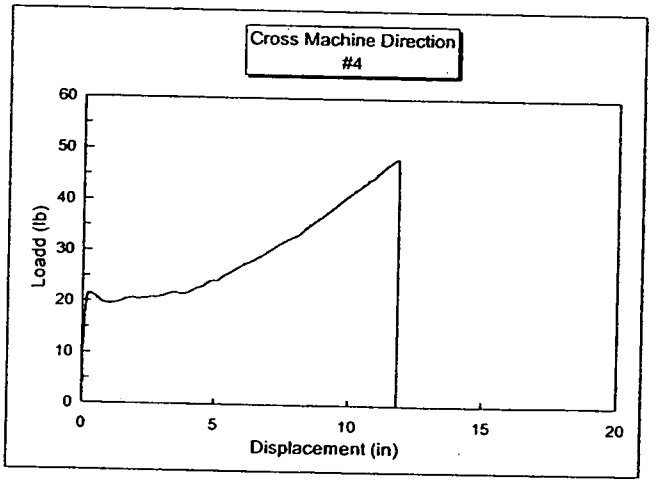
Client:	Tetra Tech - RMC
Job No.:	2617-03
Location:	Present Landfill-RFETS, Golden, CO
Sample:	Roll #104124720
Test Device:	Five Station
Load Cells:	500 lb.

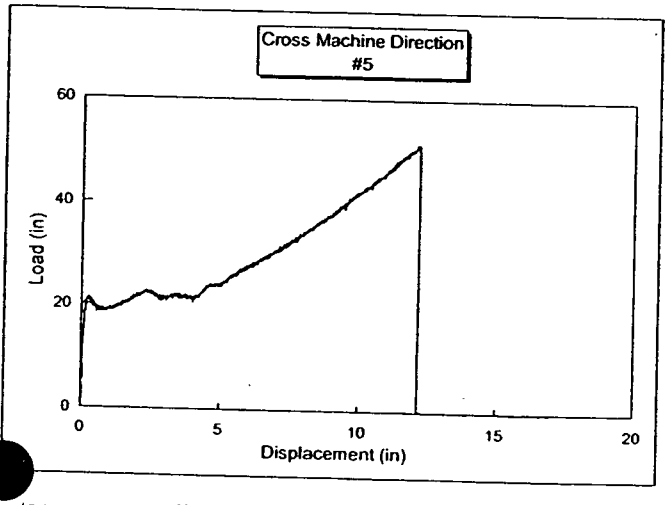
Test Type:	ASTM D 6693 Type IV
Material Type:	60 mil Smooth LLDPE-T, LUT060A000
Date Tested:	01-12-05
Tested By:	SKL
Data Entered By:	SR
Displacement Rate:	2 in/min
Grip Seperation:	2.5"











Cross Machine Direction

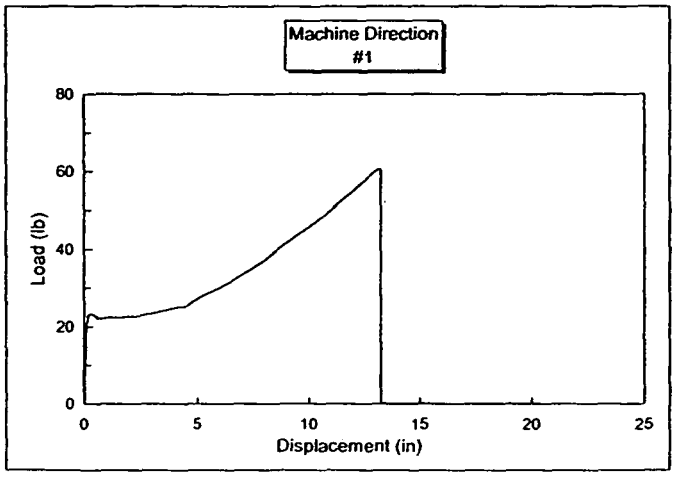
	Load at Break (lb/in width)	Elongation at Break (%)	Load at Yield (lb/in width)	Elongation at Yield (%)
Specimen #1	190.0	563.0	89.1	17.7
Specimen #2	190.1	552.4	93.2	18.3
Specimen #3	189.1	570.4	88.9	20.3
Specimen #4	206.8	588.2	92.3	18.8
Specimen #5	219.7	609.5	91.4	18.3
Average	**199.1**	**576.7**	**91.0**	**18.7**
Std. Deviation	**12.2**	**20.1**	**1.7**	**0.9**

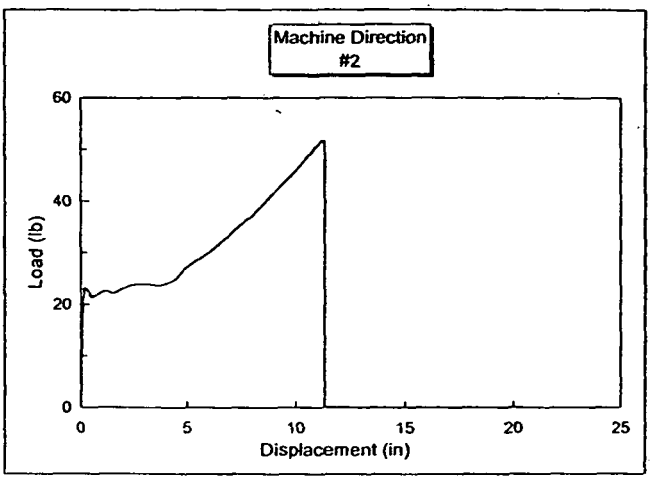
Filename: TTNT728C
Raw Data File: TTZTPC2, TTZTPC3.TXT

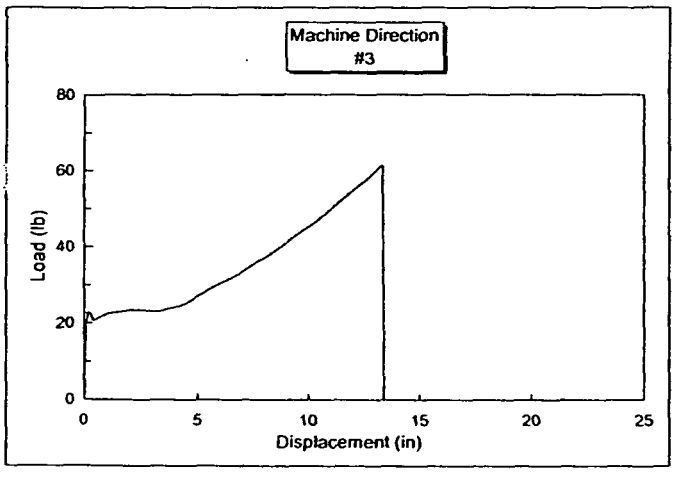
Checked By: SKL Date: 1/21/05

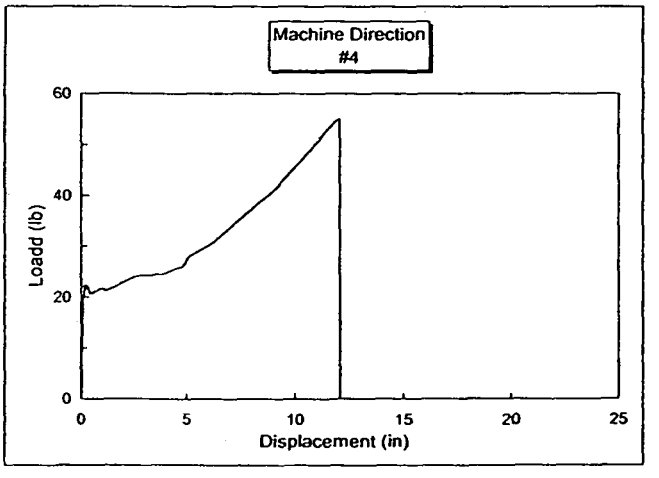
Advanced Terra Testing, Inc.

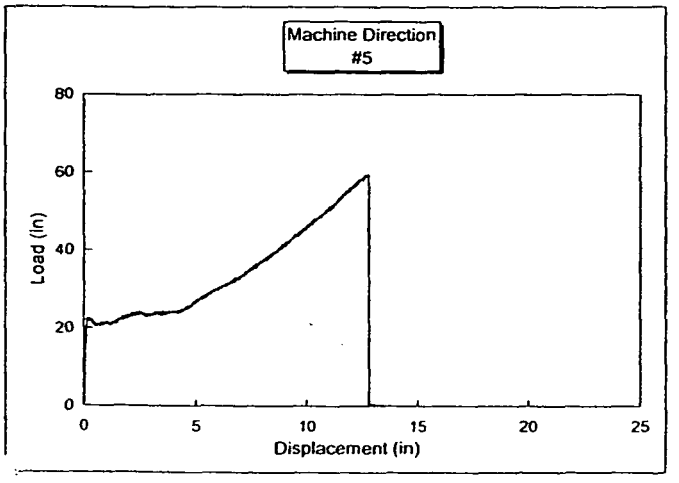
Client:	Tetra Tech - RMC	Test Type:	ASTM D 6693 Type IV
Job No.:	2617-03	Material Type:	60 mil Smooth LLDPE-T, LUT060A000
Location:	Present Landfill-RFETS, Golden, CO	Date Tested:	01-13-05
Sample:	Roll #104124728	Tested By:	JTR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
		Grip Seperation:	2.5"











Machine Direction

	Load at Break (lb/in width)	Elongation at Break (%)	Load at Yield (lb/in width)	Elongation at Yield (%)
Specimen #1	255.5	660.3	98.0	20.6
Specimen #2	218.7	564.4	97.9	16.5
Specimen #3	259.0	663.0	96.1	16.0
Specimen #4	230.5	601.6	93.6	17.8
Specimen #5	252.0	640.5	95.5	16.0
Average	**243.1**	**626.0**	**96.2**	**17.4**
Std. Deviation	**15.7**	**37.8**	**1.6**	**1.7**

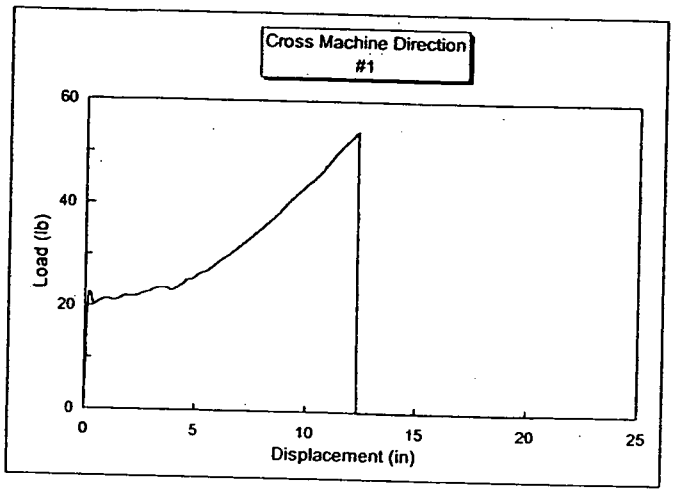
Filename: TTNT4728
Raw Data File: TTXTPM2, TTXTPM3.TXT

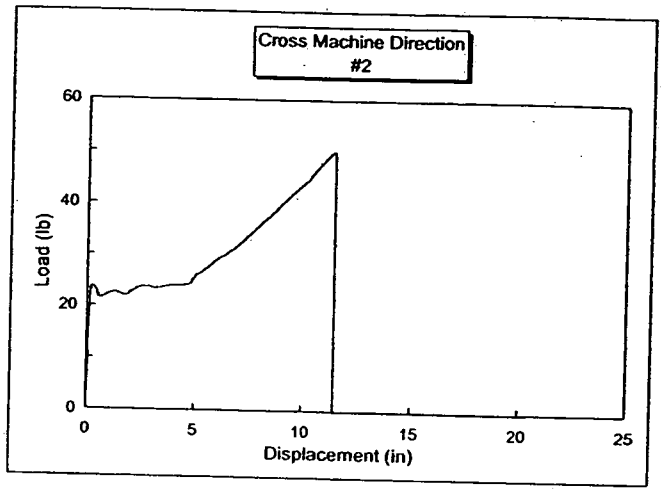
Checked By: SHL Date: 1/21/05

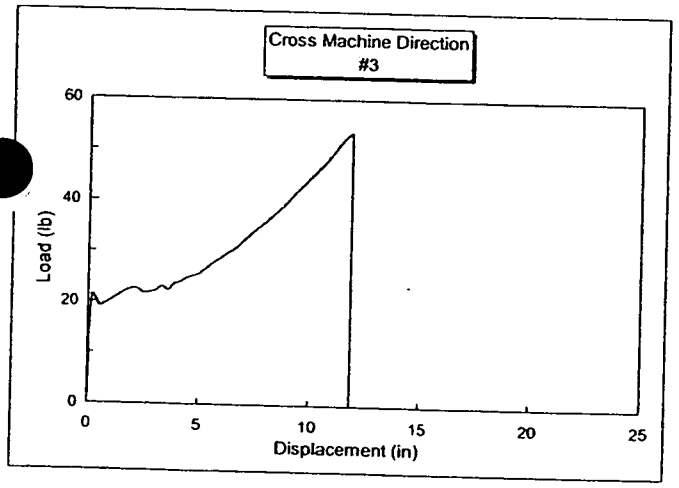
Advanced Terra Testing, Inc.

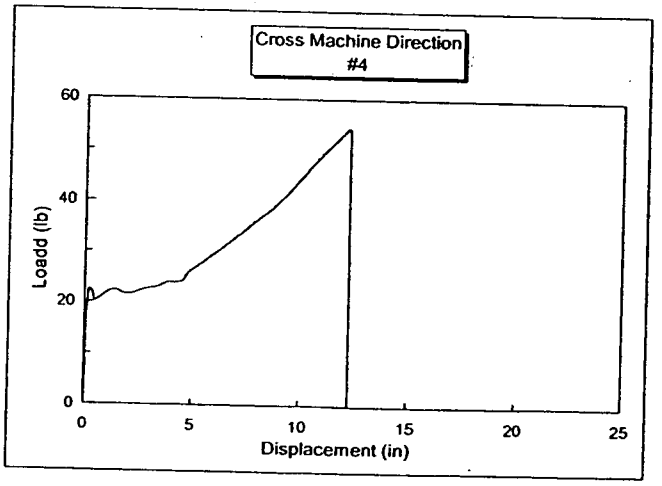
Client:	Tetra Tech - RMC
Job No.:	2617-03
Location:	Present Landfill-RFETS, Golden, CO
Sample:	Roll #104124728
Test Device:	Five Station
Load Cells:	500 lb.

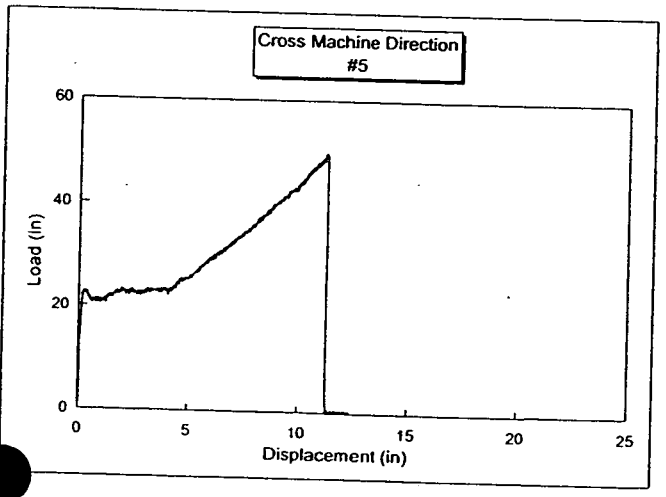
Test Type:	ASTM D 6693 Type IV
Material Type:	60 mil Smooth LLDPE-T, LUT060A000
Date Tested:	01-13-05
Tested By:	JTR
Data Entered By:	SR
Displacement Rate:	2 in/min
Grip Seperation:	2.5"











Cross Machine Direction

	Load at Break (lb/in width)	Elongation at Break (%)	Load at Yield (lb/in width)	Elongation at Yield (%)
Specimen #1	228.2	615.9	95.3	15.2
Specimen #2	212.8	570.8	101.2	17.4
Specimen #3	225.4	593.8	90.7	15.2
Specimen #4	230.1	610.6	95.9	17.7
Specimen #5	209.0	561.7	95.8	18.3
Average	**221.1**	**590.6**	**95.8**	**16.7**
Std. Deviation	**8.5**	**21.4**	**3.3**	**1.3**

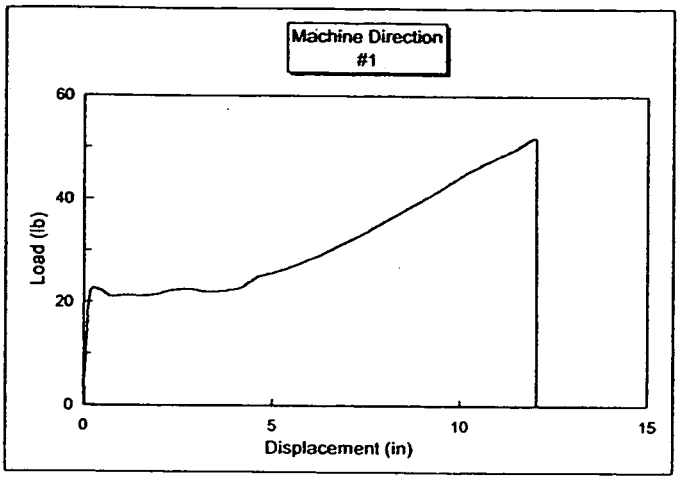
Filename: TTNT472C

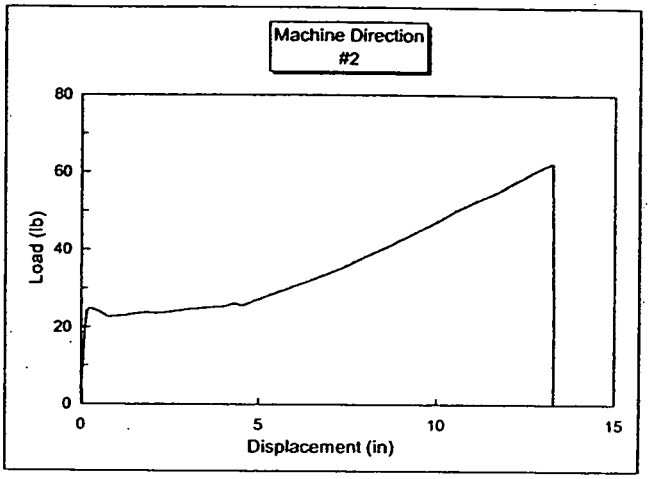
Raw Data File: TTXTPC2, TTXTPC3.TXT

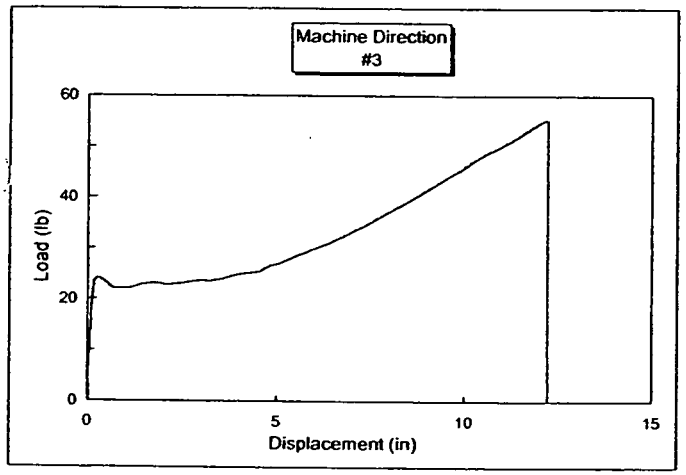
Checked By: shl Date: 1/21/05

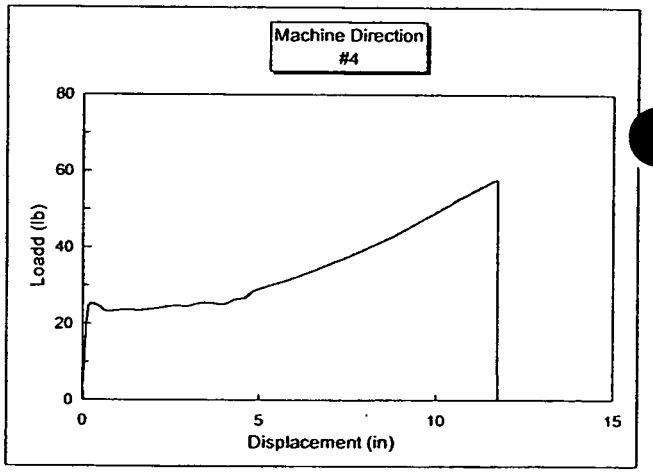
Advanced Terra Testing, Inc.

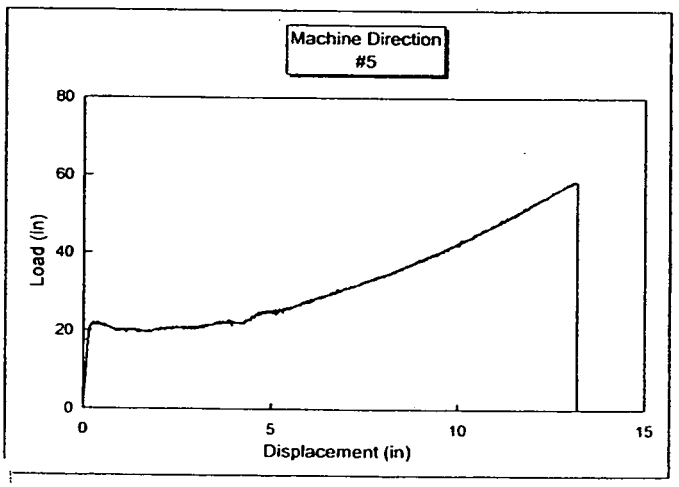
Client:	Tetra Tech - RMC	Test Type:	ASTM D 6693 Type IV
Job No.:	2617-03	Material Type:	60 mil Smooth LLDPE-T, LUT060A
Location:	Present Landfill-RFETS, Golden, CO	Date Tested:	01-13-05
Sample:	Roll #104124733	Tested By:	JTR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
		Grip Seperation:	2.5"











Machine Direction

	Load at Break (lb/in width)	Elongation at Break (%)	Load at Yield (lb/in width)	Elongation at Yield (%)
Specimen #1	223.5	598.6	98.1	18.6
Specimen #2	267.6	659.8	106.8	20.6
Specimen #3	235.3	609.0	102.8	18.6
Specimen #4	246.4	586.1	108.4	18.3
Specimen #5	247.4	656.2	93.2	27.6
Average	**244.1**	**621.9**	**101.9**	**20.8**
Std. Deviation	**14.6**	**30.3**	**5.6**	**3.5**

Filename: TTNT4733

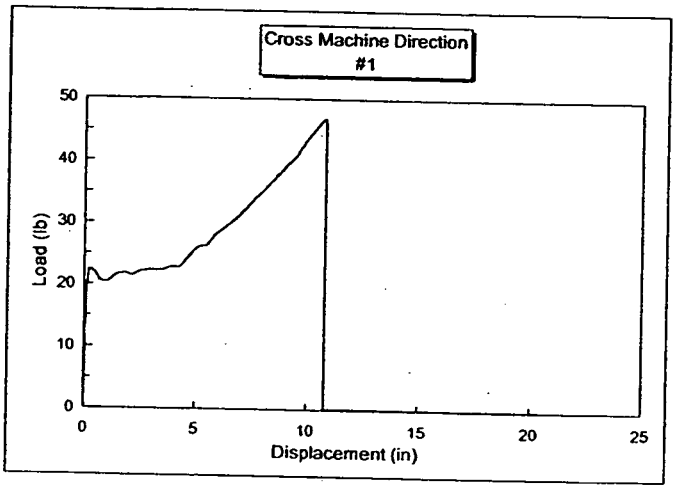
Raw Data File: TTYTPM2, TTYTPM3.TXT

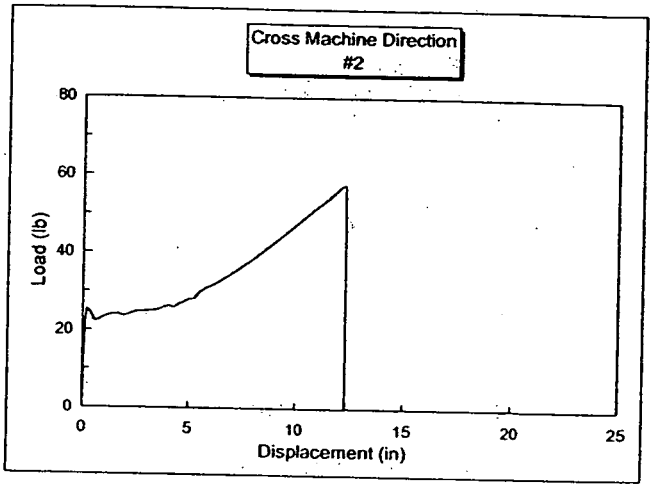
Checked By: SHL Date: 1/21/05

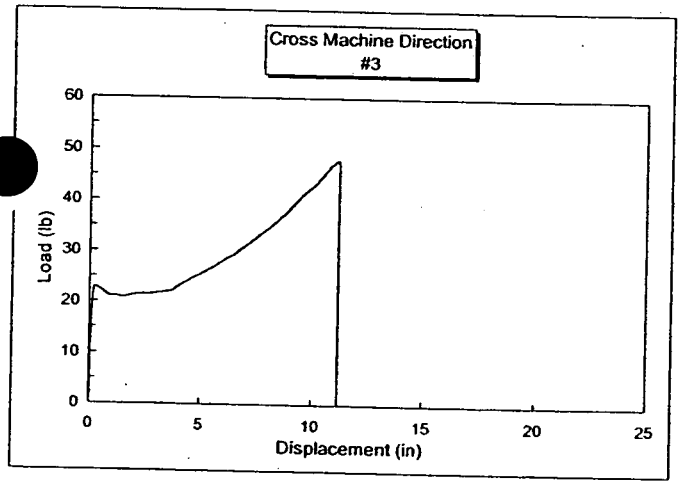
Advanced Terra Testing, Inc.

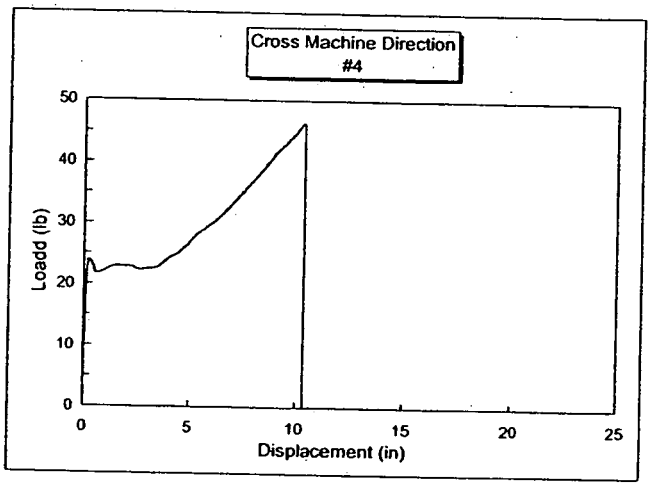
Client:	Tetra Tech - RMC
Job No.:	2617-03
Location:	Present Landfill-RFETS, Golden, CO
Sample:	Roll #104124733
Test Device:	Five Station
Load Cells:	500 lb.

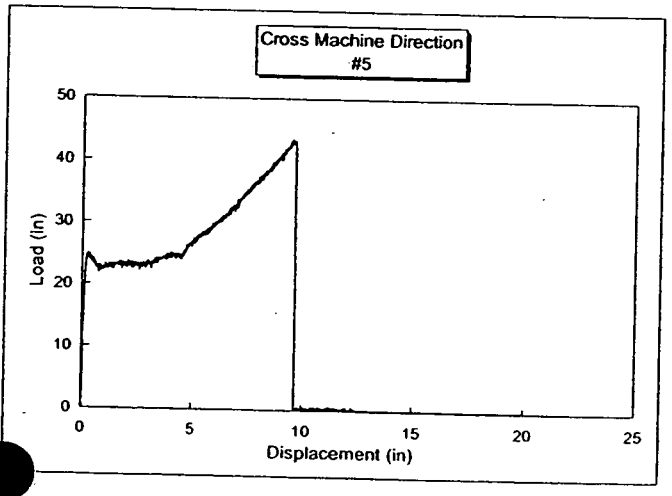
Test Type:	ASTM D 6693 Type IV
Material Type:	60 mil Smooth LLDPE-T, LUT060A000
Date Tested:	01-13-05
Tested By:	JTR
Data Entered By:	SR
Displacement Rate:	2 in/min
Grip Seperation:	2.5"











Cross Machine Direction

	Load at Break (lb/in width)	Elongation at Break (%)	Load at Yield (lb/in width)	Elongation at Yield (%)
Specimen #1	201.5	538.1	96.2	19.5
Specimen #2	246.2	611.8	107.7	16.5
Specimen #3	204.2	558.3	97.3	19.5
Specimen #4	195.7	517.1	100.8	18.0
Specimen #5	187.3	476.5	107.0	19.2
Average	**207.0**	**540.4**	**101.8**	**18.5**
Std. Deviation	**20.5**	**44.8**	**4.8**	**1.1**

Filename: TTNT473C
Raw Data File: TTYTPC2, TTYTPC3.TXT

Checked By: shl Date: 1/21/05

Advanced Terra Testing, Inc.

ISO 9001 - 2000

Precision Geosynthetic Laboratories

January 21, 2005

Sharon Roberts
ADVANCED TERRA TESTING INC.
833 Parfet Street
Lakewood, CO 80215

Dear Ms. Roberts: RE: Present Landfill Design - RFETS

Thank you for consulting Precision Geosynthetic Laboratories for your material testing needs.

Enclosed is the ***final*** laboratory report for the testing of three (3) 60 mil LLDPE Geomembrane sample(s) received January 19, 2005.

It should be noted that the test specimen and test sample used for this report was believed to be representative of the material produced under the designation herein stated. However, these results are indicative of only the specimens that were actually tested. The testing herein is based upon accepted industry practice as well as the test method listed. Precision Geosynthetic Laboratories neither accepts responsibility for nor makes claims to the final use and purpose of the material.

By accepting the data and results represented on this report, Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims arising out of the use of this data to the cost for the respective test(s) represented in this report, and Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liability in excess of the aforementioned limit.

The test data and all associated project information shall be held in confidence, not to be reproduced except in full and disclosed to other parties with the authorization of the client.

It is a company policy to keep the physical records of each job for 2 years since the receipt of the samples and keep the electronic file for 7 years. ***Failed seam samples are kept for 7 years; good seam samples are disposed after 2 weeks and conformance samples are disposed after 1 month.*** Should you need us to keep them longer, please advise us in writing.

If you have any questions or if we may be of further service, please do not hesitate to call at 800-522-4599.

Sincerely,

PRECISION GEOSYNTHETIC LABORATORIES

Maria Espitia
Quality Assurance

Cora B. Queja
Vice President

Enclosure: (Job No. G050031)

ISO 9001 - 2000

Precision Geosynthetic Laboratories

CLIENT: ADVANCED TERRA TESTING INC.
PROJECT: Present Landfill Design - RFETS

VERIFICATION OF MATERIAL PROPERTIES
(PGL Job No. G050031)

MATERIAL DESCRIPTION: 60 mil LLDPE Geomembrane

SAMPLE(S) SENT BY: Advanced Terra Testing Inc.

DATE RECEIVED: January 19, 2005 **DATE REPORTED:** January 21, 2005

SAMPLE IDENTIFICATIONS:

SAMPLE ID	PRECISION CONTROL NUMBER
R#104124720 LUT060A000	7211
R#104124733 LUT060A000	7212
R#104124728 LUT060A000	7213

TESTS REQUIRED:

TEST METHOD	DESCRIPTION
ASTM D1505	Density
ASTM D1603	Carbon Content
GRI-GM12	Asperity Height
ASTM D5596	Carbon Black Dispersion

TEST CONDITIONS: The samples were conditioned for a minimum one hour in the laboratory at 22 ± 2°C (71.6 ± 3.6°F) and at 60 ± 10% relative humidity prior to test.

TEST RESULTS:

The test results are summarized in Table(s) 1 to 3. The units in which the data are reported are included on these tables.

PRECISION GEOSYNTHETIC LABORATORIES

Initials: MC 013
Date: 1/21/05

Maria Espitia
Quality Assurance

Cora B. Queja
Vice President

1160 North Gilbert Street, Anaheim, CA. 92801, Tel# 714-520-9631, Fax#714-520-9637

TABLE 1.

MATERIAL PROPERTIES

CLIENT: ADVANCED TERRA TESTING

PROJECT: Present Landfill Design - RFETS

Date Received: **1/19/2005**
Date Reported: **1/21/2005**
Client Sample ID: **R#104124720 LUT060A000**
Material Description: **60 mil LLDPE Geomembrane**

QC'd By: _____
PGL Job No.: **G050031**
PGL Control No.: **7211**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GRI-GM12	Asperity Height of Textured Geomembrane (mils)															
	Apparatus: Has a dial indicator that travels at least 2.5mm (0.1 in), and a depth gauge with contact point that travels up and down with in the setting block with a base dimension of 50 mm x 20 mm (2.0 in x 0.75 in) and a height of 15 mm (0.5 in). The contact point is 3.12 mm (0.125 in) in radius and is tapered to 0.25 mm (0.01 in) in radius. The length of the needle is16mm (0.65in)															
	Sampling: 10 specimens across the roll width in a randomly distributed manner															
	Side A	41	38	39	42	41	38	32	36	41	32	38	4	32	42	
	Side B	21	26	21	26	18	24	23	25	24	21	23	3	18	26	
ASTM D1505	Density (grams/ cm.3)															
		0.9376	0.9376	0.9376								0.9376	0.0000	0.9376	0.9376	
ASTM D1603	Carbon Black Content (percent)															
		2.35	2.33									2.34	0.02	2.33	2.35	
ASTM D5596	Carbon Black Dispersion (category rating per reference chart PCN: 12-455960-38)															
		1	1	1	1	1	1	1	1	1	1	1	N/A	N/A	N/A	

MD - MA[redacted]RECTION
TD - TR[redacted]E DIRECTION
DC#1987 Record #268

Precision Geosynthetic Laboratories

ISO 9001 - 2000

TABLE

MATERIAL PROPERTIES

CLIENT: ADVANCED TERRA TESTING

PROJECT: Present Landfill Design - RFETS

Date Received: **1/19/2005**
Date Reported: **1/21/2005**
Client Sample ID: **R#104124728 LUT060A000**
Material Description: **60 mil LLDPE Geomembrane**

QC'd By: ME
PGL Job No.: **G050031**
PGL Control No.: **7213**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GRI-GM12	Asperity Height of Textured Geomembrane (mils)															
	Apparatus: Has a dial indicator that travels at least 2.5mm (0.1 in), and a depth gauge with contact point that travels up and down with in the setting block with a base dimension of 50 mm x 20 mm (2.0 in x 0.75 in) and a height of 15 mm (0.5 in). The contact point is 3.12 mm (0.125 in) in radius and is tapered to 0.25 mm (0.01 in) in radius. The length of the needle is16mm (0.65in)															
	Sampling: 10 specimens across the roll width in a randomly distributed manner															
	Side A	26	31	29	25	29	32	32	36	31	32	30	3	25	36	
	Side B	24	21	26	21	25	26	24	23	21	26	24	2	21	26	
ASTM D1505	Density (grams/ cm.3)															
		0.9380	0.9380	0.9380								0.9380	0.0000	0.9380	0.9380	
ASTM D1603	Carbon Black Content (percent)															
		2.37	2.40									2.39	0.02	2.37	2.40	
ASTM D5596	Carbon Black Dispersion (category rating per reference chart PCN: 12-455960-38)															
		1	1	1	1	1	1	1	1	1	1	1	N/A	N/A	N/A	

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION
DC#1987 Record #268

Precision Geosynthetic Laboratories

ISO 9001 - 2000

TABLE 2.

MATERIAL PROPERTIES

CLIENT: ADVANCED TERRA TESTING

PROJECT: Present Landfill Design - RFETS

Date Received: **1/19/2005**
Date Reported: **1/21/2005**
Client Sample ID: **R#104124733 LUT060A000**
Material Description: **60 mil LLDPE Geomembrane**

QC'd By: _____
PGL Job No.: **G050031**
PGL Control No.: **7212**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GRI-GM12	Asperity Height of Textured Geomembrane (mils)															
	Apparatus: Has a dial indicator that travels at least 2.5mm (0.1 in), and a depth gauge with contact point that travels up and down with in the setting block with a base dimension of 50 mm x 20 mm (2.0 in x 0.75 in) and a height of 15 mm (0.5 in). The contact point is 3.12 mm (0.125 in) in radius and is tapered to 0.25 mm (0.01 in) in radius. The length of the needle is16mm (0.65in)															
	Sampling: 10 specimens across the roll width in a randomly distributed manner															
	Side A	36	32	29	28	34	31	30	29	27	32	31	3	27	36	
	Side B	21	18	26	21	24	17	19	26	21	18	21	3	17	26	
ASTM D1505	Density (grams/ cm.3)															
		0.9383	0.9383	0.9383								0.9383	0.0000	0.9383	0.9383	
ASTM D1603	Carbon Black Content (percent)															
		2.35	2.41									2.38	0.05	2.35	2.41	
ASTM D5596	Carbon Black Dispersion (category rating per reference chart PCN: 12-455960-38)															
		1	1	1	1	1	1	1	1	1	1	1	N/A	N/A	N/A	

MD - MAC[illegible]RECTION
TD - TR[illegible] DIRECTION
DC#1987 [illegible]ecord #268

Precision Geosynthetic Laboratories

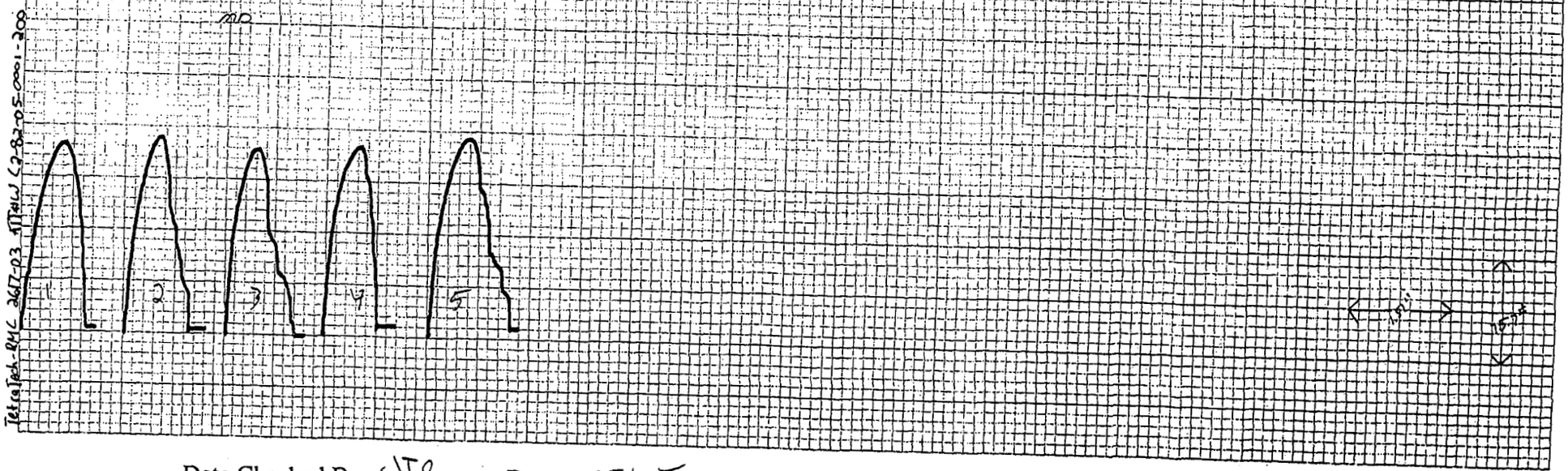
ISO 9001 - 2000

01-24-05 JTR
Chatillon Loading System
1 Kip Capacity Load Cell
2617-03

Tetra Tech - RMC
Present Landfill Design - RFETS, Golden, CO
Roll No.: C2-8-2-05-0001-200, Shift 2, 01-10-05
(Geonet Only)
Tensile Strength
ASTM D 5035/Modified
Specimen Size 2" x 6"

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN
DISPLACEMENT RATE = 12"/MIN
GRIP SEPARATION = 3.0"

Specimen	MD Load (lbs/in width)
1	69.64
2	72.29
3	68.51
4	70.02
5	73.81
Average	70.85
Std. Dev.	2.15



Data Checked By: JTR Date: 1/25/05
Filename: K:/TT2617/TTTS0001.lwp

ADVANCED TERRA TESTING, inc

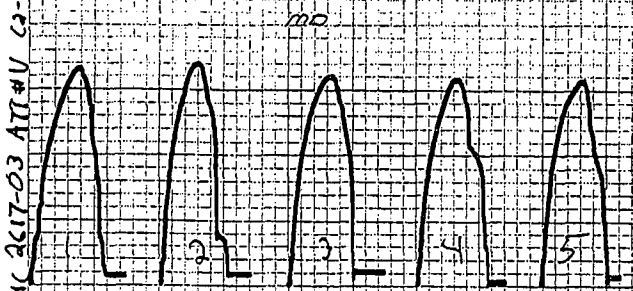
ASTM D5035
TetraTech-RMC 2617-03 ATT#W C2-8-2-05-0001-200 Shift 2 1/10/05 2802 sides weight 930 X=1.5#/in Y=75.7#/in JTR 1/24/05

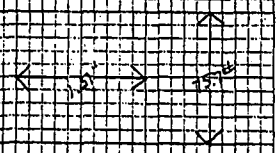
01-24-05 JTR
Chatillon Loading System
1 Kip Capacity Load Cell
2617-03

Tetra Tech - RMC
Present Landfill Design - RFETS, Golden, CO
Roll No.: C2-8-2-05-0035-200, Shift 1, 01-11-05
CETCO TEXDRAIN 200 DS8 (Geonet Only)
Tensile Strength
ASTM D 5035/Modified
Specimen Size 2" x 6"

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN
DISPLACEMENT RATE = 12"/MIN
GRIP SEPARATION = 3.0"

Specimen	MD Load (lbs/in width)
1	63.59
2	65.10
3	61.32
4	60.56
5	60.18
Average	62.15
Std. Dev.	2.11





Tetra Tech-RMC 2617-03 ATT#1 C2-8-2-05-0035-200 Texdrain 200DS8 1/11/05 Shift 1 Line/STA X=1.5"/IN Y=75.7#/IN JTR 1/24/05

Data Checked By: JTR Date: 1/25/05
Filename: K:/TT2617/TTTS0035.lwp

ADVANCED TERRA TESTING, Inc

THICKNESS
ASTM D 5199
(IN.)

CLIENT: Tetra Tech-RMC JOB NO.: 2617-03

PROJECT: Present Landfill Design-RFETS, Golden, CO DATE: 01-18-05 JTR

151A, Shift 2, 01-10-05, 28 oz sides, Weight 930, Roll No.: C2-82-05-0001-200
(GEONET ONLY)

1	0.2220	**2**	0.2208	**3**	0.2218	**4**	0.2187	**5**	0.2193
	0.2231		0.2232		0.2214		0.2151		0.2226
	0.2193		0.2219		0.2229		0.2191		0.2213
	0.2210		0.2208		0.2236		0.2186		0.2187
	0.2198		0.2224		0.2214		0.2163		0.2231
Average	0.2210	**Average**	0.2218	**Average**	0.2222	**Average**	0.2176	**Average**	0.2210
								AVERAGE FOR 5 SPECIMENS	**0.2207**

DATA ENTERED BY: SR DATE: 01/20/2005
DATA CHECKED BY: STR DATE: 1/20/05
FILENAME: TTTH0001

ADVANCED TERRA TESTING, INC.

THICKNESS
ASTM D 5199
(IN.)

CLIENT: Tetra Tech-RMC

JOB NO.: 2617-03

PROJECT: Present Landfill Design-RFETS, Golden, CO

DATE: 01-18-05 JTR

CETCO Texdrain 200 DS8, Shift 1, 01-11-05, Line 151A, Roll No.: C2-8-2-05-0035-200 (GEONET ONLY)

1	0.2185	2	0.2161	3	0.2135	4	0.2203	5	0.2170
	0.2149		0.2170		0.2164		0.2186		0.2168
	0.2179		0.2150		0.2171		0.2134		0.2143
	0.2182		0.2146		0.2149		0.2146		0.2180
	0.2152		0.2173		0.2153		0.2161		0.2195
Average	0.2169	Average	0.2160	Average	0.2154	Average	0.2166	Average	0.2171
							AVERAGE FOR 5 SPECIMENS		0.2164

DATA ENTERED BY: SR
DATA CHECKED BY: JTR
FILENAME: TTTH0035

DATE: 01/20/2005
DATE: 1/20/05

ADVANCED TERRA TESTING, INC.

Precision Geosynthetic Laboratories

January 26, 2005

Sharon Roberts
ADVANCED TERRA TESTING INC.
833 Parfet Street
Lakewood, CO 80215

Dear Ms. Roberts: RE: Present Landfill Design - RFETS

Thank you for consulting Precision Geosynthetic Laboratories for your material testing needs.

Enclosed is the ***final*** laboratory report for the testing of two (2) Double Sided Geocomposite sample(s) received January 19, 2005.

It should be noted that the test specimen and test sample used for this report was believed to be representative of the material produced under the designation herein stated. However, these results are indicative of only the specimens that were actually tested. The testing herein is based upon accepted industry practice as well as the test method listed. Precision Geosynthetic Laboratories neither accepts responsibility for nor makes claims to the final use and purpose of the material.

By accepting the data and results represented on this report, Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims arising out of the use of this data to the cost for the respective test(s) represented in this report, and Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liability in excess of the aforementioned limit.

The test data and all associated project information shall be held in confidence, not to be reproduced except in full and disclosed to other parties with the authorization of the client.

It is a company policy to keep the physical records of each job for 2 years since the receipt of the samples and keep the electronic file for 7 years. ***Failed seam samples are kept for 7 years; good seam samples are disposed after 2 weeks and conformance samples are disposed after 1 month.*** Should you need us to keep them longer, please advise us in writing.

If you have any questions or if we may be of further service, please do not hesitate to call at 800-522-4599.

Sincerely,

PRECISION GEOSYNTHETIC LABORATORIES

Maria Espitia
Quality Assurance

Cora B. Queja
Vice President

Enclosure: (Job No. G050032)

Precision Geosynthetic Laboratories

CLIENT: ADVANCED TERRA TESTING INC.
PROJECT: Present Landfill Design - RFETS

VERIFICATION OF MATERIAL PROPERTIES
(PGL Job No. G050032)

MATERIAL DESCRIPTION: Double Sided Geocomposite

SAMPLE(S) SENT BY: Advanced Terra Testing Inc.

DATE RECEIVED: January 19, 2005 **DATE REPORTED:** January 26, 2005

SAMPLE IDENTIFICATIONS:

SAMPLE ID	PRECISION CONTROL NUMBER
151A, C2-8-2-05-0001-200 Shift 2, 1-10-05	7214, 7214-1
Tendrain 200 P58, C2-8-2-05-0035-200 Shift 1 Line 151A	7215, 7215-1

TESTS REQUIRED:

TEST METHOD	DESCRIPTION
Geonet portion:	
ASTM D1603	Carbon Content
ASTM D1505	Density
Geotextile Portion:	
ASTM D4751	Apparent Opening Size
Geocomposite:	
ASTM D4716	Transmissivity

TEST CONDITIONS: The samples were conditioned for a minimum one hour in the laboratory at 22 ± 2°C (71.6 ± 3.6°F) and at 60 ± 10% relative humidity prior to test.

TEST RESULTS:

The test results are summarized in Table(s) 1 & 2. The units in which the data are reported are included on these tables.

PRECISION GEOSYNTHETIC LABORATORIES

Maria Espitia
Quality Assurance

Cora B. Queja
Vice President

1160 North Gilbert Street, Anaheim, CA. 92801, Tel# 714-520-9631, Fax#714-520-9637
DC#2000 Record#281

TABLE 1.

MATERIAL PROPERTIES

CLIENT: ADVANCED TERRA TESTING INC.
PROJECT: Present Landfill Design - RFETS

Date Received : **1/19/2005**
Date Reported: **1/26/2005**
Client Sample ID : **151A, C2-8-2-05-0001-200 Shift 2, 1-10-05**
Material Description: **Double Sided Geocomposite**

QC'd by: _____
PGL Job No. : **G050032**
PGL Control No. : **7214**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT:																
ASTM D1505	Density (grams/ cm.^{3})	0.9532	0.9532	0.9532								0.9532	0.0000	0.95	0.95	
ASTM D1603	Carbon Black Content (percent)	2.71	2.79									2.75	0.05	2.71	2.79	
GEOCOMPOSITE:																
ASTM D4716	Transmissivity *Tested at Normal Pressure : 15,000 psf, Gradient: 1.0 , Seating Time: 1 hr* *Temperature of Test Water: 20.6 °F Specimen Size: 12" x 14"*															
	Transmissivity (m.^{2}/ sec.)															
	MD	1.35E-04	1.42E-04									1.39E-04	4.62E-08	N/A	N/A	
	Transmissivity (gal./ min./ ft.)															
	MD	0.65	0.69									0.67	0.02	0.65	0.69	
	Flow Rate (gal./ min)															
	MD	0.66	0.69									0.68	0.02	0.66	0.69	

Geosynthetics arranged as follows:

Plate _____
Geocomposite XXXXXX
Plate _____

Thickness : 325.5 *mils (Before)*
Thickness : 311 *mils (After)*

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION
DC#1984 Record#265

Precision Geosynthetic Laboratories

ISO 9001 - 2000

TABLE 2.

MATERIAL PROPERTIES

CLIENT: ADVANCED TERRA TESTING INC.
PROJECT: Present Landfill Design - RFETS

Date Received : **1/19/2005**
Date Reported: **1/26/2005**
Client Sample ID : **Tendrain, 200 P58, C2-8-2-05-0035-200 Shift 1 Line 151A**
Material Description: **Double Sided Geocomposite**

QC'd by: _____
PGL Job No. : **G050032**
PGL Control No. : **7215**

METHOD DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT:															
ASTM D1505 Density (grams/ $cm.^3$)	0.9537	0.9537	0.9537								0.9537	0.0000	0.95	0.95	
ASTM D1603 Carbon Black Content (percent)	2.33	2.35									2.34	0.01	2.33	2.35	
GEOCOMPOSITE:															
ASTM D4716 Transmissivity	*Tested at Normal Pressure :* 209 *psf, Gradient:* 0.1 *, Seating Time:* 1 *hr*														
	Temperature of Test Water: 20.6 ^0F *Specimen Size: 12" x 14"*														
Transmissivity ($m.^2$/ sec.)															
MD	5.68E-04	5.84E-04									5.76E-04	1.13E-05	N/A	N/A	
Transmissivity (gal./ min./ ft.)															
MD	2.74	2.82									2.78	0.05	2.74	2.82	
Flow Rate (gal./ min)															
MD	0.28	0.29									0.28	0.01	0.28	0.29	

Geosynthetics arranged as follows:
Plate _____
Geocomposite XXXXXX
Plate _____

Thickness : 292.5 *mils (Before)*
Thickness : 266.5 *mils (After)*

MD - MACHINE DIRECTION

ISO 9001 - 2000
GAI-LAP

TABLE 1A.

MATERIAL PROPERTIES

CLIENT: ADVANCED TERRA TESTING INC.

PROJECT: Present Landfill Design - RFETS

Date Received: **1/19/2005**
Date Reported: **1/21/2005**
Client Sample ID: **151A, C2-8-2-05-0001-200 Shift 2, 1-10-05**
Material Description: **Double Sided Geocomposite**

QC'd By:
PGL Job No.: **G050032**
PGL Control No.: **7214-1**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D4751	Apparent Opening Size (U.S. standard sieve size)															
	Specimens were tested as directed in Test Method D4751. Type of sieve shaker used is W.S. Tyler Rotap.															
		100-140	100-140	100-140	100-140	100-140						100-140	N/A	N/A	N/A	
ASTM D4751	Apparent Opening Size (mm)															
	Specimens were tested as directed in Test Method D4751. Type of sieve shaker used is W.S. Tyler Rotap.															
		0.149	0.146	0.143	0.138	0.140						0.143	0.004	0.138	0.149	

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

Precision Geosynthetic Laboratories

TABLE 2A.

MATERIAL PROPERTIES

CLIENT: ADVANCED TERRA TESTING INC.

PROJECT: Present Landfill Design - RFETS

Date Received: **1/19/2005**
Date Reported: **1/21/2005**
Client Sample ID: **Tendrain, 200 P58, C2-8-2-05-0035-200 Shift 1 Line 151A**
Material Description: **Double Sided Geocomposite**

QC'd By:
PGL Job No.: **G050032**
PGL Control No.: **7215-1**

		SPECIMENS														Proj.
		1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Specs.
METHOD	**DESCRIPTION**															
ASTM D4751	Apparent Opening Size (U.S. standard sieve size)															
	Specimens were tested as directed in Test Method D4751.Type of sieve shaker used is W.S. Tyler Rotap.															
		100-140	**100-140**	**100-140**	**100-140**	**100-140**						**100-140**	N/A	N/A	N/A	
ASTM D4751	Apparent Opening Size (mm)															
	Specimens were tested as directed in Test Method D4751.Type of sieve shaker used is W.S. Tyler Rotap.															
		0.148	**0.150**	**0.142**	**0.120**	**0.150**						**0.142**	**0.013**	**0.120**	**0.150**	

MD - MACHINE DIRECTION
TD - CROSSVERSE DIRECTION

Precision G[illegible]etic Laboratories

Determination of Adhesion and Bond Strength of Geocomposites

GRI GC7

CLIENT: Tetra Tech-RMC

JOB NO.: 2617-03

PROJECT: Present Landfill-RFETS, Golden, CO

DATE: 01-19-05 JTR

Roll No.: C2-82-05-0001-200, 11-10-05, 28 oz Sides
Weight 930, Shift 2, 151A

Specimen	MD lbs/in width
1	3.0
2	0.9
3	2.6
4	3.7
5	3.3
Average	**2.70**
Std. Dev.	**1.07**

DATA ENTERED BY: SR

DATA CHECKED BY: SHL

FILENAME: TTAD0001

DATE: 01/21/2005

DATE: 1/21/05

ADVANCED TERRA TESTING, INC

Determination of Adhesion and Bond Strength of Geocomposites
GRI GC7

CLIENT: Tetra Tech-RMC

JOB NO.: 2617-03

PROJECT: Present Landfill-RFETS, Golden, CO

DATE: 01-20-05 JTR

TEXDRAIN 200 DS8, 01-11-05
Roll No.: C2-8-2-05-0035-200, Line151 A, Shift 1

Specimen	MD lbs/in width
1	6.0
2	3.4
3	4.1
4	6.0
5	2.6
Average	**4.44**
Std. Dev.	**1.55**

DATA ENTERED BY: SR
DATA CHECKED BY: SHL
FILENAME: TTAD0035

DATE: 01/21/2005
DATE: 1/21/05

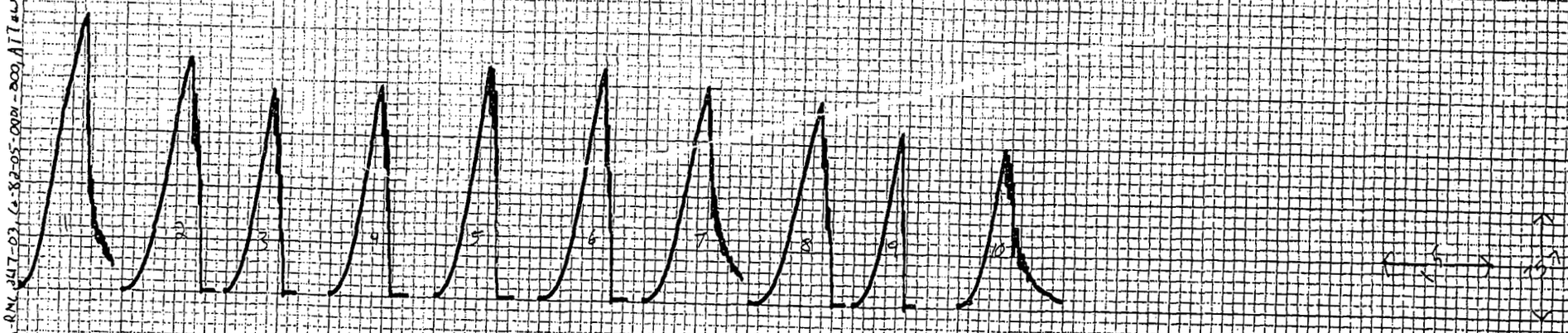
ADVANCED TERRA TESTING, INC

01-17-05 JTR
Chatillon Loading System
1 Kip Capacity Load Cell
2617-03

Tetra Tech-RMC
Present Landfill Design-RFETS, Golden, CO
151A, Shift 2, 28 oz Sides, Weight 930, 1-10-05
Roll No.: C2-82-05-0001-200, Puncture Resistance, (Geotextile)
ASTM D 4833

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN
DISPLACEMENT RATE = 12"/MIN

Specimen Number	Load (lbs)
1	197.6
2	167.3
3	146.1
4	149.9
5	165.0
6	165.0
7	152.9
8	143.8
9	124.1
10	114.3
Average	152.6
Std. Dev.	23.5



Data Checked By: JTR Date: 1/21/05
Filename: K:/TT2617/TTRP0001.lwp

ADVANCED TERRA TESTING, Inc

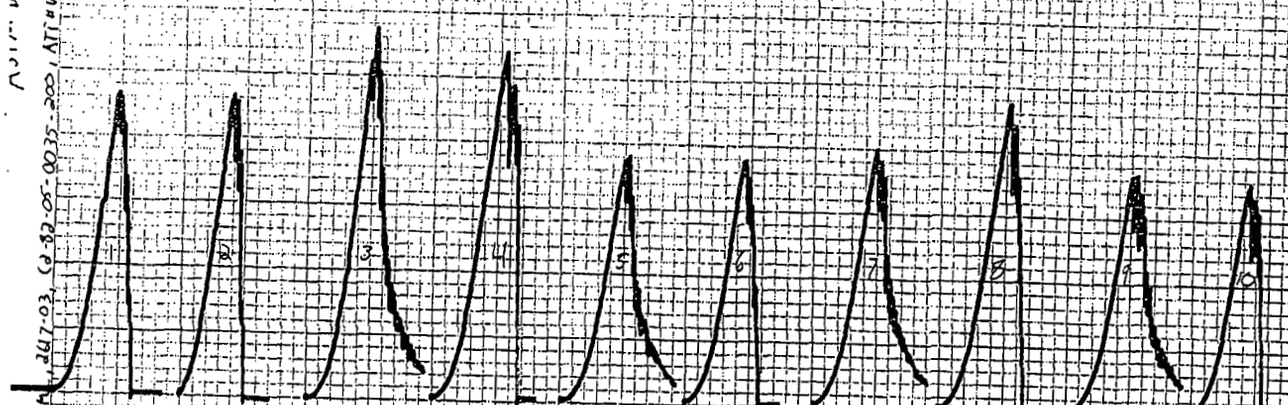
ASTM D4833
Tetra Tech-RMC 247-03, C2-82-05-0001-200, ATT#W, 151A, Shift 2, 28 oz sides, Weight 930 X=1.5"/in Y=75.7#/in JTR 1/17/05

01-17-05 JTR
Shatillon Loading System
1 Kip Capacity Load Cell
2617-03

Tetra Tech-RMC
Present Landfill Design-RFETS, Golden, CO
TEXDRAIN 200 DS8, Shift 1, Line 151A
Roll No.: C2-82-05-0035-200, Puncture Resistance, (Geotextile)
ASTM D 4833

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN
DISPLACEMENT RATE = 12"/MIN

Specimen Number	Load (lbs)
1	177.9
2	177.9
3	218.0
4	205.1
5	146.1
6	143.8
7	152.1
8	180.9
9	140.8
10	135.5
Average	167.8
Std. Dev.	28.6



Data Checked By: JTR Date: 1/21/05
Filename: K:/TT2617/TTRP0035.lwp

ADVANCED TERRA TESTING, Inc

MASS/UNIT AREA (GEOTEXTILE)
ASTM D 5261

CLIENT: Tetra Tech-RMC **JOB NO.:** 2617-03
LOCATION: Present Landfill Design-RFETS, Golden, CO

ROLL NO.	C2-82-05-0001-200	C2-82-05-0001-200	C2-82-05-0001-200	C2-82-05-0001-200	C2-82-05-0001-200
LOT NO.	Shift 2, Line 151A	Shift 2, Line 151A	Shift 2, Line 151A	Shift 2, Line 151A	Shift 2, Line 151A
SAMPLE NO.	1	2	3	4	5
ROLL IDENTIFICATION	28 oz Sides, Wt. 930	28 oz Sides, Wt. 930	28 oz Sides, Wt. 930	28 oz Sides, Wt. 930	28 oz Sides, Wt. 930
DATE TESTED	01-17-05 JTR	01-17-05 JTR	01-17-05 JTR	01-17-05 JTR	01-17-05 JTR
SAMPLE DESCRIPTION	01-10-05	01-10-05	01-10-05	01-10-05	01-10-05
MASS/UNIT AREA DETERMINATIONS					
Sample Length (in)	5.920	6.000	6.020	5.960	6.040
Sample Width (in)	4.070	4.100	4.060	4.040	4.070
Sample Area (cm²)	155.45	158.71	157.68	155.34	158.60
Mass/Unit Area (gms/m²)	412.4	398.2	362.1	410.1	370.7
Mass of Sample (gms)	6.41	6.32	5.71	6.37	5.88

Average Mass/Unit Area (5 Samples) (gms/m²)	**390.7**
Average Mass/Unit Area (5 Samples) (oz/yd²)	**11.5**

Data entered by: SR Date: 01/20/2005
Data checked by: SR Date: 1/21/05
FileName: TTMA0001

ADVANCED TERRA TESTING, INC.

MASS/UNIT AREA (GEOTEXTILE)
ASTM D 5261

CLIENT: Tetra Tech-RMC **JOB NO.:** 2617-03
LOCATION: Present Landfill Design-RFETS, Golden, CO

ROLL NO.	C2-8-2-05-0035-200	C2-8-2-05-0035-200	C2-8-2-05-0035-200	C2-8-2-05-0035-200	C2-8-2-05-0035-200
LOT NO.	Shift 1, Line 151A	Shift 1, Line 151A	Shift 1, Line 151A	Shift 1, Line 151A	Shift 1, Line 151A
SAMPLE NO.	1	2	3	4	5
ROLL IDENTIFICATION	TEXDRAIN 200, DS8	TEXDRAIN 200, DS8	TEXDRAIN 200, DS8	TEXDRAIN 200, DS8	TEXDRAIN 200, DS8
DATE TESTED	01-17-05 JTR	01-17-05 JTR	01-17-05 JTR	01-17-05 JTR	01-17-05 JTR
SAMPLE DESCRIPTION	01-11-05	01-11-05	01-11-05	01-11-05	01-11-05
MASS/UNIT AREA DETERMINATIONS					
Sample Length (in)	6.000	6.000	5.950	5.980	6.000
Sample Width (in)	4.000	4.070	4.000	4.000	4.000
Sample Area (cm^2)	154.84	157.55	153.55	154.32	154.84
Mass/Unit Area (gms/m^2)	419.1	411.3	464.3	446.5	339.1
Mass of Sample (gms)	6.49	6.48	7.13	6.89	5.25

Average Mass/Unit Area (5 Samples) (gms/m^2) **416.1**
Average Mass/Unit Area (5 Samples) (oz/yd^2) **12.3**

Data entered by: SR Date: 01/20/2005
Data checked by: SR Date: 1/21/05
FileName: TTMA0035

ADVANCED TERRA TESTING, INC.

GCL FLUX
ASTM D 5887

CLIENT Tetra Tech RMC

JOB NO. 2617-03

LOT NO.	200503L0	PROJECT	Present Landfill Design-RFETS
ROLL NO.	10	TEST STARTED	1-12-05 CAL
SAMPLE NO.		TEST FINISHED	01-27-05 CAL
MAT'L TYPE	GCL Composite	CELL NUMBER	10P
TEST TYPE	TX/Flux		
CONF. PRES. PSF	576	SITE LEACHATE WATER	No
		DI WATER	Yes

MOISTURE/DENSITY DATA FOR COMPOSITE SAMPLE	BEFORE TEST	AFTER TEST
Wt. GCL + Moisture (g)	46.3	99.2
Wt. Wet GCL & Pan (g)	54.7	107.6
Wt. Dry GCL & Pan (g)	45.4	45.4
Wt. Lost Moisture (g)	9.3	62.2
Wt. of Pan Only (g)	8.4	8.4
Wt. of Dry GCL (g)	37.0	37.0
Moisture Content %	25.1	168.0
Wet Density PCF	46.0	91.6
Dry Density PCF	36.7	34.2

Init. Diameter (in)	4.000	(cm)	10.160
Init. Area (sq in)	12.566	(sq cm)	81.078
Init. Height (in)	0.306	(cm)	0.776
Vol. Bef. Consol. (cu ft)	0.00222		
Vol. After Consol. (cu ft)	0.00239		
Porosity %	91.97		
Constant Head (PSI)	2.00	(cm)	140.79

Time Min	Time Sec	Init. Burette CC	Final Burette CC	Head Corr. CM	Composite **INDEX FLUX qi** **(M^3/M^2)/SEC**	Composite Permeability k cm/sec
30.0	1800	49.1	14.1	31.0	2.40E-06	1.3E-06
390.0	23400	48.9	15.8	30.1	1.74E-07	9.7E-08
1443.0	86580	49.0	38.1	17.9	1.55E-08	7.8E-09
1440.0	86400	38.1	31.5	27.5	9.42E-09	5.1E-09
1460.0	87600	31.5	26.2	34.0	7.46E-09	4.3E-09
4260.0	255600	26.2	14.0	43.5	5.89E-09	3.7E-09
1560.0	93600	14.0	10.1	52.3	5.14E-09	3.6E-09
1440.0	86400	10.1	6.8	56.2	4.71E-09	3.4E-09
1440.0	86400	48.5	43.5	15.3	7.14E-09	3.5E-09

Average - Last 3 Values **3.5E-09**

Data entry by: CAL/SR Date: 01/28/2005
Checked by: cal Date: 1/28/05
FileName: TTFXRL10

ADVANCED TERRA TESTING, INC.

GCL FLUX
ASTM D 5887

CLIENT Tetra Tech RMC

JOB NO. 2617-03

LOT NO.	200503L0	PROJECT	Present Landfill Design-RFETS
ROLL NO.	10	TEST STARTED	1-12-05 CAL
SAMPLE NO.		TEST FINISHED	01-27-05 CAL
MAT'L TYPE	GCL Composite	CELL NUMBER	10P
TEST TYPE	TX/Flux		
CONF. PRES. PSF	576	SITE LEACHATE WATER	No
		DI WATER	Yes

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
80.0	75.0	6.7	35.9				
80.0	75.0		27.4				

Initial Height (in)	0.306	Init. Vol. (CC)	62.92
Height Change (in)	0.023	Vol. Change (CC)	12.90
Ht. After Cons. (in)	0.283	Cell Exp. (CC)	17.61
Initial Area (sq in)	12.566	Net Change (CC)	-4.71
Area After Cons. (sq in)	14.607	Cons. Vol. (CC)	67.63

Data entry by: CAL/SR Date: 01/28/2005
Checked by: ac Date: 1/28/05
FileName: TTFXRL10

ADVANCED TERRA TESTING, INC.

GCL FLUX
ASTM D 5887

CLIENT Tetra Tech RMC

JOB NO. 2617-03

LOT NO.	200503L0	PROJECT	Present Landfill Design-RFETS
ROLL NO.	55	TEST STARTED	1-13-05 CAL
SAMPLE NO.		TEST FINISHED	01-27-05 CAL
MAT'L TYPE	GCL Composite	CELL NUMBER	12P
TEST TYPE	TX/Flux		
CONF. PRES. PSF	576	SITE LEACHATE WATER	No
		DI WATER	Yes

MOISTURE/DENSITY DATA FOR COMPOSITE SAMPLE	BEFORE TEST	AFTER TEST
Wt. GCL + Moisture (g)	50.7	100.4
Wt. Wet GCL & Pan (g)	59.1	108.7
Wt. Dry GCL & Pan (g)	48.7	48.7
Wt. Lost Moisture (g)	10.4	60.1
Wt. of Pan Only (g)	8.4	8.4
Wt. of Dry GCL (g)	40.3	40.3
Moisture Content %	25.9	149.0
Wet Density PCF	51.6	111.0
Dry Density PCF	41.0	44.6

Init. Diameter (in)	4.000	(cm)	10.160
Init. Area (sq in)	12.566	(sq cm)	81.078
Init. Height (in)	0.298	(cm)	0.758
Vol. Bef. Consol. (cu ft)	0.00217		
Vol. After Consol. (cu ft)	0.00199		
Porosity %	106.36		
Constant Head (PSI)	2.00	(cm)	140.79

Time Min	Time Sec	Init. Burette CC	Final Burette CC	Head Corr. CM	Composite INDEX FLUX qi $(M^3/M^2)/SEC$	Composite Permeability k cm/sec
100.0	6000	49.5	37.0	18.3	2.57E-07	1.5E-07
480.0	28800	49.8	20.5	27.1	1.25E-07	7.9E-08
960.0	57600	49.3	33.3	20.4	3.43E-08	2.0E-08
1440.0	86400	33.3	27.7	32.2	7.99E-09	5.3E-09
1460.0	87600	27.7	23.2	37.7	6.34E-09	4.4E-09
4260.0	255600	23.2	12.9	45.7	4.97E-09	3.8E-09
1560.0	93600	12.9	9.9	53.0	3.95E-09	3.2E-09
1440.0	86400	9.9	7.2	56.1	3.85E-09	3.3E-09
1440.0	86400	48.9	44.3	14.6	6.57E-09	3.7E-09

Average - Last 4 Values **3.5E-09**

Data entry by: CAL/SR Date: 01/28/2005
Checked by: cw Date: 1/28/05
FileName: TTFXRL55

ADVANCED TERRA TESTING, INC.

GCL FLUX
ASTM D 5887

CLIENT Tetra Tech RMC

JOB NO. 2617-03

LOT NO.	200503L0	PROJECT	Present Landfill Design-RFETS
ROLL NO.	55	TEST STARTED	1-13-05 CAL
SAMPLE NO.		TEST FINISHED	01-27-05 CAL
MAT'L TYPE	GCL Composite	CELL NUMBER	12P
TEST TYPE	TX/Flux		
CONF. PRES. PSF	576	SITE LEACHATE WATER	No
		DI WATER	Yes

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
80.0	75.0	7.9	37.7				
80.0	75.0		28.9				

Initial Height (in)	0.298	Init. Vol. (CC)	61.44
Height Change (in)	0.020	Vol. Change (CC)	16.90
Ht. After Cons. (in)	0.278	Cell Exp. (CC)	11.92
Initial Area (sq in)	12.566	Net Change (CC)	4.98
Area After Cons. (sq in)	12.378	Cons. Vol. (CC)	56.46

Data entry by: CAL/SR Date: 01/28/2005
Checked by: cal Date: 1/28/05
FileName: TTFXRL55

ADVANCED TERRA TESTING, INC.

MASS/UNIT AREA & MOISTURE CONTENT (GCL)
ASTM D 5993

CLIENT: Tetra Tech -RMC JOB NO.: 2617-03
PROJECT: Present Landfill Design, RFETS, Golden, CO

ROLL NO.	10	10	10	10
LOT NO.	200503LO	200503LO	200503LO	200503LO
SAMPLE NO.	1	2	3	4
SAMPLED	01-10-05	01-10-05	01-10-05	01-10-05
DATE TESTED	01-11-05 JTR	01-11-05 JTR	01-11-05 JTR	01-11-05 JTR
GCL DESCRIPTION	Bentomat DN	Bentomat DN	Bentomat DN	Bentomat DN
MASS/UNIT AREA DETERMINATIONS				
Sample Length (in)	8.050	8.010	7.950	8.000
Sample Width (in)	4.000	4.000	4.000	4.000
Sample Area (cm²)	207.74	206.71	205.16	206.45
Mass/Unit Area (gms/m²) Composite	5540.1	4494.7	5388.9	5865.8
Mass of Textile (gms)	8.31	8.27	8.21	8.26
Mass/Unit Area (gms/m²) Bentonite	5140.0	4094.7	4988.9	5465.8
MOISTURE DETERMINATIONS				
Wt. of Wet GCL & Dish (gms)	160.28	130.55	154.55	163.79
Wt. of Dry GCL & Dish (gms)	131.29	108.85	126.57	136.39
Net Loss of Moisture (gms)	28.99	21.70	27.98	27.40
Wt. of Dish (gms)	16.20	15.94	16.01	15.29
Wt. of Dry GCL (gms)	115.09	92.91	110.56	121.10
Moisture Content (Composite) (%)	25.2	23.4	25.3	22.6
Moisture Content (Bentonite) (%)	27.1	25.6	27.3	24.3

ROLL NO.	10
LOT NO.	200503LO
SAMPLE NO.	5
SAMPLED	01-10-05
DATE TESTED	01-11-05 JTR
GCL DESCRIPTION	Bentomat DN
MASS/UNIT AREA DETERMINATIONS	
Sample Length (in)	7.960
Sample Width (in)	3.990
Sample Area (cm²)	204.91
Mass/Unit Area (gms/m²) Composite	5573.3
Mass of Textile (gms)	8.20
Mass/Unit Area (gms/m²) Bentonite	5173.3
MOISTURE DETERMINATIONS	
Wt. of Wet GCL & Dish (gms)	157.34
Wt. of Dry GCL & Dish (gms)	129.48
Net Loss of Moisture (gms)	27.86
Wt. of Dish (gms)	15.28
Wt. of Dry GCL (gms)	114.20
Moisture Content (Composite) (%)	24.4
Moisture Content (Bentonite) (%)	26.3

NOTE: Mass of textile was taken from the GFR Specifier's Guide 2005. Assumed CETCO Bentomat DN product.

Average Moisture Content (%) (Composite) (5 samples)	**24.17**
Average Mass/Unit Area (Composite) (5 Samples) (gms/m²)	**5372.6**
Average Mass/Unit Area (Dry Bentonite) (5 Samples) (gms/m²)	**4972.5**
Average Moisture Content (%) (Bentonite) (5 samples)	**26.1**

Data entered by: SR Date: 01/21/2005
Data checked by: JTR Date: 1/21/05
FileName: TTMA10

ADVANCED TERRA TESTING, INC.

MASS/UNIT AREA & MOISTURE CONTENT (GCL)
ASTM D 5993

CLIENT: Tetra Tech -RMC JOB NO.: 2617-03
PROJECT: Present Landfill Design, RFETS, Golden, CO

ROLL NO.	55	55	55	55
LOT NO.	200503LO	200503LO	200503LO	200503LO
SAMPLE NO.	1	2	3	4
SAMPLED				
DATE TESTED	01-12-05 JTR	01-12-05 JTR	01-12-05 JTR	01-12-05 JTR
GCL DESCRIPTION	Bentomat DN	Bentomat DN	Bentomat DN	Bentomat DN
MASS/UNIT AREA DETERMINATIONS				
Sample Length (in)	7.980	8.020	8.000	8.020
Sample Width (in)	4.010	4.000	4.010	3.980
Sample Area (cm^2)	206.45	206.97	206.97	205.93
Mass/Unit Area (gms/m^2) Composite	4226.2	4333.5	5836.7	4867.1
Mass of Textile (gms)	8.26	8.28	8.28	8.24
Mass/Unit Area (gms/m^2) Bentonite	3826.2	3933.5	5436.6	4467.1
MOISTURE DETERMINATIONS				
Wt. of Wet GCL & Dish (gms)	127.89	132.64	167.67	144.07
Wt. of Dry GCL & Dish (gms)	103.05	105.66	137.05	115.62
Net Loss of Moisture (gms)	24.84	26.98	30.62	28.45
Wt. of Dish (gms)	15.80	15.97	16.25	15.39
Wt. of Dry GCL (gms)	87.25	89.69	120.80	100.23
Moisture Content (Composite) (%)	28.5	30.1	25.3	28.4
Moisture Content (Bentonite) (%)	31.4	33.1	27.2	30.9

ROLL NO.	55
LOT NO.	200503LO
SAMPLE NO.	5
SAMPLED	
DATE TESTED	01-12-05 JTR
GCL DESCRIPTION	Bentomat DN
MASS/UNIT AREA DETERMINATIONS	
Sample Length (in)	8.030
Sample Width (in)	4.040
Sample Area (cm^2)	209.30
Mass/Unit Area (gms/m^2) Composite	5998.2
Mass of Textile (gms)	8.37
Mass/Unit Area (gms/m^2) Bentonite	5598.1
MOISTURE DETERMINATIONS	
Wt. of Wet GCL & Dish (gms)	170.80
Wt. of Dry GCL & Dish (gms)	140.49
Net Loss of Moisture (gms)	30.31
Wt. of Dish (gms)	14.95
Wt. of Dry GCL (gms)	125.54
Moisture Content (Composite) (%)	24.1
Moisture Content (Bentonite) (%)	25.9

NOTE: Mass of textile was taken from the GFR Specifier's Guide 2005. Assumed CETCO Bentomat DN product.

Average Moisture Content (%) (Composite) (5 samples)	**27.29**
Average Mass/Unit Area (Composite) (5 Samples) (gms/m^2)	**5052.3**
Average Mass/Unit Area (Dry Bentonite) (5 Samples) (gms/m^2)	**4652.3**
Average Moisture Content (%) (Bentonite) (5 samples)	**29.7**

Data entered by: SR Date: 01/21/2005
Data checked by: JTR Date: 1/21/05
FileName: TTMA55

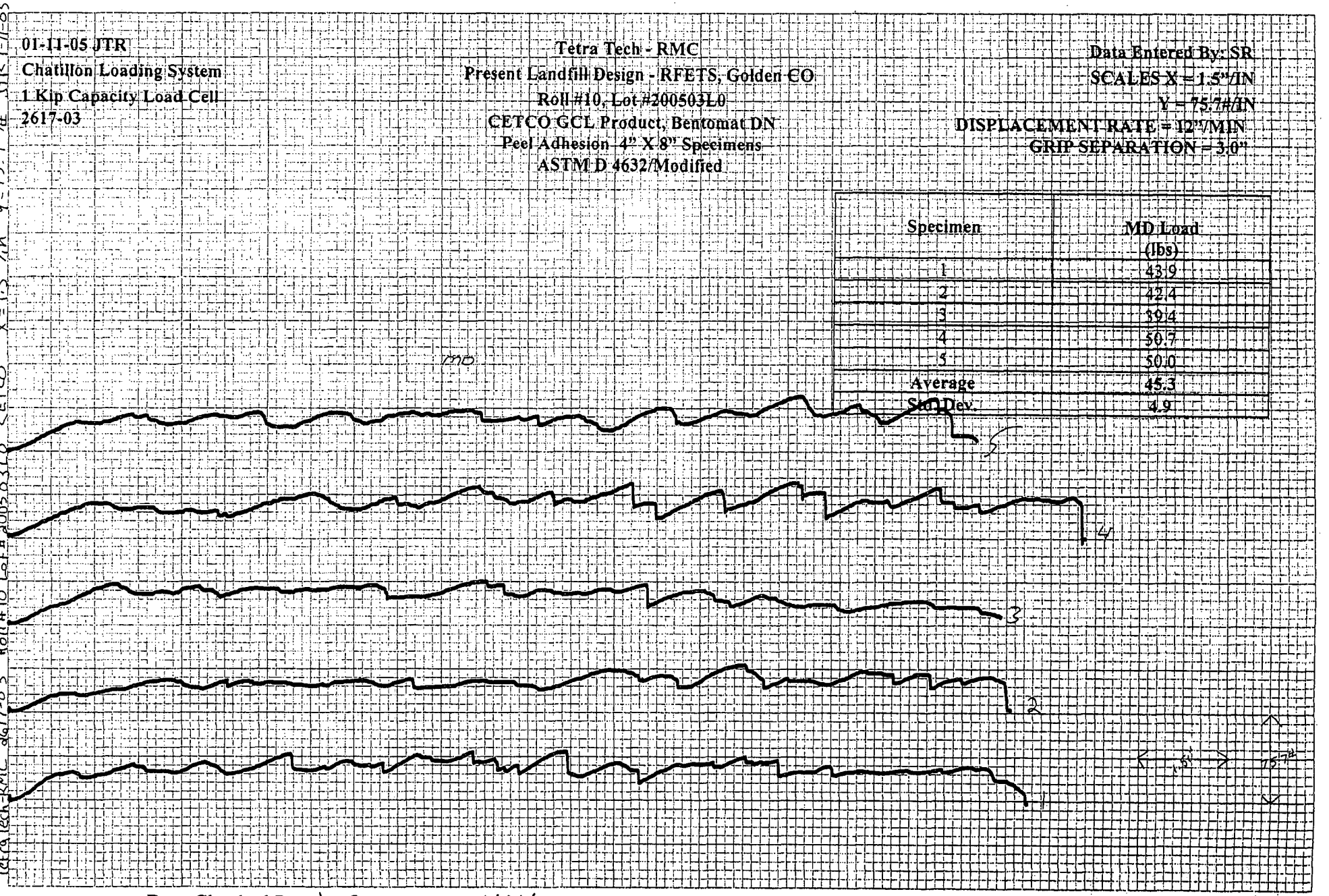
ADVANCED TERRA TESTING, INC.

01-11-05 JTR
Chatillon Loading System
1 Kip Capacity Load Cell
2617-03

Tetra Tech - RMC
Present Landfill Design - RFETS, Golden CO
Roll #10, Lot #200503L0
CETCO GCL Product, Bentomat DN
Peel Adhesion 4" X 8" Specimens
ASTM D 4632/Modified

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN
DISPLACEMENT RATE = 12"/MIN
GRIP SEPARATION = 3.0"

Specimen	MD Load (lbs)
1	43.9
2	42.4
3	39.4
4	50.7
5	50.0
Average	45.3
Std Dev.	4.9



Data Checked By: JTR Date: 1/21/05
Filename: K:/TT2617/TTPA10.lwp

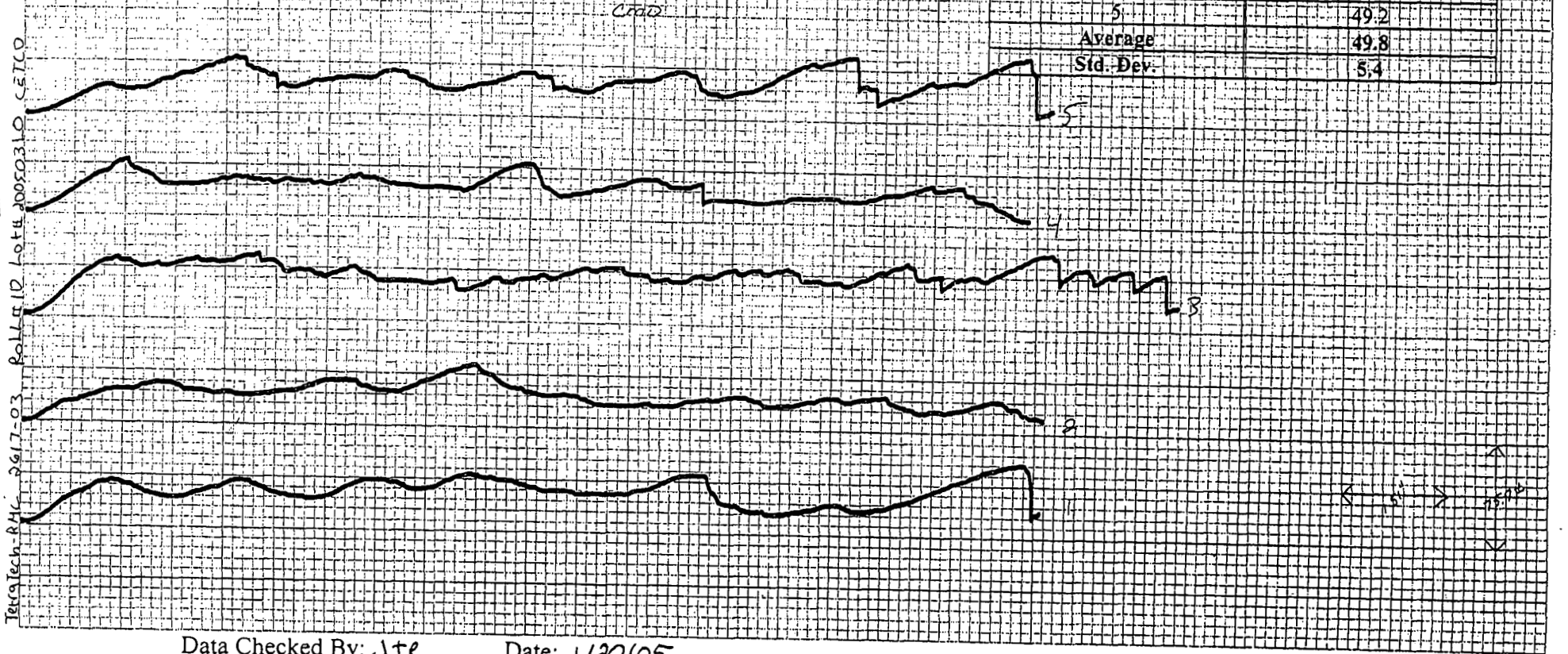
ADVANCED TERRA TESTING, Inc

01-11-05 JTR
Chatillon Loading System
1 Kip Capacity Load Cell
2617-03

Tetra Tech - RMC
Present Landfill Design - RFETS, Golden CO
Roll #10, Lot #200503L0
CETCO GCL Product, Bentomat DN
Peel Adhesion 4" X 8" Specimens
ASTM D 4632/Modified

Data-Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN
DISPLACEMENT RATE = 12"/MIN
GRIP SEPARATION = 3.0"

Specimen	CMD Load (lbs)
1	54.5
2	46.2
3	36.0
4	43.1
5	49.2
Average	49.8
Std. Dev.	5.4



CMD
TetraTech-RMC 2617-03 Roll#10 lot# 200503L0 CETCO X=1.5"/in Y=75.7#/in JTR 1-11-05

Data Checked By: JTR Date: 1/20/05
Filename: K:/TT2617/TTPA10C.lwp

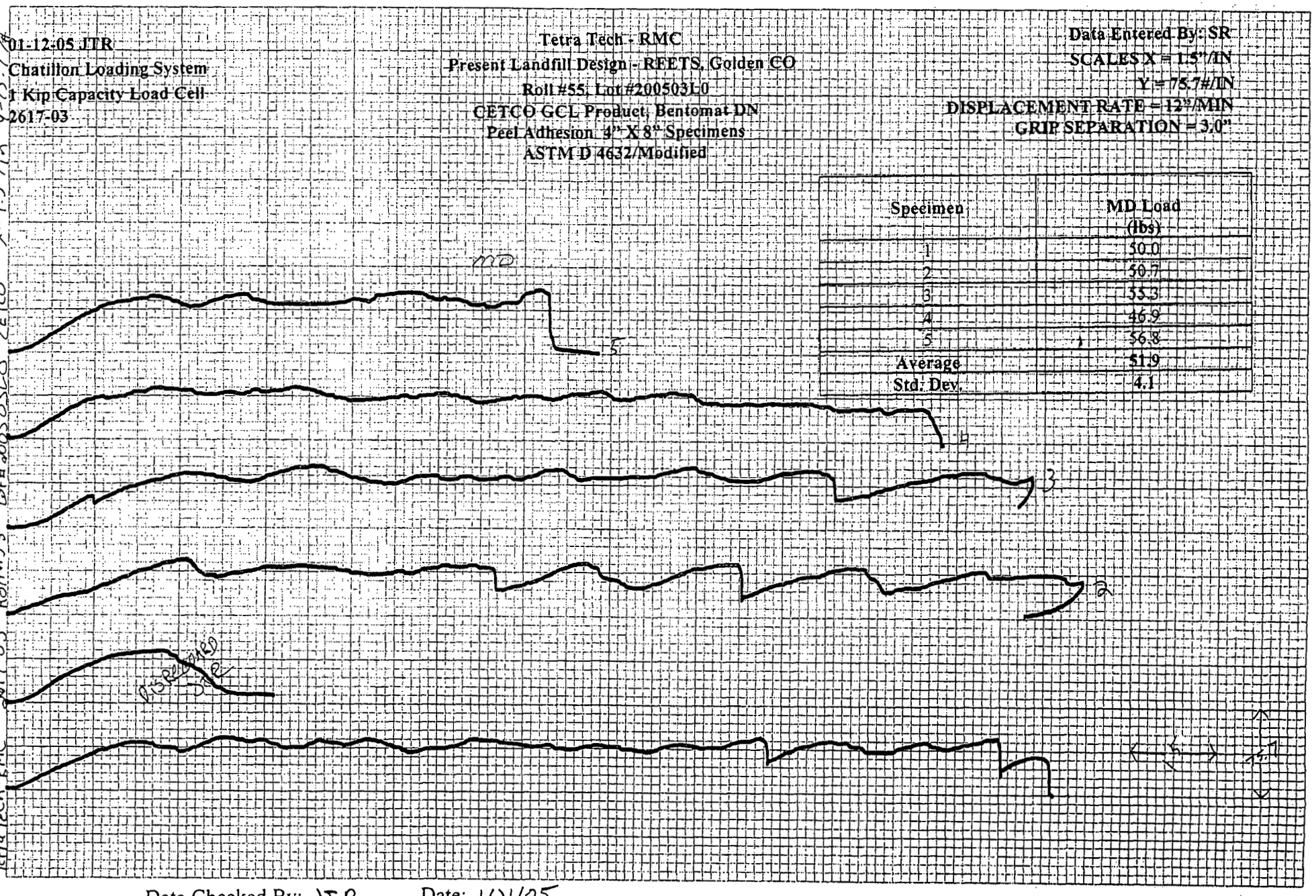
ADVANCED TERRA TESTING, Inc

01-12-05 JTR
Chatillon Loading System
1 Kip Capacity Load Cell
2617-03

Tetra Tech - RMC
Present Landfill Design - REETS, Golden CO
Roll #55, Lot#200503L0
CETCO GCL Product, Bentomat DN
Peel Adhesion 4" X 8" Specimens
ASTM D 4632/Modified

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN
DISPLACEMENT RATE = 12"/MIN
GRIP SEPARATION = 3.0"

Specimen	MD Load (lbs)
1	50.0
2	50.7
3	55.3
4	46.9
5	56.8
Average	51.9
Std. Dev.	4.1



JTR 1-12-05
Y=75.7#/in
X=1.5#/in
CETCO
Lot# 200503L0
Roll#55
MD
ASTM4632
2617-03
Tetra Tech-RMC

Data Checked By: JTR Date: 1/21/05
Filename: K:/TT2617/TTPA55.lwp

ADVANCED TERRA TESTING, Inc

01-12-05 JTR

Chatillon Loading System

1 Kip Capacity Load Cell

2617-03

Tetra Tech - RMC

Present Landfill Design - RFETS, Golden CO -

Roll #55, Lot #200503L0

CETCO GCL Product, Bentomat DN

Peel Adhesion 4" X 8" Specimens

ASTM D 4632/Modified

Data Entered By: SR

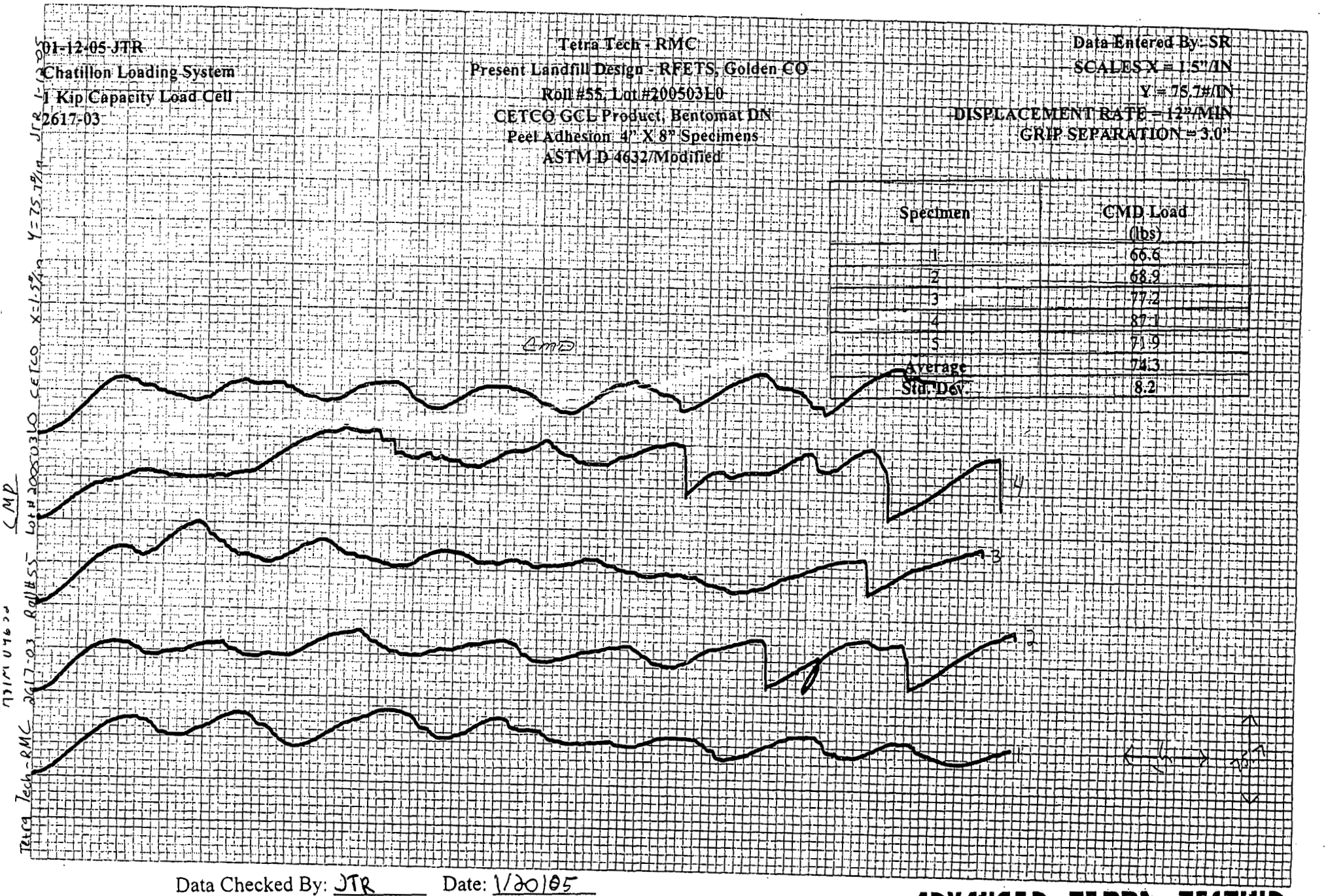
SCALES X = 1.5"/IN

Y = 75.7#/IN

DISPLACEMENT RATE = 12"/MIN

GRIP SEPARATION = 3.0"

Specimen	CMD Load (lbs)
1	66.6
2	68.9
3	77.2
4	87.1
5	71.9
Average	74.3
Std. Dev.	8.2



Data Checked By: JTR Date: 1/20/05

Filename: K:/TT2617/TTPA55C.lwp

ADVANCED TERRA TESTING, Inc

Moisture Content Determinations
ASTM D 2216

CLIENT: Tetra Tech-RMC JOB NO.: 2617-03
LOCATION: Present Landfill Design-RFETS

ROLL NUMBER	55	10
LOT NUMBER	200503L0	200503L0
SAMPLE NO.		
DATE SAMPLED		
DATE TESTED	01-24-05 JTR	01-24-05 JTR
GCL DESCRIPTION	Bentomat DN	Bentomat DN
MOISTURE DETERMINATIONS		
Wt. of Wet Soil & Dish (gms)	58.67	62.14
Wt. of Dry Soil & Dish (gms)	48.57	51.36
Net Loss of Moisture (gms)	10.10	10.78
Wt. of Dish (gms)	8.35	8.07
Wt. of Dry Soil (gms)	40.22	43.29
Moisture Content (%)	25.1	24.9

Data entered by: SR Date: 01/25/2005
Data checked by: RS Date: 1/25/05
Name: TTN05510

ADVANCED TERRA TESTING, INC.

SWELL INDEX
ASTM D 5890

Client Name: Tetra Tech-RMC

Job No.: 2617-03

Type of Bentonite:CETCO Bentomat DN
Leachate:

Date Sampled:
Date Tested:01-20-05 DPM/SKL

Project Description: Present Landfill Desing-RFETS, Golden, CO

OVEN-DRIED SAMPLES			
SAMPLE NO.	**SWELL INDEX CC/2 gms**	**START TEMP. °C**	**END TEMP °C**
Roll 10, Lot #200503L0	26.5	22.4	22.7
Roll #55, Lot #200503L0	25.0	22.3	22.6

DATA ENTERED BY: SR DATE: 01-21-05
DATA CHECKED BY: STR DATE: 1/21/05

ADVANCED TERRA TESTING, Inc.
ATT
833 Parfet Street • Lakewood, Colorado 80215 • (303) 232-8308 • Fax: (303) 232-1579

Tetra Tech-RMC
1900 S. Sunset Street, Suite 1-F
Longmont, CO 80501
ATTN: Mr. Roy Spitzer

February 22, 2005

RE: Large Scale Direct Shear Testing - Present Landfill-RFETS
Golden, CO

Dear Mr. Spitzer,

In accordance with your request, we have completed a series of Large Scale Internal Direct Shear Tests on selected Geosynthetic Clay Liner (GCL) products. A final report is enclosed. If you have any questions, please feel free to give us a call.

Sincerely yours,

Christopher J. Wienecke
Laboratory Director

Sharon Roberts
Geosynthetic Division Manager

K:\TT2617\TTFI0205.LWP

FINAL REPORT
GCL INTERNAL DIRECT SHEAR TESTING

Prepared for:

Tetra Tech-RMC
1900 S. Sunset Street, Suite 1-F
Longmont, CO 80501

Prepared by:

ADVANCED TERRA TESTING, INC.
833 Parfet Street, Unit A
Lakewood, CO 80215

Project No. 2617-03

February 22, 2005

INTRODUCTION

This laboratory test program report is for the exclusive use of Tetra Tech-RMC, and consists of one Large Scale Internal Direct Shear Test Series (3-point) performed on select geosynthetics (GCL) and supplied to Advanced Terra Testing, Inc. by CETCO. The test series was performed at three normal stress levels ranging from 200 to 600 psf as directed by Tetra Tech-RMC. At the request of John Rahe with MFG, three additional single-point tests were conducted under 200 psf normal loads on individual specimens of GCL.

The Large Scale Interface Direct Shear Tests were run in general accordance with ASTM D 6243, "Determining the Internal and Interface Shear Resistance of Geosynthetic Clay Liner by the Direct Shear Method." The testing was conducted on ATT's large direct shear box which utilizes a 12 inch x 12 inch upper (stationary) box and a 12 inch x 16 inch lower (traveling) box.

Hydration

The long term hydrated shear strength of clay is greatly affected by the degree of hydration. It is common pratice to hydrate for a minimim of 72 hours under the normal stress that the GCL will see durning shear.

Hydration was accomplished in external hydration frames, under the normal load used for shear. Samples of the GCL were placed under the test normal load, between layers of geonet geocomposite in the hydration box, thus allowing access by water to both surfaces of the GCL, and providing for consistent hydration for each sample.

Test Results - Interface Shear

Per the request of Tetra Tech-RMC, the direct shear resistance of the three test specimens DS-1, DS-3 & DS-4, were evaluated at a single normal stress of 200 psf. The actual test data are shown in Appendix A. The test data were plotted on a graph of shear force versus shear displacement. The peak value of shear force and the residual value of shear force were used to calculate peak and residual shear strength for DS-2 (3-point) test series. The total stress peak and residual shear strengths were plotted on a graph of shear stress versus corresponding normal stress. The total stress peak and residual interface friction angle is obtained by a best fit straigth line drawn through three data points. The summary plots of shear stress versus applied normal stress are also presented in Appendix A. A summary of the interface friction angles and apparent adhesions are in the summary table.

Observations

Upon completion of the DS-1 (single-point and DS-2 (3-point) test series, it was noted that the internal shear resistance under 200 psf normal load was not passing the specification requirement of 500 psf. Upon further investigation into the situation, it was determined that the serrated gripping surfaces of the test plates had become dulled over time, causing some slippage along the top and bottom surfaces of the GCL. Therefore, it was neccesary to discontinue testing, and replace the serrated gripping surfaces in the test device. Upon retesting under the 200 psf normal load, internal shear resistance was demonstrated to be greater then the 500 psf required by the project specifications. At the request of John Rahe, the retested 200 normal psf load specimen

for DS-2 was reported as a stand alone test, and not included in the orginal DS-2 envelope, to avoid skewing the results of the 3-point envelope.

This concludes our report for Large Scale Internal Direct Shear Testing performed as requested by Tetra Tech-RMC. The results reported apply only to the materials supplied for this testing program (CETCO Bentomat ST and CETCO Bentomat DN) and do not apply to other materials or test conditions.

ISO 9001 - 2000

Precision Geosynthetic Laboratories

February 01, 2005

Sharon Roberts
ADVANCED TERRA TESTING INC.
833 Parfet Street
Lakewood, CO 80215

Dear Ms. Roberts: RE: Rocky Flats Present Closure – Proj # 2617-03

Thank you for consulting Precision Geosynthetic Laboratories for your material testing needs.

Enclosed is the ***final*** laboratory report for the testing of one (1) 60 mil LLDPE Geomembrane sample(s) received January 28, 2005.

It should be noted that the test specimen and test sample used for this report was believed to be representative of the material produced under the designation herein stated. However, these results are indicative of only the specimens that were actually tested. The testing herein is based upon accepted industry practice as well as the test method listed. Precision Geosynthetic Laboratories neither accepts responsibility for nor makes claims to the final use and purpose of the material.

By accepting the data and results represented on this report, Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims arising out of the use of this data to the cost for the respective test(s) represented in this report, and Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liability in excess of the aforementioned limit.

The test data and all associated project information shall be held in confidence, not to be reproduced except in full and disclosed to other parties with the authorization of the client.

It is a company policy to keep the physical records of each job for 2 years since the receipt of the samples and keep the electronic file for 7 years. ***Failed seam samples are kept for 7 years; good seam samples are disposed after 2 weeks and conformance samples are disposed after 1 month.*** Should you need us to keep them longer, please advise us in writing.

If you have any questions or if we may be of further service, please do not hesitate to call at 800-522-4599.

Sincerely,

PRECISION GEOSYNTHETIC LABORATORIES

Maria Espitia
Quality Assurance

Cora B. Queja
Vice President

Enclosure: (Job No. G050052)

ISO 9001 - 2000

Precision Geosynthetic Laboratories

CLIENT: ADVANCED TERRA TESTING INC.
PROJECT: Rocky Flats Present Closure -- Proj #2617-03

VERIFICATION OF MATERIAL PROPERTIES
(PGL Job No. G050052)

MATERIAL DESCRIPTION: 60 mil LLDPE Geomembrane

SAMPLE(S) SENT BY: Advanced Terra Testing Inc.

DATE RECEIVED: January 28, 2005 **DATE REPORTED:** February 01, 2005

SAMPLE IDENTIFICATIONS:

SAMPLE ID	PRECISION CONTROL NUMBER
R#104124908 SAM#S038576 / 515122 Product Code: LLD060A000	7289

TESTS REQUIRED:

TEST METHOD	DESCRIPTION
ASTM D1505	Density
ASTM D1603	Carbon Content
ASTM D5596	Carbon Black Dispersion

TEST CONDITIONS: The sample was conditioned for a minimum one hour in the laboratory at 22 ± 2°C (71.6 ± 3.6°F) and at 60 ± 10% relative humidity prior to test.

TEST RESULTS:

The test results are summarized in Table 1. The units in which the data are reported are included on this table.

PRECISION GEOSYNTHETIC LABORATORIES

Initials: MC #: 013
Date: 2/1/05

Maria Espitia
Quality Assurance

Cora B. Queja
Vice President

1160 North Gilbert Street, Anaheim, CA. 92801, Tel# 714-520-9631, Fax#714-520-9637
DC#2000 Record#281

TABLE

MATERIAL PROPERTIES

CLIENT: ADVANCED TERRA TESTING

PROJECT: Rocky Flats Present Closure - Project #2617-03

Date Received: **1/28/2005**
Date Reported: **2/1/2005**
Client Sample ID: **R#104124908 SAM#S038576 / 515122 Product Code: LLD060A000**
Material Description: **60 mil LLDPE Geomembrane**

QC'd By: ME
PGL Job No.: **G050052**
PGL Control No.: **7289**

		SPECIMENS														Proj.
		1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Specs.
METHOD	**DESCRIPTION**															
ASTM D1505	Density (grams/ cm.3)	**0.9365**	**0.9365**	**0.9365**								**0.9365**	**0.0000**	0.9365	0.9365	
ASTM D1603	Carbon Black Content (percent)	**2.41**	**2.39**									**2.40**	**0.02**	2.39	2.41	
ASTM D5596	Carbon Black Dispersion (category rating per reference chart PCN: 12-455960-38)	1	1	1	1	1	1	1	1	1	1	1	N/A	N/A	N/A	

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION
DC#1987 Record #268

ISO 9001 - 2000
GAI-LAP

ADVANCED TERRA TESTING, Inc.
ATT
833 Parfet Street • Lakewood, Colorado 80215 • (303) 232-8308 • Fax: (303) 232-1579

Mr. Roy Spitzer
Tetra Tech - RMC
1900 S. Sunset Street, Suite 1-F
Longmont, CO 80501

March 02, 2005

RE: Present Landfill Design - RFETS
Golden, CO, and Rocky Flats Present Landfill Closure

Dear Mr. Spitzer,

Thank you for choosing Advanced Terra Testing, Inc. for your geosynthetic testing needs.

Per your request, we have completed the analyses pertinent to the recent testing campaign relative to the above referenced project. The following tables provide a summary of conformance testing by material type.

60 mil LLDPE -T

Roll Number	Thickness ASTM D 5199 (in)	Tear Resistance ASTM D 1004/C (lb/in width)		Puncture Resistance ASTM D 4833 (lbs)
		MD	CMD	
104122977	0.0604	37.1	38.2	122.4
104123038	0.0606	37.1	38.7	121.3
104124722	0.0639	36.1	39.2	116.1
104124723	0.0627	N/R	N/R	N/R

NOTE: N/R = Not Requested

60 mil LLDPE -T

Roll Number	MD Load @ Break (lbs/in width)	MD Elongation @ Break (%)	MD Load @ Yield (lbs/in width)	MD Elongation @ Yield (%)
104122977	246.6	630.2	106.8	20.5
104123038	255.5	635.9	109.2	17.4
104124722	253.2	639.5	102.9	17.9

60 mil LLDPE -T - ASTM D 6693 Type IV

Roll Number	CMD Load @ Break (lbs/in width)	CMD Elongation @ Break (%)	CMD Load @ Yield (lbs/in width)	CMD Elongation @ Yield (%)
104122977	220.6	580.5	108.6	19.4
104123038	226.1	585.1	110.8	16.7
104124722	222.9	590.2	101.1	17.7

60 mil LLDPE-T (Present Landfill Design - RFETS) Asperity Height - GRI-GM12, Density - ASTM D 1505, Carbon Black Content - ASTM D 1603, Carbon Black Dispersion - ASTM D 5596

Roll Number	Asperity Height * (mils)		Density ASTM D 1505 (grams/cm³)	Carbon Black Content ASTM D 1603 (%)	Carbon Black Dispersion ASTM D 5596 **
	Side A	Side B			
104122977	30	29	0.9374	2.39	1
104123038	27	28	0.9380	2.37	1
104124722	29	29	0.9372	2.43	1

Note: * Apparatus: Has a dial indicator that travels at least 2,5 mm (0.1 in), and a depth gauge with contact point that travels up and down with in the setting block with a base dimension of 50 mm x 20 mm (2.0 in x 0.75 in) and a height of 15 mm (0.5 in). The contact point is 3,12 mm (0.125 in) in radius and is tapered to 0.25 mm (0.01 in) in radius. The length of the needle is 16 mm (0.65 in). Sampling: 10 specimens across the roll width in a randomly distributed manner.
***** Carbon Black Dispersion (category rating per reference chart PCN: 12-455960-38)***

CETCO - Bentomat ST GCL - GCL Flux ASTM D 5887

Lot & Roll Number	Composite Permeability k (cm/sec)	Composite Index Flux qi (M³/M²)/SEC
200504LO, 00000708	4.9E-09	2.3E-09

CETCO - Bentomat ST GCL - Mass/Unit Area & Moisture Content (GCL)

Lot & Roll Number	Composite Moisture Content (%)	Composite Mass/Unit Area (gms/m²)	Dry Bentonite Mass/Unit Area (gms/m²)	Mositure Content Bentonite (%)
200504LO, 00000708	20.69	4326.7	4021.7	22.3

CETCO - Bentomat ST GCL - Peel Adhesion - ASTM D 4632/Modified

Lot & Roll Number	MD Load (lbs)	CDM Load (lbs)
200504LO, 00000708	49.5	59.4

CETCO - Bentomat ST GCL - Moisture Content - ASTM D 2216 (Present Landfill Design)

Lot & Roll Number	Moisture Content Bentonite (%)
200504LO, 00000708	20.8

CETCO - Bentomat ST GCL - Swell Index - ASTM D 5890 (Present Landfill Design)

Lot & Roll Number	Swell Index (cc/gms)	
200504LO, 00000708, Trial 1	22.0	rejected JHR
200504LO, 00000708, Trial 2	21.1	rejected JHR
200504LO, 00000708, Trial 3	20.0	rejected JHR
200504LO, 00000707	19.5	rejected JHR
200504LO, 00000709	20.0	rejected JHR

CETCO-Bentomat DN Large Scale Direct Shear-ASTM D 6243

Test Series Number	Normal Stress Range (psf)	Normal Sress vs. Peak Shear Sress		Normal Stress vs. Post - Peak Shear Stress	
		Friction Angle (degrees)	Cohesion (psf)	Friction Angle (degrees)	Cohesion (psf)
DS-2, Roll #10, Lot #200503LO	200-600	49.5	201.3	37.8	259.7

CETCO-Bentomat DN & ST Large Scale Direct Shear - ASTM D 6243

Test Series Number	Normal Force (psf)	Peak Shear Sress (psf)
DS-4, Roll #10 Lot #200503LO	200	1081
DS-1, Roll #55, Lot #200503LO	200	835
DS-3, Roll #00000708, Lot #200504LO, Bentomat ST	200	792

Should you have any questions or require additional information please, feel free to give us call.

Sincerley,

Sharon Roberts

Sharon Roberts
Geosynthetic Division Manager

K:/TT2617/TTFI305.lwp

Rahe, John -- MFG, Inc.

From: Rahe, John -- MFG, Inc.
Sent: Tuesday, March 08, 2005 10:32 AM
To: 'Robert.Davis@rfets.gov'
Cc: 'josh.valentine@ttrmc.com'; 'cwienecke@terratesting.com'
Subject: PLF-Bentomat ST GCL for Remainder of Top Cover - QA Conformance Testing

Bob,

The most recent free swell tests for the Bentomat ST GCL delivered to the site this winter failed to meet the required specifications; an average of 7 tests had a free swell of approximately 20.3 ml/2 grams (ASTM D 5890), and all of the tests were below the specified minimum of 24 ml/2 grms.

Close examination of the bentonite in the samples indicated a fine-grained iron material in most of the samples that could be removed with a magnet. Removal of such material from the bentonite would also likely cause the bentonite mass/unit area to be below the specified minimum. Therefore, the rolls of Bentomat ST delivered to the site this winter (Lot 200504LO, Rolls #00000701 to ---710) have been rejected for use at the site, and CETCO is delivering a new set of 10 rolls, with a sample sent directly to ATT this week for full QA conformance testing required by the QA/QC Plan. ATT will perform the QA performance testing of the new Bentomat ST as quickly as possible to provide QA data prior to installation of the remaining GCL.

Let me know if you have any questions regarding these QA conformance tests.

Thanks,
John

John H. Rahe, P.E.
Tetra Tech/MFG
303-447-0913 (ext. 104)

Rahe, John -- MFG, Inc.

From: Rahe, John -- MFG, Inc.
Sent: Tuesday, March 22, 2005 1:08 PM
To: 'Robert.Davis@rfets.gov'
Cc: 'josh.valentine@ttrmc.com'; 'marshall.masaro@ttrmc.com'
Subject: PLF - QA Laboratory Testing for GCL Bentomat ST for Remainder of PLF Top Cover System

Bob,

The final QA laboratory testing has been completed for the Bentomat ST GCL (roll #00001728, Lot # 200511LO) obtained from materials recently delivered to Advanced Terra Testing (ATT) for the remainder of the PLF top cover system. This material replaces the previous Bentomat ST delivered to the site earlier this winter, which did not meet the specifications.

1) The peel adhesion tests (ASTM D 4632 Modified) indicated an average peel adhesion of 40.4 lbs in the machine direction with a single test minimum of 25.9 lbs, and an average of 45.3 lbs in the cross machine direction, which are well above the minimum specified strength of 15 lbs.

2) The composite moisture content of the GCL (ASTM D 5993) was approximately 24.3 percent and the moisture content of the bentonite was approximately 26.3 percent (ASTM D 2216), which are acceptable.

3) The internal shear strength test (ASTM D 6243) indicated a very high shear strength of 918 psf at a confining pressure of 200 psf, which is well in excess of the minimum shear strength of 500 psf.

4) The permeability test (ASTM D 5887) indicated an end point permeability of 2.6(10)^-9 cm/sec, which is below the maximum specified permeability of 5(10)^-9 cm/sec, and the same test indicated an index flux of 4.4(10)^-9 cu m/sq m/sec, also below the specified limit of 1(10)^-8 cu m/sq m/sec.

5) The GCL bentonite was tested for mass/unit area (ASTM D 5993) and found to have an average of 0.95 lb/sq ft, which is well in excess of the specified minimum of 0.75 lb/sq ft.

6) The bentonite had a laboratory measured swell index (ASTM D 5890) of 25.5 mL/2g, which is in excess of the minimum swell index of 24 mL/2g.

Therefore, the additional Bentomat ST GCL recently delivered to ATT for completion of the top PLF cover system should be acceptable for installation.

Let me know if you have any questions regarding these QA laboratory tests.

Thanks,
John

John H. Rahe, P.E.
Tetra Tech/MFG
303-447-0913 (ext. 104)

THICKNESS
ASTM D 5199
(IN.)

CLIENT: Tetra Tech-RMC

JOB NO.: 2617-03

PROJECT: Rocky Flats Present Landfill Closure

DATE: 02-01-05 SKL

Roll #104122977, Product Code: LUT060A00
60 mil LLDPE-T

1	0.0597	**2**	0.0606	**3**	0.0609	**4**	0.0608	**5**	0.0607
	0.0608		0.0598		0.0610		0.0601		0.0590
	0.0603		0.0610		0.0596		0.0595		0.0613
	0.0610		0.0612		0.0594		0.0606		0.0602
	0.0601		0.0601		0.0606		0.0609		0.0612
Average	0.0604	**Average**	0.0605	**Average**	0.0603	**Average**	0.0603	**Average**	0.0605
							AVERAGE FOR 5 SPECIMENS		**0.0604**

DATA ENTERED BY: SR
DATA CHECKED BY: JTR
FILENAME: TTTH2977

DATE: 02/18/2005
DATE: 2/18/05

ADVANCED TERRA TESTING, INC.

THICKNESS
ASTM D 5199
(IN.)

CLIENT: Tetra Tech-RMC

JOB NO.: 2617-03

PROJECT: Rocky Flats Present Landfill Closure

DATE: 02-01-05 SKL

Roll #104123038, Product Code: LUT060A00
60 mil LLDPE-T

1	0.0620	**2**	0.0595	**3**	0.0615	**4**	0.0604	**5**	0.0604
	0.0616		0.0614		0.0603		0.0598		0.0607
	0.0594		0.0620		0.0605		0.0597		0.0600
	0.0600		0.0616		0.0588		0.0605		0.0597
	0.0613		0.0613		0.0607		0.0607		0.0613
Average	0.0608	**Average**	0.0612	**Average**	0.0603	**Average**	0.0602	**Average**	0.0604
								AVERAGE FOR 5 SPECIMENS	**0.0606**

DATA ENTERED BY: SR
DATA CHECKED BY: JTR
FILENAME: TTTH3038

DATE: 02/18/2005
DATE: 2/18/05

ADVANCED TERRA TESTING, INC.

THICKNESS
ASTM D 5199
(IN.)

CLIENT: Tetra Tech-RMC

JOB NO.: 2617-03

PROJECT: Rocky Flats Present Landfill Closure, Golden, CO

DATE: 01-31-05 JTR

Roll No.: 104124722, Product Code: LUT060A000
60 mil LLDPE-T

1	0.0635	**2**	0.0649	**3**	0.0640	**4**	0.0670	**5**	0.0633
	0.0639		0.0638		0.0638		0.0653		0.0621
	0.0628		0.0642		0.0651		0.0621		0.0649
	0.0604		0.0656		0.0639		0.0650		0.0636
	0.0619		0.0641		0.0648		0.0645		0.0628
Average	0.0625	**Average**	0.0645	**Average**	0.0643	**Average**	0.0648	**Average**	0.0633
								AVERAGE FOR 5 SPECIMENS	**0.0639**

DATA ENTERED BY: SR
DATA CHECKED BY: JTR
FILENAME: TTTH4722

DATE: 01/31/2005
DATE: 1/31/05

ADVANCED TERRA TESTING, INC.

THICKNESS
ASTM D 5994
(IN.)

CLIENT: Tetra Tech-RMC

JOB NO.: 2617-03

PROJECT: Present Landfill-RFETS, Golden, CO

DATE: 02-09-05 JTR

Roll # 104124723, Product Code: LUT060A000
60 mil LLDPE-T

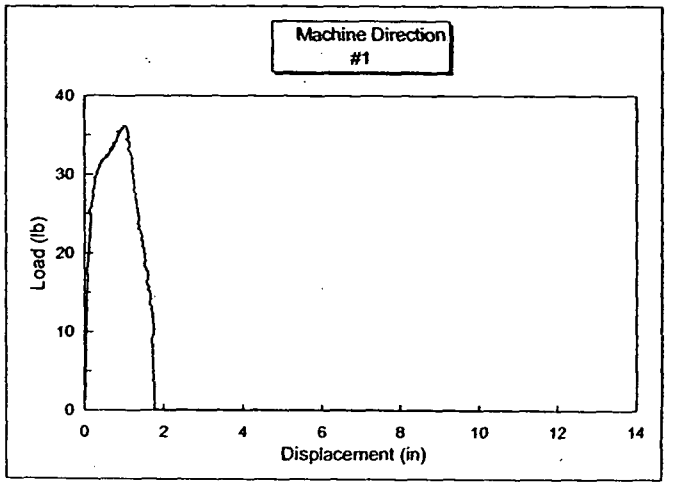
1	0.0605	**2**	0.0650	**3**	0.0604	**4**	0.0676	**5**	0.0668
	0.0656		0.0641		0.0610		0.0691		0.0639
	0.0631		0.0588		0.0570		0.0619		0.0642
	0.0611		0.0663		0.0624		0.0608		0.0618
	0.0618		0.0619		0.0572		0.0616		0.0633
Average	0.0624	**Average**	0.0632	**Average**	0.0596	**Average**	0.0642	**Average**	0.0640
								AVERAGE FOR 5 SPECIMENS	**0.0627**

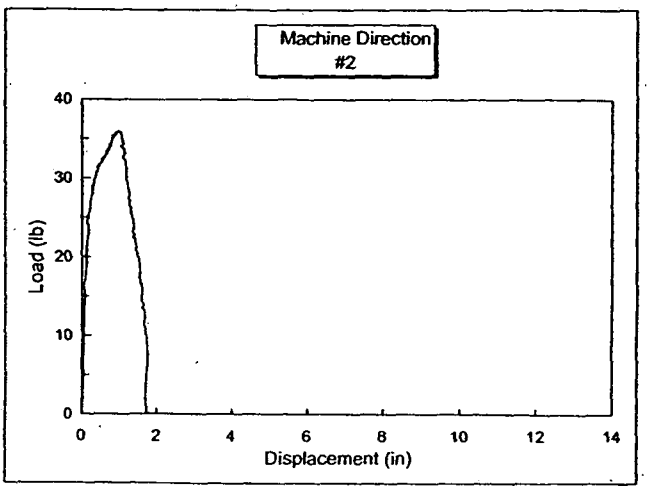
DATA ENTERED BY: SR
DATA CHECKED BY: SKL
FILENAME: TTTH4723

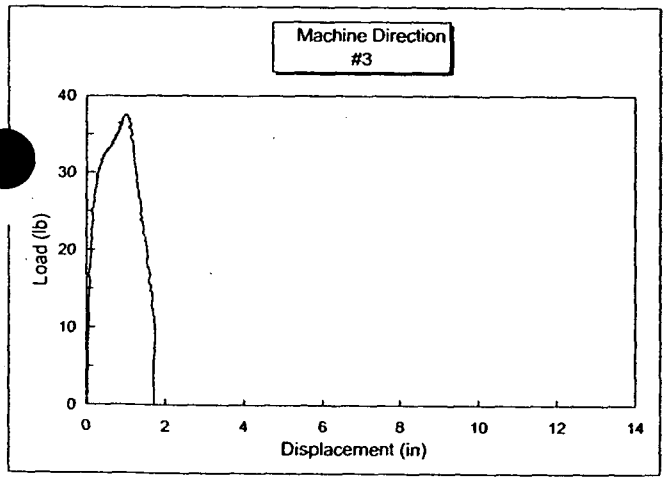
DATE: 02/09/2005
DATE: 2/9/05

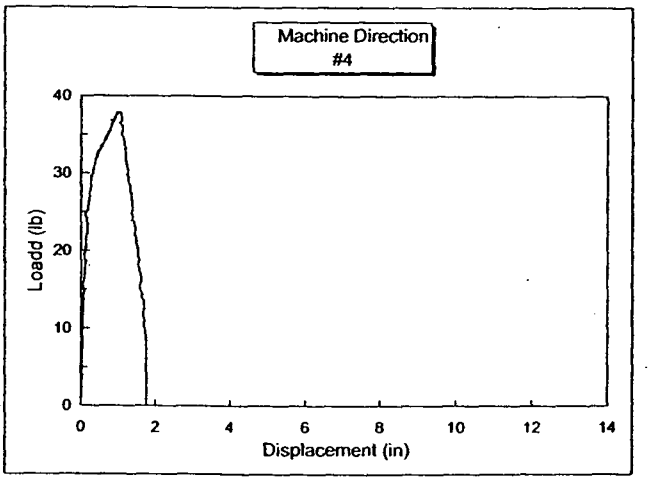
ADVANCED TERRA TESTING, INC.

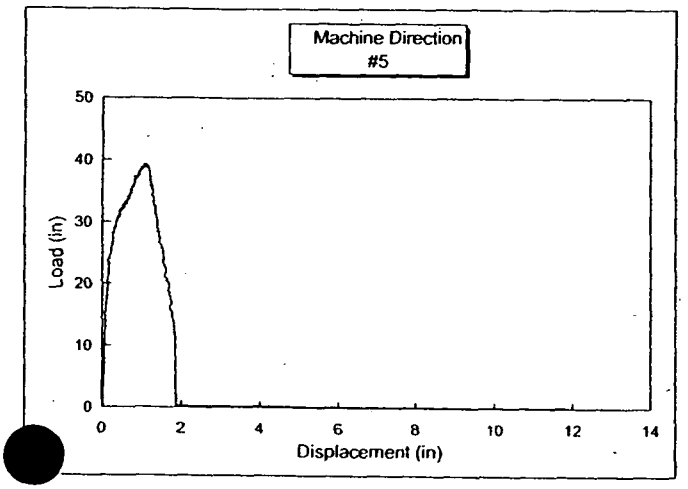
Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-03	Material Type:	60 mil LLDPE-T
Location:	Rocky Flats Present Landfill Closure, Golden, CO	Date Tested:	02-02-05 JTR
Roll No.:	104122977	Resin Lot No.:	
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	LLD060A00	Grip Seperation:	1.0"

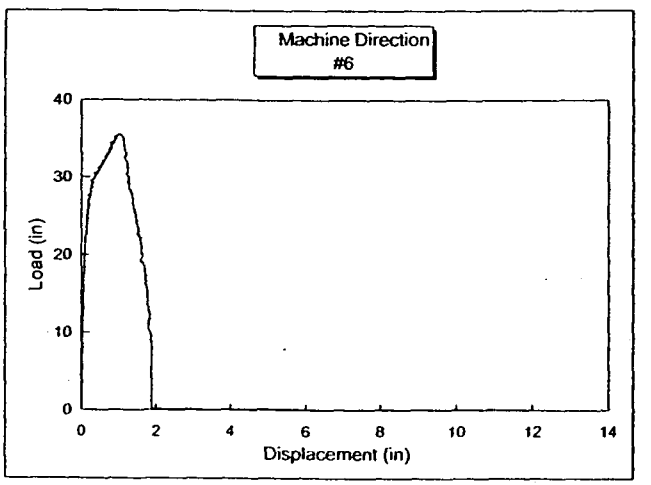










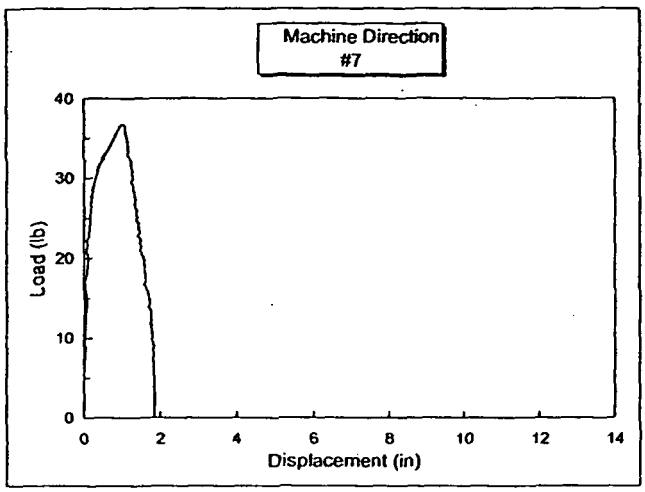


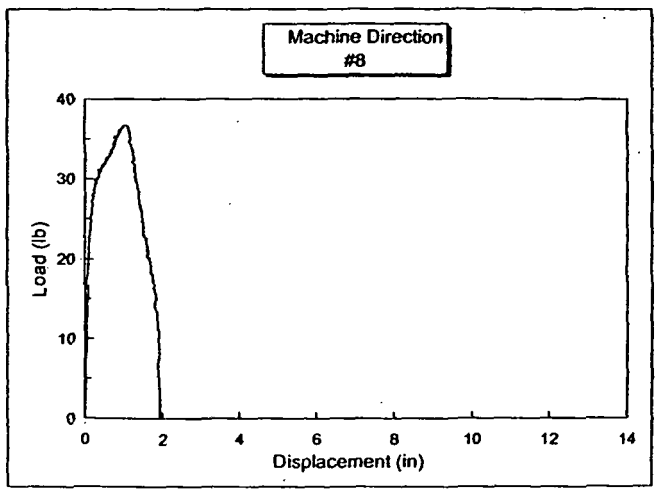
Filename: TTTR2977 Checked By: JTR Date: 2/2/05

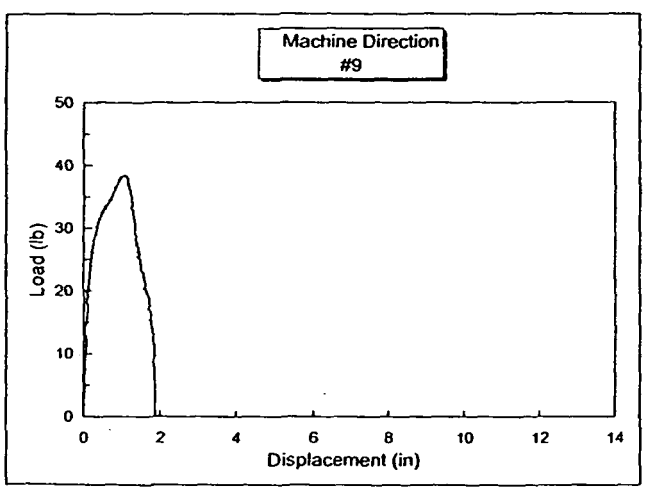
Raw Data File: TTSTRM2, TTSTRM3, TTSTRM12, TTSTRM13.TXT

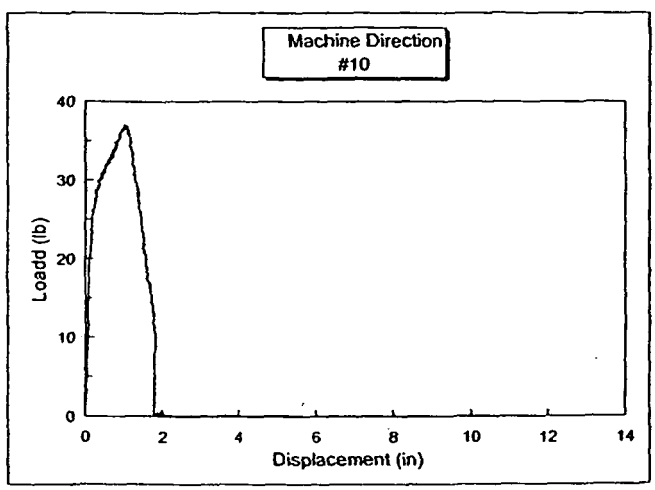
Advanced Terra Testing, Inc.

Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-03	Material Type:	60 mil LLDPE-T
Location:	Rocky Flats Present Landfill Closure, Golden, CO	Date Tested:	02-02-05 JTR
Roll Number:	104122977	Resin Lot No.:	
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	LLD060A00	Grip Seperation:	1.0"









Machine Direction

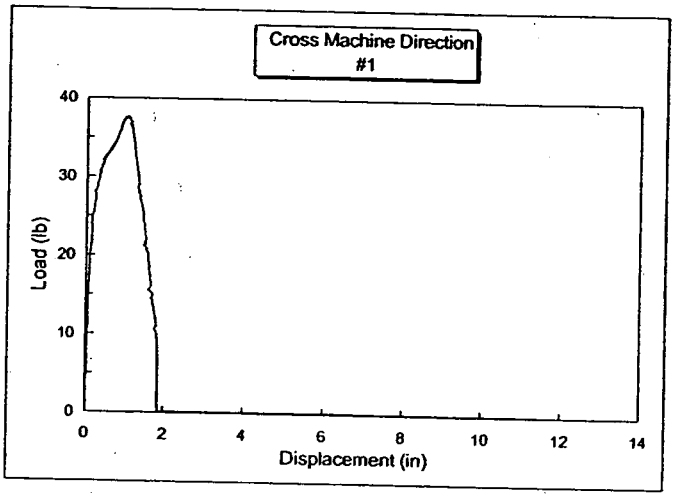
	Load at Break (lb/in width)		Load at Break (lb/in width)
Specimen #1	36.2	Specimen #6	35.5
Specimen #2	36.0	Specimen #7	36.8
Specimen #3	37.5	Specimen #8	36.8
Specimen #4	37.8	Specimen #9	38.5
Specimen #5	39.3	Specimen #10	37.1
Average	37.1		
Std. Deviation	1.1		

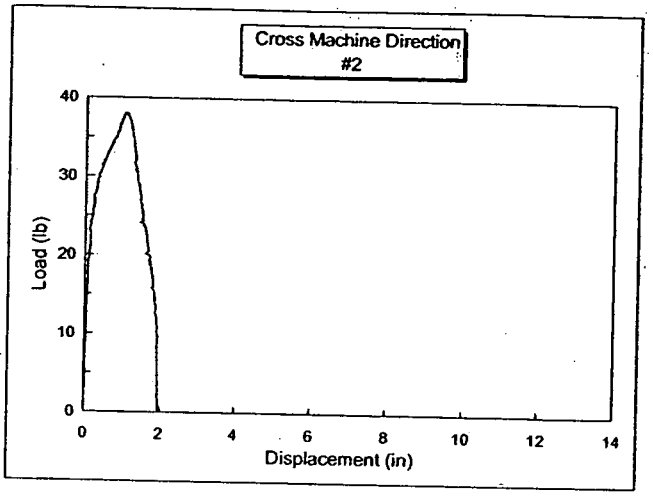
Filename: TTTR2977 Checked By: JR Date: 2/2/05

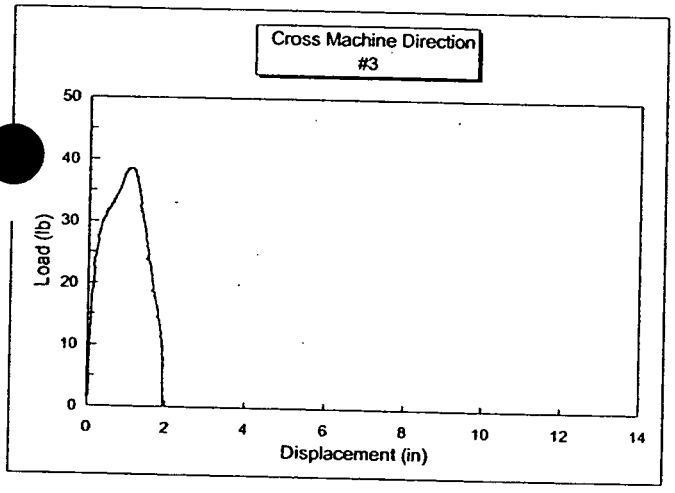
Raw Data File: TTSTRM2, TTSTRM3, TTSTRM12, TTSTRM13.TXT

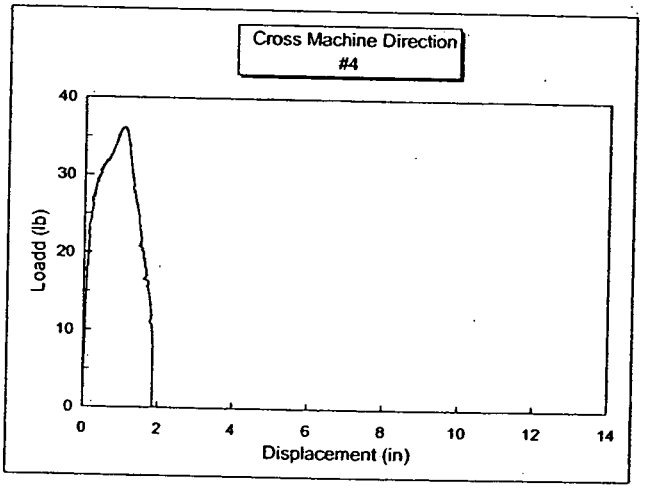
Advanced Terra Testing, Inc.

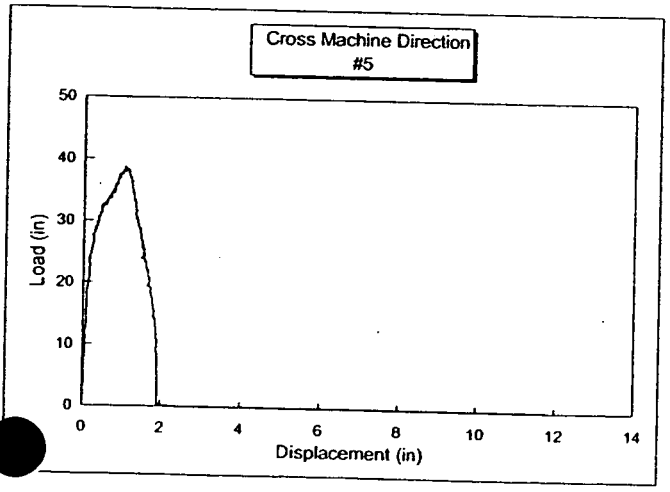
Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-03	Material Type:	60 mil LLDPE-T
Location:	Rocky Flats Present Landfill Closure, Golden, CO	Date Tested:	02-02-05 JTR
Roll No.:	104122977	Resin Lot No.:	
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	LLD060A00	Grip Seperation:	1.0"

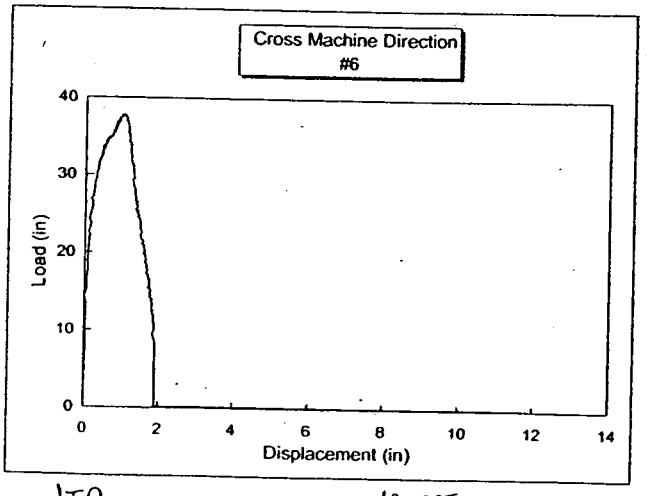












Filename: TTTR297C

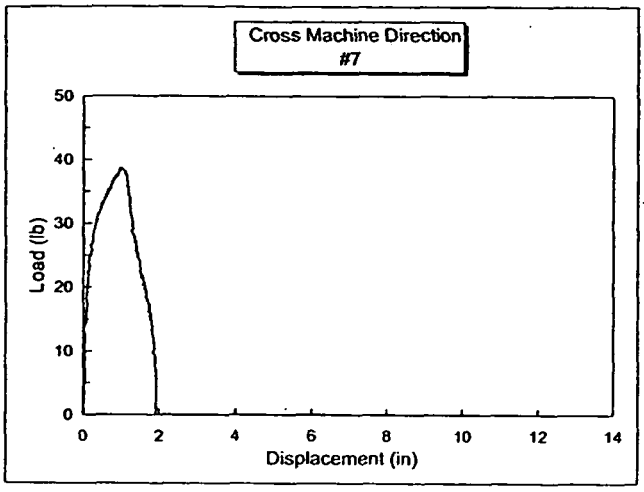
Raw Data File: TTSTRC2, TTSTRC3, TTSTRC12, TTSTRC13.TXT

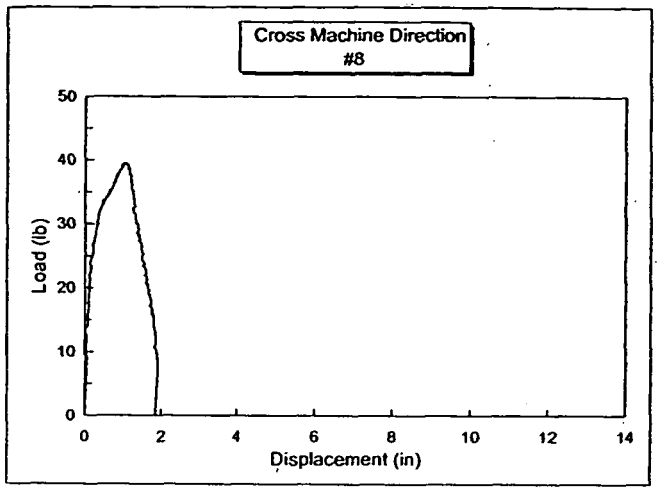
Checked By: JTR

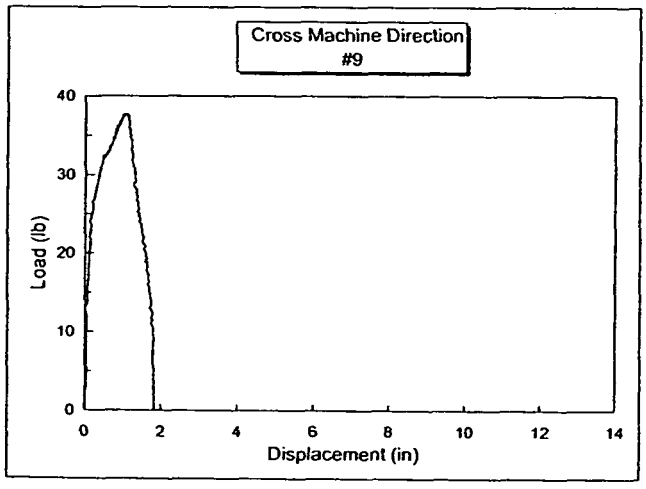
Date: 2/2/05

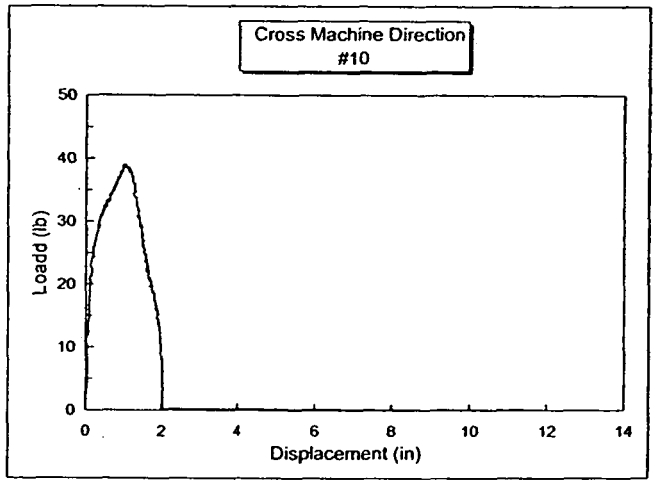
Advanced Terra Testing, Inc.

Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-03	Material Type:	60 mil LLDPE-T
Location:	Rocky Flats Present Landfill Closure, Golden, CO	Date Tested:	02-02-05 JTR
Roll Number:	104122977	Resin Lot No.:	
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	LLD060A00	Grip Seperation:	1.0"









Cross Machine Direction

	Load at Break (lb/in width)		Load at Break (lb/in width)
Specimen #1	37.7	Specimen #6	37.7
Specimen #2	38.0	Specimen #7	38.7
Specimen #3	38.5	Specimen #8	39.4
Specimen #4	36.1	Specimen #9	37.7
Specimen #5	38.8	Specimen #10	39.0

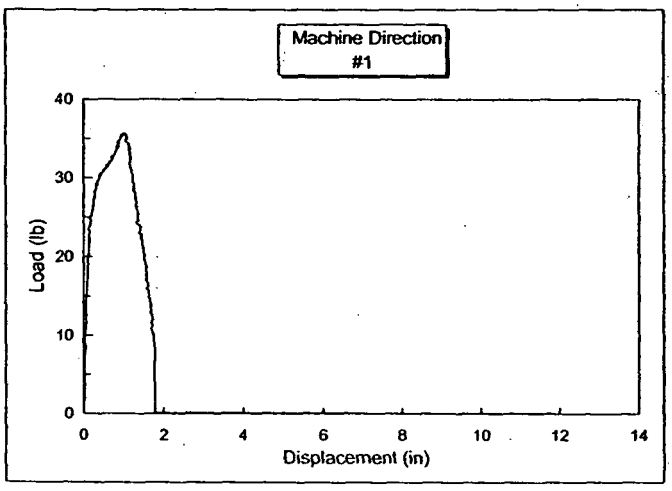
Average	38.2
Std. Deviation	0.9

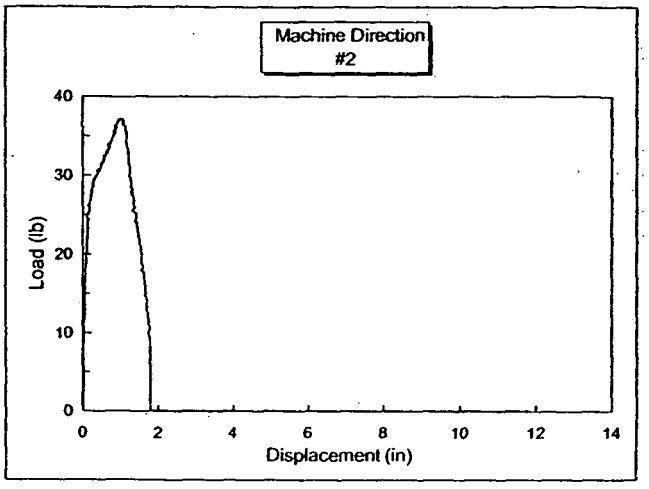
Filename: TTTR297C Checked By: JTR Date: 2/2/05

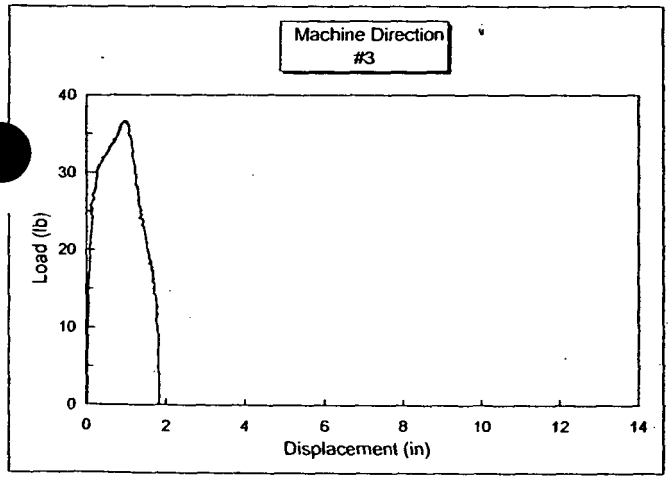
Raw Data File: TTSTRC2, TTSTRC3, TTSTRC12, TTSTRC13.TXT

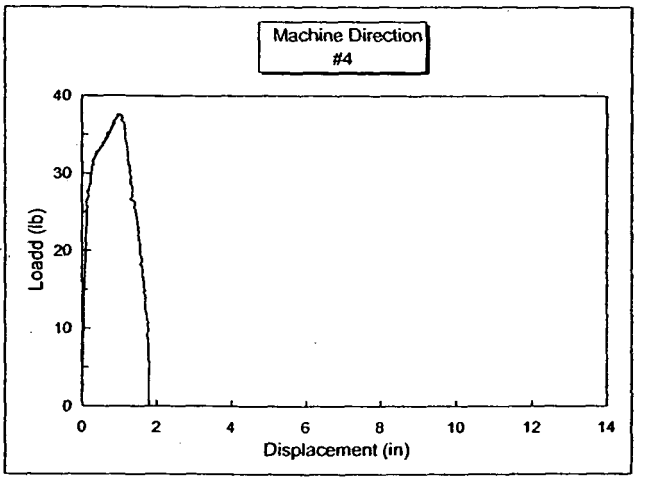
Advanced Terra Testing, Inc.

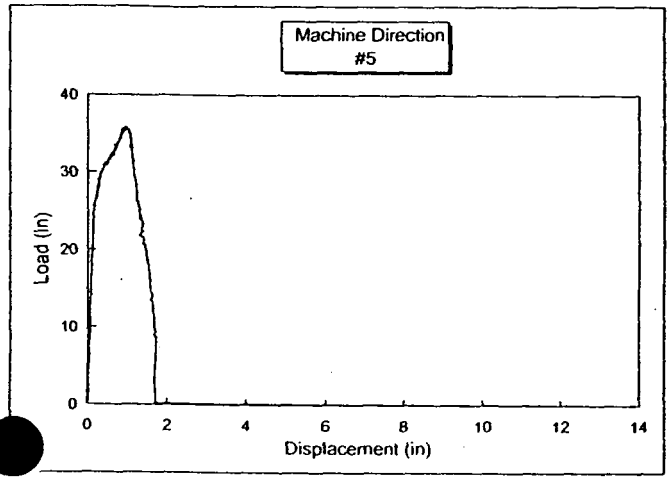
Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-03	Material Type:	60 mil LLDPE-T
Location:	Rocky Flats Present Landfill Closure, Golden, CO	Date Tested:	02-02-05
Sample:	104123038	Tested By:	JTR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	GSE, LUT060A000	Grip Seperation:	1.0"

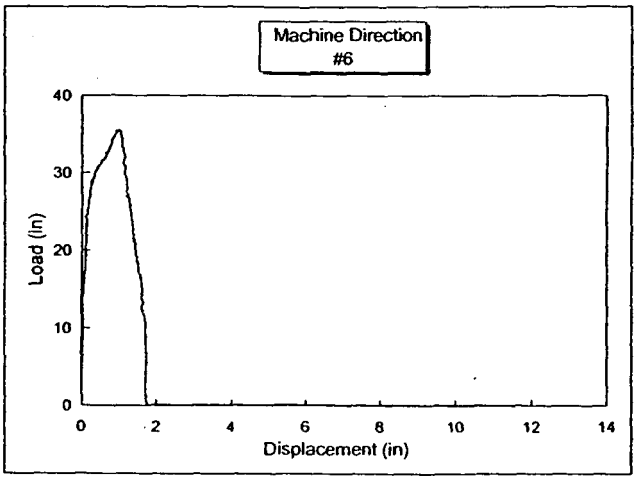










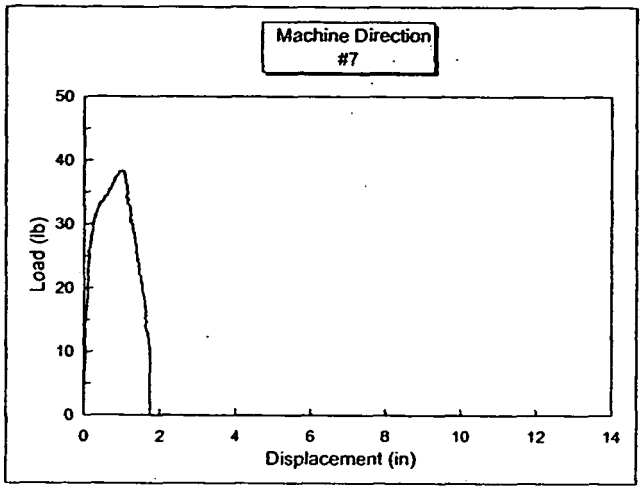


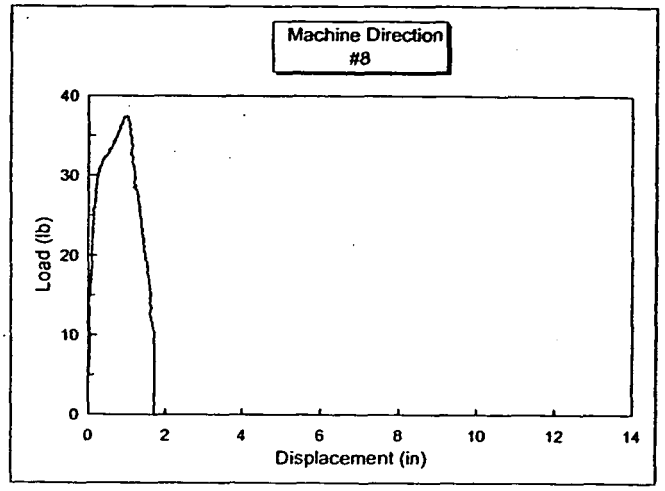
Filename: TTTR3038 Checked By: JTR Date: 2/2/05

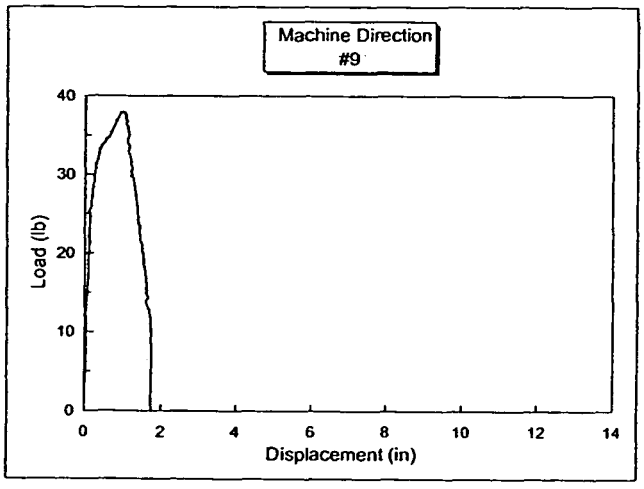
Raw Data File: TTRTRM2, TTRTRM3, TTRTRM12, TTRTRM13.TXT

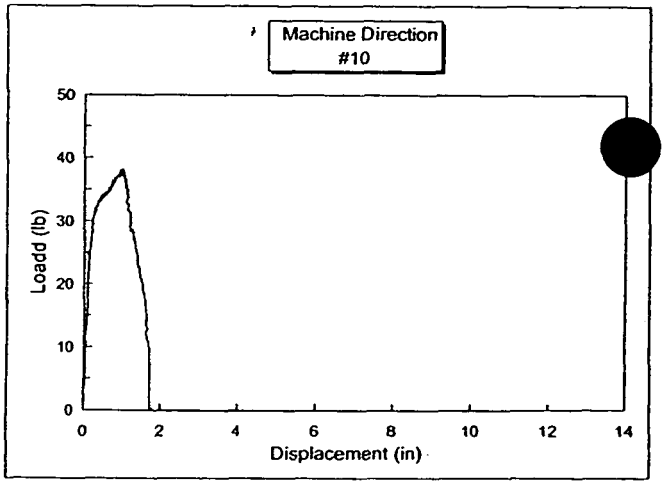
Advanced Terra Testing, Inc.

Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-03	Material Type:	60 mil LLDPE-T
Location:	Rocky Flats Present Landfill Closure, Golden, CC	Date Tested:	02-02-05
Sample:	104123038	Tested By:	JTR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	GSE, LUT060A000	Grip Seperation:	1.0"









Machine Direction

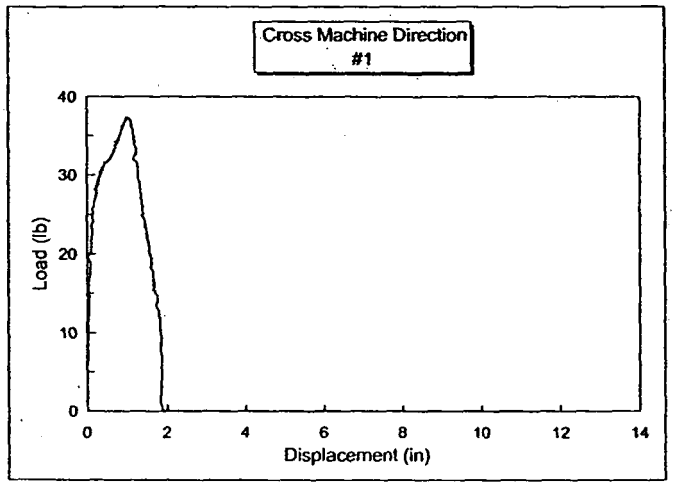
	Load at Break (lb/in width)		Load at Break (lb/in width)
Specimen #1	35.7	Specimen #6	35.5
Specimen #2	37.3	Specimen #7	38.5
Specimen #3	36.6	Specimen #8	37.5
Specimen #4	37.6	Specimen #9	38.1
Specimen #5	35.8	Specimen #10	38.4
Average	**37.1**		
Std. Deviation	**1.1**		

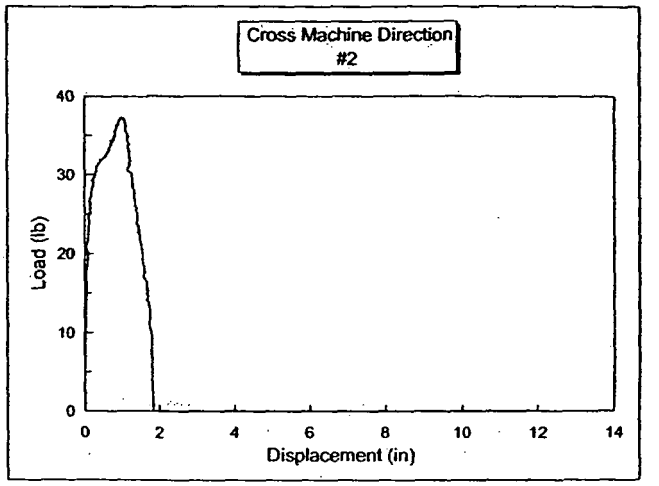
Filename: TTTR3038 Checked By: JTR Date: 2/2/05

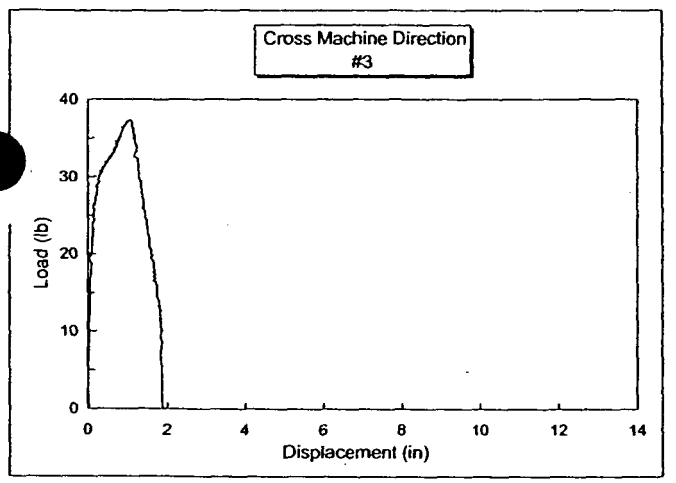
Raw Data File: TTRTRM2, TTRTRM3, TTRTRM12, TTRTRM13.TXT

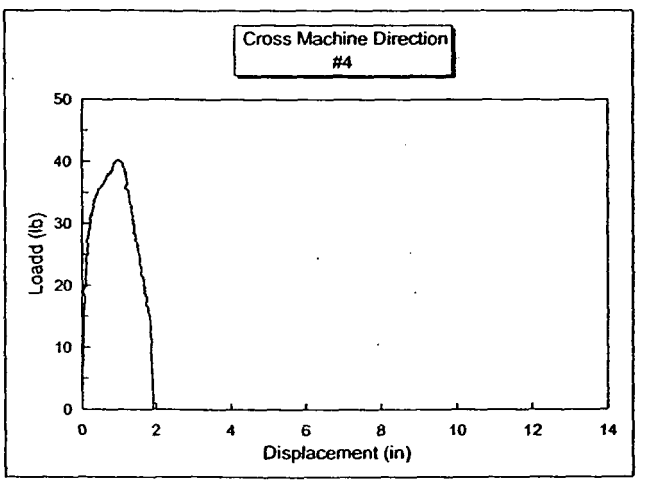
Advanced Terra Testing, Inc.

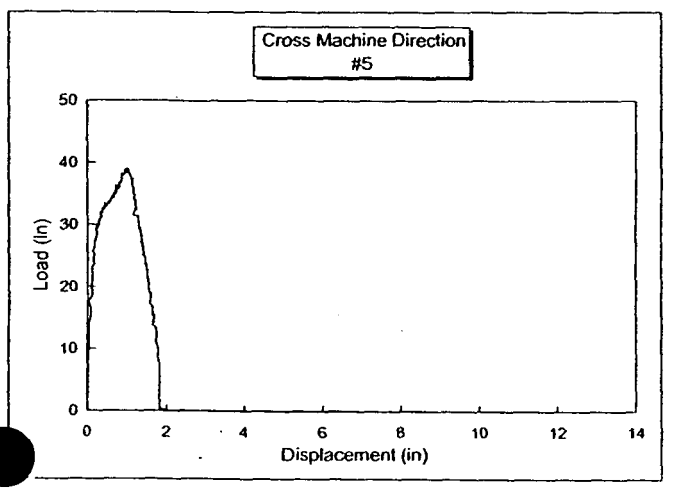
Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-03	Material Type:	60 mil LLDPE-T
Location:	Rocky Flats Present Landfill Closure, Golden, CO	Date Tested:	02-02-05
Sample:	104123038	Tested By:	JTR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	GSE, LUT060A000	Grip Seperation:	1.0"

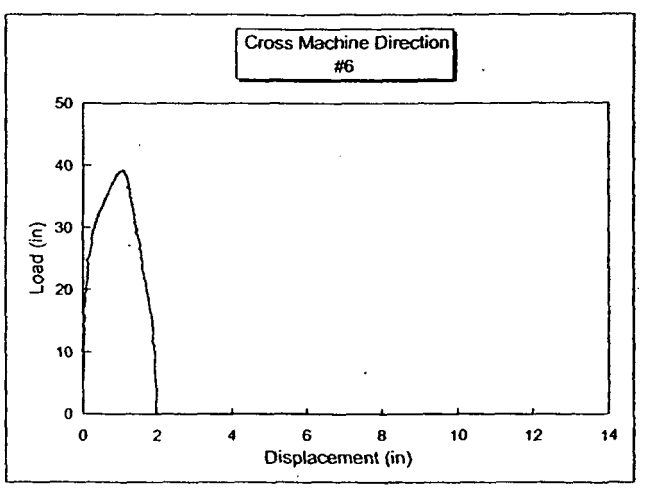










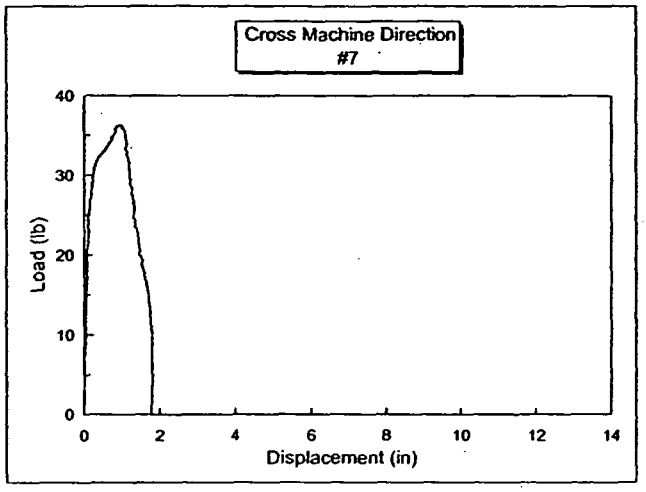


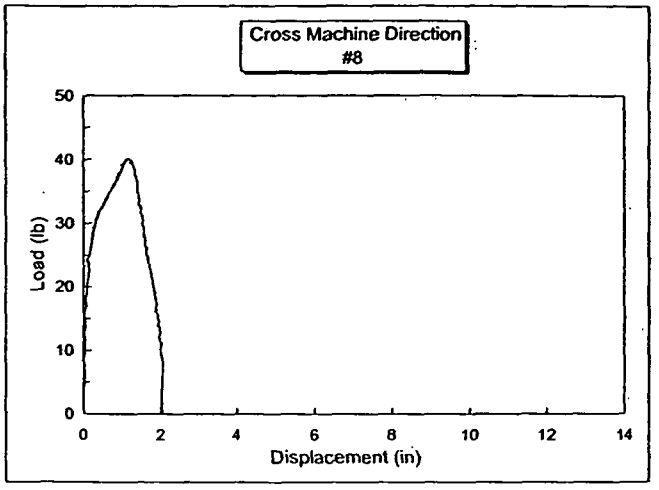
Filename: TTTR303C Checked By: JTR Date: 2/2/05

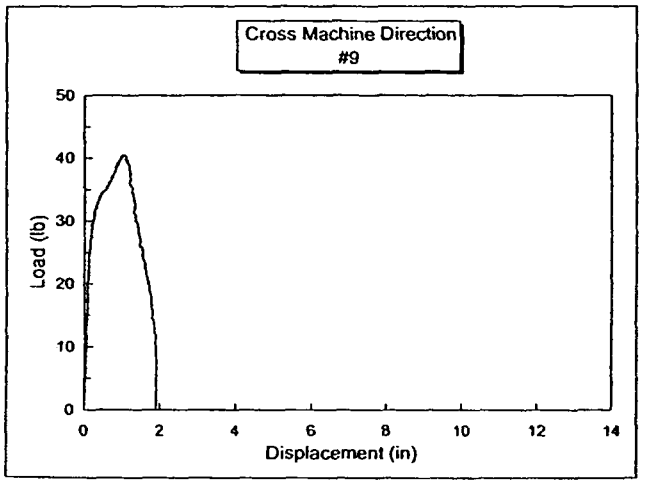
Raw Data File: TTRTRC2, TTRTRC3, TTRTRC12, TTRTRC13.TXT

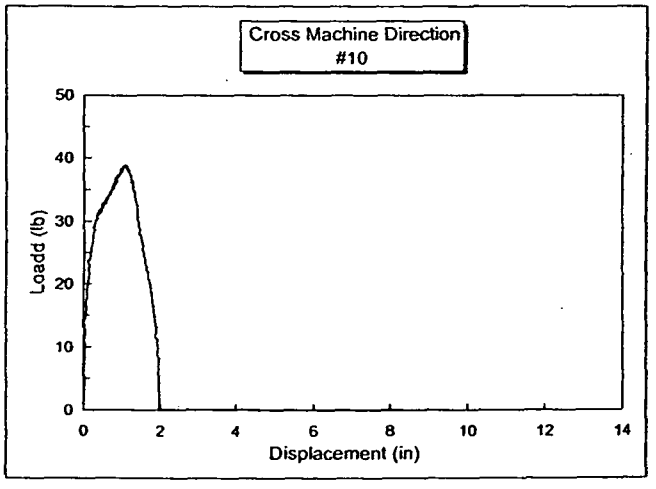
Advanced Terra Testing, Inc.

Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-03	Material Type:	60 mil LLDPE-T
Location:	Rocky Flats Present Landfill Closure, Golden, CC	Date Tested:	02-02-05
Sample:	104123038	Tested By:	JTR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	GSE, LUT060A000	Grip Seperation:	1.0"









Cross Machine Direction

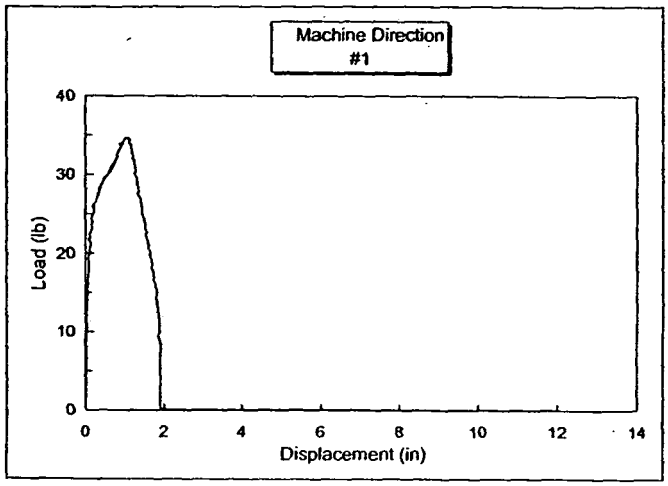
	Load at Break (lb/in width)		Load at Break (lb/in width)
Specimen #1	37.3	Specimen #6	39.2
Specimen #2	37.4	Specimen #7	36.4
Specimen #3	37.3	Specimen #8	40.1
Specimen #4	40.2	Specimen #9	40.6
Specimen #5	39.0	Specimen #10	39.0
Average	**38.7**		
Std. Deviation	**1.4**		

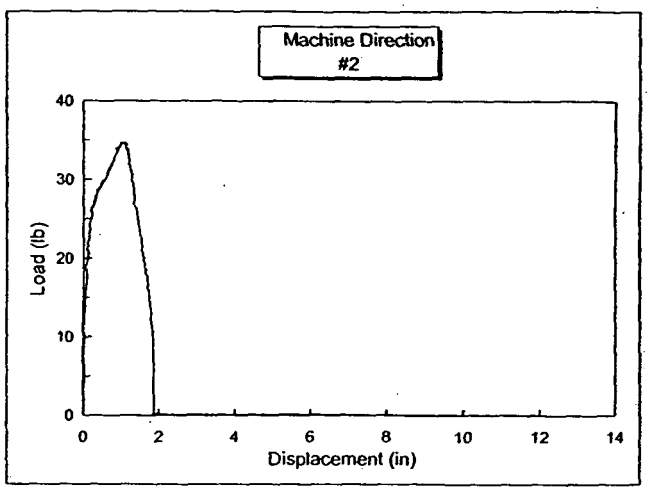
Filename: TTTR303C Checked By: JTR Date: 2/2/05

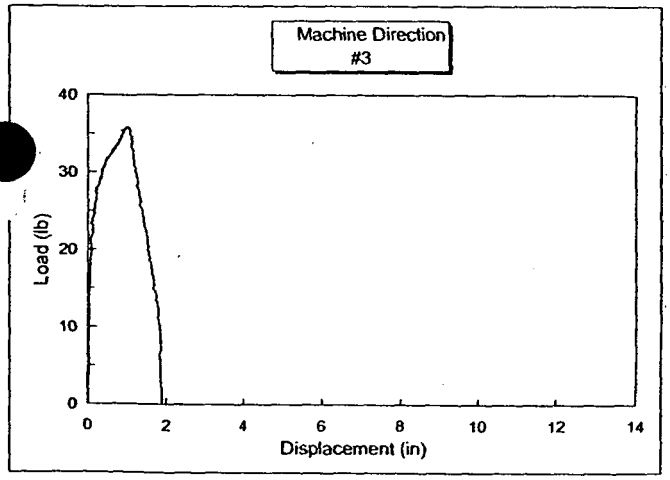
Raw Data File: TTRTRC2, TTRTRC3, TTRTRC12, TTRTRC13.TXT

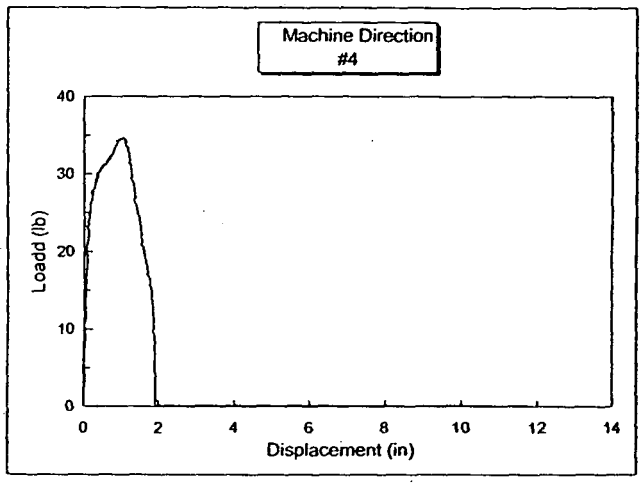
Advanced Terra Testing, Inc.

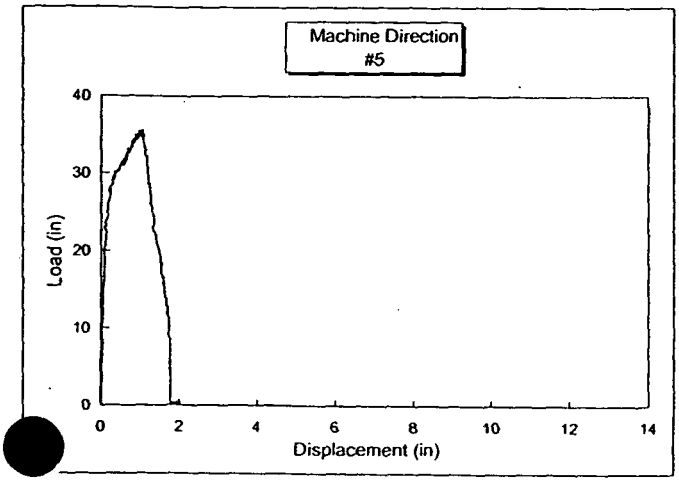
Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-03	Material Type:	60 mil LLDPE-T
Location:	Rocky FlatsPresent Landfill Closure, Golden, CO	Date Tested:	01-31-05 JTR
Roll No.:	104124722	Resin Lot No.:	
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	LUT060A00	Grip Seperation:	1.0"

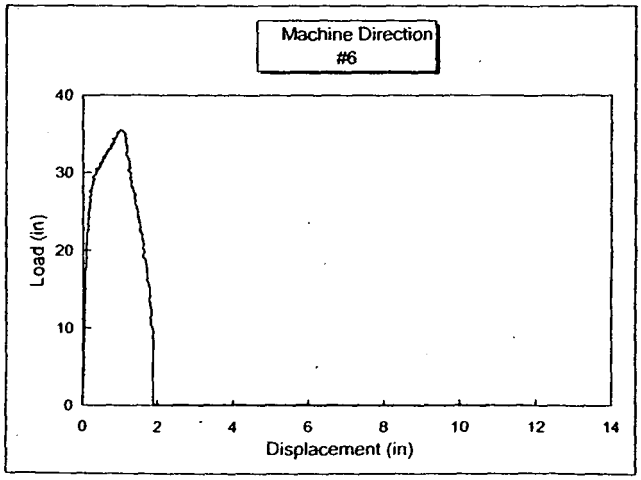










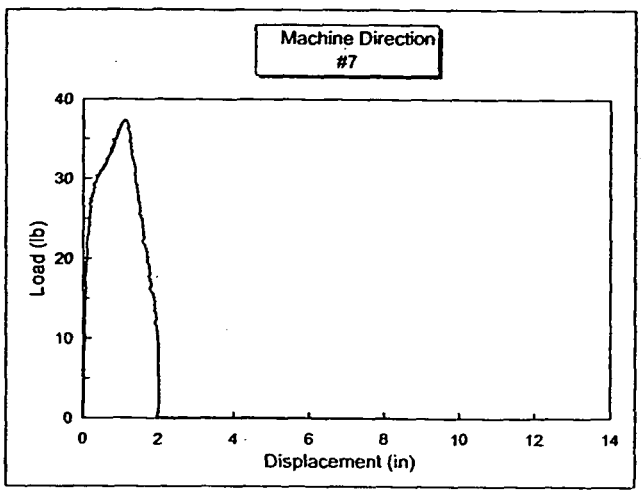


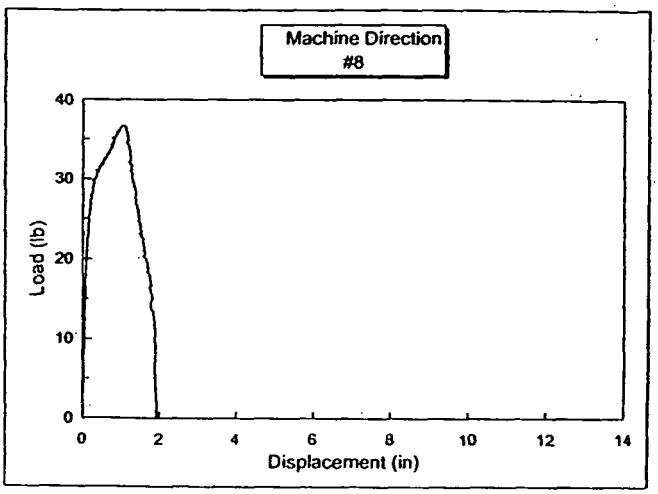
Filename: TTTR4722 Checked By: JTK Date: 1/31/05

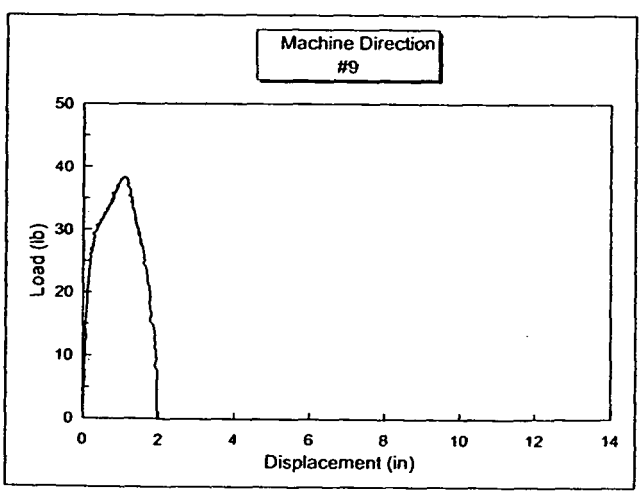
Raw Data File: TTTTRM2, TTTTRM3, TTTTRM12, TTTTRM13.TXT

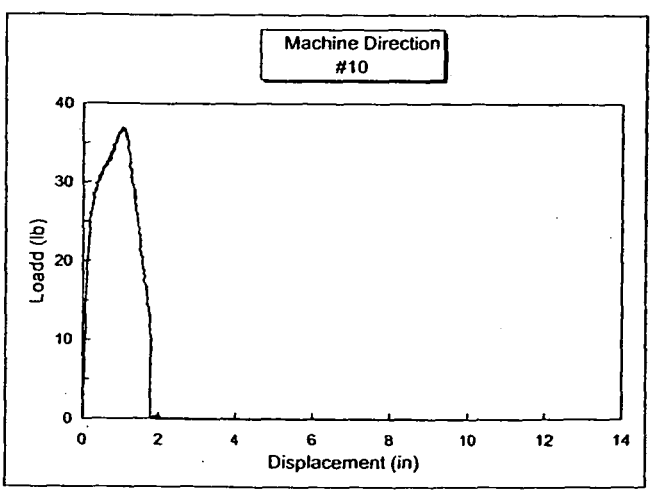
Advanced Terra Testing, Inc.

Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-03	Material Type:	60 mil LLDPE-T
Location:	Rocky FlatsPresent Landfill Closure, Golden, CO	Date Tested:	01-31-05 JTR
Roll Number:	104124722	Resin Lot No.:	
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	LUT060A00	Grip Seperation:	1.0"









Machine Direction

	Load at Break (lb/in width)		Load at Break (lb/in width)
Specimen #1	34.7	Specimen #6	35.5
Specimen #2	34.7	Specimen #7	37.5
Specimen #3	35.8	Specimen #8	36.8
Specimen #4	34.6	Specimen #9	38.5
Specimen #5	35.6	Specimen #10	37.1

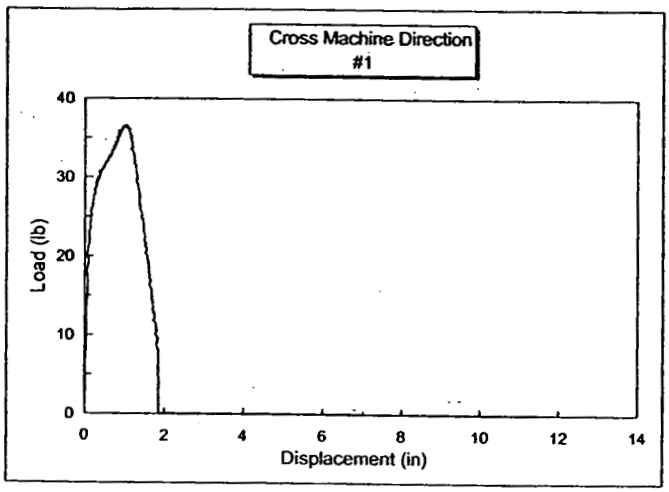
Average	36.1
Std. Deviation	1.3

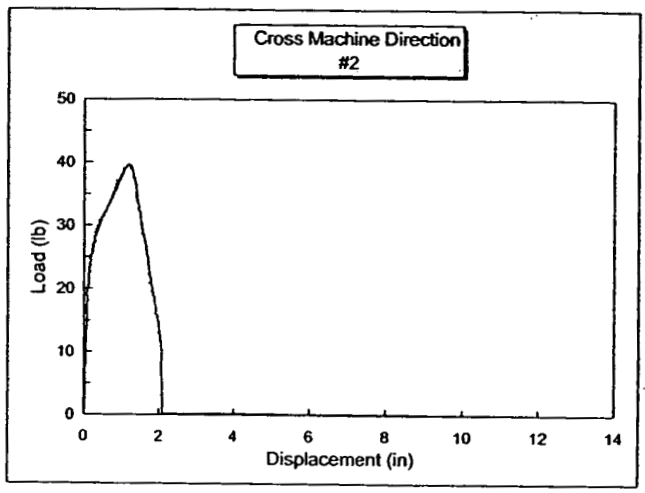
Filename: TTTR4722 Checked By: JTR Date: 1/31/05

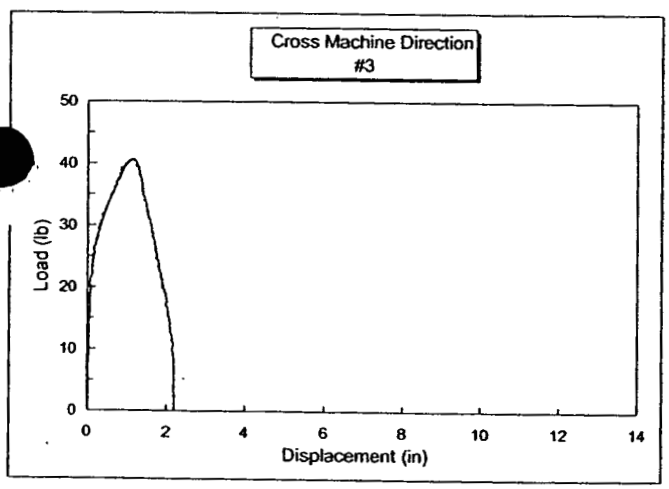
Raw Data File: TTTTRM2, TTTTRM3, TTTTRM12, TTTTRM13.TXT

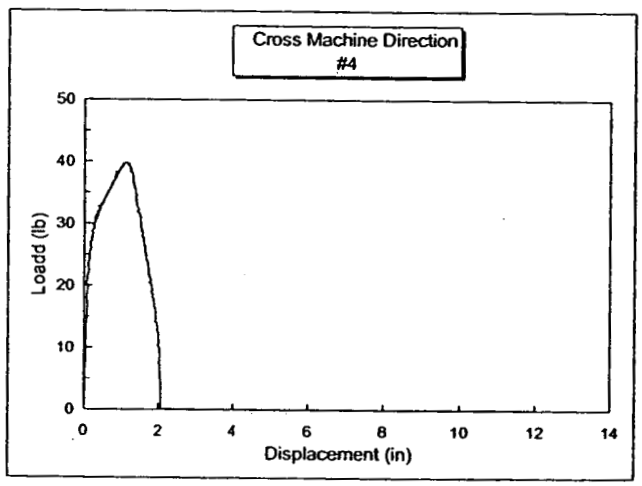
Advanced Terra Testing, Inc.

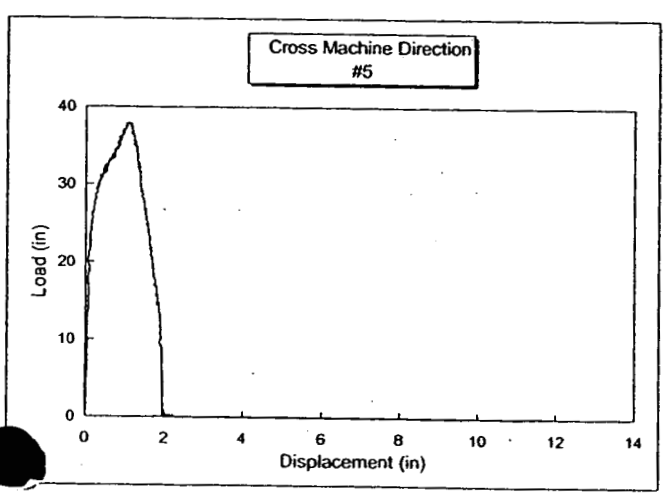
Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-03	Material Type:	60 mil LLDPE-T
Location:	Rocky FlatsPresent Landfill Closure, Golden, CO	Date Tested:	01-31-05 JTR
Roll No.:	104124722	Resin Lot No.:	
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	LUT060A00	Grip Seperation:	1.0"

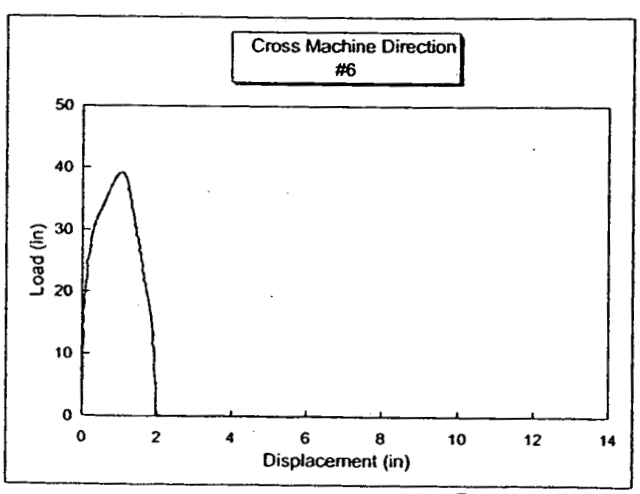












Filename: TTTR472

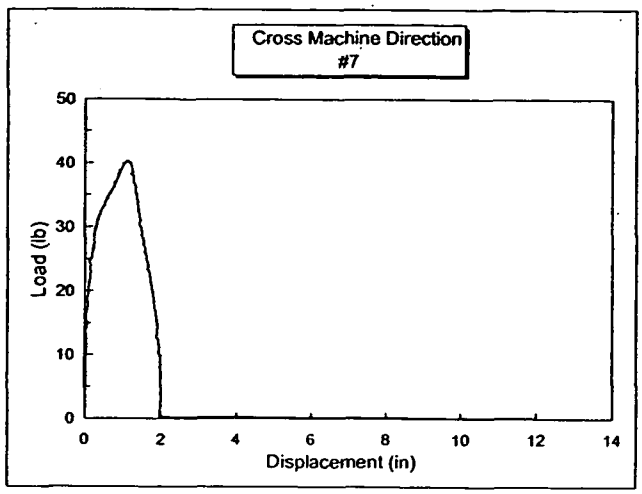
Checked By: JTR

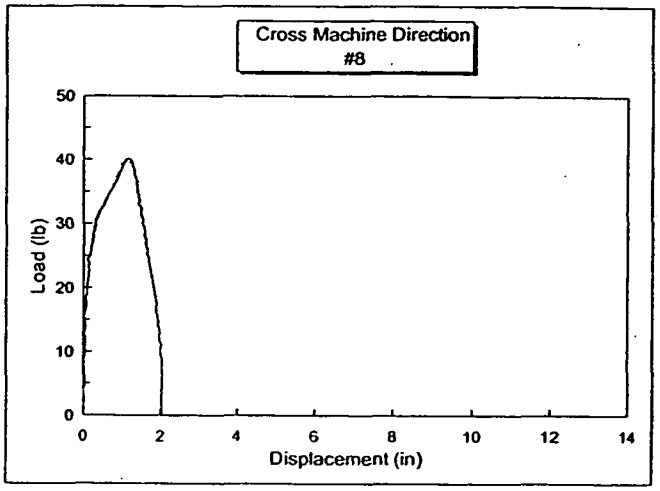
Date: 1/31/05

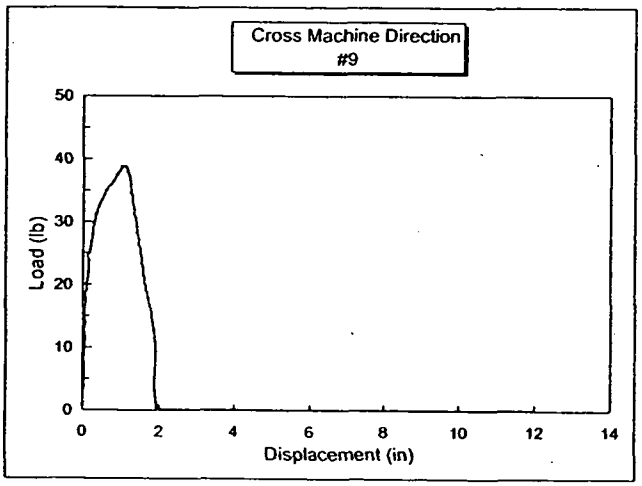
Raw Data File: TTTTRC2, TTTTRC3, TTTTRC12, TTTTRC13.TXT

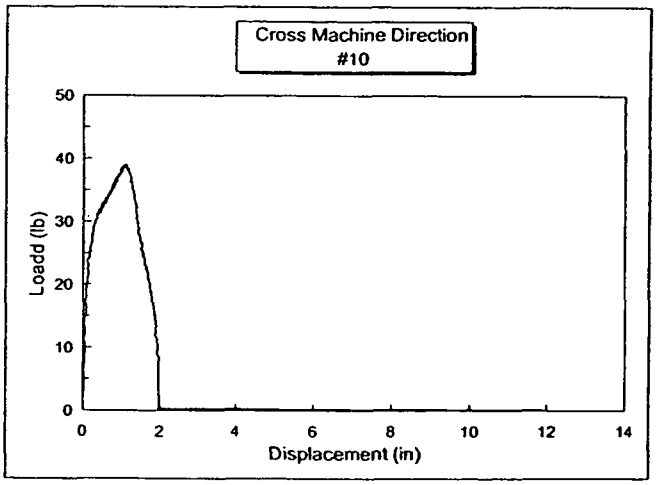
Advanced Terra Testing, Inc.

Client:	Tetra Tech - RMC	Test Type:	ASTM D 1004 Method C
Job No.:	2617-03	Material Type:	60 mil LLDPE-T
Location:	Rocky FlatsPresent Landfill Closure, Golden, CO	Date Tested:	01-31-05 JTR
Roll Number:	104124722	Resin Lot No.:	
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
Product Code:	LUT060A00	Grip Seperation:	1.0"









Cross Machine Direction

	Load at Break (lb/in width)		Load at Break (lb/in width)
Specimen #1	36.7	Specimen #6	39.2
Specimen #2	39.7	Specimen #7	40.3
Specimen #3	40.7	Specimen #8	40.1
Specimen #4	39.8	Specimen #9	38.8
Specimen #5	37.9	Specimen #10	39.0

Average	39.2
Std. Deviation	1.1

Filename: TTTR472 Checked By: JTR Date: 1/31/05

Raw Data File: TTTTRC2, TTTTRC3, TTTTRC12, TTTTRC13.TXT

Advanced Terra Testing, Inc.

02-01-05 JTR

Chatillon Loading System

1 Kip Capacity Load Cell

2617-03

Tetra Tech-RMC

Rocky Flats Present Closure

Roll No.: 104122977, Product Code: LUT060A000

Puncture Resistance, 60 MIL LLDPE-T

ASTM D 4833

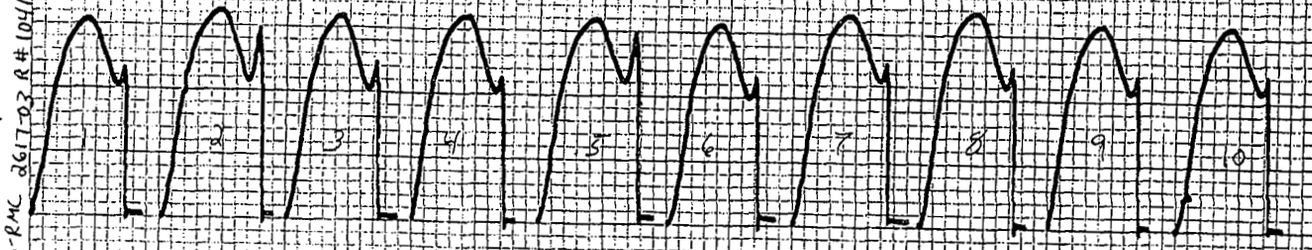
Data Entered By: SR

SCALES X = 1.5"/IN

Y = 75.7#/IN

DISPLACEMENT RATE = 12"/MIN

Specimen Number	Load (lbs)
1	116.6
2	124.1
3	121.9
4	122.6
5	121.9
6	119.6
7	126.4
8	128.7
9	121.1
10	121.1
Average	122.4
Std. Dev.	3.4



JTR 2/1/05 Y=75.7#/IN K=1.5"/IN 60MILLLDPE-T ASTM D4833 ATT#5 TetraTech-RMC 2617-03 R# 104122977

Data Checked By: JTR Date: 2/2/05

Filename: K:/TT2617/TTRP4722.lwp

ADVANCED TERRA TESTING, Inc

02-01-05 JTR
Chatillon Loading System
1 Kip Capacity Load Cell
2617-03

Tetra Tech-RMC
Rocky Flats Present Closure
Roll No.: 1041230038, Product Code: LUT060A000
Puncture Resistance, 60 MIL LLDPE-T
ASTM D 4833

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN
DISPLACEMENT RATE = 12"/MIN

Specimen Number	Load (lbs)
1	112.0
2	124.9
3	121.1
4	121.1
5	122.6
6	123.4
7	121.9
8	119.6
9	121.1
10	124.9
Average	121.3
Std. Dev.	3.7

Data Checked By: JTR Date: 8/2/05
Filename: K:/TT2617/TTRP3038.lwp

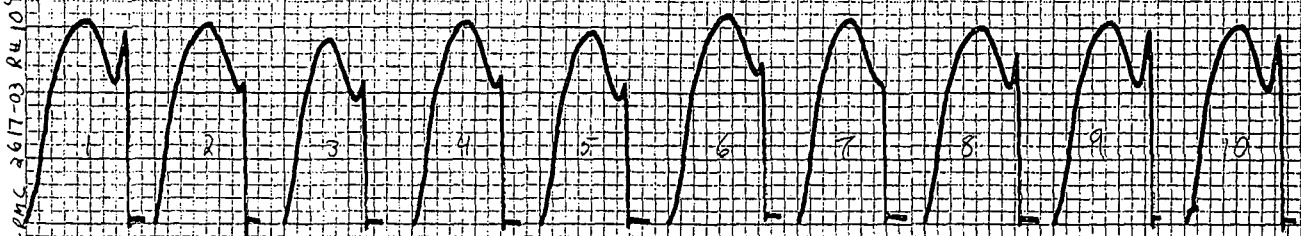
ADVANCED TERRA TESTING, Inc

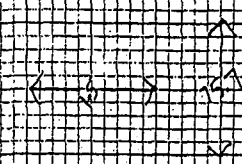
02-01-05 JTR
Chatillon Loading System
1 Kip Capacity Load Cell
2617-03

Tetra Tech-RMC
Rocky Flats Present Closure
Roll No.: 104124722, Product Code: LUT060A000
Puncture Resistance, 60 MIL LLDPE-T
ASTM D 4833

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN
DISPLACEMENT RATE = 12"/MIN

Specimen Number	Load (lbs)
1	118.1
2	116.6
3	108.3
4	117.3
5	112.0
6	121.9
7	119.6
8	114.3
9	117.3
10	115.8
Average	116.1
Std. Dev.	3.9



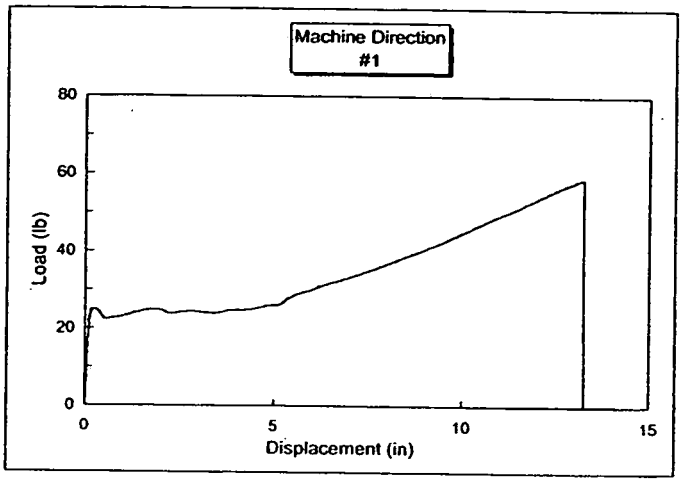


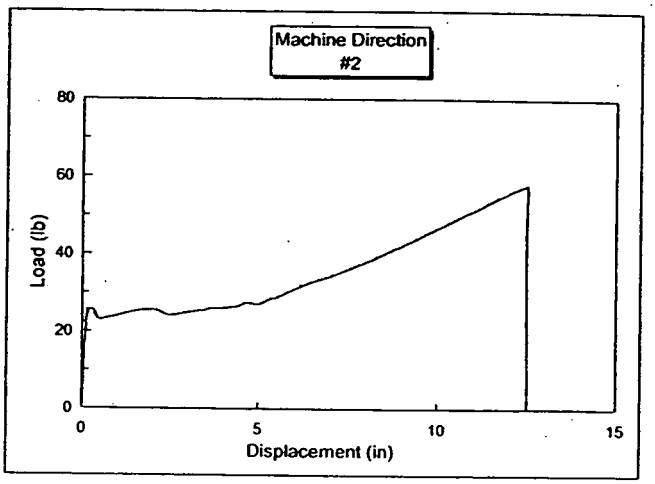
Data Checked By: JTR Date: 2/2/05
Filename: K:/TT2617/TTRP4722.lwp

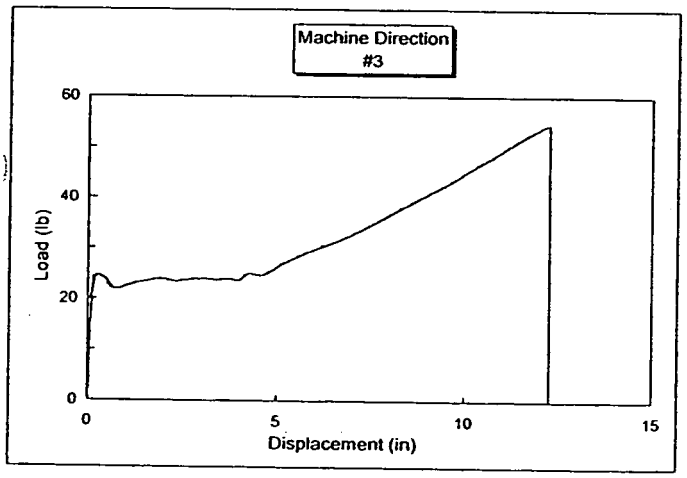
ADVANCED TERRA TESTING, Inc

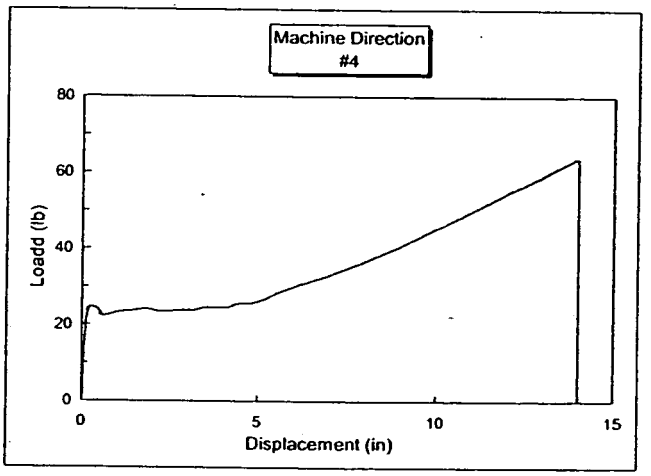
A11#1 ASTM D4833
TetraTech-RMC 2617-03 R# 104124722 LUT060A000 60 MIL LLDPE-T X=1.5 #/in Y=75.7#/in JTR 2/1/05

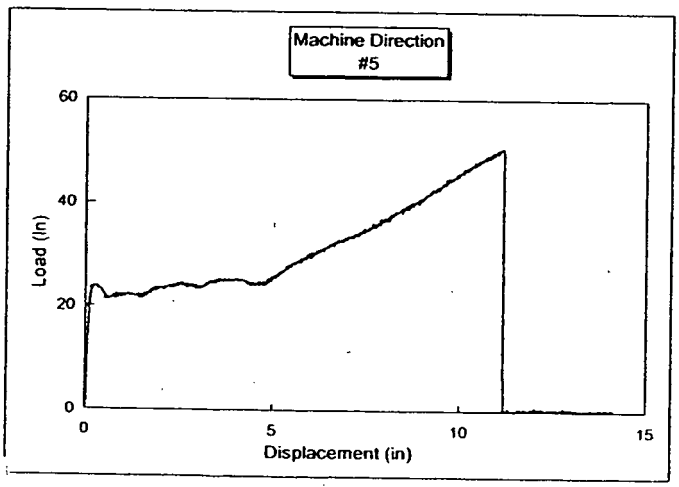
Client:	Tetra Tech - RMC	Test Type:	ASTM D 6693 Type IV
Job No.:	2617-03	Material Type:	60 mil LLDPE-T, LUT060A000
Location:	Rocky FlatsPresent Closure, Golden, CO	Date Tested:	02-02-05
Sample:	Roll #104122977	Tested By:	JTR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
		Grip Seperation:	2.5"











Machine Direction

	Load at Break (lb/in width)	Elongation at Break (%)	Load at Yield (lb/in width)	Elongation at Yield (%)
Specimen #1	250.9	661.3	106.3	18.8
Specimen #2	247.4	626.5	109.6	18.6
Specimen #3	236.3	612.1	106.8	20.1
Specimen #4	278.8	694.1	108.0	20.1
Specimen #5	219.7	556.8	103.4	24.7
Average	**246.6**	**630.2**	**106.8**	**20.5**
Std. Deviation	**19.4**	**46.4**	**2.0**	**2.2**

Filename: TTNT2977

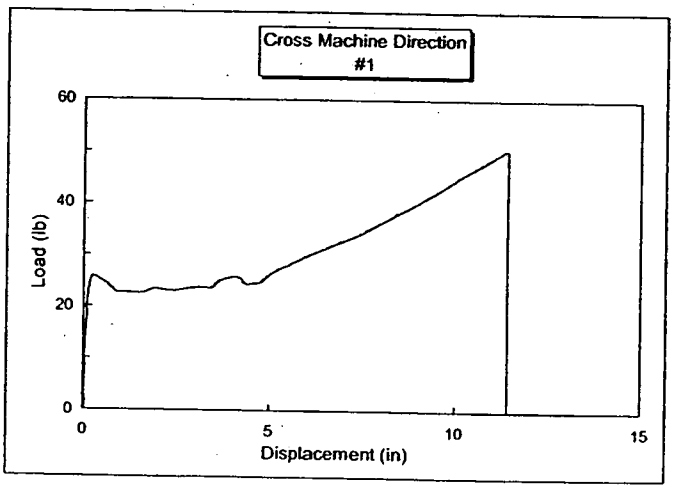
Raw Data File: TTSTPM2, TTSTPM3.TXT

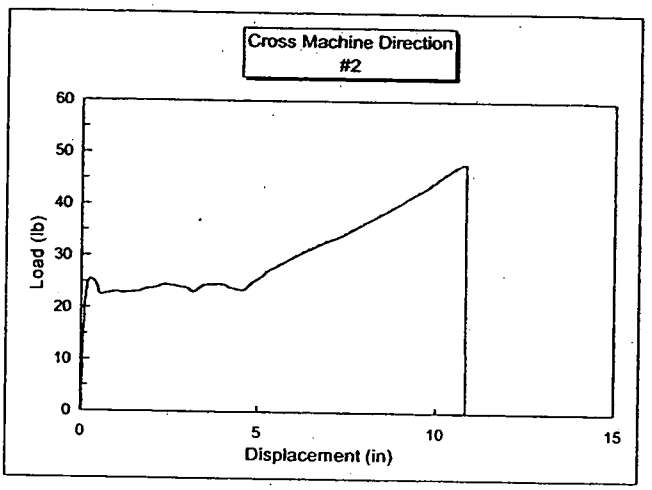
Checked By: JTR Date: 2/2/05

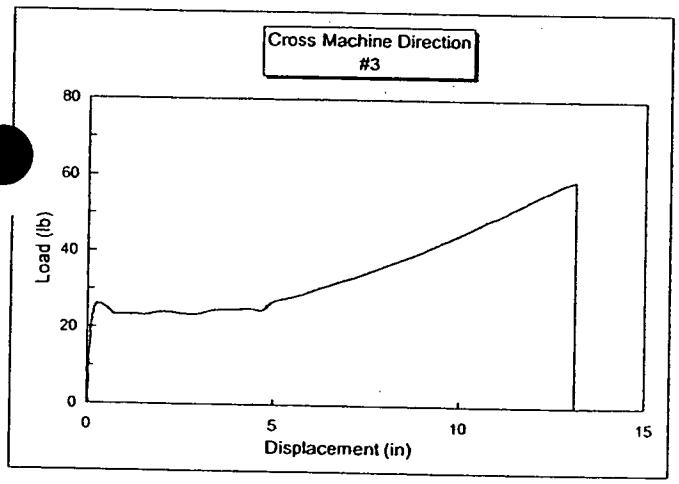
Advanced Terra Testing, Inc.

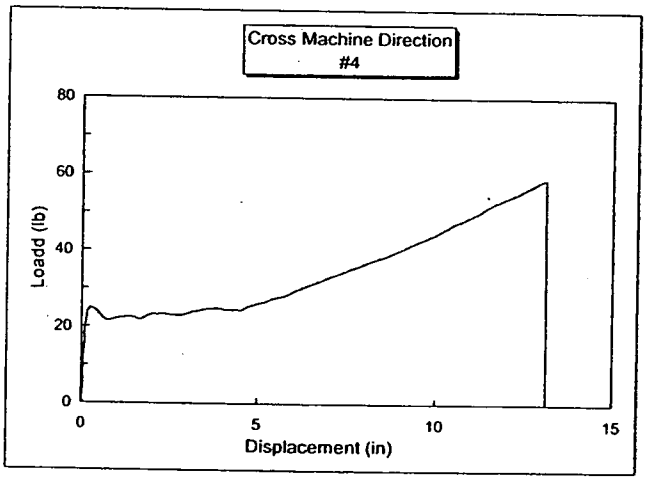
Client:	Tetra Tech - RMC
Job No.:	2617-03
Location:	Rocky FlatsPresent Closure, Golden, CO
Sample:	Roll #104122977
Test Device:	Five Station
Load Cells:	500 lb.

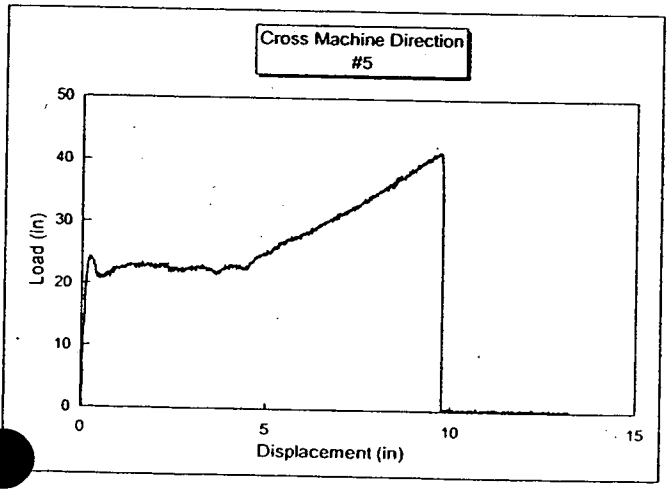
Test Type:	ASTM D 6693 Type IV
Material Type:	60 mil LLDPE-T, LUT060A000
Date Tested:	02-02-05
Tested By:	JTR
Data Entered By:	SR
Displacement Rate:	2 in/min
Grip Seperation:	2.5"











Cross Machine Direction

	Load at Break (lb/in width)	Elongation at Break (%)	Load at Yield (lb/in width)	Elongation at Yield (%)
Specimen #1	214.9	567.4	110.2	19.5
Specimen #2	205.2	538.5	109.2	18.3
Specimen #3	251.7	656.4	111.8	20.9
Specimen #4	252.4	654.9	107.1	19.2
Specimen #5	179.0	485.2	104.6	19.2
Average	**220.6**	**580.5**	**108.6**	**19.4**
Std. Deviation	**28.2**	**66.8**	**2.5**	**0.8**

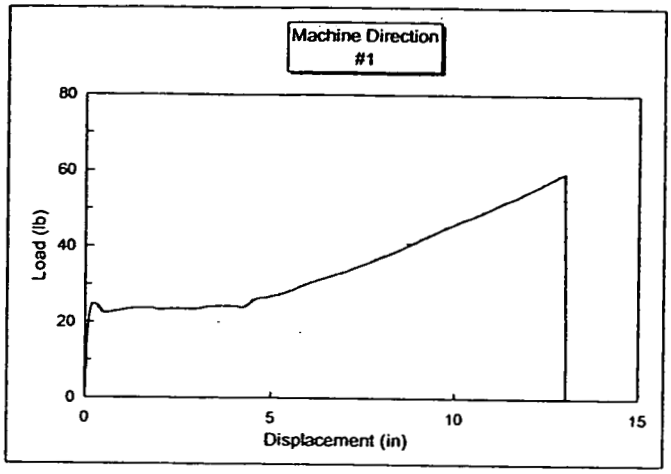
Filename: TTNT297C
Raw Data File: TTSTPC2, TTSTPC3.TXT

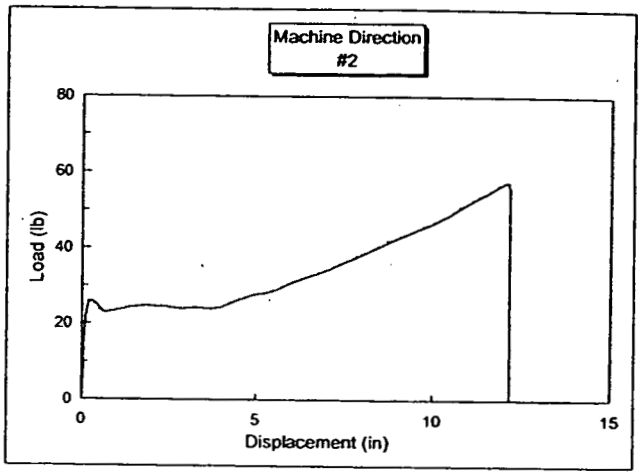
Checked By: JTR Date: 2/2/05

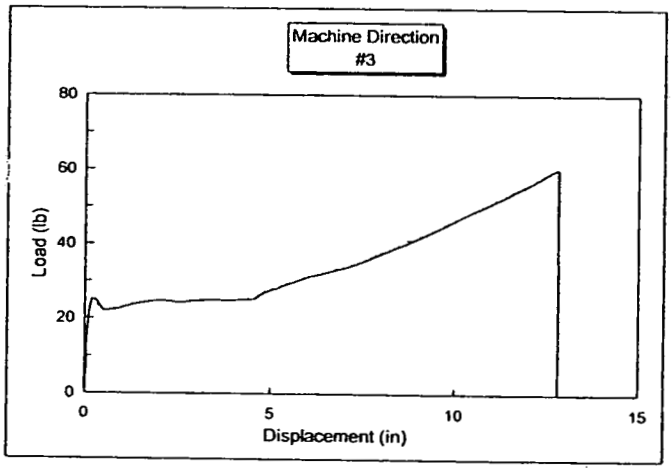
Advanced Terra Testing, Inc.

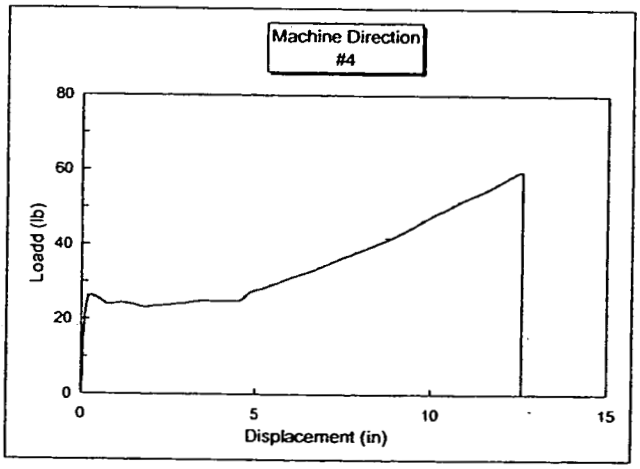
Client:	Tetra Tech - RMC
Job No.:	2617-03
Location:	Rocky Flats Present Landfill Closure, Golden, CO
Sample:	Roll #104123038
Test Device:	Five Station
Load Cells:	500 lb.

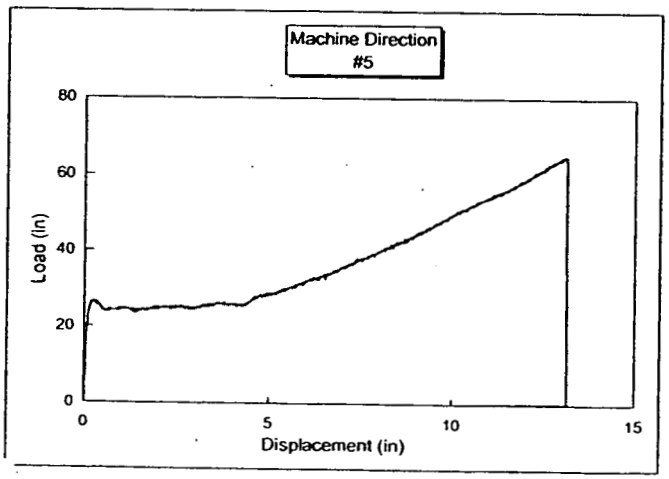
Test Type:	ASTM D 6693 Type IV
Material Type:	60 mil LLDPE-T, LUT060A000
Date Tested:	02-02-05
Tested By:	JTR
Data Entered By:	SR
Displacement Rate:	2 in/min
Grip Seperation:	2.5"











Machine Direction

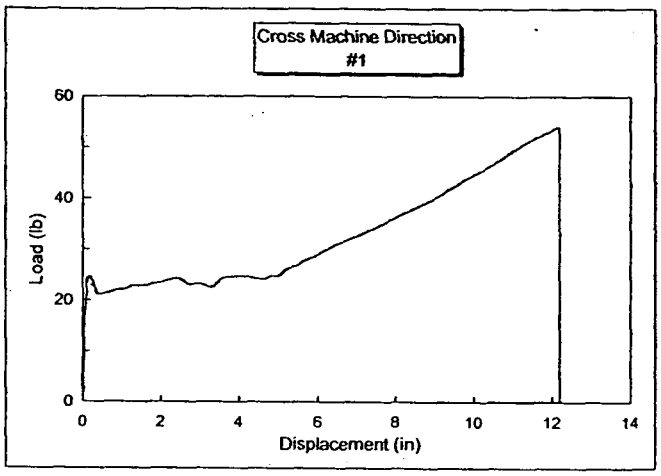
	Load at Break (lb/in width)	Elongation at Break (%)	Load at Yield (lb/in width)	Elongation at Yield (%)
Specimen #1	249.5	649.4	104.4	12.5
Specimen #2	243.8	605.6	110.3	15.5
Specimen #3	253.1	639.4	105.4	16.6
Specimen #4	254.0	628.8	112.4	21.8
Specimen #5	277.0	656.6	113.6	20.6
Average	**255.5**	**635.9**	**109.2**	**17.4**
Std. Deviation	**11.3**	**17.8**	**3.7**	**3.4**

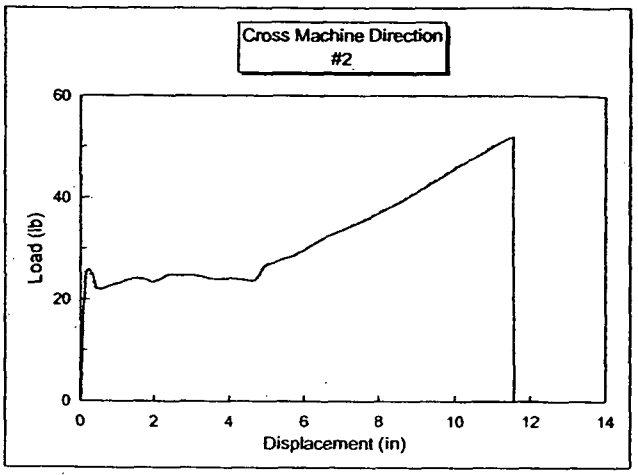
Filename: TTNT3038
Raw Data File: TTRTPM2, TTRTPM3.TXT

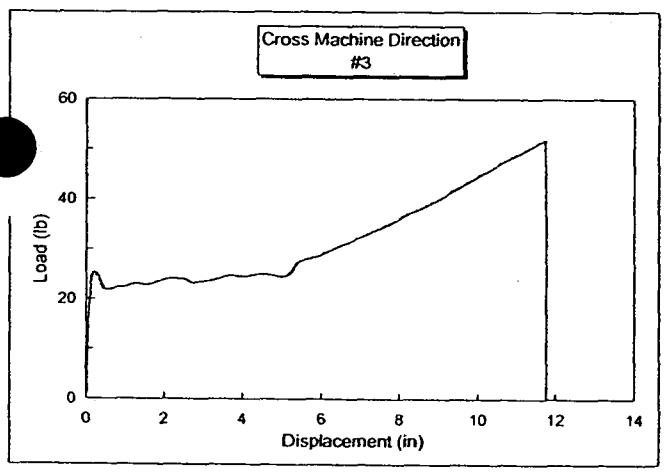
Checked By: JTR Date: 3/2/05

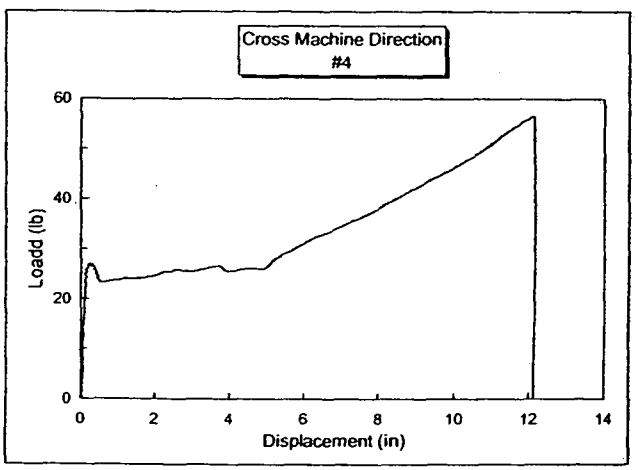
Advanced Terra Testing, Inc.

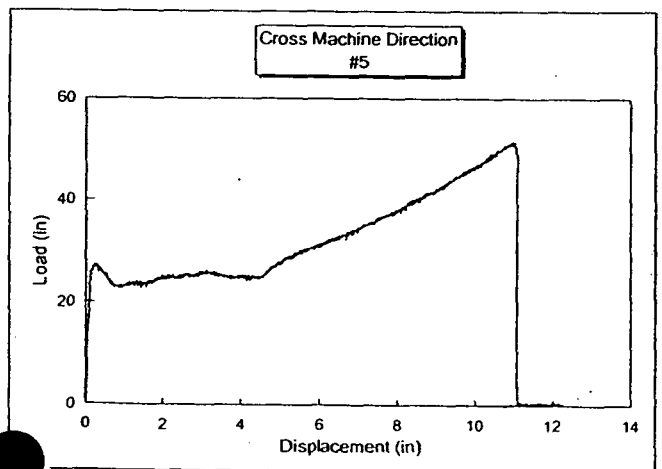
Client:	Tetra Tech - RMC	Test Type:	ASTM D 6693 Type IV
Job No.:	2617-03	Material Type:	60 mil LLDPE-T, LUT060A000
Location:	Rocky Flats Present Landfill Closure, Golden, CO	Date Tested:	02-02-05
Sample:	Roll #104123038	Tested By:	JTR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
		Grip Seperation:	2.5"











Cross Machine Direction

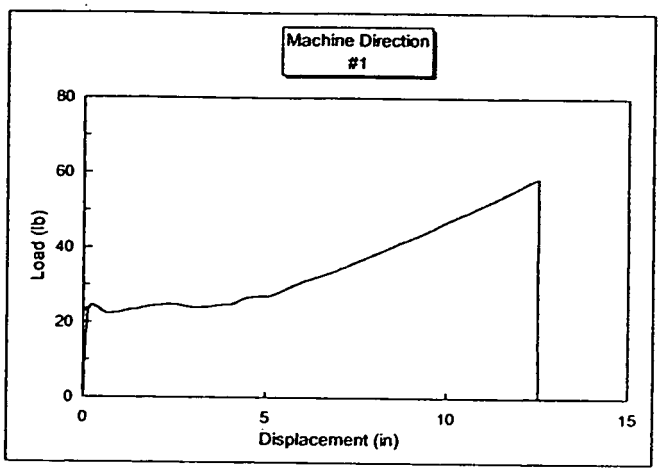
	Load at Break (lb/in width)	Elongation at Break (%)	Load at Yield (lb/in width)	Elongation at Yield (%)
Specimen #1	229.3	606.1	104.5	14.5
Specimen #2	220.0	576.8	109.6	16.5
Specimen #3	220.9	586.3	108.2	16.0
Specimen #4	239.6	605.5	114.4	18.0
Specimen #5	220.6	550.6	117.2	18.6
Average	**226.1**	**585.1**	**110.8**	**16.7**
Std. Deviation	**7.6**	**20.6**	**4.5**	**1.5**

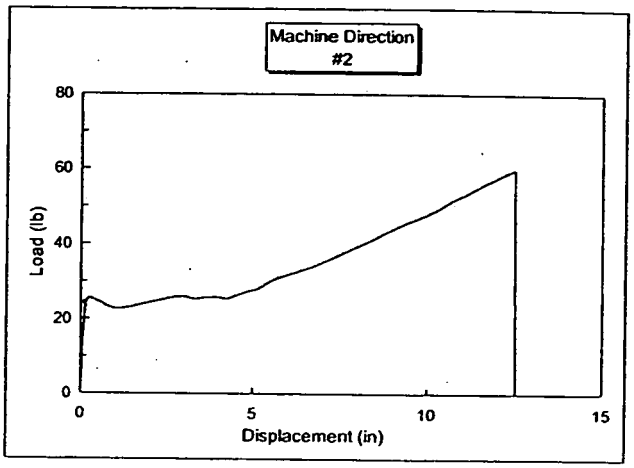
Filename:	TTNT303C	Checked By:	JTR
Raw Data File:	TTRTPC2, TTRTPC3.TXT	Date:	2/2/05

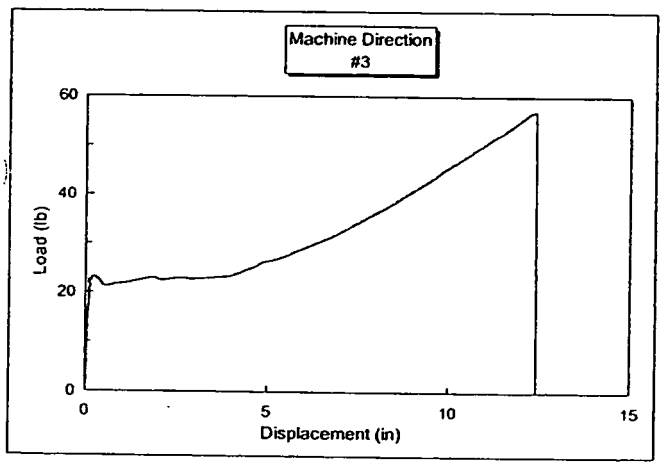
Advanced Terra Testing, Inc.

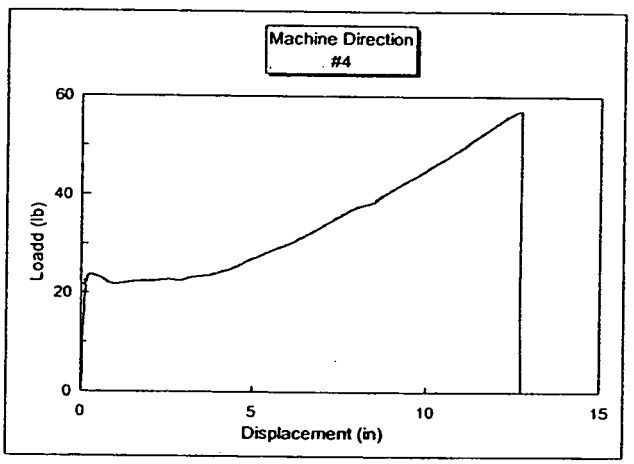
Client:	Tetra Tech - RMC
Job No.:	2617-03
Location:	Rocky Flats Present Landfill Closure, Golden, CO
Sample:	Roll #104124722
Test Device:	Five Station
Load Cells:	500 lb.

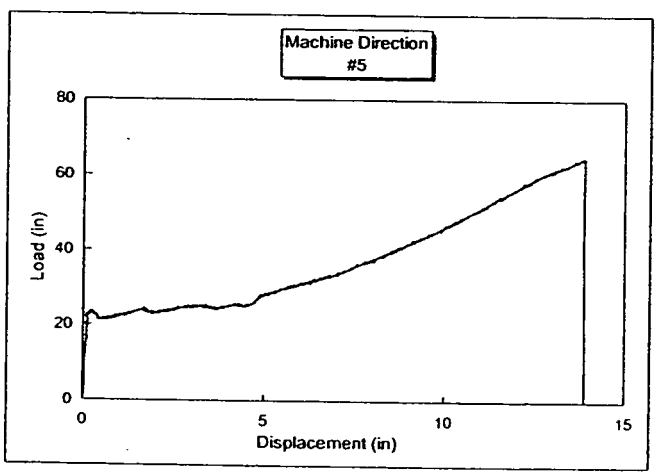
Test Type:	ASTM D 6693 Type IV
Material Type:	60 mil LLDPE-T, LUT060A000
Date Tested:	02-02-05
Tested By:	JTR
Data Entered By:	SR
Displacement Rate:	2 in/min
Grip Seperation:	2.5"











Machine Direction

	Load at Break (lb/in width)	Elongation at Break (%)	Load at Yield (lb/in width)	Elongation at Yield (%)
Specimen #1	249.6	625.6	105.0	19.5
Specimen #2	255.2	624.0	109.0	16.8
Specimen #3	245.1	618.4	99.8	17.4
Specimen #4	241.6	635.0	100.3	19.8
Specimen #5	274.6	694.3	100.3	16.2
Average	**253.2**	**639.5**	**102.9**	**17.9**
Std. Deviation	**11.6**	**28.0**	**3.6**	**1.4**

Filename: TTNT4722

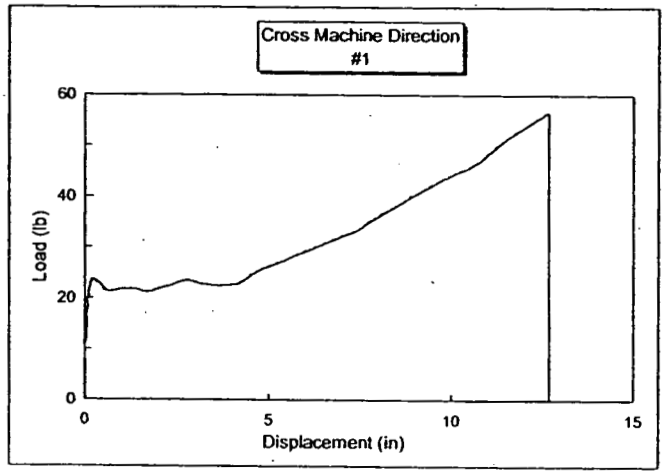
Raw Data File: TTTTPM2, TTTTPM3.TXT

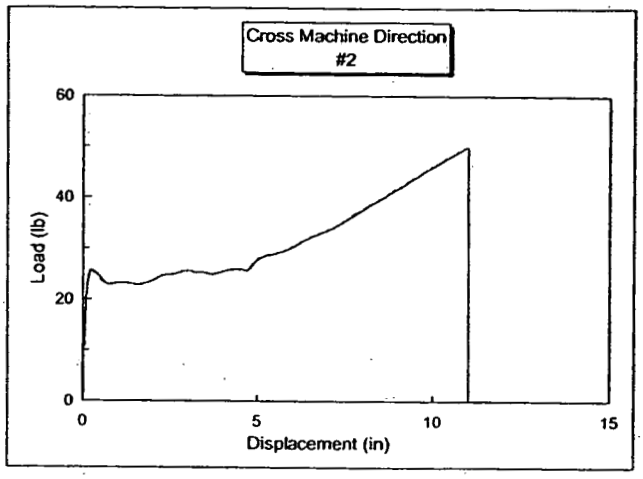
Checked By: JTR

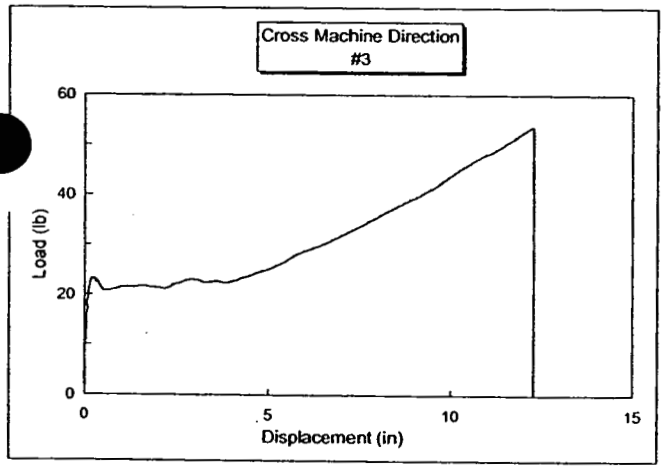
Date: 2/2/05

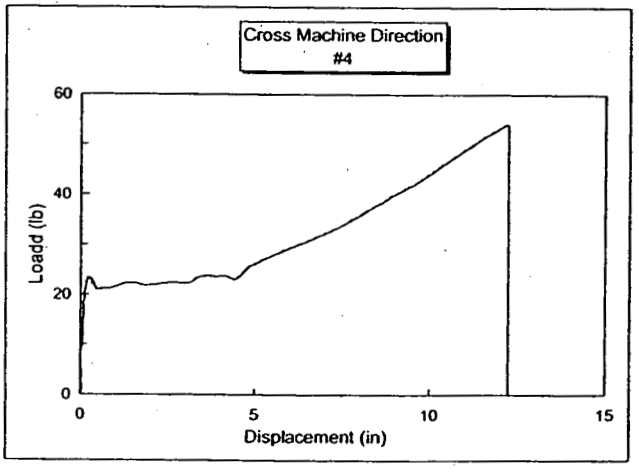
Advanced Terra Testing, Inc.

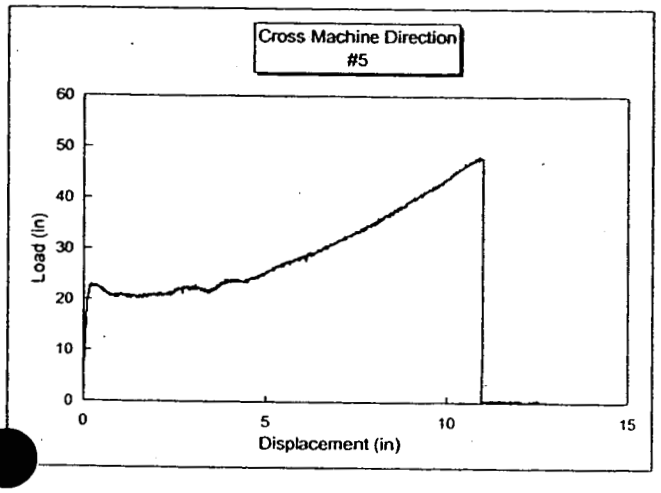
Client:	Tetra Tech - RMC	Test Type:	ASTM D 6693 Type IV
Job No.:	2617-03	Material Type:	60 mil LLDPE-T, LUT060A000
Location:	Rocky Flats Present Landfill Closure, Golden, CO	Date Tested:	02-02-05
Sample:	Roll #104124722	Tested By:	JTR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2 in/min
		Grip Seperation:	2.5"











Cross Machine Direction

	Load at Break (lb/in width)	Elongation at Break (%)	Load at Yield (lb/in width)	Elongation at Yield (%)
Specimen #1	241.7	632.0	101.6	19.5
Specimen #2	211.1	549.2	108.5	19.2
Specimen #3	225.8	613.5	97.9	17.2
Specimen #4	231.7	610.7	100.0	15.4
Specimen #5	204.5	545.8	97.4	17.5
Average	**222.9**	**590.2**	**101.1**	**17.7**
Std. Deviation	**13.5**	**35.6**	**4.0**	**1.5**

Filename: TTNT472

Raw Data File: TTTTPC2, TTTTPC3.TXT

Checked By: JTR Date: 2/2/05

Advanced Terra Testing, Inc.

ISO 9001 - 2000

Precision Geosynthetic Laboratories

February 07, 2005

Sharon Roberts
ADVANCED TERRA TESTING INC.
833 Parfet Street
Lakewood, CO 80215

Dear Ms. Roberts: RE: Rocky Flats Present Closure – Proj # 2617-03

Thank you for consulting Precision Geosynthetic Laboratories for your material testing needs.

Enclosed is the ***final*** laboratory report for the testing of three (3) Textured LLDPE Geomembrane sample(s) received February 03, 2005.

It should be noted that the test specimen and test sample used for this report was believed to be representative of the material produced under the designation herein stated. However, these results are indicative of only the specimens that were actually tested. The testing herein is based upon accepted industry practice as well as the test method listed. Precision Geosynthetic Laboratories neither accepts responsibility for nor makes claims to the final use and purpose of the material.

By accepting the data and results represented on this report, Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims arising out of the use of this data to the cost for the respective test(s) represented in this report, and Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liability in excess of the aforementioned limit.

The test data and all associated project information shall be held in confidence, not to be reproduced except in full and disclosed to other parties with the authorization of the client.

It is a company policy to keep the physical records of each job for 2 years since the receipt of the samples and keep the electronic file for 7 years. ***Failed seam samples are kept for 7 years; good seam samples are disposed after 2 weeks and conformance samples are disposed after 1 month.*** Should you need us to keep them longer, please advise us in writing.

If you have any questions or if we may be of further service, please do not hesitate to call at 800-522-4599.

Sincerely,

PRECISION GEOSYNTHETIC LABORATORIES

Maria Espitia
Quality Assurance

Cora B. Queja
Vice President

Enclosure: (Job No. G050068)

ISO 9001 - 2000

Precision Geosynthetic Laboratories

CLIENT: ADVANCED TERRA TESTING INC.
PROJECT: Rocky Flats Present Closure – Proj #2617-03

VERIFICATION OF MATERIAL PROPERTIES
(PGL Job No. G050068)

MATERIAL DESCRIPTION: Textured LLDPE Geomembrane

SAMPLE(S) SENT BY: Advanced Terra Testing Inc.

DATE RECEIVED: February 03, 2005 **DATE REPORTED:** February 07, 2005

SAMPLE IDENTIFICATIONS:

SAMPLE ID	PRECISION CONTROL NUMBER
R#104122977 LUT060A000	7347
R#104124722 LUT060A000	7348
R#104123038 LUT060A000	7349

TESTS REQUIRED:

TEST METHOD	DESCRIPTION
ASTM D1505	Density
ASTM D1603	Carbon Content
GRI-GM12	Asperity Height
ASTM D5596	Carbon Black Dispersion

TEST CONDITIONS: The samples were conditioned for a minimum one hour in the laboratory at 22 ± 2°C (71.6 ± 3.6°F) and at 60 ± 10% relative humidity prior to test.

TEST RESULTS:

The test results are summarized in Table(s) 1 to 3. The units in which the data are reported are included on these tables.

PRECISION GEOSYNTHETIC LABORATORIES

GAI-LAP
Initials: ME
Date: 2/7/05

Maria Espitia
Quality Assurance

Cora B. Queja
Vice President

1160 North Gilbert Street, Anaheim, CA. 92801, Tel# 714-520-9631, Fax#714-520-9637
DC#2000 Record#281

TABLE 1.

MATERIAL PROPERTIES

CLIENT: ADVANCED TERRA TESTING

PROJECT: Rocky Flats Present Closure – Proj #2617-03

Date Received: **2/3/2005**
Date Reported: **2/7/2005**
Client Sample ID: **R#104122977 LUT060A000**
Material Description: **Textured LLDPE Geomembrane**

QC'd By: _____
PGL Job No.: **G050068**
PGL Control No.: **7347**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GRI-GM12	Asperity Height of Textured Geomembrane (mils)															
	Apparatus: Has a dial indicator that travels at least 2.5mm (0.1 in), and a depth gauge with contact point that travels up and down with in the setting block with a base dimension of 50 mm x 20 mm (2.0 in x 0.75 in) and a height of 15 mm (0.5 in). The contact point is 3.12 mm (0.125 in) in radius and is tapered to 0.25 mm (0.01 in) in radius. The length of the needle is16mm (0.65in)															
	Sampling: 10 specimens across the roll width in a randomly distributed manner															
	Side A	32	30	27	28	33	36	30	27	28	29	30	3	27	36	
	Side B	27	29	30	27	31	32	34	30	27	26	29	3	26	34	
ASTM D1505	Density (grams/ cm.3)															
		0.9374	0.9374	0.9374								0.9374	0.0000	0.9374	0.9374	
ASTM D1603	Carbon Black Content (percent)															
		2.41	2.37									2.39	0.03	2.37	2.41	
ASTM D5596	Carbon Black Dispersion (category rating per reference chart PCN: 12-455960-38)															
		1	1	1	1	1	1	1	1	1	1	1	N/A	N/A	N/A	

MD - M[redacted]IRECTION
TD - TR[redacted]SE DIRECTION
DC#1987 Record #268

Precision Geosynthetic Laboratories

ISO 9001 - 2000
GAI-LAP

TABLE

MATERIAL PROPERTIES

CLIENT: ADVANCED TERRA TESTING

PROJECT: Rocky Flats Present Closure – Proj #2617-03

Date Received: **2/3/2005**
Date Reported: **2/7/2005**
Client Sample ID: **R#104124722 LUT060A000**
Material Description: **Textured LLDPE Geomembrane**

QC'd By: _____
PGL Job No.: **G050068**
PGL Control No.: **7348**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GRI-GM12	Asperity Height of Textured Geomembrane (mils)															
	Apparatus: Has a dial indicator that travels at least 2.5mm (0.1 in), and a depth gauge with contact point that travels up and down with in the setting block with a base dimension of 50 mm x 20 mm (2.0 in x 0.75 in) and a height of 15 mm (0.5 in). The contact point is 3.12 mm (0.125 in) in radius and is tapered to 0.25 mm (0.01 in) in radius. The length of the needle is16mm (0.65in)															
	Sampling: 10 specimens across the roll width in a randomly distributed manner															
	Side A	36	30	21	26	27	32	31	31	30	27	29	4	21	36	
	Side B	28	29	31	36	30	32	27	24	26	27	29	3	24	36	
ASTM D1505	Density (grams/ cm.3)	0.9372	0.9372	0.9372								0.9372	0.0000	0.9372	0.9372	
ASTM D1603	Carbon Black Content (percent)	2.45	2.41									2.43	0.03	2.41	2.45	
ASTM D5596	Carbon Black Dispersion (category rating per reference chart PCN: 12-455960-38)	1	1	1	1	1	1	1	1	1	1	1	N/A	N/A	N/A	

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION
DC#1987 Record #268

TABLE 3.

MATERIAL PROPERTIES

CLIENT: ADVANCED TERRA TESTING

PROJECT: Rocky Flats Present Closure – Proj #2617-03

Date Received: **2/3/2005**
Date Reported: **2/7/2005**
Client Sample ID: **R#104123038 LUT060A000**
Material Description: **Textured LLDPE Geomembrane**

QC'd By: _____
PGL Job No.: **G050068**
PGL Control No.: **7349**

		SPECIMENS														Proj.
		1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Specs.
METHOD	**DESCRIPTION**															
GRI-GM12	Asperity Height of Textured Geomembrane (mils)															
	Apparatus: Has a dial indicator that travels at least 2.5mm (0.1 in), and a depth gauge with contact point that travels up and down with in the setting block with a base dimension of 50 mm x 20 mm (2.0 in x 0.75 in) and a height of 15 mm (0.5 in). The contact point is 3.12 mm (0.125 in) in radius and is tapered to 0.25 mm (0.01 in) in radius. The length of the needle is16mm (0.65in)															
	Sampling: 10 specimens across the roll width in a randomly distributed manner															
	Side A	31	26	24	29	31	30	24	21	26	25	27	3	21	31	
	Side B	35	21	20	21	39	28	30	31	28	27	28	6	20	39	
ASTM D1505	Density (grams/ cm.3)															
		0.9380	0.9380	0.9380								0.9380	0.0000	0.9380	0.9380	
ASTM D1603	Carbon Black Content (percent)															
		2.36	2.37									2.37	0.01	2.36	2.37	
ASTM D5596	Carbon Black Dispersion (category rating per reference chart PCN: 12-455960-38)															
		1	1	1	1	1	1	1	1	1	1	1	N/A	N/A	N/A	

MD - MA[redacted]RECTION
TD - TR[redacted]SE DIRECTION
DC#1987 Record #268

Precision Geosynthetic Laboratories

ISO 9001 - 2000

GCL FLUX
ASTM D 5887

CLIENT Tetra Tech-RMC

JOB NO. 2617-03

LOT NO.	200504L0	PROJECT	Present Landfill Design-RFETS
ROLL NO.	00000708	TEST STARTED	2-07-05 CAL
SAMPLE NO.		TEST FINISHED	02-16-05 CAL
MAT'L TYPE	GCL Bentomat ST	CELL NUMBER	10P
TEST TYPE	TX/Flux		
CONF. PRES. PSF	576	SITE LEACHATE WATER	No
		DI WATER	Yes

MOISTURE/DENSITY DATA FOR COMPOSITE SAMPLE	BEFORE TEST	AFTER TEST
Wt. GCL + Moisture (g)	45.0	86.2
Wt. Wet GCL & Pan (g)	49.5	90.7
Wt. Dry GCL & Pan (g)	42.4	42.4
Wt. Lost Moisture (g)	7.1	48.4
Wt. of Pan Only (g)	4.5	4.5
Wt. of Dry GCL (g)	37.9	37.9
Moisture Content %	18.8	127.7
Wet Density PCF	61.5	111.7
Dry Density PCF	51.7	49.0

Init. Diameter	(in)	4.000	(cm)	10.160
Init. Area	(sq in)	12.566	(sq cm)	81.078
Init. Height	(in)	0.222	(cm)	0.564
Vol. Bef. Consol.	(cu ft)	0.00161		
Vol. After Consol.	(cu ft)	0.00170		
Porosity %		100.34		
Constant Head	(PSI)	2.00	(cm)	140.79

Time Min	Time Sec	Init. Burette CC	Final Burette CC	Head Corr. CM	Composite **INDEX FLUX qi** **(M^3/M^2)/SEC**	Composite Permeability k cm/sec
180.0	10800	50.0	26.8	23.5	2.65E-07	1.1E-07
335.0	20100	49.5	42.8	15.1	4.11E-08	1.6E-08
510.0	30600	42.8	40.5	20.0	9.27E-09	3.8E-09
4270.0	256200	40.5	29.9	27.0	5.10E-09	2.2E-09
1510.0	90600	29.9	26.3	34.8	4.90E-09	2.3E-09
1445.0	86700	26.3	23.0	38.5	4.69E-09	2.3E-09

Average - Last 3 Values **4.9E-09** **2.3E-09**

Data entry by: CAL/SR Date: 02/17/2005
Checked by: cal Date: 2/17/05
FileName: TTFX0708

ADVANCED TERRA TESTING, INC.

GCL FLUX
ASTM D 5887

CLIENT Tetra Tech-RMC

JOB NO. 2617-03

LOT NO.	200504L0	PROJECT	Present Landfill Design-RFETS
ROLL NO.	00000708	TEST STARTED	2-07-05 CAL
SAMPLE NO.		TEST FINISHED	02-16-05 CAL
MAT'L TYPE	GCL Bentomat ST	CELL NUMBER	10P
TEST TYPE	TX/Flux		
CONF. PRES. PSF	576	SITE LEACHATE WATER	No
		DI WATER	Yes

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
80.0	75.0	5.4	32.3				
80.0	75.0		25.0				

Initial Height (in)	0.222	Init. Vol. (CC)	45.70
Height Change (in)	0.007	Vol. Change (CC)	15.10
Ht. After Cons. (in)	0.215	Cell Exp. (CC)	17.61
Initial Area (sq in)	12.566	Net Change (CC)	-2.51
Area After Cons. (sq in)	13.688	Cons. Vol. (CC)	48.21

Data entry by: CAL/SR Date: 02/17/2005
Checked by: cal Date: 2/17/2005
FileName: TTFX0708

ADVANCED TERRA TESTING, INC.

MASS/UNIT AREA & MOISTURE CONTENT (GCL)
ASTM D 5993

CLIENT: Tetra Tech - RMC JOB NO.: 2617-03
PROJECT: Present Landfill Design, RFETS, Golden, CO

ROLL NO.	00000708	00000708	00000708	00000708
LOT NO.	200504LO	200504LO	200504LO	200504LO
SAMPLE NO.	1	2	3	4
SAMPLED				
DATE TESTED	02-04-05 JTR	02-04-05 JTR	02-04-05 JTR	02-04-05 JTR
GCL DESCRIPTION	Bentomat ST	Bentomat ST	Bentomat ST	Bentomat ST
MASS/UNIT AREA DETERMINATIONS				
Sample Length (in)	8.000	7.990	7.940	8.000
Sample Width (in)	4.020	4.000	4.000	4.000
Sample Area (cm^2)	207.48	206.19	204.90	206.45
Mass/Unit Area (gms/m^2) Composite	4424.0	4107.8	3761.3	4831.7
Mass of Textile (gms)	6.33	6.29	6.25	6.30
Mass/Unit Area (gms/m^2) Bentonite	4118.9	3802.8	3456.3	4526.6
MOISTURE DETERMINATIONS				
Wt. of Wet GCL & Dish (gms)	120.700	120.520	111.300	139.120
Wt. of Dry GCL & Dish (gms)	107.860	99.870	92.160	114.880
Net Loss of Moisture (gms)	12.84	20.65	19.14	24.24
Wt. of Dish (gms)	16.070	15.170	15.090	15.130
Wt. of Dry GCL (gms)	91.79	84.70	77.07	99.75
Moisture Content (Composite) (%)	14.0	24.4	24.8	24.3
Moisture Content (Bentonite) (%)	15.0	26.3	27.0	25.9

ROLL NO.	00000708
LOT NO.	200504LO
SAMPLE NO.	5
SAMPLED	
DATE TESTED	02-04-05 JTR
GCL DESCRIPTION	Bentomat ST
MASS/UNIT AREA DETERMINATIONS	
Sample Length (in)	8.010
Sample Width (in)	3.950
Sample Area (cm^2)	204.13
Mass/Unit Area (gms/m^2) Composite	4509.0
Mass of Textile (gms)	6.23
Mass/Unit Area (gms/m^2) Bentonite	4204.0
MOISTURE DETERMINATIONS	
Wt. of Wet GCL & Dish (gms)	122.470
Wt. of Dry GCL & Dish (gms)	107.790
Net Loss of Moisture (gms)	14.68
Wt. of Dish (gms)	15.750
Wt. of Dry GCL (gms)	92.04
Moisture Content (Composite) (%)	15.9
Moisture Content (Bentonite) (%)	17.1

Note: Mass of Geotextile was taken from the GFR Specifier's Guide, 2005. Assumed CETCO Bentomat ST Product.

Average Moisture Content (%) (Composite) (5 samples)	**20.69**
Average Mass/Unit Area (Composite) (5 Samples) (gms/m^2)	**4326.7**
Average Mass/Unit Area (Dry Bentonite) (5 Samples) (gms/m^2)	**4021.7**
Average Moisture Content (%) (Bentonite) (5 samples)	**22.3**

Data entered by: SR Date: 02/07/2005
Data checked by: JTK Date: 2/7/05
FileName: TTMA0708

ADVANCED TERRA TESTING, INC.

02-07-05 JTR

Chatillon Loading System

1 Kip Capacity Load Cell

2617-03

Tetra Tech - RMC

Present Landfill Design - RFETS, Golden CO

Roll #00000708, Lot #200504LO

CETCO GCL Product, Bentomat ST

Peel Adhesion 4" X 8" Specimens

ASTM D 4632/Modified

Data Entered By: SR

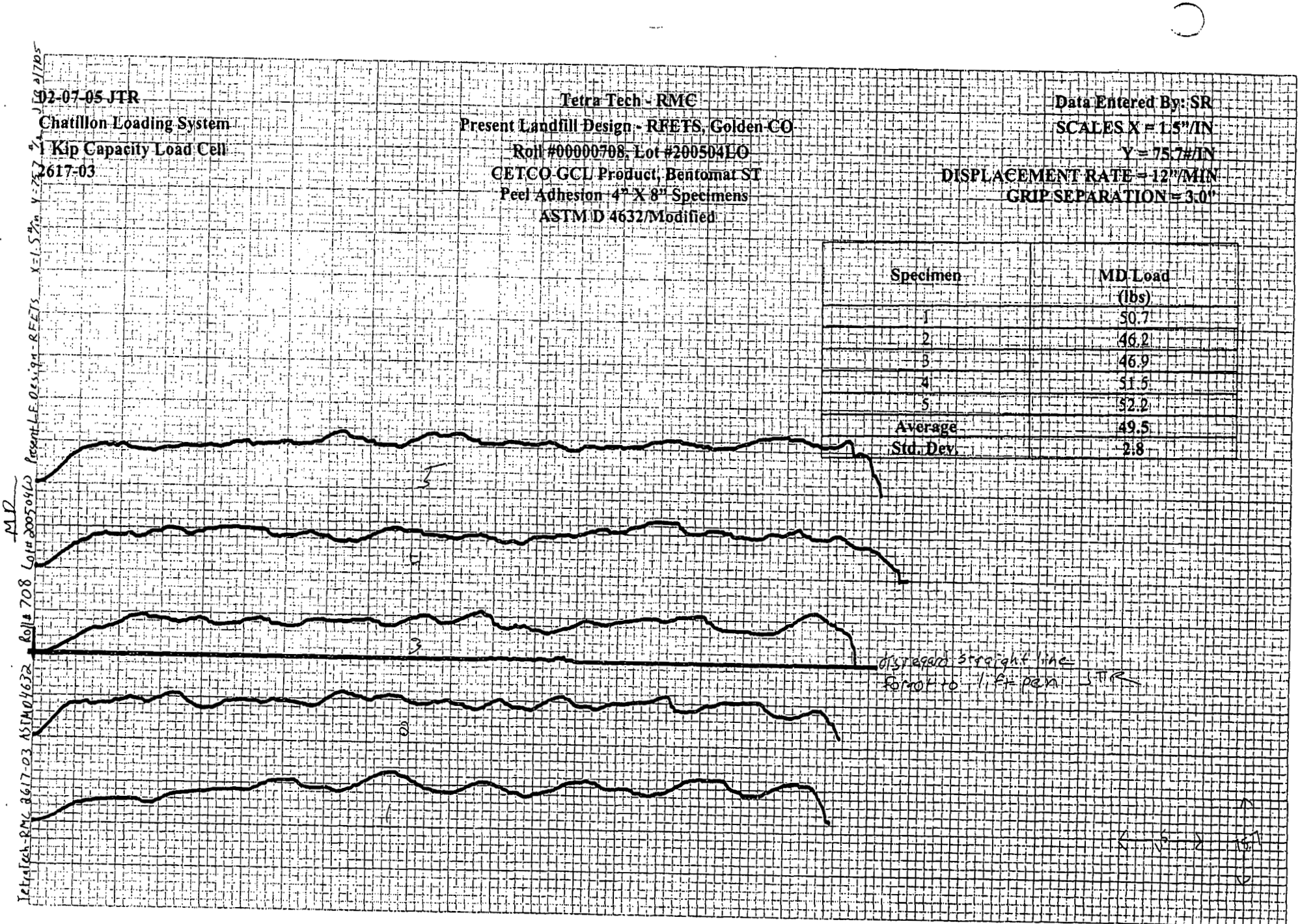
SCALES X = 1.5"/IN

Y = 75.7#/IN

DISPLACEMENT RATE = 12"/MIN

GRIP SEPARATION = 3.0"

Specimen	MD Load (lbs)
1	50.7
2	46.2
3	46.9
4	51.5
5	52.2
Average	49.5
Std. Dev.	2.8



Data Checked By: JTR Date: 2/7/05

Filename: K:/TT2617/TTPA708.lwp

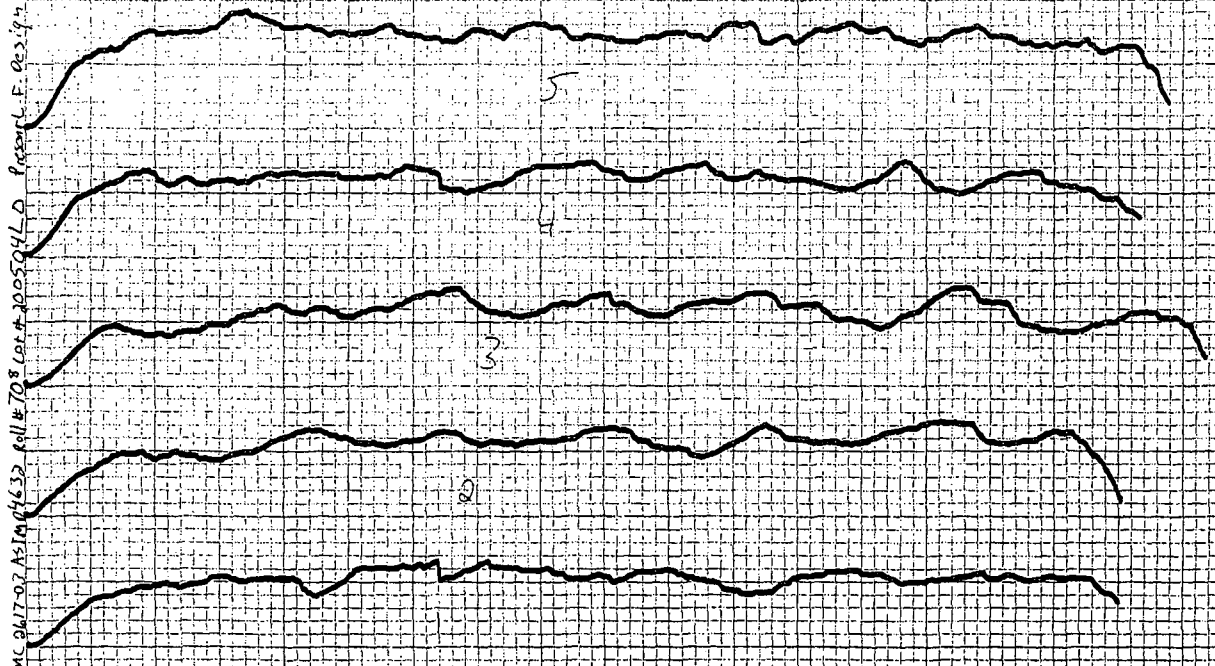
ADVANCED TERRA TESTING, inc

02-07-05 JTR
Chatillon Loading System
1 Kip Capacity Load Cell
2617-03

Tetra Tech - RMC
Present Landfill Design - RFETS, Golden CO
Roll #00000708, Lot #200504LO
CETCO GCL Product, Bentomat ST
Peel Adhesion 4" X 8" Specimens
ASTM D 4632/Modified

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN
DISPLACEMENT RATE = 12"/MIN
GRIP SEPARATION = 3.0"

Specimen	CMD Load (lbs)
1	51.5
2	56.8
3	59.8
4	57.5
5	71.2
Average	59.4
Std. Dev.	7.3



CMD

Data Checked By: JTR Date: 2/7/05
Filename: K:/TT2617/TTPA708C.lwp

ADVANCED TERRA TESTING, inc

Moisture Content Determinations
ASTM D 2216

CLIENT: Tetra Tech-RMC
LOCATION: Present Landfill Design-RFETS

JOB NO.: 2617-03

ROLL NO.	00000708
LOT NO.	200504LO
SAMPLE NO.	
DATE SAMPLED	
DATE TESTED	02-05-05 SR
GCL DESCRIPTION	CETCO Bentomat ST

MOISTURE DETERMINATIONS	
Wt. of Wet Soil & Dish (gms)	45.75
Wt. of Dry Soil & Dish (gms)	38.51
Net Loss of Moisture (gms)	7.24
Wt. of Dish (gms)	3.62
Wt. of Dry Soil (gms)	34.89
Moisture Content (%)	20.8

Data entered by: SR
Data checked by: JTR
FileName: TTN00708

Date: 2/7/05

Date: 02/07/2005

ADVANCED TERRA TESTING, INC.

SWELL INDEX
ASTM D 5890

Client Name: Tetra Tech-RMC

Job No.: 2617-03

Type of Bentonite: CETCO Bentomat ST
Leachate: DI Water

Date Sampled:
Date Tested: 02-24-05 DPM

Project Description: Present Landfill Design-RFETS, Golden, CO

OVEN-DRIED SAMPLES			
SAMPLE NO.	**SWELL INDEX CC/2 gms**	**START TEMP. °C**	**END TEMP °C**
Roll #00000707 Lot #200504L0	19.5	22.2	21.4
Roll #00000709 Lot #200504L0	20.0	22.2	21.3

Rejected JTR

DATA ENTERED BY: SR
DATA CHECKED BY: JTR

DATE: 02-28-05
DATE: 3/1/05

K:\TT2617\TTSI0707.LWP

ADVANCED TERRA TESTING, inc

ADVANCED TERRA TESTING, Inc.
ATT
833 Parfet Street • Lakewood, Colorado 80215 • (303) 232-8308 • Fax: (303) 232-1579

Mr. Roy Spitzer
Tetra Tech - RMC
1900 S. Sunset Street, Suite 1-F
Longmont, CO 80501

March 21, 2005

RE: Present Landfill Design - RFETS
Golden, CO, and Rocky Flats Present Landfill Closure

Dear Mr. Spitzer,

Thank you for choosing Advanced Terra Testing, Inc. for your geosynthetic testing needs.

Per your request, we have completed the analyses pertinent to the recent testing campaign relative to the above referenced project. The following tables provide a summary of conformance testing.

CETCO - Bentomat ST GCL - GCL Flux ASTM D 5887

Lot & Roll Number	Composite Permeability k (cm/sec)	Composite Index Flux qi (M^3/M^2)/SEC
200504LO, 00000707	5.6E-09	3.0E-09
200511LO, 00001728	4.4E-09	2.6E-09

CETCO - Bentomat ST GCL - Mass/Unit Area & Moisture Content (GCL)

Lot & Roll Number	Composite Moisture Content (%)	Composite Mass/Unit Area (gms/m^2)	Dry Bentonite Mass/Unit Area (gms/m^2)	Mositure Content Bentonite (%)
200511LO, 00001728	24.48	4927.8	4622.8	26.1

CETCO - Bentomat ST GCL - Peel Adhesion - ASTM D 4632/Modified

Lot & Roll Number	MD Load (lbs)	CDM Load (lbs)
200511LO, 00001728	45.3	40.4

CETCO - Bentomat ST GCL - Moisture Content - ASTM D 2216 (Present Landfill Design)

Lot & Roll Number	Moisture Content Bentonite (%)
200511LO, 00001728	26.3

CETCO - Bentomat ST GCL - Swell Index - ASTM D 5890 (Present Landfill Design)

Lot & Roll Number	Swell Index (cc/gms)
200504LO, 00000706	20.0 rejected JHR
200504LO, 00000710	20.0 rejected JHR
200511LO, 00001728	25.5

CETCO-Bentomat ST Large Scale Direct Shear - ASTM D 6243

Test Series Number	Normal Force (psf)	Peak Shear Sress (psf)
DS-1, 200511LO, 00001728	200	918

Should you have any questions or require additional information please, feel free to give us call.

Sincerley,

Sharon Roberts

Sharon Roberts
Geosynthetic Division Manager

K:/TT2617/TTFI305A.lwp

Rahe, John -- MFG, Inc.

From: Rahe, John -- MFG, Inc.
Sent: Tuesday, March 22, 2005 1:08 PM
To: 'Robert.Davis@rfets.gov'
Cc: 'josh.valentine@ttrmc.com'; 'marshall.masaro@ttrmc.com'
Subject: PLF - QA Laboratory Testing for GCL Bentomat ST for Remainder of PLF Top Cover System

Bob,

The final QA laboratory testing has been completed for the Bentomat ST GCL (roll #00001728, Lot # 200511LO) obtained from materials recently delivered to Advanced Terra Testing (ATT) for the remainder of the PLF top cover system. This material replaces the previous Bentomat ST delivered to the site earlier this winter, which did not meet the specifications.

1) The peel adhesion tests (ASTM D 4632 Modified) indicated an average peel adhesion of 40.4 lbs in the machine direction with a single test minimum of 25.9 lbs, and an average of 45.3 lbs in the cross machine direction, which are well above the minimum specified strength of 15 lbs.

2) The composite moisture content of the GCL (ASTM D 5993) was approximately 24.3 percent and the moisture content of the bentonite was approximately 26.3 percent (ASTM D 2216), which are acceptable.

3) The internal shear strength test (ASTM D 6243) indicated a very high shear strength of 918 psf at a confining pressure of 200 psf, which is well in excess of the minimum shear strength of 500 psf.

4) The permeability test (ASTM D 5887) indicated an end point permeability of 2.6(10)^-9 cm/sec, which is below the maximum specified permeability of 5(10)^-9 cm/sec, and the same test indicated an index flux of 4.4(10)^-9 cu m/sq m/sec, also below the specified limit of 1(10)^-8 cu m/sq m/sec.

5) The GCL bentonite was tested for mass/unit area (ASTM D 5993) and found to have an average of 0.95 lb/sq ft, which is well in excess of the specified minimum of 0.75 lb/sq ft.

6) The bentonite had a laboratory measured swell index (ASTM D 5890) of 25.5 mL/2g, which is in excess of the minimum swell index of 24 mL/2g.

Therefore, the additional Bentomat ST GCL recently delivered to ATT for completion of the top PLF cover system should be acceptable for installation.

Let me know if you have any questions regarding these QA laboratory tests.

Thanks,
John

John H. Rahe, P.E.
Tetra Tech/MFG
303-447-0913 (ext. 104)

GCL FLUX
ASTM D 5887

CLIENT Tetra Tech-RMC

JOB NO. 2617-03

LOT NO.	200504L0	PROJECT	Present Landfill Design-RFETS, Golden CO
ROLL NO.	00000707	TEST STARTED	03/01/05
SAMPLE NO.		TEST FINISHED	03/15/05
MAT'L TYPE	GCL	CELL NUMBER	10P
TEST TYPE	TX/Flux		
CONF. PRES. PSF	576	SITE LEACHATE WATER	No
		DI WATER	Yes

MOISTURE/DENSITY DATA FOR COMPOSITE SAMPLE	BEFORE TEST	AFTER TEST
Wt. GCL + Moisture (g)	49.8	91.1
Wt. Wet GCL & Pan (g)	57.9	99.2
Wt. Dry GCL & Pan (g)	49.6	49.6
Wt. Lost Moisture (g)	8.3	49.6
Wt. of Pan Only (g)	8.1	8.1
Wt. of Dry GCL (g)	41.5	41.5
Moisture Content %	20.0	119.5
Wet Density PCF	55.7	113.8
Dry Density PCF	46.5	51.8

Init. Diameter	(in)	4.000	(cm)	10.160
Init. Area	(sq in)	12.566	(sq cm)	81.078
Init. Height	(in)	0.271	(cm)	0.688
Vol. Bef. Consol.	(cu ft)	0.00197		
Vol. After Consol.	(cu ft)	0.00177		
Porosity %		99.19		
Constant Head	(PSI)	2.00	(cm)	140.79

Time Min	Time Sec	Init. Burette CC	Final Burette CC	Head Corr. CM	Composite **INDEX FLUX qi** **(M^3/M^2)/SEC**	Composite Permeability k cm/sec
220.0	13200	49.9	46.1	13.1	3.55E-08	1.7E-08
1440.0	86400	46.1	33.3	22.1	1.83E-08	9.7E-09
1681.0	100860	33.3	21.8	35.4	1.41E-08	8.4E-09
1140.0	68400	21.8	17.4	44.0	7.93E-09	5.1E-09
1440.0	86400	17.4	13.4	48.6	5.71E-09	3.9E-09
1640.0	98400	48.9	26.8	24.1	2.77E-08	1.5E-08
1440.0	86400	26.8	13.1	43.7	1.96E-08	1.3E-08
1440.0	86400	13.1	9.7	53.0	4.85E-09	3.5E-09
1470.0	88200	48.3	43.9	15.2	6.15E-09	3.1E-09
2580.0	154800	43.9	36.8	21.4	5.66E-09	3.0E-09
1440.0	86400	36.8	33.2	27.3	5.14E-09	2.8E-09
Average - Last 3 Values					**5.6E-09**	**3.0E-09**

Data entry by: CAL/SR Date: 03/17/2005
Checked by: cal Date: 3/21/05
FileName: TTFX0707

ADVANCED TERRA TESTING, INC.

GCL FLUX
ASTM D 5887

CLIENT	Tetra Tech-RMC	JOB NO.	2617-03
LOT NO.	200504L0	PROJECT	Present Landfill Design-RFETS, Golden CO
ROLL NO.	00000707	TEST STARTED	03/01/05
SAMPLE NO.		TEST FINISHED	03/15/05
MAT'L TYPE	GCL	CELL NUMBER	10P
TEST TYPE	TX/Flux		
CONF. PRES. PSF	576	SITE LEACHATE WATER	No
		DI WATER	Yes

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
80.0	75.0	7.7	41.7				
80.0	75.0		35.1				

Initial Height (in)	0.271	Init. Vol. (CC)	55.80
Height Change (in)	0.026	Vol. Change (CC)	23.40
Ht. After Cons. (in)	0.245	Cell Exp. (CC)	17.61
Initial Area (sq in)	12.566	Net Change (CC)	5.79
Area After Cons. (sq in)	12.458	Cons. Vol. (CC)	50.01

Data entry by: CAL/SR Date: 03/17/2005
Checked by: cwc Date: 3/21/05
FileName: TTFX0707

ADVANCED TERRA TESTING, INC.

GCL FLUX
ASTM D 5887

CLIENT Tetra Tech-RMC

JOB NO. 2617-03

LOT NO.	200511L0	PROJECT	Present Landfill Design-RFETS, Golden CO.
ROLL NO.	00001728	TEST STARTED	03/10/05 CAL
SAMPLE NO.		TEST FINISHED	03\17\05 CAL
MAT'L TYPE	GCL	CELL NUMBER	11P
TEST TYPE	TX/Flux		
CONF. PRES. PSF	576	SITE LEACHATE WATER	No
		DI WATER	Yes

MOISTURE/DENSITY DATA FOR COMPOSITE SAMPLE	BEFORE TEST	AFTER TEST
Wt. GCL + Moisture (g)	56.1	95.2
Wt. Wet GCL & Pan (g)	66.4	105.4
Wt. Dry GCL & Pan (g)	55.9	55.9
Wt. Lost Moisture (g)	10.5	49.5
Wt. of Pan Only (g)	10.2	10.2
Wt. of Dry GCL (g)	45.7	45.7
Moisture Content %	23.0	108.5
Wet Density PCF	59.8	114.4
Dry Density PCF	48.6	54.9

Init. Diameter (in)	4.000	(cm)	10.160	
Init. Area (sq in)	12.566	(sq cm)	81.078	
Init. Height (in)	0.285	(cm)	0.723	
Vol. Bef. Consol. (cu ft)	0.00207			
Vol. After Consol. (cu ft)	0.00183			
Porosity %	95.36			
Constant Head (PSI)	2.00	(cm)	140.79	

Time Min	Time Sec	Init. Burette CC	Final Burette CC	Head Corr. CM	Composite **INDEX FLUX qi** $(M^3/M^2)/SEC$	Composite Permeability k cm/sec
2580.0	154800	49.9	44.1	14.2	4.62E-09	2.5E-09
1440.0	86400	44.1	40.9	19.1	4.57E-09	2.6E-09
1440.0	86400	40.9	37.6	22.6	4.71E-09	2.8E-09
1440.0	86400	37.6	34.9	25.9	3.85E-09	2.3E-09

Average - Last 3 Values **4.4E-09** **2.6E-09**

Data entry by: CAL/SR Date: 03/18/2005
Checked by: cal Date: 3/18/05
FileName: TTFX01728

ADVANCED TERRA TESTING, INC.

GCL FLUX
ASTM D 5887

CLIENT	Tetra Tech-RMC	JOB NO.	2617-03
LOT NO.	200511L0	PROJECT	Present Landfill Design-RFETS, Golden CO
ROLL NO.	00001728	TEST STARTED	03/10/05 CAL
SAMPLE NO.		TEST FINISHED	03\17\05 CAL
MAT'L TYPE	GCL	CELL NUMBER	11P
TEST TYPE	TX/Flux		
CONF. PRES. PSF	576	SITE LEACHATE WATER	No
		DI WATER	Yes

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
80.0	75.0	7.7	27.8				
80.0	75.0		27.8				

Initial Height (in)	0.285	Init. Vol. (CC)	58.66
Height Change (in)	0.023	Vol. Change (CC)	20.30
Ht. After Cons. (in)	0.262	Cell Exp. (CC)	13.56
Initial Area (sq in)	12.566	Net Change (CC)	6.74
Area After Cons. (sq in)	12.100	Cons. Vol. (CC)	51.92

Data entry by: CAL/SR Date: 03/18/2005
Checked by: cal Date: 3/18/05
FileName: TTFX01728

ADVANCED TERRA TESTING, INC.

MASS/UNIT AREA & MOISTURE CONTENT (GCL)
ASTM D 5993

CLIENT: Tetra Tech-RMC JOB NO.: 2617-03
PROJECT: Present Landfill Design-RFETS, Golden, CO

ROLL NO.	00001728	00001728	00001728	00001728
LOT NO.	200511LO	200511LO	200511LO	200511LO
SAMPLE NO.	1	2	3	4
SAMPLED				
DATE TESTED	03-09-05 JTR	03-09-05 JTR	03-09-05 JTR	03-09-05 JTR
GCL DESCRIPTION	CETCO Bentomat ST	CETCO Bentomat ST	CETCO Bentomat ST	CETCO Bentomat ST
MASS/UNIT AREA DETERMINATIONS				
Sample Length (in)	8.000	8.000	8.000	8.000
Sample Width (in)	3.990	4.000	4.000	4.000
Sample Area (cm²)	205.94	206.45	206.45	206.45
Mass/Unit Area (gms/m²) Composite	4290.2	4632.6	4832.1	5321.8
Mass of Textile (gms)	6.28	6.30	6.30	6.30
Mass/Unit Area (gms/m²) Bentonite	3985.2	4327.6	4527.1	5016.8
MOISTURE DETERMINATIONS				
Wt. of Wet GCL & Dish (gms)	126.640	134.130	139.430	150.640
Wt. of Dry GCL & Dish (gms)	103.680	110.810	115.100	124.970
Net Loss of Moisture (gms)	22.96	23.32	24.33	25.67
Wt. of Dish (gms)	15.330	15.170	15.340	15.100
Wt. of Dry GCL (gms)	88.35	95.64	99.76	109.87
Moisture Content (Composite) (%)	26.0	24.4	24.4	23.4
Moisture Content (Bentonite) (%)	28.0	26.1	26.0	24.8

ROLL NO.	00001728
LOT NO.	200511LO
SAMPLE NO.	5
SAMPLED	
DATE TESTED	03-09-05 JTR
GCL DESCRIPTION	CETCO Bentomat ST
MASS/UNIT AREA DETERMINATIONS	
Sample Length (in)	8.000
Sample Width (in)	3.990
Sample Area (cm²)	205.94
Mass/Unit Area (gms/m²) Composite	5562.4
Mass of Textile (gms)	6.28
Mass/Unit Area (gms/m²) Bentonite	5257.4
MOISTURE DETERMINATIONS	
Wt. of Wet GCL & Dish (gms)	157.840
Wt. of Dry GCL & Dish (gms)	130.030
Net Loss of Moisture (gms)	27.81
Wt. of Dish (gms)	15.480
Wt. of Dry GCL (gms)	114.55
Moisture Content (Composite) (%)	24.3
Moisture Content (Bentonite) (%)	25.7

NOTE: Mass of textile was taken from the GFR Specifier's Guide 2005. Assumed CETCO Bentomat ST product.

Average Moisture Content (%) (Composite) (5 samples)	**24.48**
Average Mass/Unit Area (Composite) (5 Samples) (gms/m²)	**4927.8**
Average Mass/Unit Area (Dry Bentonite) (5 Samples) (gms/m²)	**4622.8**
Average Moisture Content (%) (Bentonite) (5 samples)	**26.1**

Data entered by: SR Date: 03/15/2005
Data checked by: JTR Date: 3/14/05
FileName: TTMA1728

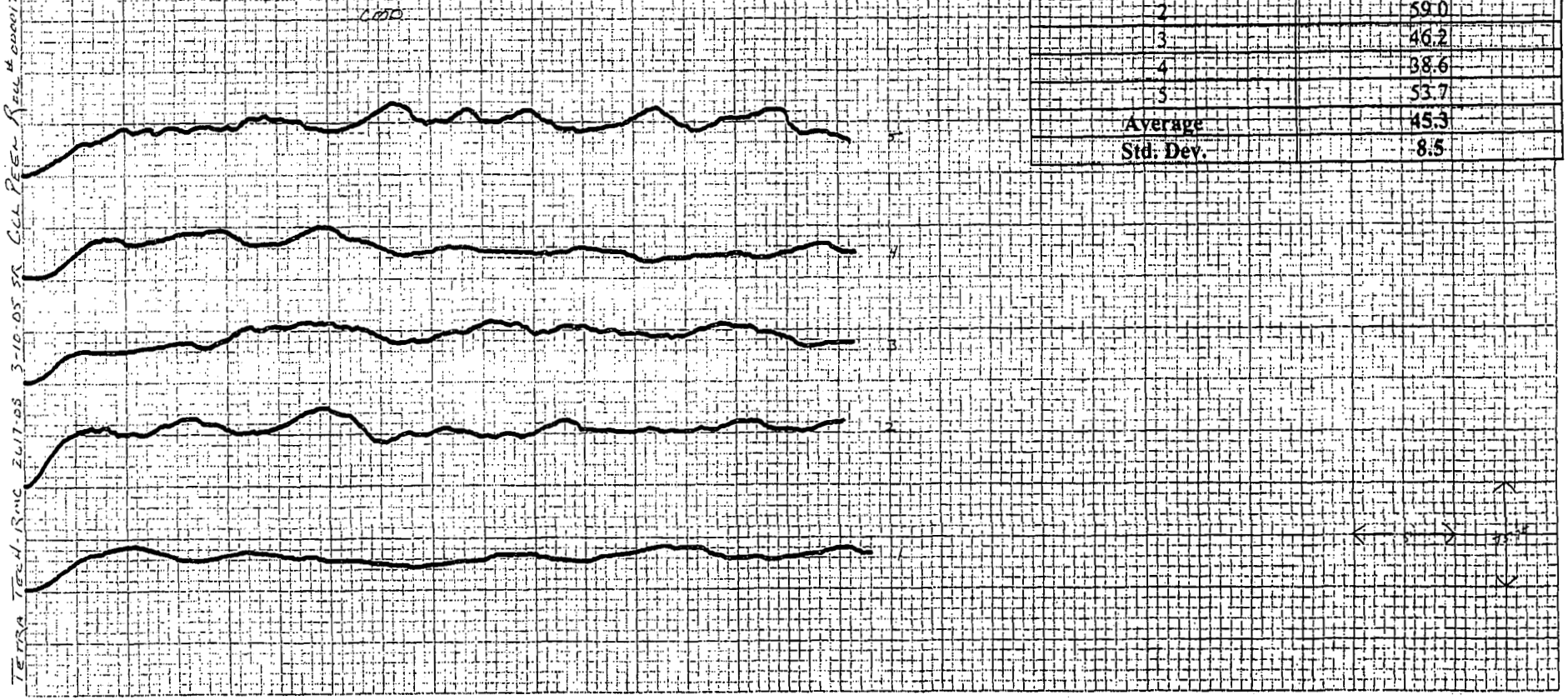
ADVANCED TERRA TESTING, INC.

03-10-05 SR
Chatillon Loading System
1 Kip Capacity Load Cell
2617-03

Tetra Tech - RMC
Present Landfill Design - RFETS, Golden CO
Roll #00001728, Lot #200511LO
CETCO GCL Product, Bentomat ST
Peel Adhesion 4" X 8" Specimens
ASTM D 4632/Modified

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN
DISPLACEMENT RATE = 12"/MIN
GRIP SEPARATION = 3.0"

Specimen	CMD Load (lbs)
1	41.6
2	59.0
3	46.2
4	38.6
5	53.7
Average	45.3
Std. Dev.	8.5



TERRA TECH-RMC 2617-03 3-10-05 SR GCL PEEL ROLL # 00001728 LOT # 200511LO

Data Checked By: JTR Date: 3/14/05
Filename: K:/TT2617/TTPA172C.lwp

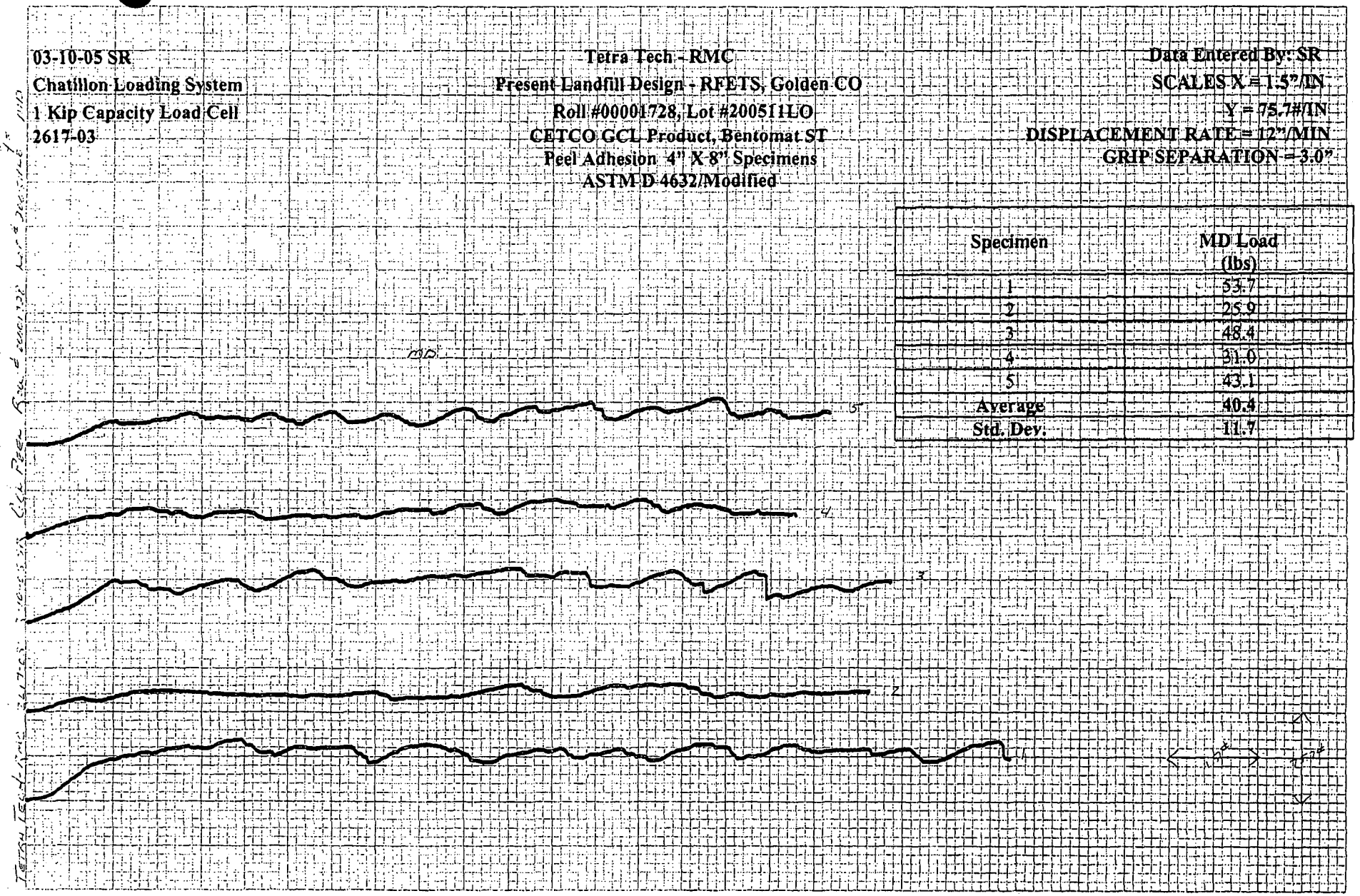
ADVANCED TERRA TESTING, Inc

03-10-05 SR
Chatillon Loading System
1 Kip Capacity Load Cell
2617-03

Tetra Tech - RMC
Present Landfill Design - RFETS, Golden CO
Roll #00001728, Lot #200511LO
CETCO GCL Product, Bentomat ST
Peel Adhesion 4" X 8" Specimens
ASTM D 4632/Modified

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN
DISPLACEMENT RATE = 12"/MIN
GRIP SEPARATION = 3.0"

Specimen	MD Load (lbs)
1	53.7
2	25.9
3	48.4
4	31.0
5	43.1
Average	40.4
Std. Dev.	11.7



Data Checked By: STR Date: 3/14/05
Filename: K:/TT2617/TTPA1728.lwp

ADVANCED TERRA TESTING, inc

Moisture Content Determinations
ASTM D 2216

CLIENT: Tetra Tech-RMC JOB NO.: 2617-03
LOCATION: Present Landfill Design-RFETS, Golden, CO

ROLL NUMBER	00001728
LOT NUMBER	200511LO
SAMPLE NO.	
DATE SAMPLED	
DATE TESTED	03-09-05 SR
GCL DESCRIPTION	Bentomat ST

MOISTURE DETERMINATIONS	
Wt. of Wet Soil & Dish (gms)	67.06
Wt. of Dry Soil & Dish (gms)	53.87
Net Loss of Moisture (gms)	13.19
Wt. of Dish (gms)	3.73
Wt. of Dry Soil (gms)	50.14
Moisture Content (%)	26.3

Data entered by: SR Date: 03/10/2005
Data checked by: JTR Date: 3/14/05
FileName: TTN01728

ADVANCED TERRA TESTING, INC.

SWELL INDEX
ASTM D 5890

Client Name: Tetra Tech-RMC

Job No.: 2617-03

Type of Bentonite: CETCO Bentomat ST
Leachate: DI Water

Date Sampled:
Date Tested: 03-02-05 RS

Project Description: Present Landfill Design-RFETS, Golden, CO

OVEN-DRIED SAMPLES			
SAMPLE NO.	SWELL INDEX CC/2 gms	START TEMP. °C	END TEMP °C
Roll #00000710 Lot #200504L0	20.0	22.3	22.2
Roll #00000706 Lot #200504L0	20.0	22.4	22.1

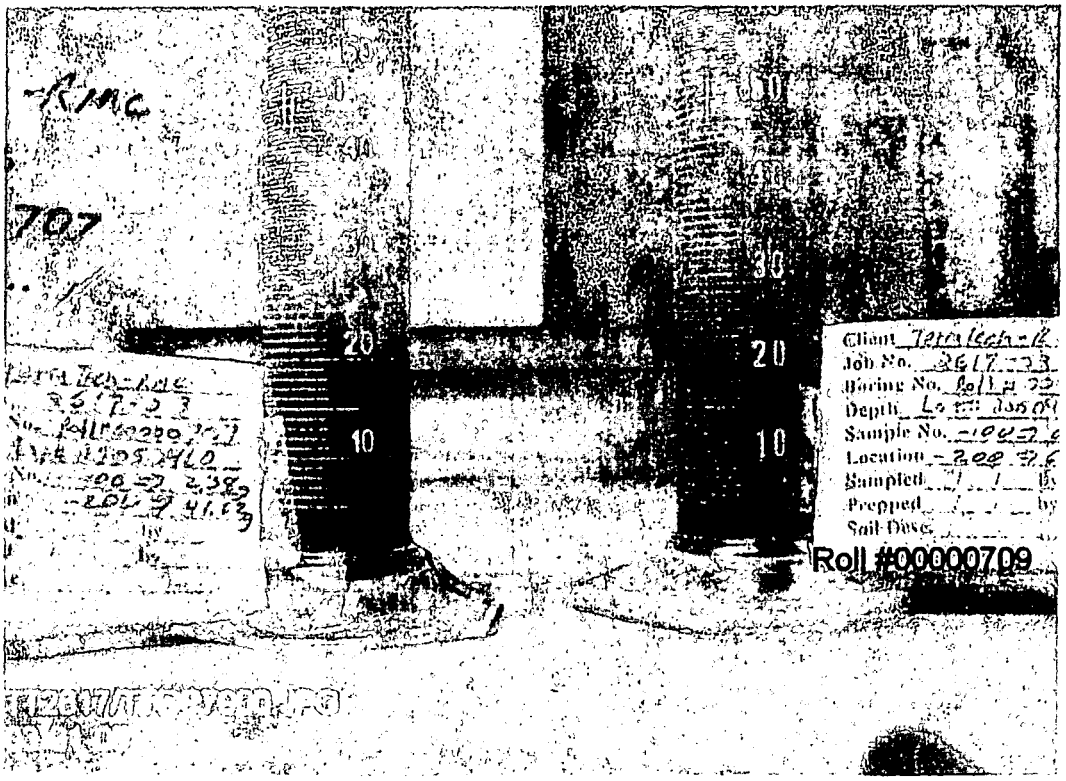
rejected JHF

DATA ENTERED BY: SR
DATA CHECKED BY: JTR

DATE: 03-03-05
DATE: 3/3/05

K:\TT2617\TTSI7106.LWP

ADVANCED TERRA TESTING, inc


707
Client
Job No.
Boring No.
Depth
Sample No.
Location
Sampled
Prepped
Soil Desc.
Roll #00000709

SWELL INDEX
ASTM D 5890

Client Name: Tetra Tech-RMC

Job No.: 2617-03

Type of Bentonite: CETCO Bentomat ST
Leachate: DI Water

Date Sampled:
Date Tested: 02,11,17,21-05 DPM/RS

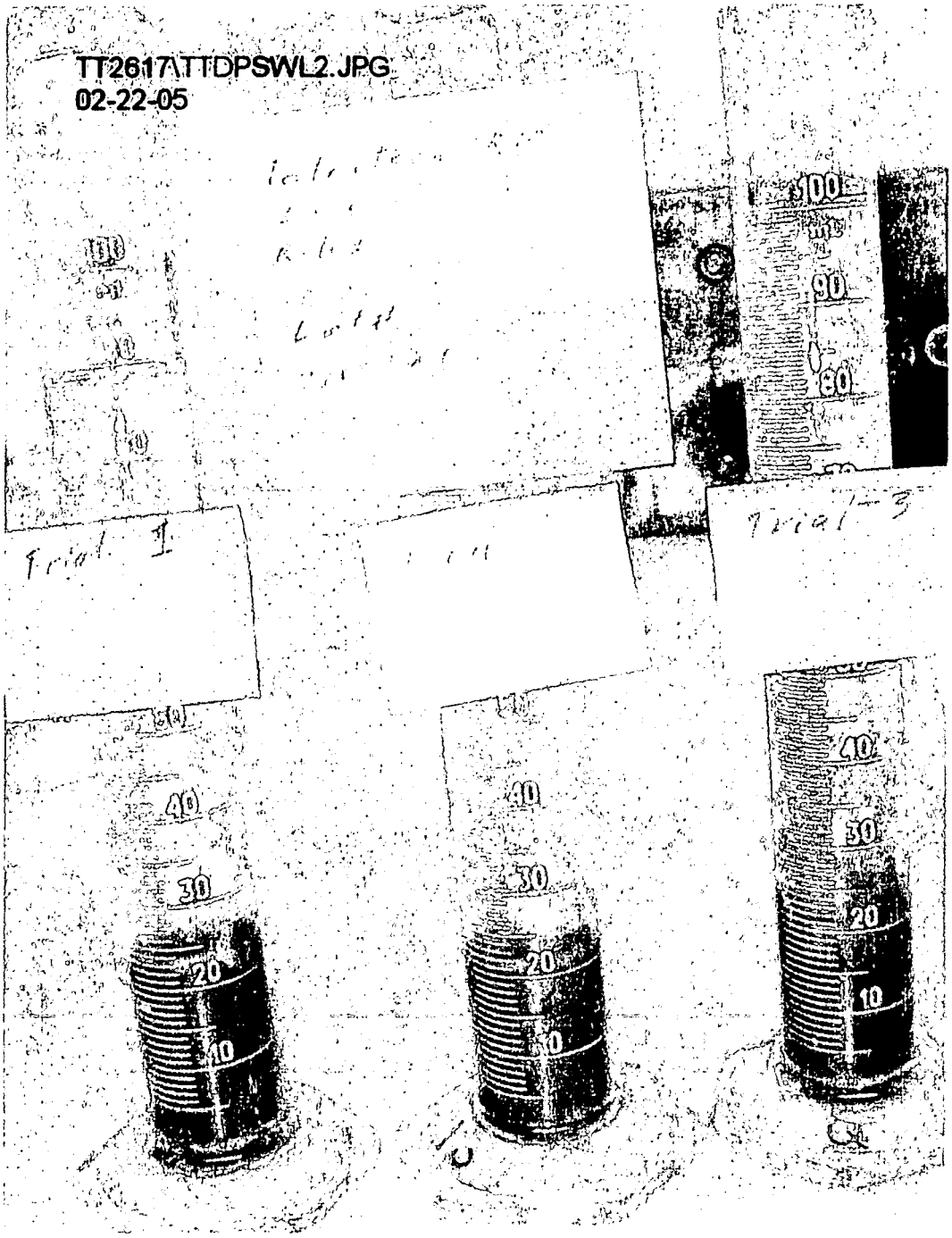
Project Description: Present Landfill Design-RFETS, Golden, CO

OVEN-DRIED SAMPLES			
SAMPLE NO.	**SWELL INDEX CC/2 gms**	**START TEMP. °C**	**END TEMP °C**
Roll #00000708 Lot #200504LO Trial 1	22.0	21.1	20.3
Roll #00000708 Lot #200504LO Trial 2	21.0	21.3	20.7
Roll #00000708 Lot #200504LO Trial 3	20.0	22.4	20.9

DATA ENTERED BY: SR DATE: 03-01-05
DATA CHECKED BY: JTR DATE: 3/1/05

K:\TT2617\TTSI708.LWP

ADVANCED TERRA TESTING, Inc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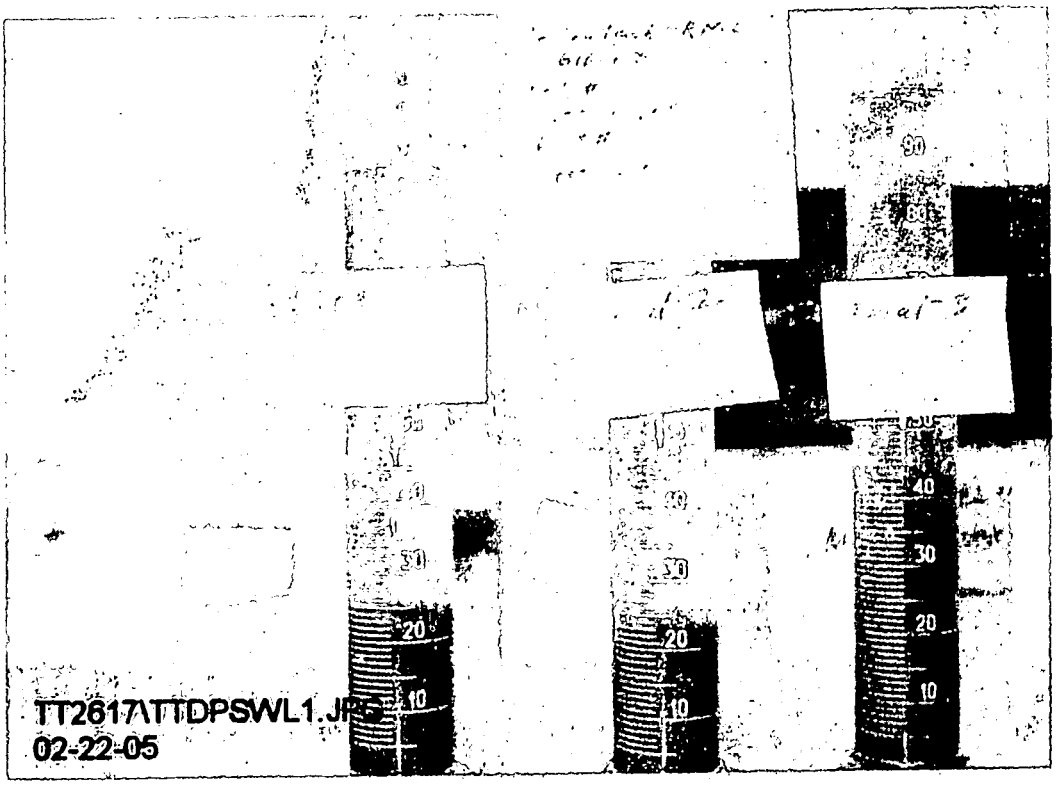
02-22-05
Trial 1
Trial 3
100
90
80
40
30
20
10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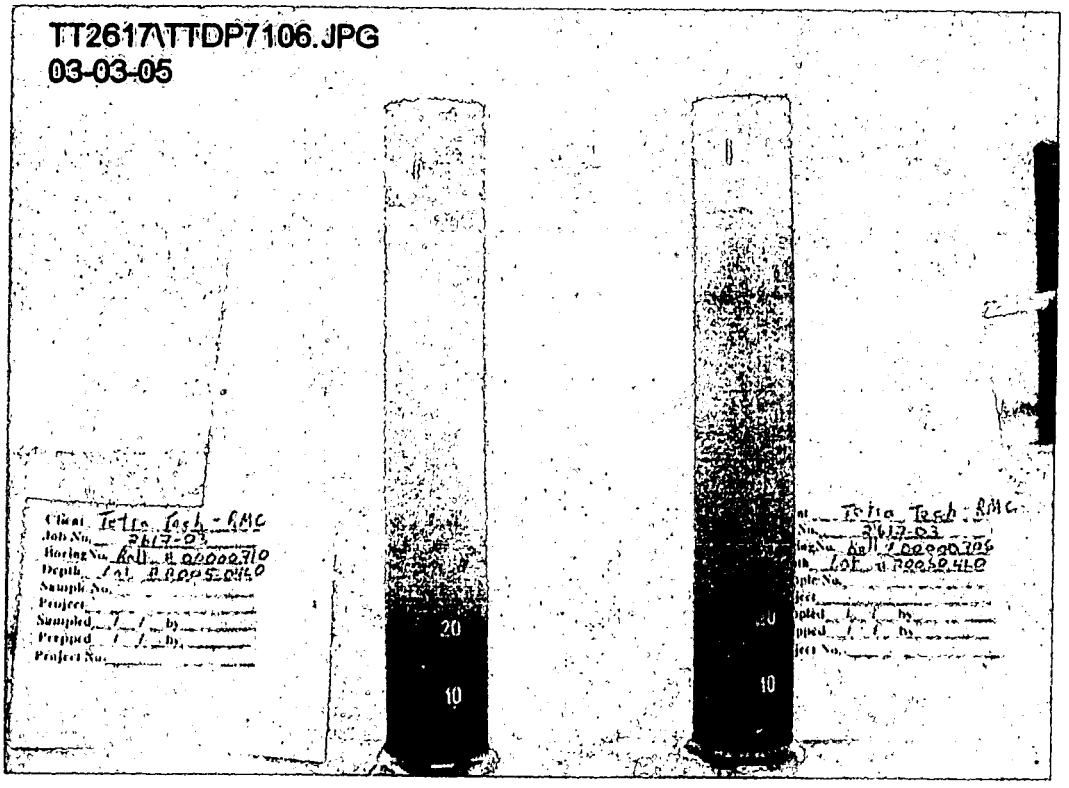
03-03-05



SWELL INDEX
ASTM D 5890

Client Name: Tetra Tech-RMC

Job No.: 2617-03

Type of Bentonite:CETCO Bentomat ST

Date Sampled:

Leachate:

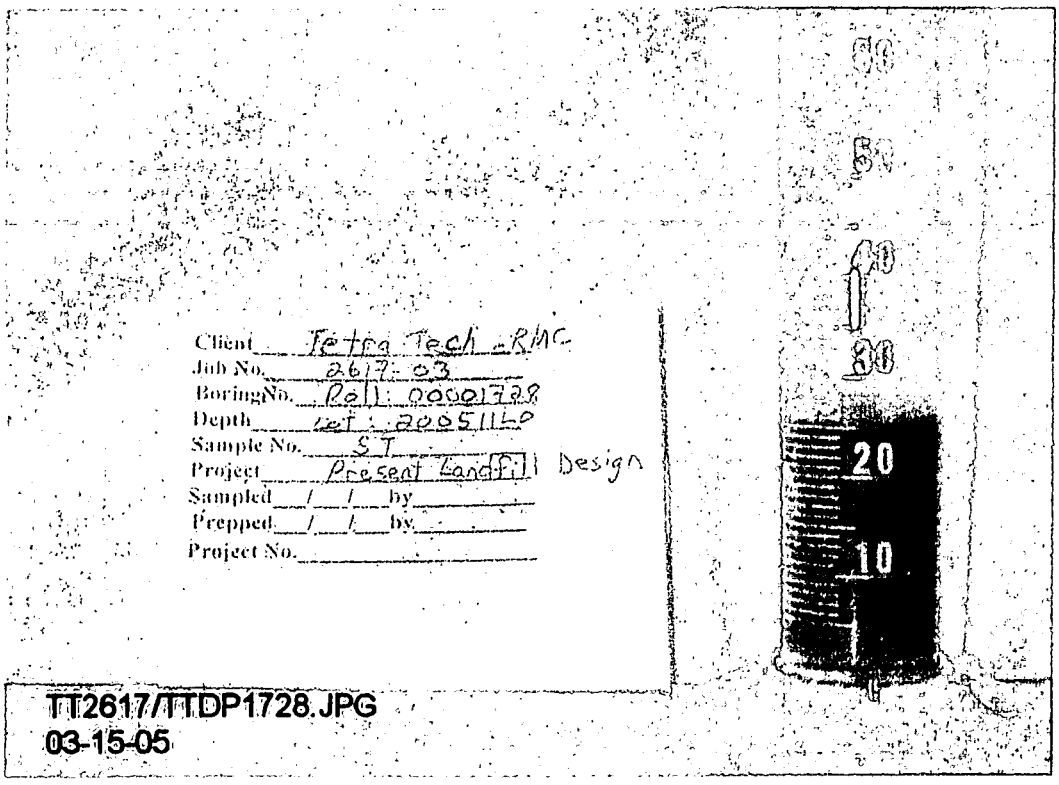
Date Tested:03-10-05 RS

Project Description: Present Landfill Desing-RFETS, Golden, CO

OVEN-DRIED SAMPLES			
SAMPLE NO.	**SWELL INDEX CC/2 gms**	**START TEMP. °C**	**END TEMP °C**
Roll 00001728, Lot #200511L0	25.5	23.1	22.2

DATA ENTERED BY: SR DATE: 03-10-05

DATA CHECKED BY: JTR DATE: 3/14/05


Client Tetra Tech - RMC
Job No. 2617.03
BoringNo. Roll: 00001728
Depth ref: 2005114.0
Sample No. ST
Project Present Landfill Design
Sampled / / by
Prepped / / by
Project No.
20
10
TT2617/TTDP1728.JPG
03-15-05

LARGE SCALE INTERFACE DIRECT SHEAR TEST DATA

ASTM D 6243 - 12" x 12" Box

Client:	Tetra Tech-RMC	Date:	03/15/2005
Project No:	2617-03	Test Date:	03/14/2005
Project:	Present Landfill Design-RFETS, Golden, CO	Technician:	JTR
Interface:	Roll #00001728, Lot #200511LO	Shear Rate:	.0066 in/min
Special conditions:		Test Series:	DS-1

Displacement (inches)	Normal Force 200 psf Shear Stress (psf)
0	0
0.022	83
0.076	121
0.134	164
0.191	202
0.25	244
0.308	290
0.364	333
0.421	375
0.479	418
0.537	461
0.594	504
0.652	536
0.71	571
0.767	612
0.824	654
0.881	694
0.938	725
0.997	758
1.054	795
1.113	813
1.169	840
1.228	861
1.285	878
1.345	899
1.403	918
1.463	909
1.519	918
1.58	891
1.641	730
1.7	680
1.761	634
1.82	536
1.882	464

ata Entered By: SR Date: 03/15/2005
Data Checked By: CJ Date: 03/15/05
File Name: TTDS1728

Advanced Terra Testing, Inc.

LARGE SCALE INTERFACE DIRECT SHEAR TEST DATA

ASTM D 6243 - 12" x 12" Box

Client:	Tetra Tech-RMC	Date:	02/09/2005
Project No:	2617-03	Test Date:	01-26,27-28-05
Project:	Present Landfill Design-RFETS, Golden, CO	Technician:	JTR
Interface:	Roll #10, Lot #200503L0	Shear Rate:	.0066 in/min
Special conditions:	CETCO Bentomat DN	Test Series:	DS-2

Displacement (inches)	Normal Force 200 psf Shear Stress (psf)	Normal Force 400 psf Shear Stress (psf)	Normal Force 600 psf Shear Stress (psf)
0	0	0	0
0.039	47	99	161
0.094	118	172	260
0.147	158	227	337
0.202	186	252	396
0.258	213	300	449
0.317	234	335	501
0.377	259	370	556
0.439	284	405	609
0.497	309	438	657
0.554	326	469	713
0.608	342	504	752
0.665	360	534	787
0.719	377	559	820
0.783	395	584	843
0.844	409	601	868
0.904	417	617	893
0.961	429	630	908
1.018	439	640	911
1.071	440	649	913
1.13	442	644	904
1.189	440	647	893
1.251	443	650	875
1.311	442	649	850
1.371	445	650	846
1.429	442	644	823
1.483	440	632	806
1.54	437	627	791
1.597	430	619	770
1.659	429	614	763
1.721	425	606	765
1.783	419	596	750
1.841	420	582	738
1.899	415	569	725

Data Entered By: SR Date: 02/09/2005

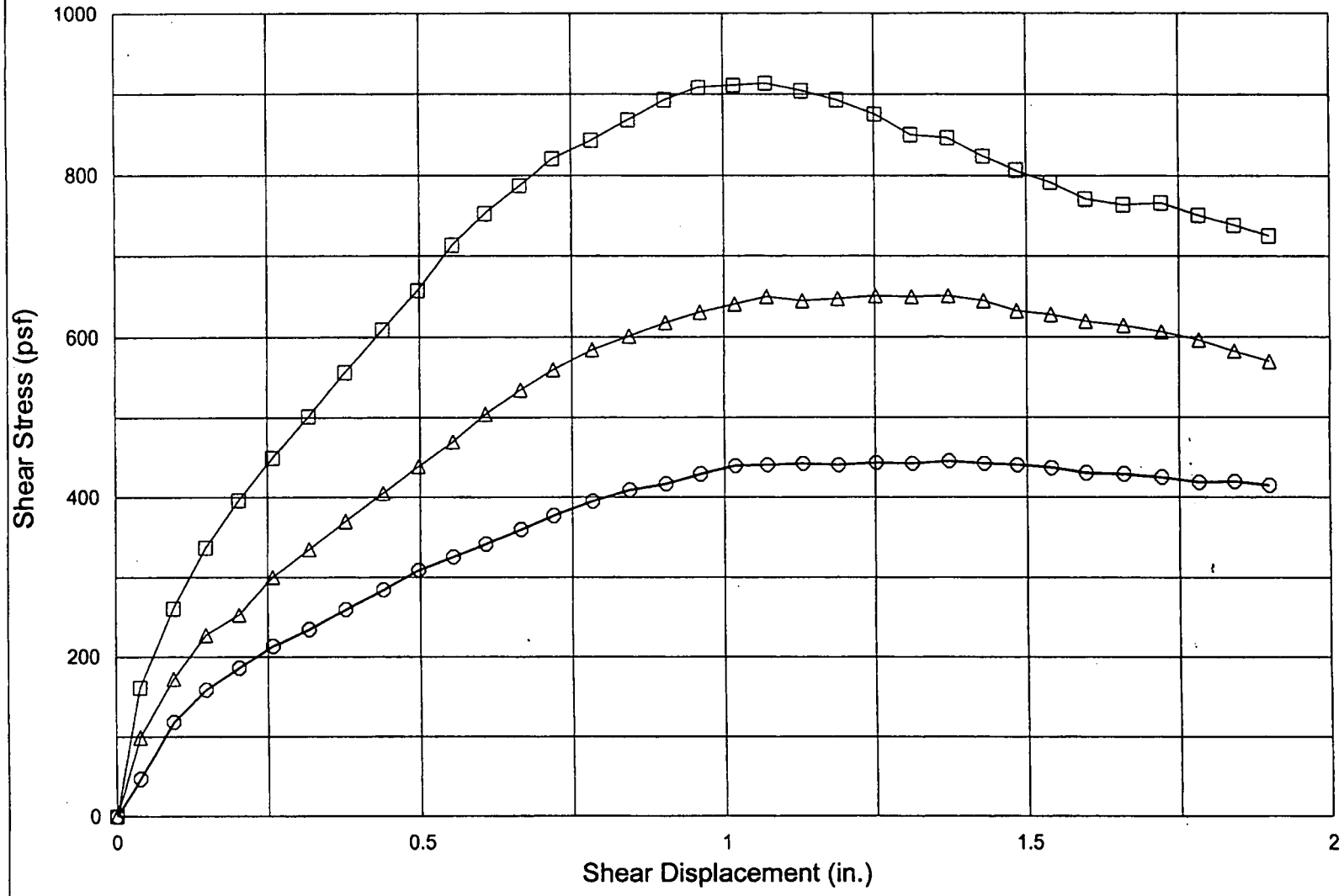
Data Checked By: CW Date: 02/09/05

File Name: TTDS10

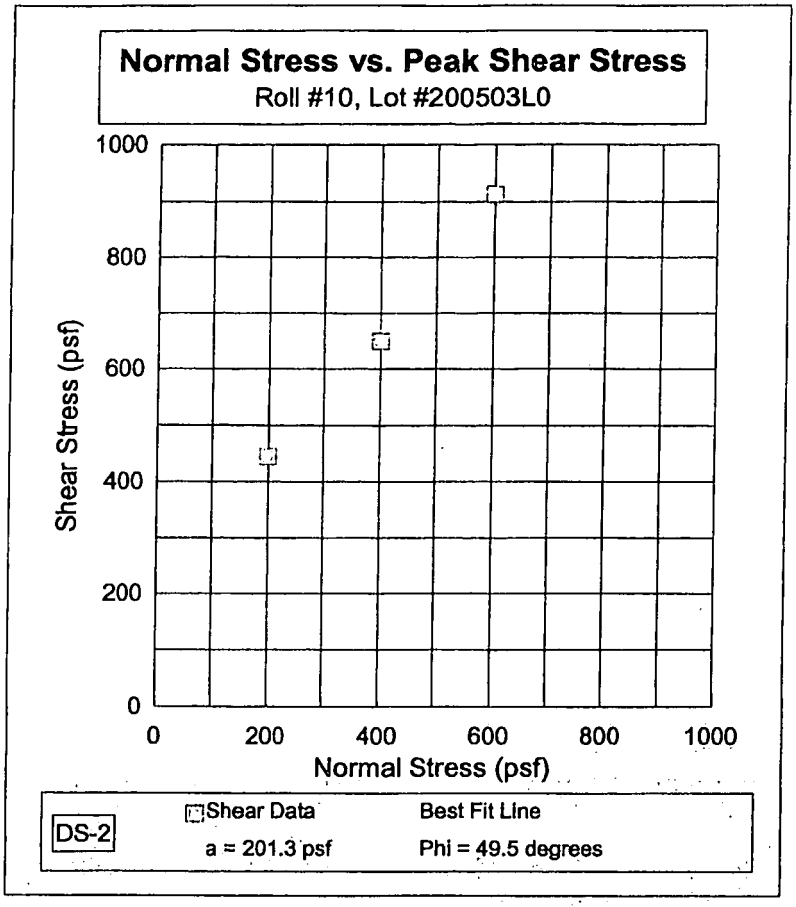
Advanced Terra Testing, Inc.

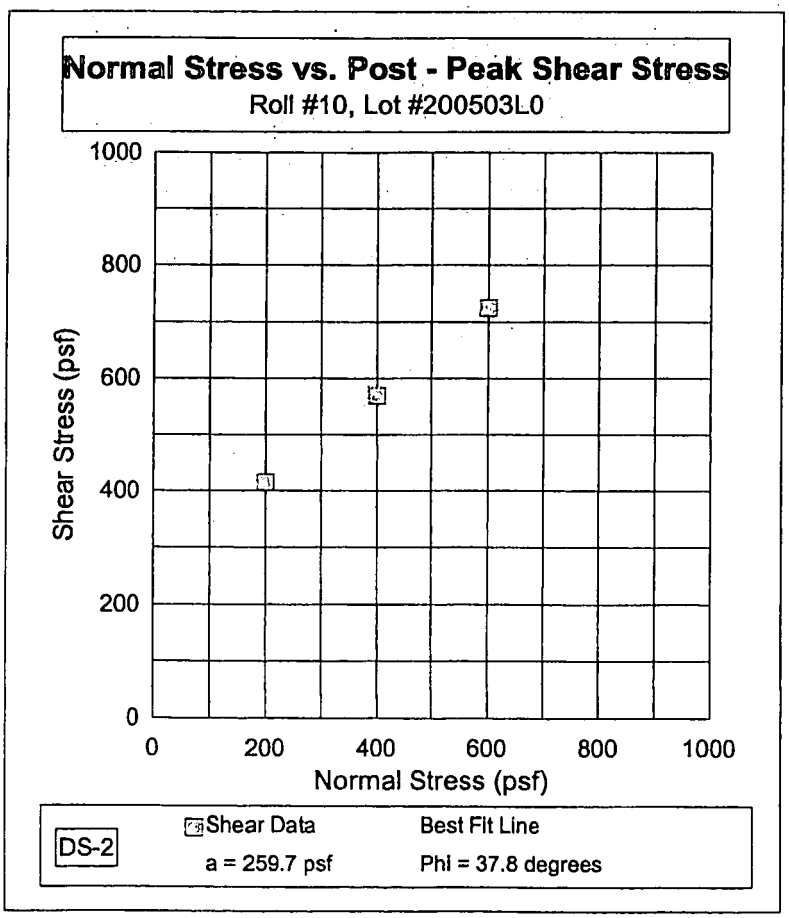
Shear Stress vs. Displacement

Roll #10, Lot #200503L0

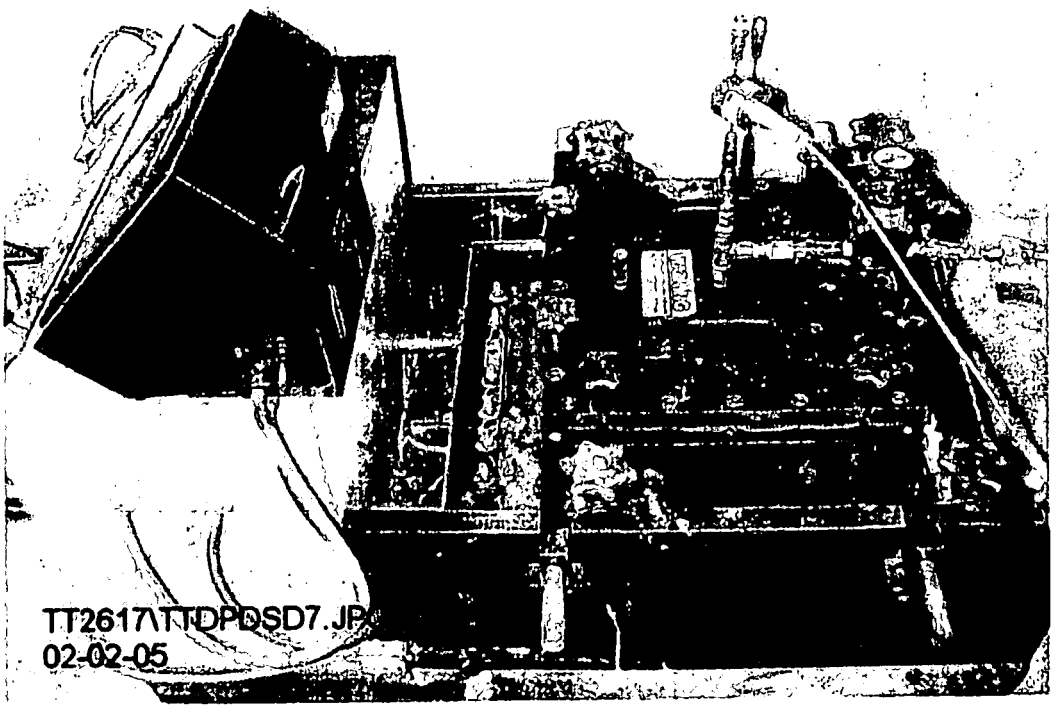


DS-2





ADVANCED TERRA TESTING, Inc.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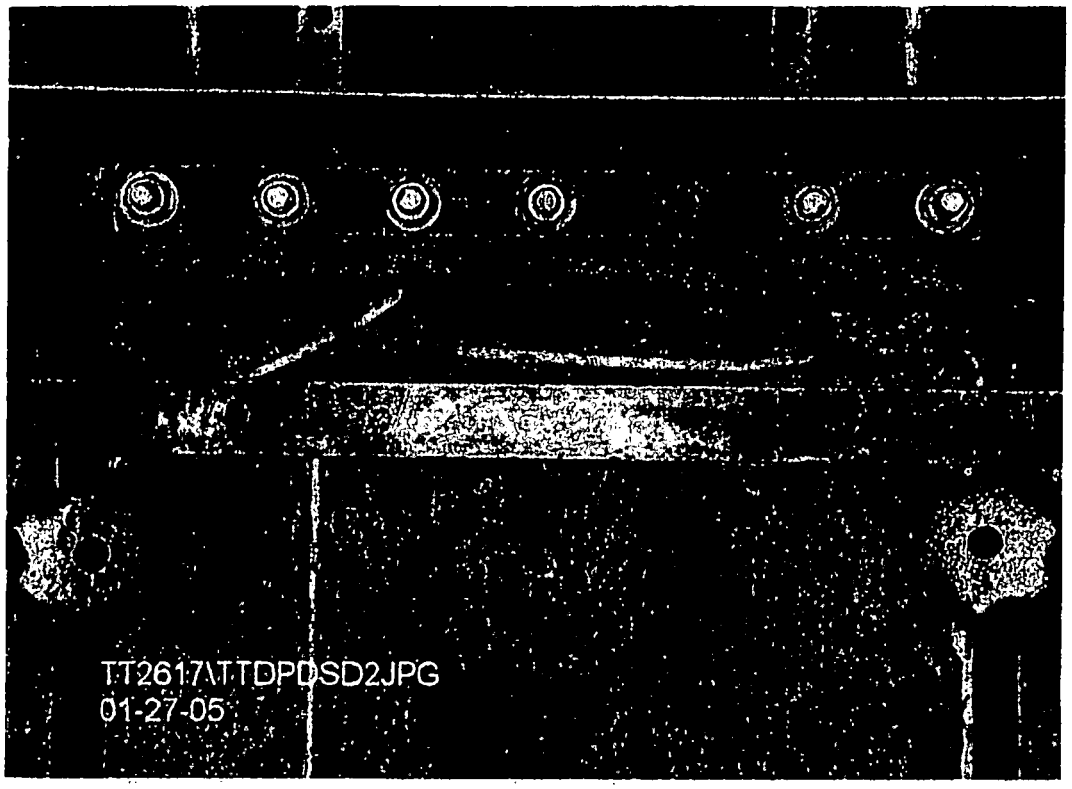
02-02-05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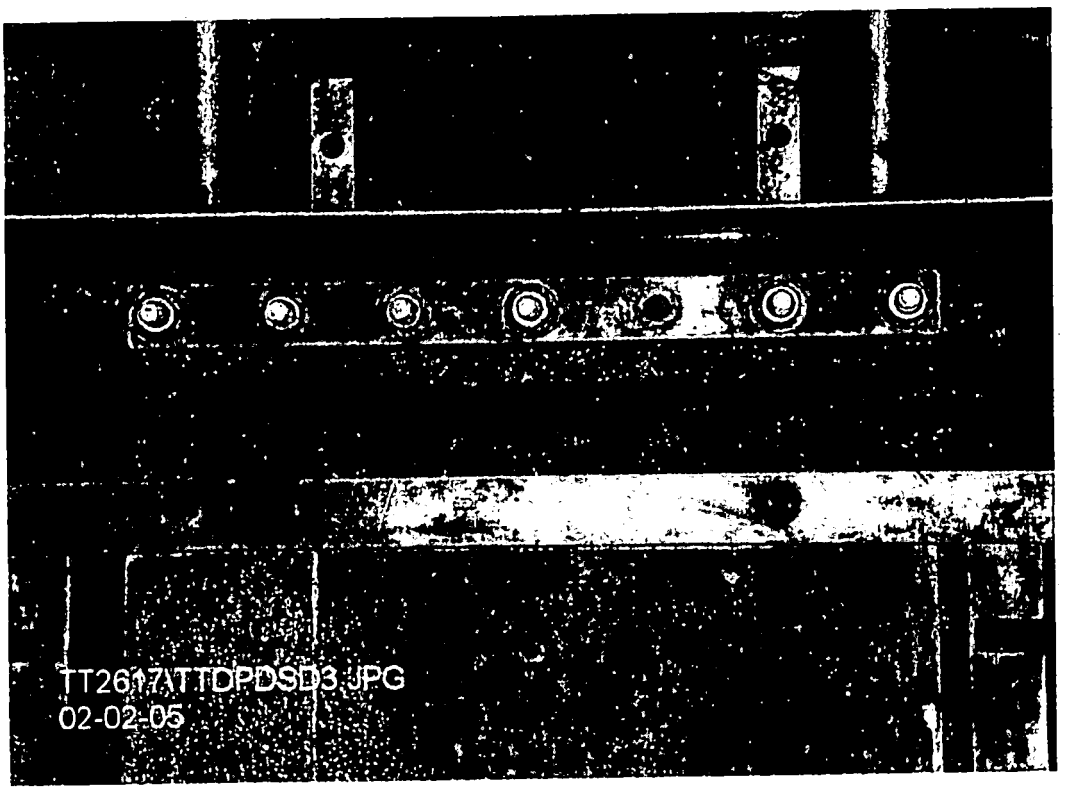
01-27-05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02-02-05

TT2617\TTDPDS4.JPG
02-02-05

LARGE SCALE INTERFACE DIRECT SHEAR TEST DATA

ASTM D 6243 - 12" x 12" Box

Client:	Tetra Tech-RMC	Date:	02/09/2005
Project No:	2617-03	Test Date:	DS-4
Project:	Present Landfill Design-RFETS, Golden, CO	Technician:	JTR
Interface:	Roll #10, Lot #200503L0	Shear Rate:	.0066 in/min
Special conditions:	CETCO Bentomat DN	Test Series:	DS-4

Displacement (inches)	Normal Force 200 psf Shear Stress (psf)
0	0
0.036	77
0.089	130
0.145	168
0.202	224
0.26	271
0.317	317
0.374	364
0.433	417
0.487	468
0.545	528
0.602	593
0.659	658
0.713	726
0.775	790
0.831	852
0.884	907
0.941	961
1.001	1008
1.056	1043
1.113	1069
1.171	1081
1.232	1079
1.289	1071
1.348	1038
1.407	998
1.468	945
1.53	902
1.588	870
1.645	854
1.706	834
1.767	810
1.824	800
1.884	790

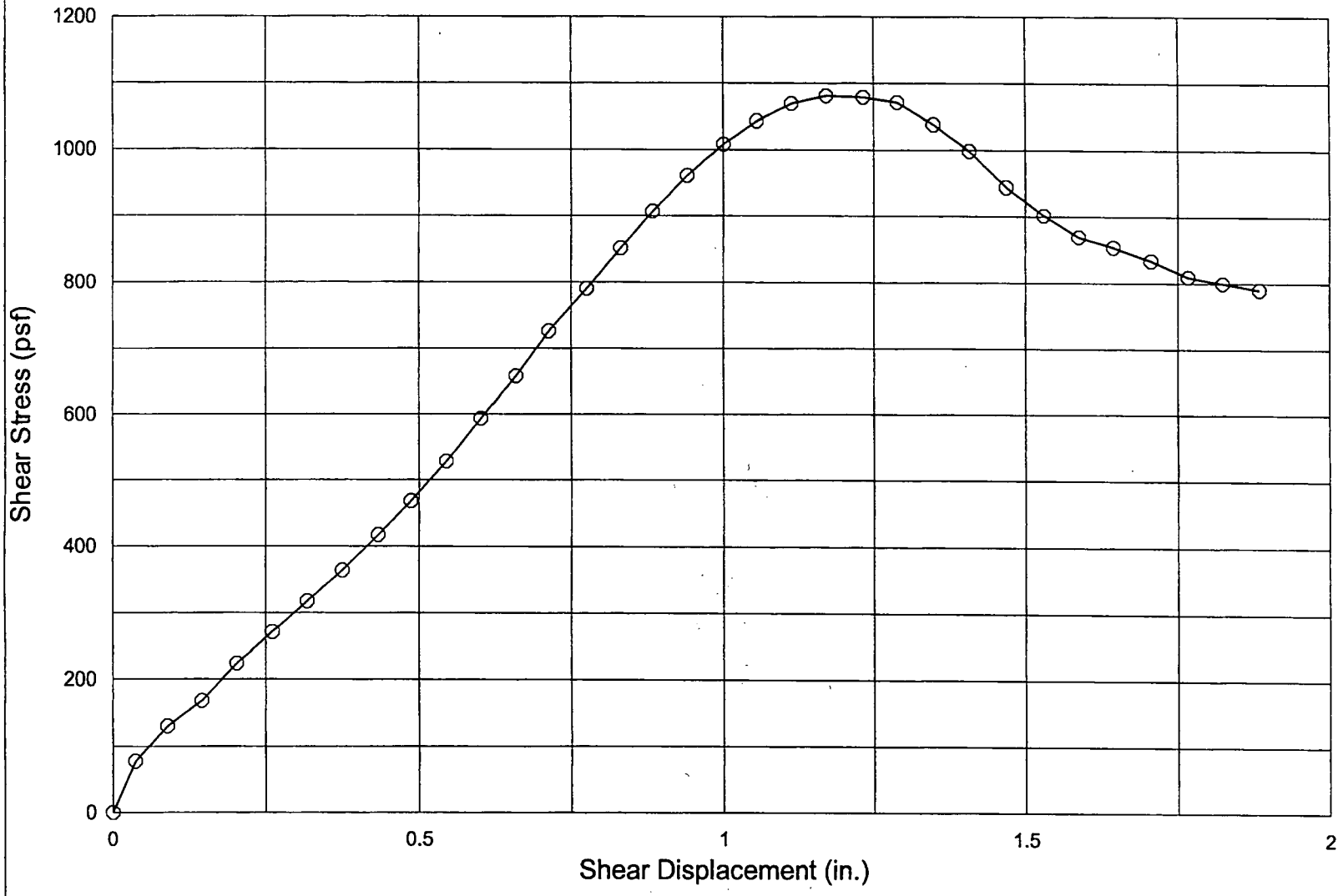
NOTE: New grip surfaces installed on testing devise.

Data Entered By: SR Date: 02/09/2005
Data Checked By: CJ Date: 02/09/05
File Name: TTDS10B

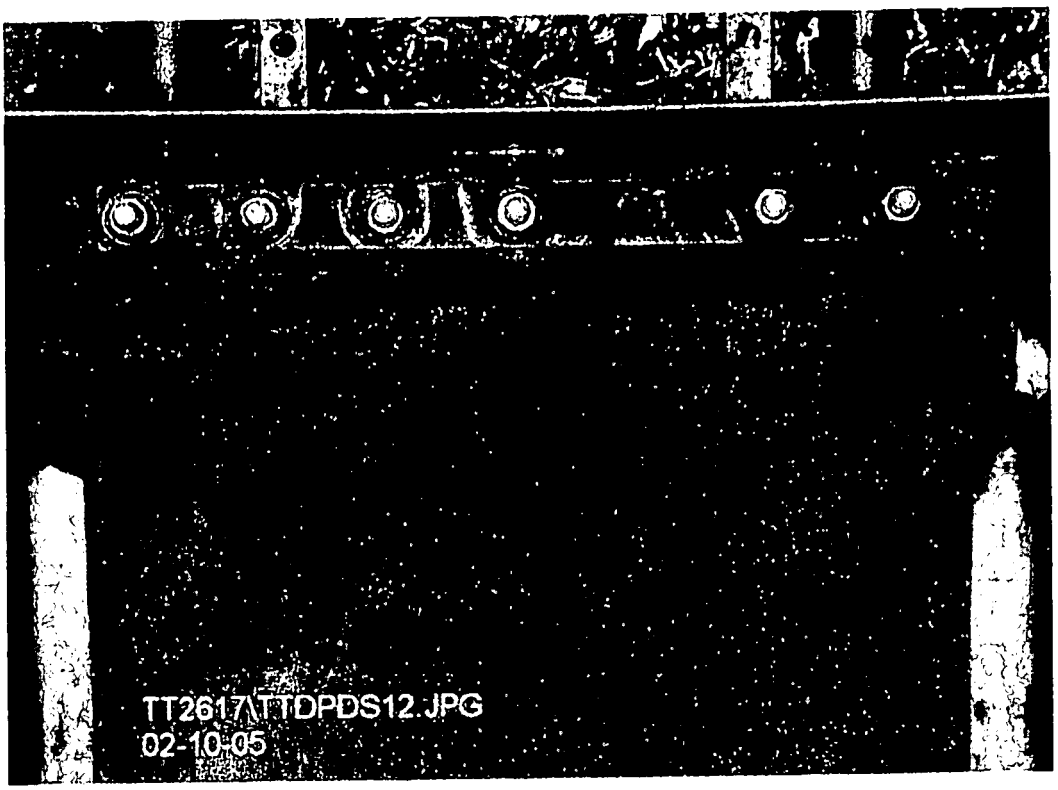
Advanced Terra Testing, Inc.

Shear Stress vs. Displacement

Roll #10, Lot #200503L0



DS-4


TT2617\TTDPDS12.JPG
02-10-05

LARGE SCALE INTERFACE DIRECT SHEAR TEST DATA

ASTM D 6243 - 12" x 12" Box

Client:	Tetra Tech-RMC	Date:	02/09/2005
Project No:	2617-03	Test Date:	01-25&02-07-05
Project:	Present Landfill Design-RFETS, Golden, CO	Technician:	JTR
Interface:	Roll #55, Lot #200503L0	Shear Rate:	.0066 in/min
Special conditions:	CETCO Bentomat DN	Test Series:	DS-1

Displacement (inches)	Normal Force 200 psf Shear Stress (psf)
0	0
0.033	104
0.089	117
0.144	152
0.204	156
0.259	197
0.319	222
0.375	254
0.435	290
0.49	323
0.547	363
0.605	408
0.664	451
0.718	498
0.778	544
0.835	591
0.892	634
0.948	680
1.008	718
1.062	752
1.123	783
1.18	810
1.238	831
1.295	835
1.354	835
1.414	825
1.472	800
1.53	773
1.59	740
1.651	708
1.71	687
1.768	662
1.827	640
1.891	629

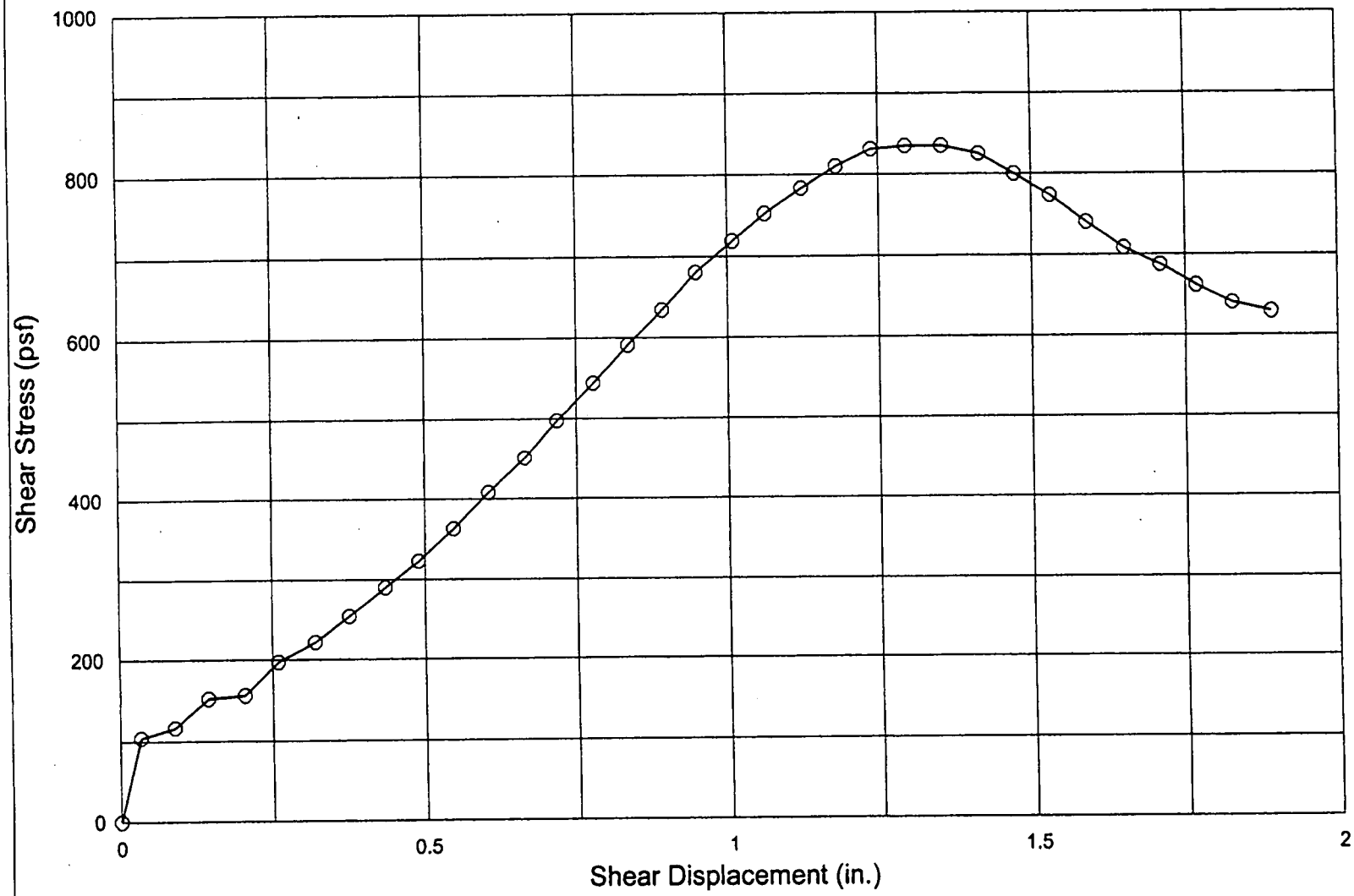
NOTE: New grip surfaces installed on testing devise.

Data Entered By:	SR	Date:	02/09/2005
Data Checked By:	CJ	Date:	02/09/05
File Name:	TTDS55A		

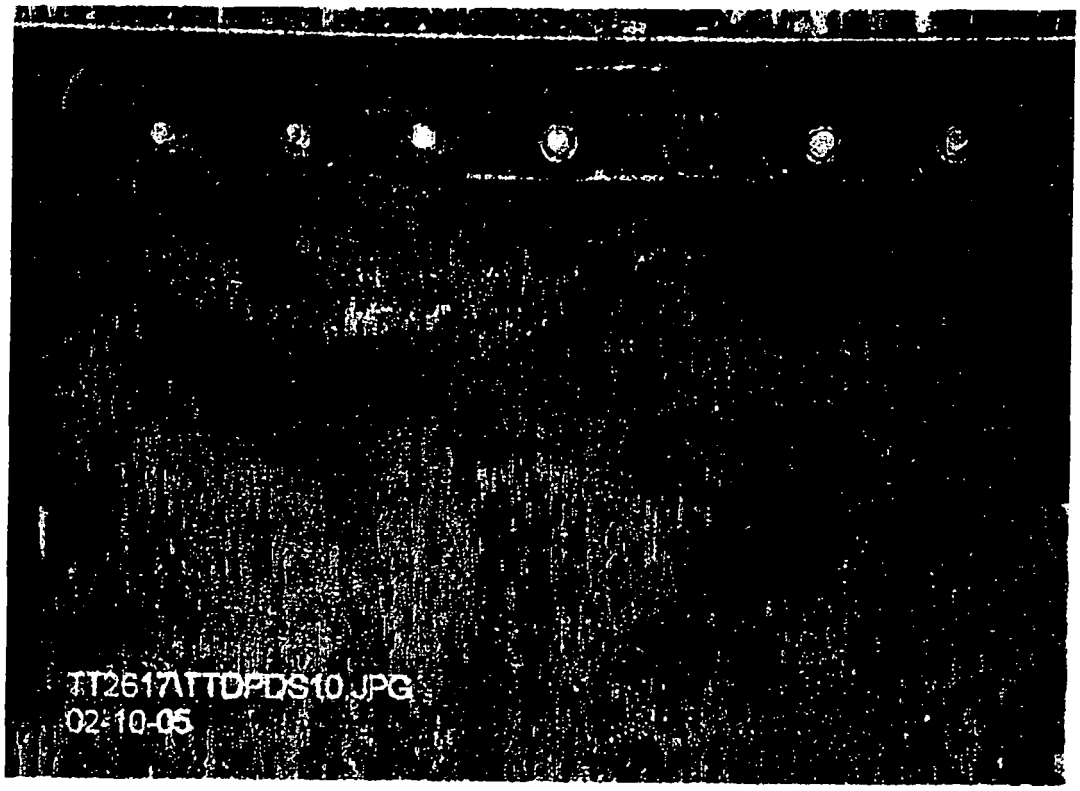
Advanced Terra Testing, Inc.

Shear Stress vs. Displacement

Roll #55, Lot #200503L0



DS-1


TT2617\TTDPDS10.JPG
02-10-05

LARGE SCALE INTERFACE DIRECT SHEAR TEST DATA

ASTM D 6243 - 12" x 12" Box

Client:	Tetra Tech-RMC	Date:	02/09/2005
Project No:	2617-03	Test Date:	02-08-05
Project:	Present Landfill Design-RFETS, Golden, CO	Technician:	JTR
Interface:	Roll #00000708, Lot #200504L0	Shear Rate:	.0066 in/min
Special conditions:	CETCO Bentomat ST	Test Series:	DS-3

Displacement (inches)	Normal Force 200 psf Shear Stress (psf)
0	0
0.035	56
0.089	109
0.143	116
0.199	154
0.256	191
0.317	226
0.376	264
0.435	310
0.487	352
0.543	390
0.599	443
0.66	483
0.718	536
0.78	584
0.835	622
0.888	656
0.943	684
1.002	720
1.058	749
1.122	767
1.181	782
1.239	792
1.293	784
1.351	750
1.412	684
1.474	606
1.537	498
1.597	427
1.655	372
1.713	337
1.773	317
1.835	289
1.899	266

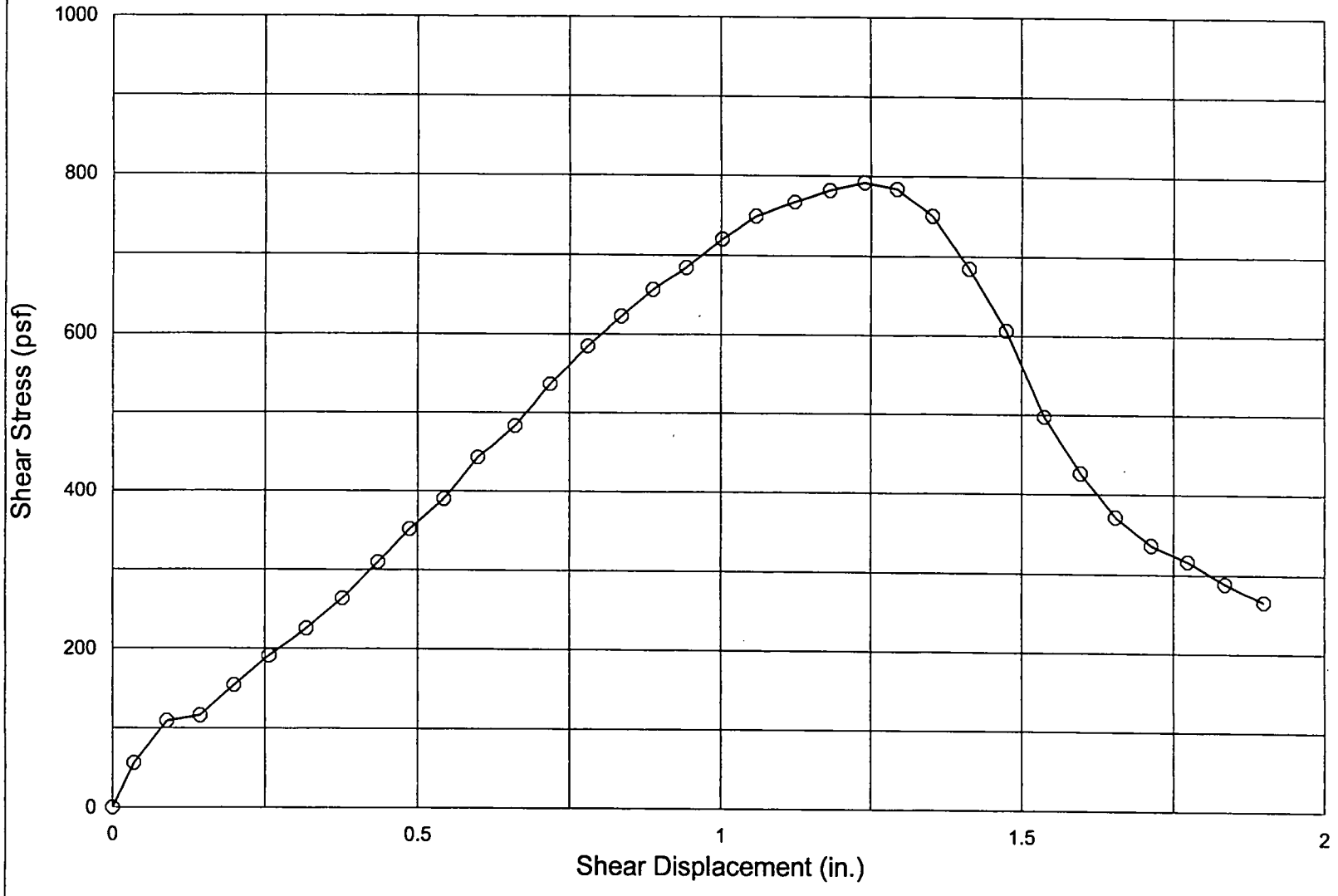
NOTE: New grip surfaces installed on testing devise.

Data Entered By: SR Date: 02/09/2005
Data Checked By: CJ Date: 02/09/05
File Name: TTDS0708

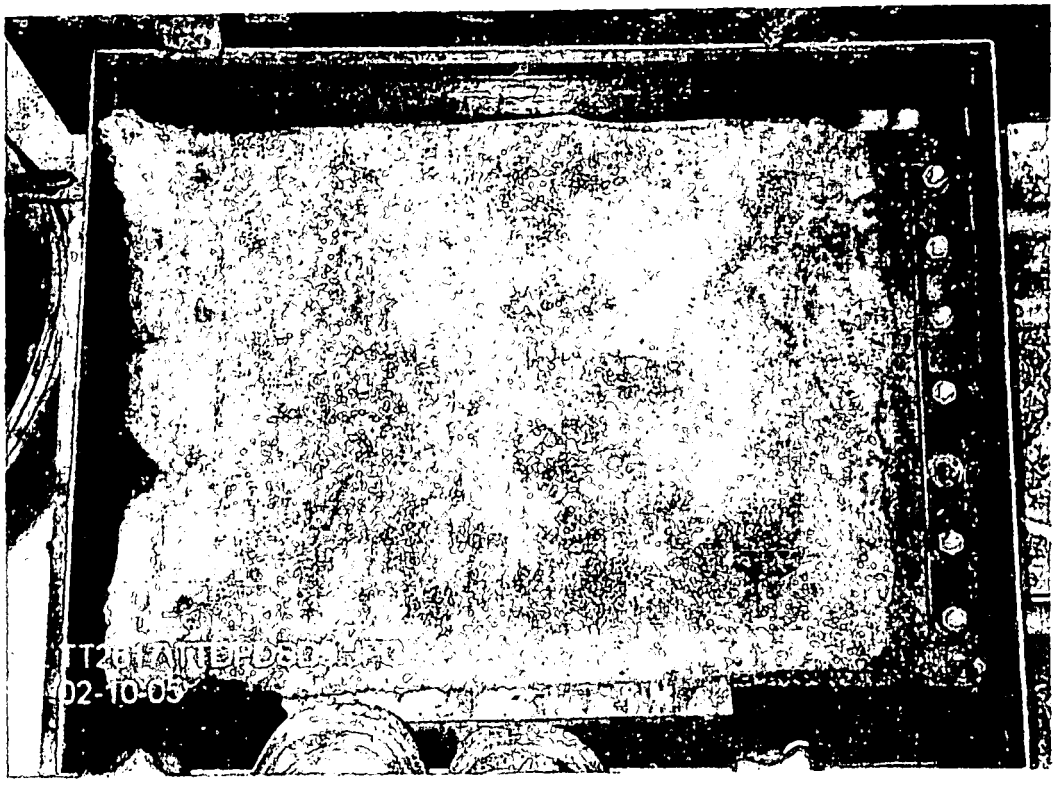
Advanced Terra Testing, Inc.

Shear Stress vs. Displacement

Roll #00000708, Lot #200504L0



DS-3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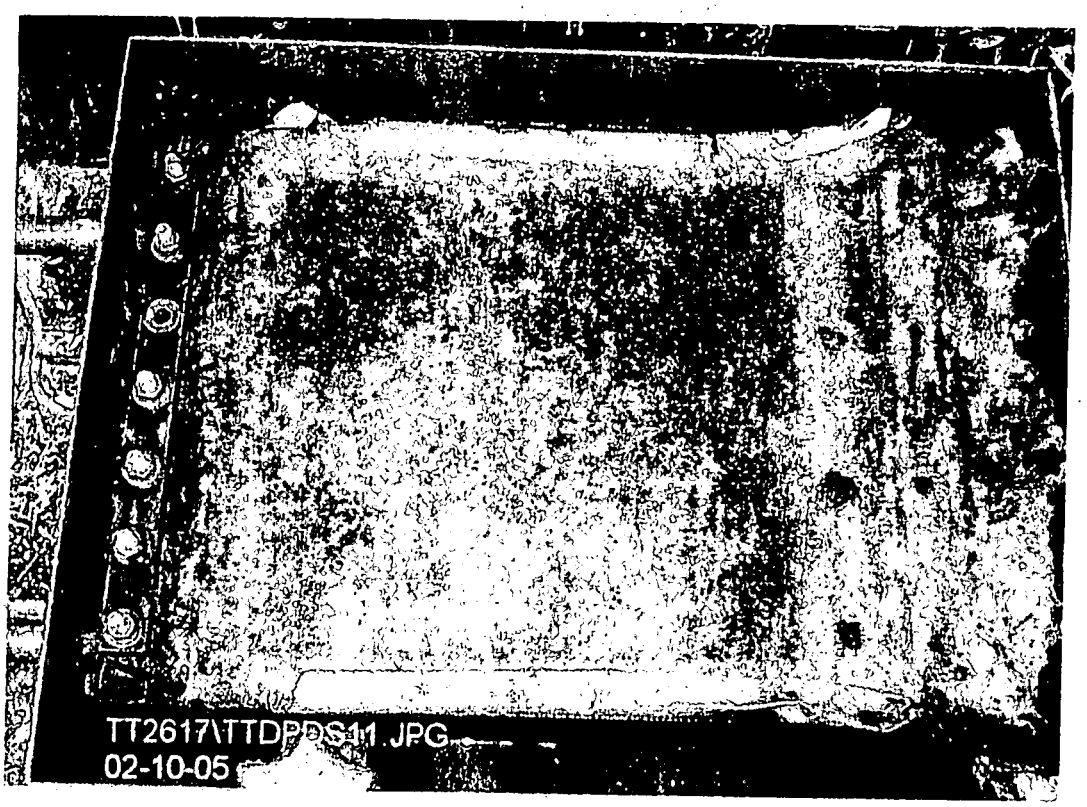
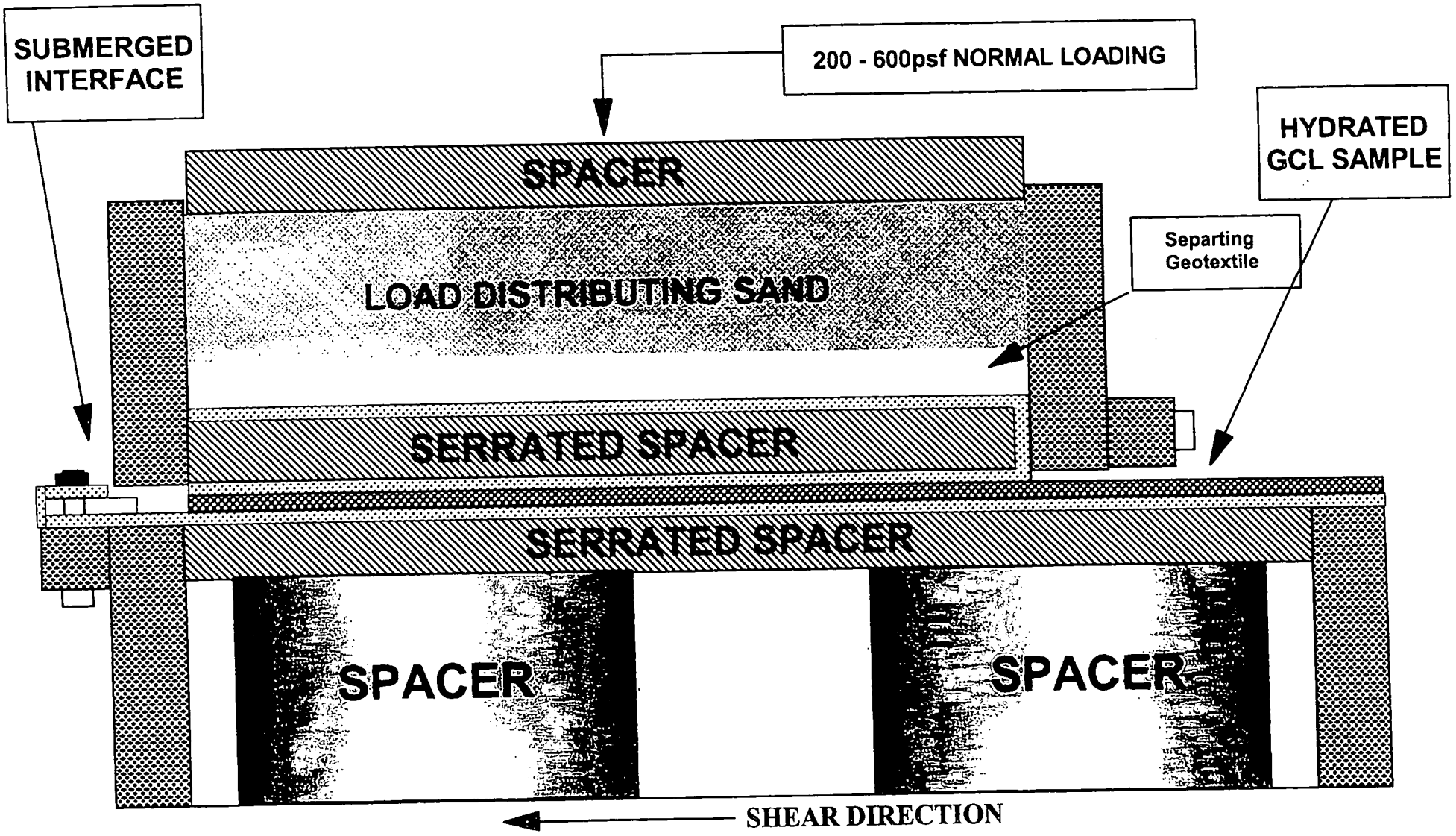

TT2617\TTDPDS11.JPG
02-10-05

LARGE SCALE INTE..FACE DIRECT SHEAR
ASTM D 6243 - 12" X 12" Box

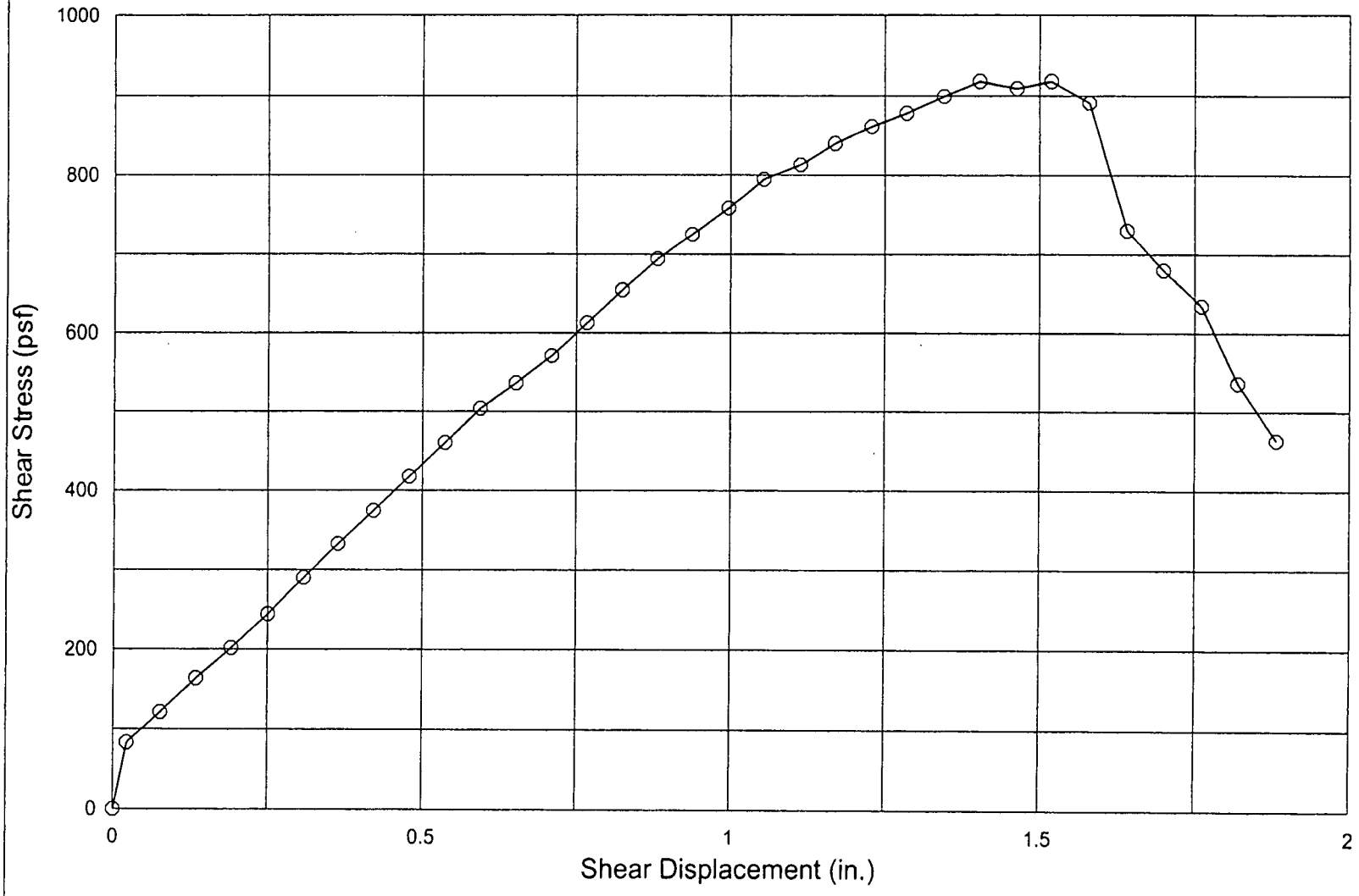
Client : Tetra Tech-RMC

Project No: 2617-03



Shear Stress vs. Displacement

Roll #00001728, Lot #200511LO



DS-1

ISO 9001 - 2000

Precision Geosynthetic Laboratories

January 26, 2005

Sharon Roberts
ADVANCED TERRA TESTING INC.
833 Parfet Street
Lakewood, CO 80215

Dear Ms. Roberts: RE: Present Landfill Design - RFETS

Thank you for consulting Precision Geosynthetic Laboratories for your material testing needs.

Enclosed is the ***final*** laboratory report for the testing of two (2) Double Sided Geocomposite sample(s) received January 19, 2005.

It should be noted that the test specimen and test sample used for this report was believed to be representative of the material produced under the designation herein stated. However, these results are indicative of only the specimens that were actually tested. The testing herein is based upon accepted industry practice as well as the test method listed. Precision Geosynthetic Laboratories neither accepts responsibility for nor makes claims to the final use and purpose of the material.

By accepting the data and results represented on this report, Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims arising out of the use of this data to the cost for the respective test(s) represented in this report, and Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liability in excess of the aforementioned limit.

The test data and all associated project information shall be held in confidence, not to be reproduced except in full and disclosed to other parties with the authorization of the client.

It is a company policy to keep the physical records of each job for 2 years since the receipt of the samples and keep the electronic file for 7 years. ***Failed seam samples are kept for 7 years; good seam samples are disposed after 2 weeks and conformance samples are disposed after 1 month.*** Should you need us to keep them longer, please advise us in writing.

If you have any questions or if we may be of further service, please do not hesitate to call at 800-522-4599.

Sincerely,

PRECISION GEOSYNTHETIC LABORATORIES

Maria Espitia
Quality Assurance

Cora B. Queja
Vice President

Enclosure: (Job No. G050032)

ISO 9001 - 2000

Precision Geosynthetic Laboratories

CLIENT: ADVANCED TERRA TESTING INC.
PROJECT: Present Landfill Design - RFETS

VERIFICATION OF MATERIAL PROPERTIES
(PGL Job No. G050032)

MATERIAL DESCRIPTION: Double Sided Geocomposite

SAMPLE(S) SENT BY: Advanced Terra Testing Inc.

DATE RECEIVED: January 19, 2005 **DATE REPORTED:** January 26, 2005

SAMPLE IDENTIFICATIONS:

SAMPLE ID	PRECISION CONTROL NUMBER
151A, C2-8-2-05-0001-200 Shift 2, 1-10-05	7214, 7214-1
Tendrain 200 P58, C2-8-2-05-0035-200 Shift 1 Line 151A	7215, 7215-1

TESTS REQUIRED:

TEST METHOD	DESCRIPTION
Geonet portion:	
ASTM D1603	Carbon Content
ASTM D1505	Density
Geotextile Portion:	
ASTM D4751	Apparent Opening Size
Geocomposite:	
ASTM D4716	Transmissivity

TEST CONDITIONS: The samples were conditioned for a minimum one hour in the laboratory at 22 ± 2°C (71.6 ± 3.6°F) and at 60 ± 10% relative humidity prior to test.

TEST RESULTS:

The test results are summarized in Table(s) 1 & 2. The units in which the data are reported are included on these tables.

PRECISION GEOSYNTHETIC LABORATORIES

GAI-LAP
Initials: MC #: 013
Date: 1/26/05

Quality Assurance

Cora B. Queja
Vice President

1160 North Gilbert Street, Anaheim, CA. 92801, Tel# 714-520-9631, Fax#714-520-9637

TABLE 1.

MATERIAL PROPERTIES

CLIENT: ADVANCED TERRA TESTING INC.
PROJECT: Present Landfill Design - RFETS

Date Received : 1/19/2005
Date Reported: 1/26/2005
Client Sample ID : 151A, C2-8-2-05-0001-200 Shift 2, 1-10-05
Material Description: Double Sided Geocomposite

QC'd by: ME
PGL Job No. : G050032
PGL Control No. : 7214

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min.	Max.	Proj. Specs.
GEONET COMPONENT:																
ASTM D1505	Density (grams/ cm.^{3})	0.9532	0.9532	0.9532								0.9532	0.0000	0.95	0.95	
ASTM D1603	Carbon Black Content (percent)	2.71	2.79									2.75	0.05	2.71	2.79	
GEOCOMPOSITE:																
ASTM D4716	Transmissivity	*Tested at Normal Pressure :* 15,000 *psf, Gradient:* 1.0 *, Seating Time:* 1 *hr*														
		Temperature of Test Water: 20.5 ^{0}F *Specimen Size: 12" x 14"*														
	Transmissivity (m.^{2}/ sec.)															
	MD	1.35E-04	1.42E-04									1.39E-04	4.62E-06	N/A	N/A	
	Transmissivity (gal./ min./ ft.)															
	MD	0.65	0.69									0.67	0.02	0.65	0.69	
	Flow Rate (gal./ min)															
	MD	0.66	0.69									0.68	0.02	0.66	0.69	

Geosynthetics arranged as follows:

Plate _____
Geocomposite XXXXXX
Plate _____

Thickness : 325.5 *mils (Before)*
Thickness : 311 *mils (After)*

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

Precision Geosynthetic Laboratories

ISO 9001 - 2000
GAI-LAP
ANSI-RAB ACCREDITED

TABLE .

MATERIAL PROPERTIES

CLIENT: ADVANCED TERRA TESTING INC.

PROJECT: Present Landfill Design - RFETS

Date Received: **1/19/2005**
Date Reported: **1/21/2005**
Client Sample ID: **151A, C2-8-2-05-0001-200 Shift 2, 1-10-05**
Material Description: **Double Sided Geocomposite**

QC'd By: ME
PGL Job No.: **G050032**
PGL Control No.: **7214-1**

		SPECIMENS														Proj.
		1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Specs.
METHOD	DESCRIPTION															
ASTM D4751	Apparent Opening Size (U.S. standard sieve size)															
	Specimens were tested as directed in Test Method D4751. Type of sieve shaker used is W.S. Tyler Rotap.															
		100-140	100-140	100-140	100-140	100-140						100-140	N/A	N/A	N/A	
ASTM D4751	Apparent Opening Size (mm)															
	Specimens were tested as directed in Test Method D4751. Type of sieve shaker used is W.S. Tyler Rotap.															
		0.149	0.146	0.143	0.138	0.140						0.143	0.004	0.138	0.149	

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

ISO 9001 - 2000
GAI-LAP

TABLE 2.

MATERIAL PROPERTIES

CLIENT: ADVANCED TERRA TESTING INC.
PROJECT: Present Landfill Design - RFETS

Date Received : **1/19/2005**
Date Reported: **1/26/2005**
Client Sample ID : **Tendrain, 200 P58, C2-8-2-05-0035-200 Shift 1 Line 151A**
Material Description: **Double Sided Geocomposite**

QC'd by: ME
PGL Job No. : **G050032**
PGL Control No. : **7215**

METHOD DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT:															
ASTM D1505 Density (grams/ cm.^{3})	0.9537	0.9537	0.9537								0.9537	0.0000	0.95	0.95	
ASTM D1603 Carbon Black Content (percent)	2.33	2.35									2.34	0.01	2.33	2.35	
GEOCOMPOSITE:															
ASTM D4716 Transmissivity *Tested at Normal Pressure : 209 psf, Gradient: 0.1 , Seating Time: 1 hr* *Temperature of Test Water: 20.6 ^{0}F Specimen Size: 12" x 14"*															
Transmissivity (m.^{2}/ sec.)															
MD	5.68E-04	5.84E-04									5.76E-04	1.13E-05	N/A	N/A	
Transmissivity (gal./ min./ ft.)															
MD	2.74	2.82									2.78	0.05	2.74	2.82	
Flow Rate (gal./ min)															
MD	0.28	0.29									0.28	0.01	0.28	0.29	

Geosynthetics arranged as follows:

Plate _____
Geocomposite XXXXXX
Plate _____

Thickness : 292.5 *mils (Before)*
Thickness : 266.5 *mils (After)*

MD - MAC[illegible]E DIRECTION
TD - TF[illegible]RSE DIRECTION
DC#19[illegible]rd#265

Precision G[illegible]nthetic Laboratories

ISO 9001 - 2000
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TABLE 2

MATERIAL PROPERTIES

CLIENT: ADVANCED TERRA TESTING INC.

PROJECT: Present Landfill Design - RFETS

Date Received: **1/19/2005**
Date Reported: **1/21/2005**
Client Sample ID: **Tendrain, 200 P58, C2-8-2-05-0035-200 Shift 1 Line 151A**
Material Description: **Double Sided Geocomposite**

QC'd By: ME
PGL Job No.: **G050032**
PGL Control No.: **7215-1**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D4751	Apparent Opening Size (U.S. standard sieve size)															
	Specimens were tested as directed in Test Method D4751.Type of sieve shaker used is W.S. Tyler Rotap.															
		100-140	100-140	100-140	100-140	100-140						100-140	N/A	N/A	N/A	
ASTM D4751	Apparent Opening Size (mm)															
	Specimens were tested as directed in Test Method D4751.Type of sieve shaker used is W.S. Tyler Rotap.															
		0.148	0.150	0.142	0.120	0.150						0.142	0.013	0.120	0.150	

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

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ADVANCED TERRA TESTING, Inc.
ATT
833 Parfet Street • Lakewood, Colorado 80215 • (303) 232-8308 • Fax: (303) 232-1579

Mr. Roy Spitzer
Tetra Tech - RMC
1900 S. Sunset Street, Suite 1-F
Longmont, CO 80501

April 11, 2005

RE: Present Landfill Design - RFETS
Golden, CO, and Rocky Flats Present Landfill Closure

Dear Mr. Spitzer,

Thank you for choosing Advanced Terra Testing, Inc. for your geosynthetic testing needs.

Per your request, we have completed the analyses pertinent to the recent testing campaign relative to the above referenced project. The following is a table providing a summary of Seam Shear and Seam Peel.

Seam Shear and Seam Peel - ASTM D 6392

Seam ID	Seam Shear (lb/in)	Seam Peel (lb/in)	
		Weld A	Weld B
DFP-078, LLDPE-T	115.9	107.5	105.0
DFP-080, LLDPE-T	113.5	105.3	104.7
DFP-100, LLDPE-S	105.3	85.2	91.1

Should you have any questions or require additional information please, feel free to give us call.

Sincerley,

Sharon Roberts
Geosynthetic Division Manager

K:\TF2617\TFF10405.lwp

Rahe, John -- MFG, Inc.

From: Rahe, John -- MFG, Inc.
Sent: Wednesday, April 13, 2005 3:34 PM
To: 'Davis, Robert W.'
Cc: 'josh.valentine@ttrmc.com'; 'marshall.massaro@ttrmc.com'
Subject: PLF - QA Laboratory Tests of FML Destructive Seam Samples

Bob,

The final destructive seam QA laboratory tests for the 60-mil LLDPE (DFP-100) and 60-mil LLDPE-T (DFP-078 and DFP-080)for the eastern portion of the PLF have been performed in accordance with ASTM D 6392. Each of the three samples was tested for shear and peel with five specimens of each sample tested.

The average seam shear strength of the textured FML (60-mil LLDPE-T) samples was approximately 114.7 lbs/in, which is approximately 27 percent higher than the minimum specified seam shear strength of 90 lbs/in. The average seam shear strength of the smooth FML (60-mil LLDPE) samples was approximately 105.3 lbs/in, which is approximately 17 percent in excess of the minimum specified value. The average peel strength of the textured FML seams (both welds) was approximately 105.6 lbs/in, which is approximately 40 percent higher than the minimum specified peel strength of 75 lb/in, and the average peel strength of the smooth FML seams was approximately 88.2 lbs/in, which is approximately 17 percent higher than the minimum specified. Thus all seam shear and peel tests exceed the minimum specified values and the average test values exceed the minimums by approximately 20 to 25 percent. These are in the same general range as the QC tests on field destructive seam samples.

The seam shear and peel tests for the 60-mil LLDPE-T placed on the East Face slope are typically approximately 10 to 20 percent higher than the seam shear and peel tests performed for the smooth 60-mil LLDPE on top of the PLF, including previous tests on smooth FML seams (e-mail of Jan. 25, '05).

All QA laboratory tests performed for the PLF liner system (GCL/FML/GDN) are complete and in conformance with specifications.

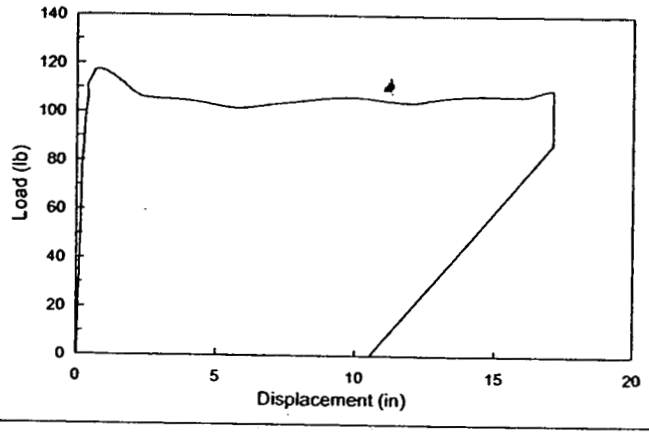
Let me know if you have any questions.

Thanks,
John

John H. Rahe, P.E.
Tetra Tech/MFG
303-447-0913 (ext. 104)

Client:	Tetra Tech-RMC	Test Type:	Seam Shear, ASTM D 6392
Job No.:	2617-08	Material Type:	LLDPE-T
Location:	Present Landfill Design-RFETS	Date Tested:	04-11-05
Sample:	DFP-078	Tested By:	JTR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	20 in/min
		Grip Seperation:	6.08 in

#1



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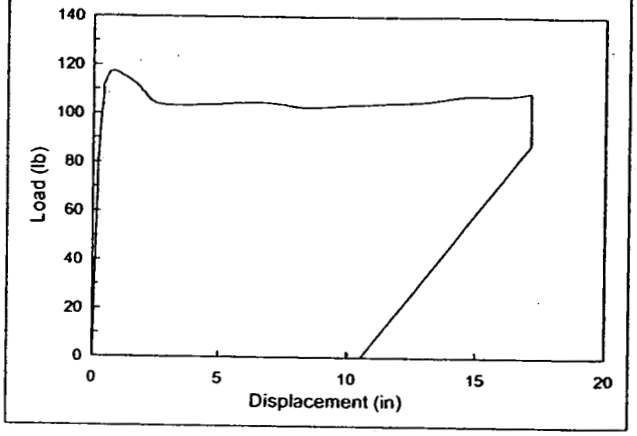

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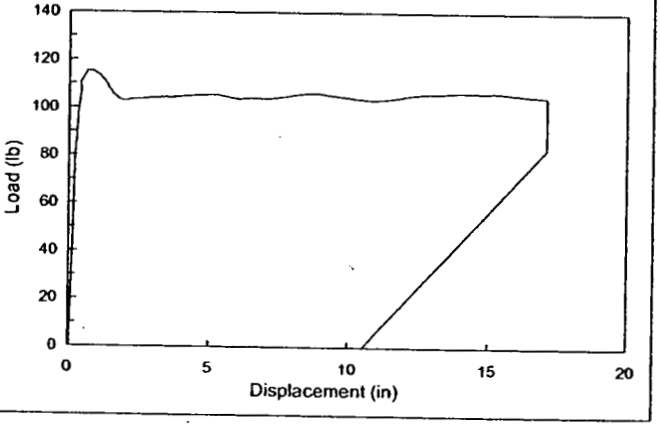

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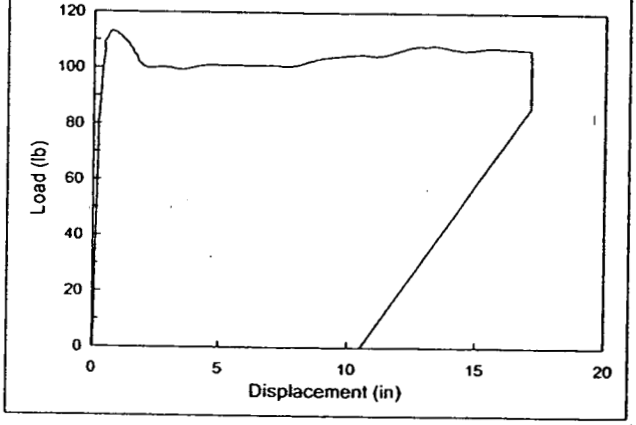

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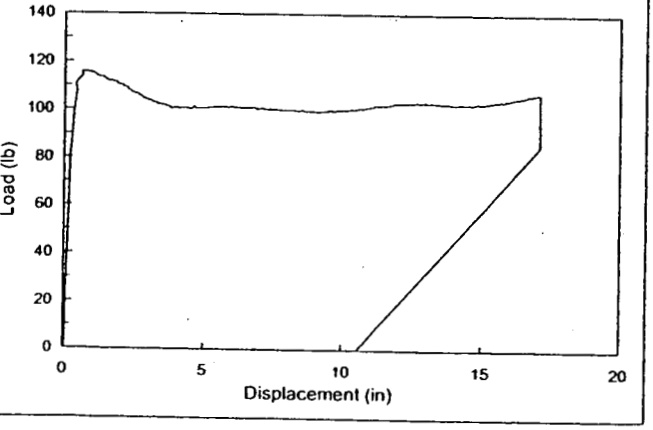


	Shear Strength (lb/in)	Locus of Break Code	Break Class
Specimen #1	117.5		
Specimen #2	117.4		
Specimen #3	115.4	**ALL EXCEEDED**	
Specimen #4	113.1	**MACHINE CAPACITY**	
Specimen #5	116.1		
Average	**115.9**		
Std. Deviation	**1.6**		

Operator:	MGC, 03-22-05
Machine:	0053, BC 800/8.3
Panels:	P121,P122
Rolls:	35' EW EOS
Seam:	DP 20F

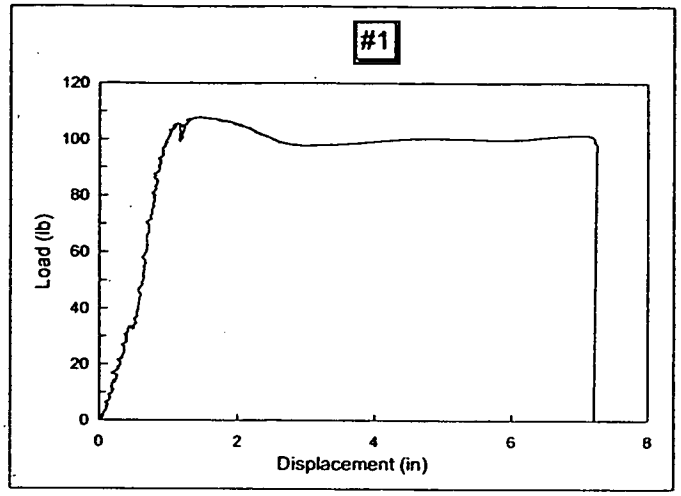
Filename: TFSS078

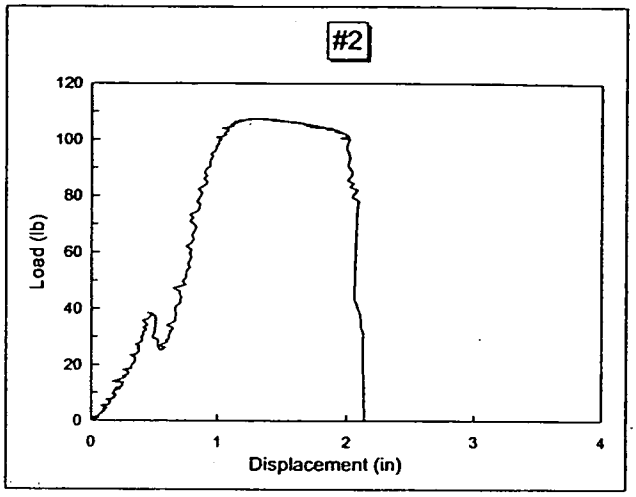
Raw Data File: TFSS1A2, TFSS1A3.TXT

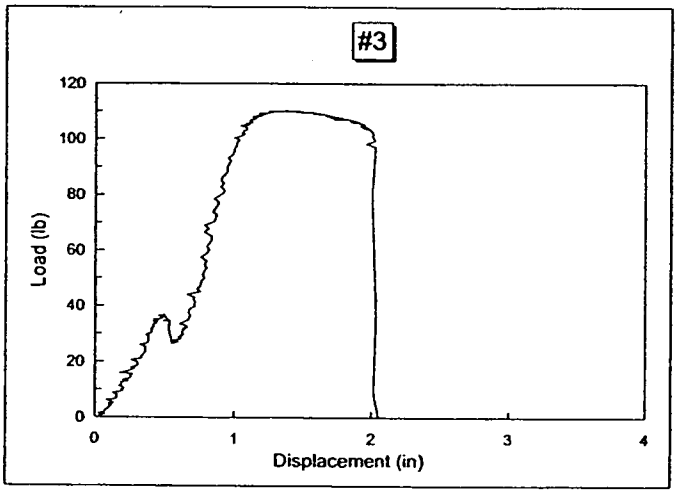
Checked By: JTR Date: 4/11/05

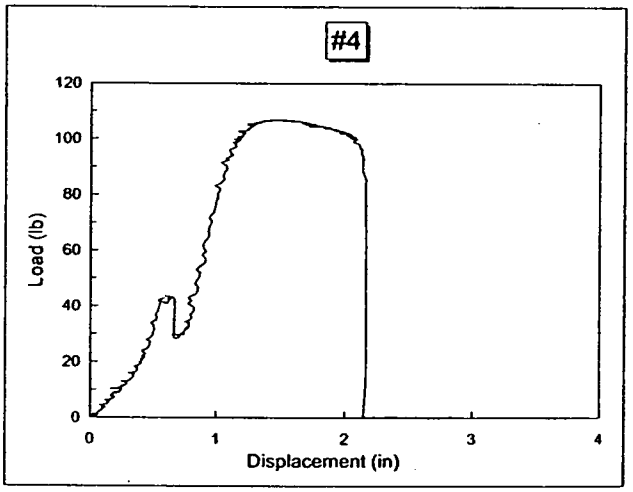
Advanced Terra Testing, Inc.

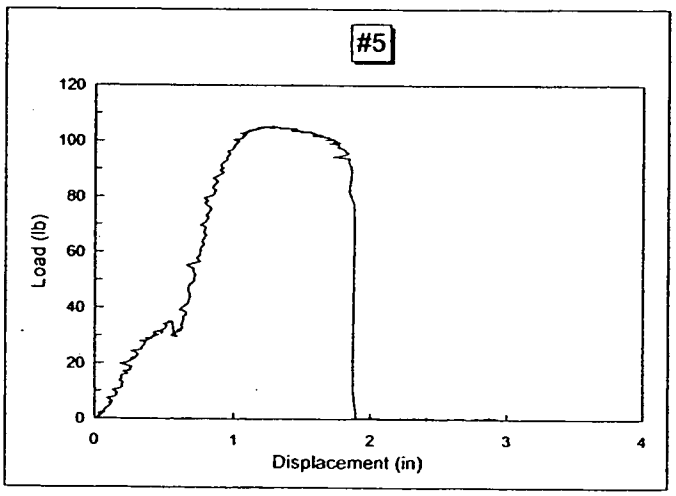
Client:	Tetra Tech-RMC	Test Type:	Peel Adhesion, ASTM D 6392
Job No.:	2617-08	Material Type:	LLDPE-T
Location:	Present Landfill Design-RFETS	Date Tested:	04-11-05
Sample:	DFP-078	Tested By:	JTR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2.0 in/min
		Grip Seperation:	1.0 in











	Peel Strength (lb/in)	Locus of Break Code	Break Class
Specimen #1	107.9	SE-1	FTB
Specimen #2	107.4	SE-1	FTB
Specimen #3	110.1	SE-1	FTB
Specimen #4	106.8	SE-1	FTB
Specimen #5	105.5	SE-1	FTB
Average	**107.5**		
Std. Deviation	**1.5**		

Operator:	MGC, 03-22-05
Machine:	0053, BC 800/8.3
Panels:	P121,P122
Rolls:	35' EW EOS
Seam:	DP 20F
Seam A or B	A

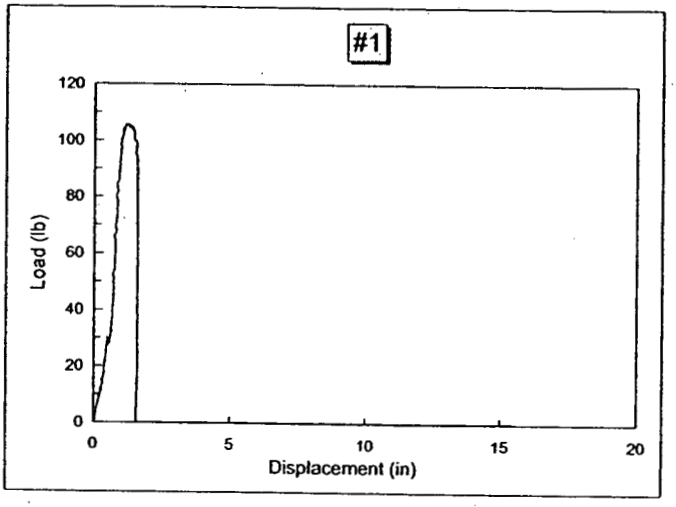
Filename: TFPA078

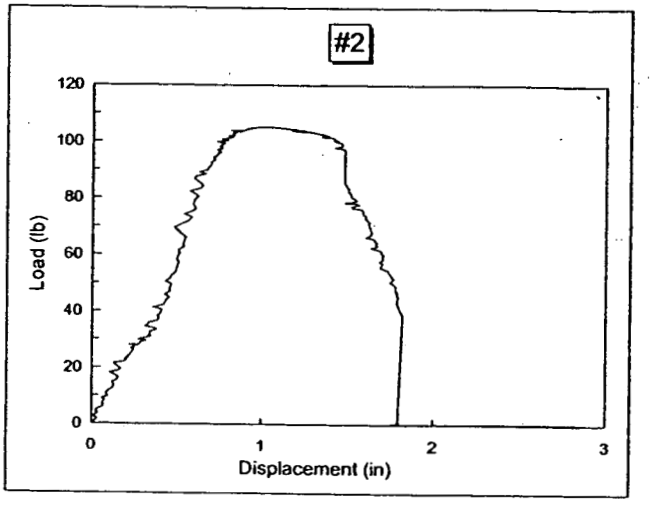
Raw Data File: TFPA1AA2, TFPA1AA3.TXT

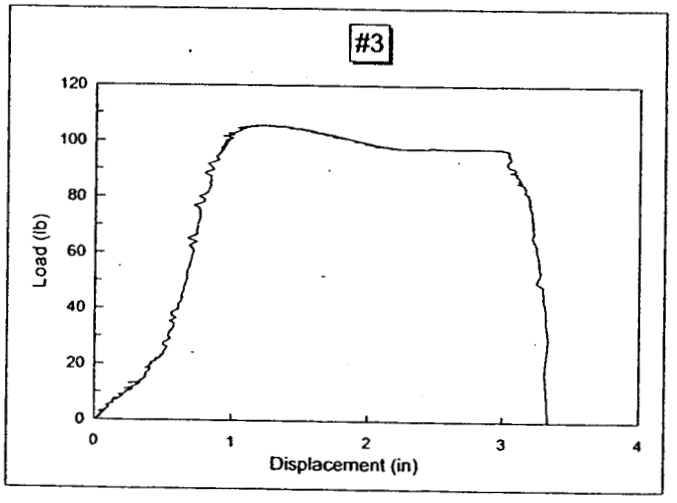
Checked By: JTR Date: 4/11/05

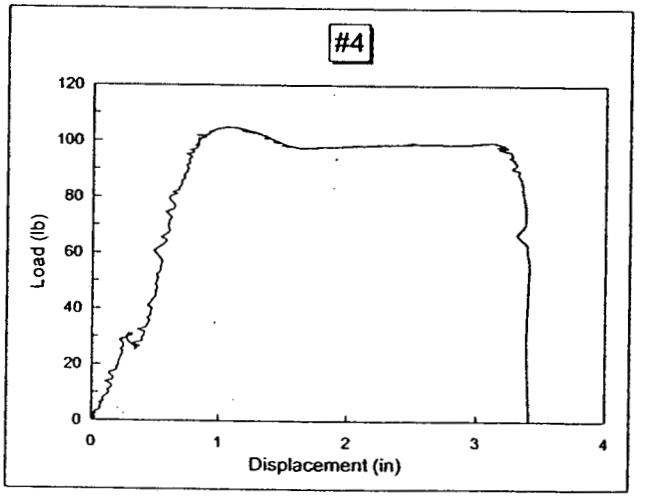
Advanced Terra Testing, Inc.

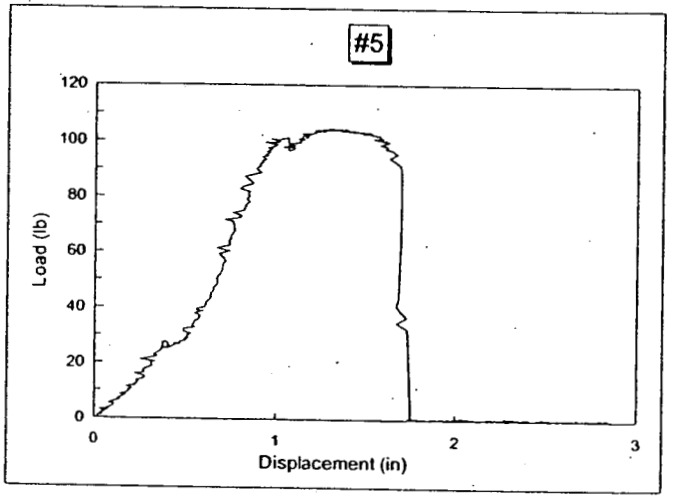
Client:	Tetra Tech-RMC	Test Type:	Peel Adhesion, ASTM D 6392
Job No.:	2617-08	Material Type:	LLDPE-T
Location:	Present Landfill Design-RFETS	Date Tested:	04-11-05
Sample:	DFP-078	Tested By:	JTR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2.0 in/min
		Grip Seperation:	1.0 in











	Peel Strength (lb/in)	Locus of Break Code	Break Class
Specimen #1	105.6	SE-1	FTB
Specimen #2	105.0	SE-1	FTB
Specimen #3	105.5	SE-1	FTB
Specimen #4	104.8	SE-1	FTB
Specimen #5	104.2	SE-1	FTB
Average	**105.0**		
Std. Deviation	**0.5**		

Operator:	MGC, 03-22-05
Machine:	0053, BC 800/8.3
Panels:	P121,P122
Rolls:	35' EW EOS
Seam:	DP 20F
Seam A or B	B

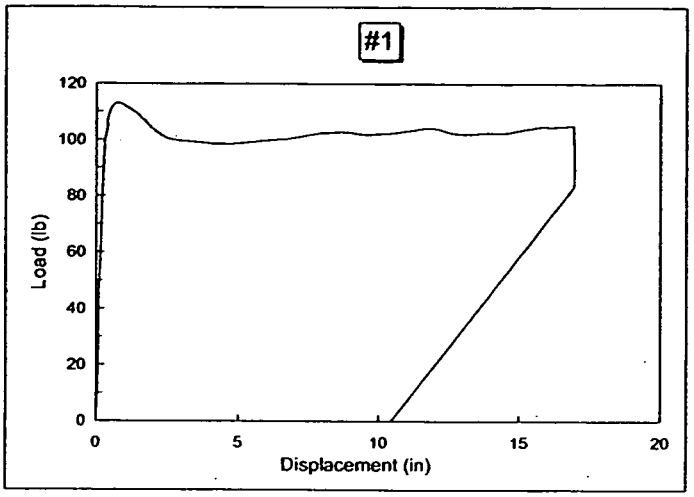
Filename: TFPA078B

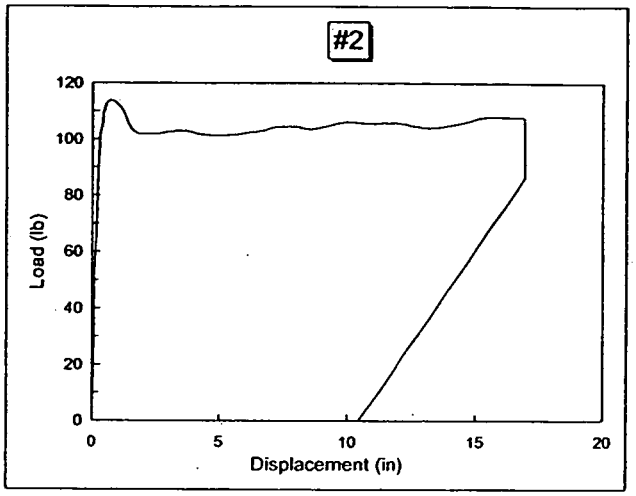
Raw Data File: TFPA1AB2, TFPA1AB3.TXT

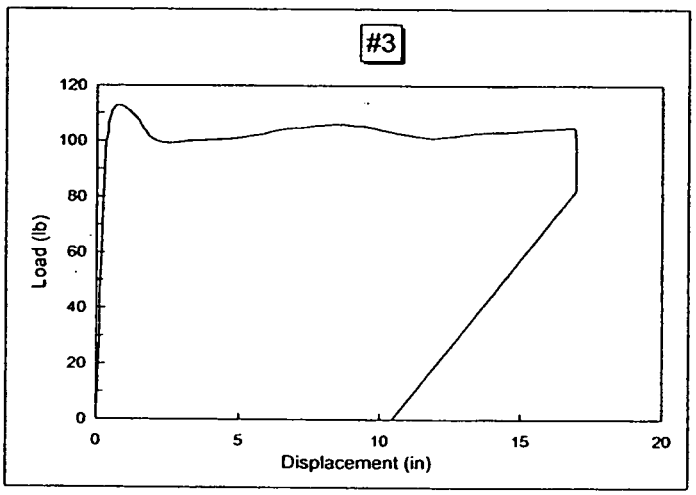
Checked By: JTR Date: 4/11/05

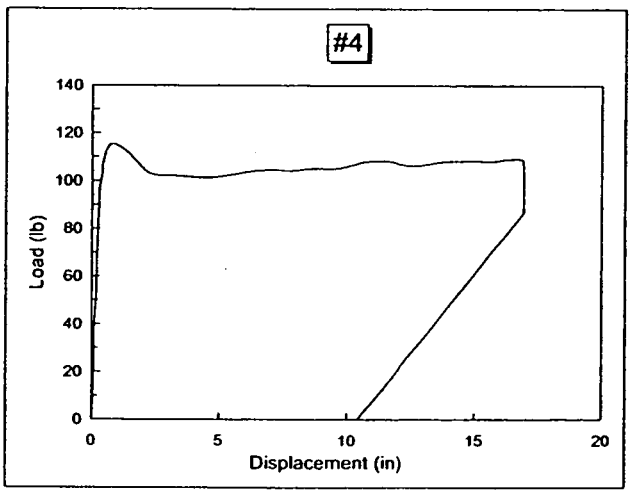
Advanced Terra Testing, Inc.

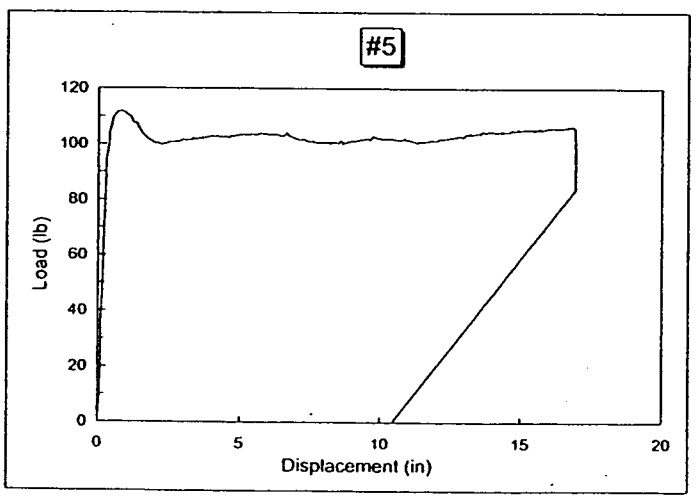
Client:	Tetra Tech-RMC	Test Type:	Seam Shear, ASTM D 6392
Job No.:	2617-08	Material Type:	LLDPE-T
Location:	Present Landfill Design-RFETS	Date Tested:	04-11-05
Sample:	DFP-080	Tested By:	JTR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	20 in/min
		Grip Seperation:	6.18 in











	Shear Strength (lb/in)	Locus of Break Code	Break Class
Specimen #1	113.1		
Specimen #2	113.9		
Specimen #3	113.0	**ALL EXCEEDED**	
Specimen #4	115.6	**MACHINE CAPACITY**	
Specimen #5	111.8		
Average	**113.5**		
Std. Deviation	**1.3**		

Operator:	MGC, 03-22-05
Machine:	0053, BC 800/8.5
Panels:	P128,P129
Rolls:	52' NS EOS
Seam:	DP 20IV

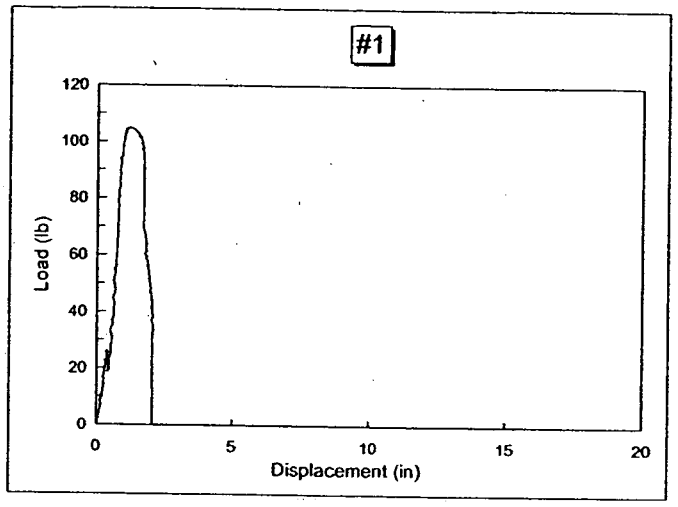
Filename: TFSS080

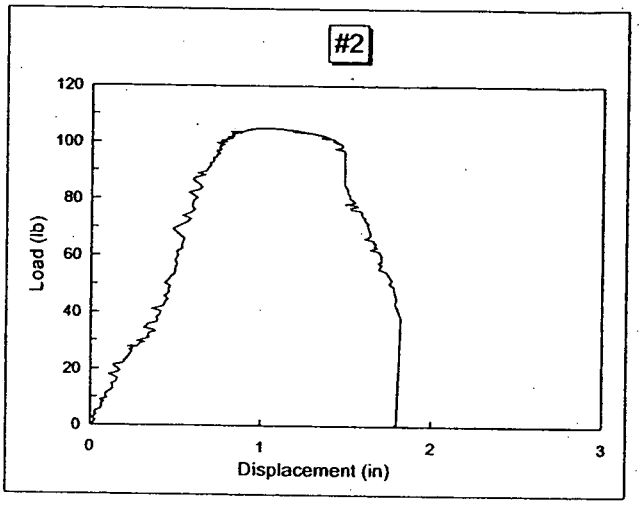
Raw Data File: TFSS1B2, TFSS1B3.TXT

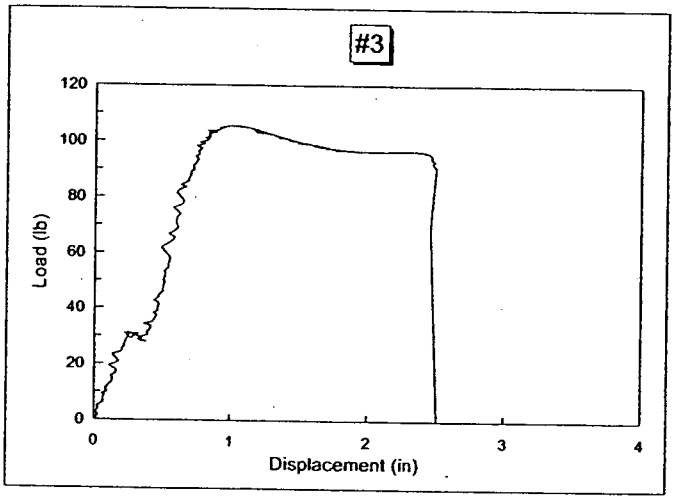
Checked By: JTR Date: 4/11/05

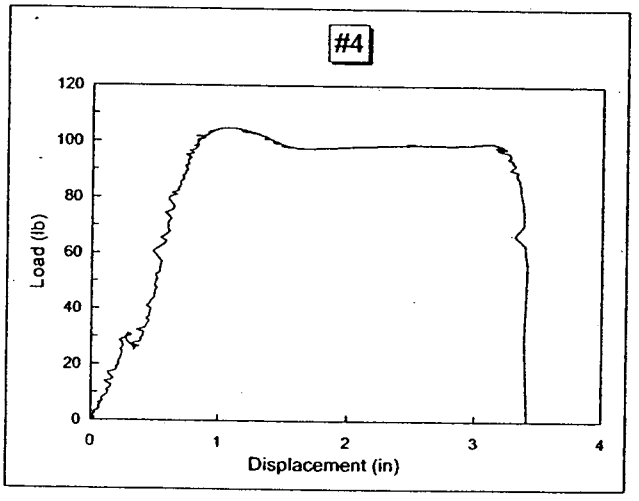
Advanced Terra Testing, Inc.

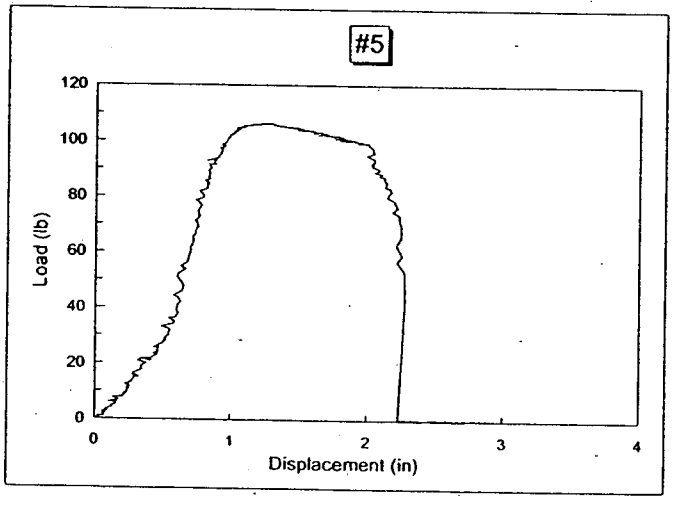
Client:	Tetra Tech-RMC	Test Type:	Peel Adhesion, ASTM D 6392
Job No.:	2617-08	Material Type:	LLDPE-T
Location:	Present Landfill Design-RFETS	Date Tested:	04-11-05
Sample:	DFP-080	Tested By:	JTR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2.0 in/min
		Grip Seperation:	1.0 in











	Peel Strength (lb/in)	Locus of Break Code	Break Class
Specimen #1	104.9	SE-1	FTB
Specimen #2	105.0	SE-1	FTB
Specimen #3	105.5	SE-1	FTB
Specimen #4	104.8	SE-1	FTB
Specimen #5	106.4	SE-1	FTB
Average	**105.3**		
Std. Deviation	**0.6**		

Operator:	MGC, 03-22-05
Machine:	0053, BC 800/8.5
Panels:	P128,P129
Rolls:	52' NS EOS
Seam:	DP 20IV
Seam A or B	A

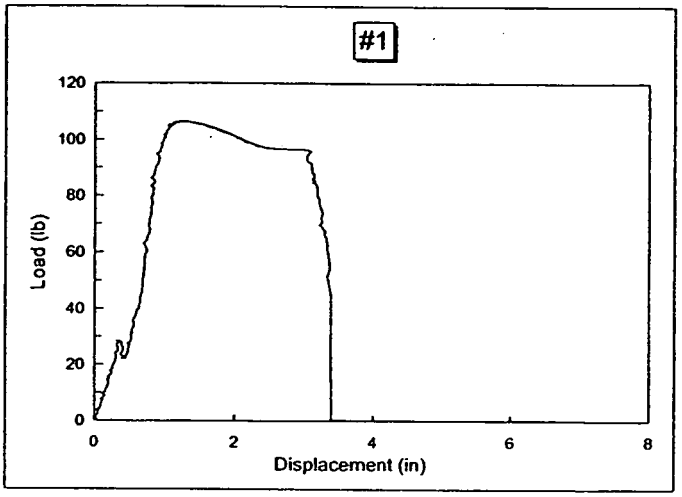
Filename: TFPA080

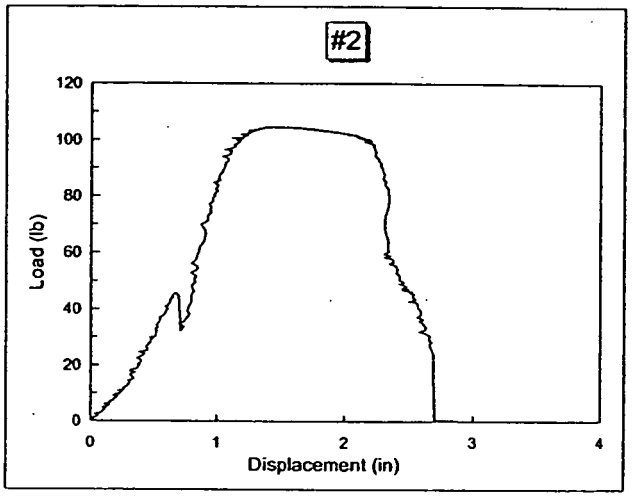
Raw Data File: TFPA1BA2, TFPA1BA3.TXT

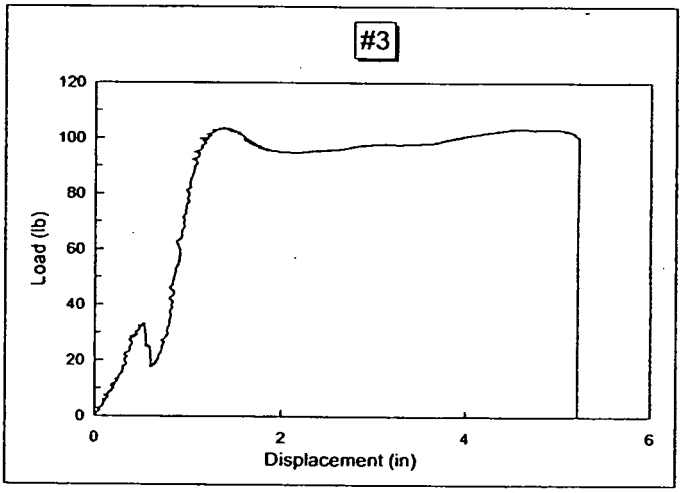
Checked By: JTR Date: 4/11/05

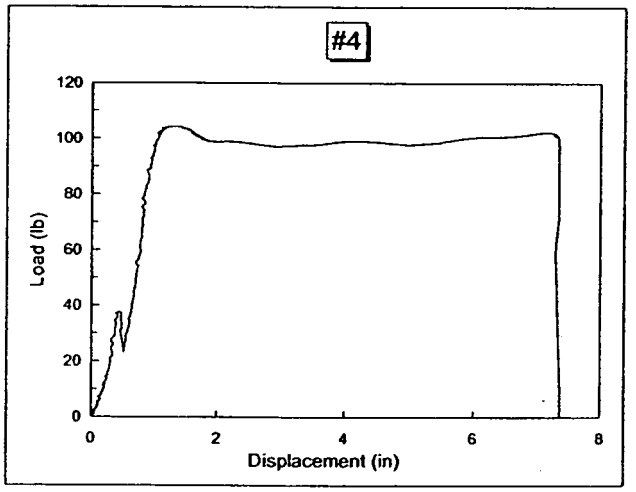
Advanced Terra Testing, Inc.

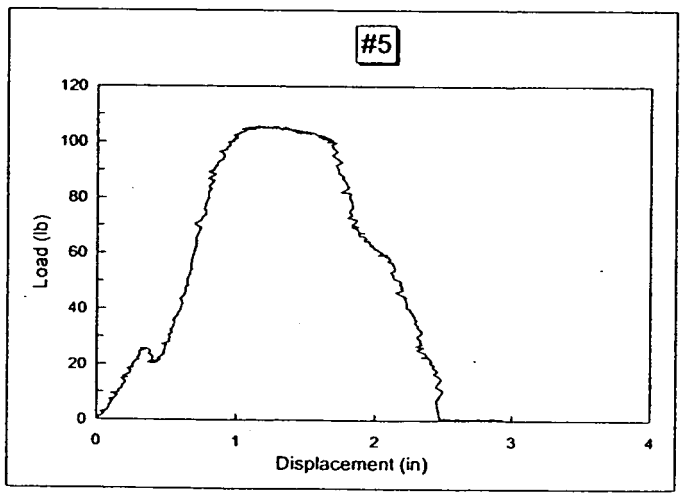
Client:	Tetra Tech-RMC	Test Type:	Peel Adhesion, ASTM D 6392
Job No.:	2617-08	Material Type:	LLDPE-T
Location:	Present Landfill Design-RFETS	Date Tested:	04-11-05
Sample:	DFP-080	Tested By:	JTR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2.0 in/min
		Grip Seperation:	1.0 in











	Peel Strength (lb/in)	Locus of Break Code	Break Class
Specimen #1	106.2	SE-1	FTB
Specimen #2	104.3	SE-1	FTB
Specimen #3	103.4	SE-1	FTB
Specimen #4	104.3	AD-BRK	FTB
Specimen #5	105.4	SE-1	FTB
Average	**104.7**		
Std. Deviation	**1.0**		

Operator:	MGC, 03-22-05
Machine:	0053, BC 800/8.5
Panels:	P128,P129
Rolls:	52' NS EOS
Seam:	DP 20IV
Seam A or B	B

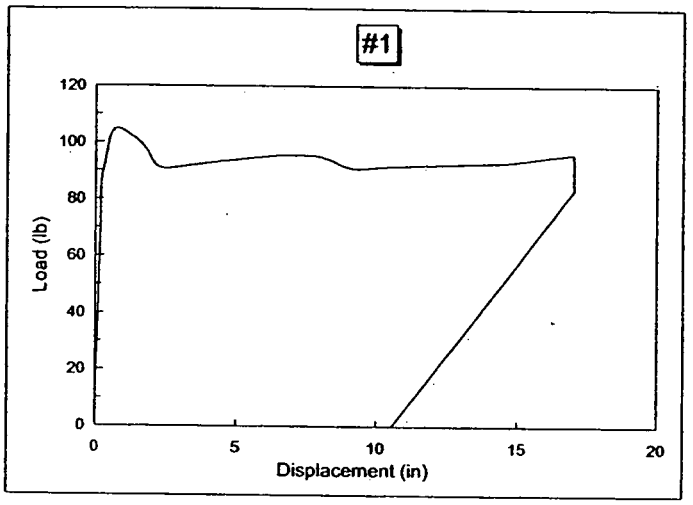
Filename: TFPA080B

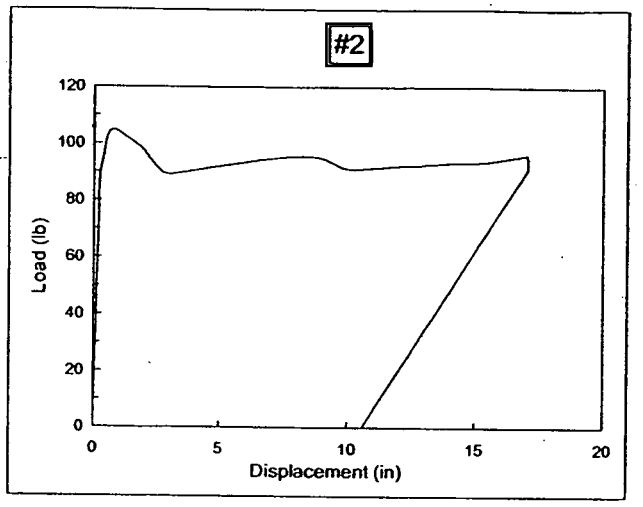
Raw Data File: TFPA1BB2, TFPA1BB3.TXT

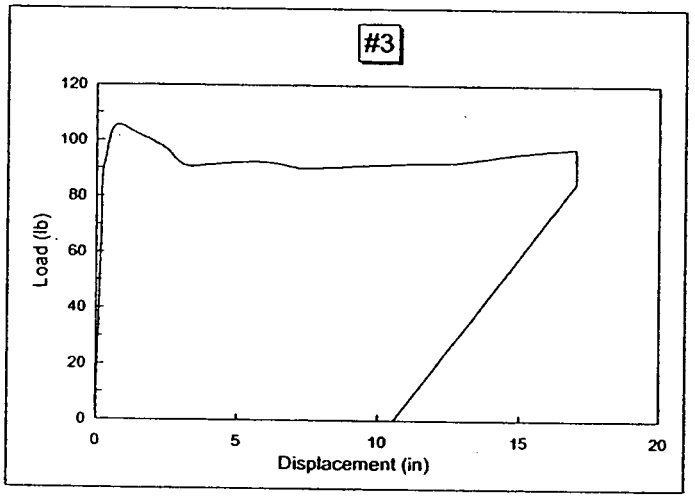
Checked By: JTR Date: 4/11/05

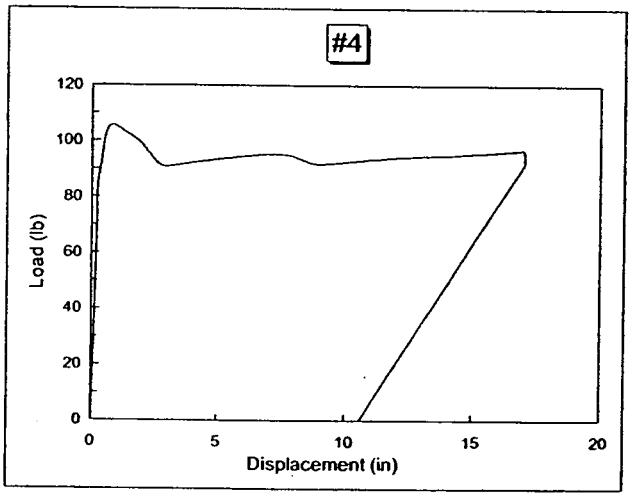
Advanced Terra Testing, Inc.

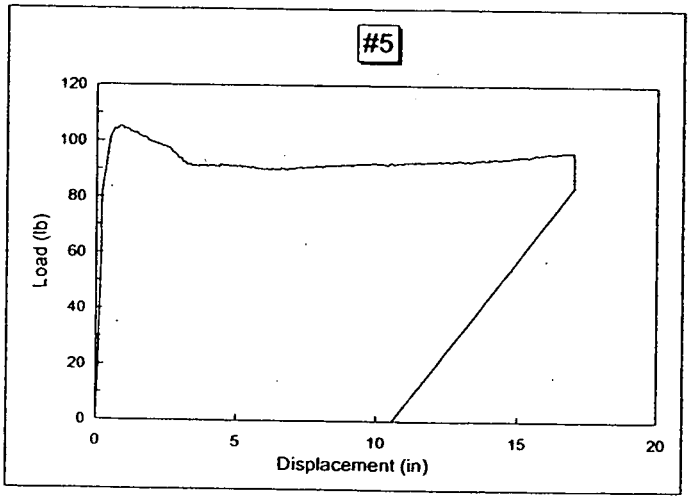
Client:	Tetra Tech-RMC	Test Type:	Seam Shear, ASTM D 6392
Job No.:	2617-08	Material Type:	LLDPE-S
Location:	Present Landfill Design-RFETS	Date Tested:	04-11-05
Sample:	DFP-100	Tested By:	JTR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	20 in/min
		Grip Seperation:	6.07 in











	Shear Strength (lb/in)	Locus of Break Code	Break Class
Specimen #1	104.9		
Specimen #2	104.9		
Specimen #3	105.6	**ALL EXCEEDED**	
Specimen #4	105.7	**MACHINE CAPACITY**	
Specimen #5	105.4		
Average	**105.3**		
Std. Deviation	**0.3**		

Operator:	MGC, 04-04-05
Machine:	0053, BC 800/9.0
Panels:	P148,P119
Rolls:	100' NS EOS
Seam:	DP 25K

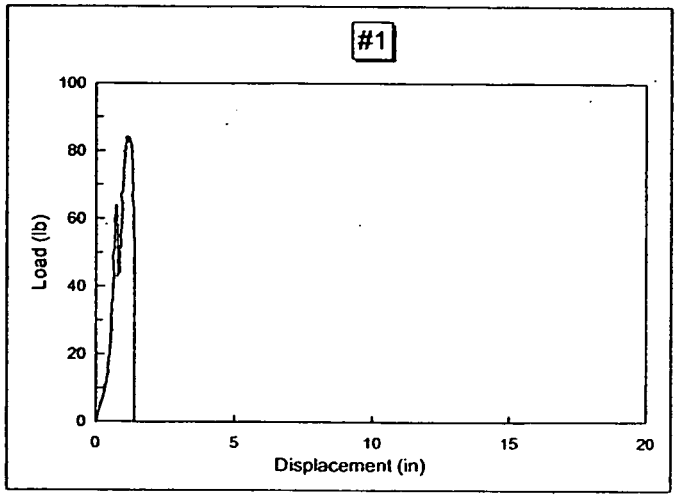
Filename: TFSS100

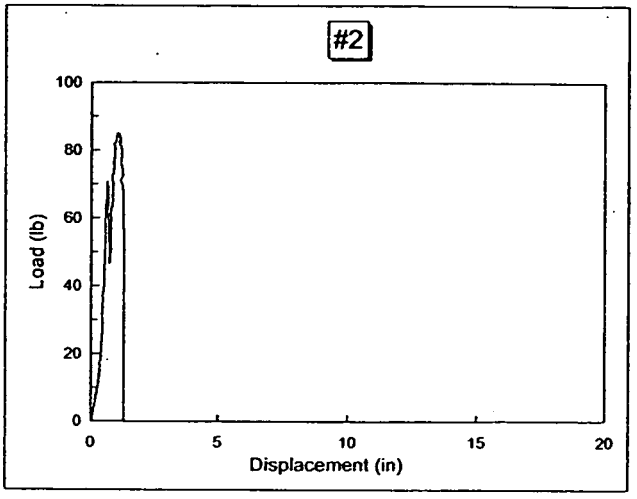
Raw Data File: TFSS1C2, TFSS1C3.TXT

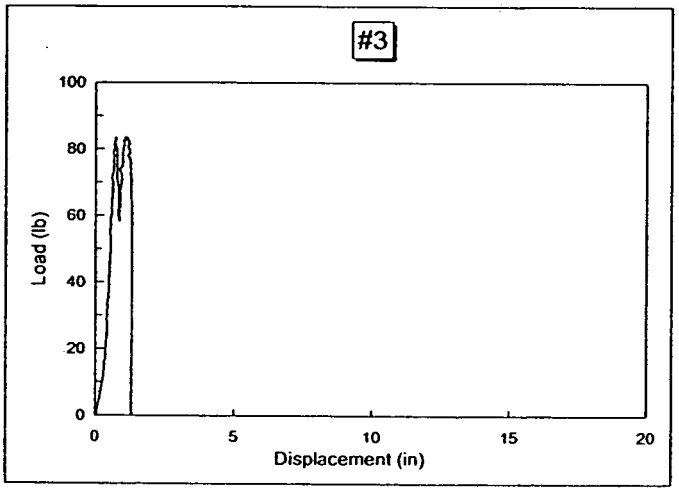
Checked By: JTR Date: 4/11/05

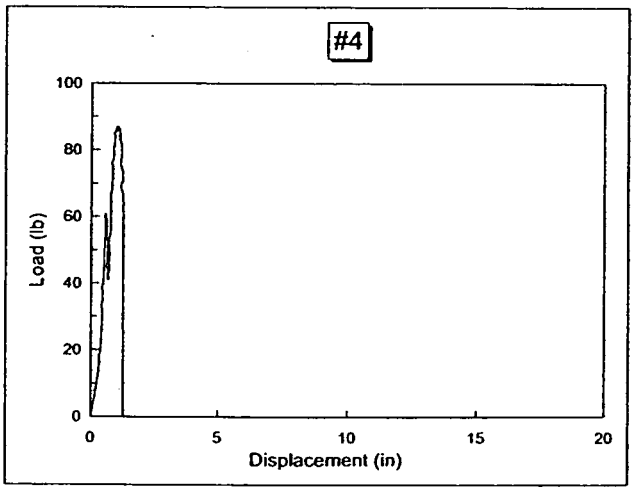
Advanced Terra Testing, Inc.

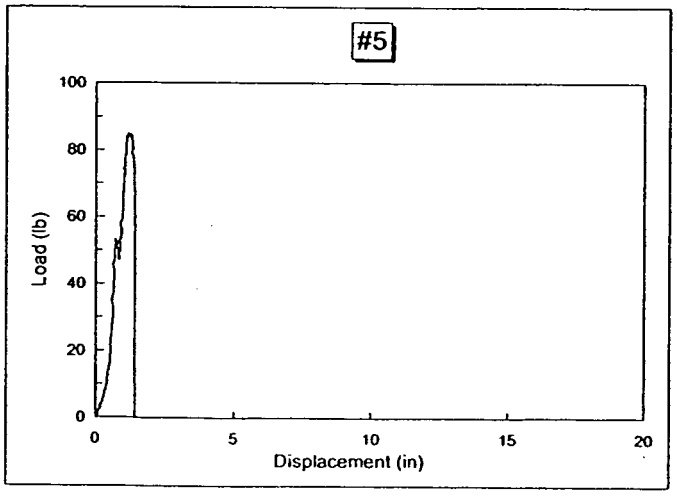
Client:	Tetra Tech-RMC	Test Type:	Peel Adhesion, ASTM D 6392
Job No.:	2617-08	Material Type:	LLDPE-S
Location:	Present Landfill Design-RFETS	Date Tested:	04-11-05
Sample:	DFP-100	Tested By:	JTR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2.0 in/min
		Grip Seperation:	1.0 in











	Peel Strength (lb/in)	Locus of Break Code	Break Class
Specimen #1	84.4	SE-1	FTB
Specimen #2	85.2	SE-1	FTB
Specimen #3	83.8	SE-1	FTB
Specimen #4	87.3	SE-1	FTB
Specimen #5	85.1	SE-1	FTB
Average	**85.2**		
Std. Deviation	**1.2**		

Operator:	MGC, 04-04-05
Machine:	0053, BC 800/9.0
Panels:	P148,P119
Rolls:	100' NS EOS
Seam:	DP 25K
Seam A or B	A

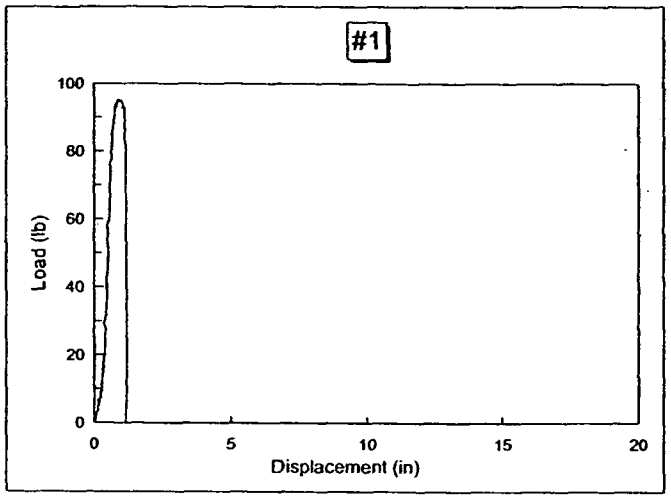
Filename: TFPA100

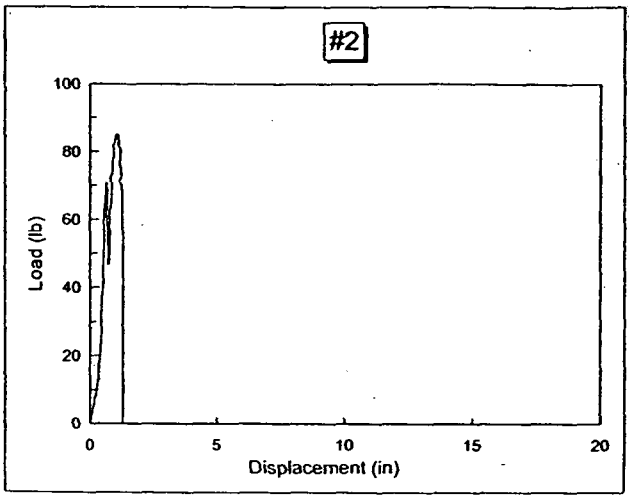
Raw Data File: TFPA1CA2, TFPA1CA3.TXT

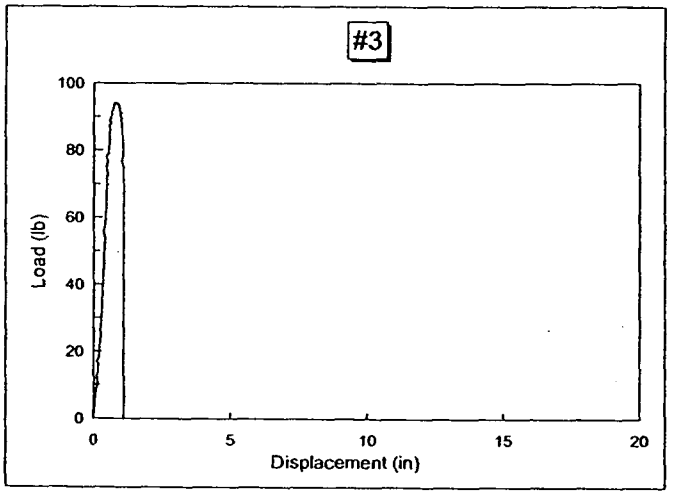
Checked By: JTR Date: 4/11/05

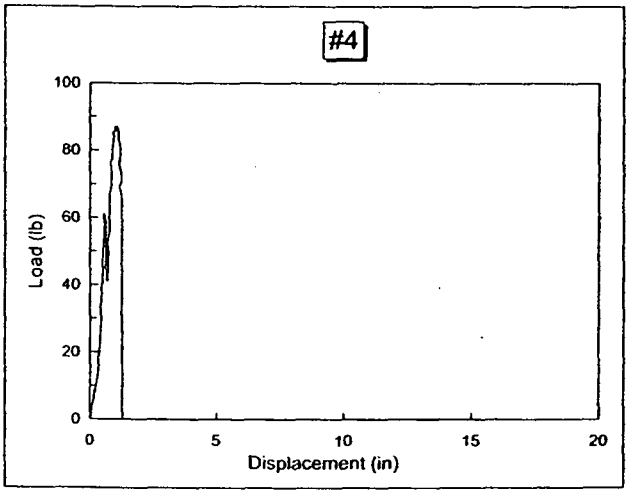
Advanced Terra Testing, Inc.

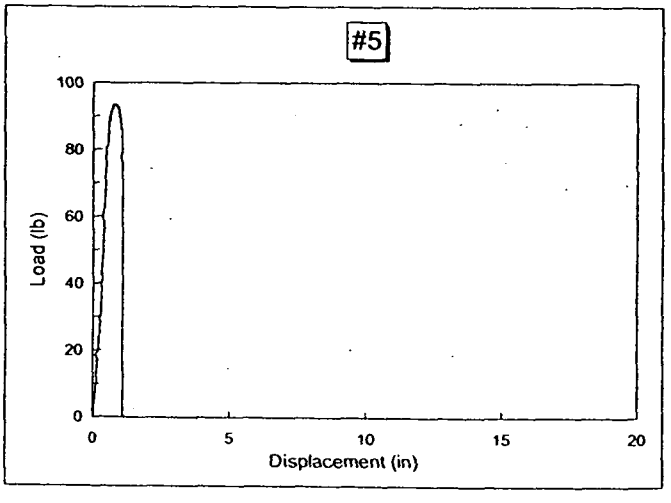
Client:	Tetra Tech-RMC	Test Type:	Peel Adhesion, ASTM D 6392
Job No.:	2617-08	Material Type:	LLDPE-S
Location:	Present Landfill Design-RFETS	Date Tested:	04-11-05
Sample:	DFP-100	Tested By:	JTR
Test Device:	Five Station	Data Entered By:	SR
Load Cells:	500 lb.	Displacement Rate:	2.0 in/min
		Grip Seperation:	1.0 in











	Peel Strength (lb/in)	Locus of Break Code	Break Class
Specimen #1	95.2	SE-1	FTB
Specimen #2	85.2	SE-1	FTB
Specimen #3	94.3	SE-1	FTB
Specimen #4	87.3	SE-1	FTB
Specimen #5	93.6	SE-1	FTB
Average	**91.1**		
Std. Deviation	**4.1**		

Operator:	MGC, 04-04-05
Machine:	0053, BC 800/9.0
Panels:	P148,P119
Rolls:	100' NS EOS
Seam:	DP 25K
Seam A or B	B

Filename: TFPA100B

Raw Data File: TFPA1CB2, TFPA1CB3.TXT

Checked By: JTR Date: 4/11/05

Advanced Terra Testing, Inc.

Turf Reinforcement Mat

Tensile Strength Tests

ADVANCED TERRA TESTING, Inc.
ATT
833 Parfet Street • Lakewood, Colorado 80215 • (303) 232-8308 • Fax: (303) 232-1579

Mr. Bruce Marshall
Tetra Tech - RMC
1900 S. Sunset Street, Suite 1-F
Longmont, CO 80501

May 18, 2005

RE: Present Landfill Design - RFETS
Golden, CO, and Rocky Flats Present Landfill Closure

Dear Mr. Spitzer,

Thank you for choosing Advanced Terra Testing, Inc. for your geosynthetic testing needs.

Per your request, we have completed the analyses pertinent to the recent testing campaign relative to the above referenced project. The following is a table providing a summary of Erosion Mat material.

Ultimate Tensile Properties of Turf Reinforcement Mats

Specimen ID	Tensile Properties ASTM D 6818		Apparent Elongation	
	Assumed MD (lbs/ft)	Assumed CMD (lbs/ft)	Assumed MD (%)	Assumed CMD (%)
NO ID (TRM-1)	742.2	732.2	28.3	17.6
NO ID (TRM-2)	686.8	665.4	27.4	18.1

Should you have any questions or require additional information please, feel free to give us call.

Sincerley,

Sharon Roberts

Sharon Roberts
Geosynthetic Division Manager

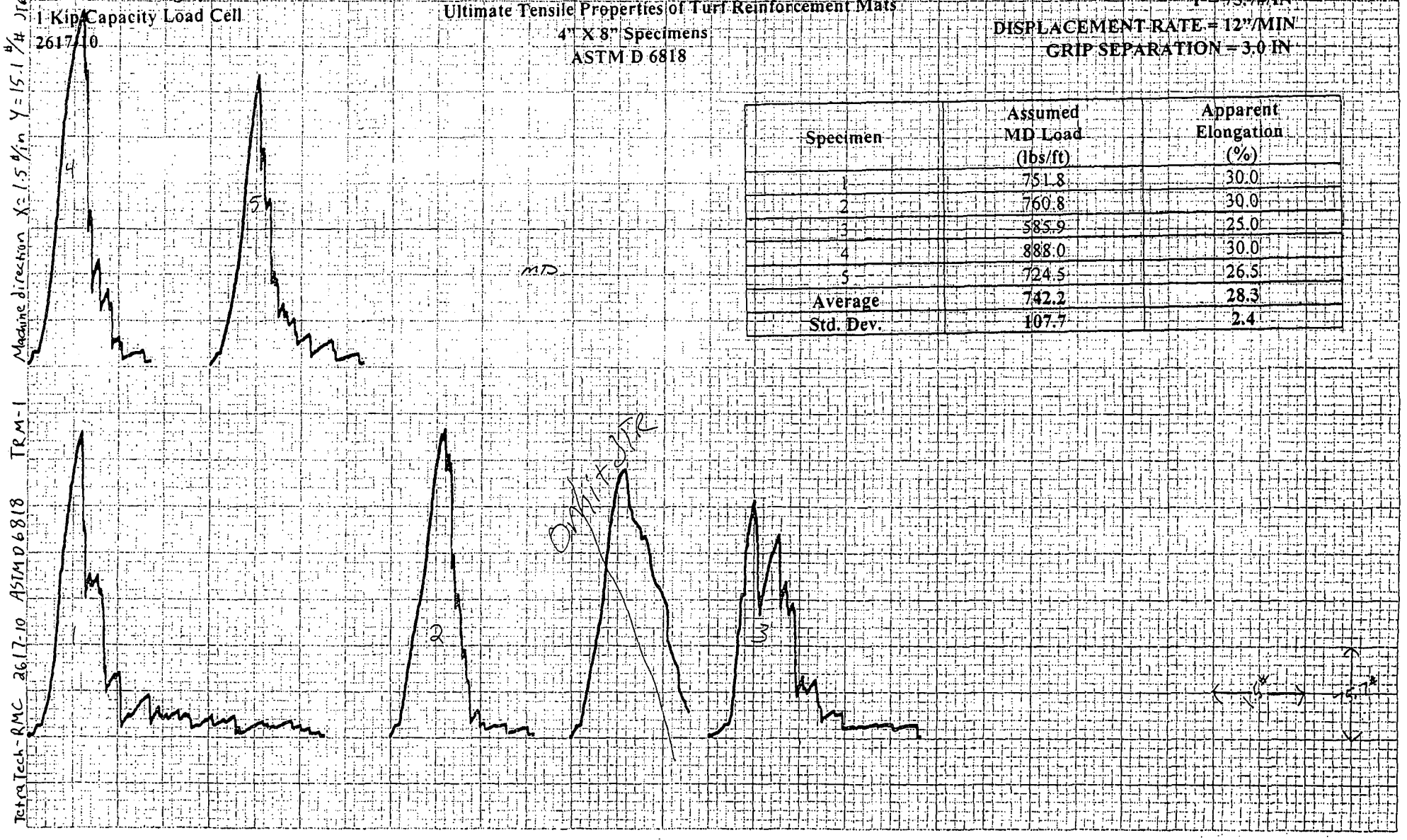
K:\TF2617\TTFI0505.lwp

05-13-05
Chatillon Loading System
1 Kip Capacity Load Cell
2617-10

Tetra Tech - RMC
No Identification (TRM-1)
Ultimate Tensile Properties of Turf Reinforcement Mats
4" X 8" Specimens
ASTM D 6818

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN
DISPLACEMENT RATE = 12"/MIN
GRIP SEPARATION = 3.0 IN

Specimen	Assumed MD Load (lbs/ft)	Apparent Elongation (%)
1	751.8	30.0
2	760.8	30.0
3	585.9	25.0
4	888.0	30.0
5	724.5	26.5
Average	742.2	28.3
Std. Dev.	107.7	2.4



Data Checked By: CW Date: 05/17/05
Filename: K:/TT2617/TTTPTM1M.lwp

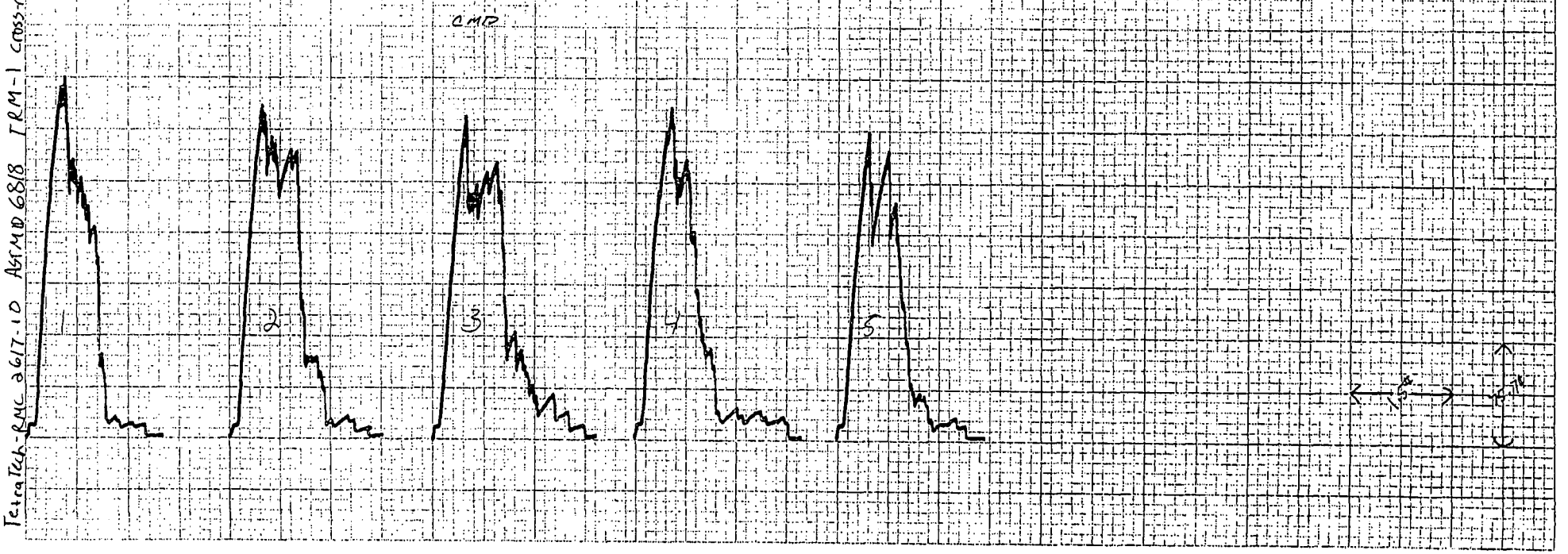
ADVANCED TERRA TESTING, Inc

05-13-05
Chatillon Loading System
1 Kip Capacity Load Cell
2617-10

Tetra Tech - RMC
No Identification (TRM-1)
Ultimate Tensile Properties of Turf Reinforcement Mats
4" X 8" Specimens
ASTM D 6818

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN
DISPLACEMENT RATE = 12"/MIN
GRIP SEPARATION = 3.0 IN

Specimen	Assumed CMD Load (lbs/ft)	Apparent Elongation (%)
1	797.1	19.0
2	738.0	17.5
3	715.5	17.5
4	731.4	18.0
5	678.9	16.0
Average	732.2	17.6
Std. Dev.	42.9	1.1



Tetra Tech-RMC 2617-10 ASTM D6818 TRM-1 Cross-Machine Direction x = 1.5 %/in Y=75.7#/in JTR 5/13/05

Data Checked By: CJ Date: 05/17/05
Filename: K:/TT2617/TTTPTM1C.lwp

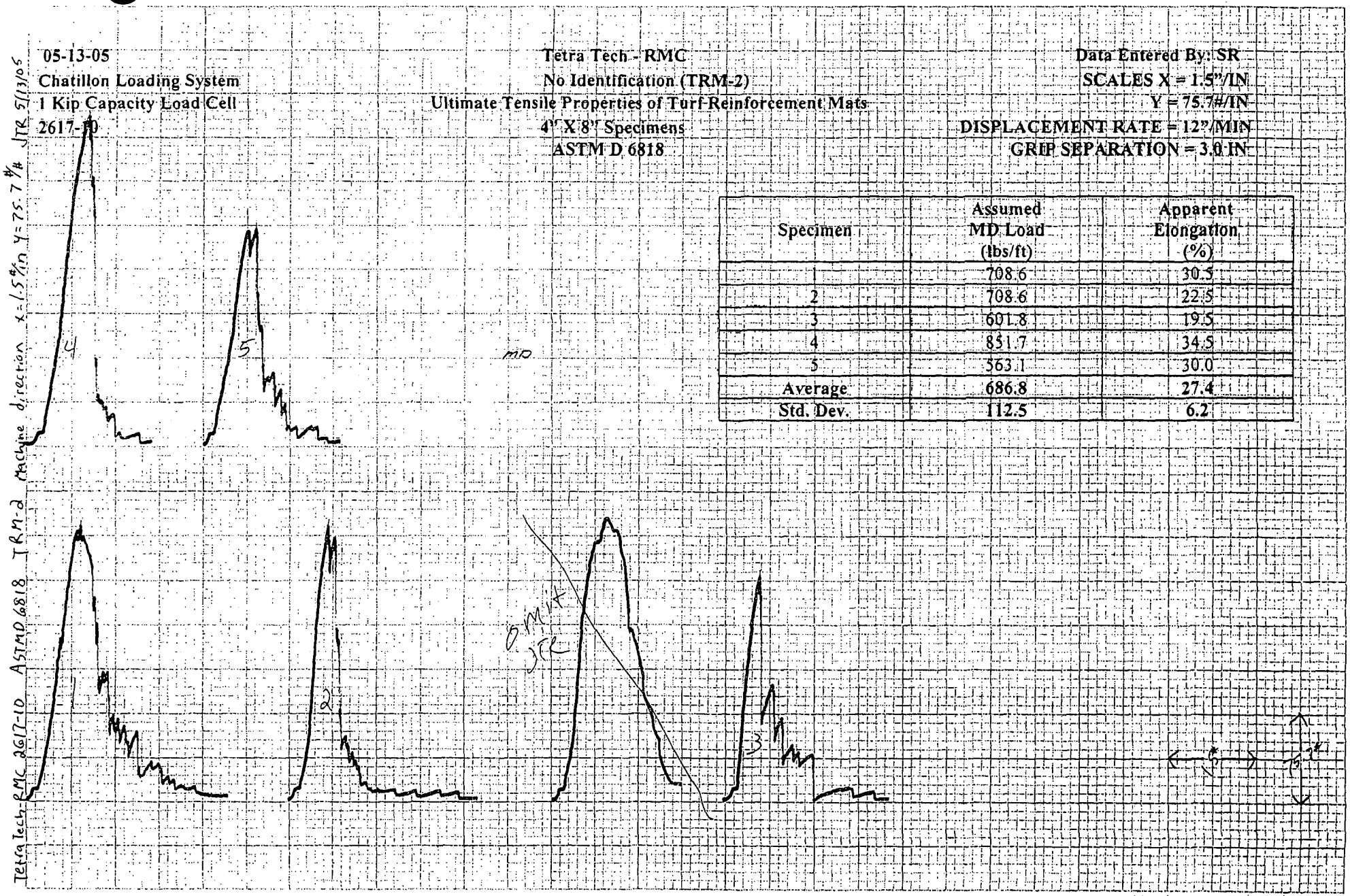
ADVANCED TERRA TESTING, Inc

05-13-05
Chatillon Loading System
1 Kip Capacity Load Cell
2617-10

Tetra Tech - RMC
No Identification (TRM-2)
Ultimate Tensile Properties of Turf Reinforcement Mats
4" X 8" Specimens
ASTM D 6818

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN
DISPLACEMENT RATE = 12"/MIN
GRIP SEPARATION = 3.0 IN

Specimen	Assumed MD Load (lbs/ft)	Apparent Elongation (%)
1	708.6	30.5
2	708.6	22.5
3	601.8	19.5
4	851.7	34.5
5	563.1	30.0
Average	686.8	27.4
Std. Dev.	112.5	6.2



Data Checked By: CJ Date: 05/17/05
Filename: K:/TT2617/TTTPTM2M.lwp

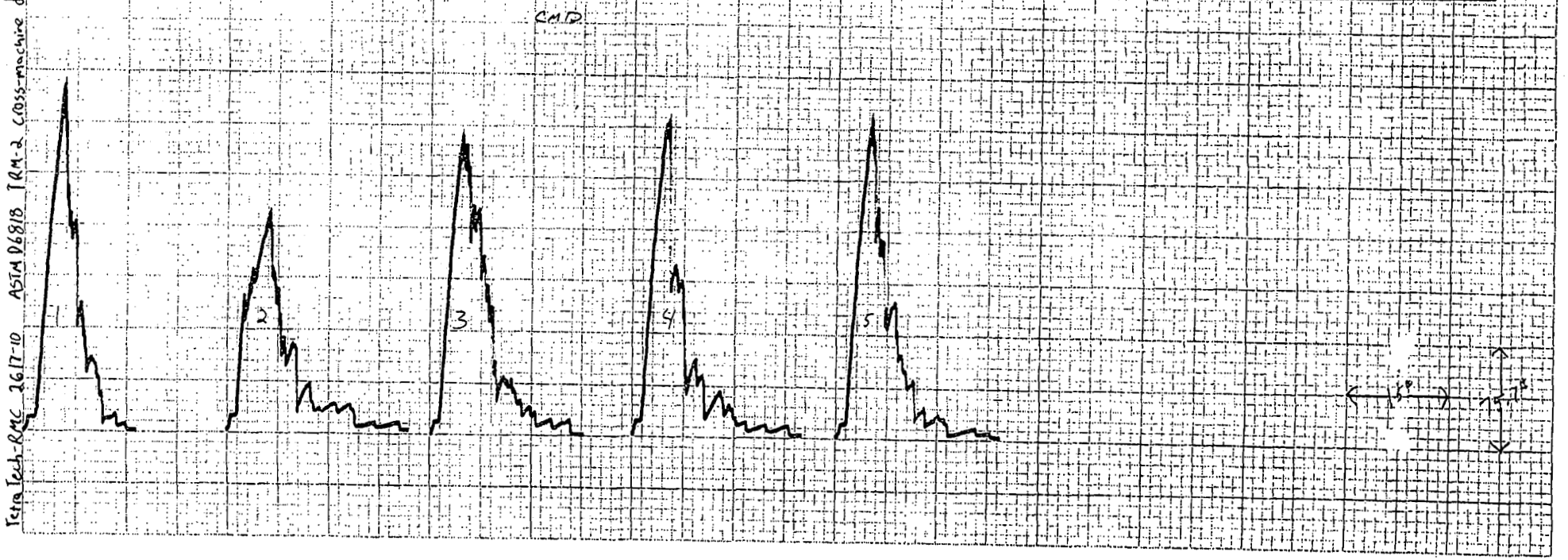
ADVANCED TERRA TESTING, Inc

05-13-05
Chatillon Loading System
1 Kip Capacity Load Cell
2617-10

Tetra Tech - RMC
No Identification (TRM-2)
Ultimate Tensile Properties of Turf Reinforcement Mats
4" X 8" Specimens
ASTM D 6818

Data Entered By: SR
SCALES X = 1.5"/IN
Y = 75.7#/IN
DISPLACEMENT RATE = 12"/MIN
GRIP SEPARATION = 3.0 IN

Specimen	Assumed CMD Load (lbs/ft)	Apparent Elongation (%)
1	769.8	20.0
2	483.6	21.0
3	660.9	15.5
4	704.1	18.0
5	708.6	16.0
Average	665.4	18.1
Std. Dev.	108.8	2.4



Tetra Tech-RMC 2617-10 ASTM D6818 TRM-2 cross-machine direction X = 1.5"/in Y = 75.7#/in JTE 5/13/05

Data Checked By: GJ Date: 05/17/05
Filename: K:/TT2617/TTTPTM2C.lwp

ADVANCED TERRA TESTING, Inc

ADVANCED TERRA TESTING, Inc.
ATT
833 Parfet Street • Lakewood, Colorado 80215 • (303) 232-8308 • Fax: (303) 232-1579

Mr. Bruce Marshall
Tetra Tech - RMC
1900 S. Sunset Street, Suite 1-F
Longmont, CO 80501

June 28, 2005

Per your request, we have completed the analyses pertinent to the recent testing campaign relative to the above referenced project. The following is a table providing a summary of the various conformance testing.

Mass/Unit Area - ASTM D 6566 & ASTM D 5261

Specimen ID	Mass/Unit Area (gms/m^2)	Mass/Unit Area (oz/yd^2)
TRM 1 (Erosion Matting)	442.4	13.1
TRM 2 (Erosion Matting)	454.4	13.4

Should you have any questions or require additional information please, feel free to give us call.

Sincerley,

Sharon Roberts

Sharon Roberts
Geosynthetic Division Manager

MASS/UNIT AREA (EROSION MATTING)
ASTM D 6566

CLIENT: Tetra Tech-RMC **JOB NO.:** 2617-11

ROLL NO.	TRM 1	TRM 1	TRM 1	TRM 1	TRM 1
LOT NO.					
SAMPLE NO.	1	2	3	4	5
ROLL IDENTIFICATION					
DATE TESTED	06-23-05 JTR	06-23-05 JTR	06-23-05 JTR	06-23-05 JTR	06-23-05 JTR
SAMPLE DESCRIPTION					
MASS/UNIT AREA DETERMINATIONS					
Sample Length (in)	8.050	8.000	8.100	8.050	7.970
Sample Width (in)	4.000	4.050	4.080	4.080	4.020
Sample Area (cm^2)	207.74	209.03	213.21	211.90	206.71
Mass/Unit Area (gms/m^2)	421.7	388.5	492.9	484.7	424.3
Mass of Sample (gms)	8.76	8.12	10.51	10.27	8.77

Average Mass/Unit Area (5 Samples) (gms/m^2) **442.4**
Average Mass/Unit Area (5 Samples) (oz/yd^2) **13.1**

ROLL NO.	TRM 2	TRM 2	TRM 2	TRM 2	TRM 2
LOT NO.					
SAMPLE NO.	1	2	3	4	5
ROLL IDENTIFICATION					
DATE TESTED	06-23-05 JTR	06-23-05 JTR	06-23-05 JTR	06-23-05 JTR	06-23-05 JTR
SAMPLE DESCRIPTION					
MASS/UNIT AREA DETERMINATIONS					
Sample Length (in)	7.930	8.050	8.100	8.000	7.980
Sample Width (in)	4.000	4.110	4.070	4.000	4.050
Sample Area (cm^2)	204.64	213.45	212.69	206.45	208.51
Mass/Unit Area (gms/m^2)	387.5	498.5	490.4	504.2	391.3
Mass of Sample (gms)	7.93	10.64	10.43	10.41	8.16

Average Mass/Unit Area (5 Samples) (gms/m^2) **454.4**
Average Mass/Unit Area (5 Samples) (oz/yd^2) **13.4**

Data entered by:
Data checked by: JTR
FileName: TTMATM12

SR Date: 6/23/05
Date: 06/23/2005

ADVANCED TERRA TESTING, INC.

APPENDIX G-5.2: EARTHWORK TESTING

UNCONFINED COMPRESSIVE STRENGTH
ASTM D 2938

UNCONFINED COMPRESSIVE STRENGTH
ASTM D 2938

CLIENT: Tetra Tech- RMC

JOB NO.: 2617-05

LOCATION:

DATE TESTED: 2/07/05 HN

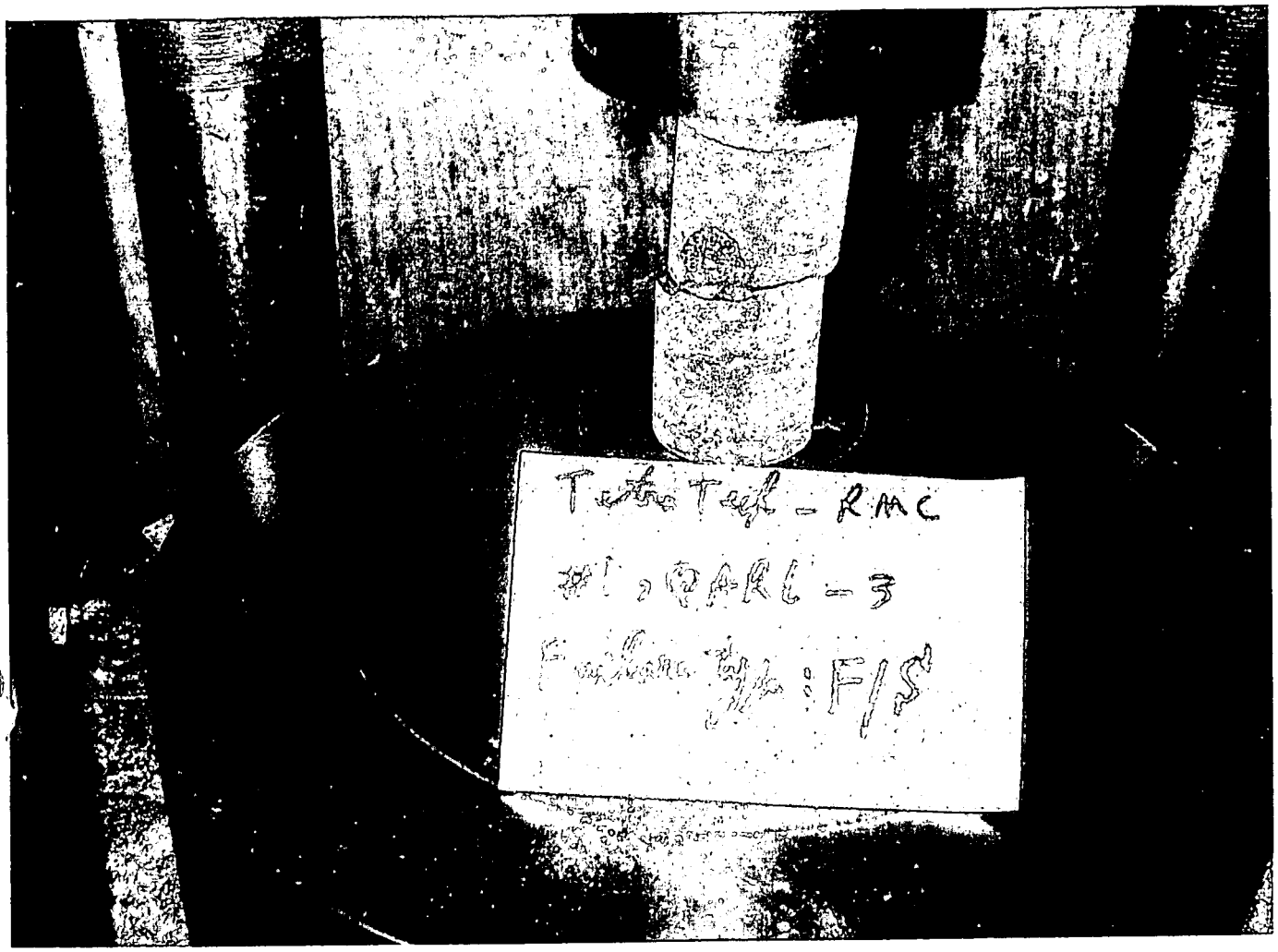
PROJECT: Present Landfill Field GSA

Specimen ID / Boring	Diameter (in.)	Length (in.)	Mass (gms)	Wet Density (pcf)	Failure Load (lb)	Failure Types *	Compressive Strength (psi)
#1,QARL-3	1.989	4.111	613.90	183.1	57,000	F/S	18,340

Notes and Comments: * Failure Types:
S: Shear Failure, M: Matrix Failure, F/V: Fracture, Bedding/Void Failure, C: Combination

Data Entered By: HN Date: 02/07/2005
Data Checked By: CJ Date: 02/07/05
Filename: TTUCSRCK

ADVANCED TERRA TESTING, Inc.



TT2617/TTDPQARL
2/08/05

6-INCH CUSHION SOIL TESTS

ATTERBERG LIMITS TEST
ASTM D 4318

CLIENT	Kaiser Hill -RFETS	JOB NO.	2195-87
BORING NO.	PLF Cushion Soil	DATE SAMPLED	10-28-04
DEPTH		DATE TESTED	11-11-04 CAL
SAMPLE NO.	05F8013-001.001		
SOIL DESCR.	RIN# 05F8013		
LOCATION	Present Landfill		

Plastic Limit Determination

	1	2	3
Wt Dish & Wet Soil	4.90	6.87	5.60
Wt Dish & Dry Soil	4.45	6.20	5.07
Wt of Moisture	0.45	0.67	0.53
Wt of Dish	0.75	0.81	0.81
Wt of Dry Soil	3.70	5.39	4.26
Moisture Content	12.16	12.43	12.44

Liquid Limit Determination — Device Number 0860

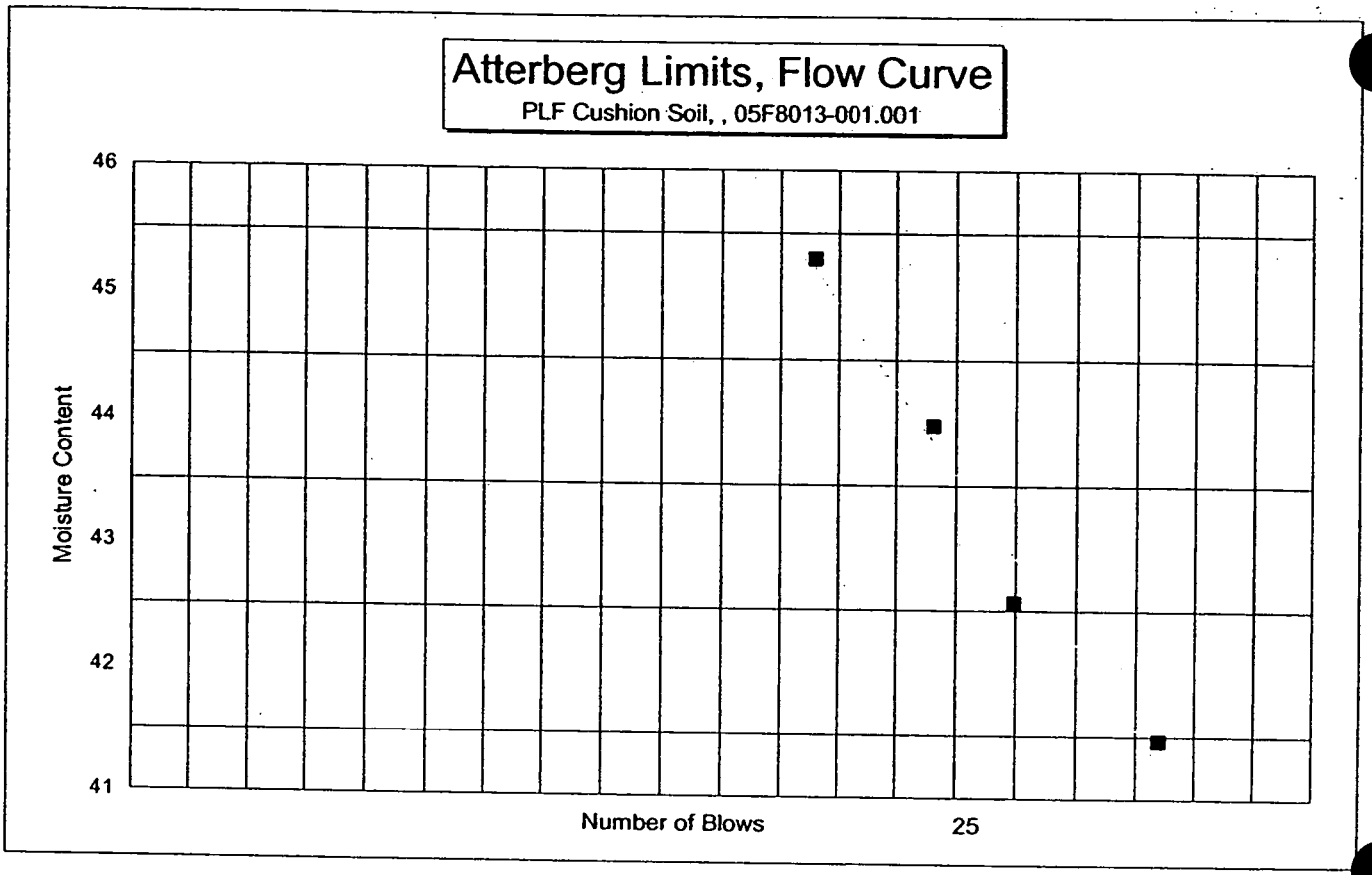
	1	2	3	4
Number of Blows	37	28	24	19
Wt Dish & Wet Soil	10.03	11.16	9.78	10.10
Wt Dish & Dry Soil	7.31	8.07	7.04	7.21
Wt of Moisture	2.72	3.09	2.74	2.89
Wt of Dish	0.75	0.81	0.81	0.83
Wt of Dry Soil	6.56	7.26	6.23	6.38
Moisture Content	41.46	42.56	43.98	45.30

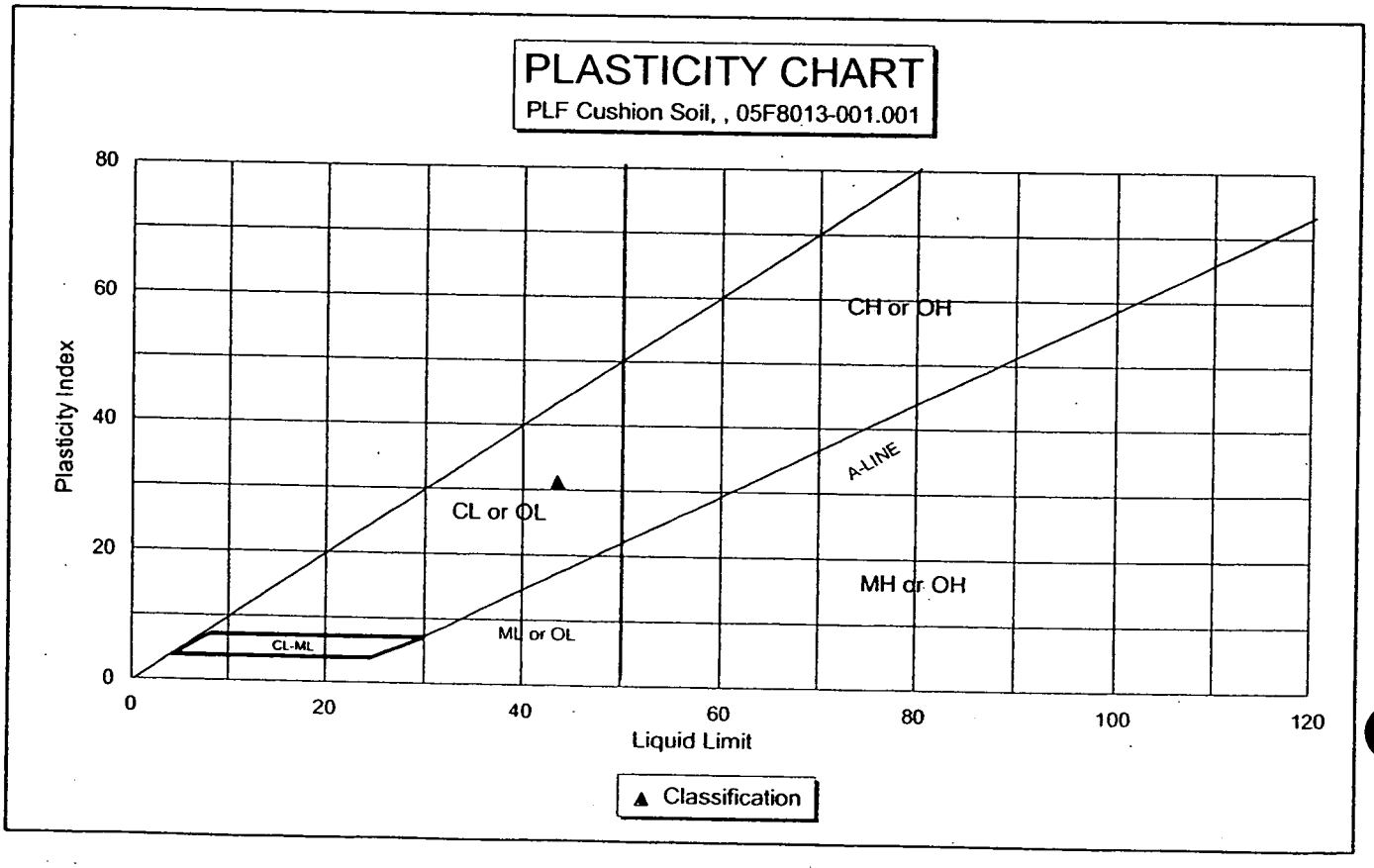
Liquid Limit	43.6
Plastic Limit	12.3
Plasticity Index	31.3

Atterberg Classification CL

Data entry by: SKL Date: 11/15/2004
Checked by: OPM Date: 11/15/04
FileName: EFG0PLFC

ADVANCED TERRA TESTING, INC.


Atterberg Limits, Flow Curve
PLF Cushion Soil, , 05F8013-001.001
Moisture Content
46
45
44
43
42
41
Number of Blows
25


PLASTICITY CHART
PLF Cushion Soil, , 05F8013-001.001
Plasticity Index
80
60
40
20
0
0
20
40
60
80
100
120
Liquid Limit
CH or OH
A-LINE
CL or OL
MH or OH
CL-ML
ML or OL
▲ Classification

MECHANICAL ANALYSIS - SIEVE TEST DATA
ASTM D 422

CLIENT Kaiser Hill - RFETS

JOB NO. 2195-87

BORING NO.	PLF Cushion Soil
DEPTH	
SAMPLE NO.	05F8013-001.01
SOIL DESCR.	RIN #05F8013
LOCATION	Present Landfill

SAMPLED	10-28-04
DATE TESTED	11-10-04 BKL
WASH SIEVE	Yes
DRY SIEVE	No

MOISTURE DATA

HYGROSCOPIC	Yes
NATURAL	No

Wt. Wet Soil & Pan (g)	52.54
Wt. Dry Soil & Pan (g)	51.63
Wt. Lost Moisture (g)	0.91
Wt. of Pan Only (g)	3.62
Wt. of Dry Soil (g)	48.01
Moisture Content %	1.9

Wt. Hydrom. Sample Wet (g)	227.52
Wt. Hydrom. Sample Dry (g)	223.29

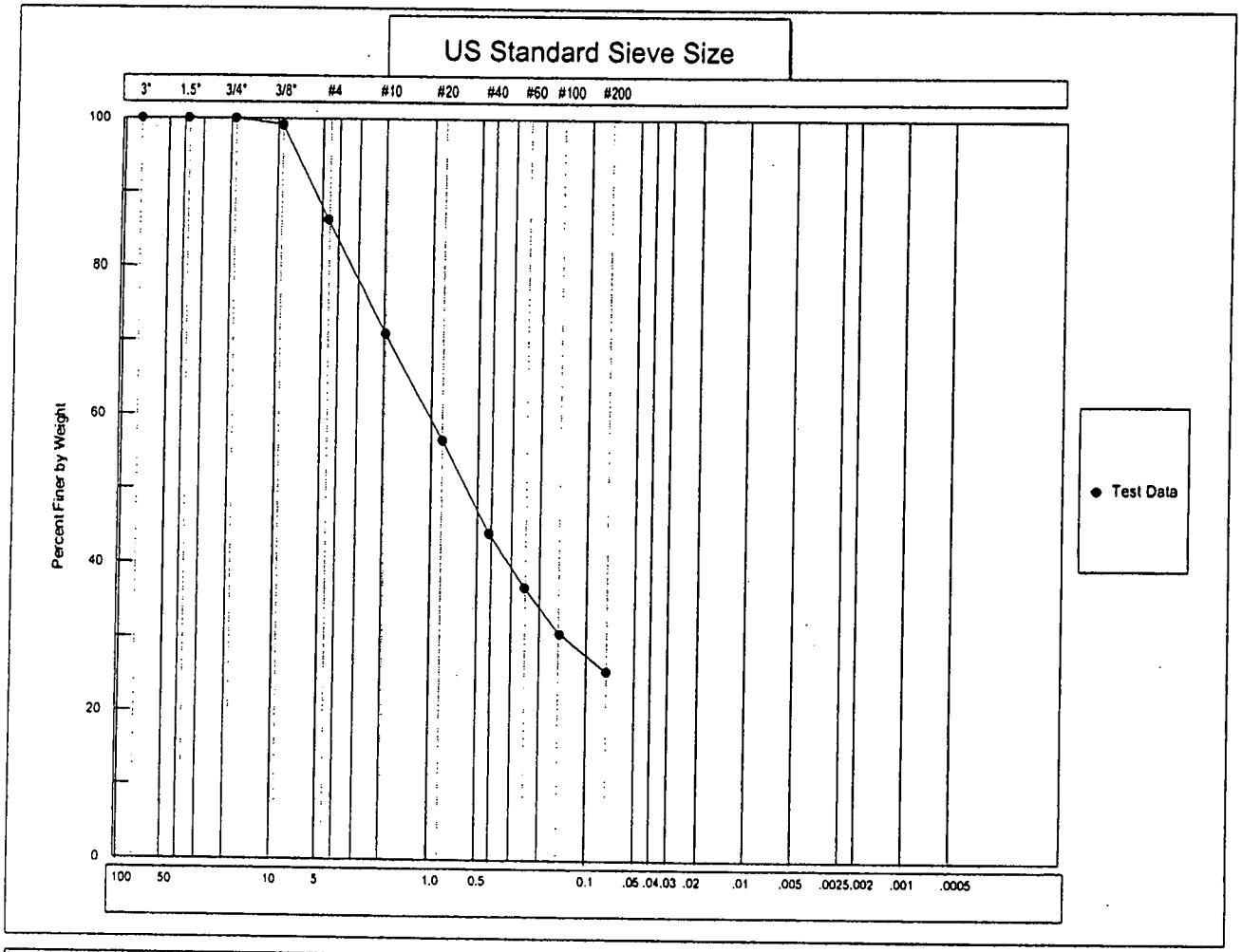
WASH SIEVE ANALYSIS

Wt. Total Sample Wet (g)	1030.60
Weight of + #10 Before Washing (g)	363.05
Weight of + #10 After Washing (g)	295.39
Weight of - #10 Wet (g)	667.55
Weight of - #10 Dry (g)	721.53
Wt. Total Sample Dry (g)	1016.92
Calc. Wt. "W" (g)	314.70
Calc. Mass + #10	91.41

Sieve Number (Size)	Pan Weight (g)	Indiv. Wt. + Pan (g)	Indiv. Wt. Retain.	Cum. Wt. Retain.	Cum. % Retain.	% Finer By Wt.	
3"	0.00	0.00	0.00	0.00	0.0	100.0	
1 1/2"	0.00	0.00	0.00	0.00	0.0	100.0	Spec.
3/4"	0.00	0.00	0.00	0.00	0.0	100.0	— 100%, 1/2"
3/8"	0.00	9.30	9.30	9.30	0.9	99.1	
#4	0.00	130.29	130.29	139.59	13.7	86.3	
#10	0.00	155.80	155.80	295.39	29.0	71.0	— 66%
#20	3.58	49.02	45.44	45.44	43.5	56.5	
#40	3.67	42.75	39.08	84.52	55.9	44.1	— 38.2%
#60	3.77	26.49	22.72	107.24	63.1	36.9	
#100	3.75	23.45	19.70	126.94	69.4	30.6	— 25%
#200	3.61	19.41	15.80	142.74	74.4	25.6	— 20.5%

Data entered by: EFM0PLFC Date: 11/11/2004
Data checked by: CAR Date: 11/11/04
FileName: SR

ADVANCED TERRA TESTING, INC.



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	CRS	MEDIUM	FINE	

USCS

COBBLES	PEBBLE GRAVEL				SAND			SILT	CLAY
TO BOULDERS	COARSE	MED	FINE	GRAN	COARSE	MED	FINE		

WENTWORTH

Client: Kaiser Hill - RFETS Boring No.: PLF Cushion Soil Sample No.: 05F8013-001.01

Job Number: 2195-87 Depth:

Classification: **Classification Not Performed**

Advanced Terra Testing, Inc.

COMPACTION TEST
ASTM D 698 B

CLIENT:	Kaiser Hill - RFETS		JOB NO. 2195-87
BORING NO.	PLF Cushion Soil	DATE SAMPLED	10/28/04 DM
DEPTH		DATE TESTED	11/12/04 DPM
SAMPLE NO.	05F8013-001.001	LOCATION	Present Landfill
SOIL DESCR.	RIN #05F8013		

Moisture Determination

	1	2	3	4
Wt of Moisture added (ml)	160.00	200.00	240.00	280.00
Wt. of soil & dish (g)	494.07	492.69	509.47	491.67
Dry wt. soil & dish (g)	455.92	446.31	456.03	432.87
Net loss of moisture (g)	38.15	46.38	53.44	58.80
Wt. of dish (g)	8.07	8.40	8.25	9.15
Net wt. of dry soil (g)	447.85	437.91	447.78	423.72
Moisture Content (%)	8.52	10.59	11.93	13.88
Corrected Moisture Content				

Density determination

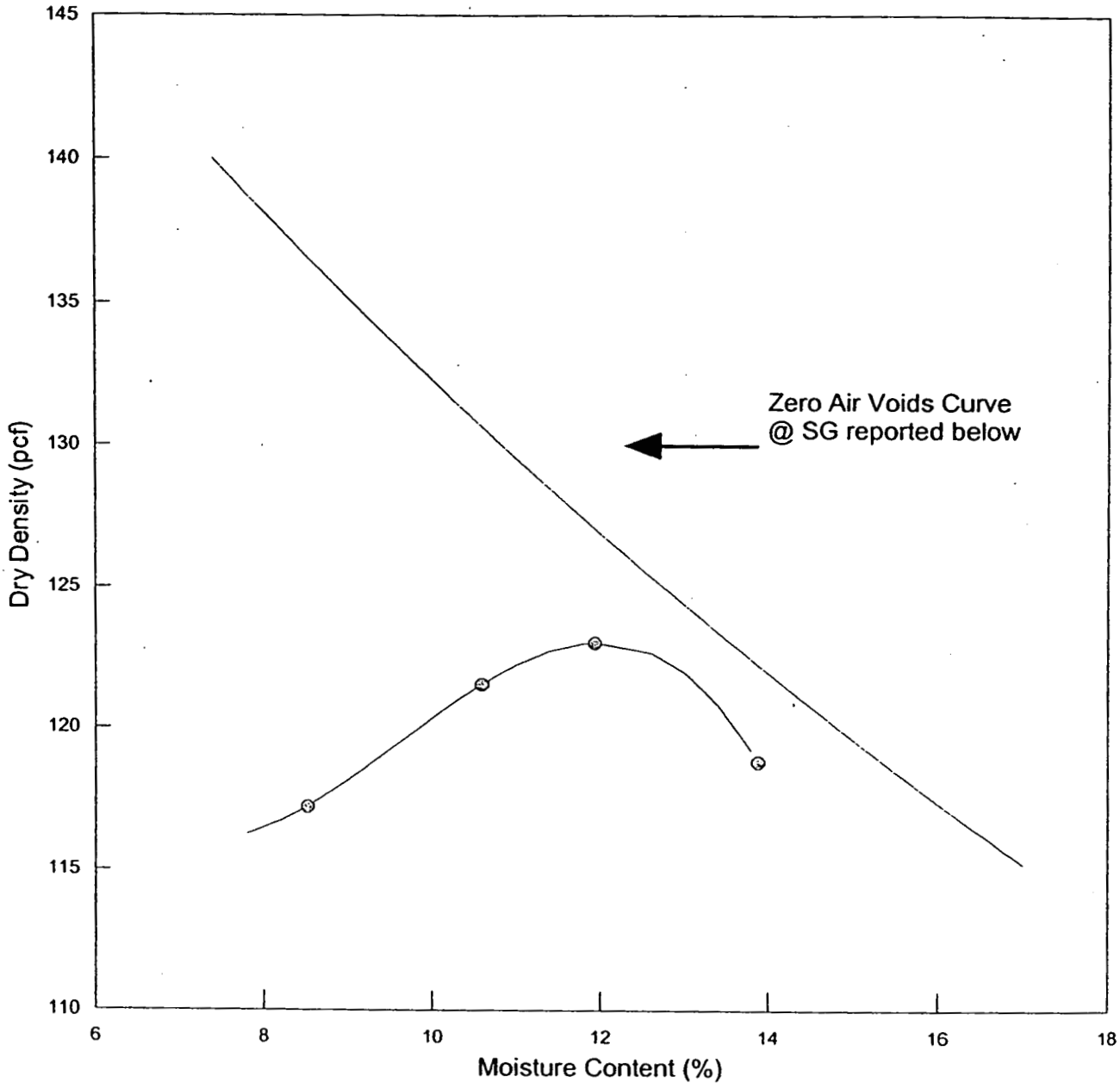
Wt of soil & mold (lb)	14.55	14.79	14.90	14.82
Wt. of mold (lb)	10.31	10.31	10.31	10.31
Net wt. of wet soil (lb)	4.24	4.48	4.59	4.51
Net wt of dry soil (lb)	3.91	4.05	4.10	3.96
Dry Density, (pcf)	117.22	121.53	123.02	118.81
Corrected Dry Density (pcf)				
Volume Factor	30	30	30	30

Data entered by: RS Date: 11/16/2004
Data checked by: KR Date: 11/16/04
FileName: EFPR1301

ADVANCED TERRA TESTING, INC

Proctor Compaction Test

PLF Cushion Soil, , 05F8013-001.001



Best Fit Curve Actual Data Zero Air VoidsCurve @ SG = 2.69

OPTIMUM MOISTURE CONTENT = 12.0 MAXIMUM DRY DENSITY = 123.0
ASTM D 698 B, Rock correction applied? N

ADVANCED TERRA TESTING, INC.

10-INCH CUSHION SOIL TESTS

COMPACTION TEST
ASTM D 698 B

CLIENT: Tetra Tech - RMC JOB NO. 2617-09

[redacted]NG NO. DATE SAMPLED
L TH DATE TESTED 5/16/05 RS
SAMPLE NO. 10" Cushion Layer LOCATION Present Landfill
SOIL DESCR.

Moisture Determination

	1	2	3	4	5	6
Wt of Moisture added (ml)	280.00	240.00	200.00	160.00	120.00	80.00
Wt. of soil & dish (g)	334.91	319.24	342.40	285.81	351.53	332.22
Dry wt. soil & dish (g)	289.13	279.88	305.39	257.41	321.48	311.11
Net loss of moisture (g)	45.78	39.36	37.01	28.40	30.05	21.11
Wt. of dish (g)	8.05	8.09	8.25	8.00	8.23	8.21
Net wt. of dry soil (g)	281.08	271.79	297.14	249.41	313.25	302.90
Moisture Content (%)	16.29	14.48	12.46	11.39	9.59	6.97
Corrected Moisture Content	15.12	13.44	11.56	10.57	8.91	6.47
Density determination						
Wt of soil & mold (lb)	14.67	14.74	14.85	14.90	14.88	14.68
Wt. of mold (lb)	10.31	10.31	10.31	10.31	10.31	10.31
Net wt. of wet soil (lb)	4.36	4.43	4.54	4.59	4.57	4.37
Net wt of dry soil (lb)	3.79	3.91	4.07	4.15	4.20	4.10
D[redacted]ensity, (pcf)	113.62	117.15	122.08	124.53	125.89	123.13
C[redacted]ted Dry Density (pcf)	116.20	119.62	124.38	126.74	128.04	125.39
Volume Factor	30	30	30	30	30	30

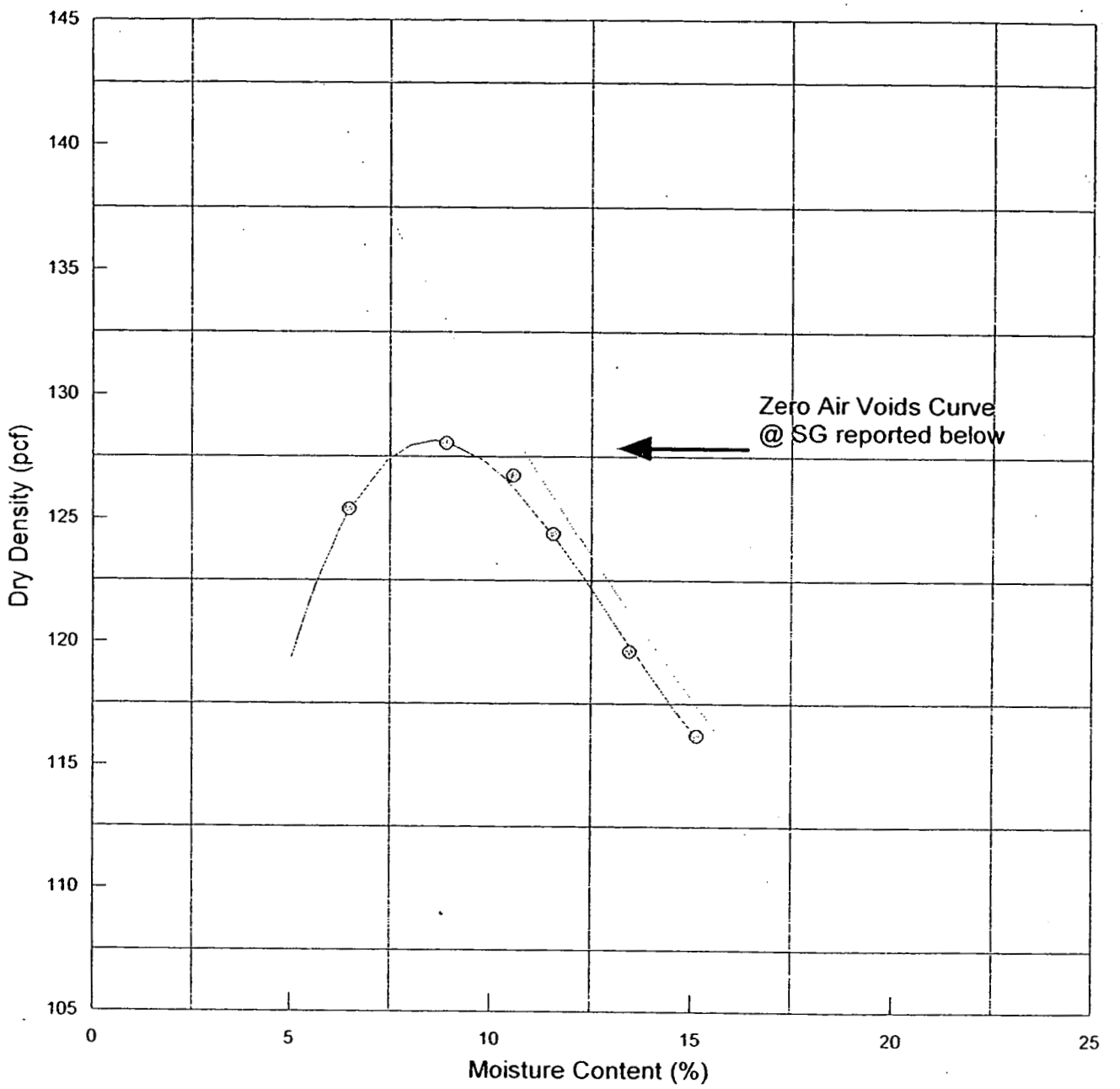
Data entered by: RS Date: 05/17/2005
Data checked by: KR Date: 5/17/05
FileName: TTPR10CL

ADVANCED TERRA TESTING, INC.

[redacted]

Proctor Compaction Test

, , 10" Cushion Layer



- Best Fit Curve ⊙ Actual Data

Zero Air VoidsCurve @ SG = 2.63

OPTIMUM MOISTURE CONTENT = 8.6 MAXIMUM DRY DENSITY = 128.1
ASTM D 698 B, Rock correction applied? Y

ADVANCED TERRA TESTING, INC.

ATTERBERG LIMITS TEST
ASTM D 4318

CLIENT Tetra Tech-RMC JOB NO. 2617-09

BORING NO.
DEPTH
SAMPLE NO. 10" Cusion
SOIL DESCR.
LOCATION Present Landfill

DATE SAMPLED
DATE TESTED 05-11-05 SKL

Plastic Limit Determination

	1	2	3
Wt Dish & Wet Soil	6.72	6.56	6.72
Wt Dish & Dry Soil	6.06	5.90	6.02
Wt of Moisture	0.66	0.66	0.70
Wt of Dish	0.75	0.75	0.81
Wt of Dry Soil	5.31	5.15	5.21
Moisture Content	12.43	12.82	13.44

Liquid Limit Determination Device Number 0966

	1	2	3	4	5
Number of Blows	16	19	23	27	29
Wt Dish & Wet Soil	12.45	12.26	11.09	12.67	11.74
Wt Dish & Dry Soil	9.26	9.14	8.33	9.52	8.87
Wt of Moisture	3.19	3.12	2.76	3.15	2.87
Wt of Dish	0.81	0.81	0.81	0.80	0.82
Wt of Dry Soil	8.45	8.33	7.52	8.72	8.05
Moisture Content	37.75	37.45	36.70	36.12	35.65

Liquid Limit	36.3
Plastic Limit	12.9
Plasticity Index	23.4

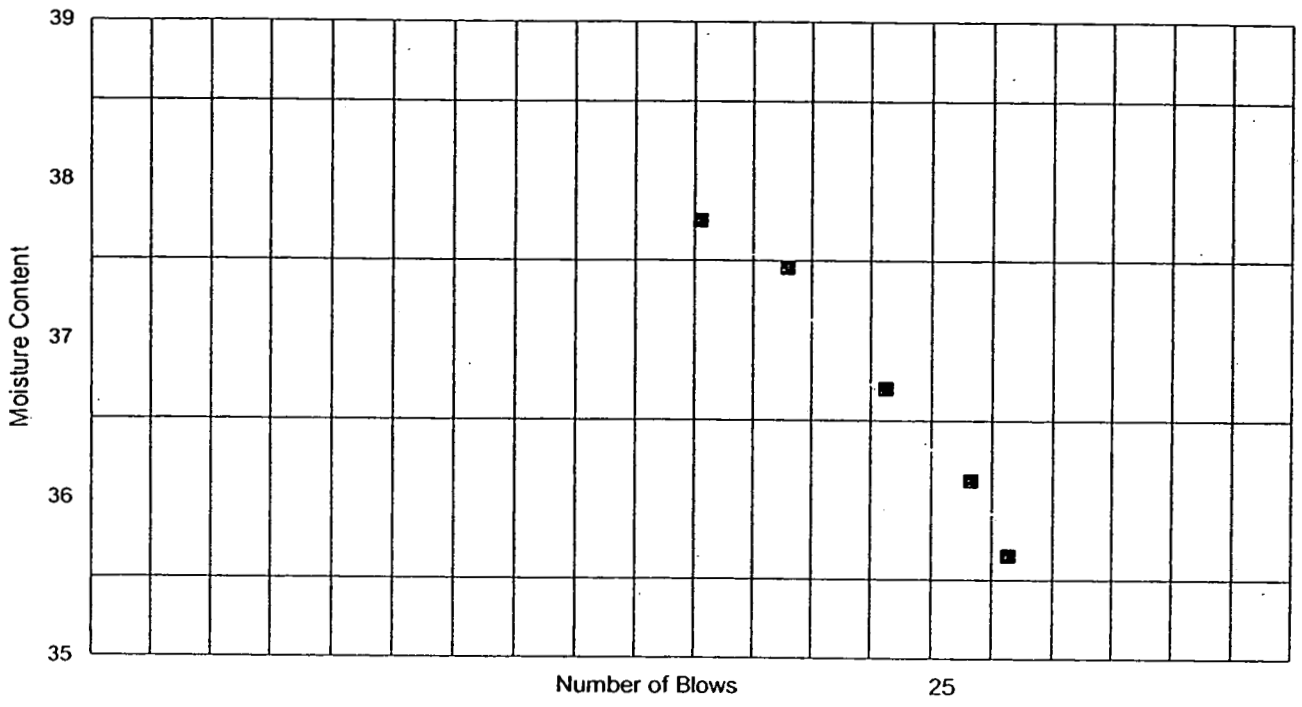
Atterberg Classification CL

Data entry by: SR Date: 05/12/2005
Checked by: SRL Date: 5/12/05
FileName: TTG010CU

ADVANCED TERRA TESTING, INC.

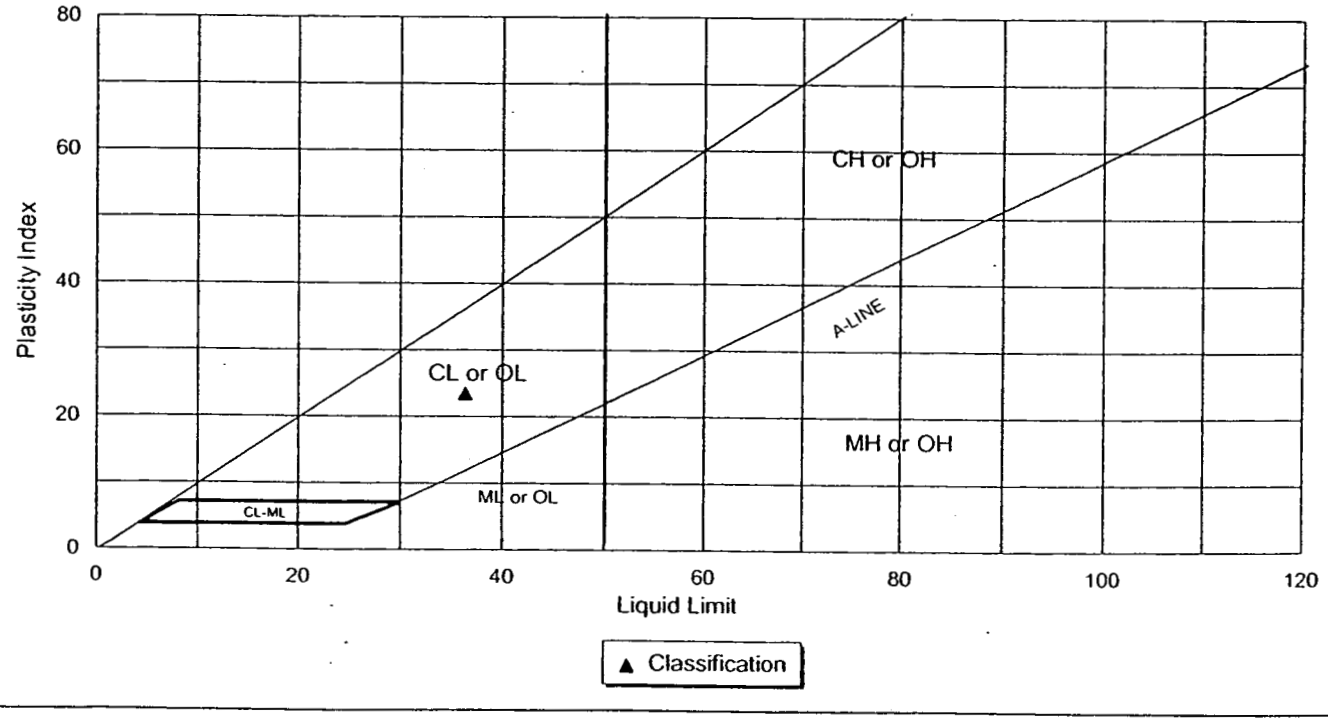
Atterberg Limits, Flow Curve

, , 10" Cusion



PLASTICITY CHART

, , 10" Cusion



MECHANICAL ANALYSIS - SIEVE TEST DATA
ASTM D 422

CLIENT Tetra Tech-RMC

JOB NO. 2617-09

BORING NO.
DEPTH
SAMPLE NO. 10" Cushion
SOIL DESCR.
LOCATION Present Landfill

SAMPLED
DATE TESTED 05-11-05 RS
WASH SIEVE Yes
DRY SIEVE No

MOISTURE DATA

HYGROSCOPIC Yes

NATURAL No

Wt. Wet Soil & Pan (g)	68.54
Wt. Dry Soil & Pan (g)	67.59
Wt. Lost Moisture (g)	0.95
Wt. of Pan Only (g)	3.64
Wt. of Dry Soil (g)	63.95
Moisture Content %	1.5
Wt. Hydrom. Sample Wet (g)	64.50
Wt. Hydrom. Sample Dry (g)	63.56

WASH SIEVE ANALYSIS

Wt. Total Sample Wet (g)	1138.81
Weight of + #10 Before Washing (g)	382.39
Weight of + #10 After Washing (g)	368.49
Weight of - #10 Wet (g)	756.42
Weight of - #10 Dry (g)	759.04
Wt. Total Sample Dry (g)	1127.53
Calc. Wt. "W" (g)	94.41
Calc. Mass + #10	30.86

Sieve Number (Size)	Pan Weight (g)	Indiv. Wt. + Pan (g)	Indiv. Wt. Retain.	Cum. Wt. Retain.	Cum. % Retain.	% Finer By Wt.
3"	0.00	0.00	0.00	0.00	0.0	100.0
1 1/2"	0.00	0.00	0.00	0.00	0.0	100.0
3/4"	0.00	0.00	0.00	0.00	0.0	100.0
3/8"	0.00	25.60	25.60	25.60	2.3	97.7
#4	0.00	173.46	173.46	199.06	17.7	82.3
#10	0.00	169.43	169.43	368.49	32.7	67.3
#20	2.28	15.26	12.98	12.98	46.4	53.6
#40	2.31	14.63	12.32	25.30	59.5	40.5
#60	2.34	10.54	8.20	33.50	68.2	31.8
#100	2.36	8.31	5.95	39.45	74.5	25.5
#200	2.36	7.81	5.45	44.90	80.2	19.8

Data entered by: SR Date: 05/13/2005
Data checked by: SR Date: 5/13/05
FileName: TTH010CU

ADVANCED TERRA TESTING, INC.

HYDROMETER ANALYSIS - SEDIMENTATION DATA
ASTM D 422

CLIENT	Tetra Tech-RMC	JOB NO.	2617-09
BORING NO.		SAMPLED	
DEPTH		DATE TESTED	05-11-05 RS
SAMPLE NO.	10" Cushion	WASH SIEVE	Yes
SOIL DESCR.		DRY SIEVE	No
LOCATION	Present Landfill		

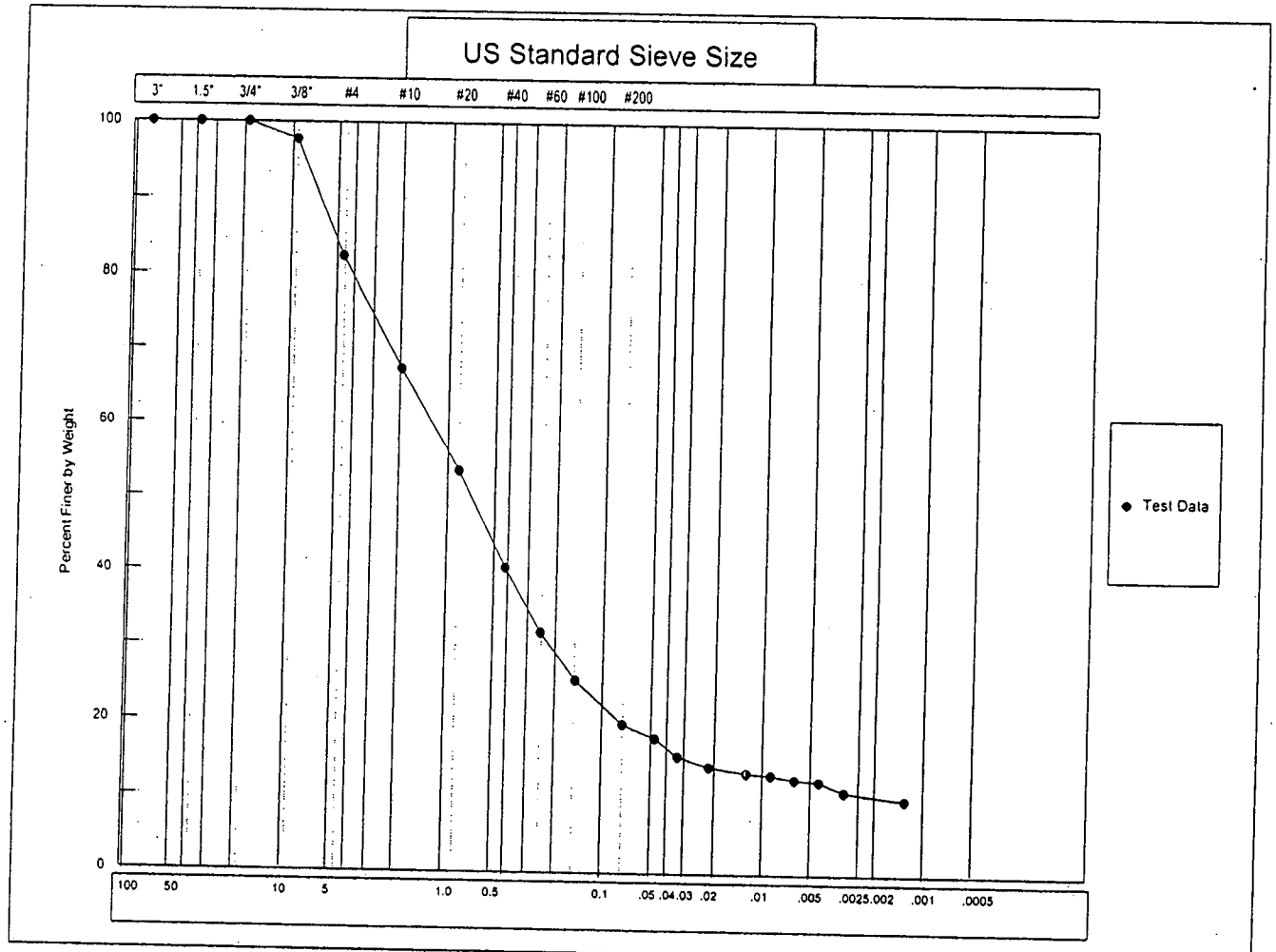
Hydrometer #	ASTM 152 H	Temp., Deg. C	22.8
Sp. Gr. of Soil	2.65	Temp. Coef. K	0.01320
Value of "alpha"	1.00	Wt. Dry Sample "W"	94.414
Deflocculant	Sodium Hexametaphosphate	% of Total Sample	100.0
Defloc. Corr'n	5.0		
Meniscus Corr'n	-0.5		

T Elapsed Time (min)	Hydrometer Reading Original	Corrected "R"	100Ra/W	% Total Sample	Effective Depth L	Grain Diameter (mm)
0.0	--	--	--	--	--	--
0.5	--	--	--	--	--	--
1.0	22.50	17.00	18.0	18.0	12.60	0.0469
2.0	20.25	14.75	15.6	15.6	12.97	0.0336
5.0	19.00	13.50	14.3	14.3	13.17	0.0214
15.0	18.25	12.75	13.5	13.5	13.30	0.0124
30.0	18.00	12.50	13.2	13.2	13.34	0.0088
60.0	17.50	12.00	12.7	12.7	13.42	0.0062
120.0	17.25	11.75	12.4	12.4	13.46	0.0044
250.0	16.00	10.50	11.1	11.1	13.67	0.0031
1440.0	15.00	9.50	10.1	10.1	13.83	0.0013

Grain Diameter = K*(SQRT(L/T))

Data entered by: SR Date: 05/13/2005
Data checked by: SHL Date: 5/13/05
FileName: TTH010CU

ADVANCED TERRA TESTING, INC.



COBBLES	GRAVEL		SAND			SILT OR CLAY	USCS
	COARSE	FINE	CRS	MEDIUM	FINE		

COBBLES	PEBBLE GRAVEL				SAND			SILT	CLAY	WENTWORTH
TO BOULDERS	COARSE	MED	FINE	GRAN	COARSE	MED	FINE			

Client: Tetra Tech-RMC
Job Number: 2617-09
Classification: Classification Not Performed (SM-SC fine)

Boring No.:
Depth:

Sample No.: 10" Cushion

Advanced Terra Testing, Inc.

DRAINAGE ROCK
GRAIN SIZE ANALYSIS

MECHANICAL ANALYSIS - SIEVE TEST DATA
ASTM D-422

CLIENT Tetra Tech-RMC

JOB NO. 2617-09

BORING NO.
DEPTH
SAMPLE NO. 3/4" Drainage Rock
SOIL DESCR.
LOCATION Present Landfill

SAMPLED
DATE TESTED 05-12-05 AG
WASH SIEVE Yes
DRY SIEVE No

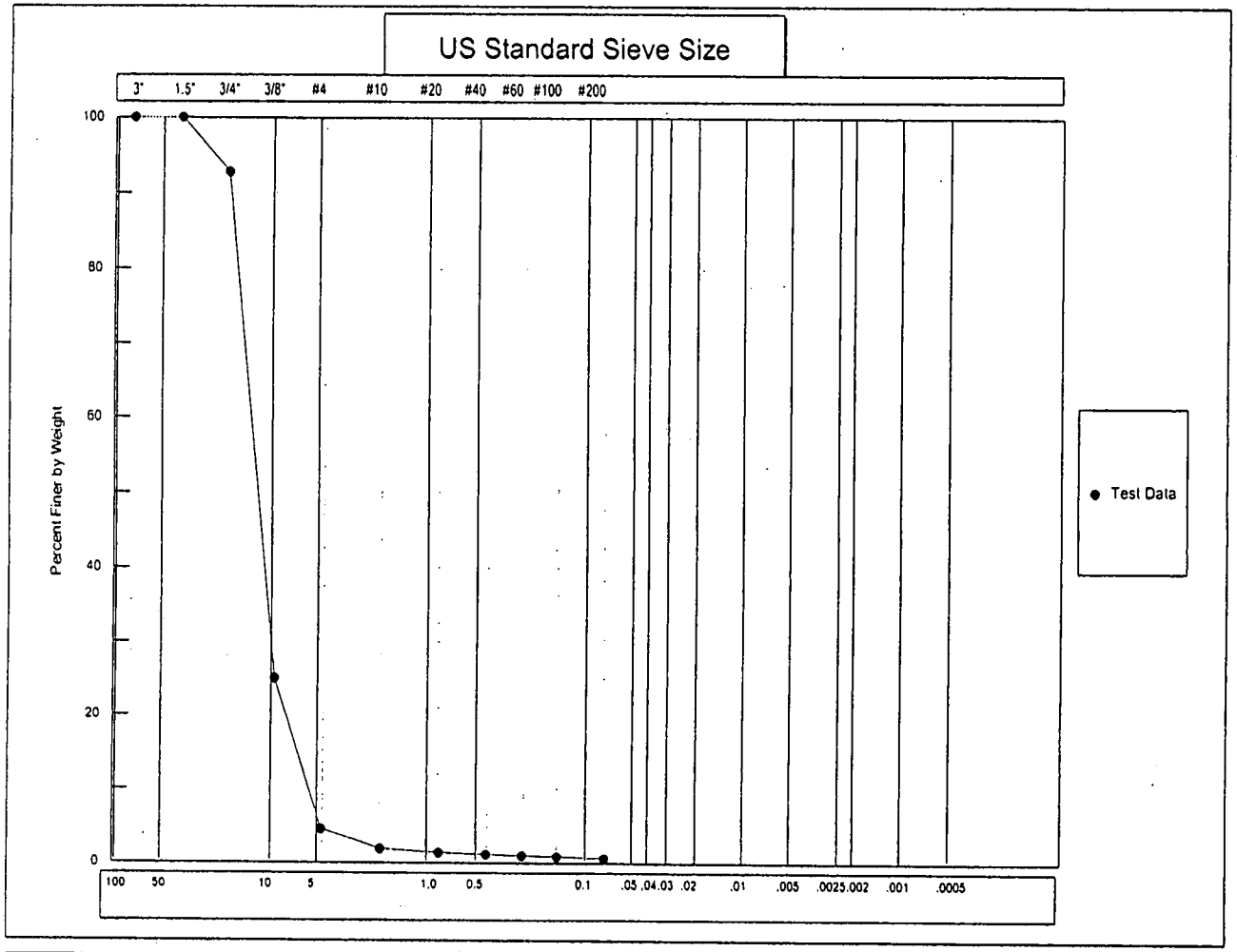
WASH SIEVE ANALYSIS

Wt. Wet Soil & Pan Before Washing (g)	1590.8
Wt. Dry Soil & Pan Before Washing (g)	1589.9
Weight of Pan (g)	15.1
Wt. of Dry Soil Before Washing	1574.7
Wt. Dry Soil & Pan After Washing (g)	1580.5
Wt. of Dry Soil After Washing (g)	1565.3
-#200 Wash. Out %	0.6

Sieve Number (Size)	Pan Weight (g)	Indiv. Wt. + Pan (g)	Indiv. Wt. Retain.	Cum. Wt. Retain.	Cum. % Retain.	% Finer By Wt.
3"	0.00	0.00	0.00	0.00	0.0	100.0
1 1/2"	0.00	0.00	0.00	0.00	0.0	100.0
3/4"	3.71	118.85	115.14	115.14	7.3	92.7
3/8"	15.40	1082.61	1067.21	1182.35	75.1	24.9
#4	8.23	328.98	320.75	1503.10	95.5	4.5
#10	3.71	46.31	42.60	1545.70	98.2	1.8
#20	2.35	9.84	7.49	1553.19	98.6	1.4
#40	2.28	6.13	3.85	1557.04	98.9	1.1
#60	2.34	4.91	2.57	1559.61	99.0	1.0
#100	2.35	4.82	2.47	1562.08	99.2	0.8
#200	2.36	5.61	3.25	1565.33	99.4	0.6

Data entered by: SR Date: 05/13/2005
Data checked by: Date: 5/13/05
FileName: TTM034DR

ADVANCED TERRA TESTING, INC.



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	CRS	MEDIUM	FINE	

USCS

COBBLES TO BOULDERS	PEBBLE GRAVEL			SAND			SILT	CLAY
	COARSE	MED	FINE	GRAN	COARSE	MED	FINE	

WENTWORTH

Client: Tetra Tech-RMC Boring No.: Sample No.: 3/4" Drainage Rock

Job Number: 2617-09 Depth:

Classification_____

Advanced Terra Testing, Inc.