

APPENDIX M  
LLDPE GEOMEMBRANE CQA DOCUMENTATION



PANEL PLACEMENT LOG

PROJECT: ASARCO El Paso Category I Landfill - Cell 3 CQA  
 LOCATION: 2301 West Paisano Drive, El Paso, TX 79922 PROJECT NO.: 06835001.2014 PHASE: 47CQ1  
 DESCRIPTION: Cell 3 CQA YEAR: 2014  
 PRIMARY  SECONDARY  OTHER: \_\_\_\_\_ PRODUCT TYPE: AGRU LLDPE Microspike

PANEL NO.	ROLL NO.	DATE (mo/day/yr)	WIDTH (ft.)	LENGTH (ft.)	AREA (sq. ft.)	COMMENTS	QA ID
1	833101	4/8/2014	22.5	186.0	4,185.0		RJ
2	833101	4/8/2014	22.5	170.0	3,825.0		RJ
3	833101	4/8/2014	22.5	153.0	3,442.5		RJ
4	833101	4/8/2014	22.5	123.0	2,767.5		RJ
5	833102	4/8/2014	22.5	41.0	922.5		RJ
6	833102	4/8/2014	22.5	152.0	3,420.0		RJ
7	833102	4/8/2014	22.5	147.0	3,307.5		RJ
8	833102	4/8/2014	22.5	155.0	3,487.5		RJ
9	833102	4/8/2014	22.5	80.0	1,800.0		RJ
10	833102	4/8/2014	22.5	49.0	1,102.5		RJ
11	832763	4/8/2014	22.5	29.0	652.5		RJ
12	832763	4/8/2014	22.5	33.0	742.5		RJ
13	832763	4/8/2014	22.5	25.0	562.5		RJ
14	832763	4/8/2014	22.5	23.0	517.5		RJ
15	832763	4/8/2014	10.0	10.0	100.0		RJ
16	832763	4/8/2014	22.5	43.0	967.5		RJ
17	832763	4/8/2014	22.5	39.0	877.5		RJ
18	832763	4/8/2014	18.0	25.0	450.0		RJ
19	832763	4/8/2014	22.5	30.0	675.0		RJ
20	832763	4/8/2014	22.5	27.0	607.5		RJ
21	832763	4/8/2014	22.5	26.0	585.0		RJ
22	832763	4/8/2014	20.0	18.0	360.0		RJ
23	832763	4/9/2014	22.5	205	4,612.5		RJ
24	832763	4/9/2014	22.5	150	3,375.0		RJ
25	832764	4/9/2014	22.5	65	1,462.5		RJ
26	832764	4/9/2014	22.5	220	4,950.0		RJ
27	832764	4/9/2014	22.5	253	5,692.5		RJ
28	832764	4/9/2014	22.5	52	1,170.0		RJ
29	832765	4/9/2014	22.5	24	540.0		RJ
30	832765	4/9/2014	22.5	51	1,147.5		RJ
31	832765	4/9/2014	22.5	56	1,260.0		RJ
32	832765	4/9/2014	22.5	60	1,350.0		RJ

TOTAL AREA: THIS PAGE: 60,917.5 FT<sup>2</sup>  
 NOTES: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_





**TRIAL SEAM LOG - FUSION**

PROJECT: ASARCO El Paso Category 1 Landfill - Cell 3 CQA  
 LOCATION: 2301 West Paisano Drive, El Paso, TX 79922 PROJECT NO.: 06835001.2014 TASK NO.: 47CQ1  
 DESCRIPTION: Cell 3 CQA YEAR: 2014  
 SPECIFICATIONS: FUSION WELD: PEEL: 50 SHEAR: 60  ppi  psi  
 EXTRUSION WELD: PEEL: 44 SHEAR: 60  ppi  psi  
 TENSIO METER DESCRIPTION: Pro-Tester T-0100 SERIAL NO.: 667867

DATE (mo/day/yr)	TRIAL SEAM NO.	TIME	OPER. ID	MACHINE NO.	MAT. DESCR. (1)	FUSHION WELD		EXTRUSION WELD		PEEL VALUES (lbs/in)			SHEER (lbs/in)			PASS	FAIL	QA ID
						WEDGE TEMP. (°F)	MACHINE SPEED SETTING (ft/min)	BARREL TEMP. (°F)	PREHEAT TEMP. (°F)									
4/8/2014	1	13:35	WB	3440	S/S	750	12	---	---	88	84	102	108	112	111		X	RJ
										103	97	92						
4/8/2014	2	13:40	WN	3351	S/S	750	12	---	---	85	96	85	101	100	98		X	RJ
										87	85	89						
4/8/2014	3	13:45	WN	3351	T/T	750	12	---	---	90	91	90	95	101	97		X	RJ
										90	90	89						
4/8/2014	4	15:25	WB	3440	S/T	750	12	---	---	87	90	98	94	93	93		X	RJ
										88	91	89						
4/8/2014	5	7:30	WN	3351	S/S	750	12	---	---	102	105	101	120	123	119		X	RJ
										100	101	101						
4/8/2014	6	7:35	WN	3351	T/T	750	12	---	---	101	98	101	113	116	118		X	RJ
										98	100	100						
4/8/2014	7	7:40	WN	3351	S/T	750	12	---	---	100	98	101	118	113	115		X	RJ
										102	100	95						
4/9/2014	8	8:20	WB	3440	S/S	750	12	---	---	112	105	110	125	120	119		X	RJ
										108	110	110						
4/9/2014	9	8:25	WB	3440	S/T	750	12	---	---	103	112	98	115	113	110		X	RJ
										111	110	98						
4/9/2014	10	13:00	WB	3440	S/S	750	12	---	---	88	101	90	102	100	98		X	RJ
										99	92	89						
4/9/2014	11	13:05	WB	3440	S/T	750	12	---	---	90	85	87	91	95	98		X	RJ
										84	89	90						
4/9/2014	12	12:55	WN	3351	S/S	750	12	---	---	93	90	92	101	105	98		X	RJ
										89	90	90						
4/9/2014	13	12:48	WN	3351	S/T	750	12	---	---	88	82	84	80	92	90		X	RJ
										84	80	80						
4/10/2014	14	8:02	RM	84	T/T	---	---	450	400				189	200	201		X	RJ
										91	89	100						
4/10/2014	15	8:15	JLO	1266	T/T	---	---	260	240				100	102	99		X	RJ
										101	100	102						

NOTE: (1) MATERIAL DESCRIPTION REFERS TO EITHER SMOOTH/SMOOTH (S/S); SMOOTH/TEXTURED (S/T); OR TEXTURED/TEXTURED (T/T).



**PRODUCTION SEAM SUMMARY LOG**

PROJECT: <u>ASARCO El Paso Category I Landfill - Cell 3 CQA</u>			
LOCATION: <u>2301 West Paisano Drive, El Paso, TX 79922</u>		PROJECT NO.: <u>06835001.2014</u>	TASK NO.: <u>47CQ1</u>
DESCRIPTION: <u>Cell 3 CQA</u>		YEAR: <u>2014</u>	
PRIMARY: <input checked="" type="checkbox"/> SECONDARY: <input type="checkbox"/> OTHER: _____			
NDT SPECIFICATIONS: AIR TEST: <u>30</u> psi ± <u>3</u> psi for <u>5</u> minutes VACUUM TEST: <u>5</u> psi for minimum <u>10</u> seconds			

PRODUCTION SEAM				LOCATION				NONDESTRUCTIVE TEST								
DATE (mo/day/yr)	TIME	MACHINE NO.	OPER. ID	SEAM NO.	ACTUAL SEAM LENGTH (ft)	QA ID	COMMENTS	TIME		PRESSURE (psi)		OPER. ID	PASS	FAIL	ACTION	QA ID
								START	FINISH	START	FINISH					
4/8/2014	13:48	3440	WB	1/2	176	RJ		15:57	16:02	30	29	RM	X		AT OK	RJ
4/8/2014	14:00	3351	WN	2/3	158	RJ		16:56	17:01	30	29	RM	X		AT OK	RJ
4/8/2014	14:23	3440	WB	3/4	98	RJ		16:23	16:28	30	30	RM	X		AT OK	RJ
4/8/2014	14:23	3440	WB	3/5	38	RJ		16:49	16:54	30	30	RM	X		AT OK	RJ
4/8/2014	14:20	3351	WN	4/5	22	RJ		16:43	16:48	30	30	RM	X		AT OK	RJ
4/8/2014	14:30	3351	WN	4/6	116	RJ		15:42	15:47	35	34	RM	X		AT OK	RJ
4/8/2014	14:30	3351	WN	5/6	32	RJ		16:42	16:47	30	29	RM	X		AT OK	RJ
4/8/2014	14:46	3440	WB	6/7	138	RJ		16:21	16:26	30	30	RM	X		AT OK	RJ
4/8/2014	14:56	3351	WN	7/8	143	RJ		16:19	16:24	30	29	RM	X		AT OK	RJ
4/8/2014	15:30	3351	WN	8/9	70	RJ		15:07	15:12	35	35	RM	X		AT OK	RJ
4/8/2014	16:50	3440	WB	8/10	22	RJ		15:09	15:14	35	34	RM	X		AT OK	RJ
4/8/2014	16:16	3440	WB	9/10	23	RJ		18:18	18:23	35	34	RM	X		AT OK	RJ
4/8/2014	16:00	3440	WB	9/11	22	RJ		18:16	18:21	35	34	RM	X		AT OK	RJ
4/8/2014	16:00	3440	WB	9/12	22	RJ		18:07	18:12	35	34	RM	X		AT OK	RJ
4/8/2014	15:43	3351	WN	9/14	27	RJ		18:06	18:11	35	35	RM	X		AT OK	RJ
4/8/2014	15:35	3440	WB	10/11	21	RJ		18:20	18:25	35	34	RM	X		AT OK	RJ

TOTALS:	FUSION: <u>1,128</u> (ft)	CUMULATED FUSION: <u>1,128</u> (ft)
	EXTRUSION _____ (ft)	CUMULATED EXTRUSION: _____ (ft)
COMMENTS: _____		

REVIEWED BY: \_\_\_\_\_



**PRODUCTION SEAM SUMMARY LOG**

PROJECT: <u>ASARCO El Paso Category I Landfill - Cell 3 CQA</u>	
LOCATION: <u>2301 West Paisano Drive, El Paso, TX 79922</u>	PROJECT NO.: <u>06835001.2014</u> TASK NO.: <u>47CQ1</u>
DESCRIPTION: <u>Cell 3 CQA</u> YEAR: <u>2014</u>	
PRIMARY: <input checked="" type="checkbox"/> SECONDARY: <input type="checkbox"/> OTHER: _____	
NDT SPECIFICATIONS: AIR TEST: <u>30</u> psi ± <u>3</u> psi for <u>5</u> minutes      VACUUM TEST: <u>5</u> psi for minimum <u>10</u> seconds	

PRODUCTION SEAM				LOCATION				NONDESTRUCTIVE TEST								
DATE (mo/day/yr)	TIME	MACHINE NO.	OPER. ID	SEAM NO.	ACTUAL SEAM LENGTH (ft)	QA ID	COMMENTS	TIME		PRESSURE (psi)		OPER. ID	PASS	FAIL	ACTION	QA ID
								START	FINISH	START	FINISH					
4/8/2014	15:45	3440	WB	11/12	26	RJ		18:09	18:14	35	34	RM	X		AT OK	RJ
4/8/2014	15:55	3351	WN	12/13	28	RJ		18:04	18:09	35	34	RM	X		AT OK	RJ
4/8/2014	16:00	3551	WN	13/14	28	RJ		17:15	17:20	35	34	RM	X		AT OK	RJ
4/8/2014	16:15	3551	WN	13/15	5	RJ		17:53	17:58	35	34	RM	X		AT OK	RJ
4/8/2014	16:10	3551	WN	14/15	5	RJ		17:52	17:57	35	35	RM	X		AT OK	RJ
4/8/2014	16:55	3440	WB	8/16	22	RJ		15:25	15:30	35	35	RM	X		AT OK	RJ
4/8/2014	17:10	3440	WB	8/17	22	RJ		16:14	16:19	30	30	RM	X		AT OK	RJ
4/8/2014	17:05	3440	WB	8/18	14	RJ		16:08	16:13	30	30	RM	X		AT OK	RJ
4/8/2014	16:28	3351	WN	10/16	40	RJ		15:13	15:18	35	35	RM	X		AT OK	RJ
4/8/2014	16:31	3440	WB	16/17	37	RJ		15:26	15:31	35	35	RM	X		AT OK	RJ
4/8/2014	16:50	3351	WN	17/18	27	RJ		16:07	16:12	30	30	RM	X		AT OK	RJ
4/8/2014	16:55	3351	WN	19/20	23	RJ		7:31	7:36	30	29	RM	X		AT OK	RJ
4/8/2014	17:00	3351	WN	20/21	22	RJ		17:20	17:25	30	30	RM	X		AT OK	RJ
4/8/2014	17:05	3351	WN	21/22	20	RJ		17:02	17:07	30	30	RM	X		AT OK	RJ
4/8/2014	17:17	3440	WB	4/22	23	RJ		15:44	15:49	35	34	RM	X		AT OK	RJ
4/8/2014	17:35	3351	WN	19/1	22	RJ		19:32	19:37	30	29	RM	X		AT OK	RJ

TOTALS:	FUSION: _____	364 (ft)	CUMULATED FUSION: _____	1,492 (ft)
	EXTRUSION _____	(ft)	CUMULATED EXTRUSION: _____	(ft)
COMMENTS:	_____			

REVIEWED BY: \_\_\_\_\_



**PRODUCTION SEAM SUMMARY LOG**

PROJECT: <u>ASARCO El Paso Category I Landfill - Cell 3 CQA</u>			
LOCATION: <u>2301 West Paisano Drive, El Paso, TX 79922</u>		PROJECT NO.: <u>06835001.2014</u>	TASK NO.: <u>47CQ1</u>
DESCRIPTION: <u>Cell 3 CQA</u>			
YEAR: <u>2014</u>			
PRIMARY: <input checked="" type="checkbox"/> SECONDARY: <input type="checkbox"/> OTHER: _____			
NDT SPECIFICATIONS: AIR TEST: <u>30</u> psi ± <u>3</u> psi for <u>5</u> minutes VACUUM TEST: <u>5</u> psi for minimum <u>10</u> seconds			

PRODUCTION SEAM				LOCATION				NONDESTRUCTIVE TEST								
DATE (mo/day/yr)	TIME	MACHINE NO.	OPER. ID	SEAM NO.	ACTUAL SEAM LENGTH (ft)	QA ID	COMMENTS	TIME		PRESSURE (psi)		OPER. ID	PASS	FAIL	ACTION	QA ID
								START	FINISH	START	FINISH					
4/8/2014	17:30	3351	WN	1/20	7	RJ		7:26	7:31	30	30	RM	X		AT OK	RJ
4/8/2014	17:25	3551	WN	2/20	16	RJ		7:25	7:30	30	30	RM	X		AT OK	RJ
4/8/2014	17:20	3351	WN	2/21	14	RJ		17:24	17:29	30	29	RM	X		AT OK	RJ
4/8/2014	17:15	3551	WN	3/21	9	RJ		17:16	17:21	30	30	RM	X		AT OK	RJ
4/8/2014	17:10	3551	WN	3/22	19	RJ		17:10	17:15	30	30	RM	X		AT OK	RJ
4/9/2014	10:10	3440	WB	1/23	192	RJ		7:29	7:34	30	30	RM	X		AT OK	RJ
4/9/2014	10:37	3351	WN	23/24	57	RJ		7:42	7:47	30	30	RM	X		AT OK	RJ
4/9/2014	10:43	3351	WN	23/25	150	RJ		7:45	7:50	30	30	RM	X		AT OK	RJ
4/9/2014	10:30	3351	WN	24/25	22	RJ		7:46	7:51	30	30	RM	X		AT OK	RJ
4/9/2014	10:50	3440	WB	24/26	74	RJ		8:04	8:09	30	30	RM	X		AT OK	RJ
4/9/2014	11:00	3351	WN	26/27	212	RJ		8:26	8:31	30	30	RM	X		AT OK	RJ
4/9/2014	11:16	3440	WB	25/26	40	RJ	S EOS to 40' N of S EOS	8:05	8:10	30	30	RM	X		AT OK	RJ
4/9/2014	13:59	3351	WN	27/28	40	RJ		9:21	9:26	30	30	RM	X		AT OK	RJ
4/9/2014	14:30	3440	WB	28/30	23	RJ		9:22	9:27	30	29	RM	X		AT OK	RJ
4/9/2014	14:40	3440	WB	29/30	81	RJ		9:41	9:46	30	29	RM	X		AT OK	RJ
4/9/2014	14:20	3440	WB	28/29	25	RJ		9:38	9:43	30	30	RM	X		AT OK	RJ

TOTALS:	FUSION: <u>981</u> (ft)	CUMULATED FUSION: <u>2,473</u> (ft)
	EXTRUSION _____ (ft)	CUMULATED EXTRUSION: _____ (ft)
COMMENTS: _____		



**PRODUCTION SEAM SUMMARY LOG**

PROJECT: ASARCO El Paso Category I Landfill - Cell 3 CQA

LOCATION: 2301 West Paisano Drive, El Paso, TX 79922 PROJECT NO.: 06835001.2014 TASK NO.: 47CQ1

DESCRIPTION: Cell 3 CQA YEAR: 2014

PRIMARY:  SECONDARY:  OTHER: \_\_\_\_\_

NDT SPECIFICATIONS: AIR TEST: 30 psi ± 3 psi for 5 minutes VACUUM TEST: 5 psi for minimum 10 seconds

PRODUCTION SEAM				LOCATION				NONDESTRUCTIVE TEST							
DATE (mo/day/yr)	TIME	MACHINE NO.	OPER. ID	SEAM NO.	ACTUAL SEAM LENGTH (ft)	QA ID	COMMENTS	TIME		PRESSURE (psi)		OPER. ID	PASS FAIL	ACTION	QA ID
								START	FINISH	START	FINISH				
4/9/2014	14:30	3351	WN	30/31	47	RJ		9:45	9:50	30	30	RM	X	AT OK	RJ
4/9/2014	14:48	3351	WN	31/32	50	RJ		9:48	9:53	30	30	RM	X	AT OK	RJ
4/9/2014	15:00	3351	WN	32/33	53	RJ		9:56	10:01	30	30	RM	X	AT OK	RJ
4/9/2014	15:20	3351	WN	33/34	58	RJ		9:59	10:04	30	29	RM	X	AT OK	RJ
4/9/2014	15:09	3440	WB	34/35	60	RJ		10:07	10:12	30	29	RM	X	AT OK	RJ
4/9/2014	15:30	3440	WB	35/36	63	RJ		10:12	10:17	30	29	RM	X	AT OK	RJ
4/9/2014	16:28	3351	WN	36/37	22	RJ		8:56	9:01	30	30	RM	X	AT OK	RJ
4/9/2014	16:30	3351	WN	36/39	40	RJ		10:15	10:20	30	30	RM	X	AT OK	RJ
4/9/2014	16:20	3351	WN	39/40	20	RJ		10:32	10:37	30	30	RM	X	AT OK	RJ
4/9/2014	16:09	3351	WN	38/40	19	RJ		10:29	10:34	30	30	RM	X	AT OK	RJ
4/9/2014	16:25	3351	WN	38/39	32	RJ		9:02	9:07	30	29	RM	X	AT OK	RJ
4/9/2014	15:58	3351	WN	37/38	42	RJ		8:59	9:04	31	30	RM	X	AT OK	RJ
4/9/2014	15:45	3351	WN	27/37	40	RJ		8:50	8:55	30	30	RM	X	AT OK	RJ
4/9/2014	16:20	3440	WB	27/36	22	RJ		8:52	8:57	30	30	RM	X	AT OK	RJ
4/9/2014	16:23	3440	WB	27/35	22	RJ		10:11	10:16	30	30	RM	X	AT OK	RJ
4/9/2014	16:26	3440	WB	27/34	22	RJ		10:04	10:09	30	29	RM	X	AT OK	RJ

TOTALS: FUSION: 612 (ft) CUMULATED FUSION: 3,085 (ft)

EXTRUSION \_\_\_\_\_ (ft) CUMULATED EXTRUSION: \_\_\_\_\_ (ft)

COMMENTS: \_\_\_\_\_

REVIEWED BY: \_\_\_\_\_





**PRODUCTION SEAM SUMMARY LOG**

PROJECT: ASARCO El Paso Category I Landfill - Cell 3 CQA

LOCATION: 2301 West Paisano Drive, El Paso, TX 79922 PROJECT NO.: 06835001.2014 TASK NO.: 47CQ1

DESCRIPTION: Cell 3 CQA YEAR: 2014

PRIMARY:  SECONDARY:  OTHER: \_\_\_\_\_

NDT SPECIFICATIONS: AIR TEST: 30 psi ± 3 psi for 5 minutes VACUUM TEST: 5 psi for minimum 10 seconds

PRODUCTION SEAM				LOCATION				NONDESTRUCTIVE TEST							
DATE (mo/day/yr)	TIME	MACHINE NO.	OPER. ID	SEAM NO.	ACTUAL SEAM LENGTH (ft)	QA ID	COMMENTS	TIME		PRESSURE (psi)		OPER. ID	PASS FAIL	ACTION	QA ID
								START	FINISH	START	FINISH				
4/9/2014	16:29	3440	WB	27/33	22	RJ		10:00	10:05	30	29	RM	X	AT OK	RJ
4/9/2014	16:32	3440	WB	27/32	22	RJ		9:52	9:57	30	30	RM	X	AT OK	RJ
4/9/2014	16:35	3440	WB	27/31	22	RJ		9:46	9:51	30	30	RM	X	AT OK	RJ
4/9/2014	16:38	3440	WB	27/30	22	RJ		9:25	9:30	30	29	RM	X	AT OK	RJ
4/9/2014	17:10	3440	WB	27/44	11	RJ		8:31	8:36	30	30	RM	X	AT OK	RJ
4/9/2014	17:05	3440	WB	27/45	22	RJ		8:42	8:47	30	30	RM	X	AT OK	RJ
4/9/2014	17:20	3440	WB	44/45	21	RJ		8:41	8:46	30	29	RM	X	AT OK	RJ
4/9/2014	17:00	3440	WB	43/44	28	RJ		8:06	8:11	30	30	RM	X	AT OK	RJ
4/9/2014	16:50	3440	WB	42/43	27	RJ		7:55	8:00	30	29	RM	X	AT OK	RJ
4/9/2014	17:00	3351	WN	41/42	27	RJ		7:48	7:53	30	30	RM	X	AT OK	RJ
4/9/2014	16:45	3351	WN	19/41	24	RJ		7:39	7:44	30	30	RM	X	AT OK	RJ
4/9/2014	17:20	3351	WN	23/41	22	RJ		7:40	7:45	30	29	RM	X	AT OK	RJ
4/9/2014	17:22	3351	WN	23/42	5	RJ		---	---	---	---	RM	X	VT OK	RJ
4/9/2014	17:25	3351	WN	24/42	19	RJ		7:52	7:57	30	29	RM	X	AT OK	RJ
4/9/2014	17:27	3351	WN	24/43	10	RJ		7:58	8:03	30	29	RM	X	AT OK	RJ
4/9/2014	17:30	3351	WN	26/43	13	RJ		8:10	8:15	30	29	RM	X	AT OK	RJ

TOTALS: FUSION: 317 (ft) CUMULATED FUSION: 3,402 (ft)

EXTRUSION \_\_\_\_\_ (ft) CUMULATED EXTRUSION: \_\_\_\_\_ (ft)

COMMENTS: \_\_\_\_\_



**PRODUCTION SEAM SUMMARY LOG**

PROJECT: ASARCO El Paso Category I Landfill - Cell 3 CQA  
 LOCATION: 2301 West Paisano Drive, El Paso, TX 79922 PROJECT NO.: 06835001.2014 TASK NO.: 47CQ1  
 DESCRIPTION: Cell 3 CQA YEAR: 2014  
 PRIMARY:  SECONDARY:  OTHER: \_\_\_\_\_  
 NDT SPECIFICATIONS: AIR TEST: 30 psi ± 3 psi for 5 minutes VACUUM TEST: 5 psi for minimum 10 seconds

PRODUCTION SEAM				LOCATION				NONDESTRUCTIVE TEST								
DATE (mo/day/yr)	TIME	MACHINE NO.	OPER. ID	SEAM NO.	ACTUAL SEAM LENGTH (ft)	QA ID	COMMENTS	TIME		PRESSURE (psi)		OPER. ID	PASS	FAIL	ACTION	QA ID
								START	FINISH	START	FINISH					
4/9/2014	17:33	3351	WN	26/44	16	RJ		8:20	8:25	30	30	RM	X		AT OK	RJ
4/9/2014	11:16	3440	WB	25/26	91	RJ	44' N of S EOS to N EOS	8:10	8:15	30	30	RM	X		AT OK	RJ

TOTALS: FUSION: \_\_\_\_\_ 107 (ft) CUMULATED FUSION: \_\_\_\_\_ 3,509 (ft)  
 EXTRUSION \_\_\_\_\_ (ft) CUMULATED EXTRUSION: \_\_\_\_\_ (ft)  
 COMMENTS: \_\_\_\_\_



**REPAIR SUMMARY LOG**

PROJECT: <u>ASARCO El Paso Category I Landfill - Cell 3 CQA</u>	
LOCATION: <u>2301 West Paisano Drive, El Paso, TX 79922</u>	PROJECT NO.: <u>06835001.2014</u> TASK NO.: <u>47CQ1</u>
DESCRIPTION: <u>Cell 3 CQA</u>	YEAR: <u>2014</u>
INSTALLER: <u>American Environmental Group (AEG)</u>	<input checked="" type="checkbox"/> PRIMARY <input type="checkbox"/> SECONDARY <input type="checkbox"/> OTHER

REPAIR NO. <sup>1</sup>	REP. TYPE/ DS NO	DATE (da/mo/yr)	LOCATION <sup>2</sup>			SIZE <sup>2</sup>			WELDER ID		QA ID	NON-DESTRUCTIVE TESTING					
			SEAM	PANEL	LOCATION	LENGTH	WIDTH	DIA.	MACH. NO.	OP. ID		DATE (da/mo/yr)	OP. ID	PASS	FAIL	ACTION	QA ID
1	P	4/10/2014	8/17/18	---	---	1	1	---	RM	84	RJ	4/10/2014	RM	X		VT OK	RJ
2	P	4/10/2014	8/17/16	---	---	1	1	---	RM	84	RJ	4/10/2014	RM	X		VT OK	RJ
3	P	4/10/2014	8/10/16	---	---	1	1	---	RM	84	RJ	4/10/2014	RM	X		VT OK	RJ
4	P/DS-3	4/10/2014	10/16	---	---	2	5	---	RM	84	RJ	4/10/2014	RM	X		VT OK	RJ
5	P	4/10/2014	9/10/11	---	---	2	2	---	RM	84	RJ	4/10/2014	RM	X		VT OK	RJ
6	P	4/10/2014	8/9/10	---	---	2	2	---	RM	84	RJ	4/10/2014	RM	X		VT OK	RJ
7	P	4/10/2014	9/11/12	---	---	2	2	---	RM	84	RJ	4/10/2014	RM	X		VT OK	RJ
8	P	4/10/2014	9/12/13/14	---	---	3	2	---	RM	84	RJ	4/10/2014	RM	X		VT OK	RJ
9	P	4/10/2014	13/14/15	---	---	3	2	---	RM	84	RJ	4/10/2014	RM	X		VT OK	RJ
10	P	4/10/2014	9/14	---	1' N OF S EOS	2	2	---	RM	84	RJ	4/10/2014	RM	X		VT OK	RJ
11	P	4/10/2014	4/5/6	---	---	1	1	---	RM	84	RJ	4/10/2014	RM	X		VT OK	RJ
12	P/DS-2	4/10/2014	4/6	---	---	2	4	---	RM	84	RJ	4/10/2014	RM	X		VT OK	RJ
13	P	4/10/2014	3/4/5	---	---	1	1	---	RM	84	RJ	4/10/2014	RM	X		VT OK	RJ
14	P	4/10/2014	25/26	---	44' N OF S EOS	2	5	---	RM	84	RJ	4/10/2014	RM	X		VT OK	RJ
15	P	4/10/2014	27/28/30	---	---	2	2	---	RM	84	RJ	4/10/2014	RM	X		VT OK	RJ
16	P	4/10/2014	28/29/30	---	---	2	4	---	RM	84	RJ	4/10/2014	RM	X		VT OK	RJ
17	S	4/10/2014	28/29	---	2' N OF S EOS	2	2	---	RM	84	RJ	4/10/2014	RM	X		VT OK	RJ
18	P	4/10/2014	27/30/31	---	---			---	RM	84	RJ	4/10/2014	RM	X		VT OK	RJ
19	P	4/10/2014	27/31/32	---	---			---	RM	84	RJ	4/10/2014	RM	X		VT OK	RJ

NOTES: (1) REPAIR NUMBERS SHALL BE NUMBERED SEQUENTIALLY, REPAIR TYPES: P = PATCH C = CAP S = ANCHOR TRENCH EXTENSION (SKIRT)  
 DS = DESTRUCTIVE SAMPLE G = GRIND & WELD T = TOPPING ALONG FUSION SEAM R = RECONSTRUCTION B = BEAD (EXTRUSION)  
 (2) LOCATION & SIZE SHALL BE INDICATED IN FEET

20	P/DS-7	4/10/2014	31/32	---	---	2	5	---	RM	84	RJ	4/10/2014	RM	X		VT OK	RJ
----	--------	-----------	-------	-----	-----	---	---	-----	----	----	----	-----------	----	---	--	-------	----

REVIEWED BY: \_\_\_\_\_



**REPAIR SUMMARY LOG**

PROJECT: ASARCO El Paso Category I Landfill - Cell 3 CQA  
 LOCATION: 2301 West Paisano Drive, El Paso, TX 79922 PROJECT NO.: 06835001.2014 TASK NO.: 47CQ1  
 DESCRIPTION: Cell 3 CQA YEAR: 2014  
 INSTALLER: American Environmental Group (AEG)  PRIMARY  SECONDARY  OTHER

REPAIR NO. <sup>1</sup>	REP. TYPE/ DS NO	DATE (da/mo/yr)	LOCATION <sup>2</sup>			SIZE <sup>2</sup>			WELDER ID		QA ID	NON-DESTRUCTIVE TESTING					
			SEAM	PANEL	LOCATION	LENGTH	WIDTH	DIA.	MACH. NO.	OP. ID		DATE (da/mo/yr)	OP. ID	PASS	FAIL	ACTION	QA ID
21	P/DS-1	4/10/2014	1/2	---	---	2	4	---	RM	84	RJ	4/10/2014	RM	X		VT OK	RJ
22	P/DS-5	4/10/2014	25/26	---	---	2	6	---	RM	84	RJ	4/10/2014	RM	X		VT OK	RJ
23	P	4/10/2014	23/24/25	---	---	2	2	---	RM	84	RJ	4/10/2014	RM	X		VT OK	RJ
24	P	4/10/2014	23/24/26	---	---	2	2	---	RM	84	RJ	4/10/2014	RM	X		VT OK	RJ
25	P	4/10/2014	27/32/33	---	---	2	2	---	RM	84	RJ	4/10/2014	RM	X		VT OK	RJ
26	P	4/10/2014	27/33/34	---	---	2	2	---	RM	84	RJ	4/10/2014	RM	X		VT OK	RJ
27	P	4/10/2014	27/34/35	---	---	2	2	---	RM	84	RJ	4/10/2014	RM	X		VT OK	RJ
28	P/DS-6	4/10/2014	26/27	---	---	2	6	---	RM	84	RJ	4/10/2014	RM	X		VT OK	RJ
29	P	4/10/2014	27/35/36	---	---	2	2	---	RM	84	RJ	4/10/2014	RM	X		VT OK	RJ
30	P/DS-8	4/10/2014	35/36	---	---	2	5	---	JLO	1266	RJ	4/10/2014	RM	X		VT OK	RJ
31	P	4/10/2014	27/36/37	---	---	2	2	---	JLO	1266	RJ	4/10/2014	RM	X		VT OK	RJ
32	P	4/10/2014	36/37/38/39	---	---	2	2	---	JLO	1266	RJ	4/10/2014	RM	X		VT OK	RJ
33	P	4/10/2014	38/39/40	---	---	2	2	---	JLO	1266	RJ	4/10/2014	RM	X		VT OK	RJ
34	P	4/10/2014	27/44/45	---	---	2	2	---	JLO	1266	RJ	4/10/2014	RM	X		VT OK	RJ
35	P	4/10/2014	26/27/44	---	---	2	2	---	JLO	1266	RJ	4/10/2014	RM	X		VT OK	RJ
36	S	4/10/2014	26/43/44	---	---	2	2	---	JLO	1266	RJ	4/10/2014	RM	X		VT OK	RJ
37	P	4/10/2014	24/26/43	---	---	2	2	---	JLO	1266	RJ	4/10/2014	RM	X		VT OK	RJ
38	P	4/10/2014	24/42/43	---	---	2	2	---	JLO	1266	RJ	4/10/2014	RM	X		VT OK	RJ

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 DS = DESTRUCTIVE SAMPLE G = GRIND & WELD T = TOPPING ALONG FUSION SEAM R = RECONSTRUCTION B = BEAD (EXTRUSION)  
 (2) LOCATION & SIZE SHALL BE INDICATED IN FEET

39	P	4/10/2014	---	42	24'S OF 42/43 N EOS, 10' W	1	1	---	JLO	1266	RJ	4/10/2014	RM	X		VT OK	RJ
----	---	-----------	-----	----	-------------------------------	---	---	-----	-----	------	----	-----------	----	---	--	-------	----



**REPAIR SUMMARY LOG**

PROJECT: ASARCO El Paso Category I Landfill - Cell 3 CQA  
 LOCATION: 2301 West Paisano Drive, El Paso, TX 79922 PROJECT NO.: 06835001.2014 TASK NO.: 47CQ1  
 DESCRIPTION: Cell 3 CQA YEAR: 2014  
 INSTALLER: American Environmental Group (AEG)  PRIMARY  SECONDARY  OTHER

REPAIR NO. <sup>1</sup>	REP. TYPE/ DS NO	DATE (da/mo/yr)	LOCATION <sup>2</sup>			SIZE <sup>2</sup>			WELDER ID		QA ID	NON-DESTRUCTIVE TESTING					
			SEAM	PANEL	LOCATION	LENGTH	WIDTH	DIA.	MACH. NO.	OP. ID		DATE (da/mo/yr)	OP. ID	PASS	FAIL	ACTION	QA ID
40	P	4/10/2014	23/24/41/42	---	---	2	5	---	JLO	1266	RJ	4/10/2014	RM	X		VT OK	RJ
41	P	4/10/2014	1/19/23/41	---	---	2	3	---	JLO	1266	RJ	4/10/2014	RM	X		VT OK	RJ
42	P	4/10/2014	---	1	20' S OF 1/23 N EOS, 1' W	1	1	---	JLO	1266	RJ	4/10/2014	RM	X		VT OK	RJ
43	P	4/10/2014	1/19/20	---	---	1	1	---	JLO	1266	RJ	4/10/2014	RM	X		VT OK	RJ
44	P	4/10/2014	1/2/20	---	---	1	1	---	JLO	1266	RJ	4/10/2014	RM	X		VT OK	RJ
45	P	4/10/2014	2/20/21	---	---	1	1	---	JLO	1266	RJ	4/10/2014	RM	X		VT OK	RJ
46	P	4/10/2014	2/3/21	---	---	1	1	---	JLO	1266	RJ	4/10/2014	RM	X		VT OK	RJ
47	P	4/10/2014	3/21/22	---	---	1	1	---	JLO	1266	RJ	4/10/2014	RM	X		VT OK	RJ
48	P	4/10/2014	3/4/22	---	---	2	5	---	JLO	1266	RJ	4/10/2014	RM	X		VT OK	RJ
49	P/DS-4	4/10/2014	4/22	---	---	2	5	---	JLO	1266	RJ	4/10/2014	RM	X		VT OK	RJ

NOTES: (1) REPAIR NUMBERS SHALL BE NUMBERED SEQUENTIALLY, REPAIR TYPES: P = PATCH C = CAP S = ANCHOR TRENCH EXTENSION (SKIRT)  
 DS = DESTRUCTIVE SAMPLE G = GRIND & WELD T = TOPPING ALONG FUSION SEAM R = RECONSTRUCTION B = BEAD (EXTRUSION)  
 (2) LOCATION & SIZE SHALL BE INDICATED IN FEET



**DESTRUCTIVE TEST LOG**

PROJECT: <u>ASARCO El Paso Category I Landfill - Cell 3 CQA</u>			PROJECT NO.: <u>06835001.2014</u>			TASK NO.: <u>47CQ1</u>		
LOCATION: <u>2301 West Paisano Drive, El Paso, TX 79922</u>			YEAR: <u>2014</u>			YEAR: <u>2014</u>		
DESCRIPTION: <u>Cell 3 CQA</u>			TENSIO METER DESCRIPTION: <u>Pro-Tester T-0100</u>			SERIAL NO.: <u>667867</u>		
SPECIFICATIONS: FUSION WELD: PEEL: <u>50 ppi</u> SHEAR: <u>60 ppi</u>								

FIELD DATA										LABORATORY DATA												
DESTRUCT SAMPLE NO.	FIELD TEST DATE (mo/day/yr)	SEAM	LOCATION	OPER. ID	MACHINE NO.	PEEL VALUES (lbs/in)				SHEER (lbs/in)			PASS	FAIL	QA ID	RESULT DATE (mo/day/yr)	AVG. PEEL VALUE (lbs/in)		AVG. SHEER VALUE (lbs/in)	PASS	FAIL	QA ID
																		A				
1	4/10/2014	1/2	53' S of N EOS	WB	3440	105	90	97	107	112	115	120	X		RJ	4/11/2014	107	91	111	X		WL
						85	103	89	88													
2	4/10/2014	4/6	15' N of S EOS	WN	3351	82	110	100	85	101	101	102	X		RJ	4/11/2014	109	99	117	X		WL
						98	98	92	97													
3	4/10/2014	10/16	13' W of E EOS	WN	3351	80	80	97	114	109	109	114	X		RJ	4/11/2014	110	98	120	X		WL
						81	80	85	93													
4	4/10/2014	4/22	15' S of N EOS	WB	3440	89	95	91	85	90	96	100	X		RJ	4/11/2014	104	105	107	X		WL
						101	92	90	82													
5	4/10/2014	25/26	24' S of N EOS	WB	3440	98	90	89	88	106	103	100	X		RJ	4/11/2014	107	92	120	X		WL
						101	99	100	98													
6	4/10/2014	26/27	38' S of N EOS	WN	3351	91	99	91	94	106	108	105	X		RJ	4/11/2014	102	99	119	X		WL
						94	87	93	90													
7	4/10/2014	31/32	10' E of W EOS	WN	3351	92	90	93	97	115	112	111	X		RJ	4/11/2014	110	97	120	X		WL
						92	83	87	86													
8	4/10/2014	35/36	40' E of W EOS	WB	3440	95	106	87	96	109	109	104	X		RJ	4/11/2014	103	96	117	X		WL
						93	91	91	92													

NOTE:



Date: 2014-04-11

**Mail To:**

**Bill Sabatka**  
**Arcadis**  
**211 North Florence, Suite 202**  
**El Paso , TX , 79901**

**Bill To:**

**Arcadis**  
**Accounts Payable**  
**630 PLaza Drive, Suite 600**  
**Highlands Ranch , CO , 80129**  
**06835001.2014 Task 47CQ1**

e-mail:bill.sabatka@arcadis-us.com

Dear Mr. Sabatka,

Thank you for consulting with TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

**Project: Asarco Cell 3**

TRI Job Reference Number: **12997**

Material(s) Tested: (8) Heat Fusion Weld Seam(s)

Test(s) Requested: SAME DAY Peel and Shear  
(ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)

Codes:

AD	Adhesion Failure (100% Peel)
BRK	Break in sheeting away from Seam edge.
SE	Break in sheeting at edge of seam.
AD-BRK	Break in sheeting after some adhesion failure - partial peel.
SIP	Separation in the plane of the sheet (leaving the bond intact).
FTB	Film tearing bond (all non "AD" failures).
NON-FTB	100% peel.

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

Willow Lucas  
Project Manager  
Geosynthetic Services Division  
<http://www.geosyntheticstestinc.com>

The testing herein is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.



DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: Arcadis

Project: Asarco Cell 3

Material: 40 mil. LLDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)

TRI Log#: 12997

Table with columns: PARAMETER, TEST REPLICATE NUMBER (1-5), MEAN. Includes sections for Sample ID: DS-1 and DS-2, with sub-sections for Side: A, Side: B, and Shear. Values include Peel Strength (ppi), Peel Incursion (%), Peel Locus Of Failure Code, Peel NSF Failure Code, Shear Strength (ppi), and Shear Elongation @ Break (%).

The testing herein is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.





DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: Arcadis

Project: Asarco Cell 3

Material: 40 mil. LLDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)

TRI Log#: 12997

Table with columns: PARAMETER, TEST REPLICATE NUMBER (1-5), MEAN. Includes sections for Sample ID: DS-3 and DS-4, with sub-sections for Side: A, Side: B, and Shear. Values include Peel Strength (ppi), Peel Incursion (%), Peel Locus Of Failure Code, Peel NSF Failure Code, Shear Strength (ppi), and Shear Elongation @ Break (%).

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: Arcadis

Project: Asarco Cell 3

Material: 40 mil. LLDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)

TRI Log#: 12997

Table with columns: PARAMETER, TEST REPLICATE NUMBER (1-5), MEAN. Includes sections for Sample ID: DS-5 and DS-6, with sub-sections for Side: A, Side: B, and Shear. Values include Peel Strength (ppi), Peel Incursion (%), Peel Locus Of Failure Code, Peel NSF Failure Code, Shear Strength (ppi), and Shear Elongation @ Break (%).

The testing herein is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.



DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: Arcadis

Project: Asarco Cell 3

Material: 40 mil. LLDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)

TRI Log#: 12997

PARAMETER	TEST REPLICATE NUMBER					MEAN
	1	2	3	4	5	
<b>Sample ID: DS-7   Weld: Heat Fusion</b>						
<b>Side: A</b>						<b>Peel A</b>
Peel Strength (ppi)	111	111	114	109	106	<b>110</b>
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
<b>Side: B</b>						<b>Peel B</b>
Peel Strength (ppi)	98	100	95	99	92	<b>97</b>
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
<b>Shear</b>						<b>Shear</b>
Shear Strength (ppi)	120	119	122	120	120	<b>120</b>
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
<b>Sample ID: DS-8   Weld: Heat Fusion</b>						
<b>Side: A</b>						<b>Peel A</b>
Peel Strength (ppi)	113	88	106	111	95	<b>103</b>
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
<b>Side: B</b>						<b>Peel B</b>
Peel Strength (ppi)	97	100	93	98	94	<b>96</b>
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
<b>Shear</b>						<b>Shear</b>
Shear Strength (ppi)	117	119	117	117	117	<b>117</b>
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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