



APPENDIX K – THIRD PARTY 80MIL LLDPE GEOMEMBRANE CONFORMANCE TESTING RESULTS

December 26, 2019

Nikoliya Boyanich

NewFields

9400 Station Street, Suite 300

Lone Tree, CO, 80124

Re: FINAL LABORATORY TEST REPORT



Dear Ms. Boyanich:

Thank you for consulting TRI California for your material testing needs.

Enclosed is the **final** laboratory report for the Conformance testing of number of four (4) 80mil LLDPE Microspike geomembrane samples.**PROJECT NAME:** CC&V VLF2 Phase 2B**DATE REPORTED:** December 26, 2019**REFERENCE TRI JOB NO.:** G192048**DATE RECEIVED:** December 11, 2019**SAMPLED BY:** TRI-CA at AGRU, NV**SAMPLE IDENTIFICATIONS:****SAMPLE ID**

R# FNB0047810003 L#DKJ810770

R# FNB0047810018 L#DKJ810770

R# FNB0047810033 L#DKJ810770

R# FNB0047810048 L#DKJ810770

TRI CONTROL NUMBER

145806

145807

145808

145809

TESTS REQUIRED / PERFORMED:**TEST METHOD**

1. ASTM D5994

2. ASTM D6693

3. ASTM D792

4. ASTM D4218

DESCRIPTION

Thickness

Tensile Properties

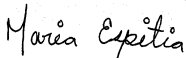
Specific Gravity

Carbon Content Muffle

TEST RESULTS: The test results are summarized in the attached Tables 1 to 4.

Note: The general conditioning and testing of the material samples identified in this report were performed within the range of the laboratory environmental conditions; i.e., 20-24°C and 45-65% RH. Otherwise, the actual environmental conditions are indicated in the respective test method reported.

Respectfully,
TRI Environmental, Inc. - California



Maria Espitia
Quality Assurance



Cora Queja
TRI-CA Director

Signatures are on file

It shall be noted that the samples tested are believed to be true representatives of the material produced under the designation herein stated. In addition, the attached laboratory tests results are considered indicative only of the quality of samples/specimens that were actually tested. The appropriate test methods hereby employed are based on the current and accepted industry practices. TRI neither accepts responsibility for nor makes claims to the intended final use and purpose of the material. The test data and all associated project information shall be held confidential and not to be reproduced and/or disclosed to other parties except in full and with prior written approval from pertinent entity duly authorized by the respective client or from the client itself. It is our policy to keep physical records of each job for two (2) years commencing from the date of receipt of the samples and keep its corresponding electronic file for seven (7) years. **Retained conformance samples are disposed of after one (1) month.** On the other hand, should you need us to keep them at a longer period, please advise us in writing.

5 Pages Total (including this sheet)



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TABLE 1.

MATERIAL PROPERTIES

CLIENT: Newfields
PROJECT: CC&V VLF2 Phase 2B

Date Received: 12/11/2019
Date Reported: 12/26/2019
Client Sample ID: R#FNB0047810003 L#DKJ810770
Material Description: 80mil LLDPE Microspike Geomembrane

QC'd By: *Maria Espitia*
TRI Job No.: G192048
TRI Control No.: 145806

SPECIMENS											Avg.	Std. Dev.	Min	Max	Proj. Specs.		
1	2	3	4	5	6	7	8	9	10								
METHOD	DESCRIPTION																
ASTM D5994	Thickness (mils) <i>Apparatus: Dead-weight dial micrometer with gauge points tapered at an angle of 60^o +/- 2^o to the horizontal with the tip rounded to a radius of 0.8+/-0.1 mm(0.031+/-0.004 in), with a specified force of 0.56+/-0.05 N (2+/-0.2 oz)</i> <i>Loading Time: 5 sec Specimen Size: 4" x 4"</i>														68 min. 76 MARV 80 nominal		
	80	80	81	82	84	82	81	80	80	81	81	1	80	84			
ASTM D792	Specific Gravity (23/ 23 ^o C)																
Method A	0.9365	0.9364										0.9365	0.0000	0.9364	0.9365	0.939 max.	
ASTM D6693	Tensile Properties:																
Type IV	<i>Test Specimens: Type IV, Width of narrow section:0.25in, Length of narrow section:1.3in, Width Overall:0.75in, Length Overall: 4.5in Conditioning: Conducted test in standard laboratory atmosphere of 23+/-2^o C (73.4+/-3.6^o F), and 50+/-5% relative humidity. Rate of Separation: 2"/min</i>																
	Tensile Strength at Break (lbs/ in.- width)																
MD	244	267	243	264	237							251	14	237	267	120 min.	
TD	268	290	263	274	289							277	13	263	290		
	Elongation at Break (percent, %)																
MD	482	495	493	521	475	Gauge Length = 2.0 in.										250 min.	
TD	574	613	566	596	617							493	18	475	521		
ASTM D4218	Carbon Content																
	<i>Apparatus: Muffle Furnace</i>																
	2.46	2.39										2.42	0.05	2.39	2.46	2 - 3	

(End of Table 1)

(Sheet 1 of 1)

By accepting the data and results presented on this report, the Client agrees to limit the liability of TRI Environmental, Inc. from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless TRI Environmental, Inc. from and against all liabilities in excess of the aforementioned limit.

LEGENDS:
MD - MACHINE DIRECTION
TD- TRANSVERSE DIRECTION

1160 North Gilbert Street, Anaheim, CA 92801, www.precisionlabs.net
Precision Geosynthetic Laboratories International dba TRI Environmental, Inc.



TABLE 2.
MATERIAL PROPERTIES
 CLIENT: Newfields
 PROJECT: CC&V VLF2 Phase 2B

Date Received: **12/11/2019**
 Date Reported: **12/26/2019**
 Client Sample ID: **R#FNB0047810018 L#DKJ810770**
 Material Description: **80mil LLDPE Microspike Geomembrane**

QC'd By: *Maria Espitia*
 TRI Job No.: **G192048**
 TRI Control No.: **145807**

SPECIMENS															Proj. Specs.	
1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max			
METHOD	DESCRIPTION															
ASTM D5994	Thickness (mils) <i>Apparatus: Dead-weight dial micrometer with gauge points tapered at an angle of 60^o +/- 2^o to the horizontal with the tip rounded to a radius of 0.8+/-0.1 mm(0.031+/-0.004 in), with a specified force of 0.56+/-0.05 N (2+/-0.2 oz)</i> <i>Loading Time: 5 sec Specimen Size: 4" x 4"</i>															
	82	82	84	82	83	80	82	80	81	81	82	1	80	84	68 min. 76 MARV 80 nominal	
ASTM D792	Specific Gravity (23/ 23°C)															
Method A	0.9351	0.9352									0.9352	0.0000	0.9351	0.9352	0.939 max.	
ASTM D6693	Tensile Properties:															
Type IV	<i>Test Specimens: Type IV, Width of narrow section:0.25in, Length of narrow section:1.3in, Width Overall:0.75in, Length Overall: 4.5in Conditioning: Conducted test in standard laboratory atmosphere of 23+/-2^o C (73.4+/-3.6^o F), and 50+/-5% relative humidity. Rate of Separation: 2"/min</i>															
	Tensile Strength at Break (lbs/ in.- width)															
MD	257	243	242	276	277						259	17	242	277	120 min.	
TD	276	293	263	285	277						279	11	263	293		
	Elongation at Break (percent, %) <i>Gauge Length = 2.0 in.</i>															
MD	498	501	466	531	530						505	27	466	531	250 min.	
TD	594	616	585	618	621						607	16	585	621		
ASTM D4218	Carbon Content															
	<i>Apparatus: Muffle Furnace</i>															
	2.48	2.53									2.50	0.04	2.48	2.53	2 - 3	

(End of Table 2)

(Sheet 1 of 1)

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TABLE 3.

MATERIAL PROPERTIES

CLIENT: Newfields

PROJECT: CC&V VLF2 Phase 2B

Date Received: 12/11/2019

Date Reported: 12/26/2019

Client Sample ID: R#FNB0047810033 L#DKJ810770

Material Description: 80mil LLDPE Microspike Geomembrane

QC'd By: *Maria Espitia*

TRI Job No.: G192048

TRI Control No.: 145808

SPECIMENS															Proj. Specs.			
	1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max				
METHOD	DESCRIPTION																	
ASTM D5994	Thickness (mils) <i>Apparatus: Dead-weight dial micrometer with gauge points tapered at an angle of 60 ° +/- 2 ° to the horizontal with the tip rounded to a radius of 0.8+/-0.1 mm(0.031+/-0.004 in), with a specified force of 0.56+/-0.05 N (2+/-0.2 oz)</i> <i>Loading Time: 5 sec Specimen Size: 4" x 4"</i>																	
	83	82	82	81	81	82	81	80	83	82	82	1	80	83	68 min. 76 MARV 80 nominal			
ASTM D792	Specific Gravity (23/ 23°C)																	
Method A	0.9352	0.9349									0.9350	0.0002	0.9349	0.9352	0.939 max.			
ASTM D6693	Tensile Properties:																	
Type IV	<i>Test Specimens: Type IV, Width of narrow section:0.25in, Length of narrow section:1.3in, Width Overall:0.75in, Length Overall: 4.5in Conditioning: Conducted test in standard laboratory atmosphere of 23+/-2 ° C (73.4+/-3.6 ° F), and 50+/-5% relative humidity. Rate of Separation: 2"/min</i>																	
	Tensile Strength at Break (lbs/ in.- width)																	
MD	262	253	281	263	238						260	15	238	281	120 min.			
TD	280	285	287	266	296						283	11	266	296				
	Elongation at Break (percent, %)										<i>Gauge Length = 2.0 in.</i>							
MD	501	530	552	510	492						517	24	492	552	250 min.			
TD	599	608	627	606	654						619	22	599	654				
ASTM D4218	Carbon Content																	
	<i>Apparatus: Muffle Furnace</i>																	
	2.47	2.39									2.43	0.05	2.39	2.47	2 - 3			

(End of Table 3)

(Sheet 1 of 1)

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TABLE 4.
MATERIAL PROPERTIES
CLIENT: Newfields
PROJECT: CC&V VLF2 Phase 2B

Date Received: **12/11/2019**
 Date Reported: **12/26/2019**
 Client Sample ID: **R#FNB0047810048 L#DKJ810770**
 Material Description: **80mil LLDPE Microspike Geomembrane**

QC'd By: *Maria Espitia*
 TRI Job No.: **G192048**
 TRI Control No.: **145809**

SPECIMENS															Proj. Specs.			
		1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max			
METHOD	DESCRIPTION																	
ASTM D5994	Thickness (mils) <i>Apparatus: Dead-weight dial micrometer with gauge points tapered at an angle of 60° +/- 2° to the horizontal with the tip rounded to a radius of 0.8+/-0.1 mm(0.031+/-0.004 in), with a specified force of 0.56+/-0.05 N (2+/-0.2 oz)</i> <i>Loading Time: 5 sec Specimen Size: 4" x 4"</i>																68 min. 76 MARV 80 nominal	
		82	82	83	82	83	80	82	80	81	81	81	1	80	83			
ASTM D792	Specific Gravity (23/ 23°C)																	
Method A	0.9374 0.9374											0.9374	0.0000	0.9374	0.9374	0.939 max.		
ASTM D6693	Tensile Properties:																	
Type IV	<i>Test Specimens: Type IV, Width of narrow section:0.25in, Length of narrow section:1.3in, Width Overall:0.75in, Length Overall: 4.5in Conditioning: Conducted test in standard laboratory atmosphere of 23+/-2° C (73.4+/-3.6° F), and 50+/-5% relative humidity. Rate of Separation: 2"/min</i>																	
	Tensile Strength at Break (lbs/ in.- width)																	
MD	237 237 266 291 243											255	23	237	291	120 min.		
TD	280 271 286 285 276											280	6	271	286			
	Elongation at Break (percent, %)	Gauge Length = 2.0 in.																
MD	453 454 517 540 482											489	38	453	540	250 min.		
TD	617 580 616 600 603											603	15	580	617			
ASTM D4218	Carbon Content																	
	<i>Apparatus: Muffle Furnace</i>																	
	2.43 2.41											2.42	0.01	2.41	2.43	2 - 3		

(End of Table 4)

(Sheet 1 of 1)

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December 26, 2019

Nikoliya Boyanich

NewFields

9400 Station Street, Suite 300

Lone Tree, CO, 80124

Re: FINAL LABORATORY TEST REPORT



Dear Ms. Boyanich:

Thank you for consulting TRI California for your material testing needs.

Enclosed is the **final** laboratory report for the Conformance testing of number of two (2) 80 mil LLDPE Microspike Geomembrane samples.

PROJECT NAME: CC&V VLF2 Phase 2B

DATE REPORTED: December 26, 2019

REFERENCE TRI JOB NO.: G192062

DATE RECEIVED: December 12, 2019

SAMPLED BY: TRI-CA at AGRU, NV

SAMPLE IDENTIFICATIONS:

SAMPLE ID

R# FNB0047810063 L#DKJ810770

R# FNB0047810078 L#DKJ810770

TRI CONTROL NUMBER

145869

145870

TESTS REQUIRED / PERFORMED:

TEST METHOD

1. ASTM D5994
2. ASTM D6693
3. ASTM D792
4. ASTM D4218

DESCRIPTION

Thickness
Tensile Properties
Specific Gravity
Carbon Content Muffle

TEST RESULTS: The test results are summarized in the attached Tables 1 to 2.

Note: The general conditioning and testing of the material samples identified in this report were performed within the range of the laboratory environmental conditions; i.e., 20-24°C and 45-65% RH. Otherwise, the actual environmental conditions are indicated in the respective test method reported.

Respectfully,

TRI Environmental, Inc. - California

Maria Espitia
Quality Assurance

Cora Queja
TRI-CA Director

Signatures are on file

It shall be noted that the samples tested are believed to be true representatives of the material produced under the designation herein stated. In addition, the attached laboratory tests results are considered indicative only of the quality of samples/specimens that were actually tested. The appropriate test methods hereby employed are based on the current and accepted industry practices. TRI neither accepts responsibility for nor makes claims to the intended final use and purpose of the material. The test data and all associated project information shall be held confidential and not to be reproduced and/or disclosed to other parties except in full and with prior written approval from pertinent entity duly authorized by the respective client or from the client itself. It is our policy to keep physical records of each job for two (2) years commencing from the date of receipt of the samples and keep its corresponding electronic file for seven (7) years. **Retained conformance samples are disposed of after one (1) month.** On the other hand, should you need us to keep them at a longer period, please advise us in writing.

3 Pages Total (including this sheet)



TABLE 1.
MATERIAL PROPERTIES
 CLIENT: Newfields
 PROJECT: CC&V VLF2 Phase 2B

Date Received: **12/11/2019**
 Date Reported: **12/26/2019**
 Client Sample ID: **R#FNB0047810063 L#DKJ810770**
 Material Description: **80mil LLDPE Microspike Geomembrane**

QC'd By: *Maria Espitia*
 TRI Job No.: **G192062**
 TRI Control No.: **145869**

SPECIMENS											Avg.	Std. Dev.	Min	Max	Proj. Specs.
1	2	3	4	5	6	7	8	9	10						
METHOD	DESCRIPTION														
ASTM D5994	Thickness (mils)														
	Apparatus: Dead-weight dial micrometer with gauge points tapered at an angle of 60° +/- 2° to the horizontal with the tip rounded to a radius of 0.8+/-0.1 mm(0.031+/-0.004 in), with a specified force of 0.56+/-0.05 N (2+/-0.2 oz)														
	Loading Time: 5 sec Specimen Size: 4" x 4"														
	80	81	81	81	83	80	82	81	81	81	81	1	80	83	68 min. 76 MARV 80 nominal
ASTM D792	Specific Gravity (23/ 23°C)														
Method A	0.9350	0.9344									0.9347	0.0004	0.9344	0.9350	0.939 max.
ASTM D6693	<u>Tensile Properties:</u>														
Type IV	Test Specimens: Type IV, Width of narrow section:0.25in, Length of narrow section:1.3in, Width Overall:0.75in, Length Overall: 4.5in Conditioning: Conducted test in standard laboratory atmosphere of 23+/-2 °C (73.4+/-3.6° F), and 50+/-5% relative humidity. Rate of Separation: 2"/min														
	Tensile Strength at Break (lbs/ in.- width)														
	MD	272	264	254	234	250					255	14	234	272	120 min.
	TD	315	307	301	276	318					303	17	276	318	
	Elongation at Break (percent, %) Gauge Length = 2.0 in.														
	MD	539	506	502	482	511					508	20	482	539	250 min.
	TD	670	647	649	595	674					647	32	595	674	
ASTM D4218	Carbon Content														
	Apparatus: Muffle Furnace														
	2.41	2.44									2.43	0.02	2.41	2.44	2 - 3

(End of Table 1)

(Sheet 1 of 1)

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LEGENDS:

MD - MACHINE DIRECTION

TD- TRANSVERSE DIRECTION



TABLE 2.
MATERIAL PROPERTIES
 CLIENT: Newfields
 PROJECT: CC&V VLF2 Phase 2B

Date Received: **12/11/2019**
 Date Reported: **12/26/2019**
 Client Sample ID: **R#FNB0047810078 L#DKJ810770**
 Material Description: **80mil LLDPE Microspike Geomembrane**

QC'd By: *Maria Espitia*
 TRI Job No.: **G192062**
 TRI Control No.: **145870**

SPECIMENS										Avg.	Std. Dev.	Min	Max	Proj. Specs.
1	2	3	4	5	6	7	8	9	10					
METHOD	DESCRIPTION													
ASTM D5994	Thickness (mils)													
	Apparatus: Dead-weight dial micrometer with gauge points tapered at an angle of 60° +/- 2° to the horizontal with the tip rounded to a radius of 0.8+/-0.1 mm(0.031+/-0.004 in), with a specified force of 0.56+/-0.05 N (2+/-0.2 oz)													
	Loading Time: 5 sec Specimen Size: 4" x 4"													
	82	81	80	80	83	82	80	81	81	81	81	80	83	68 min. 76 MARV 80 nominal
ASTM D792	Specific Gravity (23/ 23°C)													
Method A	0.9375	0.9376								0.9376	0.0000	0.9375	0.9376	0.939 max.
ASTM D6693	<u>Tensile Properties:</u>													
Type IV	Test Specimens: Type IV, Width of narrow section:0.25in, Length of narrow section:1.3in, Width Overall:0.75in, Length Overall: 4.5in Conditioning: Conducted test in standard laboratory atmosphere of 23+/-2 °C (73.4+/-3.6 °F), and 50+/-5% relative humidity. Rate of Separation: 2"/min													
	Tensile Strength at Break (lbs/ in.- width)													
	MD	252	258	255	257	264				257	5	252	264	120 min.
	TD	273	288	283	289	291				285	7	273	291	
	Elongation at Break (percent, %) Gauge Length = 2.0 in.													
	MD	496	510	519	521	543				518	17	496	543	250 min.
	TD	589	620	621	636	629				619	18	589	636	
ASTM D4218	Carbon Content													
	Apparatus: Muffle Furnace													
	2.41	2.45								2.43	0.03	2.41	2.45	2 - 3

(End of Table 2)

(Sheet 1 of 1)

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December 26, 2019

Nikoliya Boyanich

NewFields

9400 Station Street, Suite 300

Lone Tree, CO, 80124

Re: FINAL LABORATORY TEST REPORT



Dear Ms. Boyanich:

Thank you for consulting TRI California for your material testing needs.

Enclosed is the **final** laboratory report for the Conformance testing of number of two (2) 80mil LLDPE Microspike Geomembrane samples.

PROJECT NAME: CC&V VLF2 Phase 2B

DATE REPORTED: December 26, 2019

REFERENCE TRI JOB NO.: G192072

DATE RECEIVED: December 16, 2019

SAMPLED BY: TRI-CA at AGRU, NV

SAMPLE IDENTIFICATIONS:

SAMPLE ID

R# FNB0047810085 L#DKJ810770

R# FNB0047810100 L#DKK810700

TRI CONTROL NUMBER

145955

145956

TESTS REQUIRED / PERFORMED:

TEST METHOD

1. ASTM D5994
2. ASTM D6693
3. ASTM D792
4. ASTM D4218

DESCRIPTION

Thickness
Tensile Properties
Specific Gravity
Carbon Content Muffle

TEST RESULTS: The test results are summarized in the attached Tables 1 to 2.

Note: The general conditioning and testing of the material samples identified in this report were performed within the range of the laboratory environmental conditions; i.e., 20-24°C and 45-65% RH. Otherwise, the actual environmental conditions are indicated in the respective test method reported.

Respectfully,

TRI Environmental, Inc. - California

Maria Espitia
Quality Assurance

Cora Queja
TRI-CA Director

Signatures are on file

It shall be noted that the samples tested are believed to be true representatives of the material produced under the designation herein stated. In addition, the attached laboratory tests results are considered indicative only of the quality of samples/specimens that were actually tested. The appropriate test methods hereby employed are based on the current and accepted industry practices. TRI neither accepts responsibility for nor makes claims to the intended final use and purpose of the material. The test data and all associated project information shall be held confidential and not to be reproduced and/or disclosed to other parties except in full and with prior written approval from pertinent entity duly authorized by the respective client or from the client itself. It is our policy to keep physical records of each job for two (2) years commencing from the date of receipt of the samples and keep its corresponding electronic file for seven (7) years. **Retained conformance samples are disposed of after one (1) month.** On the other hand, should you need us to keep them at a longer period, please advise us in writing.

3 Pages Total (including this sheet)



TABLE 1.
MATERIAL PROPERTIES
 CLIENT: Newfields
 PROJECT: CC&V VLF2 Phase 2B

Date Received: **12/16/2019**
 Date Reported: **12/26/2019**
 Client Sample ID: **R#FNB0047810085 L#DKJ810770**
 Material Description: **80mil LLDPE Microspike Geomembrane**

QC'd By: *Maria Espitia*
 TRI Job No.: **G192072**
 TRI Control No.: **145955**

SPECIMENS											Avg.	Std. Dev.	Min	Max	Proj. Specs.
1	2	3	4	5	6	7	8	9	10						
METHOD	DESCRIPTION														
ASTM D5994	Thickness (mils)														
	<i>Apparatus: Dead-weight dial micrometer with gauge points tapered at an angle of 60° +/- 2° to the horizontal with the tip rounded to a radius of 0.8+/-0.1 mm(0.031+/-0.004 in), with a specified force of 0.56+/-0.05 N (2+/-0.2 oz)</i>														
	<i>Loading Time: 5 sec Specimen Size: 4" x 4"</i>														
	84	82	82	84	84	81	82	82	80	83	82	1	80	84	68 min. 76 MARV 80 nominal
ASTM D792	Specific Gravity (23/ 23°C)														
Method A	0.9345	0.9344									0.9344	0.0001	0.9344	0.9345	0.939 max.
ASTM D6693	<u>Tensile Properties:</u>														
Type IV	<i>Test Specimens: Type IV, Width of narrow section:0.25in, Length of narrow section:1.3in, Width Overall:0.75in, Length Overall: 4.5in Conditioning: Conducted test in standard laboratory atmosphere of 23+/-2 °C (73.4+/-3.6 °F), and 50+/-5% relative humidity. Rate of Separation: 2"/min</i>														
	Tensile Strength at Break (lbs/ in.- width)														
	MD	251	260	244	250	234					248	10	234	260	120 min.
	TD	254	253	254	264	254					256	5	253	264	
	Elongation at Break (percent, %) <i>Gauge Length = 2.0 in.</i>														
	MD	488	535	492	533	491					508	24	488	535	250 min.
	TD	593	576	595	624	631					604	23	576	631	
ASTM D4218	Carbon Content														
	<i>Apparatus: Muffle Furnace</i>														
	2.36	2.44									2.40	0.06	2.36	2.44	2 - 3

(End of Table 1)

(Sheet 1 of 1)

By accepting the data and results presented on this report, the Client agrees to limit the liability of TRI Environmental, Inc. from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless TRI Environmental, Inc. from and against all liabilities in excess of the aforementioned limit.

LEGENDS:

MD - MACHINE DIRECTION

TD- TRANSVERSE DIRECTION



TABLE 2.
MATERIAL PROPERTIES
 CLIENT: Newfields
 PROJECT: CC&V VLF2 Phase 2B

Date Received: **12/16/2019**
 Date Reported: **12/26/2019**
 Client Sample ID: **R#FNB0047810100 L#DKK810700**
 Material Description: **80mil LLDPE Microspike Geomembrane**

QC'd By: *Maria Espitia*
 TRI Job No.: **G192072**
 TRI Control No.: **145956**

SPECIMENS											Avg.	Std. Dev.	Min	Max	Proj. Specs.
1	2	3	4	5	6	7	8	9	10						
METHOD	DESCRIPTION														
ASTM D5994	Thickness (mils) <i>Apparatus: Dead-weight dial micrometer with gauge points tapered at an angle of 60 ° +/- 2° to the horizontal with the tip rounded to a radius of 0.8+/-0.1 mm(0.031+/-0.004 in), with a specified force of 0.56+/-0.05 N (2+/-0.2 oz)</i> <i>Loading Time: 5 sec Specimen Size: 4" x 4"</i>														
	81	80	81	82	82	81	84	82	80	82	81	1	80	84	68 min. 76 MARV 80 nominal
ASTM D792 Method A	Specific Gravity (23/ 23°C) 0.9378 0.9378										0.9378	0.0000	0.9378	0.9378	0.939 max.
ASTM D6693 Type IV	<u>Tensile Properties:</u> <i>Test Specimens: Type IV, Width of narrow section:0.25in, Length of narrow section:1.3in, Width Overall:0.75in, Length Overall: 4.5in Conditioning: Conducted test in standard laboratory atmosphere of 23+/-2 °C (73.4+/-3.6 °F), and 50+/-5% relative humidity. Rate of Separation: 2"/min</i> Tensile Strength at Break (lbs/ in.- width) <i>MD 273 264 231 244 232</i> <i>TD 269 272 251 250 253</i>														
	Elongation at Break (percent, %) <i>Gauge Length = 2.0 in.</i> <i>MD 519 524 494 502 498</i> <i>TD 628 615 586 592 615</i>										249 259	19 11	231 250	273 272	120 min.
ASTM D4218	Carbon Content <i>Apparatus: Muffle Furnace</i> 2.43 2.46										507 607	13 18	494 586	524 628	250 min.
											2.44	0.02	2.43	2.46	2 - 3

(End of Table 2)

(Sheet 1 of 1)

By accepting the data and results presented on this report, the Client agrees to limit the liability of TRI Environmental, Inc. from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless TRI Environmental, Inc. from and against all liabilities in excess of the aforementioned limit.

LEGENDS:

MD - MACHINE DIRECTION

TD- TRANSVERSE DIRECTION



TESTING, RESEARCH, CONSULTING AND FIELD SERVICES

Austin, TX - USA | Anaheim, CA - USA | Anderson, SC - USA | Gold Coast - Australia | Suzhou - China

December 26, 2019

Nikoliya Boyanich

NewFields

9400 Station Street, Suite 300

Lone Tree, CO, 80124

Re: FINAL LABORATORY TEST REPORT



Dear Ms. Boyanich:

Thank you for consulting TRI California for your material testing needs.

Enclosed is the **final** laboratory report for the Conformance testing of number of three (3) 80mil LLDPE Microspike Geomembrane samples.

PROJECT NAME: CC&V VLF2 Phase 2B

DATE REPORTED: December 26, 2019

REFERENCE TRI JOB NO.: G192083

DATE RECEIVED: December 17, 2019

SAMPLED BY: TRI-CA at AGRU

SAMPLE IDENTIFICATIONS:

SAMPLE ID

R# FNB0047810115 L#DKK810700

R# FNB0047810130 L#DKK810700

R# FND0047820005 L#DKK810710

TRI CONTROL NUMBER

146015

146016

146017

TESTS REQUIRED / PERFORMED:

TEST METHOD

1. ASTM D5994

2. ASTM D6693

3. ASTM D792

4. ASTM D4218

DESCRIPTION

Thickness

Tensile Properties

Specific Gravity

Carbon Content Muffle

TEST RESULTS: The test results are summarized in the attached Tables 1 to 3.

Note: The general conditioning and testing of the material samples identified in this report were performed within the range of the laboratory environmental conditions; i.e., 20-24°C and 45-65% RH. Otherwise, the actual environmental conditions are indicated in the respective test method reported.

Respectfully,

TRI Environmental, Inc. - California

Maria Espitia
Quality Assurance

Cora Queja
TRI-CA Director

Signatures are on file

It shall be noted that the samples tested are believed to be true representatives of the material produced under the designation herein stated. In addition, the attached laboratory tests results are considered indicative only of the quality of samples/specimens that were actually tested. The appropriate test methods hereby employed are based on the current and accepted industry practices. TRI neither accepts responsibility for nor makes claims to the intended final use and purpose of the material. The test data and all associated project information shall be held confidential and not to be reproduced and/or disclosed to other parties except in full and with prior written approval from pertinent entity duly authorized by the respective client or from the client itself. It is our policy to keep physical records of each job for two (2) years commencing from the date of receipt of the samples and keep its corresponding electronic file for seven (7) years. **Retained conformance samples are disposed of after one (1) month.** On the other hand, should you need us to keep them at a longer period, please advise us in writing.

4 Pages Total (including this sheet)



TABLE 1.
MATERIAL PROPERTIES
 CLIENT: Newfields
 PROJECT: CC&V VLF2 Phase 2B

Date Received: **12/17/2019**
 Date Reported: **12/26/2019**
 Client Sample ID: **R#FNB0047810115 L#DKK810700**
 Material Description: **80mil LLDPE Microspike Geomembrane**

QC'd By: *Maria Espitia*
 TRI Job No.: **G192083**
 TRI Control No.: **146015**

SPECIMENS											Avg.	Std. Dev.	Min	Max	Proj. Specs.
1	2	3	4	5	6	7	8	9	10						
METHOD	DESCRIPTION														
ASTM D5994	Thickness (mils)														
	Apparatus: Dead-weight dial micrometer with gauge points tapered at an angle of 60° +/- 2° to the horizontal with the tip rounded to a radius of 0.8+/-0.1 mm(0.031+/-0.004 in), with a specified force of 0.56+/-0.05 N (2+/-0.2 oz)														
	Loading Time: 5 sec Specimen Size: 4" x 4"														
	83	80	81	80	82	81	82	80	82	80	81	1	80	83	68 min. 76 MARV 80 nominal
ASTM D792	Specific Gravity (23/ 23°C)														
Method A	0.9348	0.9348									0.9348	0.0000	0.9348	0.9348	0.939 max.
ASTM D6693	<u>Tensile Properties:</u>														
Type IV	Test Specimens: Type IV, Width of narrow section:0.25in, Length of narrow section:1.3in, Width Overall:0.75in, Length Overall: 4.5in Conditioning: Conducted test in standard laboratory atmosphere of 23+/-2 °C (73.4+/-3.6 °F), and 50+/-5% relative humidity. Rate of Separation: 2"/min														
	Tensile Strength at Break (lbs/ in.- width)														
	MD	263	263	250	242	242					252	11	242	263	120 min.
	TD	280	286	280	292	275					283	7	275	292	
	Elongation at Break (percent, %) Gauge Length = 2.0 in.														
	MD	494	539	501	552	486					514	29	486	552	250 min.
	TD	630	627	618	641	619					627	9	618	641	
ASTM D4218	Carbon Content														
	Apparatus: Muffle Furnace														
	2.45	2.41									2.43	0.03	2.41	2.45	2 - 3

(End of Table 1)

(Sheet 1 of 1)

By accepting the data and results presented on this report, the Client agrees to limit the liability of TRI Environmental, Inc. from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless TRI Environmental, Inc. from and against all liabilities in excess of the aforementioned limit.

LEGENDS:

MD - MACHINE DIRECTION

TD- TRANSVERSE DIRECTION



TABLE 2.
MATERIAL PROPERTIES
 CLIENT: Newfields
 PROJECT: CC&V VLF2 Phase 2B

Date Received: **12/17/2019**
 Date Reported: **12/26/2019**
 Client Sample ID: **R#FNB0047810130 L#DKK810700**
 Material Description: **80mil LLDPE Microspike Geomembrane**

QC'd By: *Maria Espitia*
 TRI Job No.: **G192083**
 TRI Control No.: **146016**

SPECIMENS											Avg.	Std. Dev.	Min	Max	Proj. Specs.
1	2	3	4	5	6	7	8	9	10						
METHOD	DESCRIPTION														
ASTM D5994	Thickness (mils)														
	Apparatus: Dead-weight dial micrometer with gauge points tapered at an angle of 60° +/- 2° to the horizontal with the tip rounded to a radius of 0.8+/-0.1 mm(0.031+/-0.004 in), with a specified force of 0.56+/-0.05 N (2+/-0.2 oz)														
	Loading Time: 5 sec Specimen Size: 4" x 4"														
	83	80	84	80	80	82	80	82	81	82	81	1	80	84	68 min. 76 MARV 80 nominal
ASTM D792 Method A	Specific Gravity (23/ 23°C)										0.9347	0.0002	0.9346	0.9348	0.939 max.
ASTM D6693 Type IV	Tensile Properties:														
	Test Specimens: Type IV, Width of narrow section:0.25in, Length of narrow section:1.3in, Width Overall:0.75in, Length Overall: 4.5in Conditioning: Conducted test in standard laboratory atmosphere of 23+/-2 °C (73.4+/-3.6 °F), and 50+/-5% relative humidity. Rate of Separation: 2"/min														
	Tensile Strength at Break (lbs/ in.- width)														
	MD	256	239	254	238	251					248	8	238	256	120 min.
	TD	285	288	280	281	284					284	3	280	288	
	Elongation at Break (percent, %) Gauge Length = 2.0 in.														
	MD	500	504	498	503	528					507	12	498	528	250 min.
	TD	603	605	610	605	605					606	3	603	610	
ASTM D4218	Carbon Content														
	Apparatus: Muffle Furnace														
		2.30	2.31								2.31	0.01	2.30	2.31	2 - 3

(End of Table 2)

(Sheet 1 of 1)

By accepting the data and results presented on this report, the Client agrees to limit the liability of TRI Environmental, Inc. from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless TRI Environmental, Inc. from and against all liabilities in excess of the aforementioned limit.

LEGENDS:

MD - MACHINE DIRECTION

TD- TRANSVERSE DIRECTION



TABLE 3.
MATERIAL PROPERTIES
 CLIENT: Newfields
 PROJECT: CC&V VLF2 Phase 2B

Date Received: **12/17/2019**
 Date Reported: **12/26/2019**
 Client Sample ID: **R#FND0047820005 L#DKK810710**
 Material Description: **80mil LLDPE Microspike Geomembrane**

QC'd By: *Maria Espitia*
 TRI Job No.: **G192083**
 TRI Control No.: **146017**

SPECIMENS											Avg.	Std. Dev.	Min	Max	Proj. Specs.
1	2	3	4	5	6	7	8	9	10						
METHOD	DESCRIPTION														
ASTM D5994	Thickness (mils)														
	Apparatus: Dead-weight dial micrometer with gauge points tapered at an angle of 60° +/- 2° to the horizontal with the tip rounded to a radius of 0.8+/-0.1 mm(0.031+/-0.004 in), with a specified force of 0.56+/-0.05 N (2+/-0.2 oz)														
	Loading Time: 5 sec Specimen Size: 4" x 4"														
	82	81	81	81	82	81	80	84	81	80	81	1	80	84	68 min. 76 MARV 80 nominal
ASTM D792	Specific Gravity (23/ 23°C)														
Method A	0.9356	0.9355									0.9355	0.0001	0.9355	0.9356	0.939 max.
ASTM D6693	<u>Tensile Properties:</u>														
Type IV	Test Specimens: Type IV, Width of narrow section:0.25in, Length of narrow section:1.3in, Width Overall:0.75in, Length Overall: 4.5in Conditioning: Conducted test in standard laboratory atmosphere of 23+/-2 °C (73.4+/-3.6 °F), and 50+/-5% relative humidity. Rate of Separation: 2"/min														
	Tensile Strength at Break (lbs/ in.- width)														
	MD	261	257	268	258	243					258	9	243	268	120 min.
	TD	250	291	270	275	283					274	15	250	291	
	Elongation at Break (percent, %) Gauge Length = 2.0 in.														
	MD	496	484	522	472	517					498	21	472	522	250 min.
	TD	566	620	619	602	597					601	22	566	620	
ASTM D4218	Carbon Content														
	Apparatus: Muffle Furnace														
	2.42	2.38									2.40	0.03	2.38	2.42	2 - 3

(End of Table 3)

(Sheet 1 of 1)

By accepting the data and results presented on this report, the Client agrees to limit the liability of TRI Environmental, Inc. from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless TRI Environmental, Inc. from and against all liabilities in excess of the aforementioned limit.

LEGENDS:

MD - MACHINE DIRECTION

TD- TRANSVERSE DIRECTION



December 26, 2019

Nikoliya Boyanich
NewFields
9400 Station Street, Suite 300
Lone Tree, CO 80124

Re: FINAL LABORATORY TEST REPORT



Dear Ms. Boyanich:

Thank you for consulting TRI California for your material testing needs.

Enclosed is the **final** laboratory report for the Conformance testing of six (6) 80 mil LLDPE Microspike Geomembrane samples.

PROJECT NAME: CC&V VLF2 Phase 2B

DATE REPORTED: December 26, 2019

REFERENCE TRI JOB NO.: G192088

DATE RECEIVED: December 18, 2019

SAMPLED BY: TRI-CA at AGRU,NV

SAMPLE IDENTIFICATIONS:

SAMPLE ID	TRI CONTROL NUMBER
R# FNB0047810145 L#DKK810700	146047
R# FNB0047810160 L#DKK810700	146048
R# FNB0047810175 L#DKK810700	146049
R# FND0047820022 L#DKK810710	146050
R# FND0047820037 L#DKK810710	146051
R# FND0047820052 L#DKK810710	146052

TESTS REQUIRED / PERFORMED:

TEST METHOD	DESCRIPTION
1. ASTM D5994	Thickness
2. ASTM D6693	Tensile Properties
3. ASTM D792	Specific Gravity
4. ASTM D4218	Carbon Content Muffle

TEST RESULTS: The test results are summarized in the attached Tables 1 to 6.

Note: The general conditioning and testing of the material samples identified in this report were performed within the range of the laboratory environmental conditions; i.e., 20-24°C and 45-65% RH. Otherwise, the actual environmental conditions are indicated in the respective test method reported.

Respectfully,

TRI Environmental, Inc. - California

Maria Espitia
Quality Assurance

Cora Queja
TRI-CA Director

Signatures are on file

It shall be noted that the samples tested are believed to be true representatives of the material produced under the designation herein stated. In addition, the attached laboratory tests results are considered indicative only of the quality of samples/specimens that were actually tested. The appropriate test methods hereby employed are based on the current and accepted industry practices. TRI neither accepts responsibility for nor makes claims to the intended final use and purpose of the material. The test data and all associated project information shall be held confidential and not to be reproduced and/or disclosed to other parties except in full and with prior written approval from pertinent entity duly authorized by the respective client or from the client itself. It is our policy to keep physical records of each job for two (2) years commencing from the date of receipt of the samples and keep its corresponding electronic file for seven (7) years. **Retained conformance samples are disposed of after one (1) month.** On the other hand, should you need us to keep them at a longer period, please advise us in writing.

7 Pages Total (including this sheet)



TABLE 1.
MATERIAL PROPERTIES
 CLIENT: Newfields
 PROJECT: CC&V VLF2 Phase 2B

Date Received: **12/18/2019**
 Date Reported: **12/26/2019**
 Client Sample ID: **R#FNB0047810145 L#DKK810700**
 Material Description: **80mil LLDPE Microspike Geomembrane**

QC'd By: *Maria Espitia*
 TRI Job No.: **G192088**
 TRI Control No.: **146047**

SPECIMENS											Avg.	Std. Dev.	Min	Max	Proj. Specs.
1	2	3	4	5	6	7	8	9	10						
METHOD	DESCRIPTION														
ASTM D5994	Thickness (mils)														
	Apparatus: Dead-weight dial micrometer with gauge points tapered at an angle of 60° +/- 2° to the horizontal with the tip rounded to a radius of 0.8+/-0.1 mm(0.031+/-0.004 in), with a specified force of 0.56+/-0.05 N (2+/-0.2 oz)														
	Loading Time: 5 sec Specimen Size: 4" x 4"														
	82	83	84	82	80	81	80	82	80	81	82	1	80	84	68 min. 76 MARV 80 nominal
ASTM D792	Specific Gravity (23/ 23°C)														
Method A	0.9343	0.9342									0.9342	0.0000	0.9342	0.9343	0.939 max.
ASTM D6693	<u>Tensile Properties:</u>														
Type IV	Test Specimens: Type IV, Width of narrow section:0.25in, Length of narrow section:1.3in, Width Overall:0.75in, Length Overall: 4.5in Conditioning: Conducted test in standard laboratory atmosphere of 23+/-2 °C (73.4+/-3.6 °F), and 50+/-5% relative humidity. Rate of Separation: 2"/min														
	Tensile Strength at Break (lbs/ in.- width)														
	MD	262	276	217	255	234					249	23	217	276	120 min.
	TD	285	281	283	292	276					283	6	276	292	
	Elongation at Break (percent, %) Gauge Length = 2.0 in.														
	MD	511	528	442	489	518					498	34	442	528	250 min.
	TD	636	629	639	659	601					633	21	601	659	
ASTM D4218	Carbon Content														
	Apparatus: Muffle Furnace														
	2.33	2.37									2.35	0.03	2.33	2.37	2 - 3

(End of Table 1)

(Sheet 1 of 1)

By accepting the data and results presented on this report, the Client agrees to limit the liability of TRI Environmental, Inc. from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless TRI Environmental, Inc. from and against all liabilities in excess of the aforementioned limit.

LEGENDS:

MD - MACHINE DIRECTION

TD- TRANSVERSE DIRECTION



TABLE 2.
MATERIAL PROPERTIES
 CLIENT: Newfields
 PROJECT: CC&V VLF2 Phase 2B

Date Received: **12/18/2019**
 Date Reported: **12/26/2019**
 Client Sample ID: **R#FNB0047810160 L#DKK810700**
 Material Description: **80mil LLDPE Microspike Geomembrane**

QC'd By: *Maria Espitia*
 TRI Job No.: **G192088**
 TRI Control No.: **146048**

SPECIMENS											Avg.	Std. Dev.	Min	Max	Proj. Specs.
1	2	3	4	5	6	7	8	9	10						
METHOD	DESCRIPTION														
ASTM D5994	Thickness (mils)														
	Apparatus: Dead-weight dial micrometer with gauge points tapered at an angle of 60° +/- 2° to the horizontal with the tip rounded to a radius of 0.8+/-0.1 mm(0.031+/-0.004 in), with a specified force of 0.56+/-0.05 N (2+/-0.2 oz)														
	Loading Time: 5 sec Specimen Size: 4" x 4"														
	80	82	81	82	81	82	81	80	80	85	81	1	80	85	68 min. 76 MARV 80 nominal
ASTM D792	Specific Gravity (23/ 23°C)														
Method A	0.9383	0.9383									0.9383	0.0000	0.9383	0.9383	0.939 max.
ASTM D6693	<u>Tensile Properties:</u>														
Type IV	Test Specimens: Type IV, Width of narrow section:0.25in, Length of narrow section:1.3in, Width Overall:0.75in, Length Overall: 4.5in Conditioning: Conducted test in standard laboratory atmosphere of 23+/-2 °C (73.4+/-3.6 °F), and 50+/-5% relative humidity. Rate of Separation: 2"/min														
	Tensile Strength at Break (lbs/ in.- width)														
	MD	263	235	210	216	245					234	22	210	263	120 min.
	TD	282	304	276	127	290					256	73	127	304	
	Elongation at Break (percent, %) Gauge Length = 2.0 in.														
	MD	507	473	438	482	517					483	31	438	517	250 min.
	TD	672	647	616	595	644					635	30	595	672	
ASTM D4218	Carbon Content														
	Apparatus: Muffle Furnace														
	2.36	2.41									2.38	0.03	2.36	2.41	2 - 3

(End of Table 2)

(Sheet 1 of 1)

By accepting the data and results presented on this report, the Client agrees to limit the liability of TRI Environmental, Inc. from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless TRI Environmental, Inc. from and against all liabilities in excess of the aforementioned limit.

LEGENDS:

MD - MACHINE DIRECTION

TD- TRANSVERSE DIRECTION



TABLE 3.
MATERIAL PROPERTIES
 CLIENT: Newfields
 PROJECT: CC&V VLF2 Phase 2B

Date Received: **12/18/2019**
 Date Reported: **12/26/2019**
 Client Sample ID: **R#FNB0047810175 L#DKK810700**
 Material Description: **80mil LLDPE Microspike Geomembrane**

QC'd By: *Maria Espitia*
 TRI Job No.: **G192088**
 TRI Control No.: **146049**

SPECIMENS											Avg.	Std. Dev.	Min	Max	Proj. Specs.
1	2	3	4	5	6	7	8	9	10						
METHOD	DESCRIPTION														
ASTM D5994	Thickness (mils)														
	<i>Apparatus: Dead-weight dial micrometer with gauge points tapered at an angle of 60° +/- 2° to the horizontal with the tip rounded to a radius of 0.8+/-0.1 mm(0.031+/-0.004 in), with a specified force of 0.56+/-0.05 N (2+/-0.2 oz)</i>														
	<i>Loading Time: 5 sec Specimen Size: 4" x 4"</i>														
	81	80	80	82	83	81	80	81	82	81	81	1	80	83	68 min. 76 MARV 80 nominal
ASTM D792 Method A	Specific Gravity (23/ 23°C)										0.9371	0.0000	0.9371	0.9371	0.939 max.
ASTM D6693 Type IV	<u>Tensile Properties:</u>														
	<i>Test Specimens: Type IV, Width of narrow section:0.25in, Length of narrow section:1.3in, Width Overall:0.75in, Length Overall: 4.5in Conditioning: Conducted test in standard laboratory atmosphere of 23+/-2 °C (73.4+/-3.6 °F), and 50+/-5% relative humidity. Rate of Separation: 2"/min</i>														
	Tensile Strength at Break (lbs/ in.- width)														
	MD	241	300	262	278	242					264	25	241	300	120 min.
	TD	269	279	274	268	281					274	6	268	281	
	Elongation at Break (percent, %) <i>Gauge Length = 2.0 in.</i>														
	MD	492	551	513	510	503					514	22	492	551	250 min.
	TD	606	627	641	612	674					632	27	606	674	
ASTM D4218	Carbon Content														
	<i>Apparatus: Muffle Furnace</i>														
		2.36	2.32								2.34	0.03	2.32	2.36	2 - 3

(End of Table 3)

(Sheet 1 of 1)

By accepting the data and results presented on this report, the Client agrees to limit the liability of TRI Environmental, Inc. from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless TRI Environmental, Inc. from and against all liabilities in excess of the aforementioned limit.

LEGENDS:

MD - MACHINE DIRECTION

TD- TRANSVERSE DIRECTION



TABLE 4.
MATERIAL PROPERTIES
 CLIENT: Newfields
 PROJECT: CC&V VLF2 Phase 2B

Date Received: **12/18/2019**
 Date Reported: **12/26/2019**
 Client Sample ID: **R#FND0047820022 L#DKK810710**
 Material Description: **80mil LLDPE Microspike Geomembrane**

QC'd By: *Maria Espitia*
 TRI Job No.: **G192088**
 TRI Control No.: **146050**

SPECIMENS											Avg.	Std. Dev.	Min	Max	Proj. Specs.
1	2	3	4	5	6	7	8	9	10						
METHOD	DESCRIPTION														
ASTM D5994	Thickness (mils)														
	<i>Apparatus: Dead-weight dial micrometer with gauge points tapered at an angle of 60° +/- 2° to the horizontal with the tip rounded to a radius of 0.8+/-0.1 mm(0.031+/-0.004 in), with a specified force of 0.56+/-0.05 N (2+/-0.2 oz)</i>														
	<i>Loading Time: 5 sec Specimen Size: 4" x 4"</i>														
	81	80	83	81	84	81	80	83	81	83	82	1	80	84	68 min. 76 MARV 80 nominal
ASTM D792 Method A	Specific Gravity (23/ 23°C)										0.9371	0.0000	0.9371	0.9372	0.939 max.
ASTM D6693 Type IV	<u>Tensile Properties:</u>														
	<i>Test Specimens: Type IV, Width of narrow section:0.25in, Length of narrow section:1.3in, Width Overall:0.75in, Length Overall: 4.5in Conditioning: Conducted test in standard laboratory atmosphere of 23+/-2 °C (73.4+/-3.6 °F), and 50+/-5% relative humidity. Rate of Separation: 2"/min</i>														
	Tensile Strength at Break (lbs/ in.- width)														
	MD	256	208	240	222	232					232	18	208	256	120 min.
	TD	279	263	280	300	264					277	15	263	300	
	Elongation at Break (percent, %) <i>Gauge Length = 2.0 in.</i>														
	MD	537	473	512	485	483					498	26	473	537	250 min.
	TD	650	613	619	666	608					631	25	608	666	
ASTM D4218	Carbon Content														
	<i>Apparatus: Muffle Furnace</i>														
		2.48	2.49								2.48	0.01	2.48	2.49	2 - 3

(End of Table 4)

(Sheet 1 of 1)

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LEGENDS:

MD - MACHINE DIRECTION

TD- TRANSVERSE DIRECTION



TABLE 5.
MATERIAL PROPERTIES
CLIENT: Newfields
PROJECT: CC&V VLF2 Phase 2B

Date Received: **12/18/2019**
Date Reported: **12/26/2019**
Client Sample ID: **R#FND0047820037 L#DKK810710**
Material Description: **80mil LLDPE Microspike Geomembrane**

QC'd By: *Maria Espitia*
TRI Job No.: **G192088**
TRI Control No.: **146051**

SPECIMENS																Proj. Specs.
1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max			
METHOD	DESCRIPTION															
ASTM D5994	Thickness (mils) <i>Apparatus: Dead-weight dial micrometer with gauge points tapered at an angle of 60 ° +/- 2 ° to the horizontal with the tip rounded to a radius of 0.8+/-0.1 mm(0.031+/-0.004 in), with a specified force of 0.56+/-0.05 N (2+/-0.2 oz)</i> <i>Loading Time: 5 sec Specimen Size: 4" x 4"</i>															
	85	80	82	81	81	81	82	80	80	82	82	2	80	85	68 min. 76 MARV 80 nominal	
ASTM D792	Specific Gravity (23/ 23°C)															
Method A	0.9348	0.9350									0.9349	0.0002	0.9348	0.9350	0.939 max.	
ASTM D6693	Tensile Properties:															
Type IV	<i>Test Specimens: Type IV, Width of narrow section:0.25in, Length of narrow section:1.3in, Width Overall:0.75in, Length Overall: 4.5in Conditioning: Conducted test in standard laboratory atmosphere of 23+/-2 °C (73.4+/-3.6 °F), and 50+/-5% relative humidity. Rate of Separation: 2"/min</i>															
	Tensile Strength at Break (lbs/ in.- width)															
MD	235	241	229	264	236						241	14	229	264	120 min.	
TD	259	270	271	277	259						267	8	259	277		
	Elongation at Break (percent, %)															
MD	493	519	496	528	503	Gauge Length = 2.0 in.					508	15	493	528	250 min.	
TD	596	627	619	635	611						618	15	596	635		
ASTM D4218	Carbon Content															
	<i>Apparatus: Muffle Furnace</i>															
	2.33	2.30									2.32	0.02	2.30	2.33	2 - 3	

(End of Table 5)

(Sheet 1 of 1)

By accepting the data and results presented on this report, the Client agrees to limit the liability of TRI Environmental, Inc. from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless TRI Environmental, Inc. from and against all liabilities in excess of the aforementioned limit.

LEGENDS:

MD - MACHINE DIRECTION

TD- TRANSVERSE DIRECTION



TABLE 6.
MATERIAL PROPERTIES
 CLIENT: Newfields
 PROJECT: CC&V VLF2 Phase 2B

Date Received: **12/18/2019**
 Date Reported: **12/26/2019**
 Client Sample ID: **R#FND0047820052 L#DKK810710**
 Material Description: **80mil LLDPE Microspike Geomembrane**

QC'd By: *Maria Espitia*
 TRI Job No.: **G192088**
 TRI Control No.: **146052**

SPECIMENS											Avg.	Std. Dev.	Min	Max	Proj. Specs.
1	2	3	4	5	6	7	8	9	10						
METHOD	DESCRIPTION														
ASTM D5994	Thickness (mils)														
	Apparatus: Dead-weight dial micrometer with gauge points tapered at an angle of 60° +/- 2° to the horizontal with the tip rounded to a radius of 0.8+/-0.1 mm(0.031+/-0.004 in), with a specified force of 0.56+/-0.05 N (2+/-0.2 oz)														
	Loading Time: 5 sec Specimen Size: 4" x 4"														
	81	81	83	81	81	84	82	80	82	80	82	1	80	84	68 min. 76 MARV 80 nominal
ASTM D792	Specific Gravity (23/ 23°C)														
Method A	0.9345	0.9351									0.9348	0.0004	0.9345	0.9351	0.939 max.
ASTM D6693	<u>Tensile Properties:</u>														
Type IV	Test Specimens: Type IV, Width of narrow section:0.25in, Length of narrow section:1.3in, Width Overall:0.75in, Length Overall: 4.5in Conditioning: Conducted test in standard laboratory atmosphere of 23+/-2 °C (73.4+/-3.6 °F), and 50+/-5% relative humidity. Rate of Separation: 2"/min														
	Tensile Strength at Break (lbs/ in.- width)														
	MD	228	276	229	264	302					260	32	228	302	120 min.
	TD	285	264	271	286	309					283	17	264	309	
	Elongation at Break (percent, %) Gauge Length = 2.0 in.														
	MD	491	526	478	540	569					521	37	478	569	250 min.
	TD	646	591	587	623	676					625	38	587	676	
ASTM D4218	Carbon Content														
	Apparatus: Muffle Furnace														
	2.49	2.45									2.47	0.03	2.45	2.49	2 - 3

(End of Table 6)

(Sheet 1 of 1)

By accepting the data and results presented on this report, the Client agrees to limit the liability of TRI Environmental, Inc. from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless TRI Environmental, Inc. from and against all liabilities in excess of the aforementioned limit.

LEGENDS:

MD - MACHINE DIRECTION

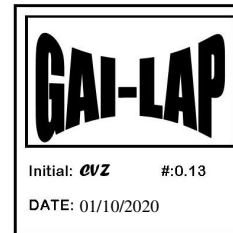
TD- TRANSVERSE DIRECTION



January 10, 2020

Nikoliya Boyanich
NewFields
9400 Station Street, Suite 300
Lone Tree, CO 80124

Re: FINAL LABORATORY TEST REPORT



Dear Ms. Boyanich:

Thank you for consulting TRI California for your material testing needs.

Enclosed is the **final** laboratory report for the Conformance testing of three (3) 80 mil LLDPE Microspike Geomembrane samples.

PROJECT NAME: CC&V VLF2 Phase 2B

DATE REPORTED: January 10, 2020

REFERENCE TRI JOB NO.: G192093

DATE RECEIVED: December 19, 2019

SAMPLED BY: TRI-CA at AGRU, NV

SAMPLE IDENTIFICATIONS:

SAMPLE ID	TRI CONTROL NUMBER
R# FNB0047810190 Lot DKJ810710	146076
R# FND0047820067 Lot DKJ810710	146078
R# FND0047820082 Lot DKJ810710	146079

TESTS REQUIRED / PERFORMED:

TEST METHOD	DESCRIPTION
1. ASTM D5994	Thickness
2. ASTM D6693	Tensile Properties
3. ASTM D792	Specific Gravity
4. ASTM D4218	Carbon Content Muffle

TEST RESULTS: The test results are summarized in the attached Tables 1 to 3.

Note: The general conditioning and testing of the material samples identified in this report were performed within the range of the laboratory environmental conditions; i.e., 20-24°C and 45-65% RH. Otherwise, the actual environmental conditions are indicated in the respective test method reported.

Respectfully,

TRI Environmental, Inc. - California

Maria Espitia

Maria Espitia
Quality Assurance

Cora Queja
TRI-CA Director

Signatures are on file

It shall be noted that the samples tested are believed to be true representatives of the material produced under the designation herein stated. In addition, the attached laboratory tests results are considered indicative only of the quality of samples/specimens that were actually tested. The appropriate test methods hereby employed are based on the current and accepted industry practices. TRI neither accepts responsibility for nor makes claims to the intended final use and purpose of the material. The test data and all associated project information shall be held confidential and not to be reproduced and/or disclosed to other parties except in full and with prior written approval from pertinent entity duly authorized by the respective client or from the client itself. It is our policy to keep physical records of each job for two (2) years commencing from the date of receipt of the samples and keep its corresponding electronic file for seven (7) years. **Retained conformance samples are disposed of after one (1) month.** On the other hand, should you need us to keep them at a longer period, please advise us in writing.

4 Pages Total (including this sheet)



TABLE 1.
MATERIAL PROPERTIES
CLIENT: Newfields
PROJECT: CC&V VLF2 Phase 2B

Date Received: **12/20/2019**
Date Reported: **1/10/2019**
Client Sample ID: **R# FNB0047810190 L# DKJ810710**
Material Description: **80mil LLDPE Microspike Geomembrane**

QC'd By: Maria Espitia
TRI Job No.: **G192093**
TRI Control No.: **146076**

SPECIMENS											Avg.	Std. Dev.	Min	Max	Proj. Specs.	
1	2	3	4	5	6	7	8	9	10							
METHOD	DESCRIPTION															
ASTM D5994	Thickness (mils) <i>Apparatus: Dead-weight dial micrometer with gauge points tapered at an angle of 60° +/- 2° to the horizontal with the tip rounded to a radius of 0.8+/-0.1 mm(0.031+/-0.004 in), with a specified force of 0.56+/-0.05 N (2+/-0.2 oz)</i> <i>Loading Time: 5 sec Specimen Size: 4" x 4"</i>														68 min. 76 MARV 80 nominal	
	83	80	80	80	84	84	80	83	80	81	82	2	80	84		
ASTM D792	Specific Gravity (23/ 23°C)															
Method A	0.9365	0.9366									0.9365	0.0001	0.9365	0.9366	0.939 max.	
ASTM D6693	Tensile Properties:															
Type IV	<i>Test Specimens: Type IV, Width of narrow section:0.25in, Length of narrow section:1.3in, Width Overall:0.75in, Length Overall: 4.5in Conditioning: Conducted test in standard laboratory atmosphere of 23+/-2° C (73.4+/-3.6° F), and 50+/-5% relative humidity. Rate of Separation: 2"/min</i>															
	Tensile Strength at Break (lbs/ in.- width)															
	MD	247	250	232	237	237					241	8	232	250	120 min.	
	TD	280	272	269	261	294					275	12	261	294		
	Elongation at Break (percent, %) <i>Gauge Length = 2.0 in.</i>															
	MD	518	521	486	509	500					507	14	486	521	250 min.	
	TD	636	625	626	601	665					630	23	601	665		
ASTM D4218	Carbon Content <i>Apparatus: Muffle Furnace</i>															
	2.44	2.35									2.39	0.06	2.35	2.44	2 - 3	

(End of Table 1)

(Sheet 1 of 1)

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LEGENDS:

MD - MACHINE DIRECTION
TD- TRANSVERSE DIRECTION

1160 North Gilbert Street, Anaheim, CA 92801, www.precisionlabs.net
Precision Geosynthetic Laboratories International dba TRI Environmental, Inc.



TABLE 2.
MATERIAL PROPERTIES
CLIENT: Newfields
PROJECT: CC&V VLF2 Phase 2B

Date Received: 12/20/2019
Date Reported: 1/10/2019
Client Sample ID: R# FND0047820067 L# DKJ810710
Material Description: 80mil LLDPE Microspike Geomembrane

QC'd By: Maria Espitia
TRI Job No.: G192093
TRI Control No.: 146078

		SPECIMENS										Avg.	Std. Dev.	Min	Max	Proj. Specs.
METHOD	DESCRIPTION	1	2	3	4	5	6	7	8	9	10					
ASTM D5994	Thickness (mils) <i>Apparatus: Dead-weight dial micrometer with gauge points tapered at an angle of 60° +/- 2° to the horizontal with the tip rounded to a radius of 0.8+/-0.1 mm(0.031+/-0.004 in), with a specified force of 0.56+/-0.05 N (2+/-0.2 oz)</i> <i>Loading Time: 5 sec Specimen Size: 4" x 4"</i>	81	80	82	80	80	81	82	80	81	80	81	1	80	82	68 min. 76 MARV 80 nominal
ASTM D792 Method A	Specific Gravity (23/ 23°C) 0.9354 0.9355											0.9355	0.0001	0.9354	0.9355	0.939 max.
ASTM D6693 Type IV	<u>Tensile Properties:</u> <i>Test Specimens: Type IV, Width of narrow section:0.25in, Length of narrow section:1.3in, Width Overall:0.75in, Length Overall: 4.5in Conditioning: Conducted test in standard laboratory atmosphere of 23+/-2° C (73.4+/-3.6° F), and 50+/-5% relative humidity. Rate of Separation: 2"/min</i> Tensile Strength at Break (lbs/ in.- width) <i>MD 248 228 250 269 255</i> <i>TD 294 276 320 312 280</i> Elongation at Break (percent, %) <i>Gauge Length = 2.0 in.</i> <i>MD 514 498 506 522 523</i> <i>TD 672 617 712 697 640</i>															120 min.
ASTM D4218	Carbon Content <i>Apparatus: Muffle Furnace</i> 2.29 2.40											2.34	0.07	2.29	2.40	2 - 3

(End of Table 2)

(Sheet 1 of 1)

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LEGENDS:

MD - MACHINE DIRECTION
TD- TRANSVERSE DIRECTION

TABLE 3.
MATERIAL PROPERTIES
CLIENT: Newfields
PROJECT: CC&V VLF2 Phase 2B

Date Received: 12/20/2019

Date Reported: 1/10/2019

Client Sample ID: R# FND0047820082 L# DKJ810710

Material Description: 80mil LLDPE Microspike Geomembrane

QC'd By: *Maria Espitia*

TRI Job No.: G192093

TRI Control No.: 146079

		SPECIMENS										Avg.	Std. Dev.	Min	Max	Proj. Specs.
METHOD	DESCRIPTION	1	2	3	4	5	6	7	8	9	10					
ASTM D5994	Thickness (mils) <i>Apparatus: Dead-weight dial micrometer with gauge points tapered at an angle of 60° +/- 2° to the horizontal with the tip rounded to a radius of 0.8+/-0.1 mm(0.031+/-0.004 in), with a specified force of 0.56+/-0.05 N (2+/-0.2 oz)</i> <i>Loading Time: 5 sec Specimen Size: 4" x 4"</i>	80	81	81	82	80	81	80	80	81	80	81	1	80	82	68 min. 76 MARV 80 nominal
ASTM D792	Specific Gravity (23/ 23°C)	0.9382	0.9383									0.9382	0.0001	0.9382	0.9383	0.939 max.
Method A																
ASTM D6693	<u>Tensile Properties:</u> <i>Test Specimens: Type IV, Width of narrow section:0.25in, Length of narrow section:1.3in, Width Overall:0.75in, Length Overall: 4.5in Conditioning: Conducted test in standard laboratory atmosphere of 23+/-2° C (73.4+/-3.6° F), and 50+/-5% relative humidity. Rate of Separation: 2"/min</i>															
Type IV	Tensile Strength at Break (lbs/ in.- width)															
	MD	265	272	217	242	232						246	23	217	272	120 min.
	TD	296	284	286	270	272						282	11	270	296	
	Elongation at Break (percent, %)															
	MD	544	541	475	499	485						509	32	475	544	250 min.
	TD	668	673	668	622	636						653	23	622	673	
ASTM D4218	Carbon Content <i>Apparatus: Muffle Furnace</i>	2.37	2.34									2.35	0.02	2.34	2.37	2 - 3

(End of Table 3)

(Sheet 1 of 1)

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LEGENDS:

MD - MACHINE DIRECTION

TD- TRANSVERSE DIRECTION



APPENDIX L – TENSIO METER CERTIFICATIONS

Demtech Services, Inc.
Placerville, California, USA

CALIBRATION CERTIFICATE

Tensiometer Model:

Pro-Tester T-0100

Device Calibrated:

S-Type load cell

Calibration Apparatus:

Range:

0 - 750 lbs. Tension

Model No:

M2405-750#

Pro-Cal unit, model TC-0100/A

Serial No:

686331

A/D Module Model No:

T-029

Dead Weight:

W1

2

Reference Cell:

R1

2

A/D Module Serial No:

3912686331

W2

152

R2

152

Channel No:

N/A

W3

302

R3

302

Indicator reading with no load:

0

Offset:

1.966512

Scale:

3.146753

Applied Force lbs.

Cell Response:

Deviation Error:

2
52
102
152
202
252
302

2
52
102
152
202
252
302

0.00
0.00
0.00
0.00
0.00
0.00
0.00

Total Deviation Error (%): **0.00%**

Temperature at time of calibration: 73 degrees F

Excitation Voltage:

5 V DC

This calibration conforms to the standards set by ASTM E4 and is traceable to NIST standards

Note: A/D Module and load cell above have been systems calibrated and are considered a matched pair. In general, calibrated A/D Modules and load cells are not interchangeable.

Calibration Technician:

MH

Date:

05/13/20

Signature:

Math Harrison

Demtech Services, Inc.
Placerville, California, USA

CALIBRATION CERTIFICATE

Tensiometer Model:

Pro-Tester T-0100

Device Calibrated:

S-Type load cell
0 - 750 lbs. Tension

Calibration Apparatus:

Range:

Model No:

M2405-750#

Pro-Cal unit, model TC-0100/A

Serial No:

688139

A/D Module Model No:

T-029

A/D Module Serial No:

4612688139

Channel No:

N/A

Dead Weight:

W1

2

W2

152

W3

302

Reference Cell:

R1

2

R2

152

R3

302

Indicator reading with no load:

0

Offset

1.960214

Scale:

3.183084

Applied Force lbs.

Cell Response:

Deviation Error:

2
52
102
152
202
252
302

2
52
102
152
202
252
302

0.00
0.00
0.00
0.00
0.00
0.00
0.00

Total Deviation Error (%): **0.00%**

Temperature at time of calibration: 73 degrees F

Excitation Voltage: 5 V DC

This calibration conforms to the standards set by ASTM E4 and is traceable to NIST standards

Note: A/D Module and load cell above have been systems calibrated and are considered a matched pair. In general, calibrated A/D Modules and load cells are not interchangeable.

Calibration Technician:

MH

Date: 05/13/20

Signature:

Matthew Harrison