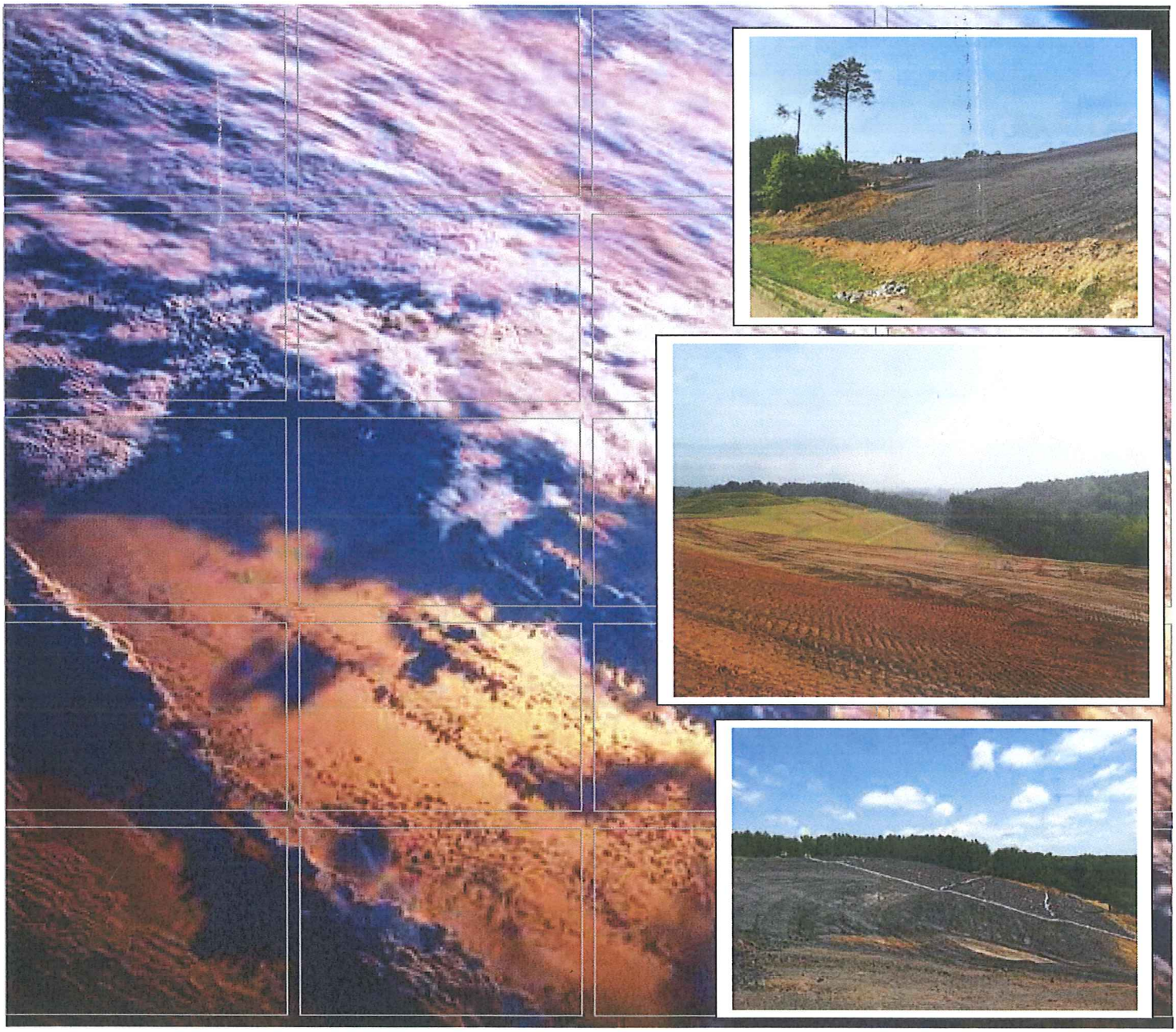

R. J. Reynolds Tobacco Company

Construction Quality Assurance (CQA) Certification – Edwards Road Landfill, Cap Modification – Permit No. 34-05

Rural Hall, North Carolina

September 2012

NORTH CAROLINA PROFESSIONAL SEAL 20770 ENGINEER DAVID W. NASIELA

9-21-12

Delivering sustainable solutions in a more competitive world

ERM

ERM NC, Inc.

8000 Corporate Center Dr.
Suite 200
Charlotte, NC 28226
(704) 541-8345
(704) 541-8416 (fax)

September 21, 2012

NCDENR – Division of Waste Management
610 East Center Avenue
Suite 301
Mooresville, NC 28115

Attention: Mr. John Murray

Reference: **Construction Quality Assurance (CQA) for Closure Modification – Former Edwards Road Landfill R.J. Reynolds Tobacco Company, Permit No. 34-05 Rural Hall, North Carolina**

Mr. Murray:

ERM NC, Inc. (ERM) has completed the necessary monitoring, inspection and testing for the construction of the Closure Modification for the former Edwards Road Landfill (Permit No. 34-05). Construction of the Closure Modification was performed by Earnhardt Grading, Inc. (Contractor). The Closure Modification was approved by NCDENR – Division of Waste Management; Letter of Closure Modification issued August 12, 2011 based on the Proposed Closure Modification submittal from ERM NC, Inc. as revised through July 15, 2011. All monitoring, testing and inspections were performed and documented based on the technical specifications and Construction Quality Assurance (CQA) Plan developed by ERM as revised through July 15, 2011. This submittal contains material certifications, laboratory testing, field testing and as-built survey drawings for each component of the approved landfill closure modification. As required in the Division of Solid Waste Management Rules, copies of colored photographs of each phase of landfill closure construction are included in the CQA submittal.

Individual sections of this report describe the materials and testing / inspection procedures used for:

- Subgrade Preparation
- Linear Low Density Polyethylene (LLDPE) Liner
- Geocomposite
- Protective Cover Soils
- Storm Water Management
- Photographs

DEVIATIONS FROM APPROVED PLAN

The approved plans and specifications were followed throughout construction of the Closure Modification with the exception of the installation of an underdrain system in the south eastern portion of the ash landfill. During the re-grading of ash within this area of the landfill, soft areas were identified by evidence of rutting from heavy equipment. ERM personnel were on site to evaluate the soft condition with Contractor. A brief investigation including excavation of test pits into the disposed ash revealed impounded water within the ash approximately 14 feet below the existing landfill surface.

ERM contacted the Division of Waste Management; Mr. John Murray and Ms. Jaclynne Drummond to discuss the conditions and proposed underdrain system on June 11, 2012. ERM submitted a proposed underdrain location with construction details for approval to the Division of Waste Management on June 11, 2012. ERM received approval to proceed from Division of Waste Management; Jaclynne Drummond on June 13, 2012.

Installation of the underdrain system required removal of approximately 10,000 cubic yards of previously disposed ash to safely access the areas of impounded water at an appropriate depth for installation. During this process, a soil embankment was discovered beneath the landfill surface that appeared to be acting as a dike to impound water subsurface in disposed ash.

The underdrain system was installed in general accordance with the plans approved by the Division of Waste Management including two perforated polyethylene pipes within a trench of NCDOT #57 washed stone wrapped with 8-ounce non-woven geotextile. This underdrain section was installed within ash and extended through the soil embankment discovered during excavation. The outlet of the underdrain is located immediately west of sediment trap ST-2 and consist of solid polyethylene pipe and a prefabricated metal flared end outlet structure.

Following installation of the underdrain, there was no flow recorded from the underdrain pipes. It appears that the removal of the soil embankment discovered within disposed ash allowed impounded water to disperse into other areas of the landfill. Previously excavated ash was placed back into the landfill as backfilling of the underdrain area was completed. Following backfilling of this area, equipment was able to operate and complete re-grading of this area of the landfill.

As-built locations for the underdrain installation and photographs are included in the CQA submittal document for reference.

ENGINEER'S CERTIFICATION

The professional seal of David W. Wasiela, P.E. is affixed to this submittal to certify that the construction of the former Edwards Road Landfill Closure Modification has been completed in general accordance with the approved Plans, CQA Plan and Project Technical Specifications under the full-time observation of ERM personnel and ERM subconsultants.

If you should have any questions or require additional information concerning this submittal, please contact me at dave.wasiela@erm.com or (704) 541-8345.

Sincerely,

ERM NC, Inc.
NC License # C-2206

NORTH CAROLINA PROFESSIONAL SEAL 20770 ENGINEER DAVID W. WASIELA

9-21-12

David W. Wasiela, P.E.
NC Registration No. 20770
Senior Project Engineer

cc: Mr. Ed Mussler – NCDENR – Division of Waste Management
Mr. Max Hopkins – R.J. Reynolds Tobacco Company
Ms. Yongsheng Yi – R.J. Reynolds Tobacco Company

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Appendix 3	Linear Low Density Polyethylene (LLDPE) Liner Conformance Testing
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SECTION 1
SUBGRADE CERTIFICATION

ERM NC, Inc. (ERM) has completed necessary monitoring and inspection of the R. J. Reynolds Tobacco Company (RJR) ash landfill closure cap, subgrade preparation. The entire landfill footprint required removal of existing cover soils and re-grading of previously disposed ash to improve site drainage and storm water control. This process was completed in three phases beginning from the north and progressing south. Phasing of the project allowed for stockpiling of removed cover soils as re-grading of ash and liner installation were completed.

Site Preparation

Site preparation included the completion of the erosion and sedimentation control devices permitted by NCDENR – Division of Land Quality dated June 24, 2011. Matthew Osborne with Division of Land Quality conducted a pre-construction meeting on site for erosion and sedimentation control installation on March 15, 2012. These devices included:

- Expansion of existing sediment trap ST-1
- Expansion of existing sediment trap ST-2
- Construction of new sediment trap ST-3
- Installation of a stabilized construction entrance
- Installation of silt fence
- Installation of silt fence rip rap outlets
- Temporary seeding

Following installation of erosion and sedimentation control devices, Contractor notified Matthew Osborne with Division of Land Quality that installation was complete and available for inspection.

Subgrade Preparation

In order to perform regrading of previously disposed ash, the existing two feet of cover soils required removal and temporary stockpiling. As mentioned previously, this process required the phasing of landfill cap installation to allow for stockpile areas within the landfill footprint. This process was completed using trackhoes, bulldozers and off road articulating dump trucks implementing care not to remove disposed ash during the cover soil removal as these materials were used as cover soils for the final cap.

Following removal of cover soils, the previously disposed ash was re-graded to meet the lines and grades of the approved Grading Plan prepared by ERM and approved by Division of Waste Management. Re-grading was executed using trackhoes, bulldozers and off road articulating dump trucks. A bull dozer utilizing GPS receivers affixed to the dozer blade was utilized to meet the final proposed grades within the approved Grading Plan. Once final grades were achieved, the surface of the exposed ash was evaluated for deployment of linear low density polyethylene (LLDPE) liner. Criteria for acceptance included a relatively smooth surface with no rigid obstructions evident on the surface.

The exposed surface of ash was inspected daily by the LLDPE liner installer, Environmental Specialties International, Inc. (ESI) and a representative of ESP Associates, P.A. (ESP) prior to liner installation. Both representatives signed a subgrade acceptance form for each day of liner installation to declare the subgrade suitable. Copies of the signed subgrade certification forms are included in Appendix 1.

As – Built Conditions

An as-built survey drawing was produced by Lawrence Associates, PA for top of exposed ash and final grades. The as-built survey is combined with the final cover as-built drawing to certify a minimum final cover over the liner system of two feet. A copy of the Final As-Built Drawing is included in Appendix 13 for reference.

Underdrain Installation

During the re-grading of ash within the eastern portion the landfill, soft areas were identified by evidence of rutting from heavy equipment. ERM personnel were on site to evaluate the soft condition with Contractor. A brief investigation including excavation of test pits into the disposed ash revealed impounded water within the ash approximately 14 feet below the existing landfill surface in an area of approximately 4,000 square feet.

ERM contacted the Division of Waste Management; Mr. John Murray and Ms. Jaclynne Drummond to discuss the conditions and proposed underdrain system on June 11, 2012. ERM submitted a proposed underdrain location with construction details for approval to the Division of Waste Management on June 11, 2012. ERM received approval to proceed from Division of Waste Management; Jaclynne Drummond on June 13, 2012.

Installation of the underdrain system required removal of approximately 10,000 cubic yards of previously disposed ash to safely access the areas of impounded water at an appropriate depth for installation. During this process, a soil embankment was discovered beneath the landfill surface that appeared to be acting as a dike to impound water subsurface in disposed ash.

The underdrain system was installed in general accordance with the plans approved by the Division of Waste Management including two perforated polyethylene pipes within a trench of NCDOT #57 washed stone wrapped with 8-ounce non-woven geotextile. This underdrain section was installed within ash and extended through the soil embankment discovered during excavation. The outlet of the underdrain is located immediately west of sediment trap ST-2 and consist of solid polyethylene pipe and a prefabricated metal flared end outlet structure.

Following installation of the underdrain, there was no flow recorded from the underdrain pipes. It appears that, during installation of the underdrain, the removal of the soil embankment discovered within disposed ash allowed the limited volume of impounded water to disperse into other areas of the landfill and alleviate the soft condition. Previously excavated ash was placed

back into the landfill as backfilling of the underdrain area was completed. Following backfilling of this area, equipment was able to operate and complete re-grading of this area of the landfill.

As-built locations for the underdrain installation is included on the LLDPE Liner As-Built Drawing in Appendix 5 and photographs are included in Appendix 14 for reference.

SECTION 2
LINEAR LOW DENSITY POLYETHYLENE (LLDPE) LINER

ESP provided full-time monitoring and testing for the installation of the Edwards Road Landfill Cap Modification liner system. A textured 40-mil LLDPE liner supplied by Agru-America, Inc. was used for the Cap Modification installation. Installation of the LLDPE liner was performed by ESI. A copy of the roll certifications, resins and pre-shipping testing is included in Appendix 2. Conformance sampling and testing for the LLDPE liner materials was performed in accordance with the approved specifications and CQA plan. A copy of the conformance testing results performed by TRI/Environmental is included in Appendix 3. All materials used for the LLDPE liner system installation meet or exceed the requirements of the project specifications and CQA Plan.

LLDPE Panel Deployment

Prior to placing LLDPE liner material, ESP personnel and ESI representatives inspected the surface of the subgrade for suitability. ESP and ESI accepted the subgrade by signing a subgrade certification form (copy included in Appendix 1).

LLDPE panels were deployed using a boom and spear on an excavator; pulling the sheet material from the roll using manpower and four wheel all terrain vehicles. The LLDPE liner panels were deployed directly on top of the exposed ash. Each panel was inspected by ESP personnel during deployment, assigned a sequential panel number and measured for dimensions. A copy of the panel deployment records is included in Appendix 4 for reference. The LLDPE Liner As-Built Drawing showing the locations of each panel is presented in Appendix 5 for reference.

LLDPE Panel Seaming

At the beginning of each work day during LLDPE liner installation, trial seams were performed (fusion and / or extrusion) to test the integrity of the welding machine and welding technician. Following completion of the trial seams, destructive testing specimens were cut from the trial seams and tested using the Installer's tensiometer. In order to accept a trial seam, the failure mode for both peel adhesion and bonded shear strength must be Film Tear Bond (FTB). Subsequent trial seams were performed throughout the day for approximately every 4 hours of seaming or if a new welder or technician was used. A copy of the trail seam reports is included in Appendix 6.

ESP personnel provided full-time monitoring during seaming of LLDPE panels. The majority of field seaming was accomplished using double hot wedge fusion welding equipment and

techniques. Seaming of repair patches and small panels was performed using extrusion welding techniques. Each seam was assigned a sequential number in accordance with the project specifications. ESP provided full-time monitoring for non-destructive testing of field seams; air pressure testing for double hot wedge fusion welds and vacuum box testing for extrusion welds. A copy of the Seam Inspection Reports documenting non-destructive testing results completed by ESP personnel is included in Appendix 7 for reference.

The locations of all LLDPE panels and subsequent seams are shown on the LLDPE Liner As-Built Drawing included in Appendix 5 for review and reference.

Destructive Testing

The destructive testing program for the Edwards Road Landfill Cap Modification included sampling of field seams for approximately every 500 feet of production field seams. The location of the Laboratory Destructive sample was determined by ESP personnel and is identified in the Geomembrane Seam Destructive Sample Log in Appendix 8 denoted by DS-#. Three 1-inch wide specimens were taken from the destructive testing sample in the field and tested using the Installer's tensiometer for Peel Adhesion using Film Tear Bond and passing criteria. Once passing results were achieved in the field, the remainder of the sample was sent to TRI / Environmental in Austin, Texas for Laboratory Destructive testing. A total of 78 destructive samples were collected and sent to TRI for testing. All of the 78 samples met the passing criteria in the field prior to sending to the laboratory. All of the 78 samples met or exceeded the laboratory destructive testing requirements in accordance with the technical specifications and CQA plan. A copy of the Laboratory Destructive testing results is included in Appendix 9 for review.

Repairs

Six hundred ninety seven (697) repairs were necessary for the 40-mil LLDPE liner installation. Seventy eight (78) of these repairs were necessary for laboratory destructive sampling. The majority of the remaining repairs were necessary at the intersection of panel butt seams with another seam or in areas containing "pie" wedge panels meeting at "tip points". The locations of repairs are shown on the LLDPE Liner As-Built Drawing in Appendix 5. Documentation of the repair size and repair type is described in the Field LLDPE Defect and Repair Testing Log in Appendix 10. All repairs were monitored and tested in accordance with the project specifications and CQA Plan.

Final Acceptance

Prior to placing geocomposite for the drainage layer system above the LLDPE liner, ESP, ESI and ERM personnel inspected the entire LLDPE liner surface to inspect for any further defects requiring repair. At this time, documentation was also reviewed for compliance with the project specifications and CQA Plan. Once there were no further defects found and documentation was deemed complete, the liner installation was accepted for placement of geocomposite.

SECTION 3
GEOCOMPOSITE

ESP personnel provided full time monitoring and inspection for the geocomposite materials and installation. A double sided 6-ounce geocomposite was used to install the drainage layer for the landfill cap modification. The material was supplied by Skapps Industries, Inc., product number 270-2-6. A copy of the material certifications is included in Appendix 11 and conformance testing results are included in Appendix 12 for reference.

Rolls of geocomposite were deployed using manpower and appropriately overlapped along the panel sides and ends. The panels of geocomposite were joined by sewing the top layer of geotextile together joining one panel to another panel using a polyester thread. In some cases, primarily along “butt seams”, plastic “zip ties” were used to join panels together along with heat bonding of the top layer of geotextile.

SECTION 4
PROTECTIVE COVER

ERM and ESP personnel provided periodic monitoring and inspection for the placement of operational cover soils above the geocomposite drainage layer. In summary, a 2-foot thick minimum layer of soils previously removed from the existing landfill cap were placed across the entire liner installation limits. Following placement of the protective cover, the surface was surveyed in order to certify that a minimum of 2 feet had been placed. There was no damage to the underlying liner or geocomposite observed or reported during placement of protective cover soils. A copy of the surveyed certification drawing is included in Appendix 13 for review.

SECTION 5
STORM WATER COLLECTION & REMOVAL

Storm water control devices included the installation of benches during the re-grading of ash, installation of perimeter rip rap lined open channels and installation of vegetated open channels with rip rap check dams. The benches serve to interrupt the continuous sheet flow along the landfill slopes and collect storm water to convey to the perimeter ditches. The ditches direct the storm water to topographically low areas where temporary sediment traps are constructed (ST-1, ST-2 & ST-3).

Storm water that infiltrates through the protective cover and reaches the geocomposite drainage layer will flow through the geocomposite and will collect in the anchor trench. The anchor trench collection consists of the installation of a perforated polyethylene pipe surrounded with

NCDOT #57 washed stone. This section of stone and perforated pipe is encapsulated with geocomposite to protect the stone from intrusion of surrounding soils. As the drainage layer water is collected in the anchor trench, water flows through the stone and perforated pipe to topographically low areas. At these low areas, "T" intersections were installed using solid wall pipe to transmit the water collected in the anchor trenches the exterior of the landfill cap limits. Locations of the "T" intersections are shown on the as-built drawings included in Appendix 5 for reference.

Final seeding of all disturbed areas following construction of the cap modification was performed by Sides Seeding. Due to the phased construction of the landfill cap, the northern areas of the landfill were seeded earlier in the construction process and a good stand of vegetation is established (reference photographs in Appendix 14).

SECTION 6
PHOTOGRAPH DOCUMENTAION

Photographs were taken throughout the cap modification construction and included in Appendix 14 for reference. Photographs included in this submittal are intended to include all of the individual construction components required to complete the project.

Appendix

Appendix 1 Subgrade Certification
Appendix 2 Linear Low Density Polyethylene (LLDPE) Material Certifications
Appendix 3 Linear Low Density Polyethylene (LLDPE) Liner Conformance Testing
Appendix 4 Field LLDPE Deployment Records
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Appendix 8 Field LLDPE Seam Destructive Sample Log
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Appendix 12 Geocomposite Conformance Testing
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Appendix 14 Photographs

APPENDIX 1

SUBGRADE CERTIFICATION

ESP ASSOCIATES, P.A.
engineering • surveying • planning

SUBGRADE CERTIFICATION

Date: 5-17-12
ESP Project Number: XH01,304
Project Name: RUCAL HALL ASH LANDFILL
Project Location: RUCAL HALL, N.C.
Page: 1

Material: 40 MIL LLDPE
Manufacturer: AA
Installer: ESI

P- 1 through P- 21

THE SUBGRADE THAT THE ABOVE LISTED PANELS ARE TO BE DEPLOYED UPON WAS INSPECTED AND DETERMINED TO BE SUITABLE IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS

IF THE SUBGRADE IS NOT SUITABLE, STATE REASONS:

CORRECTIVE ACTION:

DATE CORRECTIVE ACTION WAS IMPLEMENTED:

DATE SUBGRADE WAS ACCEPTED BY INSTALLER:

Dale Story
INSTALLER'S PERSONNEL

CQA PERSONNEL

ESP ASSOCIATES, P.A.
engineering • surveying • planning

SUBGRADE CERTIFICATION

Date: 5-18-12
ESP Project Number: XH01.304
Project Name: RURAL HALL ASH LANDFILL
Project Location: RURAL HALL, NC
Page: 1

Material: 40 M.L LLDPE
Manufacturer: AA
Installer: ESI

P- 22 through P- 65

THE SUBGRADE THAT THE ABOVE LISTED PANELS ARE TO BE DEPLOYED UPON WAS INSPECTED AND DETERMINED TO BE SUITABLE IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS

IF THE SUBGRADE IS NOT SUITABLE, STATE REASONS:

CORRECTIVE ACTION:

DATE CORRECTIVE ACTION WAS IMPLEMENTED:

DATE SUBGRADE WAS ACCEPTED BY INSTALLER:

Dale Story
INSTALLER'S PERSONNEL

CQA PERSONNEL

ESP ASSOCIATES, P.A.
engineering • surveying • planning

SUBGRADE CERTIFICATION

Date: 5-21-12
ESP Project Number: XH01.304
Project Name: RURAL HALL ASH Landfill
Project Location: RURAL HALL, N.C
Page: 1

Material: 40 mil LLDPE
Manufacturer: AA
Installer: ESI

P- 66 through P- 73

THE SUBGRADE THAT THE ABOVE LISTED PANELS ARE TO BE DEPLOYED UPON WAS INSPECTED AND DETERMINED TO BE SUITABLE IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS

IF THE SUBGRADE IS NOT SUITABLE, STATE REASONS:

CORRECTIVE ACTION:

DATE CORRECTIVE ACTION WAS IMPLEMENTED:

DATE SUBGRADE WAS ACCEPTED BY INSTALLER:

Dale Stur
INSTALLER'S PERSONNEL

CQA PERSONNEL

ESP ASSOCIATES, P.A.
engineering • surveying • planning

SUBGRADE CERTIFICATION

Date: 5-22-12
ESP Project Number: XH01.304
Project Name: Lumberton Ash Landfill
Project Location: Lumberton, N.C
Page: 1

Material: 40 mil LLDPE
Manufacturer: AA
Installer: EST

P- 74 through P- 110

THE SUBGRADE THAT THE ABOVE LISTED PANELS ARE TO BE DEPLOYED UPON WAS INSPECTED AND DETERMINED TO BE SUITABLE IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS

IF THE SUBGRADE IS NOT SUITABLE, STATE REASONS:

CORRECTIVE ACTION:

DATE CORRECTIVE ACTION WAS IMPLEMENTED:

DATE SUBGRADE WAS ACCEPTED BY INSTALLER:

Dale Stu
INSTALLER'S PERSONNEL

CQA PERSONNEL

ESP ASSOCIATES, P.A.
engineering • surveying • planning

SUBGRADE CERTIFICATION

Date: 5-24-12
ESP Project Number: XH01.304
Project Name: RURAL HALL ASH CELL
Project Location: RURAL HALL, N.C.
Page: 1

Material: HDPE LINER
Manufacturer: AA
Installer: ESI

P- 111 through P- 138

THE SUBGRADE THAT THE ABOVE LISTED PANELS ARE TO BE DEPLOYED UPON WAS INSPECTED AND DETERMINED TO BE SUITABLE IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS

IF THE SUBGRADE IS NOT SUITABLE, STATE REASONS:

CORRECTIVE ACTION:

DATE CORRECTIVE ACTION WAS IMPLEMENTED:

DATE SUBGRADE WAS ACCEPTED BY INSTALLER:

INSTALLER'S PERSONNEL

CQA PERSONNEL

ESP ASSOCIATES, P.A.
engineering • surveying • planning

SUBGRADE CERTIFICATION

Date: 5-25-12
ESP Project Number: XH01.304
Project Name: RUKOL HALL ASH Landfill
Project Location: RUKOL HALL, NC
Page: 1

Material: 40 MIL LLDPE
Manufacturer: 4A
Installer: EST

P- 139 through P- 163

THE SUBGRADE THAT THE ABOVE LISTED PANELS ARE TO BE DEPLOYED UPON WAS INSPECTED AND DETERMINED TO BE SUITABLE IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS

IF THE SUBGRADE IS NOT SUITABLE, STATE REASONS:

CORRECTIVE ACTION:

DATE CORRECTIVE ACTION WAS IMPLEMENTED:

DATE SUBGRADE WAS ACCEPTED BY INSTALLER:

INSTALLER'S PERSONNEL

CQA PERSONNEL

ESP ASSOCIATES, P.A.
engineering • surveying • planning

SUBGRADE CERTIFICATION

Date: 5-30-12
ESP Project Number: 2-H01.304
Project Name: Rural Hall Ash Landfill
Project Location: Rural Hall, NC
Page: 1

Material: 40 mil LLDPE
Manufacturer: AA
Installer: ESI

P- 164 through P- 205

THE SUBGRADE THAT THE ABOVE LISTED PANELS ARE TO BE DEPLOYED UPON WAS INSPECTED AND DETERMINED TO BE SUITABLE IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS

IF THE SUBGRADE IS NOT SUITABLE, STATE REASONS:

CORRECTIVE ACTION:

DATE CORRECTIVE ACTION WAS IMPLEMENTED:

DATE SUBGRADE WAS ACCEPTED BY INSTALLER:

INSTALLER'S PERSONNEL

CQA PERSONNEL

ESP ASSOCIATES, P.A.
engineering • surveying • planning

SUBGRADE CERTIFICATION

Date: 8-9-12
ESP Project Number: XH01.304
Project Name: Rural Hall Ash Landfill
Project Location: Rural Hall, NC.
Page: 1

Material: 40 mil LLDPE
Manufacturer: AA
Installer: ESE

P- 314 **through** **P-** 335

THE SUBGRADE THAT THE ABOVE LISTED PANELS ARE TO BE DEPLOYED UPON WAS INSPECTED AND DETERMINED TO BE SUITABLE IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS

IF THE SUBGRADE IS NOT SUITABLE, STATE REASONS:

CORRECTIVE ACTION:

DATE CORRECTIVE ACTION WAS IMPLEMENTED:

DATE SUBGRADE WAS ACCEPTED BY INSTALLER:

INSTALLER'S PERSONNEL

CQA PERSONNEL

ESP ASSOCIATES, P.A.
engineering • surveying • planning

SUBGRADE CERTIFICATION

Date: 8-10-12
ESP Project Number: XH01.304
Project Name: RURAL HALL ASH LANDFILL
Project Location: RURAL HALL, N.C.
Page: 1

Material: 40-mil LLDPE
Manufacturer: AA
Installer: EST

P- 336 **through** **P-** 381

THE SUBGRADE THAT THE ABOVE LISTED PANELS ARE TO BE DEPLOYED UPON WAS INSPECTED AND DETERMINED TO BE SUITABLE IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS

IF THE SUBGRADE IS NOT SUITABLE, STATE REASONS:

CORRECTIVE ACTION:

DATE CORRECTIVE ACTION WAS IMPLEMENTED:

DATE SUBGRADE WAS ACCEPTED BY INSTALLER:

INSTALLER'S PERSONNEL

CQA PERSONNEL

APPENDIX 2

LINEAR LOW DENSITY POLYETHYLENE (LLDPE) MATERIAL CERTIFICATIONS

cust:	Environmental Specialties	doc	18582
PO#:	16723 Edwards Rd Rural Hall Ash LF		
Dest:	Rural Hall, NC		

53 rolls 40 LL micro (710)

English Dimensions

roll #		wid	len	area	check weld rod qty (if ordered)				wgt		resin lot #
					TRI (100k/lot) sqs						
417330	.12	23	710.0	16,330	40LL	micro	53tot	1	3564	sqs	CCC810980
417331	.12	23	710.0	16,330	40LL	micro	53tot	2	3486		CCC810980
417332	.12	23	710.0	16,330	40LL	micro	53tot	3	3618		CCC810980
417333	.12	23	710.0	16,330	40LL	micro	53tot	4	3618		CCC810980
417334	.12	23	710.0	16,330	40LL	micro	53tot	5	3622		CCC810980
417435	.12	23	710.0	16,330	40LL	micro	53tot	6	3618		CCC810980
417436	.12	23	710.0	16,330	40LL	micro	53tot	7	3636	sqs	CCC810980
417437	.12	23	710.0	16,330	40LL	micro	53tot	8	3630		CCC810980
417438	.12	23	710.0	16,330	40LL	micro	53tot	9	3636		CCC810980
417439	.12	23	710.0	16,330	40LL	micro	53tot	10	3617		CCC810980
417440	.12	23	710.0	16,330	40LL	micro	53tot	11	3602		CCC810980
417442	.12	23	710.0	16,330	40LL	micro	53tot	12	3660		CCC810980
417443	.12	23	710.0	16,330	40LL	micro	53tot	13	3650	sqs	CCC810980
417444	.12	23	710.0	16,330	40LL	micro	53tot	14	3682		CCC810980
417445	.12	23	710.0	16,330	40LL	micro	53tot	15	3698		CCC810980
417446	.12	23	710.0	16,330	40LL	micro	53tot	16	3696		CCC810980
417547	.12	23	710.0	16,330	40LL	micro	53tot	17	3690		CCC810980
417549	.12	23	710.0	16,330	40LL	micro	53tot	18	3674		CCC810980
417550	.12	23	710.0	16,330	40LL	micro	53tot	19	3666	sqs	CCC810980
417551	.12	23	710.0	16,330	40LL	micro	53tot	20	3674		CCC810980
417552	.12	23	710.0	16,330	40LL	micro	53tot	21	3668		CCC810980
417553	.12	23	710.0	16,330	40LL	micro	53tot	22	3672		CCC810980
417554	.12	23	710.0	16,330	40LL	micro	53tot	23	3658		CCC810980
417555	.12	23	710.0	16,330	40LL	micro	53tot	24	3650		CCC810980
417556	.12	23	710.0	16,330	40LL	micro	53tot	25	3652	sqs	CCC810980
417557	.12	23	710.0	16,330	40LL	micro	53tot	26	3656		CCC810980
417658	.12	23	710.0	16,330	40LL	micro	53tot	27	3660		CCC810980
417659	.12	23	710.0	16,330	40LL	micro	53tot	28	3654		CCC810980
417660	.12	23	710.0	16,330	40LL	micro	53tot	29	3658		CCC810980
417661	.12	23	710.0	16,330	40LL	micro	53tot	30	3670		CCC810980
417662	.12	23	710.0	16,330	40LL	micro	53tot	31	3668	sqs	CCC810980
417663	.12	23	710.0	16,330	40LL	micro	53tot	32	3663		CCC810980
417664	.12	23	710.0	16,330	40LL	micro	53tot	33	3666		CCC810980
417665	.12	23	710.0	16,330	40LL	micro	53tot	34	3668		CCC810980
417666	.12	23	710.0	16,330	40LL	micro	53tot	35	3668		CCC810980
417667	.12	23	710.0	16,330	40LL	micro	53tot	36	3664		CCC810980
417668	.12	23	710.0	16,330	40LL	micro	53tot	37	3658	sqs	CCC810980
417669	.12	23	710.0	16,330	40LL	micro	53tot	38	3670		CCC810980
417770	.12	23	710.0	16,330	40LL	micro	53tot	39	3666		CCC810980
417771	.12	23	710.0	16,330	40LL	micro	53tot	40	3672		CCA810100
417772	.12	23	710.0	16,330	40LL	micro	53tot	41	3668		CCA810100
417773	.12	23	710.0	16,330	40LL	micro	53tot	42	3674		CCA810100
417774	.12	23	710.0	16,330	40LL	micro	53tot	43	3674	sqs	CCA810100
417775	.12	23	710.0	16,330	40LL	micro	53tot	44	3668		CCA810100
417776	.12	23	710.0	16,330	40LL	micro	53tot	45	3670		CCA810100
417777	.12	23	710.0	16,330	40LL	micro	53tot	46	3668		CCA810100
417778	.12	23	710.0	16,330	40LL	micro	53tot	47	3676		CCA810100
417779	.12	23	710.0	16,330	40LL	micro	53tot	48	3664		CCA810100
417780	.12	23	710.0	16,330	40LL	micro	53tot	49	3664	sqs	CCA810100
417781	.12	23	710.0	16,330	40LL	micro	53tot	50	3660		CCA810100
418101	.12	23	710.0	16,330	40LL	micro	53tot	51			CCA810100
418102	.12	23	710.0	16,330	40LL	micro	53tot	52			CCA810100
418103	.12	23	710.0	16,330	40LL	micro	53tot	53			CCA810100

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ROLL # **417330-12** Lot #: **CCC810980** **Liner Type: MICROSPIKE™ LLDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.0 mm	40 mil
	MIN:	0.86	mm	34	mil	Length.....	216.411 m	710.0 feet
	MAX:	1.08	mm	43	mil	Width.....	7.01 m;	23.0 feet
Asperity ASTM D7466: 30/38 mil TOP / BOTTOM	AVE:	0.99	mm	39	mil	OIT(Standard) ASTM D3895 minutes 178		

								TEST RESULTS
Specific Gravity ASTM D792	Density			g/cc				.935
MFI ASTM D1238 COND. E GRADE: 7104	Melt Flow Index 190ºC /2160 g			g/10 min				.35
Carbon Black Content ASTM D4218	Range			%				2.24
Carbon Black Dispersion ASTM D5596	Category							10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Break	25	N/mm		141	ppi	3,612	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Break			%				528.8
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change			%				-.68
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	150.7	N				33.871	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	327.1	N				73.548	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	384.6	N				86.472	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs				CERTIFIED	

Customer: **Environmental Specialties**
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ROLL # **417331-12** Lot #: **CCC810980** **Liner Type: MICROSPIKE™ LLDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.0 mm	40 mil
	MIN:	1.06	mm	42	mil	Length.....	216.411 m	710.0 feet
	MAX:	1.44	mm	57	mil	Width.....	7.01 m;	23.0 feet
Asperity ASTM D7466: 27/36 mil TOP / BOTTOM	AVE:	1.15	mm	45	mil	OIT(Standard) ASTM D3895 minutes 178		

								TEST RESULTS	
Specific Gravity ASTM D792	Density			g/cc				.935	
MFI ASTM D1238 COND. E GRADE: 7104	Melt Flow Index 190ºC /2160 g			g/10 min				.35	
Carbon Black Content ASTM D4218	Range			%				2.15	
Carbon Black Dispersion ASTM D5596	Category							10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Break	27	N/mm		151	ppi		3,345	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Break			%				537.5	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change			%				-.68	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	150.7	N					33.871	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	327.1	N					73.548	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	384.6	N					86.472	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs					CERTIFIED	

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ROLL # **417332-12** Lot #: **CCC810980** **Liner Type: MICROSPIKE™ LLDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.0 mm	40 mil
	MIN:	0.98	mm	39	mil	Length.....	216.411 m	710.0 feet
	MAX:	1.13	mm	44	mil	Width.....	7.01 m;	23.0 feet
Asperity ASTM D7466: 25/36 mil TOP / BOTTOM	AVE:	1.06	mm	42	mil	OIT(Standard) ASTM D3895 minutes 178		

								TEST RESULTS	
Specific Gravity ASTM D792	Density			g/cc				.935	
MFI ASTM D1238 COND. E GRADE: 7104	Melt Flow Index 190ºC /2160 g			g/10 min				.35	
Carbon Black Content ASTM D4218	Range			%				2.15	
Carbon Black Dispersion ASTM D5596	Category							10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Break	24	N/mm		140	ppi		3,345	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Break			%				537.5	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change			%				-.68	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	150.7	N					33.871	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	327.1	N					73.548	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	384.6	N					86.472	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs					CERTIFIED	

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ROLL # **417333-12** Lot #: **CCC810980** **Liner Type: MICROSPIKE™ LLDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.0 mm	40 mil
	MIN:	0.97	mm	38	mil	Length.....	216.411 m	710.0 feet
	MAX:	1.08	mm	43	mil	Width.....	7.01 m;	23.0 feet
Asperity ASTM D7466: 30/38 mil TOP / BOTTOM	AVE:	1.02	mm	40	mil	OIT(Standard) ASTM D3895 minutes 178		

						TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc			.935	
MFI ASTM D1238 COND. E GRADE: 7104	Melt Flow Index 190ºC /2160 g		g/10 min			.35	
Carbon Black Content ASTM D4218	Range		%			2.20	
Carbon Black Dispersion ASTM D5596	Category					10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Break	24	N/mm	134	ppi	3,345	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Break		%			537.5	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%			-.68	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	150.7	N			33.871	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	327.1	N			73.548	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	384.6	N			86.472	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs			CERTIFIED	

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ROLL # **417334-12** Lot #: **CCC810980** **Liner Type: MICROSPIKE™ LLDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	**0.93**	mm	**37**	mil
	MAX:	**1.12**	mm	**44**	mil
Asperity ASTM D7466: **26/34** mil TOP / BOTTOM	AVE:	**1.02**	mm	**40**	mil

Thickness.....	**1.0 mm**	**40 mil**
Length.....	**216.411** m	**710.0** feet
Width.....	**7.01** m;	**23.0** feet

OIT(Standard) ASTM D3895 minutes **178**

								TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc						**.935**	
MFI ASTM D1238 COND. E GRADE: **7104**	Melt Flow Index 190ºC /2160 g	g/10 min						**.35**	
Carbon Black Content ASTM D4218	Range	%						**2.20**	
Carbon Black Dispersion ASTM D5596	Category							**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Break	**24**	N/mm	**134**	ppi			**3,345**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Break	%						**537.5**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%						**-.68**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**150.7**	N					**33.871**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**327.1**	N					**73.548**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**384.6**	N					**86.472**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs						**CERTIFIED**	

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ROLL # **417435-12** Lot #: **CCC810980** **Liner Type: MICROSPIKE™ LLDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	**0.97**	mm	**38**	mil
	MAX:	**1.10**	mm	**43**	mil
Asperity ASTM D7466: **29/38** mil TOP / BOTTOM	AVE:	**1.04**	mm	**41**	mil

Thickness.....	**1.0 mm**	**40 mil**
Length.....	**216.411** m	**710.0** feet
Width.....	**7.01** m;	**23.0** feet

OIT(Standard) ASTM D3895 minutes **178**

								TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc					**.935**	
MFI ASTM D1238 COND. E GRADE: **7104**	Melt Flow Index 190ºC /2160 g		g/10 min					**.35**	
Carbon Black Content ASTM D4218	Range		%					**2.20**	
Carbon Black Dispersion ASTM D5596	Category							**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Break	**24**	N/mm	**137**	ppi			**3,345**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Break		%					**537.5**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%					**-.68**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**150.7**	N					**33.871**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**327.1**	N					**73.548**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**384.6**	N					**86.472**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs					**CERTIFIED**	

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ROLL # **417436-12** Lot #: **CCC810980** **Liner Type: MICROSPIKE™ LLDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	**0.97**	mm	**38**	mil
	MAX:	**1.20**	mm	**47**	mil
Asperity ASTM D7466: **27/34** mil TOP / BOTTOM	AVE:	**1.09**	mm	**43**	mil

Thickness.....	**1.0 mm**	**40 mil**
Length.....	**216.411** m	**710.0** feet
Width.....	**7.01** m;	**23.0** feet

OIT(Standard) ASTM D3895 minutes **178**

						TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc				**.935**	
MFI ASTM D1238 COND. E GRADE: **7104**	Melt Flow Index 190ºC /2160 g	g/10 min				**.35**	
Carbon Black Content ASTM D4218	Range	%				**2.10**	
Carbon Black Dispersion ASTM D5596	Category					**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Break	**25**	N/mm	**140**	ppi	**3,261**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Break	%				**439.5**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%				**-.68**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**151.6**	N			**34.072**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**322.5**	N			**72.497**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**402.6**	N			**90.502**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs				**CERTIFIED**	

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ROLL # **417437-12** Lot #: **CCC810980** **Liner Type: MICROSPIKE™ LLDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.0 mm	40 mil
	MIN:	0.92	mm	36	mil	Length.....	216.411 m	710.0 feet
	MAX:	1.13	mm	44	mil	Width.....	7.01 m;	23.0 feet
Asperity ASTM D7466: 26/33 mil TOP / BOTTOM	AVE:	1.05	mm	41	mil	OIT(Standard) ASTM D3895 minutes 178		

								TEST RESULTS	
Specific Gravity ASTM D792	Density			g/cc				.935	
MFI ASTM D1238 COND. E GRADE: 7104	Melt Flow Index 190ºC /2160 g			g/10 min				.35	
Carbon Black Content ASTM D4218	Range			%				2.10	
Carbon Black Dispersion ASTM D5596	Category							10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Break	24	N/mm		135	ppi		3,261	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Break			%				439.5	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change			%				-.68	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	151.6	N					34.072	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	322.5	N					72.497	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	402.6	N					90.502	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs					CERTIFIED	

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ROLL # **417438-12** Lot #: **CCC810980** **Liner Type: MICROSPIKE™ LLDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	**0.96**	mm	**38**	mil
	MAX:	**1.07**	mm	**42**	mil
Asperity ASTM D7466: **28/37** mil TOP / BOTTOM	AVE:	**1.02**	mm	**40**	mil

Thickness.....	**1.0 mm**	**40 mil**
Length.....	**216.411** m	**710.0** feet
Width.....	**7.01** m;	**23.0** feet

OIT(Standard) ASTM D3895 minutes **178**

								TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc						**.935**	
MFI ASTM D1238 COND. E GRADE: **7104**	Melt Flow Index 190ºC /2160 g	g/10 min						**.35**	
Carbon Black Content ASTM D4218	Range	%						**2.10**	
Carbon Black Dispersion ASTM D5596	Category							**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Break	**23**	N/mm	**131**	ppi			**3,261**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Break	%						**439.5**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%						**-.68**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**151.6**	N					**34.072**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**322.5**	N					**72.497**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**402.6**	N					**90.502**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs						**CERTIFIED**	

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ROLL # **417439-12** Lot #: **CCC810980** **Liner Type: MICROSPIKE™ LLDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	**0.96**	mm	**38**	mil
	MAX:	**1.15**	mm	**45**	mil
Asperity ASTM D7466: **28/36** mil TOP / BOTTOM	AVE:	**1.05**	mm	**41**	mil

Thickness.....	**1.0 mm**	**40 mil**
Length.....	**216.411** m	**710.0** feet
Width.....	**7.01** m;	**23.0** feet

OIT(Standard) ASTM D3895 minutes **178**

						TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc				**.935**	
MFI ASTM D1238 COND. E GRADE: **7104**	Melt Flow Index 190ºC /2160 g	g/10 min				**.35**	
Carbon Black Content ASTM D4218	Range	%				**2.18**	
Carbon Black Dispersion ASTM D5596	Category					**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Break	**24**	N/mm	**135**	ppi	**3,261**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Break	%				**439.5**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%				**-.68**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**151.6**	N			**34.072**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**322.5**	N			**72.497**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**402.6**	N			**90.502**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs				**CERTIFIED**	

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ROLL # **417440-12** Lot #: **CCC810980** **Liner Type: MICROSPIKE™ LLDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	**0.98**	mm	**39**	mil
	MAX:	**1.15**	mm	**45**	mil
Asperity ASTM D7466: **28/36** mil TOP / BOTTOM	AVE:	**1.04**	mm	**41**	mil

Thickness.....	**1.0 mm**	**40 mil**
Length.....	**216.411** m	**710.0** feet
Width.....	**7.01** m;	**23.0** feet
OIT(Standard) ASTM D3895 minutes **178**		

								TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc					**.935**	
MFI ASTM D1238 COND. E GRADE: **7104**	Melt Flow Index 190ºC /2160 g		g/10 min					**.35**	
Carbon Black Content ASTM D4218	Range		%					**2.18**	
Carbon Black Dispersion ASTM D5596	Category							**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Break	**23**	N/mm	**134**	ppi			**3,261**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Break		%					**439.5**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%					**-.68**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**151.6**	N					**34.072**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**322.5**	N					**72.497**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**402.6**	N					**90.502**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs					**CERTIFIED**	

Customer: **Environmental Specialties**
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ROLL # **417442-12** Lot #: **CCC810980** **Liner Type: MICROSPIKE™ LLDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	**0.93**	mm	**37**	mil
	MAX:	**1.18**	mm	**46**	mil
Asperity ASTM D7466: **36/26** mil TOP / BOTTOM	AVE:	**1.09**	mm	**43**	mil

Thickness.....	**1.0 mm**	**40 mil**
Length.....	**216.411** m	**710.0** feet
Width.....	**7.01** m;	**23.0** feet

OIT(Standard) ASTM D3895 minutes **178**

						TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc				**.935**	
MFI ASTM D1238 COND. E GRADE: **7104**	Melt Flow Index 190ºC /2160 g	g/10 min				**.35**	
Carbon Black Content ASTM D4218	Range	%				**2.18**	
Carbon Black Dispersion ASTM D5596	Category					**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Break	**25**	N/mm	**142**	ppi	**3,316**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Break	%				**523.2**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%				**-.68**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**151.6**	N			**34.072**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**322.5**	N			**72.497**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**402.6**	N			**90.502**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs				**CERTIFIED**	

Customer: **Environmental Specialties**
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ROLL # **417443-12** Lot #: **CCC810980** **Liner Type: MICROSPIKE™ LLDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	**1.0**	**mm**	**40**	**mil**
	MIN:	**0.96**	mm	**38**	mil	Length.....	**216.411**	m	**710.0**	feet
	MAX:	**1.10**	mm	**43**	mil	Width.....	**7.01**	m;	**23.0**	feet
Asperity ASTM D7466: **30/38** mil TOP / BOTTOM	AVE:	**1.04**	mm	**41**	mil	OIT(Standard) ASTM D3895 minutes **178**				

									TEST RESULTS	
Specific Gravity ASTM D792	Density			g/cc					**.935**	
MFI ASTM D1238 COND. E GRADE: **7104**	Melt Flow Index 190ºC /2160 g			g/10 min					**.35**	
Carbon Black Content ASTM D4218	Range			%					**2.18**	
Carbon Black Dispersion ASTM D5596	Category								**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Break	**24**	N/mm			**136**	ppi		**3,316**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Break			%					**523.2**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change			%					**-.68**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**151.6**	N						**34.072**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**322.5**	N						**72.497**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**402.6**	N						**90.502**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs						**CERTIFIED**	

Customer: **Environmental Specialties**
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ROLL # **417444-12** Lot #: **CCC810980** **Liner Type: MICROSPIKE™ LLDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	**0.95**	mm	**37**	mil
	MAX:	**1.10**	mm	**43**	mil
Asperity ASTM D7466: **29/38** mil TOP / BOTTOM	AVE:	**1.05**	mm	**41**	mil

Thickness.....	**1.0 mm**	**40 mil**
Length.....	**216.411** m	**710.0** feet
Width.....	**7.01** m;	**23.0** feet
OIT(Standard) ASTM D3895 minutes	**178**	

								TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc					**.935**	
MFI ASTM D1238 COND. E GRADE: **7104**	Melt Flow Index 190ºC /2160 g		g/10 min					**.35**	
Carbon Black Content ASTM D4218	Range		%					**2.24**	
Carbon Black Dispersion ASTM D5596	Category							**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Break	**24**	N/mm	**137**	ppi			**3,316**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Break		%					**523.2**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%					**-.68**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**151.6**	N					**34.072**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**322.5**	N					**72.497**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**402.6**	N					**90.502**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs					**CERTIFIED**	

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ROLL # **417445-12** Lot #: **CCC810980** **Liner Type: MICROSPIKE™ LLDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	**1.0**	**mm**	**40**	**mil**
	MIN:	**1.00**	mm	**39**	mil	Length.....	**216.411**	m	**710.0**	feet
	MAX:	**1.11**	mm	**44**	mil	Width.....	**7.01**	m;	**23.0**	feet
Asperity ASTM D7466: **30/38** mil TOP / BOTTOM	AVE:	**1.06**	mm	**42**	mil	OIT(Standard) ASTM D3895	minutes	**178**		

									TEST RESULTS	
Specific Gravity ASTM D792	Density			g/cc					**.935**	
MFI ASTM D1238 COND. E GRADE: **7104**	Melt Flow Index 190ºC /2160 g			g/10 min					**.35**	
Carbon Black Content ASTM D4218	Range			%					**2.24**	
Carbon Black Dispersion ASTM D5596	Category								**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Break	**24**	N/mm			**138**	ppi		**3,316**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Break			%					**523.2**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change			%					**-.68**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**151.6**	N						**34.072**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**322.5**	N						**72.497**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**402.6**	N						**90.502**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs						**CERTIFIED**	

Customer: **Environmental Specialties**
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ROLL # **417446-12** Lot #: **CCC810980** **Liner Type: MICROSPIKE™ LLDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	**0.98**	mm	**39**	mil
	MAX:	**1.17**	mm	**46**	mil
Asperity ASTM D7466: **29/36** mil TOP / BOTTOM	AVE:	**1.07**	mm	**42**	mil

Thickness.....	**1.0 mm**	**40 mil**
Length.....	**216.411** m	**710.0** feet
Width.....	**7.01** m;	**23.0** feet

OIT(Standard) ASTM D3895 minutes **178**

								TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc					**.935**	
MFI ASTM D1238 COND. E GRADE: **7104**	Melt Flow Index 190ºC /2160 g		g/10 min					**.35**	
Carbon Black Content ASTM D4218	Range		%					**2.20**	
Carbon Black Dispersion ASTM D5596	Category							**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Break	**24**	N/mm	**139**	ppi			**3,293**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Break		%					**530.9**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%					**-.68**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**158.4**	N					**35.610**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**295.8**	N					**66.503**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**415.2**	N					**93.337**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs					**CERTIFIED**	

Customer: **Environmental Specialties**
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ROLL # **417547-12** Lot #: **CCC810980** **Liner Type: MICROSPIKE™ LLDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	**0.94**	mm	**37**	mil
	MAX:	**1.11**	mm	**44**	mil
Asperity ASTM D7466: **28/37** mil TOP / BOTTOM	AVE:	**1.03**	mm	**41**	mil

Thickness.....	**1.0 mm**	**40 mil**
Length.....	**216.411** m	**710.0** feet
Width.....	**7.01** m;	**23.0** feet
OIT(Standard) ASTM D3895 minutes	**178**	

								TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc					**.935**	
MFI ASTM D1238 COND. E GRADE: **7104**	Melt Flow Index 190ºC /2160 g		g/10 min					**.35**	
Carbon Black Content ASTM D4218	Range		%					**2.20**	
Carbon Black Dispersion ASTM D5596	Category							**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Break	**23**	N/mm	**134**	ppi			**3,293**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Break		%					**530.9**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%					**-.68**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**158.4**	N					**35.610**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**295.8**	N					**66.503**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**415.2**	N					**93.337**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs					**CERTIFIED**	

Customer: **Environmental Specialties**
PO: **16723 Edwards Rd Rural Hall Ash LF**
Destination **Rural Hall, NC**

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ROLL # **417549-12** Lot #: **CCC810980** **Liner Type: MICROSPIKE™ LLDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.0 mm	40 mil
	MIN:	0.97	mm	38	mil	Length.....	216.411 m	710.0 feet
	MAX:	1.12	mm	44	mil	Width.....	7.01 m;	23.0 feet
Asperity ASTM D7466: 27/36 mil TOP / BOTTOM	AVE:	1.04	mm	41	mil	OIT(Standard) ASTM D3895 minutes 178		

								TEST RESULTS	
Specific Gravity ASTM D792	Density				g/cc			.935	
MFI ASTM D1238 COND. E GRADE: 7104	Melt Flow Index 190ºC /2160 g				g/10 min			.35	
Carbon Black Content ASTM D4218	Range				%			2.08	
Carbon Black Dispersion ASTM D5596	Category							10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Break	24	N/mm	135	ppi			3,293	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Break				%			530.9	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change				%			-.68	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	158.4	N					35.610	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	295.8	N					66.503	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	415.2	N					93.337	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs					CERTIFIED	

Customer: **Environmental Specialties**
PO: **16723 Edwards Rd Rural Hall Ash LF**
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ROLL # **417550-12** Lot #: **CCC810980** **Liner Type: MICROSPIKE™ LLDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.0 mm	40 mil
	MIN:	0.98	mm	39	mil	Length.....	216.411 m	710.0 feet
	MAX:	1.19	mm	47	mil	Width.....	7.01 m;	23.0 feet
Asperity ASTM D7466: 28/35 mil TOP / BOTTOM	AVE:	1.08	mm	43	mil	OIT(Standard) ASTM D3895 minutes 178		

								TEST RESULTS	
Specific Gravity ASTM D792	Density			g/cc				.935	
MFI ASTM D1238 COND. E GRADE: 7104	Melt Flow Index 190ºC /2160 g			g/10 min				.35	
Carbon Black Content ASTM D4218	Range			%				2.08	
Carbon Black Dispersion ASTM D5596	Category							10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Break	25	N/mm		140	ppi		3,293	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Break			%				530.9	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change			%				-.68	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	158.4	N					35.610	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	295.8	N					66.503	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	415.2	N					93.337	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs					CERTIFIED	

Customer: **Environmental Specialties**
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ROLL # **417551-12** Lot #: **CCC810980** **Liner Type: MICROSPIKE™ LLDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	**1.01**	mm	**40**	mil
	MAX:	**1.08**	mm	**43**	mil
Asperity ASTM D7466: **27/35** mil TOP / BOTTOM	AVE:	**1.06**	mm	**42**	mil

Thickness.....	**1.0 mm**	**40 mil**
Length.....	**216.411** m	**710.0** feet
Width.....	**7.01** m;	**23.0** feet

OIT(Standard) ASTM D3895 minutes **178**

						TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc				**.935**	
MFI ASTM D1238 COND. E GRADE: **7104**	Melt Flow Index 190ºC /2160 g	g/10 min				**.35**	
Carbon Black Content ASTM D4218	Range	%				**2.21**	
Carbon Black Dispersion ASTM D5596	Category					**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Break	**26**	N/mm	**146**	ppi	**3,499**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Break	%				**533.0**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%				**-.68**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**158.4**	N			**35.610**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**295.8**	N			**66.503**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**415.2**	N			**93.337**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs				**CERTIFIED**	

Customer: **Environmental Specialties**
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ROLL # **417552-12** Lot #: **CCC810980** **Liner Type: MICROSPIKE™ LLDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.0 mm	40 mil
	MIN:	1.01	mm	40	mil	Length.....	216.411 m	710.0 feet
	MAX:	1.25	mm	49	mil	Width.....	7.01 m;	23.0 feet
Asperity ASTM D7466: 29/35 mil TOP / BOTTOM	AVE:	1.09	mm	43	mil	OIT(Standard) ASTM D3895 minutes 178		

								TEST RESULTS	
Specific Gravity ASTM D792	Density			g/cc				.935	
MFI ASTM D1238 COND. E GRADE: 7104	Melt Flow Index 190ºC /2160 g			g/10 min				.35	
Carbon Black Content ASTM D4218	Range			%				2.21	
Carbon Black Dispersion ASTM D5596	Category							10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Break	26	N/mm		150	ppi		3,499	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Break			%				533.0	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change			%				-.68	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	158.4	N					35.610	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	295.8	N					66.503	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	415.2	N					93.337	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs					CERTIFIED	

Customer: **Environmental Specialties**
PO: **16723 Edwards Rd Rural Hall Ash LF**
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ROLL # **417553-12** Lot #: **CCC810980** **Liner Type: MICROSPIKE™ LLDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	**1.0**	**mm**	**40**	**mil**
	MIN:	**0.95**	mm	**37**	mil	Length.....	**216.411**	m	**710.0**	feet
	MAX:	**1.13**	mm	**44**	mil	Width.....	**7.01**	m;	**23.0**	feet
Asperity ASTM D7466: **27/36** mil TOP / BOTTOM	AVE:	**1.06**	mm	**42**	mil	OIT(Standard) ASTM D3895 minutes **178**				

									TEST RESULTS	
Specific Gravity ASTM D792	Density			g/cc					**.935**	
MFI ASTM D1238 COND. E GRADE: **7104**	Melt Flow Index 190ºC /2160 g			g/10 min					**.35**	
Carbon Black Content ASTM D4218	Range			%					**2.21**	
Carbon Black Dispersion ASTM D5596	Category								**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Break	**26**	N/mm			**146**	ppi		**3,499**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Break			%					**533.0**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change			%					**-.68**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**158.4**	N						**35.610**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**295.8**	N						**66.503**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**415.2**	N						**93.337**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs						**CERTIFIED**	

Customer: **Environmental Specialties**
PO: **16723 Edwards Rd Rural Hall Ash LF**
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ROLL # **417554-12** Lot #: **CCC810980** **Liner Type: MICROSPIKE™ LLDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.0 mm	40 mil
	MIN:	1.00	mm	39	mil	Length.....	216.411 m	710.0 feet
	MAX:	1.12	mm	44	mil	Width.....	7.01 m;	23.0 feet
Asperity ASTM D7466: 27/35 mil TOP / BOTTOM	AVE:	1.07	mm	42	mil	OIT(Standard) ASTM D3895 minutes 178		

								TEST RESULTS	
Specific Gravity ASTM D792	Density			g/cc				.935	
MFI ASTM D1238 COND. E GRADE: 7104	Melt Flow Index 190ºC /2160 g			g/10 min				.35	
Carbon Black Content ASTM D4218	Range			%				2.21	
Carbon Black Dispersion ASTM D5596	Category							10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Break	26	N/mm		147	ppi		3,499	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Break			%				533.0	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change			%				-.68	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	158.4	N					35.610	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	295.8	N					66.503	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	415.2	N					93.337	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs					CERTIFIED	

Customer: **Environmental Specialties**
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ROLL # **417555-12** Lot #: **CCC810980** **Liner Type: MICROSPIKE™ LLDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	**1.0**	**mm**	**40**	**mil**
	MIN:	**0.94**	mm	**37**	mil	Length.....	**216.411**	m	**710.0**	feet
	MAX:	**1.12**	mm	**44**	mil	Width.....	**7.01**	m;	**23.0**	feet
Asperity ASTM D7466: **29/39** mil TOP / BOTTOM	AVE:	**1.05**	mm	**41**	mil	OIT(Standard) ASTM D3895 minutes **178**				

									TEST RESULTS	
Specific Gravity ASTM D792	Density			g/cc					**.935**	
MFI ASTM D1238 COND. E GRADE: **7104**	Melt Flow Index 190ºC /2160 g			g/10 min					**.35**	
Carbon Black Content ASTM D4218	Range			%					**2.21**	
Carbon Black Dispersion ASTM D5596	Category								**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Break	**25**	N/mm			**145**	ppi		**3,499**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Break			%					**533.0**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change			%					**-.68**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**158.4**	N						**35.610**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**295.8**	N						**66.503**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**415.2**	N						**93.337**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs							**CERTIFIED**	

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ROLL # **417556-12** Lot #: **CCC810980** **Liner Type: MICROSPIKE™ LLDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.0 mm	40 mil
	MIN:	0.91	mm	36	mil	Length.....	216.411 m	710.0 feet
	MAX:	1.15	mm	45	mil	Width.....	7.01 m;	23.0 feet
Asperity ASTM D7466: 29/37 mil TOP / BOTTOM	AVE:	1.06	mm	42	mil	OIT(Standard) ASTM D3895 minutes 178		

								TEST RESULTS	
Specific Gravity ASTM D792	Density			g/cc				.935	
MFI ASTM D1238 COND. E GRADE: 7104	Melt Flow Index 190ºC /2160 g			g/10 min				.35	
Carbon Black Content ASTM D4218	Range			%				2.23	
Carbon Black Dispersion ASTM D5596	Category							10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Break	23	N/mm			132	ppi	3,156	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Break			%				517.4	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change			%				-.68	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	159.4	N					35.838	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	309.6	N					69.597	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	423.0	N					95.097	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs					CERTIFIED	

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ROLL # **417557-12** Lot #: **CCC810980** **Liner Type: MICROSPIKE™ LLDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.0 mm	40 mil
	MIN:	1.00	mm	39	mil	Length.....	216.411 m	710.0 feet
	MAX:	1.18	mm	46	mil	Width.....	7.01 m;	23.0 feet
Asperity ASTM D7466: 29/38 mil TOP / BOTTOM	AVE:	1.06	mm	42	mil	OIT(Standard) ASTM D3895 minutes 178		

								TEST RESULTS	
Specific Gravity ASTM D792	Density			g/cc				.935	
MFI ASTM D1238 COND. E GRADE: 7104	Melt Flow Index 190ºC /2160 g			g/10 min				.35	
Carbon Black Content ASTM D4218	Range			%				2.23	
Carbon Black Dispersion ASTM D5596	Category							10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Break	23	N/mm			132	ppi	3,156	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Break			%				517.4	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change			%				-.68	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	159.4	N					35.838	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	309.6	N					69.597	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	423.0	N					95.097	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs					CERTIFIED	

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ROLL # **417658-12** Lot #: **CCC810980** **Liner Type: MICROSPIKE™ LLDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.0 mm	40 mil
	MIN:	0.99	mm	39	mil	Length.....	216.411 m	710.0 feet
	MAX:	1.17	mm	46	mil	Width.....	7.01 m;	23.0 feet
Asperity ASTM D7466: 28/37 mil TOP / BOTTOM	AVE:	1.07	mm	42	mil	OIT(Standard) ASTM D3895 minutes 178		

								TEST RESULTS	
Specific Gravity ASTM D792	Density			g/cc				.935	
MFI ASTM D1238 COND. E GRADE: 7104	Melt Flow Index 190ºC /2160 g			g/10 min				.35	
Carbon Black Content ASTM D4218	Range			%				2.23	
Carbon Black Dispersion ASTM D5596	Category							10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Break	23	N/mm			133	ppi	3,156	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Break			%				517.4	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change			%				-.68	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	159.4	N					35.838	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	309.6	N					69.597	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	423.0	N					95.097	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs					CERTIFIED	

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ROLL # **417659-12** Lot #: **CCC810980** **Liner Type: MICROSPIKE™ LLDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.0 mm	40 mil
	MIN:	0.93	mm	37	mil	Length.....	216.411 m	710.0 feet
	MAX:	1.15	mm	45	mil	Width.....	7.01 m;	23.0 feet
Asperity ASTM D7466: 29/37 mil TOP / BOTTOM	AVE:	1.08	mm	43	mil	OIT(Standard) ASTM D3895 minutes 178		

								TEST RESULTS	
Specific Gravity ASTM D792	Density			g/cc				.935	
MFI ASTM D1238 COND. E GRADE: 7104	Melt Flow Index 190ºC /2160 g			g/10 min				.35	
Carbon Black Content ASTM D4218	Range			%				2.15	
Carbon Black Dispersion ASTM D5596	Category							10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Break	24	N/mm			134	ppi	3,156	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Break			%				517.4	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change			%				-.68	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	159.4	N					35.838	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	309.6	N					69.597	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	423.0	N					95.097	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs					CERTIFIED	

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ROLL # **417660-12** Lot #: **CCC810980** **Liner Type: MICROSPIKE™ LLDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.0 mm	40 mil
	MIN:	1.02	mm	40	mil	Length.....	216.411 m	710.0 feet
	MAX:	1.21	mm	48	mil	Width.....	7.01 m;	23.0 feet
Asperity ASTM D7466: 29/39 mil TOP / BOTTOM	AVE:	1.08	mm	43	mil	OIT(Standard) ASTM D3895 minutes 178		

								TEST RESULTS	
Specific Gravity ASTM D792	Density			g/cc				.935	
MFI ASTM D1238 COND. E GRADE: 7104	Melt Flow Index 190ºC /2160 g			g/10 min				.35	
Carbon Black Content ASTM D4218	Range			%				2.15	
Carbon Black Dispersion ASTM D5596	Category							10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Break	24	N/mm		134	ppi		3,156	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Break			%				517.4	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change			%				-.68	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	159.4	N					35.838	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	309.6	N					69.597	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	423.0	N					95.097	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs					CERTIFIED	

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ROLL # **417661-12** Lot #: **CCC810980** **Liner Type: MICROSPIKE™ LLDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.0 mm	40 mil
	MIN:	1.01	mm	40	mil	Length.....	216.411 m	710.0 feet
	MAX:	1.17	mm	46	mil	Width.....	7.01 m;	23.0 feet
Asperity ASTM D7466: 29/36 mil TOP / BOTTOM	AVE:	1.09	mm	43	mil	OIT(Standard) ASTM D3895 minutes 178		

								TEST RESULTS	
Specific Gravity ASTM D792	Density			g/cc				.935	
MFI ASTM D1238 COND. E GRADE: 7104	Melt Flow Index 190ºC /2160 g			g/10 min				.35	
Carbon Black Content ASTM D4218	Range			%				2.25	
Carbon Black Dispersion ASTM D5596	Category							10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Break	25	N/mm		144	ppi		3,358	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Break			%				512.5	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change			%				-.68	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	159.4	N					35.838	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	309.6	N					69.597	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	423.0	N					95.097	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs					CERTIFIED	

Customer: **Environmental Specialties**
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ROLL # **417662-12** Lot #: **CCC810980** **Liner Type: MICROSPIKE™ LLDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.0 mm	40 mil
	MIN:	0.95	mm	37	mil	Length.....	216.411 m	710.0 feet
	MAX:	1.17	mm	46	mil	Width.....	7.01 m;	23.0 feet
Asperity ASTM D7466: 28/37 mil TOP / BOTTOM	AVE:	1.08	mm	43	mil	OIT(Standard) ASTM D3895 minutes 178		

								TEST RESULTS	
Specific Gravity ASTM D792	Density			g/cc				.935	
MFI ASTM D1238 COND. E GRADE: 7104	Melt Flow Index 190ºC /2160 g			g/10 min				.35	
Carbon Black Content ASTM D4218	Range			%				2.25	
Carbon Black Dispersion ASTM D5596	Category							10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Break	25	N/mm		143	ppi		3,358	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Break			%				512.5	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change			%				-.68	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	159.4	N					35.838	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	309.6	N					69.597	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	423.0	N					95.097	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs					CERTIFIED	

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ROLL # **417663-12** Lot #: **CCC810980** **Liner Type: MICROSPIKE™ LLDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.0 mm	40 mil
	MIN:	0.99	mm	39	mil	Length.....	216.411 m	710.0 feet
	MAX:	1.13	mm	44	mil	Width.....	7.01 m;	23.0 feet
Asperity ASTM D7466: 28/36 mil TOP / BOTTOM	AVE:	1.07	mm	42	mil	OIT(Standard) ASTM D3895 minutes 178		

								TEST RESULTS	
Specific Gravity ASTM D792	Density			g/cc				.935	
MFI ASTM D1238 COND. E GRADE: 7104	Melt Flow Index 190ºC /2160 g			g/10 min				.35	
Carbon Black Content ASTM D4218	Range			%				2.25	
Carbon Black Dispersion ASTM D5596	Category							10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Break	25	N/mm		141	ppi		3,358	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Break			%				512.5	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change			%				-.68	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	159.4	N					35.838	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	309.6	N					69.597	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	423.0	N					95.097	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs					CERTIFIED	

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ROLL # **417664-12** Lot #: **CCC810980** **Liner Type: MICROSPIKE™ LLDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.0 mm	40 mil
	MIN:	1.06	mm	42	mil	Length.....	216.411 m	710.0 feet
	MAX:	1.23	mm	48	mil	Width.....	7.01 m;	23.0 feet
Asperity ASTM D7466: 26/35 mil TOP / BOTTOM	AVE:	1.14	mm	45	mil	OIT(Standard) ASTM D3895 minutes 178		

								TEST RESULTS	
Specific Gravity ASTM D792	Density			g/cc				.935	
MFI ASTM D1238 COND. E GRADE: 7104	Melt Flow Index 190ºC /2160 g			g/10 min				.35	
Carbon Black Content ASTM D4218	Range			%				2.25	
Carbon Black Dispersion ASTM D5596	Category							10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Break	26	N/mm		151	ppi		3,358	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Break			%				512.5	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change			%				-.68	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	159.4	N					35.838	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	309.6	N					69.597	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	423.0	N					95.097	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs					CERTIFIED	

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ROLL # **417665-12** Lot #: **CCC810980** **Liner Type: MICROSPIKE™ LLDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.0 mm	40 mil
	MIN:	1.06	mm	42	mil	Length.....	216.411 m	710.0 feet
	MAX:	1.23	mm	48	mil	Width.....	7.01 m;	23.0 feet
Asperity ASTM D7466: 27/35 mil TOP / BOTTOM	AVE:	1.14	mm	45	mil	OIT(Standard) ASTM D3895 minutes 178		

								TEST RESULTS	
Specific Gravity ASTM D792	Density			g/cc				.935	
MFI ASTM D1238 COND. E GRADE: 7104	Melt Flow Index 190ºC /2160 g			g/10 min				.35	
Carbon Black Content ASTM D4218	Range			%				2.25	
Carbon Black Dispersion ASTM D5596	Category							10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Break	26	N/mm			151	ppi	3,358	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Break			%				512.5	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change			%				-.68	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	159.4	N					35.838	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	309.6	N					69.597	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	423.0	N					95.097	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs					CERTIFIED	

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ROLL # **417666-12** Lot #: **CCC810980** **Liner Type: MICROSPIKE™ LLDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.0 mm	40 mil
	MIN:	1.07	mm	42	mil	Length.....	216.411 m	710.0 feet
	MAX:	1.21	mm	48	mil	Width.....	7.01 m;	23.0 feet
Asperity ASTM D7466: 27/37 mil TOP / BOTTOM	AVE:	1.13	mm	44	mil	OIT(Standard) ASTM D3895 minutes 178		

								TEST RESULTS	
Specific Gravity ASTM D792	Density			g/cc				.935	
MFI ASTM D1238 COND. E GRADE: 7104	Melt Flow Index 190ºC /2160 g			g/10 min				.35	
Carbon Black Content ASTM D4218	Range			%				2.12	
Carbon Black Dispersion ASTM D5596	Category							10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Break	27	N/mm		153	ppi		3,437	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Break			%				518.8	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change			%				-.68	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	161.7	N					36.364	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	333.6	N					74.992	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	425.5	N					95.656	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs					CERTIFIED	

Customer: **Environmental Specialties**
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ROLL # **417667-12** Lot #: **CCC810980** **Liner Type: MICROSPIKE™ LLDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	**1.05**	mm	**41**	mil
	MAX:	**1.20**	mm	**47**	mil
Asperity ASTM D7466: **28/36** mil TOP / BOTTOM	AVE:	**1.12**	mm	**44**	mil

Thickness.....	**1.0 mm**	**40 mil**
Length.....	**216.411** m	**710.0** feet
Width.....	**7.01** m;	**23.0** feet
OIT(Standard) ASTM D3895 minutes	**178**	

								TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc					**.935**	
MFI ASTM D1238 COND. E GRADE: **7104**	Melt Flow Index 190ºC /2160 g		g/10 min					**.35**	
Carbon Black Content ASTM D4218	Range		%					**2.12**	
Carbon Black Dispersion ASTM D5596	Category							**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Break	**27**	N/mm	**152**	ppi			**3,437**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Break		%					**518.8**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%					**-.68**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**161.7**	N					**36.364**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**333.6**	N					**74.992**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**425.5**	N					**95.656**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs					**CERTIFIED**	

Customer: **Environmental Specialties**
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ROLL # **417668-12** Lot #: **CCC810980** **Liner Type: MICROSPIKE™ LLDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.0 mm	40 mil
	MIN:	0.96	mm	38	mil	Length.....	216.411 m	710.0 feet
	MAX:	1.16	mm	46	mil	Width.....	7.01 m;	23.0 feet
Asperity ASTM D7466: 28/38 mil TOP / BOTTOM	AVE:	1.04	mm	41	mil	OIT(Standard) ASTM D3895 minutes 178		

								TEST RESULTS	
Specific Gravity ASTM D792	Density			g/cc				.935	
MFI ASTM D1238 COND. E GRADE: 7104	Melt Flow Index 190ºC /2160 g			g/10 min				.35	
Carbon Black Content ASTM D4218	Range			%				2.12	
Carbon Black Dispersion ASTM D5596	Category							10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Break	25	N/mm		141	ppi		3,437	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Break			%				518.8	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change			%				-.68	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	161.7	N					36.364	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	333.6	N					74.992	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	425.5	N					95.656	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs					CERTIFIED	

Customer: **Environmental Specialties**
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ROLL # **417669-12** Lot #: **CCC810980** **Liner Type: MICROSPIKE™ LLDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.0 mm	40 mil
	MIN:	0.87	mm	34	mil	Length.....	216.411 m	710.0 feet
	MAX:	1.10	mm	43	mil	Width.....	7.01 m;	23.0 feet
Asperity ASTM D7466: 28/38 mil TOP / BOTTOM	AVE:	1.02	mm	40	mil	OIT(Standard) ASTM D3895 minutes 178		

								TEST RESULTS	
Specific Gravity ASTM D792	Density				g/cc			.935	
MFI ASTM D1238 COND. E GRADE: 7104	Melt Flow Index 190ºC /2160 g				g/10 min			.35	
Carbon Black Content ASTM D4218	Range				%			2.17	
Carbon Black Dispersion ASTM D5596	Category							10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Break	24	N/mm	138	ppi			3,437	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Break				%			518.8	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change				%			-.68	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	161.7	N					36.364	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	333.6	N					74.992	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	425.5	N					95.656	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs					CERTIFIED	

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ROLL # **417770-12** Lot #: **CCC810980** **Liner Type: MICROSPIKE™ LLDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.0 mm	40 mil
	MIN:	0.96	mm	38	mil	Length.....	216.411 m	710.0 feet
	MAX:	1.14	mm	45	mil	Width.....	7.01 m;	23.0 feet
Asperity ASTM D7466: 30/39 mil TOP / BOTTOM	AVE:	1.05	mm	41	mil	OIT(Standard) ASTM D3895 minutes 178		

								TEST RESULTS	
Specific Gravity ASTM D792	Density			g/cc				.935	
MFI ASTM D1238 COND. E GRADE: 7104	Melt Flow Index 190ºC /2160 g			g/10 min				.35	
Carbon Black Content ASTM D4218	Range			%				2.17	
Carbon Black Dispersion ASTM D5596	Category							10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Break	25	N/mm		142	ppi		3,437	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Break			%				518.8	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change			%				-.68	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	161.7	N					36.364	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	333.6	N					74.992	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	425.5	N					95.656	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs					CERTIFIED	

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ROLL # **417771-12** Lot #: **CCC810100** **Liner Type: MICROSPIKE™ LLDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	**0.96**	mm	**38**	mil
	MAX:	**1.13**	mm	**44**	mil
Asperity ASTM D7466: **28/38** mil TOP / BOTTOM	AVE:	**1.05**	mm	**41**	mil

Thickness.....	**1.0 mm**	**40 mil**
Length.....	**216.411** m	**710.0** feet
Width.....	**7.01** m;	**23.0** feet

OIT(Standard) ASTM D3895 minutes **175**

						TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc				**.937**	
MFI ASTM D1238 COND. E GRADE: **7104**	Melt Flow Index 190ºC /2160 g	g/10 min				**.36**	
Carbon Black Content ASTM D4218	Range	%				**2.21**	
Carbon Black Dispersion ASTM D5596	Category					**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Break	**25**	N/mm	**143**	ppi	**3,458**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Break	%				**526.1**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%				**-1.23**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**161.7**	N			**36.364**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**333.6**	N			**74.992**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**425.5**	N			**95.656**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs				**CERTIFIED**	

Customer: **Environmental Specialties**
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ROLL # **417772-12** Lot #: **CCC810100** **Liner Type: MICROSPIKE™ LLDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.0 mm	40 mil
	MIN:	0.92	mm	36	mil	Length.....	216.411 m	710.0 feet
	MAX:	1.19	mm	47	mil	Width.....	7.01 m;	23.0 feet
Asperity ASTM D7466: 28/38 mil TOP / BOTTOM	AVE:	1.02	mm	40	mil	OIT(Standard) ASTM D3895 minutes 175		

								TEST RESULTS	
Specific Gravity ASTM D792	Density				g/cc			.937	
MFI ASTM D1238 COND. E GRADE: 7104	Melt Flow Index 190ºC /2160 g				g/10 min			.36	
Carbon Black Content ASTM D4218	Range				%			2.21	
Carbon Black Dispersion ASTM D5596	Category							10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Break	24	N/mm	139	ppi			3,458	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Break				%			526.1	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change				%			-1.23	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	161.7	N					36.364	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	333.6	N					74.992	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	425.5	N					95.656	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs					CERTIFIED	

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ROLL # **417773-12** Lot #: **CCC810100** **Liner Type: MICROSPIKE™ LLDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	**0.97**	mm	**38**	mil
	MAX:	**1.14**	mm	**45**	mil
Asperity ASTM D7466: **27/35** mil TOP / BOTTOM	AVE:	**1.06**	mm	**42**	mil

Thickness.....	**1.0 mm**	**40 mil**
Length.....	**216.411** m	**710.0** feet
Width.....	**7.01** m;	**23.0** feet

OIT(Standard) ASTM D3895 minutes **175**

								TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc					**.937**	
MFI ASTM D1238 COND. E GRADE: **7104**	Melt Flow Index 190ºC /2160 g		g/10 min					**.36**	
Carbon Black Content ASTM D4218	Range		%					**2.09**	
Carbon Black Dispersion ASTM D5596	Category							**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Break	**25**	N/mm	**144**	ppi			**3,458**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Break		%					**526.1**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%					**-1.23**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**161.7**	N					**36.364**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**333.6**	N					**74.992**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**425.5**	N					**95.656**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs					**CERTIFIED**	

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ROLL # **417774-12** Lot #: **CCC810100** **Liner Type: MICROSPIKE™ LLDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.0 mm	40 mil
	MIN:	1.00	mm	39	mil	Length.....	216.411 m	710.0 feet
	MAX:	1.17	mm	46	mil	Width.....	7.01 m;	23.0 feet
Asperity ASTM D7466: 26/34 mil TOP / BOTTOM	AVE:	1.10	mm	43	mil	OIT(Standard) ASTM D3895 minutes 175		

								TEST RESULTS	
Specific Gravity ASTM D792	Density			g/cc				.937	
MFI ASTM D1238 COND. E GRADE: 7104	Melt Flow Index 190ºC /2160 g			g/10 min				.36	
Carbon Black Content ASTM D4218	Range			%				2.09	
Carbon Black Dispersion ASTM D5596	Category							10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Break	26	N/mm	150	ppi			3,458	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Break			%				526.1	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change			%				-1.23	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	161.7	N					36.364	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	333.6	N					74.992	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	425.5	N					95.656	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs					CERTIFIED	

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ROLL # **417775-12** Lot #: **CCC810100** **Liner Type: MICROSPIKE™ LLDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	**1.04**	mm	**41**	mil
	MAX:	**1.16**	mm	**46**	mil
Asperity ASTM D7466: **24/34** mil TOP / BOTTOM	AVE:	**1.10**	mm	**43**	mil

Thickness.....	**1.0 mm**	**40 mil**
Length.....	**216.411** m	**710.0** feet
Width.....	**7.01** m;	**23.0** feet

OIT(Standard) ASTM D3895 minutes **175**

								TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc					**.937**	
MFI ASTM D1238 COND. E GRADE: **7104**	Melt Flow Index 190ºC /2160 g		g/10 min					**.36**	
Carbon Black Content ASTM D4218	Range		%					**2.09**	
Carbon Black Dispersion ASTM D5596	Category							**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Break	**26**	N/mm	**150**	ppi			**3,458**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Break		%					**526.1**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%					**-1.23**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**161.7**	N					**36.364**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**333.6**	N					**74.992**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**425.5**	N					**95.656**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs					**CERTIFIED**	

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ROLL # **417776-12** Lot #: **CCC810100** **Liner Type: MICROSPIKE™ LLDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	**0.92**	mm	**36**	mil
	MAX:	**1.16**	mm	**46**	mil
Asperity ASTM D7466: **28/34** mil TOP / BOTTOM	AVE:	**1.05**	mm	**41**	mil

Thickness.....	**1.0 mm**	**40 mil**
Length.....	**216.411** m	**710.0** feet
Width.....	**7.01** m;	**23.0** feet

OIT(Standard) ASTM D3895 minutes **175**

						TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc				**.937**	
MFI ASTM D1238 COND. E GRADE: **7104**	Melt Flow Index 190ºC /2160 g	g/10 min				**.36**	
Carbon Black Content ASTM D4218	Range	%				**2.35**	
Carbon Black Dispersion ASTM D5596	Category					**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Break	**24**	N/mm	**134**	ppi	**3,254**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Break	%				**506.2**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%				**-1.23**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**150.9**	N			**33.930**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**365.0**	N			**82.065**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**423.5**	N			**95.213**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs				**CERTIFIED**	

Customer: **Environmental Specialties**
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ROLL # **417777-12** Lot #: **CCC810100** **Liner Type: MICROSPIKE™ LLDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	**0.94**	mm	**37**	mil
	MAX:	**1.09**	mm	**43**	mil
Asperity ASTM D7466: **26/32** mil TOP / BOTTOM	AVE:	**1.04**	mm	**41**	mil

Thickness.....	**1.0 mm**	**40 mil**
Length.....	**216.411** m	**710.0** feet
Width.....	**7.01** m;	**23.0** feet
OIT(Standard) ASTM D3895 minutes	**175**	

								TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc					**.937**	
MFI ASTM D1238 COND. E GRADE: **7104**	Melt Flow Index 190ºC /2160 g		g/10 min					**.36**	
Carbon Black Content ASTM D4218	Range		%					**2.35**	
Carbon Black Dispersion ASTM D5596	Category							**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Break	**23**	N/mm	**133**	ppi			**3,254**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Break		%					**506.2**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%					**-1.23**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**150.9**	N					**33.930**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**365.0**	N					**82.065**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**423.5**	N					**95.213**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs					**CERTIFIED**	

Customer: **Environmental Specialties**
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ROLL # **417778-12** Lot #: **CCC810100** **Liner Type: MICROSPIKE™ LLDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.0 mm	40 mil
	MIN:	0.97	mm	38	mil	Length.....	216.411 m	710.0 feet
	MAX:	1.15	mm	45	mil	Width.....	7.01 m;	23.0 feet
Asperity ASTM D7466: 25/35 mil TOP / BOTTOM	AVE:	1.06	mm	42	mil	OIT(Standard) ASTM D3895 minutes 175		

								TEST RESULTS	
Specific Gravity ASTM D792	Density			g/cc				.937	
MFI ASTM D1238 COND. E GRADE: 7104	Melt Flow Index 190ºC /2160 g			g/10 min				.36	
Carbon Black Content ASTM D4218	Range			%				2.35	
Carbon Black Dispersion ASTM D5596	Category							10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Break	24	N/mm		136	ppi		3,254	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Break			%				506.2	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change			%				-1.23	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	150.9	N					33.930	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	365.0	N					82.065	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	423.5	N					95.213	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs					CERTIFIED	

Customer: **Environmental Specialties**
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ROLL # **417779-12** Lot #: **CCC810100** **Liner Type: MICROSPIKE™ LLDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.0 mm	40 mil
	MIN:	0.97	mm	38	mil	Length.....	216.411 m	710.0 feet
	MAX:	1.11	mm	44	mil	Width.....	7.01 m;	23.0 feet
Asperity ASTM D7466: 26/33 mil TOP / BOTTOM	AVE:	1.05	mm	41	mil	OIT(Standard) ASTM D3895 minutes 175		

								TEST RESULTS	
Specific Gravity ASTM D792	Density			g/cc				.937	
MFI ASTM D1238 COND. E GRADE: 7104	Melt Flow Index 190ºC /2160 g			g/10 min				.36	
Carbon Black Content ASTM D4218	Range			%				2.35	
Carbon Black Dispersion ASTM D5596	Category							10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Break	24	N/mm		134	ppi		3,254	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Break			%				506.2	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change			%				-1.23	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	150.9	N					33.930	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	365.0	N					82.065	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	423.5	N					95.213	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs					CERTIFIED	

Customer: **Environmental Specialties**
PO: **16723 Edwards Rd Rural Hall Ash LF**
Destination **Rural Hall, NC**

Date:..... **4/29/2012**

Signature.....
Quality Control Department

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ROLL # **417780-12** Lot #: **CCC810100** **Liner Type: MICROSPIKE™ LLDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.0 mm	40 mil
	MIN:	0.93	mm	37	mil	Length.....	216.411 m	710.0 feet
	MAX:	1.14	mm	45	mil	Width.....	7.01 m;	23.0 feet
Asperity ASTM D7466: 28/39 mil TOP / BOTTOM	AVE:	1.02	mm	40	mil	OIT(Standard) ASTM D3895 minutes 175		

								TEST RESULTS	
Specific Gravity ASTM D792	Density			g/cc				.937	
MFI ASTM D1238 COND. E GRADE: 7104	Melt Flow Index 190ºC /2160 g			g/10 min				.36	
Carbon Black Content ASTM D4218	Range			%				2.35	
Carbon Black Dispersion ASTM D5596	Category							10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Break	23	N/mm			131	ppi	3,254	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Break			%				506.2	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change			%				-1.23	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	150.9	N					33.930	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	365.0	N					82.065	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	423.5	N					95.213	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs					CERTIFIED	

Customer: **Environmental Specialties**
PO: **16723 Edwards Rd Rural Hall Ash LF**
Destination **Rural Hall, NC**

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ROLL # **417781-12** Lot #: **CCC810100** **Liner Type: MICROSPIKE™ LLDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	**0.93**	mm	**37**	mil
	MAX:	**1.21**	mm	**48**	mil
Asperity ASTM D7466: **27/36** mil TOP / BOTTOM	AVE:	**1.05**	mm	**41**	mil

Thickness.....	**1.0 mm**	**40 mil**
Length.....	**216.411** m	**710.0** feet
Width.....	**7.01** m;	**23.0** feet

OIT(Standard) ASTM D3895 minutes **175**

						TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc				**.937**	
MFI ASTM D1238 COND. E GRADE: **7104**	Melt Flow Index 190ºC /2160 g	g/10 min				**.36**	
Carbon Black Content ASTM D4218	Range	%				**2.14**	
Carbon Black Dispersion ASTM D5596	Category					**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Break	**26**	N/mm	**148**	ppi	**3,572**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Break	%				**524.6**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%				**-1.23**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**150.9**	N			**33.930**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**365.0**	N			**82.065**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**423.5**	N			**95.213**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs				**CERTIFIED**	

Customer: **Environmental Specialties**
PO: **16723 Edwards Rd Rural Hall Ash LF**
Destination **Rural Hall, NC**

Date:..... **4/29/2012**

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ROLL # **418101-12** Lot #: **CCC810100** **Liner Type: MICROSPIKE™ LLDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	**0.96**	mm	**38**	mil
	MAX:	**1.16**	mm	**46**	mil
Asperity ASTM D7466: **29/37** mil TOP / BOTTOM	AVE:	**1.08**	mm	**43**	mil

Thickness.....	**1.0 mm**	**40 mil**
Length.....	**216.411** m	**710.0** feet
Width.....	**7.01** m;	**23.0** feet

OIT(Standard) ASTM D3895 minutes **175**

								TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc					**.937**	
MFI ASTM D1238 COND. E GRADE: **7104**	Melt Flow Index 190ºC /2160 g		g/10 min					**.36**	
Carbon Black Content ASTM D4218	Range		%					**2.14**	
Carbon Black Dispersion ASTM D5596	Category							**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Break	**27**	N/mm	**152**	ppi			**3,572**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Break		%					**524.6**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%					**-1.23**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**150.9**	N					**33.930**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**365.0**	N					**82.065**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**423.5**	N					**95.213**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs					**CERTIFIED**	

Customer: **Environmental Specialties**
PO: **16723 Edwards Rd Rural Hall Ash LF**
Destination **Rural Hall, NC**

Date:..... **4/30/2012**

Signature.....
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ROLL # **418102-12** Lot #: **CCC810100** **Liner Type: MICROSPIKE™ LLDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	**1.0**	**mm**	**40**	**mil**
	MIN:	**0.95**	mm	**37**	mil	Length.....	**216.411**	m	**710.0**	feet
	MAX:	**1.11**	mm	**44**	mil	Width.....	**7.01**	m;	**23.0**	feet
Asperity ASTM D7466: **30/38** mil TOP / BOTTOM	AVE:	**1.05**	mm	**41**	mil	OIT(Standard) ASTM D3895 minutes **175**				

									TEST RESULTS	
Specific Gravity ASTM D792	Density			g/cc					**.937**	
MFI ASTM D1238 COND. E GRADE: **7104**	Melt Flow Index 190ºC /2160 g			g/10 min					**.36**	
Carbon Black Content ASTM D4218	Range			%					**2.14**	
Carbon Black Dispersion ASTM D5596	Category								**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Break	**26**	N/mm			**148**	ppi		**3,572**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Break			%					**524.6**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change			%					**-1.23**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**150.9**	N						**33.930**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**365.0**	N						**82.065**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**423.5**	N						**95.213**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs						**CERTIFIED**	

Customer: **Environmental Specialties**
PO: **16723 Edwards Rd Rural Hall Ash LF**
Destination **Rural Hall, NC**

Date:..... **4/30/2012**

Signature.....
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ROLL # **418103-12** Lot #: **CCC810100** **Liner Type: MICROSPIKE™ LLDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.0 mm	40 mil
	MIN:	0.92	mm	36	mil	Length.....	216.411 m	710.0 feet
	MAX:	1.14	mm	45	mil	Width.....	7.01 m;	23.0 feet
Asperity ASTM D7466: 30/38 mil TOP / BOTTOM	AVE:	1.05	mm	41	mil	OIT(Standard) ASTM D3895 minutes 175		

								TEST RESULTS	
Specific Gravity ASTM D792	Density			g/cc				.937	
MFI ASTM D1238 COND. E GRADE: 7104	Melt Flow Index 190ºC /2160 g			g/10 min				.36	
Carbon Black Content ASTM D4218	Range			%				2.19	
Carbon Black Dispersion ASTM D5596	Category							10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Break	26	N/mm			148	ppi	3,572	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Break			%				524.6	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change			%				-1.23	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	150.9	N					33.930	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	365.0	N					82.065	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	423.5	N					95.213	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs					CERTIFIED	

Customer: **Environmental Specialties**
PO: **16723 Edwards Rd Rural Hall Ash LF**
Destination **Rural Hall, NC**

Date:..... **4/30/2012**

Signature.....
Quality Control Department

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CoA Date: 04/09/2012

Certificate of Analysis

Shipped To: AGRU AMERICA INC
500 GARRISON RD
GEORGETOWN SC 29440
USA

Recipient: PALMER
Fax:

Delivery #: 88441443
PO #: 006422
Weight: 184900 LB
Ship Date: 04/09/2012
Package: BULK
Mode: Hopper Car
Car #: GACX008580
Seal No: 526350

Product: PE 7104 BULK

Lot Number: CCC810980

Property	Test Method	Value	Unit
Melt Index	ASTM D1238	0.35	g/10mi
HLMI	ASTM D1238	14.80	g/10mi
Pellet Count	ST-905	33	pel/g
Production date		20120319	
Density	D1505 or D4883	0.920	g/cm3

The data set forth herein have been carefully compiled by Chevron Phillips Chemical Company LP (CPChem).
However, there is no warranty of any kind, either expressed or implied, applicable to its use, and the user assumes all risk and liability in connection therewith.

Kevin Ayres
Quality Control Supervisor

For CoA questions contact Customer Service Representative at +1-832-813-4806

CoA Date: 01/25/2012

Certificate of Analysis

Shipped To: AGRU AMERICA INC
500 GARRISON RD
GEORGETOWN SC 29440
USA

Recipient: PALMER
Fax:

Delivery #: 88402772
PO #: 6410
Weight: 184050 LB
Ship Date: 01/25/2012
Package: BULK
Mode: Hopper Car
Car #: CHVX896703
Seal No: 523509

Product: PE 7104 BULK

Lot Number: CCA810100

Property	Test Method	Value	Unit
Melt Index	ASTM D1238	0.36	g/10mi
HLMI	ASTM D1238	9.25	g/10mi
Pellet Count	ST-905	31	pel/g
Production date		20120102	
Density	D1505 or D4883	0.920	g/cm3

The data set forth herein have been carefully compiled by Chevron Phillips Chemical Company LP.
However, there is no warranty of any kind, either expressed or implied, applicable to its use, and the user assumes all risk and liability in connection therewith.

Kevin Ayres
Quality Control Supervisor

For CoA questions contact Customer Service Representative at +1-832-813-4806

Lili Cui, Ph.D., Geomembrane Technical Service & Applications Development
Room 154 PTC ■ Bartlesville, OK 74004■
918-661-1897 ■ cuil@cpchem.com ■ Fax: 918-662-2220 ■ www.cpchem.com

April 23, 2012

Grant Palmer
Agru America
500 Garrison Road
Georgetown, SC 29440

Dear Grant:

This letter is to report the final results of oven-aging and UV-aging tests (according to GRI-GM13 and GRI-GM17) on Agru America sheet samples that you provided to us in 2011. These tests were performed by CPChem's Materials Evaluation Laboratory in Bartlesville, OK. The tests were completed April 2012.

The GRI-GM13 (HDPE) and GRI-GM17 (LLDPE) durability tests were done according to the following procedures.

Test	Exposure	Method
HP-OIT	150 °C, 500 psi oxygen	D5885
Oven Aging	90 days, 85 °C	D5721
UV Aging	1600 UV hrs (Conditions were 20 hours UVA-340 at 75 °C followed by 4 hrs dark with condensation at 60 °C. Irradiance was 0.72 W/m^2 at 340 nm.)	GRI-GM11

Oven-Aging Results

Sample	Initial HP-OIT (min)	HP-OIT Value after Oven Aging (min)	% HP-OIT Retained	GRI-GM13 or GRI-GM17 % Retained Requirement
40 mil LLDPE Roll # 346550-11 from Marlex® 7104 Polyethylene Lot # CBC810430	659	572	**87**	60
60 mil HDPE Roll # 447108-11 from Marlex® K307 Polyethylene Lot # 71-1-1104	1136	994	**88**	80

UV-Aging Results

Sample	Initial HP-OIT (min)	HP-OIT Value after UV Aging (min)	% HP-OIT Retained	GRI-GM13 or GRI-GM17 % Retained Requirement
40 mil LLDPE Roll # 346550-11 from Marlex® 7104 Polyethylene Lot # CBC810430	659	449	**68**	35
60 mil HDPE Roll # 447108-11 from Marlex® K307 Polyethylene Lot # 71-1-1104	1136	924	**81**	50

According to these test results, the durability requirements are met.

If you have any questions, please call me at 918-661-1897.

Sincerely,

Lili Cui, Ph.D.
Geomembrane Technical Service & Applications Development

Any technical advice, recommendations, results, or analysis ("Information") contained herein, including, without limitation, Information as it may relate to the selection of a specific product ("Product") for your use and application, is given ***without warranty or guarantee*** *and is accepted at your sole risk. It is imperative that you test the Information (and Product, if applicable) to determine to your own satisfaction whether the Information (and Product, if applicable) are suitable for your intended use and application.* ***You expressly assume, and release Chevron Phillips Chemical Company, from all risk and liability, whether based in contract, tort or otherwise, in connection with the use of, or results obtained from, such Information (and Product, if applicable).***

APPENDIX 3

LINEAR LOW DENSITY POLYETHYLENE (LLDPE) LINER CONFORMANCE TESTING

May 2, 2012

Mail To:

David W. Wasiela
ERM NC, Inc.
8000 Corporate Center Drive, Suite 200
Charlotte, NC 28226

email: Dave.Wasiela@erm.com

Bill To:

<= Same

Dear Mr. Wasiela:

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

Project:	**Edwards Road / RJ Reynolds Ash Landfill Closure Rural Hall, NC**
TRI Job Reference Number:	E2366-57-04
Material(s) Tested:	2, Agru 40 mil Microspike LLDPE Geomembrane(s)
Test(s) Requested:	Thickness (ASTM D 5994) Density (ASTM D 1505) Carbon Content (ASTM D 4218) Carbon Dispersion (ASTM D 5596) Tensile (ASTM D 6693)

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

Sincerely,

MPatel

Mansukh Patel
Sr. Laboratory Coordinator
Geosynthetic Services Division
www.GeosyntheticTesting.com

cc: Sam R. Allen, Vice President and Division Manager

GeosyntheticTesting.com
9063 Bee Caves Road / Austin, TX 78733 / 512 263 2101 / fax: 512 263 2558

GEOMEMBRANE TEST RESULTS

TRI Client: ERM NC, Inc.
Project: Edwards Road / RJ Reynolds Ash Landfill Closure Rural Hall, NC

Material: Agru 40 mil Microspike LLDPE Geomembrane
Sample Identification: Roll Number :417330.12
TRI Log #: E2366-57-04

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STD. DEV.	PROJ. SPEC.
Thickness (ASTM D 5994)													
Thickness (mils)	40	39	43	41	41	44	42	41	41	41	**41**	1	40 min
											39	<< min	
Density (ASTM D 1505)													
Density (g/cm3)	0.933	0.933	0.933								**0.933**	0.000	0.939 max
Carbon Black Content (ASTM D 4218)													
% Carbon Black	2.19	2.25									**2.22**	0.04	2.0-3.0%
Carbon Black Dispersion (ASTM D 5596)													
Rating - 1st field view	1	1	1	1	1								9 in cat 1 or 2
Rating - 2nd field view	1	1	1	1	1								1 in cat 3
Tensile Properties (ASTM D 6693, 2 ipm strain rate)													
MD Yield Strength (ppi)	75	85	77	84	85						**81**	5	
TD Yield Strength (ppi)	79	86	80	90	90						**85**	5	
MD Break Strength (ppi)	124	153	134	161	145						**143**	15	112 min
TD Break Strength (ppi)	111	145	127	132	123						**128**	12	112 min
MD Yield Elongation (%)	24	24	25	26	26						**25**	1	
TD Yield Elongation (%)	18	21	19	18	16						**18**	2	
MD Break Elongation (%)	509	499	524	465	508						**501**	22	400 min
TD Break Elongation (%)	506	598	553	553	535						**549**	33	400 min

MD Machine Direction TD Transverse Direction

The testing 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.

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9063 Bee Caves Road / Austin, TX 78733 / 512 263 2101 / fax: 512 263 2558

GEOMEMBRANE TEST RESULTS

TRI Client: ERM NC, Inc.
Project: Edwards Road / RJ Reynolds Ash Landfill Closure Rural Hall, NC

Material: Agru 40 mil Microspike LLDPE Geomembrane
Sample Identification: Roll Number: 417436.12
TRI Log #: E2366-57-04

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STD. DEV.	PROJ. SPEC.
Thickness (ASTM D 5994)													
Thickness (mils)	38	40	44	43	43	41	40	40	43	44	**42**	2	40 min
											38	<< min	
Density (ASTM D 1505)													
Density (g/cm3)	0.933	0.934	0.934								**0.934**	0.001	0.939 max
Carbon Black Content (ASTM D 4218)													
% Carbon Black	2.22	2.24									**2.23**	0.01	2.0-3.0%
Carbon Black Dispersion (ASTM D 5596)													
Rating - 1st field view	1	1	1	1	1								9 in cat 1 or 2
Rating - 2nd field view	1	1	1	1	1								1 in cat 3
Tensile Properties (ASTM D 6693, 2 ipm strain rate)													
MD Yield Strength (ppi)	82	88	88	82	96						**87**	6	
TD Yield Strength (ppi)	94	94	87	100	80						**91**	8	
MD Break Strength (ppi)	105	143	194	125	180						**149**	37	112 min
TD Break Strength (ppi)	129	129	133	143	124						**132**	7	112 min
MD Yield Elongation (%)	27	24	26	24	26						**25**	1	
TD Yield Elongation (%)	17	17	17	17	18						**17**	0	
MD Break Elongation (%)	476	485	484	500	485						**486**	9	400 min
TD Break Elongation (%)	531	553	560	578	565						**557**	17	400 min

MD Machine Direction TD Transverse Direction

The testing 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.

GeosyntheticTesting.com
9063 Bee Caves Road / Austin, TX 78733 / 512 263 2101 / fax: 512 263 2558

May 7, 2012

Mail To:

David W. Wasiela
ERM NC, Inc.
8000 Corporate Center Drive, Suite 200
Charlotte, NC 28226

email: Dave.Wasiela@erm.com

Bill To:

<= Same

Dear Mr. Wasiela:

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

Project:	**Edwards Road / RJ Reynolds Ash Landfill Closure Rural Hall, NC**
TRI Job Reference Number:	E2366-61-10
Material(s) Tested:	7, Agru 40 mil Microspike LLDPE Geomembrane(s)
Test(s) Requested:	Thickness (ASTM D 5994) Density (ASTM D 1505) Carbon Content (ASTM D 4218) Carbon Dispersion (ASTM D 5596) Tensile (ASTM D 6693)

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

Sincerely,

Mansukh Patel
Sr. Laboratory Coordinator
Geosynthetic Services Division
www.GeosyntheticTesting.com

cc: Sam R. Allen, Vice President and Division Manager

GEOMEMBRANE TEST RESULTS

TRI Client: ERM NC, Inc.
Project: Edwards Road / RJ Reynolds Ash Landfill Closure Rural Hall, NC

Material: Agru 40 mil Microspike LLDPE Geomembrane
Sample Identification: 417443.12
TRI Log #: E2366-61-10

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STD. DEV.	PROJ. SPEC.
Thickness (ASTM D 5994)													
Thickness (mils)	41	42	42	41	42	47	42	43	45	43	**43**	2	40 min
											41	<< min	
Density (ASTM D 1505)													
Density (g/cm3)	0.935	0.935	0.935								**0.935**	0.000	0.939 max
Carbon Black Content (ASTM D 4218)													
% Carbon Black	2.16	2.21									**2.19**	0.04	2.0-3.0%
Carbon Black Dispersion (ASTM D 5596)													
Rating - 1st field view	1	1	1	1	1								9 in cat 1 or 2
Rating - 2nd field view	1	1	1	1	1								1 in cat 3
Tensile Properties (ASTM D 6693, 2 ipm strain rate)													
MD Yield Strength (ppi)	88	90	91	84	82						**87**	4	
TD Yield Strength (ppi)	91	85	92	93	96						**91**	4	
MD Break Strength (ppi)	147	168	162	171	129						**155**	17	112 min
TD Break Strength (ppi)	140	113	126	135	132						**129**	10	112 min
MD Yield Elongation (%)	27	23	23	22	22						**23**	2	
TD Yield Elongation (%)	20	23	19	19	19						**20**	2	
MD Break Elongation (%)	495	490	459	483	524						**490**	23	400 min
TD Break Elongation (%)	590	519	539	554	563						**553**	27	400 min

MD Machine Direction TD Transverse Direction

The testing 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.

GeosyntheticTesting.com
9063 Bee Caves Road / Austin, TX 78733 / 512 263 2101 / fax: 512 263 2558

GEOMEMBRANE TEST RESULTS

TRI Client: ERM NC, Inc.
Project: Edwards Road / RJ Reynolds Ash Landfill Closure Rural Hall, NC

Material: Agru 40 mil Microspike LLDPE Geomembrane
Sample Identification: Roll Number: 417550.12
TRI Log #: E2366-61-10

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STD. DEV.	PROJ. SPEC.
Thickness (ASTM D 5994)													
Thickness (mils)	41	43	46	42	43	46	42	43	41	41	**43**	2	40 min
											41	<< min	
Density (ASTM D 1505)													
Density (g/cm3)	0.934	0.934	0.934								**0.934**	0.000	0.939 max
Carbon Black Content (ASTM D 4218)													
% Carbon Black	2.19	2.18									**2.19**	0.01	2.0-3.0%
Carbon Black Dispersion (ASTM D 5596)													
Rating - 1st field view	1	1	1	1	1								9 in cat 1 or 2
Rating - 2nd field view	1	1	1	1	1								1 in cat 3
Tensile Properties (ASTM D 6693, 2 ipm strain rate)													
MD Yield Strength (ppi)	81	90	89	83	85						**86**	4	
TD Yield Strength (ppi)	84	84	94	95	90						**89**	5	
MD Break Strength (ppi)	123	158	170	154	139						**149**	18	112 min
TD Break Strength (ppi)	116	108	134	124	136						**124**	12	112 min
MD Yield Elongation (%)	25	30	30	25	24						**27**	3	
TD Yield Elongation (%)	23	22	19	19	20						**21**	2	
MD Break Elongation (%)	456	489	496	473	546						**492**	34	400 min
TD Break Elongation (%)	525	495	574	518	589						**540**	40	400 min

MD Machine Direction TD Transverse Direction

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GEOMEMBRANE TEST RESULTS

TRI Client: ERM NC, Inc.
Project: Edwards Road / RJ Reynolds Ash Landfill Closure Rural Hall, NC

Material: Agru 40 mil Microspike LLDPE Geomembrane
Sample Identification: 417556.12
TRI Log #: E2366-61-10

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STD. DEV.	PROJ. SPEC.
Thickness (ASTM D 5994)													
Thickness (mils)	41	43	44	41	43	43	43	44	49	45	**44**	2	40 min
											41	<< min	
Density (ASTM D 1505)													
Density (g/cm3)	0.932	0.932	0.932								**0.932**	0.000	0.939 max
Carbon Black Content (ASTM D 4218)													
% Carbon Black	2.15	2.14									**2.15**	0.01	2.0-3.0%
Carbon Black Dispersion (ASTM D 5596)													
Rating - 1st field view	1	1	1	1	1								9 in cat 1 or 2
Rating - 2nd field view	1	1	1	1	1								1 in cat 3
Tensile Properties (ASTM D 6693, 2 ipm strain rate)													
MD Yield Strength (ppi)	83	80	80	86	76						**81**	4	
TD Yield Strength (ppi)	75	83	87	89	87						**84**	6	
MD Break Strength (ppi)	151	129	151	172	102						**141**	27	112 min
TD Break Strength (ppi)	118	126	146	128	131						**130**	10	112 min
MD Yield Elongation (%)	28	25	24	24	22						**25**	2	
TD Yield Elongation (%)	22	18	20	19	19						**20**	2	
MD Break Elongation (%)	451	436	485	494	445						**462**	26	400 min
TD Break Elongation (%)	546	546	600	531	543						**553**	27	400 min

MD Machine Direction TD Transverse Direction

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GEOMEMBRANE TEST RESULTS

TRI Client: ERM NC, Inc.
Project: Edwards Road / RJ Reynolds Ash Landfill Closure Rural Hall, NC

Material: Agru 40 mil Microspike LLDPE Geomembrane
Sample Identification: Roll Number: 417662.12
TRI Log #: E2366-61-10

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STD. DEV.	PROJ. SPEC.
Thickness (ASTM D 5994)													
Thickness (mils)	42	41	43	43	46	48	41	42	44	41	**43**	2	40 min
											41	<< min	
Density (ASTM D 1505)													
Density (g/cm3)	0.933	0.933	0.933								**0.933**	0.000	0.939 max
Carbon Black Content (ASTM D 4218)													
% Carbon Black	2.17	2.22									**2.20**	0.04	2.0-3.0%
Carbon Black Dispersion (ASTM D 5596)													
Rating - 1st field view	1	1	1	1	1								9 in cat 1 or 2
Rating - 2nd field view	1	1	1	1	1								1 in cat 3
Tensile Properties (ASTM D 6693, 2 ipm strain rate)													
MD Yield Strength (ppi)	89	83	84	95	91						**88**	5	
TD Yield Strength (ppi)	90	84	92	101	104						**94**	8	
MD Break Strength (ppi)	174	132	141	174	185						**161**	23	112 min
TD Break Strength (ppi)	122	129	134	136	141						**132**	7	112 min
MD Yield Elongation (%)	28	23	26	26	25						**26**	2	
TD Yield Elongation (%)	21	23	18	18	19						**20**	2	
MD Break Elongation (%)	545	524	458	465	473						**493**	39	400 min
TD Break Elongation (%)	516	563	573	541	534						**545**	23	400 min

MD Machine Direction TD Transverse Direction

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GEOMEMBRANE TEST RESULTS

TRI Client: ERM NC, Inc.
Project: Edwards Road / RJ Reynolds Ash Landfill Closure Rural Hall, NC

Material: Agru 40 mil Microspike LLDPE Geomembrane
Sample Identification: 417668.12
TRI Log #: E2366-61-10

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STD. DEV.	PROJ. SPEC.
Thickness (ASTM D 5994)													
Thickness (mils)	41	41	44	39	45	45	44	42	44	43	**43**	2	40 min
											39	<< min	
Density (ASTM D 1505)													
Density (g/cm3)	0.934	0.934	0.934								**0.934**	0.000	0.939 max
Carbon Black Content (ASTM D 4218)													
% Carbon Black	2.19	2.15									**2.17**	0.03	2.0-3.0%
Carbon Black Dispersion (ASTM D 5596)													
Rating - 1st field view	1	1	1	1	1								9 in cat 1 or 2
Rating - 2nd field view	1	1	1	1	1								1 in cat 3
Tensile Properties (ASTM D 6693, 2 ipm strain rate)													
MD Yield Strength (ppi)	90	89	95	91	85						**90**	4	
TD Yield Strength (ppi)	88	87	94	97	98						**93**	5	
MD Break Strength (ppi)	160	167	170	180	134						**162**	17	112 min
TD Break Strength (ppi)	152	117	116	148	139						**134**	17	112 min
MD Yield Elongation (%)	23	23	24	26	25						**24**	1	
TD Yield Elongation (%)	18	21	18	18	18						**19**	1	
MD Break Elongation (%)	435	483	504	459	514						**479**	32	400 min
TD Break Elongation (%)	605	514	501	600	578						**560**	49	400 min

MD Machine Direction TD Transverse Direction

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GEOMEMBRANE TEST RESULTS

TRI Client: ERM NC, Inc.
Project: Edwards Road / RJ Reynolds Ash Landfill Closure Rural Hall, NC

Material: Agru 40 mil Microspike LLDPE Geomembrane
Sample Identification: Roll Number: 417774.12
TRI Log #: E2366-61-10

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STD. DEV.	PROJ. SPEC.
Thickness (ASTM D 5994)													
Thickness (mils)	41	40	46	43	47	45	45	43	45	42	**44**	2	40 min
											40	<< min	
Density (ASTM D 1505)													
Density (g/cm3)	0.934	0.934	0.934								**0.934**	0.000	0.939 max
Carbon Black Content (ASTM D 4218)													
% Carbon Black	2.06	2.12									**2.09**	0.04	2.0-3.0%
Carbon Black Dispersion (ASTM D 5596)													
Rating - 1st field view	1	1	1	1	1								9 in cat 1 or 2
Rating - 2nd field view	1	1	1	1	1								1 in cat 3
Tensile Properties (ASTM D 6693, 2 ipm strain rate)													
MD Yield Strength (ppi)	88	80	87	92	90						**87**	5	
TD Yield Strength (ppi)	91	93	83	92	100						**92**	6	
MD Break Strength (ppi)	152	140	164	181	168						**161**	16	112 min
TD Break Strength (ppi)	127	116	124	126	139						**126**	8	112 min
MD Yield Elongation (%)	28	26	25	27	26						**26**	1	
TD Yield Elongation (%)	22	19	24	21	18						**21**	2	
MD Break Elongation (%)	505	570	488	515	423						**500**	53	400 min
TD Break Elongation (%)	533	501	553	524	580						**538**	30	400 min

MD Machine Direction TD Transverse Direction

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GEOMEMBRANE TEST RESULTS

TRI Client: ERM NC, Inc.
Project: Edwards Road / RJ Reynolds Ash Landfill Closure Rural Hall, NC

Material: Agru 40 mil Microspike LLDPE Geomembrane
Sample Identification: 417780.12
TRI Log #: E2366-61-10

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STD. DEV.	PROJ. SPEC.
Thickness (ASTM D 5994)													
Thickness (mils)	41	40	45	41	46	47	42	43	43	43	**43**	2	40 min
											40	<< min	
Density (ASTM D 1505)													
Density (g/cm3)	0.933	0.933	0.933								**0.933**	0.000	0.939 max
Carbon Black Content (ASTM D 4218)													
% Carbon Black	2.24	2.14									**2.19**	0.07	2.0-3.0%
Carbon Black Dispersion (ASTM D 5596)													
Rating - 1st field view	1	1	1	1	1								9 in cat 1 or 2
Rating - 2nd field view	1	1	1	1	1								1 in cat 3
Tensile Properties (ASTM D 6693, 2 ipm strain rate)													
MD Yield Strength (ppi)	91	88	88	92	83						**88**	4	
TD Yield Strength (ppi)	88	93	87	93	81						**88**	5	
MD Break Strength (ppi)	180	145	167	187	123						**160**	26	112 min
TD Break Strength (ppi)	133	139	100	139	134						**129**	16	112 min
MD Yield Elongation (%)	27	27	27	29	24						**27**	2	
TD Yield Elongation (%)	20	17	19	18	21						**19**	2	
MD Break Elongation (%)	481	473	509	498	496						**491**	14	400 min
TD Break Elongation (%)	561	569	458	586	594						**554**	55	400 min

MD Machine Direction TD Transverse Direction

The testing 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.

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APPENDIX 4

FIELD LLDPE DEPLOYMENT RECORDS

GEOMEMBRANE DEPLOYMENT REPORT

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Material Description
40 MIL LLDPE

Date: 5-17-12
ESP Project Number: XH01.304
Project Name: RURAL HALL ASH LANDFILL
Project Location: RURAL HALL
Page: 1 of 1

Carry Over

Panel #	Roll Number	Length	Width	Approximate Area	CQA Initials	Remarks
P-1	417776-12	356	22	8052	TR	
P-2	" "	350	22	7700		
P-3	7554	381	22	8382		
P-4	"	320	22	7040		
P-5	7663	58	22	1276		
P-6	" "	372	22	8184		
P-7	" "	266	22	5852		
P-8	7665	93	22	2046		
P-9	7665	348	22	7656		
P-10	7665	237	22	5214		
P-11	7553	50	22	1100	TR	
P-12	7553	272	22	5984		
P-13	" "	216	22	4752		
P-14	7553	26	13	169		π
P-15	7553	92	22	2024		
P-16	7668	42	22	924		
P-17	"	53	22	1166		
P-18	"	40	22	440		π
P-19	"	32	16	256		π
P-20	7668	38	22	836		
P-21	7668	30	22	330	TR	π
			Daily Total			
			Current Total	79,383 ft		

CQA Personnel: [signature]

GEOMEMBRANE DEPLOYMENT REPORT

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Material Description
40 mil LLDPE

Date: 5-18-12
ESP Project Number: XH01.304
Project Name: Rural Hall Ash Landfill
Project Location: Rural Hall, N.C.
Page: 1 of 2

Carry Over 79383

Panel #	Roll Number	Length	Width	Approximate Area	CQA Initials	Remarks
P-22	7668	25	22	550	TBL	
P-23	"	41		902		
P-24	"	33		726		
P-25	7668	23		506		
P-26	7668	77	22	1694		
P-27	" "	86	22	1892		
P-28	" "	101	22	2222		
P-29	7668	20	22	220		π
P-30	7549	19	19	180.5		π
P-31	" "	29	22	638		
P-32	7549	40	22	880		
P-33	7549	28	22	308	TBL	π
P-34	" "	64	22	1408		
P-35	7549	26	22	572		
P-36	7549	73	22	1606		
P-37	7549	103	22	2266		
P-38	7549	118	22	2596		
P-39	7549	24	6	72		π
P-40	7549	112	22	2464		
P-41	7549	52	22	1144		
P-42	7557	79	22	1738		
P-43	7549	15	15	112.5		π
P-44	7557	94	22	2068		
P-45	7557	93	22	2046		
P-46	7557	25	22	550	TBL	
			Daily Total	29361		
			Current Total	108,744		

CQA Personnel: [signature]

A = ½ BH

GEOMEMBRANE DEPLOYMENT REPORT

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Date: 5-18-12
ESP Project Number: X401.304
Project Name: RURAL HALL ASH LANDFILL
Project Location: RURAL HALL, N.C.
Page: 2 of 2

Material Description
40 MIL LLDPE

Carry Over 108,744

Panel #	Roll Number	Length	Width	Approximate Area	CQA Initials	Remarks
P-47	7549	13	22	286	TEL	TT
P-48	7557	44	22	968		
P-49	7557	34	22	748		
P-50	7557	22	22	484		
P-51	7557	19	22	209		TT
P-52	7557	93	22	2046	TEL	
P-53	" "	92	22	2024		
P-54	7557	72	22	1584		
P-55	7445	13	22	286		
P-56	7445	71	22	1562		
P-57	7445	75	22	1650		
P-58	7445	72	22	1584		
P-59	7445	332	22	7304		
P-60	7445	115'	22	2530		
P-61	7666	214	22	4708		
P-62	7666	120	22	2640		
P-63	7666	147	22	3234		
P-64	7334	190	22	4180		
P-65	7334	337	22	7414	TEL	

Daily Total	45,441
Current Total	154,185

CQA Personnel: EL

GEOMEMBRANE DEPLOYMENT REPORT

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Material Description
40ML LLDPE

Date: 5-21-12
ESP Project Number: X407.301
Project Name: Rural Hall Ash Landfill
Project Location: Rural Hall, NC
Page: 1 of 1

Carry Over 154,185

Panel #	Roll Number	Length	Width	Approximate Area	CQA Initials	Remarks
P-66	7658	340	22	7480	TG	
P-67	7658	345	22	7590		
P-68	7442	357	22	7854		
P-69	7442	336	22	7392		
P-70	7552	32	22	704		
P-71	7552	375	22	8250		
P-72	7552	293	22	6446		
P-73	7551	76	22	1672	TR	
			Daily Total	47,388		
			Current Total	201,573		

CQA Personnel: _____

GEOMEMBRANE DEPLOYMENT REPORT

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Material Description
40 mil LLDPE

Date: 5-22-12
ESP Project Number: XH01.304
Project Name: Rural Hall Ash Landfill
Project Location: Rural Hall, N.C.
Page: 1 of 2

Carry Over: 201,573

Panel #	Roll Number	Length	Width	Approximate Area	CQA Initials	Remarks
P-74	7551	73	22	1606	TBL	
P-75	"	32	10	155		π
P-76	7551	72	22/13=17.5	1260		
P-77	"	74	22	1628		
P-78	7551	38	11	209		π
P-79	"	79	22/11=11.0	869	TBL	
P-80	"	80	22	1760		
P-81	" "	79	22	1738		
P-82	" "	30	26	390		π
P-83	7551	55	22/11=11	605		
P-84		19	22/15=18.5	352		
P-85	7555	20	22	440		
P-86	7551	74	22	1628		
P-87	7555	76	22	1672	TBL	
P-88		76	22	1672		
P-89		73	22	1606		
P-90	7555	71	22	1562		
P-91	" "	67	22	1472		
P-92	7555	67	22	1472		
P-93		65	22	1430		
P-94		27	25	338		π
P-95		36	22	792		
P-96	7555	58	22	1276		
P-97	7661	57	22	1254	TBL	
			Daily Total			
			Current Total			

CQA Personnel: _____

GEOMEMBRANE DEPLOYMENT REPORT

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Material Description
40 MIL LLDPE

Date: 5-22-12
ESP Project Number: X407.304
Project Name: Rural Hall Ash Landfill
Project Location: Rural Hall, N.C.
Page: 2 of 2

Carry Over

Panel #	Roll Number	Length	Width	Approximate Area	CQA Initials	Remarks
P-98	7661	55	22	1210	TDL	
P-99	7661	55	22	1210	|	
P-100	"	18	18	162	|	TT
P-101	"	27	22	594	|	
P-102	7661	50	22	1100	|	
P-103	|	49	22	1078	|	
P-104	|	50	22	1100	|	
P-105	|	53	22	1166	|	
P-106		55	22	1210	|	
P-107	7661	28	11	154		TT
P-108	7661	56	22/11=11	616	TDL	
P-109	"	56	22	1232		
P-110	"	57	22	1254	TDL	
			Daily Total	39,272		
			Current Total	240,845		

CQA Personnel: [signature]

GEOMEMBRANE DEPLOYMENT REPORT

ESP ASSOCIATES, P.A.
engineering - surveying - planning

Date: 5-24-12
ESP Project Number: X401.304
Project Name: Rural Hall Ash Landfill
Project Location: Rural Hall, N.C.
Page: 1 of 2

Material Description
40 mil LLDPE

Carry Over 240,845

Panel #	Roll Number	Length	Width	Approximate Area	CQA Initials	Remarks
P-111	7444	16	22	176	TBL	π
P-112	|	23	22	506	|	
P-113	|	40	|	880	|	
P-114	|	15	|	330	|	
P-115	|	43	|	946	|	
P-116	|	74	|	1628	|	
P-117	7444	82	|	1804	|	
P-118	"	78	|	1716	|	
P-119	7444	73	22	1606	|	
P-120	|	71	22	1562	TBL	
P-121	|	11	14	77	|	π
P-122	|	25	22	550	|	
P-123	|	25	22	550	|	
P-124	|	20	22	220	|	π
P-125	|	30	22	660	|	
P-126	|	20	14	140	|	π
P-127	7444	42	11	462	|	
P-128	7444	21	12	126	|	π
P-129	7446	80	22	1760		
P-130	|	81	22	1782	TBL	
P-131	|	80	22	1760	|	
P-132	|	75	22	1650	|	
P-133	7446	74	22	1628	|	
P-134	"	36	11	198	|	π
P-135	"	66	22/10 = 16	1056	TBL	
			Daily Total			
			Current Total			

CQA Personnel: EJ

GEOMEMBRANE DEPLOYMENT REPORT

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Date: 5-24-12
ESP Project Number: XHD1.304
Project Name: Rural Hall Ash Landfill
Project Location: Rural Hall, NC
Page: 2 of 2

Material Description

40 mil LLDPE

Carry Over

Panel #	Roll Number	Length	Width	Approximate Area	CQA Initials	Remarks
P-136	7446	66	22	1451	TQ	
P-137	7446	22	22	242	"	TI
P-138	7446	58	22	1276	TQ	

Daily Total	26,742
Current Total	267,587

CQA Personnel:

GEOMEMBRANE DEPLOYMENT REPORT

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Material Description
40 M.L CLOPE

Date: 5-25-12
ESP Project Number: X401.304
Project Name: RURAL HALL ASH Landfill
Project Location: RURAL HALL, NC.
Page: 1 of 1

Carry Over: 267,587

Panel #	Roll Number	Length	Width	Approximate Area	CQA Initials	Remarks
P-139	7669	110	22	2420	TBL	
P-140	7669	60	22	1660		TT
P-141		117	22	2574		
P-142		68	22	748		TT
P-143		11	22	242		
P-144		224	22	4928		
P-145	7669	70	22	1540	TBL	
P-146	7773	220	22	4840		
P-147		24	22	264		TT
P-148		264	22	5808		
P-149	7330	150	22	3300		
P-150	"	115	22	2530		
P-151	7330	45	22	990		TT
P-152		55	22	1210		
P-153		50	22	550		TT
P-154		40	22	440	TBL	TT
P-155		50	22	1100		
P-156		165	22	3630		
P-157		199	22	4378		
P-158	7330	34	22	374		TT
P-159	7660	170	22	3740		
P-160	" "	130	22	2860		
P-161	7660	22	22	242		TT
P-162	" "	29	22	319		TT
P-163	" "	35	22	385	TBL	TT

Daily Total	50,072
Current Total	317,659

CQA Personnel: _____

GEOMEMBRANE DEPLOYMENT REPORT

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Material Description
40 mil LLDPE

Date: 5-30-12
ESP Project Number: XH01.304
Project Name: Rural Hall Ash Landfill
Project Location: Rural Hall, NC
Page: 1 of 2

Carry Over: 317,659

Panel #	Roll Number	Length	Width	Approximate Area	CQA Initials	Remarks
P-164	7668	38	22	836	TEL	
P-165	|	44	22	968	|	
P-166	|	51	22	1122	|	
P-167	|	28	22	616	|	
P-168	7660	51	22	1122	|	
P-169	|	12	22	264	|	
P-170	|	69	22	1518	|	
P-171	7435	12	16	96	|	TT
P-172	7660	18	22	198	|	TT
P-173	7435	50	22	550	|	TT
P-174	"	102	22	2244	TEL	
P-175	|	115	22	2530	|	
P-176	|	114	22	2508	|	
P-177	|	124	22	2728	|	
P-178	7435	39	22	858	|	
P-179	7446	81	22	1782	|	
P-180	7446	19	22	418	|	
P-181	7334	32	22	704	|	
P-182	7659	51	22	1122	|	
P-183	7435	58	22	1276	|	TT
P-184	7334	36	22	792	|	
P-185	7659	90	22	1980	|	
P-186	7659	20	22	440	|	
P-187	7659	60	22	1320	|	
P-188	7659	24	22	264	TEL	TT

Daily Total	
Current Total	

CQA Personnel: [signature]

GEOMEMBRANE DEPLOYMENT REPORT

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Material Description
40 mil LLDPE

Date: 5-30-12
ESP Project Number: xH01.304
Project Name: Rural Hall Ash Landfill
Project Location: Rural Hall, N.C.
Page: 2 of 2

Carry Over

Panel #	Roll Number	Length	Width	Approximate Area	CQA Initials	Remarks
P-189	7659	42	22	924	TBL	
P-190	|	38	22	836	|	
P-191	|	23	14	322	|	
P-192	|	25	22	550	|	
P-193	7659	58	22	1276	TBL	
P-194	|	81	22	1782		
P-195	|	67	22	1474	|	
P-196	|	72	22	1584	|	
P-197	7659	23	22	506	|	
P-198	7667	63	22	1386	|	
P-199	7667	97	22	2134	|	
P-200	"	96	22	2112	|	
P-201	7667	40	22	440	|	IT
P-202	" "	22	6	132	|	
P-203	7667	15	8	60	TBL	IT

Daily Total	43,774
Current Total	301,433

CQA Personnel: EJ

GEOMEMBRANE DEPLOYMENT REPORT

ESP ASSOCIATES, P.A.
engineering - surveying - planning

Date: 5-31-12
ESP Project Number: X101.304
Project Name: RURAL HALL ASH LANDFILL
Project Location: RURAL HALL, N.C.
Page: 1 of 1

Material Description
40 mil LLDPE

Carry Over

Panel #	Roll Number	Length	Width	Approximate Area	CQA Initials	Remarks
P-204	7667	30	22	660	TOL	
P-205	7667	15	22	165	TOL	IT
			Daily Total	825		
			Current Total	362,258		

CQA Personnel: _____

GEOMEMBRANE DEPLOYMENT REPORT

ESP ASSOCIATES, P.A.
engineering - surveying - planning

Material Description
40 MILL LLDPE

Date: 7-5-12
ESP Project Number: XH01.304
Project Name: RURAL HALL ASH LANDFILL
Project Location: RURAL HALL, N.C.
Page: 1 of 2

Carry Over: —

Panel #	Roll Number	Length	Width	Approximate Area	CQA Initials	Remarks
206	7772	200	22	4400	TBL	
207		130	22	2860		
208		70	22	1540		
209		18	22	396		
210	7772	30	22	660		TT
211		70	15	525		TT
212		150	22	3300		
213	7772	85	22	1870		
214	7781	25	22	550		
215		70	22	1540		
216		180	22	3960	TBL	
217		209	22	4598		
218		15	22	330		
219	7781	172	22	3784		
220	"	42	22	924		
221	8101	240	22	5280		
222	"	260	22	5720		
223	8101	100	22	2200		
224	7771	178	22	3916		
225	" "	295	22	6490		
226	8101	23	10	230		
227	7771	78	22	1716		
228	7443	235	22	5170		
229	7443	284	22	6248		
230	7771	40	18	720	TBL	
			Daily Total			
			Current Total			

CQA Personnel: [signature]

GEOMEMBRANE DEPLOYMENT REPORT

ESP ASSOCIATES, P.A.
engineering - surveying - planning

Material Description
40 mil LLDPE

Date: 7-5-12
ESP Project Number: X401.304
Project Name: Rural Hall Ash Landfill
Project Location: Rural Hall, N.C
Page: 2 of 2

Carry Over

Panel #	Roll Number	Length	Width	Approximate Area	CQA Initials	Remarks
231	7271	70	22	1540	TBL	
232	7443	44	22	968		
233	7443	22	12	132		TI
234	7443	35	22	770	TBL	

Daily Total	
Current Total	12,337 ft²

CQA Personnel: EJ

GEOMEMBRANE DEPLOYMENT REPORT

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Date: 7-6-12
ESP Project Number: X401.304
Project Name: Rural Hall Ash Landfill
Project Location: Rural Hall, NC.
Page: 1 of 1

Material Description
40 mil LLDPE

Carry Over: 72,337

Panel #	Roll Number	Length	Width	Approximate Area	CQA Initials	Remarks
235	7443	50	22	1100	TDL	
236	7667	239	22	5258		
237	7667	90	20	1980		
238	7438	192	22	4224		
239	7438	330	22	7260		
240	7438	43	22	473		T
241	7438	42	22	924		
242	7331	249	22	5478		
243	7331	270	22	5940	TDL	
244	7331	17	18	153		T
245	7331	168	22	3696		
246	7333	88	22	1936		
247	7333	164	22	3608		
248	" "	30	22	330		T
249	7333	142	22	3124		
250	" "	41	44	902		T
251	7333	106	22/11 = 11 ave	1166		
252	7438	82	11	902	TDL	

Daily Total	48,454 ft
Current Total	120,791 ft

CQA Personnel: EJ

GEOMEMBRANE DEPLOYMENT REPORT

ESP ASSOCIATES, P.A.
engineering - surveying - planning

Material Description
40 mil LLDPE

Date: 7-9-12
ESP Project Number: X H07.304
Project Name: Rural Hall Ash Landfill
Project Location: Rural Hall
Page: 1 of 1

Carry Over 120,791 #

Panel #	Roll Number	Length	Width	Approximate Area	CQA Initials	Remarks
253	7333	52	22	1144	TR	
254	" "	19	22	418		
255	7549	33	22	726		
256	7547	52	22	1144		
257		53	22	1166		
258		53	22	1166		
259	7547	55	22	1210		
260	7544	55	22	1210	TR	
261		57	22	1254		
262		53	22	1166		
263		55	22	1210		
264	7547	150	22	3300		
265	7774	82	22	1804		
266	"	74	22	1628		
267	7774	75	22	1650	TR	

Daily Total	20,196 #
Current Total	140,987 #

CQA Personnel: _____

GEOMEMBRANE DEPLOYMENT REPORT

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Material Description
40 mil LLDPE

Date: 7-12-12
ESP Project Number: XH01.304
Project Name: Rural Hall Ash Landfill
Project Location: Rural Hall, N.C.
Page: 1 of 1

Carry Over 140,987 #

Panel #	Roll Number	Length	Width	Approximate Area	CQA Initials	Remarks
268	7774	392	22	8624	TBC	
269	"	20	22	440		
270	7437	358	22	7876		
271		291	22	6402		
272		22	22	484		
273	7436	80	22	1760		
274	7436	336	22	7392		
275	7436	240	22	5280		
276	7332	114'	22	2508		
277	7332	322	22	7084		
278	7436	18	22	396	TR	
			Daily Total	48,246 #		
			Current Total	189,233 #		

CQA Personnel: _____

GEOMEMBRANE DEPLOYMENT REPORT

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Material Description
40 M.L LLDPE

Date: 7-13-12
ESP Project Number: X H01. 304
Project Name: Rural Hall ASL Landfill
Project Location: Rural Hall, N.C.
Page: 1 of 2

Carry Over 189233

Panel #	Roll Number	Length	Width	Approximate Area	CQA Initials	Remarks
279	7332	180	22	3960	TBL	
280	" "	18'	22	396		
281	8103	151	22	3322		
282	" "	162	22	3564		
283		33	19	313.5		TT
284		55	22	1210		
285		97	22	2134		
286		21	15	157.5		TT
287	8103	140	22	3080		
288	7556	135	22	2970	TBL	TT
289	" "	39	22	429		TT
290	" "	85	22	1870		
291	" "	76	22	1672		
292	7556	40	22	440		TT
293	7556	23	22	506		
294	7547	11	22	121		TT
295	7556	220	22	4840		
296	7332	67	22	1474	TBL	
297	" "	155	22	3410		
298	7662	25	18	225		TT
299	" "	15	20	150		TT
300	" "	24	22	528		
301	" "	28	22	616		
302	" "	31	22	682		
303	" "	35	22	770	TBL	
			Daily Total	[illegible]		
			Current Total			

304
305

CQA Personnel: [signature]

GEOMEMBRANE DEPLOYMENT REPORT

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Material Description
40 mil LLDPE

Date: 7-13-12
ESP Project Number: XH01.304
Project Name: RURAL HALL ASH Landfill
Project Location: RURAL HALL, N.C.
Page: 2 of 2

Carry Over

Panel #	Roll Number	Length	Width	Approximate Area	CQA Initials	Remarks
304	7662	45	22	990	TR	
305	"	35	22	770		
306		17	7	60		TI
307		20	22	440		
308	7662	46	22	1012		
309	" "	80	22	1760		
310	" "	121	22	2662		
311	7332	26	22	572		
312	7770	21	22	462		
313	7332	22	11	242	TR	
			Daily Total	47,810 ft		
			Current Total	237,043 ft	TOTAL	

CQA Personnel: _____

GEOMEMBRANE DEPLOYMENT REPORT

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Material Description
40 mil LLDPE

Date: 8-9-12
ESP Project Number: 41401.304
Project Name: Rural Hall Ash Landfill
Project Location: Rural Hall NC
Page: 1 of 1

Carry Over

Panel #	Roll Number	Length	Width	Approximate Area	CQA Initials	Remarks
314	7780	104	22	2288	TBL	
315	7780	90	22	1980		
316	7780	355	22	7810		
317	7439	70	22	1540		
318	7439	51	22	1122		
319	7780	8	22	176		
320	7780	124	22	2728		
321	7439	139	22	3058		
322	" "	145	22	3190	TBL	
323	" "	145	22	3190		
324	7439	138	22	3036		
325	7664	10	22	220		
326	7664	146	22	3212		
327	7664	146	22	3212	TBL	
328	7664	145	22	3190		
329	" "	144	22	3168		
330	7664	104	22	2288		
331	7770	41	22	902		
332	" "	135	22	2970		
333	7770	135	22	2970		
334	" "	130'	22	2860		
335	" "	121'	22	2662	TBL	
			Daily Total	57,772		
			Current Total			

CQA Personnel: [signature]

51
19

GEOMEMBRANE DEPLOYMENT REPORT

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Material Description
40 M.L LLDPE

Date: 8-10-12
ESP Project Number: XHOI. 304
Project Name: RURAL HALL ASH LANDFILL
Project Location: RURAL HALL, N.C.
Page: 1 of 2

Carry Over

Panel #	Roll Number	Length	Width	Approximate Area	CQA Initials	Remarks
336	7770	95	22	2090	TOL	
337	7550	268'	22	5896		
338	7550	360	22	7920		
339	" "	69	22	1518		
340	7440	295	22	6490		
341	7440	360	22	7920		
342	7440	37	22	814		
343	7778	53	22	1166		
344	7778	92	22	2024		
345	7778	92	22	2024		
346		89	22	1958		
347		75	22	1650		
348		76	22	1672	TOL	
349		75	22	1650		
350	7778	75	22	1650		
351	7779	108	22	2376		
352	" "	108	22	2376		
353	" "	95	22	2090		
354	" "	94	22	2068		
355	" "	89	22	1958		
356	7779	80	22	1760		
357	"	73	22	1606		
358	7775	64	22	1408		
359	"	59	22	1298		
360	" "	53	22	1166	TOL	
			Daily Total			
			Current Total			

CQA Personnel: [signature]

GEOMEMBRANE DEPLOYMENT REPORT

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Material Description
40 mil LLDPE

Date: 8-10-12
ESP Project Number: XH01.304
Project Name: Rural Hall Ash Landfill
Project Location: Rural Hall, N.C.
Page: 2 of 2

Carry Over

Panel #	Roll Number	Length	Width	Approximate Area	CQA Initials	Remarks
361	7775	40	22	880	TDL	
362	7778	52	22	1144		
363	7775	215	22	4730		
364	7775	230	22	5060		
365	7777	22	22	484		
366	7777	24	22	264		TT
367	7777	26	22	572		
368	7777	28	22	616		
369	7777	30	22	660		
370	7777	42	22	924		
371		59	22	1298	TDL	
372		75	22	1650		
373	7777	86	22	1892		
374	7777	94	22	2068		
375	"	67	22	1474		
376	"	79	22	1738		
377	8102	18	16	144		TT
378	"	20	22	440		
379	"	23	22	506		
380	8102	26	21	273		TT
381	8102	45	22	990	TDL	
			Daily Total	92,355		
			Current Total	150,127		

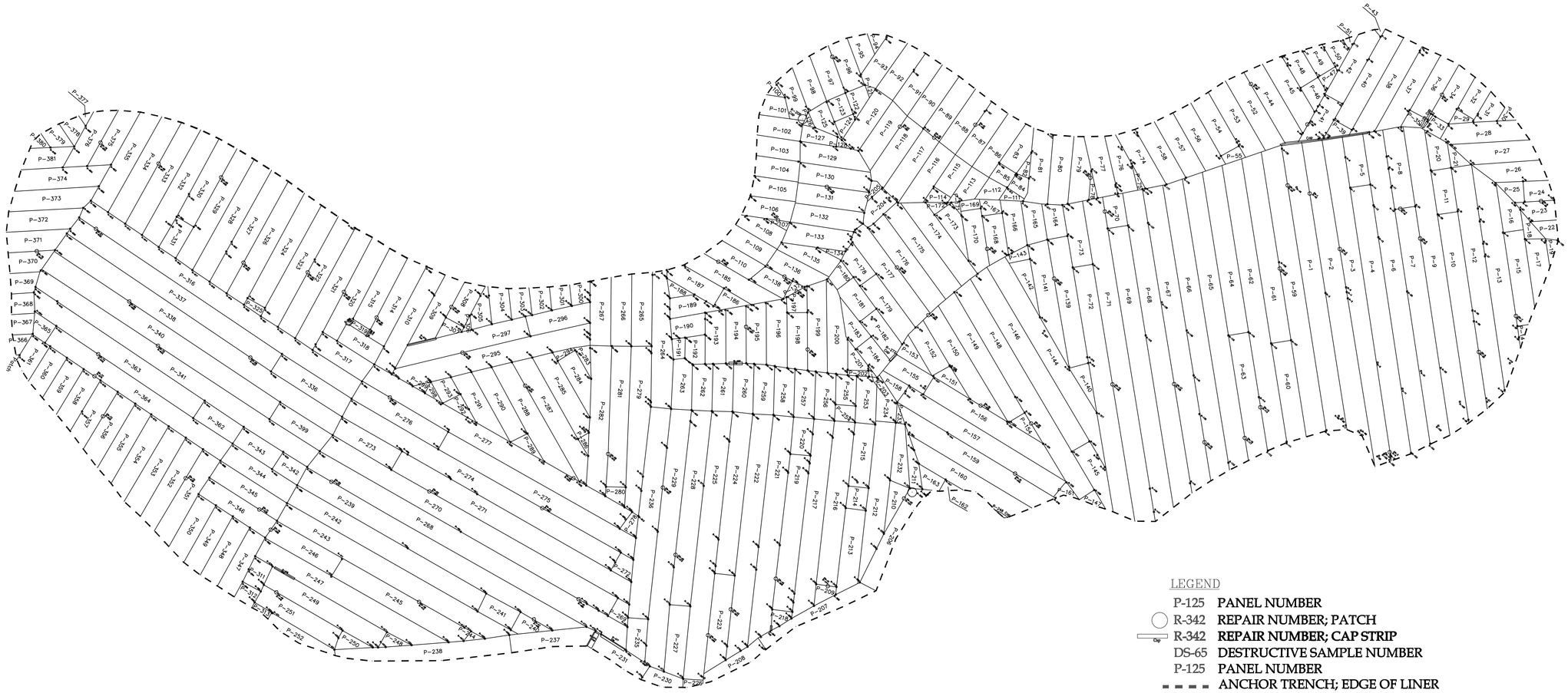
CQA Personnel: _____

APPENDIX 5

LLDPE LINER AS-BUILT DRAWING

NOTES:

1. 40-MIL LLDPE LINER INSTALLED BY ENVIRONMENTAL SPECIALIST INTERNATIONAL (ESI)
2. 40-MIL LLDPE LINER AS-BUILT INFORMATION IS A COMPILATION OF FIELD DATA COLLECTED BY LAWRENCE ASSOCIATES, P.A., EARNHARDT GRADING, INC., ESP ASSOCIATES, P.A. AND ERM NC, INC.
3. ALL AS-BUILT INFORMATION IS TIED TO ON SITE BENCHMARK AND NC STATE PLANE COORDINATE SYSTEM



LEGEND

P-125	PANEL NUMBER
R-342	REPAIR NUMBER; PATCH
R-342	REPAIR NUMBER; CAP STRIP
DS-65	DESTRUCTIVE SAMPLE NUMBER
P-125	PANEL NUMBER
	ANCHOR TRENCH; EDGE OF LINER
	EDGE OF LINER PANEL

SCALE IN FEET
60 30 15 0 60

NO.	DATE	APPR.	REVISION	NO.	DATE	APPR.	REVISION

RURAL HALL ASH LANDFILL

R.J. REYNOLDS TOBACCO COMPANY — RURAL HALL, NORTH CAROLINA

DRAWN BY D. WASIELA	PROJECT ENGINEER
DESIGN ENGINEER D. WASIELA	PROJECT MANAGER

LICENSE #C-2206
ERM NC, INC.
8000 CORPORATE CENTER DRIVE, SUITE 200
CHARLOTTE, NORTH CAROLINA 28226
(704) 343-8345

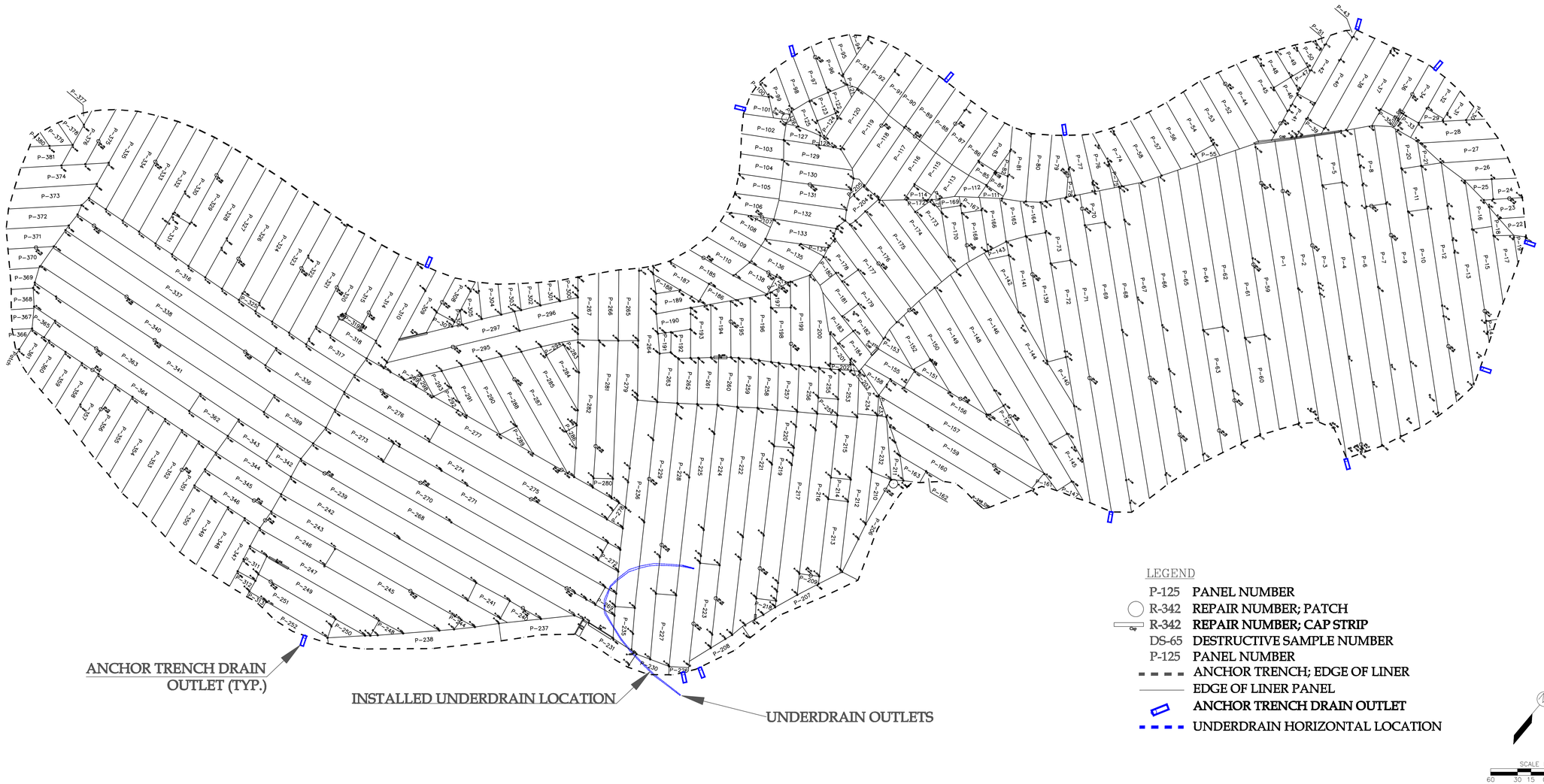
LANDFILL FINAL CAP 40-MIL LLDPE LINER AS-BUILT DRAWING

SCALE 1" = 60'	DATE 9/19/12
PROJECT NO. 0103137	AutoCAD 2002 LANDFILL CAP liner as-built.DWG

DRAWING NO. 1
REV. NO. 0
SHEET 1 OF 1

NOTES:

1. 40-MIL LLDPE LINER INSTALLED BY ENVIRONMENTAL SPECIALIST INTERNATIONAL (ESI)
2. 40-MIL LLDPE LINER AS-BUILT INFORMATION IS A COMPILATION OF FIELD DATA COLLECTED BY LAWRENCE ASSOCIATES, P.A., EARNHARDT GRADING, INC., ESP ASSOCIATES, P.A. AND ERM NC, INC.
3. ALL AS-BUILT INFORMATION IS TIED TO ON SITE BENCHMARK AND NC STATE PLANE COORDINATE SYSTEM



NO.	DATE	APPR.	REVISION	NO.	DATE	APPR.	REVISION

RURAL HALL ASH LANDFILL

R.J. REYNOLDS TOBACCO COMPANY — RURAL HALL, NORTH CAROLINA

DRAWN BY D. WASIELA	PROJECT ENGINEER
DESIGN ENGINEER D. WASIELA	PROJECT MANAGER

LICENSE #C-2206
ERM NC, INC.
8000 CORPORATE CENTER DRIVE, SUITE 200
CHARLOTTE, NORTH CAROLINA 28226
(704) 343-8345

LANDFILL FINAL CAP 40-MIL LLDPE LINER AS-BUILT DRAWING

SCALE 1" = 60'	DATE 9/19/12
PROJECT NO. 0103137	AutoCAD 2002 LANDFILL CAP liner as-built.DWG

DRAWING NO. 1

REV. NO. 0

SHEET 1 OF 1

APPENDIX 6

FIELD LLDPE TRIAL SEAM REPORTS

GEOMEMBRANE TRIAL SEAM LOG

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Date: 5-17-12
ESP Project No.: XH01.304
Project Name: RURAL HALL ASH LANDFILL
Project Location: RURAL HALL, N.C
Page: 1 of 1

Fusion | Extrusion

Sample Number	Approximate Time	Machine Number	Technician Initials	Machine Settings: Preheat or Speed	Machine Settings: Temp. Setting	Peel Test Results 1	Peel Test Results 2	Peel Test Results 3	Shear Test Results 1	Shear Test Results 2	Shear Test Results 3	Pass or Fail	CQA Initials	Remarks
1	10:30	2030	CK	800	7.5	73 73	76 73	79 74	91	97	82	(P) F	TEL	S/S
2	10:30	2030	CK	800	7.0	82 80	82 86	84 89	86	86	80	(P) F	TEL	T/T
3	10:45	1995	JM	850	8.0	58 60	73 74	43 53	82	87	94	(P) F	TEL	S/S
4	10:50	93	WF	860	8.0	82 59	81 79	71 84	95	91	94	(P) F	TEL	S/S
5	4:05	1995	JM	850	8.5	92 91	90 79	92 93	84	97	95	(P) F	TEL	S/S
6	4:08	1995	JM	850	8.0	82 86	89 81	85 88	91	93	88	(P) F	TEL	T/T
7	4:03	93	WF	860	8.0	90 87	88 90	86 88	95	91	93	(P) F	TEL	S/S
8	4:20	2030	CK	850	8.0	77 78	82 88	73 87	94	94	86	(P) F	TEL	S/S
9	4:18	2030	CK	800	8.0	88 89	91 90	84 83	89	90	85	(P) F	TEL	T/T
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		

CQA Personnel: [signature]

DEMTECH

GEOMEMBRANE TRIAL SEAM LOG

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Date: 5-18-12
ESP Project No.: XH01304
Project Name: RUCAL HALL ASH LANDFILL
Project Location: RUCAL HALL, N.C
Page: 1 of 1

Fusion | Extrusion

Sample Number	Approximate Time	Machine Number	Technician Initials	Machine Settings: Preheat or Speed	Machine Settings: Temp. Setting	Peel Test Results 1	Peel Test Results 2	Peel Test Results 3	Shear Test Results 1	Shear Test Results 2	Shear Test Results 3	Pass or Fail	CQA Initials	Remarks
1	7:50	5383	JM	450	400	73	95	92	97	91	86	P F	TBL	EXT
2	7:30	2030	CK	800	8.0	78 85	82 85	80 84	113	114	110	P F	TBL	S/S
3	7:30	2030	CK	800	8.0	86 86	99 96	103 101	118	117	115	P F	TBL	T/T
4	7:30	2030	CK	800	8.0	87 94	80 86	84 90	107	114	116	P F	TBL	T/S
5	7:47	93	WF	860	8.5	84 90	81 80	84 80	111	112	101	P F	TBL	S/S
6	7:44	93	WF	860	8.5	98 103	93 97	95 97	112	114	114	P F	TBL	T/T
7	1:16	93	WF	860	8.5	94 103	93 90	95 92	102	104	114	P F	TBL	S/S
8	1:14	93	WF	860	8.5	95 85	95 87	92 84	110	112	116	P F	TBL	T/T
9	1:08	2030	CK	800	8.0	74 62	62 82	72 86	110	106	109	P F	TBL	S/S
10	1:08	2030	CK	800	8.0	80 69	79 72	70 74	92	96	84	P F	TBL	S/T
11	1:08	2030	CK	800	8.0	80 75	72 73	60 71	89	87	75	P F	TBL	T/T
12	1:32	5383	JM	450	450	86	77	65	88	91	98	P F	TBL	EXT
												P F		
												P F		
												P F		
												P F		

CQA Personnel: _____

GEOMEMBRANE TRIAL SEAM LOG

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Date: 5-19-12
ESP Project No.: XH01.304
Project Name: Rural Hall Ash Landfill
Project Location: Rural Hall N.C.
Page: 1 of 1

Fusion	Extrusion

Sample Number	Approximate Time	Machine Number	Technician Initials	Machine Settings: Preheat or Speed	Machine Settings: Temp. Setting	Peel Test Results 1	Peel Test Results 2	Peel Test Results 3	Shear Test Results 1	Shear Test Results 2	Shear Test Results 3	Pass or Fail	CQA Initials	Remarks
1	7:30	9153	JM	450	450	96	111	96	103	100	101	(P) F	TR	
2	8:00	0250	CK	410°	420	65	72	70	74	70	72	(P) F	TR	
3	7:49	5383	WF	450	400	100	105	104	110	111	110	(P) F	TR	
4	1:18	0252	CK	420°	430	80	76	77	70	61	78	(P) F	TR	
5	1:30	9153	JM	450	450	83	84	94	94	95	92	(P) F	TR	
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		

CQA Personnel: EJ

GEOMEMBRANE TRIAL SEAM LOG

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Date: 5-21-12
ESP Project No.: XH01.304
Project Name: RURAL HALL ASH Landfill
Project Location: RURAL HALL, N.C.
Page: 1 of 1

Fusion | Extrusion

Sample Number	Approximate Time	Machine Number	Technician Initials	Machine Settings: Preheat or Speed	Machine Settings: Temp. Setting	Peel Test Results 1	Peel Test Results 2	Peel Test Results 3	Shear Test Results 1	Shear Test Results 2	Shear Test Results 3	Pass or Fail	CQA Initials	Remarks
1	7:40	2030	CK	800	7.5	81 / 82	85 / 87	88 / 84	87	93	86	(P) F	TR	T/T
2	7:55	0252	LP	500	500	54	55	62	93	95	96	(P) F	TR	EXT
3	1:20	2030	CK	800	9.0	65 / 70	67 / 83	60 / 72	85	88	86	(P) F	TR	S/S
4	1:20	2030	CK	"	7	54 / 73	71 / 55	56 / 70	83	87	89	(P) F	TR	T/T
5	2:04	1995	JM	850	8.5	81 / 73	73 / 70	83 / 78	82	85	78	(P) F	TR	S/S
6	2:04	"	"	"	7.5	83 / 83	82 / 83	85 / 83	92	99	96	(P) F	TR	T/T
7	2:00	252	CK	400	400	72	70	54	88	72	90	(P) F	TR	EXT
8	2:14	1993	WF	860	8.5	73 / 77	76 / 74	56 / 50	81	82	80	(P) F	TR	S/S
9	2:10	"	"	"	"	82 / 66	63 / 64	54 / 53	86	95	81	(P) F	TR	T/T
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		

CQA Personnel: [signature]

GEOMEMBRANE TRIAL SEAM LOG

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Date: 5-22-12
ESP Project No.: X4-01,304
Project Name: Rural Hall Ash Landfill
Project Location: Rural Hall, N.C.
Page: 1 of 1

Fusion | Extrusion

Sample Number	Approximate Time	Machine Number	Technician Initials	Machine Settings: Preheat or Speed	Machine Settings: Temp. Setting	Peel Test Results 1	Peel Test Results 2	Peel Test Results 3	Shear Test Results 1	Shear Test Results 2	Shear Test Results 3	Pass or Fail	CQA Initials	Remarks
1	1:15	2030	CK	800	9.0	83 58	85 70	84 83	87	86	94	(P) F	TRL	S/S
2	1:15	2030	CK	800	9.0	72 81	86 73	85 84	82	76	84	(P) F	TRL	T/T
3	1:26	1993	WF	860	8.5	85 72	86 84	66 72	80	83	89	(P) F	TRL	S/S
4	1:29	1993	WF	860	8.5	83 82	76 65	69 70	96	84	82	(P) F	TRL	S/T
5	1:41	0952	J.M	450	450	95	99	89	88	85	90	(P) F	TRL	EXT
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		

CQA Personnel: _____

GEOMEMBRANE TRIAL SEAM LOG

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Date: 5-23-12
ESP Project No.: X401,304
Project Name: RURAL HALL ASH LANDFILL
Project Location: RURAL HALL, N.C.
Page: 1 of 1

Fusion	Extrusion

Sample Number	Approximate Time	Machine Number	Technician Initials	Machine Settings: Preheat or Speed	Machine Settings: Temp. Setting	Peel Test Results 1	Peel Test Results 2	Peel Test Results 3	Shear Test Results 1	Shear Test Results 2	Shear Test Results 3	Pass or Fail	CQA Initials	Remarks
1	1128	252	CK	400	400	62	64	70	81	83	85	(P) F	TR	EXT
2	1130	9153	JM	450	350	74	75	68	86	88	80	(P) F	TR	EXT
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		

CQA Personnel: _____

GEOMEMBRANE TRIAL SEAM LOG

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Date: 5-24-11
ESP Project No.: X101.304
Project Name: RURAL HALL MH Lndfill
Project Location: RURAL HALL, NC
Page: 1 of 1

Fusion | Extrusion

Sample Number	Approximate Time	Machine Number	Technician Initials	Machine Settings: Preheat or Speed	Machine Settings: Temp. Setting	Peel Test Results 1	Peel Test Results 2	Peel Test Results 3	Shear Test Results 1	Shear Test Results 2	Shear Test Results 3	Pass or Fail	CQA Initials	Remarks
1	1:30	1995	JM	850	8.5	84 82	72 73	66 77	77	83	90	(P) F	TR	S/S
2	1:30	"	"	"	"	87 82	83 93	75 93	83	101	98	(P) F	TR	T/T
3	1:20	2030	CK	800	9.0	78 73	81 79	80 78	90	91	78	(P) F	TR	S/S
4	1:20	"	"	"	"	89 79	81 78	80 77	93	92	89	(P) F	TR	S/T
5	1:20	"	"	"	"	80 77	79 77	80 79	87	89	86	(P) F	TR	T/T
6	1:09	93	WF	860	8.5	77 83	84 85	83 80	105	107	108	(P) F	TR	S/S
7	1:05	93	WF	860	8.5	92 86	92 88	94 87	105	104	108	(P) F	TR	T/T
8	6:03	9153	JM	450	450	84	91	82	79	83	91	(P) F	TR	EXT.
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		

CQA Personnel: [signature]

GEOMEMBRANE TRIAL SEAM LOG

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Date: 5-25-12
ESP Project No.: XH01.304
Project Name: RURAL HALL AST Cap
Project Location: RURAL HALL, NC
Page: 1 of 1

Fusion	Extrusion

Sample Number	Approximate Time	Machine Number	Technician Initials	Machine Settings: Preheat or Speed	Machine Settings: Temp. Setting	Peel Test Results 1	Peel Test Results 2	Peel Test Results 3	Shear Test Results 1	Shear Test Results 2	Shear Test Results 3	Pass or Fail	CQA Initials	Remarks
1	7:40	1995	JM	850	8.5	83 88	89 87	88 76	96	101	100	(P) F	TR	S/S
2	7:44	1995	"	"	"	85 87	83 80	86 86	96	97	101	(P) F	TR	T/T
3	7:36	93	WF	860	8.5	79 84	85 91	85 88	107	110	108	(P) F	TR	S/S
4	7:34	93	WF	"	"	104 95	103 95	100 94	110	96	105	(P) F	TR	T/T
5	7:55	2030	CK	800	9.0	81 74	82 77	65 73	92	102	106	(P) F	TR	S/S
6	7:55	2030	CK	"	8.5	71 84	89 90	70 71	95	98	88	(P) F	TR	T/T
7	7:55	2030	"	"	"	79 64	78 81	76 88	89	84	87	(P) F	TR	S/T
8	1:55	5383	JM	430	450	86	71	72	84	83	79	(P) F	TR	EXT
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		

CQA Personnel: _____

GEOMEMBRANE TRIAL SEAM LOG

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Date: 5-26-12
ESP Project No.: XH01.304
Project Name: Kinston Ash Landfill
Project Location: Kinston, N.C
Page: 1 of 1

Fusion | Extrusion

Sample Number	Approximate Time	Machine Number	Technician Initials	Machine Settings: Preheat or Speed	Machine Settings: Temp. Setting	Peel Test Results 1	Peel Test Results 2	Peel Test Results 3	Shear Test Results 1	Shear Test Results 2	Shear Test Results 3	Pass or Fail	CQA Initials	Remarks
1	7:38	53B3	J.M.	450	400	84	80	75	103	96	97	(P) F	TDR	EXT
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		

CQA Personnel: [signature]

GEOMEMBRANE TRIAL SEAM LOG

ESP ASSOCIATED, P.A.
engineering • surveying • planning

Date: 5-30-12
ESP Project No.: XH01.304
Project Name: Rural Hall ASH Landfill
Project Location: Rural Hall, NC
Page: 1 of 1

Fusion | Extrusion

Sample Number	Approximate Time	Machine Number	Technician Initials	Machine Settings: Prehent or Speed	Machine Settings: Temp. Setting	Peel Test Results 1	Peel Test Results 2	Peel Test Results 3	Shear Test Results 1	Shear Test Results 2	Shear Test Results 3	Pass or Fail	CQA Initials	Remarks
1	7:48	2030	CK	800	8.5	87 78	95 87	85 90	102	105	99	(P) F	TL	T/T
2	7:50	93	WF	860	8.6	80 70	80 79	81 80	104	101	104	(P) F	TL	T/T
3	7:50	93	WF	"	"	93 85	81 84	83 93	101	104	101	(P) F	TL	S/S
4	8:30	JM	1995	850	8.5	81 88	74 78	65 68	96	100	98	(P) F	TL	S/S
5	"	"	"	"	7.5	98 63	98 70	90 92	106	100	99	(P) F	TL	T/T
6	1:10	93	WF	860	8.6	84 86	87 86	91 84	101	104	98	(P) F	TL	S/S
7	1:14	"	"	"	"	88 86	89 85	88 84	101	104	101	(P) F	TL	T/T
8	1:20	9153	JM	450	400	68	70	66	84	89	92	(P) F	TL	EXT
9	1:19	5358	SK	450	400	74	66	58	90	97	87	(P) F	TL	EXT
10	1:35	1995	SM	800	8.5	81 63	80 72	82 66	84	92	79	(P) F	TL	S/S
11	1:35	"	"	"	8.0	77 73	78 75	60 74	89	99	87	(P) F	TL	T/T
												P F		
												P F		
												P F		
												P F		
												P F		

CQA Personnel: _____

GEOMEMBRANE TRIAL SEAM LOG

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Date: 5-31-12
ESP Project No.: XH01.504
Project Name: RURAL HALL ASH LANDFILL
Project Location: RURAL HALL, NC
Page: 1 of 1

Fusion | Extrusion

Sample Number	Approximate Time	Machine Number	Technician Initials	Machine Settings: Preheat or Speed	Machine Settings: Temp. Setting	Peel Test Results 1	Peel Test Results 2	Peel Test Results 3	Shear Test Results 1	Shear Test Results 2	Shear Test Results 3	Pass or Fail	CQA Initials	Remarks
1	8:05	0252	CK	450	400	62	65	60	89	87	91	(P) F	TAR	EXT
2	10:28	1993	WF	860	8.6	88 / 85	88 / 88	88 / 89	101	109	106	(P) F		TT
3	10:28	"	"	"	"	93 / 92	93 / 95	93 / 93	101	104	107	(P) F		SLB
4	1:15	0252	CK	470	400	75	73	72	81	95	97	(P) F	TAR	EXT
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		

CQA Personnel: _____

GEOMEMBRANE TRIAL SEAM LOG

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Date: 7-5-12
ESP Project No.: XH01.304
Project Name: RURAL HALL ASH LANDfill
Project Location: RURAL HALL, N.C
Page: 1 of

(Fusion) | Extrusion

Sample Number	Approximate Time	Machine Number	Technician Initials	Machine Settings: Preheat or Speed	Machine Settings: Temp. Setting	Peel Test Results 1	Peel Test Results 2	Peel Test Results 3	Shear Test Results 1	Shear Test Results 2	Shear Test Results 3	Pass or Fail	CQA Initials	Remarks
1	9:09	1993	WF	7.0	860	62/67	67/68	65/63	92	91	94	(P) F	TR	S/S
2	9:10	1993	WF	7.0	860	61/60	64/67	66/62	93	96	91	(P) F	TR	T/T
3	9:15	2030	CK	9.0	800	63/64	61/65	60/62	91	94	95	(P) F	TR	S/S
4	9:15	2030	CK	8.0	800	61/60	63/66	65/62	95	98	94	(P) F	TR	S/T
5	9:15	2030	CK	8.0	800	61/64	65/62	67/66	96	91	90	(P) F	TR	T/T
6	1:14	1993	WF	8.0	860	60/62	64/66	61/63	92	90	96	(P) F	TR	S/S
7	1:14	"	"	8.0	"	61/63	63/62	63/65	92	94	96	(P) F	TR	T/T
8	1:20	2030	CK	9.0	800	63/66	60/65	61/64	98	96	93	(P) F	TR	S/S
9	1:20	"	"	8.0	"	68/70	66/61	63/62	91	95	92	(P) F	TR	S/T
10	1:20	"	"	8.0	800	64/65	66/61	60/63	92	96	97	(P) F	TR	T/T
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		

CQA Personnel: [signature]

GEOMEMBRANE TRIAL SEAM LOG

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Date: 7-6-12
ESP Project No.: XH01.304
Project Name: RURAL HALL ASH LANDFILL
Project Location: RURAL HALL N.C.
Page: 1 of 1

Fusion | Extrusion

Sample Number	Approximate Time	Machine Number	Technician Initials	Machine Settings: Preheat or Speed	Machine Settings: Temp. Setting	Peel Test Results 1	Peel Test Results 2	Peel Test Results 3	Shear Test Results 1	Shear Test Results 2	Shear Test Results 3	Pass or Fail	CQA Initials	Remarks
1	7:40	252	CK	500	380	76	82	80	97	98	92	(P) F	TGR	EXT
2	7:22	5383	WF	500	400	96	97	75	92	94	95	(P) F	TGR	EXT
3	7:20	9153	LA	500	325	92	95	91	96	98	93	(P) F	TGR	EXT
4	1:20	2030	CK	9.0	800	61 66	62 60	64 61	96	94	98	(P) F	TGR	S/S
5	1:20	"	"	8.0	"	66 68	65 64	63 67	99	97	95	(P) F	TGR	S/T
6	1:20	"	"	"	"	68 60	63 61	64 69	96	95	93	(P) F	TGR	T/T
7	1:29	1993	WF	8.0	860	86 82	62 64	84 86	92	98	94	(P) F	TGR	S/S
8	1:25	"	WF	8.0	860	78 60	76 78	78 75	96	99	97	(P) F	TGR	T/T
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		

CQA Personnel: _____

GEOMEMBRANE TRIAL SEAM LOG

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Date: 7-7-12
ESP Project No.: X401.504
Project Name: RURAL HALL ASH LANDFILL
Project Location: RURAL HALL, N.C.
Page: 1 of 1

Fusion	Extrusion

Sample Number	Approximate Time	Machine Number	Technician Initials	Machine Settings: Preheat or Speed	Machine Settings: Temp. Setting	Peel Test Results 1	Peel Test Results 2	Peel Test Results 3	Shear Test Results 1	Shear Test Results 2	Shear Test Results 3	Pass or Fail	CQA Initials	Remarks
1	7:43	252	CK	500	300	68	72	70	96	99	93	(P) F	TDC	
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		

CQA Personnel: _____

GEOMEMBRANE TRIAL SEAM LOG

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Date: 7-9-12
ESP Project No.: XH01.304
Project Name: Rural Hall ASL Landfill
Project Location: Rural Hall, N.C.
Page: 1 of 1

Fusion | Extrusion

Sample Number	Approximate Time	Machine Number	Technician Initials	Machine Settings: Preheat or Speed	Machine Settings: Temp. Setting	Peel Test Results 1	Peel Test Results 2	Peel Test Results 3	Shear Test Results 1	Shear Test Results 2	Shear Test Results 3	Pass or Fail	CQA Initials	Remarks
1	7:36	2030	CK	9.0	800	73 72	74 69	70 68	97	94	98	(P) F	TOL	S/S
2	7:36	"	"	"	"	70 72	78 70	71 74	91	93	95	(P) F	TOL	T/T
3	7:50	1993	WF	860	8.0	61 77	84 81	76 73	94	93	90	(P) F	TOL	S/S
4	7:45	"	"	"	"	78 72	75 82	69 71	97	92	96	(P) F	TOL	T/T
5	9:30	9153	CK	500	300	71	68	72	99	97	94	(P) F	TOL	EXT
6	10:05	252	LP	500	300	65	67	70	94	92	98	(P) F	TOL	EXT
7	1:46	2030	CK	9.0	800	65 66	68 64	61 69	93	96	97	(P) F	TOL	S/S
8	1:46	"	"	"	"	69 64	70 67	62 63	100	99	92	(P) F	TOL	T/T
9	1:50	1993	WF	8.0	860	71 70	69 63	67 68	95	97	94	(P) F	TOL	S/S
10	1:51	"	"	"	"	66 64	61 68	62 69	96	91	91	(P) F	TOL	T/T
11	3:20	252	LP	250	500	68	66	67	91	96	99	(P) F	TOL	EXT
12	3:25	9153	CK	250	500	78	70	64	92	93	95	(P) F	TOL	EXT
												P F		
												P F		
												P F		
												P F		

CQA Personnel: _____

GEOMEMBRANE TRIAL SEAM LOG

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Date: 7-10-12
ESP Project No.: X401.504
Project Name: RURAL HALL ASH LANDFILL
Project Location: RURAL HALL, N.C.
Page: 1 of 1

Fusion	Extrusion

Sample Number	Approximate Time	Machine Number	Technician Initials	Machine Settings: Preheat or Speed	Machine Settings: Temp. Setting	Peel Test Results 1	Peel Test Results 2	Peel Test Results 3	Shear Test Results 1	Shear Test Results 2	Shear Test Results 3	Pass or Fail	CQA Initials	Remarks
1	1:00	252	CK	500	300	62	80	71	94	98	97	P F	TER	
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		

CQA Personnel: EK

GEOMEMBRANE TRIAL SEAM LOG

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Date: 7-12-12
ESP Project No.: X401.304
Project Name: Coral Hill Ash Landfill
Project Location: Coral Hill, N.C.
Page: 1 of

Fusion | Extrusion

Sample Number	Approximate Time	Machine Number	Technician Initials	Machine Settings: Preheat or Speed	Machine Settings: Temp. Setting	Peel Test Results 1	Peel Test Results 2	Peel Test Results 3	Shear Test Results 1	Shear Test Results 2	Shear Test Results 3	Pass or Fail	CQA Initials	Remarks
1	7:30	0252	CK	500	300	80	79	84	90	91	90	P F	TBL	EXT
2	8:10	9153	WF	450	350°	76	80	84	97	92	95	P F	TBL	EXT
3	10:02	1993	WF	860	7.0	93 92	96 90	94 86	106	105	106	P F	TBL	S/S
4	10:02	"	"	"	"	86 90	89 91	88 86	100	101	104	P F	TBL	T/T
5	9:00	2030	CK	8.0	800	93 92	90 88	94 88	90	89	93	P F	TBL	T/T
6	"	"	"	9.0	800	77 82	84 84	78 80	95	93	93	P F	TBL	S/S
7	1:35	2030	CK	9.0	800	74 71	78 76	72 74	93	96	98	P F	TBL	S/S
8	"	"	"	8.0	"	78 74	76 69	70 75	96	100	99	P F	TBL	S/T
9	1:42	1993	WF	7.0	860	74 69	81 66	60 67	93	98	100	P F	TBL	S/S
10	"	"	"	"	"	66 76	70 78	72 80	96	97	100	P F	TBL	T/T
11	2:15	5383	LP	500	300	67	77	79	96	100	98	P F	TBL	EXT
12	3:00	252	WF	500	300	70	72	69	97	94	92	P F	TBL	EXT
												P F		
												P F		
												P F		
												P F		

CQA Personnel: [signature]

GEOMEMBRANE TRIAL SEAM LOG

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Date: 7-13-12
ESP Project No.: XH01.304
Project Name: RURAL HALL ASH LANDFILL
Project Location: RURAL HALL, N.C.
Page: 1 of 1

Fusion | Extrusion

Sample Number	Approximate Time	Machine Number	Technician Initials	Machine Settings: Preheat or Speed	Machine Settings: Temp. Setting	Peel Test Results 1	Peel Test Results 2	Peel Test Results 3	Shear Test Results 1	Shear Test Results 2	Shear Test Results 3	Pass or Fail	CQA Initials	Remarks
1	7:30	2030	CK	9.0	880	64 / 64	75 / 74	72 / 69	109	99	100	(P) F	TR	S/S
2	"	"	"	8.0	800	67 / 76	78 / 71	73 / 70	100	98	103	(P) F	TR	S/T
3	"	"	"	"	"	85 / 72	80 / 81	73 / 71	96	99	101	(P) F	TR	T/T
4	8:00	1993	WF	8.0	860	83 / 61	78 / 79	76 / 72	100	94	102	(P) F	TR	S/S
5	8:08	"	"	7.0	860	64 / 69	66 / 63	70 / 68	103	101	98	(P) F	TR	T/T
6	10:50	5383	LP	500	350	68	76	80	98	100	102	(P) F	TR	EXT
7	10:25	1993	WF	8.0	860	66 / 62	70 / 78	71 / 64	100	96	97	(P) F	TR	S/T
8	1:00	2030	CK	9.0	800	71 / 70	62 / 62	66 / 64	97	92	99	(P) F	TR	S/S
9	"	"	"	8.0	800	72 / 77	76 / 60	65 / 61	98	96	94	(P) F	TR	S/T
10	"	2030	"	"	"	69 / 71	72 / 64	66 / 68	93	98	97	(P) F	TR	T/T
11	12:50	1993	WF	8.0	860	70 / 69	71 / 77	74 / 75	100	101	96	(P) F	TR	S/S
12	12:54	"	"	"	"	80 / 71	74 / 76	78 / 68	100	93	92	(P) F	TR	S/T
13	"	"	"	8.0	860	66 / 64	71 / 70	68 / 63	97	99	95	(P) F	TR	T/T
14	2:10	5383	LP	500	300	69	71	76	99	100	96	(P) F	TR	EXT
15	3:00	0252	CK	500	300	65	66	67	91	91	92	(P) F	TR	EXT
16	3:00	0252	WF	500	300	72	70	69	98	101	95	(P) F	TR	EXT

CQA Personnel: _____

GEOMEMBRANE TRIAL SEAM LOG

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Date: 7-15-12
ESP Project No.: XH01.304
Project Name: Roxal Hall Ash Landfill
Project Location: Roxal Hall, NC
Page: 1 of 1

Fusion | Extrusion

Sample Number	Approximate Time	Machine Number	Technician Initials	Machine Settings: Preheat or Speed	Machine Settings: Temp. Setting	Peel Test Results 1	Peel Test Results 2	Peel Test Results 3	Shear Test Results 1	Shear Test Results 2	Shear Test Results 3	Pass or Fail	CQA Initials	Remarks
1	7:25	5383	WF	500	300	68	71	74	100	98	102	(P) F	TB	
2	8:02	252	LP	500	300	71	70	73	95	102	99	(P) F	TL	
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		

CQA Personnel: _____

GEOMEMBRANE TRIAL SEAM LOG

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Date: 8-9-12
ESP Project No.: X401.304
Project Name: RURAL HALL ASH LANDFILL
Project Location: RURAL HALL, N.C.
Page: 1 of

Fusion | Extrusion

Sample Number	Approximate Time	Machine Number	Technician Initials	Machine Settings: Preheat or Speed	Machine Settings: Temp. Setting	Peel Test Results 1	Peel Test Results 2	Peel Test Results 3	Shear Test Results 1	Shear Test Results 2	Shear Test Results 3	Pass or Fail	CQA Initials	Remarks
1	10:30	1993	CK	8.0	800	75 / 69	77 / 70	72 / 76	92	96	97	(P) F	TR	S/S
2	" "	"	"	7.5	800	73 / 67	75 / 74	73 / 72	94	95	98	(P) F	TR	T/T
3	10:01	1995	JM	8.5	850	72 / 81	70 / 70	70 / 82	95	96	90	(P) F	TR	S/S
4	10:10	"	"	8.0	850	71 / 75	69 / 72	63 / 68	99	95	91	(P) F	TR	T/T
5	4:06	1995	JM	8.5	850	70 / 72	68 / 71	66 / 75	91	94	96	(P) F	TR	S/S
6	4:07	"	"	8.0	850	70 / 77	74 / 80	73 / 75	92	98	99	(P) F	TR	T/T
7	4:18	1993	CK	8.0	800	74 / 78	71 / 70	73 / 76	92	99	93	(P) F	TR	S/S
8	"	"	"	7.5	800	72 / 76	71 / 75	73 / 77	96	92	98	(P) F	TR	T/T
9	5:20	1995	CK	7.5	850	72 / 70	71 / 74	68 / 76	92	96	98	(P) F	TR	S/T
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		

CQA Personnel: _____

GEOMEMBRANE TRIAL SEAM LOG

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Date: 8-10-12
ESP Project No.: X1401.304
Project Name: RURAL HALL ASH LANDFILL
Project Location: RURAL HALL, NC.
Page: 1 of

(Fusion) | Extrusion

Sample Number	Approximate Time	Machine Number	Technician Initials	Machine Settings: Preheat or Speed	Machine Settings: Temp. Setting	Peel Test Results 1	Peel Test Results 2	Peel Test Results 3	Shear Test Results 1	Shear Test Results 2	Shear Test Results 3	Pass or Fail	CQA Initials	Remarks
1	7:30	1995	JM	8.0	850	79 78	80 80	85 84	91	93	95	(P) F	TDL	S/S
2	7:35	"	"	7.0	850	78 73	77 78	77 76	90	90	92	(P) F	TDL	T/T
3	8:00	1993	CK	8.0	800	70 84	83 84	84 84	92	90	98	(P) F	TDL	S/S
4	8:00	1993	CK	7.0	800	75 80	78 80	77 78	97	99	90	(P) F	TDL	T/T
5	1:20	1995	JM	8.5	850	66 75	70 69	79 67	95	98	91	(P) F	TDL	T/T
6	1:25	1995	J.M	7.5	850	72 68	67 69	73 66	91	92	90	P F	TDL	S/S
7	1:15	1993	CK	8.0	800	63 68	75 69	73 73	93	96	97	(P) F	TDL	S/S
8	1:15	"	"	7.0	800	61 66	67 68	66 66	98	91	98	(P) F	TDL	T/T
9	3:02	1995	J.M	7.5	800	69 70	71 74	76 77	93	96	92	(P) F	TDL	S/T
10	4:01	1993	CK	7.0	800	68 65	66 69	71 73	98	91	94	(P) F	TDL	S/T
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		

CQA Personnel: _____

GEOMEMBRANE TRIAL SEAM LOG

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Date: 8-13-12
ESP Project No.: X401 304
Project Name: Rural Hall Ash Landfill
Project Location: Rural Hall N.C.
Page: 1 of 1

Fusion	Extrusion

Sample Number	Approximate Time	Machine Number	Technician Initials	Machine Settings: Preheat or Speed	Machine Settings: Temp. Setting	Peel Test Results 1	Peel Test Results 2	Peel Test Results 3	Shear Test Results 1	Shear Test Results 2	Shear Test Results 3	Pass or Fail	CQA Initials	Remarks
1	7:13	252	CK	400	520	87	90	89	92	93	92	(P) F	TR	
2	7:20	5383	WF	400	520	91	92	93	94	96	97	(P) F	TR	
3	7:20	9153	LP	400	500	90	91	93	95	94	98	(P) F	TR	
4	1:20	252	CK	350	510	61	72	74	72	75	73	(P) F	TR	
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		
												P F		

CQA Personnel: [signature]

APPENDIX 7

FIELD LLDPE SEAM LOG AND NON-DESTRUCTIVE TESTING

GEOMEMBRANE SEAM LOG
AND NON DESTRUCTIVE TESTING

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Project No. XH01.304
Project Name: RURAL HALL ASH LANDFILL
Project Location: RURAL HALL, N.C.

Material: 40 mil LLDPE
Installer: ESI

5-17-12

Page 1 of 2

Seam Number	Weld Time	Tech ID	Machine ID	Machine Temp	Machine Speed or Preheat	Starting Point	Ending Point	Seam Length	Air Pressure Testing PSI Start	PSI Finish	Time Start	Time Finish	Tech Init.	Vac. Test	Tech. Init.	Test Date
1/2	11:31/12:02	WF	93	860	8/100	E ANCHOR	W EOS	336	30/30	30/30	1:13/1:18	1:18/1:18	LM			
2/3	11:46 12:02 / 11:42-12:05	CK/JM	2030/1995	800/850	7.5/8.0	E ANCHOR	W EOS	355	30/30	30/30	1:19/1:19	1:24/1:24	LM	1:44-30	1:49 30	LM
3/4	1:23/1:49	JM	1995	850	8.0	E Anchor	S-4/5	323	30/30	30/30	2:32/1:36	2:37/2:10	LM			
4/5(B)	1:26-1:28	CK	2030	800	7.0	P-6	P-3	22	30	30	2:32	2:37	LM			
3/5	1:49-1:53	JM	1995	850	8.0	S END 4/5	W END 3/5	58	30/30	30/30	2:38/2:32	2:40/2:37	LM			
5/6	2:06-2:10	WF	93	860	8.0	N END 4/5	W end 5/6	59	30	30	2:41	2:46	LM			
6/4	1:38-2:06	WF	93	860	8.0	E Anchor	N END 4/5	317	30/30	30/30	2:02/2:20	2:07/2:25	LM	30-30 2:26-	2:31	30-30 2:46-2:51
6/8	2:18-2:27	CK	2030	800	7.5	S end 7/8	W end 6/8	93	30/30	30/30	2:153/2:153	2:158/2:158	LM			
									30/30	30/30	2:158/2:158	3:03/3:03	LM			
8/7	2:08-2:10	JM	1995	850	8.0	Butt	—	22	30	30	2:26	2:31	LM			
7/6	1:55-2:18	CK	2030	800	7.5	E Anchor	S end 8/7	274	30/30	30/30	2:26/2:14	2:31/2:19	LM			
									30	29	2:09	2:13	LM			
7/9	2:34-2:57	WF	93	860	8.0	E Anchor	to N end 7/8	266	30/30	30/30	3:12/3:07	3:17/3:12	LM			
8/9	2:57-3:06	WF	93	860	8.0	N end 7/8	W end 8/9	91	30	30	3:07	3:12	LM			
9/11	3:19-3:25	WF	93	"	"	S end 11/10	W end 9/11	50	30	30	4:04	4:09	LM			
10/11	3:18-3:20	CK	2030	800	7.0	Butt	—	22	30	29	3:54	3:59	LM			
10/9	2:57-3:19	JM	1995	850	8.0	E Anchor	S end 10/11	242	30	28	4:04	4:09	LM			
10/12	3:27-4:02	WF	93	860	8.0	E Anchor	N end 10/11	231	30/30	29/30	3:40/3:40	3:45/3:45	LM			
									30	30	3:50	3:55	LM			
11/12	4:02-4:08	WF	93	860	8.0	N end 10/11	N end 11/20	50	30/30	30/30	4:20/4:20	4:25/4:25	LM			

Daily Total

CQA Personnel: EJ

GEOMEMBRANE SEAM LOG
AND NON DESTRUCTIVE TESTING

5-17-12

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Project No. XH 01,304
Project Name: RUKAL HALL ASH LANDFILL
Project Location: RUKAL HALL, NC

Material: 40mil LLDPE
Installer: ESI

5-17-12

Page 2 of 2

Seam Number	Weld Time	Tech ID	Machine ID	Machine Temp	Machine Speed or Preheat	Starting Point	Ending Point	Seam Length	Air Pressure Testing PSI Start	PSI Finish	Time Start	Time Finish	Tech Init.	Vac. Test	Tech. Init.	Test Date
12/13	5:17-	CK	2030	800	7.5	N end 12/21	E Anchor	262	30/30	28/30	4:17/4:16	4:22/4:21	LM			
									30/30	30/30	4:16/4:10	4:21/4:15	LM			
13/14	4:34	JM	1995	850	8.5	N Anchor	S end 14/15	26	30/30	30/30	4:32/4:32	4:37/4:37	LM			
14/15	4:26-4:27	JM	1995	850	8.5	Butt —		13'	30	30	4:37	4:42	LM			
15/13	4:38-4:44	JM	1995	850	8.5	S end 14/15	S END 14/15	110	30	28	4:53	4:58	LM			
13/16	4:44-4:54	JM	"	"	"	S end 15/16	EOS	60	30	30	5:03	5:08	LM			
15/16	4:28-4:30	WF	93	860	8.0	Butt —		22	30	30	4:53	4:58	LM			
16/18	4:32-4:54	WF	93	860	8.0	N end 15/18	EOS	23	30	30	5:02	5:07	LM			
15/18	4:28-4:32	WF	93	860	8.0	S end 15/18	N end 15/16	17	CAPPED		WITH	Patch				
17/18	4:36-4:38	WF	93	860	8.0	Butt —		22	30	30	5:00	5:05	LM			
15/17	4:40-4:50	WF	93	860	8.0	S end 17/18	Anchor	74	30	30	5:01	5:06	LM			
17/19	5:19-5:22	WF	93	860	8.0	Anchor	EOS	32	30	30	5:20	5:25	LM			
12/21	4:27-4:29	JM	1995	850	8.0	EOS	E end 20/21	22	30	30	5:30	5:35	LM			
11/20	4:29-5:33	JM	1995	850	8.0	E end 20/21	E end 9/20	22	30	30	5:30	5:35	LM			
9/20	5:14-5:17	J.M	1995	850	8.5	S end 20/11	EOS	46	30	30	5:35	5:40	LM			
20/21	5:19-5:21	J.M	1995	850	8.5	W end 11/12	EOS	30	30	30	5:30	5:35	LM			

Daily Total 3592

CQA Personnel: EJ

GEOMEMBRANE SEAM LOG
AND NON DESTRUCTIVE TESTING

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Project No. XH01.304
Project Name: RURAL HALL ASH LANDFILL
Project Location: RURAL HALL, N.C

Material: 40 MIL LLDPE
Installer: ESI

Page 1 of 5

5-18-12

Seam Number	Weld Time	Tech ID	Machine ID	Machine Temp	Machine Speed or Preheat	Starting Point	Ending Point	Seam Length	Air Pressure Testing PSI Start	PSI Finish	Time Start	Time Finish	Tech Init.	Vac. Test	Tech. Init.	Test Date
22/19	9:58-9:59	CK	2030	800	8.0	W end 19/18	Anchor	15	30	30	10:06	10:11	LM			
22/23	8:34-8:36	CK	2030	800	8.0	Anchor	TYN	34	30	30	8:51	8:56	LM			
23/24	8:26-8:29	CK	2030	800	8.0	Anchor	E end 24/25	36	30	30	8:46	8:51	LM			
24/25	8:08-8:10	CK	"	"	"	BUTT	—	22	30	30	8:40	8:45	LM			
23/25	8:29-8:30	CK	"	"	"	E end 24/25	TYN	12	30	30	8:46	8:51	LM			
24/26	8:19-8:21	CK	"	"	"	Anchor	W end 24/25	29'	30	30	8:40	8:45	LM			
26/25	8:21-8:24	CK	"	"	"	W end 24/25	TYN	34	30	30	8:40	8:45	LM			
26/27	8:32-8:38	WF	93	860	8.5	Anchor	TYN	80	30	30	8:57	9:02	LM			
27/28	8:40-8:50	CK	2030	800	8.0	Anchor	TYN	92	30	30	9:03	9:08	LM			
28/33	10:37-10:42	WF	93	860	8.0	TYN	E end 33/34	28	30	30	11:01	11:06	LM			
28/29	10:42-10:44	WF	93	860	8.0	E end 33/34	N 29/32	27	30	30	10:56	11:01	LM			
28/31	10:44-10:48	WF	93	860	8.0	N end 29/32	30/31	29	30	30	10:50	10:55	LM			
28/30	10:48-10:50	WF	93	860	8.0	N end 30/31	Anchor	25	30	30	10:50	10:55	LM			
30/31	10:20-10:22	WF	93	860	8.0	P-28	Anchor	19	30	30	10:50	10:55	LM			
31/32	10:11-10:14	WF	93	860	8.5	Anchor	E end 29/32	38	30 / 30	30 / 30	10:45 / 10:45	10:50 / 10:50	LM			
32/29	9:51-9:53	WF	93	860	8.5	BUTT	—	22	30	30	10:40	10:45	LM			
29/34	10:00-10:02	WF	93	860	8.5	E end 33/34	W end 29/32	20	30	30	10:40	10:45	LM			
32/34	10:02-10:08	WF	93	860	8.5	W end 29/32	Anchor	43	30	30	10:40	10:45	LM			
34/36	9:30-9:41	WF	93	860	8.5	Anchor	W end 33/34	65	30	30	9:42	9:47	LM			
36/33	9:41-9:42	WF	93	860	8.5	W end 33/34	E end 33/34	68	30	30	9:42	9:47	LM			

Daily Total 3592 — 5-17-12 - Running

CQA Personnel: EK

GEOMEMBRANE SEAM LOG
AND NON DESTRUCTIVE TESTING

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Project No. XH01.304
Project Name: RURAL HALL ASH LANDFILL
Project Location: RURAL HALL, N.C.

Material: 40 M.L. LLDPE
Installer: ESI

Page 2 of 5

5-18-12

Seam Number	Weld Time	Tech ID	Machine ID	Machine Temp	Machine Speed or Preheat	Starting Point	Ending Point	Seam Length	Air Pressure Testing PSI Start	PSI Finish	Time Start	Time Finish	Tech Init.	Vac. Test	Tech. Init.	Test Date
35/33	9:42-9:42	WF	93	860	8.5	Wed 35/36	TYN	5'	30	30	9:47	9:52	LM			
35/37	9:17-9:20	WF	93	860	8.5	TYN	Wed 35/36	24'	30	30	9:21	9:26	LM			
35/36	9:06-9:08	WF	"	"	"	Butt	—	22	30	30	9:21	9:26	LM			
36/37	9:08-9:15	"	"	"	"	W End 35/36	Anchor	72	30	30	9:21	9:26	LM			
37/38	10:24-10:35	CK	2030	850	8.0	Anchor	TYN	110'	30	30	11:06	11:11	LM			
38/39	10:47-10:47	CK	2030	850	8.0	TYN	Wed 39/40	6'	30	30	11:16	11:21	LM			
38/40	10:39-10:47	CK	230	850	8.0	Wed 39/40	Anchor	119	30	30	11:11	11:16	LM			
39/40	10:52-10:52	CK	2030	850	8.0	Butt	—	22	30	30	11:16	11:21	LM			
40/42	11:04-11:12	CK	2030	"	"	Wed 42/43	Wed 41/42	85	30/30	30/30	11:26/11:26	11:31/11:31	LM			
40/41	11:12-11:13	CK	"	"	"	Wed 41/42	S end 39/40	20	30	30	11:21	11:26	LM			
41/39	11:13-11:15	"	"	"	"	S END 39/40	TYN	24	30	30	11:31	11:31	LM			
41/44	1:46-1:46	WF	93	860	8.5	TYN	E END 44/45	8'	30	30	1:58	2:03	LM			
41/45	1:46-1:48	WF	93	"	"	E END 44/45	E end 45/46	27	30	30	1:58	2:03	LM			
41/46	1:48-1:51	WF	"	"	"	E end 45/46	W end 41/42	24	30/30	30/30	2:03/2:03	2:08/2:08	LM			
41/42	11:57-12:00	WF	"	"	"	Butt	—	22	30	30	2:00	2:05	LM			
42/46	1:51	"	"	"	"	S end 41/42	E end 46/49	4'	30	30	2:08	2:13	LM			
42/47	1:57-1:54	"	"	"	"	E end 46/49	E END 47/50	28	30	30	2:08	2:13	LM			
42/50	1:54-1:58	"	"	"	"	E END 47/50	E end 50/51	27	30	30	2:08	2:13	LM			
42/51	1:58-2:00	"	"	"	"	E END 50/51	Anchor	22	30/30	30/30	2:13/2:13	2:18/2:18	LM			
42/43	EXT	JM	5383	450	450	P-40	ANCHOR	14	VT	—	—	—		VB	SV	5-18

Daily Total

CQA Personnel: [signature]

GEOMEMBRANE SEAM LOG
AND NON DESTRUCTIVE TESTING

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Project No. XH01.304
Project Name: RURAL HALL ASH LANDFILL
Project Location: RURAL HALL, NC.

Material: 40 MIL LLDPE
Installer: ESE

Page 3 of 5

5-18-12

Seam Number	Weld Time	Tech ID	Machine ID	Machine Temp	Machine Speed or Preheat	Starting Point	Ending Point	Seam Length	Air Pressure Testing PSI Start	PSI Finish	Time Start	Time Finish	Tech Init.	Vac. Test	Tech. Init.	Test Date
40/43	EXT	JM	5383	450	450	P-42	Anch	11	NT	—				JB	SV	5-18
50/51	11:52-11:53	CK	2030	800	8.0	P-42	Anchor	15	30	30	1:10	1:15	LM			
49/50	11:46-11:50	"	"	"	"	Anchor	Nad 47/49	30	30	30	1:05	1:10	LM			
47/50	11:50-	"	"	"	"	Nad 47/49	P-42	6	30	30	1:05	1:10	LM			
47/49	11:38-11:40	"	"	"	"	Butt	—	22	30	30	11:51	11:56	LM			
49/48	11:44-11:47	WF	93	860	8.5	Sad 49/47	Anchor	37	30	30	11:51	11:56	LM			
47/48	11:44	WF	93	860	8.5	Nad 46/48	Sad 47/49	2	30	30	11:51	11:56	LM			
46/47	11:43-11:44	WF	93	860	8.5	P-42	Nad 46/48	18	30	30	11:57	11:56	LM			
46/45	11:34-11:37	WF	93	860	8.5	P-41	Sad 46/48	32	30	30	11:41	11:46	LM			
46/48	11:30-11:32	CK	2030	800	8.0	— Butt	—	22	30	30	11:46	11:51	LM			
45/48	11:37-11:43	WF	93	860	8.0	Sad 46/48	Anchor	44	30/30	30/30	11:46/11:52	11:51/12:01	LM			
44/45	11:10-11:15	WF	93	"	"	P-49 to	Anchor	93	30	30	11:36	11:41	LM			
44/52	1:30-1:40	CK	2030	800	8.0	Anchor to	TYN	94	30	30	1:53	1:58	LM			
52/53	1:49 1:55	CK	2030	"	"	Anchor to	TYN	92	30	30	2:19	2:24	LM			
53/54	2:08-2:15	"	"	"	"	Anchor	Nad 55/54	72	30	30	2:24	2:29	LM			
53/55	2:15-2:15	"	"	"	"	Nad 55/54	TYN	13	30	30	2:19	2:24	LM			
55/56	2:24 2:28	"	"	"	"	Sad 55/54	TYN	10	30	30	2:29	2:34	LM			
54/55	2:04-2:06	"	"	"	"	Butt	—	22	30	30	2:24	2:29	LM			
54/56	2:18-2:24	"	"	"	"	Anchor	Sad 54/55	71	30	30	2:29	2:34	LM			
56/57	2:17-2:23	WF	93	860	8.5	Anchor	TYN	75	30	30	2:34	2:39	LM			

Daily Total

CQA Personnel: EC

GEOMEMBRANE SEAM LOG
AND NON DESTRUCTIVE TESTING

ESP ASSOCIATES, P.A.
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Project No. XH01.304
Project Name: RURAL HALL ASH Landfill
Project Location: RURAL HALL, N.C.

Material: 40 mil LLDPE
Installer: ESI

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Seam Number	Weld Time	Tech ID	Machine ID	Machine Temp	Machine Speed or Preheat	Starting Point	Ending Point	Seam Length	Air Pressure Testing PSI Start	PSI Finish	Time Start	Time Finish	Tech Init.	Vac. Test	Tech. Init.	Test Date
57/58	2:27-2:35	WF	93	860	8.5	Anch N	TYN	72	30	30	2:34	2:39	LM			
1/59	2:40-3:21	CK	2030	800	8.5	W TYN	E Anchor	332	30	30	3:03	3:08	LM			
59/60	3:01-3:15	WF	93	860	8.5	E Anch	N end 60/61	113	30	30	3:18	3:23	LM			
60/61	2:56-2:58	WF	93	"	"	Butt	—	22	30	30	3:18	3:23	LM			
59/61	3:15-3:42	WF	93	"	"	N end 60/61	TYN	213	30/30	30/30	3:40/3:35	3:45/3:45	LM			
61/62	3:27-3:54	CK	2030	800	8.5	S end 60/61	TYN	214	30	30	3:43	3:48	LM			
60/62	3:12-3:27	CK	2030	"	"	E Anchor	S end 60/61	117	30	30	3:23	3:28	LM			
62/63	4:00-4:15	WF	93	860	8.5	E Anch	N end 63/64	139	30/30	30/30	4:20/4:22	4:25/4:32	LM			
62/64	4:15-4:30	WF	"	"	"	N end 63/64	TYN	190	30	30	4:27	4:32	LM			
63/64	3:51-3:53	WF	93	"	"	Butt	—	22	30	30	4:27	4:32	LM			
65/64	4:28-4:50	CK	2030	800	8.0	S END 63/64	W TYN	190	30	30	4:33	4:38	LM			
63/65	4:10-4:28	CK	2030	"	"	E Anchor	S end 63/64	147	30	30	4:33	4:38	LM			
						Daily Total										

CQA Personnel: [signature]

GEOMEMBRANE SEAM LOG
AND NON DESTRUCTIVE TESTING

ESP ASSOCIATES, P.A.
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Project No. XH01.304
Project Name: RURAL HALL ASH Landfill
Project Location: RURAL HALL, N.C.

Material: 40 MIL LLDPE
Installer: ESI

5-18-12

TYN

Page 5 of 5

Seam Number	Weld Time	Tech ID	Machine ID	Machine Temp	Machine Speed or Preheat	Starting Point	Ending Point	Seam Length	Air Pressure Testing PSI Start	PSI Finish	Time Start	Time Finish	Tech Init.	Vac. Test	Tech. Init.	Test Date
28/20	10:18-10:21	CK	2030	800	8.0	Top TYN	W end 20/21	29	30	30	10:35	10:40	LM			
28/21	10:18-					W end 20/21	S end 28/27	5'	30	30	10:35	10:40	LM			
21/27	10:13-10:18					S end 28/27	N end 21/12	32'	30	30	10:30	10:35	LM			
26/13	10:09-10:15					N end 21/12	W end 13/16	35	30	30	10:25	10:30	LM			
25/16	10:05-10:09					W end 13/16	S end 25/23	32	30	30	10:25	10:30	LM			
16/23	10:04-10:05					S end 25/23	W end 16/18	11	30	30	10:15	10:20	LM			
18/23	10:02-10:04					W end 16/18	S end 23/22	18	30	30	10:15	10:20	LM			
18/22	9:59-10:02					S end 22/23	W end 19/18	27	30	30	10:06	10:11	LM			
19/22	9:58-9:59	CK	2030	800	8.0	W end 19/18	Anchor	15	30	30	10:06	10:11	LM			

Daily Total 3338 6930 RUNNING

CQA Personnel: EJ

GEOMEMBRANE SEAM LOG
AND NON DESTRUCTIVE TESTING

ESP ASSOCIATES, P.A.
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Project No. PHOA 304
Project Name: RURAL HALL RST Landfill
Project Location: RURAL HALL, NC

Material: 40 mil LL LLDPE
Installer: ESI

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Seam Number	Weld Time	Tech ID	Machine ID	Machine Temp	Machine Speed or Preheat	Starting Point	Ending Point	Seam Length	Air Pressure Testing PSI Start	PSI Finish	Time Start	Time Finish	Tech Init.	Vac. Test	Tech. Init.	Test Date
65/66	2:19-2:39	WF	93	860	8.5	W top of slope	E Anchor	341	30	30	2:58	2:58	LM			
66/67	2:21-2:32	JM	1995	850	8.5	" "	E Anchor	339	30/30	30/30	3:04/3:33	3:11/3:38	LM			
67/68	3:00-3:14	WF	93	860	8.5	W to Slope	E Anchor	352	30/30	30/30	3:15/3:21	3:20/3:26	LM			
68/69	3:14-3:41	JM	1995	850	8.5	N end 69/70	E Anchor	329	30/30	30/30	3:50/3:50	3:55/4:00	LM			
69/70	3:67-3:09	JM	1995	850	8.5	Butt	———	22	30	30	4:08	4:13				
68/70	3:12 3:14	"	"	"	"	W to slope	N end 69/70	32	30	30	4:08	4:13				
70/71	3:25-3:30	CK	"	"	"	W Top Slop	S end 69/70	32	30	30	4:03	4:08				
71/69	3:30	CK	"	"		S end 69/70	E Anchor	343	30	30	4:03	4:08				
71/72	4:07	WF	93	860	8.5	N end 72/73	E Anchor	301	30	30	4:28	4:33				
72/73	3:59-4:02	JM	1995	850	8.5	Butt	———	22	30	30	4:23	4:28				
73/71	4:01 4:07	WF	93	860	8.5	W Top slope	N end 72/73	73	30	30	4:23	4:28	LM			

Daily Total

CQA Personnel: [signature]

GEOMEMBRANE SEAM LOG
AND NON DESTRUCTIVE TESTING

ESP ASSOCIATES, P.A.
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Project No. XH01.304
Project Name: Rural Hall Ash Landfill
Project Location: Rural Hall, N.C.

Material: 40 mil LLDPE
Installer: EST

TYN @ Top

Page 2 of 4

5-21-12

Seam Number	Weld Time	Tech ID	Machine ID	Machine Temp	Machine Speed or Preheat	Starting Point	Ending Point	Seam Length	Air Pressure Testing PSI Start	PSI Finish	Time Start	Time Finish	Tech Init.	Vac. Test	Tech. Init.	Test Date
73/80	2:55	WF	93	860	8.5	Seed R73	End 79/80	5	30	30	4:00	4:05	LM			
73/79	2:55-2:57	|	|	|	|	End 79/80	Wed 73/71	17	30	30	4:00	4:05	|		
71/79	2:57	|	|	|	|	Wed 73/71	End 79/78	6	30	30	4:00	4:05	|		
71/78	2:57-2:58	|	|	|	|	End 79/78	End 78/77	11	30	30	4:00	4:05	|		
77/71	2:58	|	|	|	|	End 78/77	Wed 70/71	5	30	30	3:55	4:00	|		
77/70	2:59-3:01	|	|	|	|	Wed 70/71	End 77/76	17	|	|	|	|	|		
76/70	3:01	|	|	|	|	End 77/76	Wed 68/70	5	|	|	|	|	|		
76/68	3:01-3:02	|	|	|	|	Wed 68/70	End 75/76	17	|	|	|	|	|		
75/68	3:03	|	|	|	|	End 75/76	Wed 68/67	6'	30	30	3:55	4:00	|		
67/75	3:04	|	|	|	|	Wed 68/67	End 75/74	4'	30	30	3:30	3:35	|		
67/74	3:04-3:06	WF	93	860	8.5	End 75/74	Wed 67/66	18	30	30	3:30	3:35	LM			

Daily Total

CQA Personnel: [signature]

GEOMEMBRANE SEAM LOG
AND NON DESTRUCTIVE TESTING

ESP ASSOCIATES, P.A.
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Project No. XH01304
Project Name: KURALHAM ASH LANDFILL
Project Location: RURAL HALL, N.C.

Material: 40 M.L. LLDPE
Installer: EST

TYN @ TOP

Page 3 of 4

5-21-12

Seam Number	Weld Time	Tech ID	Machine ID	Machine Temp	Machine Speed or Preheat	Starting Point	Ending Point	Seam Length	Air Pressure Testing PSI Start	PSI Finish	Time Start	Time Finish	Tech Init.	Vac. Test	Tech. Init.	Test Date
9/35	8:00 8:03	CK	2030	800	7.5	Seal 36/33	Wed 8/9	22	30	30	8:14	8:15	LM			
9/35	8:03	|	|	|	|	Wed 8/9	End 37/35	4'	CAPPED		with	~~Plant~~	CH		
8/37	8:03-8:05	|	|	|	|	End 37/35	Wed 6/8	18	30	30	8:14	8:19	LM		
6/37	8:05-8:06	|	|	|	|	Wed 6/8	End 37/38	10	30	30	8:14	8:19	LM		
6/38	8:06	CK	2030	800	7.5	End 37/38	Wed 5/6	5	30	30	8:20	8:25	"			
—	CAP	—	—													
CAP/38	8:15	CK	2030	800	7.5	Wed 5/6	Wed 38/39	5	30	30	8:20	8:25	LM			
CAP/39		|	|	|		Wed 38/39	Wed 39/41	26	30	30	8:20	8:25	LM	30-30	8:29/	8:34
CAP/41	8:45-8:5	|	|	|	|	Wed 39/41	Wed 41/44	27	30/30	30/30	8:29/8:54	8:34/8:59	LM			
CAP/44		|	|	|	|	Wed 41/44	Wed 44/52	14	30	30	8:54	8:59	LM			
CAP/6	8:30	|	|	|	|	TYN	Wed 5/6	5	30	30	8:34	8:39	LM		
CAP/5		|	|	|	|	Wed 5/6	Wed 3/5	20	|	|	|	|	|			
CAP/3		|	|	|	|	Wed 5/5	Wed 3/2	20	|	|	|	|	|			
CAP 2		|	|	|	|	Wed 3/2	Wed 1/2	21	30	30	8:59	9:04	LM			
CAP/1		CK	2030	800	7.5	Wed 1/2	Wed 1/59	20	"	"	"	"	LM			
						Daily Total										

CQA Personnel: [signature]

GEOMEMBRANE SEAM LOG
AND NON DESTRUCTIVE TESTING

ESP ASSOCIATES, P.A.
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Project No. XH01-304
Project Name: RURAL HALL ASH LANDFILL
Project Location: RURAL HALL, N.C.

Material: 40 mL LLDPE
Installer: ESI

TYN @ TOP

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5-21-12

Seam Number	Weld Time	Tech ID	Machine ID	Machine Temp	Machine Speed or Preheat	Starting Point	Ending Point	Seam Length	Air Pressure Testing PSI Start	Air Pressure Testing PSI Finish	Air Pressure Testing Time Start	Air Pressure Testing Time Finish	Air Pressure Testing Tech Init.	Vac. Test	Tech. Init.	Test Date
59/52	1:30-1:32	CK	2030	800	8.5	Wed 1/59	End 52/53	18'	30	30	1:45	1:50	LM			
53/59	1:32					End 52/53	Wed 59/60	5								
61/53	1:32-1:35					Wed 59/60	End 53/55	18								
61/55	1:35					End 53/55	Wed 61/62	5								
62/55	1:35-1:38					Wed 61/62	End 55/56	18								
62/56	1:38					End 55/56	Wed 62/64	5								
64/56	1:38-1:41					Wed 62/64	End 56/57	19								
64/57	1:41					End 56/57	Wed 64/65	4								
65/57	1:41-1:43					Wed 64/65	End 57/58	19								
65/58	4:15					Wed 57/58	Wed 65/66	3								
66/58	4:15-4:17					Wed 65/66	End P-58	18'								

Daily Total 2596

CQA Personnel: EL

GEOMEMBRANE SEAM LOG
AND NON DESTRUCTIVE TESTING

ESP ASSOCIATES, P.A.
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Project No. XH01.304
Project Name: Cumberland Ash Landfill
Project Location: Roxboro, NC.

Material: 60 m.l. LLDPE
Installer: ESI

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Seam Number	Weld Time	Tech ID	Machine ID	Machine Temp	Machine Speed or Preheat	Starting Point	Ending Point	Seam Length	Air Pressure Testing PSI Start	PSI Finish	Time Start	Time Finish	Tech Init.	Vac. Test	Tech. Init.	Test Date
58/74	1:28-1:35	CK	2030	800	9.0	E top slope	W Anchor	73	30	30	3:35	3:40	LM			
76/74	1:50-1:55	WF	93	860	8.5	E Anchor	Wed 74/75	43	30	30	3:40	3:45				
74/75	1:38-1:41	WF	93	"	"	P-74	E top slope	32	30	30	3:40	3:45				
75/76	1:45-1:48	"	"	"	"	E top slope	P-174	30	30	30	3:40	3:45	LM			
77/76	1:50-1:56	CK	2030	800	9.0	W Anchor	E top slope	22	30	30	3:55	4:00				
77/79	2:18-2:22	WF	93	860	850	W Anchor	Wed P-78	38	30	30	3:50	3:05				
77/78	2:22-2:26	"	"	"	"	Wed P-78	E top slope	38	30	30	3:50	3:55				
78/79	2:26-2:09	"	93	"	"	E top Slope	P-77	38	30	30	3:50	3:55				
79/80	2:10 2:15	CK	2030	800	9.0	W Anchor	E top Slope	79'	30	30	4:05	4:10				
80/81	2:24-2:29	CK	2030	"	"	W Anchor	E top Slope	80'	30	30	4:10	4:15				
84/82	2:34-2:35	CK	2030	"	"	Bulkhead	—	14	30	30	4:20	4:25				
81/84	3:23-3:25	WF	93	860	8.5	E 2nd Tier	Wed 84/82	19'	30	30	4:15	4:20	LM			
81/82	3:21-3:23	WF	93	"	"	Wed 82/83	Seal 82/84	30	30	30	4:20	4:25				
81/83	3:18-3:21	WF	93	860	850	E Anchor	Wed 82/83	28	30	30	4:30	4:35				
82/83	2:49-2:51	CK	2030	800	9.0	Wed 81/83	Wed 82/84	26	30	30	4:30	4:35				
83/84	2:49	"	"	"	"	Seal 83/85	Wed 84/84	4	30	30	4:35	4:40				
84/85	2:47-2:49	CK	2030	860	9.0	E 2nd Tier	Seal 83/85	18	30	30	4:35	4:40				
85/83	2:42-2:44	CK	"	"	"	Bulkhead		22	30	30	4:35	4:40				
85/86	2:55-2:57	CK	"	"	"	E 2nd Tier	Seal 83/85	21	30	30	4:40	4:45				
83/86	2:57-3:08	"	"	"	"	Seal 83/85	W Anchor	55	30	30	4:40	4:45	LM			
						Daily Total										

CQA Personnel: [signature]

GEOMEMBRANE SEAM LOG
AND NON DESTRUCTIVE TESTING

ESP ASSOCIATES, P.A.
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Project No. XH01.304
Project Name: RURAL HALL ASH LANDFILL
Project Location: RURAL HALL, N.C.

Material: 40 M.L. LLDPE
Installer: ESI

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Seam Number	Weld Time	Tech ID	Machine ID	Machine Temp	Machine Speed or Preheat	Starting Point	Ending Point	Seam Length	Air Pressure Testing PSI Start	PSI Finish	Time Start	Time Finish	Tech Init.	Vac. Test	Tech. Init.	Test Date
86/87	3:04-3:12	CK	2030	800	9.0	E 2ND Tier	W Anchor	74	30	30	4:45	4:50	LM			
87/88	3:13-3:21	"	"	"	"	E 2ND Tier	W Anchor	76	30	30	4:45	4:50				
88/89	3:28-3:34	CK	"	"	"	E 2ND Tier	W Anchor	76	30	30	4:55	5:00				
89/90	3:33-3:39	WF	93	860	8.50	E 2ND Tier	W Anchor	73	30	30	4:55	4:50				
90/91	3:43-3:50	CK	2030	800	9.0	E 2ND Tier	W Anchor	71	30	30	5:00	5:05				
91/92	3:44-3:49	WF	93	860	8.50	E 2ND Tier	W Anchor	67	30/30	30/30	5:05/5:05	5:10/5:10				
92/93	3:54-4:00	CK	2030	800	9.0	E 2ND Tier	W Anchor	65	30	30	5:10	5:15				
93/96	4:18-4:19	WF	93	860	8.5	E 2ND Tier	to Weld 95/93	13	30	30	5:25	5:30	LM			
93/95	4:23-4:26	"	"	"	"	P-96	Weld 94/93	29	30	30	5:25	5:30				
93/94	4:20-4:23	WF	93	860	8.5	Weld 94/93	W Anchor	27	30	30	5:15	5:20				
94/95	3:53-3:55	WF	93	"	"	P-93	W Anchor	25	30	30	5:15	5:20				
95/96	4:03-4:08	WF	93	"	"	Weld 95/96	W Anchor	46	30/30	30/30	5:20/5:25	5:20/5:25				
96/97	4:14-4:20	CK	2030	800	9.0	E 2ND Tier	W Anchor	58	30	30	5:30	5:35				
97/98	4:24-4:29	CK	"	"	"	E Tier 2ND	W Anchor	55	30	30	5:30	5:35				
98/99	4:28-4:32	WF	93	860	8.5	E 2ND Tier	S Anchor	54	30	30	5:40	5:45	LM			
99/100	4:55-4:07	WF	93	"	"	S Anchor	Weld 100/101	18	30	30	5:45	5:50				
99/101	4:09-4:12	"	"	"	"	Weld 100/101	Weld 101/102	27	30	30	5:40	5:45				
100/101	4:37-4:39	"	"	"	"	P-99	S Anchor	18	30	30	5:45	5:50				
102/99	4:51-4:52	WF	93	860	8.5	E Weld 101/99	2ND Tier	10	30	30	5:35	5:40				
102/101	4:44-4:47	WF	"	"	"	E Weld 101/99	W Anchor	36	30	30	5:40	5:45	LM			

Daily Total

CQA Personnel: [signature]

GEOMEMBRANE SEAM LOG
AND NON DESTRUCTIVE TESTING

ESP ASSOCIATES, P.A.
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Project No. FH01.304
Project Name: Rural Hall Ash Landfill
Project Location: Rural Hall, N.C.

Material: 40 m.l. LLDPE
Installer: ESI

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5-22-12

Seam Number	Weld Time	Tech ID	Machine ID	Machine Temp	Machine Speed or Preheat	Starting Point	Ending Point	Seam Length	Air Pressure Testing PSI Start	PSI Finish	Time Start	Time Finish	Tech Init.	Vac. Test	Tech. Init.	Test Date
102/103	4:43-4:47	CK	2050	800	9.0	2ND Tier	S Anchor	50	30	30	5:50	5:55	LM			
103/104	4:53-4:56	CK	"	"	"	2ND Tier	S Anchor	48	30	30	5:50	5:55	LM			
104/105	5:06-5:09	"	"	"	"	2ND Tier	S Anchor	57	30	30	5:55	6:00	LM			
105/106	5:03-5:07	WF	93	860	8.5	2ND Tier	S Anchor	53	30	30	5:55	6:00	LM			
106/108	5:23-5:26	WF	93	"	"	Seal 106/107	S Anchor	28	30 / 30	30 / 30	6:05 / 6:05	6:10 / 6:10	LM			
106/107	5:20-5:23	WF	93	"	"	2ND Tier	Seal 107/108	29	30	30	6:05	6:10	LM			
107/108	5:13-5:16	WF	93	"	"	Seal 106/107	2ND Tier	25	30	30	6:00	6:05	LM			
108/109	5:14-5:16	CK	2050	800	9.0	2ND Tier	S Anchor	54	30	30	6:10	6:15	LM			
109/110	5:25-5:30	CK	"	"	"	2ND Tier	S Anchor	57	30	30	6:10	6:15	LM			
					Daily Total	2067										

CQA Personnel: [signature]

GEOMEMBRANE SEAM LOG
AND NON DESTRUCTIVE TESTING

ESP ASSOCIATES, P.A.
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Project No. XH01.304
Project Name: Rural Hall Ash Landfill
Project Location: Rural Hall, N.C.

Material: 40 m.l. LLDPE
Installer: ESI

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5-24-12

Seam Number	Weld Time	Tech ID	Machine ID	Machine Temp	Machine Speed or Preheat	Starting Point	Ending Point	Seam Length	Air Pressure Testing PSI Start	PSI Finish	Time Start	Time Finish	Tech Init.	Vac. Test	Tech. Init.	Test Date
111/112	1:28-1:30	WF	93	860	8.5	TYN	2ND Tier	16	30	30	1:41	1:46	LM			
112/113	1:33-1:57	WF	"	"	"	TYN	2ND Tier	29	30	30	1:46	1:51	LM			
113/115	1:42-1:45	"	"	"	"	TYN	2ND Tier	42	30	30	1:46	1:52	LM			
115/116	1:51-1:56	"	"	"	"	2ND Tier	Seal 114/115	44	30	30	1:53	1:58				
114/115	1:39-1:44	WF	93	860	8.5	Bad	—	22	30	30	1:58	2:03				
114/116	1:49-1:51	WF	"	"	"	TYN to	Seal 114/115	22	30	30	1:58	2:03	LM			
116/117	1:55-2:02	"	"	"	"	Top Rym.	2ND Tier	82	30	30	2:04	2:09				
117/118	1:43-1:50	JM	1995	850	8.5	Top	2ND Tier	81	30	30	2:09	2:14				
118/119	1:53-1:59	"	"	"	"	Top	2ND Tier	75	30	30	2:09	2:14	LM			
119/120	2:02 2:08	"	"	"	"	Top	2ND Tier	71	30	30	2:15	2:20				
120/121	5:32-5:33	JM	1995	"	"	Weld 122/120	N 93/92	11	30	30	5:35	5:40				
121/122	5:28-5:30	JM	1995	850	8.5	P-120	Seal 96/93	14	30	30	5:35	5:40				
121/93	PART	OF	TYN		—	—										
120/124	2:14-2:17	WF	93	860	8.5	P-128	E end 124/122	26	30	30	2:28	2:33	LM			
120/122	2:19-2:22	WF	"	"	"	E end 124/122	P-121	29	30	30	2:28	2:28				
122/124	2:17	JM	1995	850	8.5	E end 124/122	N end 120/123	7	30	30	2:23	2:28				
123/124	2:07-2:09	CK	2030	800	9.0	Bad		22	30	30	2:33	2:38				
122/123	2:17-2:20	JM	1995	850	8.5	N end 123/124	2ND Tier	26'	30	30	2:34	2:39				
123/125	2:17-2:19	CK	2030	800	9.0	S end 123/124	2ND Tier	24	30	30	2:39	2:44				
124/125	2:15-2:17	"	"	"	"	P-128	S end 125/124	22	30	30	2:39	2:44	LM			

Daily Total

CQA Personnel: EA

GEOMEMBRANE SEAM LOG
AND NON DESTRUCTIVE TESTING

ESP ASSOCIATES, P.A.
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Project No. XH01.304
Project Name: KURAL HALL Ash Landfill
Project Location: KURACHA, NC.

Material: 40 M.L. LLDPE
Installer: ESI

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Seam Number	Weld Time	Tech ID	Machine ID	Machine Temp	Machine Speed or Preheat	Starting Point	Ending Point	Seam Length	Air Pressure Testing PSI Start	PSI Finish	Time Start	Time Finish	Tech Init.	Vac. Test	Tech. Init.	Test Date
125/126	2:24-2:25	CK	2030	800	9.0	P-127	2ND TIER	20	30	30	3:44	3:49	LM			
126/127	2:39-2:40	JM	1995	850	8.5	E end 125/126	2ND TIER	14	30	30	3:44	3:49				
127/125	2:34-2:39	JM	1995	850	8.5	W end 127/128	E end 125/126	29	30	30	3:49	3:54	LM			
127/128	2:30	CK	2030	800	9.0	Bu[illegible]		12	30	30	2:49	2:55	LM			
128/125	2:49-2:49	JM	1995	850	8.0	W end 127/128	N end 124/125	6	PATCH							
120/128	2:48-2:49	JM	1995	850	8.5	P-29	E end 120/124	15	30	30	3:00	3:05				
120/129	2:57-2:58	JM	1995	"	"	E end 119/120	N end 129/128	10	30	30	3:00	3:05				
129/119	2:55-2:57	JM	"	"	"	Top Pyramid	E end 119/129	26	30	30	3:05	3:10				
128/129	2:34-2:35	CK	2030	800	9.0	N end 128/120	E end 127/128	17	30	30	2:55	3:00				
127/129	2:35-2:39	CK	"	"	"	E end 127/128	2ND TIER	42	30	30	2:55	3:00	LM			
129/130	2:35-2:41	WF	93	860	8.5	Top Pyramid	2ND TIER	80	30	30	3:05	3:10				
130/131	2:45-2:51	WF	93	"	"	"	"	81	30	30	3:10	3:15				
131/132	2:50-2:56	CK	2030	800	9.0	"	"	80	30	30	3:10	3:15				
132/133	2:55-3:01	WF	93	860	8.5	"	"	74	30	30	3:15	3:20				
133/134	3:22-3:25	CK	2030	800	9.0	"	S end 134/135	36	30	30	3:32	3:37	LM			
135/133	3:25-3:28	"	"	"	"	S end 134/135	2ND TIER	40	30	30	3:32	3:37				
135/134	3:05-3:08	CK	"	"	"	Top Pyramid	S end 134/135	31	30	30	3:32	3:37				
135/136	3:10-3:15	WF	93	860	8.5	Top Pyramid	TYN 2ND TIER	66	30	30	3:20	3:25				
136/137	3:26-3:27	WF	93	"	"	TYN	W end 137/138	22	30	30	3:38	3:43				
138/136	3:27-3:3[illegible]	"	"	"	"	W end 137/138	2ND TIER	36	30	30	3:38	3:43	LM			
						Daily Total										

CQA Personnel: EK

GEOMEMBRANE SEAM LOG
AND NON DESTRUCTIVE TESTING

ESP ASSOCIATES, P.A.
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Project No. XH01.304
Project Name: RURAL HILL ASH LANDFILL
Project Location: RURAL HILL, NC.

Material: 40 m. LLDPE
Installer: ESP

Page 3 of 4

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Seam Number	Weld Time	Tech ID	Machine ID	Machine Temp	Machine Speed or Preheat	Starting Point	Ending Point	Seam Length	Air Pressure Testing PSI Start	PSI Finish	Time Start	Time Finish	Tech Init.	Vac. Test	Tech. Init.	Test Date
137/138	3:20-3:22	WF	93	860	8.5	— BUTT —		22	30	30	3:38	3:43	LM			
— TYN @ 2ND TIER						—										
110/136	4:38-4:41	JM	1995	850	8.5	End @ P.138		22	30	30	4:40	4:45	LM			
109/136	4:41-4:44					Seal 136/135	Seal 136/135	22	30	30	4:40	4:45				
108/135	4:44-4:46					Seal 136/135	Seal 133/135	10	"	"	"	"				
108/133	4:46-4:47					Seal 133/135	Seal 108/107	11	30	30	4:50	4:55	LM			
107/133	4:47-4:49					Seal 108/107	Seal 132/135	11	"	"	"	"				
106/132	4:50-4:53					Seal 107/106	Seal 131/132	22	30	30	4:55	5:00				
105/131	4:53-4:56					Seal 105/106	Seal 130/131	22	"	"	"	"				
104/130	4:56-4:59					Seal 130/131	Seal 104/105	22	"	"	"	"				
103/129	4:59-5:02					Seal 129/130	Seal 103/102	22	30	30	5:00	5:05				
102/127	5:02-5:04					Seal 102/103	Seal 127/126	18	30	30	5:05	5:10				
126/Patch	5:04-5:05					Seal 127/126	Seal 126/125	16	30	30	5:10	5:15				
98/125	5:10-5:14					Seal 125/126	Seal 125/124	22	30	30	5:20	5:25	LM			
97/123	5:14-5:17					Seal 97/98	Seal 122/123	22	30	30	5:25	5:30				
96/122	5:17-5:20					Seal 122/123	Seal 96/93	22	30	30	"	"				
93/121	5:41-5:42					Seal 96/93	Seal 92/93	15	30	30	5:43	5:48				
92/120	3:54-3:57	JM	1995	800	8.5	End 92/93	End 92/91	22	30	30	4:05	4:05	LM			

Daily Total

CQA Personnel: [signature]

GEOMEMBRANE SEAM LOG
AND NON DESTRUCTIVE TESTING

ESP ASSOCIATES, P.A.
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Project No. XH01.301
Project Name: Rural Hall Ash Landfill
Project Location: Rural Hall, NC

Material: 40 mil LLDPE
Installer: EST

TYN @ end of line cont

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5-24-12

Seam Number	Weld Time	Tech ID	Machine ID	Machine Temp	Machine Speed or Preheat	Starting Point	Ending Point	Seam Length	Air Pressure Testing PSI Start	PSI Finish	Time Start	Time Finish	Tech Init.	Vac. Test	Tech. Init.	Test Date
91/119	3:57-3:59	JM	1995	800	8.5	End 92/91	End 90/91	22	30	30	4:00	4:05	LM			
90/118	3:59-4:00					End 90/91	End 90/89	22	4	4	4	4				
89/117	4:00-4:03					End 90/89	End 88/89	22	30	30	4:10	4:15				
88/116	4:03-4:06					End 88/89	End 88/87	22								
87/115	4:06-4:09					End 88/87	End 87/86	22								
86/113	4:09-4:12					End 87/86	End 86/85	22								
85/112	4:12-4:15					End 86/85	End 85/84	22								
84/111	4:15-4:18	JM	1995	800	8.5	End 85/84	End of TYN	22	30	30	4:10	4:15	LM			
114/113	1:56-1:57	WF	93	860	8.5	N end 114/115	TYN	7	30	30	1:53	1:59	LM			

Daily Total 1908

CQA Personnel: [signature]

GEOMEMBRANE SEAM LOG
AND NON DESTRUCTIVE TESTING

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Project No. V.H01.304
Project Name: LOCAL HALL ASH LANDFILL
Project Location: ROCKY HALL, N.C.

Material: 40 mil LLDPE
Installer: ESI

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Seam Number	Weld Time	Tech ID	Machine ID	Machine Temp	Machine Speed or Preheat	Starting Point	Ending Point	Seam Length	Air Pressure Testing PSI Start	PSI Finish	Time Start	Time Finish	Tech Init.	Vac. Test	Tech. Init.	Test Date
139/73	7:58-8:02	WF	93	860	8.5	Top of slope	E Anchor	38	30	30	8:15	8:20	LM			
139/72	8:02-8:16	"	"	"	"	S end 73/72	N end 139/140	110	~~30~~ 30	~~30~~ 30	~~8:55~~ 9:05	~~9:00~~ 9:10	|			
139/140	8:19-8:21	"	"			— Butt	—	22	30	30	9:05	9:10	|			
140/72	8:21-8:27	"	"	"	"	N end 139/140	E end 140/144	58	30	30	9:10	9:15	|			
144/72	8:29-8:36	"	"	"	"	E end 140/144	E end 144/145	66	30	30	9:15	9:20	LM			
145/72	8:36-8:40	"	"	"	—	E end 144/72	E Anchor	51	30	30	9:25	9:30	|			
140/144	8:50 8:55	CK	2030	800	9.0	S end 140/139	E end 140/72	60	30	30	9:10	9:15	|			
139/141	8:03 8:16	JM	1995	850	8.5	Top of Slope	E end 141/141	150	30	30	8:17	8:22	LM			
141/143	8:22-8:20	JM.	"	"	"	Top of slope	N end 142/143	15	30	30	8:25	8:30				
143/142	8:13-8:15	CK	2030	800	9.0	Butt	—	22	30	30	8:40	8:45	|			
141/142	8:23 8:28	JM	1995	850	8.5	N end 142/143	P-144	68	30	30	8:27	8:32	|			
141/144	8:28-8:30	CK	2030	800	9.0	E end 141/142	E end 141/139	70	30	30	9:00	9:05	|			
142/144	8:26-8:30	"	"	"	"	E end 142/141	S end 142/143	67	30	30	8:50	8:55	|			
144/146	8:48-9:13	JM	1995	850	8.5	Top of Slope	N end 145/146	234	30	30	9:30	9:35	|			
145/146	8:57-8:59	WF	93	860	8.5	— Butt —		22	30	30	9:20	9:25	|			
144/145	9:07-9:10	JM	1995	850	8.5	N end 145/146	P-72	37	30	30	9:20	9:28	LM			
145/147	9:40-9:42	WF	93	860	8.5	N end 147/148	E Anchor	27	30	30	9:43	9:48				
147/148	9:20-9:21	JM	1995	850	8.5	Butt	—	16	30	30	9:43	9:48	|			
145/148	9:35-9:40	WF	93	860	8.5	N end 147/148	S end 145/146	51	30	30	9:36	9:41	|			
146/148	9:15-9:35	WF	93	860	8.5	S end 145/146	Top of slope	231	30	30	9:30	9:35	LM			

Daily Total

CQA Personnel: EJ

GEOMEMBRANE SEAM LOG
AND NON DESTRUCTIVE TESTING

ESP ASSOCIATES, P.A.
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Project No. XH01.304
Project Name: Duke Mill Ash Landfill
Project Location: Duke Mill, N.C.

Material: 40 mil LL LLDPE
Installer: EI

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5-25-12

Seam Number	Weld Time	Tech ID	Machine ID	Machine Temp	Machine Speed or Preheat	Starting Point	Ending Point	Seam Length	Air Pressure Testing PSI Start	PSI Finish	Time Start	Time Finish	Tech Init.	Vac. Test	Tech. Init.	Test Date
148/149	9:46-10:01	CK	2030	800	9.0	Top of slope	End 149/154	149	30/30	30/30	9:55/10:05	10:03/10:08	LM			
149/154	9:46-9:48	JM	1995	850	8.5	Butt	—	24	30	30	10:03	10:08				
148/154	10:01-10:06	CK	2030	800	9.0	End 149/154	End 154/156	51	30	30	10:08	10:13				
148/156	10:06-10:11	CK	"	"	"	End 154/156	End 156/157	50	30	30	10:08	10:13				
148/161	11:29-11:31	JM	1995	850	8.0	End 156/157	End	20	30	30	11:34	11:39	LM			
161/157	11:22-11:24	WF	93	860	8.5	Butt	—	22	30	30	11:34	11:39				
149/150	9:51-10:08	WF	93	"	"	Top of slope	P-48	153	30	30	10:25	10:30				
150/152	10:14-10:20	JM	1995	850	8.5	Top of slope	End 151/152	60	30	30	10:33	10:38				
151/152	10:05-10:07	JM	1995	"	"	Butt	—	22	30	30	10:38	10:43				
150/151	10:20-10:24	JM	"	"	"	End 151/152	P-156	45	30	30	10:35	10:38				
152/153	10:19-10:23	WF	93	860	8.5	Top of slope	End 154/152	254	30	30	10:43	10:48				
153/155	10:23-10:29	CK	2030	800	9.0	End 153/152	Top of slope	48	30	30	10:43	10:48				
151/155	10:23	CK	"	"	"	End 155/153	End 155/156	3'	Patched	over			LM			
155/156	9:35-9:37	CK	2030	800	9.0	Butt	—	22	30	30	11:00	11:05				
151/156	10:19-10:23					End 155/151	End 154/151	49	30	30	10:38	10:43				
150/156	10:15-10:19					End 150/156	End 149/150	48	30	30	10:25	10:30				
149/156	10:15					End 149/154	End 149/150	5	30	30	10:20	10:25				
154/156	10:10-10:15	CK	2030	800	9.0	End 154/149	End 149/154	49	30	30	10:20	10:25				
156/157	10:43-10:50	JM	1995	800	8.5	End 155/156	End 161/157	193	30	30	11:00	11:05				
155/157	10:40-10:43	"	"	"	"	End 155/156	End 157/158	20	30	30	10:50	10:55	LM			

Daily Total

CQA Personnel: EI

GEOMEMBRANE SEAM LOG
AND NON DESTRUCTIVE TESTING

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Project No. XH01.304
Project Name: RUFUS HAYI ASH LANDFILL
Project Location: RUFUS HAYI, N.C.

Material: 40 m.l. LLDPE
Installer: ESI

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Seam Number	Weld Time	Tech ID	Machine ID	Machine Temp	Machine Speed or Preheat	Starting Point	Ending Point	Seam Length	Air Pressure Testing PSI Start	PSI Finish	Time Start	Time Finish	Tech Init.	Vac. Test	Tech. Init.	Test Date
155/158	10:38-10:40	JM	1995	850	8.5	Top of slope	Nd 157/158	33	30	30	10:50	10:55	LM			
157/158	10:37-10:39	WF	93	860	8.5	Butt	—	22	30/30	30/30	10:55/11:10	11:10/11:15				
157/159	10:55-11:19	WF	93	"	"	Top of slope	E Anchor	211	30/30	30/30	11:15/11:20	11:20/11:25	LM			
159/160	11:15-11:30	JM	1995	850	8.5	Top of slope	E Anchor	162	30	30	11:34	11:39	LM			
160/163	11:49-11:53	JM	"	"	"	Top slope	Nd 162/163	35	30	30	11:53	11:58				
162/163	11:43-11:45	"	1995	"	"	Butt	—	22	30	30	11:44	1:49	LM			
160/162	11:37-11:39	JM	"	"	"	Nd 162/163	E Anchor	22'	30	30	11:44	11:49	LM			
143/144	8:28-	JM	"	"	"	Nd 142/143	TPW	16	30	30	8:27	8:32	LM			

Daily Total 3009

CQA Personnel: [signature]

GEOMEMBRANE SEAM LOG
AND NON DESTRUCTIVE TESTING

ESP ASSOCIATES, P.A.
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Project No. XH01.304
Project Name: RURAL HALL ASH LANDFILL
Project Location: RURAL HALL, N.C.

Material: 40 m.l. LLDPE
Installer: ESI

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Seam Number	Weld Time	Tech ID	Machine ID	Machine Temp	Machine Speed or Preheat	Starting Point	Ending Point	Seam Length	Air Pressure Testing PSI Start	PSI Finish	Time Start	Time Finish	Tech Init.	Vac. Test	Tech. Init.	Test Date
73/164	8:40-8:45	WF	93	860	8.6	TYN	Wed 139/173	35	30	30	9:06	9:11	LM			
164/165	8:47-8:51	WF	93	"	"	TYN	Wed 139/141	40	30	30	9:13	9:18	LM			
165/166	8:45-8:49	CK	2030	800	9.0	TYN	Wed 141/143	45	30	30	9:18	9:23				
167/168	8:48-8:51	JM	1995	850	8.5	Butt	———	22	30	30	9:21	9:24				
166/167	8:56-8:58	WF	93	860	8.6	TYN	Wed 167/168	14	30	30	9:19	9:24				
166/168	8:58-9:03	"	"	"	"	Wed 167/168	TYN	42	30	30	9:24	9:29				
167/169	9:13-9:14	JM	1995	850	8.5	TYN	Wed 169/170	12	30	30	9:30	9:35				
167/170	9:14-9:15	"	"	"	"	Wed 169/170	Sed 167/168	9	30	30	9:30	9:35	LM			
168/170	9:15-9:21	"	"	"	"	Sed 167/168	P-144	50	30	30	9:37	9:42				
170/174	9:35-9:37	WF	"	"	"	Sed 173/170	P-146	15	30	30	9:52	9:57				
173/174	9:29-9:35	WF	93	860	8.6	Sed 172/173	Sed 173/170	66	30	30	9:52	9:59				
172/174	9:28-9:29	WF	"	"	"	TYN	Sed 172/173	18	30	30	9:57	10:02				
172/171	9:36	CK	2030	800	8.0	TYN	Wed 172/173	7	30	30	9:47	9:52				
172/173	9:23-9:25	WF	93	860	8.6	Butt	———	22	30	30	9:47	9:52				
171/173	9:36-9:37	CK	2030	800	8.0	Wed 172/173	P-170	16	30	30	9:47	9:52	LM			
171/169	9:18-9:19	WF	93	860	8.6	TYN	Wed 169/170	16	30	30	9:42	9:47	"			
170/171	9:19	"	"	"	"	Wed 167/170	Eed 173/171	7	CAPPED w/ PATCH							
170/173	9:25-9:30	CK	2030	800	8.0	Eed 173/171	P-174	50	30	30	9:52	9:57	LM			
174/175	9:27-9:37	JM	1995	850	8.5	P-117 Top Slope	TYN	121	30	30	10:02	10:07	"			
175/176	9:43-9:53	JM	"	"	"	Top	TYN	121	30	30	10:08	10:13	LM			

Daily Total

CQA Personnel: [signature]

GEOMEMBRANE SEAM LOG
AND NON DESTRUCTIVE TESTING

ESP ASSOCIATES, P.A.
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Project No. XH01.304
Project Name: RURAL HALL ASH LANDFILL
Project Location: RURAL HALL, NC

Material: 40 MIL LLDPE
Installer: ESE

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Seam Number	Weld Time	Tech ID	Machine ID	Machine Temp	Machine Speed or Preheat	Starting Point	Ending Point	Seam Length	Air Pressure Testing PSI Start	PSI Finish	Time Start	Time Finish	Tech Init.	Vac. Test	Tech. Init.	Test Date
176/177	9:50-10:01	CK	2030	800	9.0	Top Slope	TYN	121	30	30	10:08	10:13	LM			
177/178	9:57-10:00	WF	93	860	8.6	P-133	End 178/179	45	30	30	10:14	10:19				
177/179	10:00-10:09	"	"	"	"	End 178/179	TYN	80	30	30	10:14	10:19				
178/179	9:49-9:51	WF	93	"	"	— Butt —		22	30	30	10:26	10:31	LM			
179/182	10:23-10:26	JM	1995	850	8.5	End 181/182	TYN	47	30	30	10:37	10:42				
179/181	10:19-10:23					Sed 178/179	End 181/182	32	30	30	10:32	10:37				
181/178	10:17-10:19					End 180/181	Sed 178/179	13	30	30	10:26	10:31				
178/180	10:15-10:17	JM	1995	850	8.5	Top Slope	End 180/181	24	30	30	10:20	10:25	LM			
181/182	10:13-10:15	WF	93	860	8.6	— Butt —		22	30	30	10:32	10:37				
181/180	10:02-10:04	JM	1995	850	8.5	— Butt —		22	30	30	10:20	10:25				
181/183	11:19-11:24					Sed 181/182	TYN	36	30	30	11:25	11:30				
182/183	11:11-11:19					End 183/184	Sed 181/182	22	30	30	11:40	11:45				
182/184	11:13-11:17					TYN	End 183/184	30	30	30	11:20	11:25				
183/184	11:03-11:05	JM	1995	850	8.5	— Butt —		22	30	30	11:40	11:45	LM			
138/185	1:27-1:31	WF	93	860	8.6	TYN	End 138/110	43	30	30	1:35	1:40				
165/110	1:31-1:36	"	"	"	"	End 138/110	S Anchor	59	30	29	1:35	1:40				
185/187	1:47-1:50	JM	1995	800	8.5	End 186/187	S Anchor	54	30	29	1:50	1:55				
185/186	1:42-1:47	"	"	"	"	TYN	End 186/187 (PATCH)	37	30	30	1:48	1:53				
186/189	1:57-1:58	WF	93	860	8.6	TYN	End 186/187	10	30	30	2:03	2:08				
186/187	2:00-2:02	"	"	"	"	— Butt	—	22	30	30	2:03	2:08	LM			
						Daily Total										

CQA Personnel: [signature]

GEOMEMBRANE SEAM LOG
AND NON DESTRUCTIVE TESTING

ESP ASSOCIATES, P.A.
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Project No. XH01.304
Project Name: Rockingham PSI Landfill
Project Location: Rockingham NC.

Material: 40 mil LLDPE
Installer: EST

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Seam Number	Weld Time	Tech ID	Machine ID	Machine Temp	Machine Speed or Preheat	Starting Point	Ending Point	Seam Length	Air Pressure Testing PSI Start	PSI Finish	Time Start	Time Finish	Tech Init.	Vac. Test	Tech. Init.	Test Date
187/189	1:58-2:00	WF	93	860	8.6	End 186/187	End 188/189	26	30/30	30/29	2:03/2:08	2:08/2:13	LM			
187/188	2:00-2:40	"	"	"	"	End 188/189	EOS	35	30	30	2:08	2:13				
188/189	1:44-1:47	WF	93	"	"	EOS	End 187/187	29	30	30	2:13	2:18				
189/190	2:27-2:31					End 193/190	EOS	41	30	30	2:46	2:51				
193/189	2:25-2:27					End 189/186	End 193/190	19	30	30	2:56	3:01				
193/186	2:25					End 193/194	End 189/186	5	30	30	2:56	3:01				
194/186	2:33-2:25	WF	93	860	8.6	End 194/195	End 193/194	23	30	30	3:02	3:07	LM			
190/191	2:17-2:18	SM	1995	850	8.0	End 191/192	EOS	15	30/30	30/30	2:34/2:34	2:39/2:39				
190/192	2:15-2:17	SM	1995	850	8.0	P-193	End 191/192	23	30	30	2:28	2:33				
191/192	2:15-2:17	WF	93	860	8.6	EOS	P-190	22	30	30	2:34	2:39				
192/193	2:19-2:23	WF	93	"	"	EOS	End 192/190	33	30	30	2:28	2:33				
193/190	2:23-2:25	"	"	"	"	End 192/190	End 189/193	24	30/30	30/29	2:51/2:51	2:56/2:56				
193/194	1:59-2:06	SM	1995	850	8.0	EOS	P-186	60	30	30	2:19	2:24				
194/195	2:34-2:39	SM	"	"	"	EOS	P-186	66	30	30	3:02	3:07				
195/196	2:48-2:56	WF	93	860	8.6	EOS	P-185	72	30	30	3:07	3:12				
196/198	3:03-3:08	SM	1995	850	8.0	EOS	End 197/198	63	30	30	3:12	3:17	LM			
196/197	3:08-3:09	"	"	"	"	End 197/198	P-138	18	30	30	3:12	3:17				
197/198	3:04-3:06	WF	93	860	8.6	Butt	—	22	30	30	3:17	3:22				
198/199	3:18-3:24	"	"	"	"	EOS	End 197/198	67	30	30	3:27	3:32				
199/197	3:24-3:27	"	"	"	"	End 197/198	P-136	30	30	30	3:32	3:37	LM			
						Daily Total										

CQA Personnel: [signature]

GEOMEMBRANE SEAM LOG
AND NON DESTRUCTIVE TESTING

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Project No. XH01.304
Project Name: RURAL HALL ASH LANDFILL
Project Location: RURAL HALL, NC

Material: 40 MIL - LLDPE
Installer: ESI

TYN E side @ TION

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5-30-12

Seam Number	Weld Time	Tech ID	Machine ID	Machine Temp	Machine Speed or Preheat	Starting Point	Ending Point	Seam Length	Air Pressure Testing PSI Start	PSI Finish	Time Start	Time Finish	Tech Init.	Vac. Test	Tech. Init.	Test Date
164/139	10:53-10:55	WF	93	860	8.6	P-73	E end 164/165	22	30	30	10:45	10:50	LM			
165/141	10:55-10:57					E end 164/165	E end 165/166	22	30	30	10:45	10:50				
166/143	10:57-10:59					E end 165/166	E end 166/168	22	30	30	11:18	11:23				
168/144	10:59-11:03					E end 166/168	E end 168/170	24	30 / 30	30 / 30	11:18 / 11:23	11:23 / 11:28				
170/144	11:03					E end 168/170	W end 144/146	3	30	30	11:23	11:28				
170/146	11:03-11:05					W end 144/146	E end 170/174	16	30	30	"	"				
174/146	11:05-11:06					E end 170/174	W end 146/148	16'	30	30	11:23	11:28				
174/148	11:06-11:07					W end 146/148	E end 174/175	12	"	"	"	"	LM			
175/148	11:07-11:08					E end 174/175	W end 148/149	11	"	"	"	"				
175/149	11:08-11:09					W end 148/149	E end 175/176	12	30	30	11:32	11:37				
176/149	11:09-11:10					E end 175/176	W end 149/150	12								
176/150	11:10-11:11					W end 149/150	E end 177/176	11								
177/150	11:11-11:12					E end 177/176	W end 150/152	11	30	30	11:32	11:37				
177/152	11:12-11:13					W end 150/152	E end 177/179	12	"	"	"	"				
179/152	11:13-11:14					E end 177/179	W end 152/153	12	30	30	11:32	11:37				
179/153	11:14-11:15					W end 153/155	E end 179/182	11	"	"	"	"				
182/153	11:36-11:37					E end 179/182	W end 153/155	14	30	30	11:45	11:50	LM			
182/155	11:37-11:38					W end 153/155	E end 184/182	9	CAPPED WITH PATCH							
184/155	11:38-11:39	WF	93	860	8.6	E end 184/182	end of TYN	41	30	30	11:15	11:20	LM			

Daily Total

CQA Personnel: EJ

GEOMEMBRANE SEAM LOG
AND NON DESTRUCTIVE TESTING

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Project No. XH81.304
Project Name: RURAL HALL KH Landfill
Project Location: RURAL HALL, NC

Material: 40 mil LLDPE
Installer: ESI

TYN @ Top

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5-30-12

Seam Number	Weld Time	Tech ID	Machine ID	Machine Temp	Machine Speed or Preheat	Starting Point	Ending Point	Seam Length	Air Pressure Testing PSI Start	PSI Finish	Time Start	Time Finish	Tech Init.	Vac. Test	Tech. Init.	Test Date
164/81	10:56-10:59	CK	2030	800	8.0	Wed 73/164	End 80/81	16	30	30	11:06	11:11	LM			
164/81	10:59					End 80/81	Wed 164/165	6	30	30	11:06	11:11	"			
165/81	10:59-11:00					Wed 164/165	Wed 81/84	15	"	"	"	"	LM			
165/111	11:00					Wed 81/84	End 165/166	8	Capped	with	PATCH					
166/111	11:00-11:02					Wed 165/166	End 111/112	24	30	28	10:51	10:56	LM			
167/112	11:02-11:04					End 111/112	Wed 167/169	24								
169/112	11:04					Wed 167/169	End 112/113	5								
113/169	11:04-11:05					End 112/113	Wed 169/171	17	30	28	10:51	10:56	LM			
171/113	11:05					Wed 169/171	End 114/115	8	30	28	10:57	10:52				
171/114	11:05					End 114/115	Wed 171/172	4	30	30	10:57	11:02				
172/114	11:05-11:08					Wed 171/172	End 114/116	27	30	30	"	"	LM			
174/116	11:08-11:12	CK	2030	800	8.0	End 114/116	Wed 116/117	30	30	30	10:57	11:02	LM			

Daily Total

CQA Personnel: Ed

GEOMEMBRANE SEAM LOG
AND NON DESTRUCTIVE TESTING

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Project No. X H01.304
Project Name: RURAL HALL ASH LANDFILL
Project Location: RURAL HALL, N.C.

Material: 40 mil LLDPE
Installer: ESI

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5-30-12

Seam Number	Weld Time	Tech ID	Machine ID	Machine Temp	Machine Speed or Preheat	Starting Point	Ending Point	Seam Length	Air Pressure Testing PSI Start	PSI Finish	Time Start	Time Finish	Tech Init.	Vac. Test	Tech. Init.	Test Date
136/199	3:41-3:42	WF	93	860	8.6	P-199	Wed 197/199	15	30	30	3:45	3:50	LM			
197/136	3:42	"	"	"	"	Wed 197/199	Wed 136/137	3	EXT					OK	SV	5-30
197/137	3:42-3:45	"	"	"	"	Wed 136/137	Wed 197/196	24	30	30	3:50	3:55	LM			
196/137	3:45	"	"	"	"	Wed 197/196	Wed 138/135	5	30	30	3:50	3:55				
196/185	3:45-3:47	"	"	"	"	Wed 138/135	Wed 195/196	19	30	30	3:55	4:00				
195/185	3:47-3:48	"	"	"	"	Wed 195/196	Wed 185/186	15	30	30	4:00	4:05	LM			
195/186	3:48	"	"	"	"	Wed 185/186	Wed 195/194	8	30	30	4:00	4:05	LM			
200/202	3:57	WF	93	860	8.6	EOS	Sed 202/201	6	30	30	4:30	4:35	LM			
201/200	3:57-4:02	"	"	"	"	Sed 202/201	P-183	36	30	30	4:10	4:15				
200/183	4:02-4:06	"	"	"	"	Wed 183/201	Wed 181/183	50								
202/201	4:21-4:23	"	93	"	"	Burst		22	30	30	4:30	4:35	LM			
202/203	4:10	"	"	"	"	EOS	Wed 202/201	6	30	30	4:36	4:41				
203/201	4:11	"	"	"	"	Wed 202/201	P-184	6	"	"	"	"				
203/184	4:05-4:06	"	"	"	"	EOS	Wed 203/201	14	30	30	4:36	4:41	LM			
201/184	4:06-4:08	"	"	"	"	Wed 203/201	Sed 183/184	22	30	29	4:15	4:20	"			
201/183	4:08-4:09	"	"	"	"	Sed 183/184	P-200	14	30	30	4:10	4:15	LM			

Daily Total 2921

CQA Personnel: [signature]

GEOMEMBRANE SEAM LOG
AND NON DESTRUCTIVE TESTING

ESP ASSOCIATES, P.A.
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Project No. VH01.304
Project Name: RURAL HALL ASH LANDFILL
Project Location: RURAL HALL N.C.

Material: 40 mil LLDPE
Installer: ESI

Page 1 of 1

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Seam Number	Weld Time	Tech ID	Machine ID	Machine Temp	Machine Speed or Preheat	Starting Point	Ending Point	Seam Length	Air Pressure Testing PSI Start	PSI Finish	Time Start	Time Finish	Tech Init.	Vac. Test	Tech. Init.	Test Date
199/200	10:39-10:49	WF	93	860	8.6	EOS	Top Wed 199/200	110	30	30	10:58	11:03	LM			
180/135	10:49-10:52	"	"	"	"	Wed 135/136	Wed 180/178	23	30	30	11:03	11:08				
178/134	10:52-10:53					Wed 180/178	Wed 134/133	13	30	30	11:05	11:10				
178/133	10:53-10:54					Wed 134/133	Wed 178/177	15	30	30	11:10	11:15	LM			
177/133	10:54-10:56					Wed 178/177	Wed 133/132	10	30	30	11:11	11:16				
177/132	10:56-10:58					Wed 133/132	P-204	16	30	30	11:11	11:16				
204/205	11:00-11:02					P-118	P-131	23	30	30	11:20	11:25	LM			
205/118	11:13-11:14					P-130	Wed 204/205	15	30	30	11:19	11:24				
204/117	11:14-11:16					Wed 204/205	P-175	22	30	30	11:25	11:30				
204/175	11:16-11:18					Wed P-175	Wed 175/176	22	30	30	11:26	11:31				
204/176	11:18-11:20					Wed 175/176	Wed 176/177	22	30	30	11:31	11:36	LM			
204/177	11:20					Wed 176/177	P-132	8	30	30	11:36	11:41				
204/132	11:20-11:21					Wed 177/132	Wed 132/131	11	30	29	11:41	11:46				
204/131	11:21-11:22					Wed 132/131	End 204/205	14	30	30	11:41	11:46				
205/131	11:22-11:23					End 204/205	Wed 131/130	10	30	30	11:47	11:52				
205/130	11:23-11:25	WF	93	860	8.6	Wed 131/130	P-118	14	30	30	11:47	11:52	LM			

Daily Total 348

TOTAL - 17,712

CQA Personnel: EJ

GEOMEMBRANE SEAM LOG
AND NON DESTRUCTIVE TESTING

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Project No. XH01.304
Project Name: RURAL HALL ASH LANDFILL
Project Location: RURAL HALL N.C.

Material: 40 MIL LLDPE
Installer: ESI

7-5-12

Page 1 of 17

Seam Number	Weld Time	Tech ID	Machine ID	Machine Temp	Machine Speed or Preheat	Starting Point	Ending Point	Seam Length	Air Pressure Testing PSI Start	PSI Finish	Time Start	Time Finish	Tech Init.	Vac. Test	Tech. Init.	Test Date
206/211	10:18-10:20	WF	1993	860	7.0	TYN	Seal 210/211	29	30	30	10:23	10:28	LM			
210/211	10:04-10:06	"	"	"	"	BUT	—	21	30	30	10:15	10:20				
206/210	10:20-10:30	"	"	"	"	Seal 210/211	Seal 219/212	60	30	30	10:28	10:33				
206/212	10:30-10:41	"	"	"	"	Seal 206/210	Seal 206/207	62	30/30	50/30	10:34/10:35	10:39/10:40				
206/207	10:42-10:43	"	"	"	"	Butt	—	22	30	30	10:42	10:47	LM			
210/212	9:58-10:08	CK	2030	800	8.0	P-206	Seal 210/211	64	30	30	10:16	10:21				
212/213	10:53-11:00	CK	"	"	"	Seal 213/214	ETYN	86	30	30	11:02	11:07				
213/214	10:25-10:27	CK	2030	800	8.0	— Butt	—	22	30	30	10:57	11:02				
212/214	10:51-10:53	CK	"	"	"	Seal 214/215	Seal 214/215	26	30	30	10:51	10:56				
214/215	10:40-10:42	CK	2030	800	8.0	— Butt	—	22	30	30	10:50	10:55				
212/215	10:45-10:51	CK	2030	800	8.0	TYN	Seal 214/215	74	30	30	10:50	10:55	LM			
215/216	10:53-11:01	WF	1993	860	7.0	TYN	Seal 214/215	72	30/30	30/30	11:08/11:08	11:13/11:13				
214/216	11:01-11:02	WF	"	"	"	Seal 214/215	Seal 213/214	25	30	30	11:14	11:19				
213/216	11:02-11:12	"	"	"	"	Seal 213/214	Seal 216/209	91	30	30	11:15	11:20				
209/216	11:01-11:03	CK	2030	800	8.0	— Butt	—	22	30	30	11:22	11:27				
209/213	11:12-11:12	WF	1993	860	7.0	Seal 209/216	TYN	8	30	30	11:23	11:28				
209/217	11:10-11:12	CK	2030	800	8.0	TYN	Seal 209/216	26	30	30	11:29	11:34				
216/217	11:12-11:21	"	"	"	"	Seal 209/216	TYN	189	30	30	11:29	11:34				
217/220	11:40-11:45	WF	1993	860	8.0	Seal 219/220	TYN	42	30/30	30/30	11:29/11:29	11:34/11:34				
219/220	11:28-11:30	CK	2030	800	8.0	— Butt	—	22	30	30	11:29	11:34	LM			

Daily Total

CQA Personnel: EA

GEOMEMBRANE SEAM LOG
AND NON DESTRUCTIVE TESTING

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Project No. XH01.304
Project Name: RURAL HALL ASH Landfill
Project Location: RURAL HALL, NC

Material: 40 mil LLDPE
Installer: EST

7-5-12

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Seam Number	Weld Time	Tech ID	Machine ID	Machine Temp	Machine Speed or Preheat	Starting Point	Ending Point	Seam Length	Air Pressure Testing PSI Start	PSI Finish	Time Start	Time Finish	Tech Init.	Vac. Test	Tech. Init.	Test Date
217/219	11:21-11:40	WF	1993	860	8.0	Seal 218/219	Seal 219/220	183	30/30	30/30	11:23/11:22	11:29/11:27	LM			
									30/30	30/30	11:10/11:10	11:15/11:15	30/30	11:45/11:50	LM	
217/218	11:21	WF	1993	860	8.0	TYN	Seal 218/219	6	30	30	11:45	11:50	LM			
218/219	11:16-11:18	"	"	"	"	— Butt —		22	30	30	11:20	11:25				
218/221	11:50-11:52	CK	2030	800	9.0	Seal 218/219	TYN	27	30	30	11:16	11:21				
219/221	11:35-11:50	CK	2030	800	9.0	Seal 219/220	Seal 218/219	182	30/30	30/30	11:16/1:23	1:21/1:28	30	30	1:23	1:28
220/221	11:30-11:35	CK	2030	800	9.0	TYN	Seal 219/220	42	30	30	1:29	1:34	LM			
221/222	1:23-1:51	WF	1993	860	9.0	TYN	ETYN	260	30/30	30/30	1:50/1:50	1:55/1:55	30	30	2:10	2:15
222/223	1:30-1:40	CK	2050	800	9.0	Seal 223/224	TYN	99	30/30	30/30	2:18/2:20	2:23/2:30	LM			
223/224	2:30-2:32	CK	2030	800	9.0	— Butt —		22	30/30	30/30	2:25/2:31	2:30/2:36	LM			
222/224	1:36-1:51	CK	2030	800	9.0	TYN	Seal 223/224	174	30/30	30/29	1:56/1:56	2:01/2:01	LM			
224/225	2:00-2:22	WF	1993	860	9.0	TYN	Seal 223/224	182	30/30	30/30	2:40/2:40	2:45/2:45	30	30	2:31	2:36
223/225	2:22-2:33	WF	"	"	"	Seal 223/224	TYN	120	30	30	2:31	2:36	LM			
225/227	3:04-3:12	CK	2030	800	9.0	Seal 227/228	TYN	84	30	30	3:34	3:39				
225/228	2:36-3:04	"	"	"	"	TYN	Seal 227/228	225	30/30	30/30	3:20/3:22	3:25/3:27				
227/228	2:50-2:52	WF	1993	860	9.0	— Butt —		22	30	30	3:33	3:38				
228/229	3:06-3:26	WF	"	"	"	TYN	Seal 227/228	223	30/30	30/30	3:28/3:28	3:33/3:33	LM			
227/227	3:26-3:32	WF	"	"	"	Seal 227/228	TYN	78	30	30	3:33	3:38	LM			
230/231	4:27-4:28	WF	"	"	"	TYN	E Anchor	19	30	30	4:23	4:28	LM			
226/230	4:32	"	"	"	"	TYN	E Anchor	10	30	30	4:42	4:48	LM			
						Daily Total										

CQA Personnel: [signature]

GEOMEMBRANE SEAM LOG
AND NON DESTRUCTIVE TESTING

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Project No. XH01.304
Project Name: Rural Hall Ash Landfill
Project Location: Rural Hall, N.C.

Material: 40 M.L. LLDPE
Installer: ESI

TYN E slope

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Seam Number	Weld Time	Tech ID	Machine ID	Machine Temp	Machine Speed or Preheat	Starting Point	Ending Point	Seam Length	Air Pressure Testing PSI Start	PSI Finish	Time Start	Time Finish	Tech Init.	Vac. Test	Tech. Init.	Test Date
225/226	4:11-4:13	WF	1993	860	9.0	P-208	End 225/227	22	30	30	4:16	4:21	LM			
229/230	4:13-4:15	"	"	"	"	End 225/227	End 229/227	23	30	30	4:17	4:22	|			
229/230	4:15-4:17	"	"	"	"	End 229/229	Wed 230/231	18	30	30	4:23	4:28	|			
231/229	4:17	"	"	"	"	Wed 230/231	E05	4	30	30	4:23	4:28	LM			
208/222	4:34-4:37	"	"	"	"	End 221/222	End 222/223	30	30/30	30/30	4:44/4:44	4:49/4:49	|			
208/223	4:37-4:40	"	"	"	"	End 222/223	End 223/225	31	30	30	4:44	4:49				
207/212	4:54	"	"	"	"	End 206/212	End 212/213	3	COVERED. WHL PATCH					VB	SV	7-9-12
213/207	4:54-4:58	"	"	"	"	End 212/213	End 213/209	27	30	30	5:03	5:08	|			
207/209	4:58-5:00	"	"	"	"	End 209/213	End 209/217	27	30	30	5:03	5:08	LM			
207/217	— CAPP	ED	—	—	—	—	—	29	—	—	—	—	—			
207/218	5:04-5:07	WF	1993	860	9.0	End 217/218	End 218/221	30	30/30	30/30	5:10/5:10	5:15/5:15	LM			
207/221	5:07-5:08	"	"	"	"	End 218/221	R-	17	CAPP	ED	—	—				
TYN N																
211/163	5:00-5:10	CK	2030	800	8.0	P-206	End 163/160	31	30	30	7:10	7:15	LM			
211/160	5:10-5:11	"	"	"	"	End 163/160	Wed 211/232	16	30	30	7:10	7:15	|			
160/232	5:11-5:13	"	"	"	"	Wed 211/232	End 160/159	21	30	30	7:16	7:21	|			
232/159	5:13-5:14	"	"	"	"	End 159/160	Wed 233/233	11	30	30	7:16	7:21	|			
159/233	5:14-5:17	"	"	"	"	Wed 233/232	End 159/158	28	30	30	7:32	7:37	|			
158/234	5:17-5:20	"	"	"	"	End 159/158	E05	37	30	30	7:32	7:37	LM			

Daily Total

CQA Personnel: Ed

GEOMEMBRANE SEAM LOG
AND NON DESTRUCTIVE TESTING

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Project No. XH01.304
Project Name: RURAL HALL ASH LANDFILL
Project Location: RURAL HALL, N.C.

Material: 40 M.C LLDPE
Installer: ESI

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Seam Number	Weld Time	Tech ID	Machine ID	Machine Temp	Machine Speed or Preheat	Starting Point	Ending Point	Seam Length	Air Pressure Testing PSI Start	Air Pressure Testing PSI Finish	Air Pressure Testing Time Start	Air Pressure Testing Time Finish	Air Pressure Testing Tech Init.	Vac. Test	Tech. Init.	Test Date
207/208	5:10-5:11	WF	199	860	9.0	TYN	E Anchor	14	30	30	5:16	5:21	LM			
206/207	5:11-5:14	WF	1993	860	8.0	E Anchor	TYN	22	30	30	10:42	10:47	LM			
210/232	4:30-4:31	CK	2030	800	9.0	P-212	P-206	18	30	30	5:29	5:34	LM			
211/232	4:31-4:39	"	"	"	"	TYN	P-210	44	30	30	7:11	7:16				
206/211	4:39-	"	"	"	"	End 211/232	TYN	14	30	30	5:29	5:34				
232/233	4:50	"	"	"	"	End 233/234	TYN	11	30	30	7:18	7:23				
212/234	4:34-4:36	CK	"	"		E03	End 233/234	22	30	30	7:25	7:30				
212/232	4:04-4:10	CK	"	"	"	S end 210/232	N end 212/234	66	30	30	7:18	7:23				
233/234	4:36-4:38	CK	"	"	"	S end 233/234	TYN	25	30	30	7:25	7:30	LM			

Daily Total 3603

CQA Personnel: [signature]

GEOMEMBRANE SEAM LOG
AND NON DESTRUCTIVE TESTING

ESP ASSOCIATES, P.A.
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Project No. XH01.304
Project Name: Rural Hall ASL Landfill
Project Location: Rural Hall, NC

Material: 40 m.c. LLDPE
Installer: ESI

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Seam Number	Weld Time	Tech ID	Machine ID	Machine Temp	Machine Speed or Preheat	Starting Point	Ending Point	Seam Length	Air Pressure Testing PSI Start	PSI Finish	Time Start	Time Finish	Tech Init.	Vac. Test	Tech. Init.	Test Date
229/236	1:40-2:07	CK	2030	800	9.0	TYN	Nad 235/236	239'	30/30	30/30	1:50/2:02	1:55/2:07	LM	30-30	1:56-2:10	
235/236	1:54-1:56	WF	1993	860	8.0	Butt	—	22	30	30	2:07	2:12				
229/235	2:07-2:11	CK	2030	800	9.0	Nad 235/236	TYN	50	30/30	30/30	2:07/2:45	2:12/2:50				
239/242	3:00-3:30	WF	1993	800	8.0	TYN	Nad 242/243	249	30	30	3:46	3:51				
241/242	3:24-3:26	WF	"	"	"	— Butt	—	22	30	30	3:46	3:51				
239/241	3:31-3:37	WF	"	"	"	Nad 241/242	Nad 240/241	45	30	30	3:45	3:50				
239/240	3:37-3:43	"	"	"	"	N 240/241	TYN	43	30	30	4:06	4:11				
240/241	2:59-2:56	CK	2030	800	9.0	— Butt	—	22	30	30	4:00	4:05	LM			
241/243	3:31-3:34	CK	2030	"	"	Sad 241/242	TYN	45	30	30	4:00	4:05				
242/243	3:09-3:31	CK	"	"	"	TYN	Sad 241/242	250	30	30	3:52	3:57				
243/246	4:05-4:14	WF	1993	800	8.0	TYN	Nad 245/246	88	30	30	4:16	4:21				
245/246	3:55-3:57	WF	"	"	"	— Butt	—	22	30	30	4:16	4:21				
243/245	4:14-4:32	WF	"	"	"	Nad 245/246	Nad 244/245	168	30/30	30/30	4:36/4:41	4:41/4:46	LM			
244/245	4:31-4:32	WF	"	"	"	Butt		18	30	30	4:41	4:46				
244/243	4:35-4:37	WF	"	"	"	Nad 244/245	TYN	17	30	30	4:41	4:46				
245/247	4:18-4:35	CK	2030	800	9.0	Sad 245/246	TYN	152	30	30	4:30	4:35				
246/247	4:08-4:10	"	"	"	"	TYN	Sad 245/246	88	30	30	4:22	4:27	LM			
247/249	4:55-5:14	WF	1993	800	8.0	TYN	Nad 248/249	149	30/30	29/36	5:05/5:40	5:40/5:14				
248/249	4:42-4:44	"	"	"	"	— Butt	—	22	30	30	5:58	6:03				
247/248	5:14-5:18	"	"	"	"	Nad 248/249	TYN	33	30	30	7:49	7:54	LM			

Daily Total

CQA Personnel: EL

GEOMEMBRANE SEAM LOG
AND NON DESTRUCTIVE TESTING

ESP ASSOCIATES, P.A.
engineering • managing • planning

Project No. XH01.304
Project Name: RURAL HALL ASH Landfill
Project Location: RURAL HALL, N.C.

Material: 40 M. LLDPE
Installer: EST

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7-6-12

Seam Number	Weld Time	Tech ID	Machine ID	Machine Temp	Machine Speed or Preheat	Starting Point	Ending Point	Seam Length	Air Pressure Testing PSI Start	PSI Finish	Time Start	Time Finish	Tech Init.	Vac. Test	Tech. Init.	Test Date
249/251	5:00-5:10	CK	2030	800	9.0	TYN	Wd 250/251	106	30	30	5:25	5:30	LM			
249/250	5:10-5:14	"	"	"	"	Wd 250/251	TYN	41	30	30	5:25	5:30				
250/251	4:52	"	"	"	"	— Butt —		11	30	30	5:25	5:30				
251/252	5:33-5:38	"	"	"	"	Sed 250/251	TYN	64	30	30	5:45	5:50				
200/252	5:42	"	"	"	"	Sed 250/251	TYN(S)	14	30	30	5:45	5:50	LM			
238/252	—	CAPPED	with	Patch		—		7'	—	—	—	—		VB	SV	7-7-12
237/238	3:00-3:02	CK	2030	800	9.0	Butt		22	30	30	7:36	7:41	LM			
—TYN—																
238/250	5:45-5:50	CK	2030	800	9.0	P-252	Ed 249/250	44'	30	30	5:52	5:57	LM			
238/249	5:50	"	"	"	"	Ed 249/250	Sd 249/249	5	30	30	5:53	5:58				
238/248	5:50-5:55	"	"	"	"	Sd 249/250	Ed 247/248	39	30/30	30/30	5:58/7:49	6:03/7:54				
238/247	5:55-5:58	"	"	"	"	Ed 247/248	Ed 245/247	42	30	30	7:43	7:48				
238/245	5:58-5:52	"	"	"	"	Ed 245/247	Sed 244/245	19'	30	30	7:43	7:48				
238/244	5:14-5:16	WF	1993	860	8.0	Ed 244/243	Sed 244/245	26	30	30	7:37	7:42				
238/243	5:12-5:14	"	"	"	"	Ned 237/238	Ed 243/244	29	30	30	7:36	7:41				
237/243	5:14	"	"	"		CAPPED	WITH Patch	10'	—	—	—			VB	SV	7-7-12
237/240	5:10-5:14	"	"	"	"	Ed 239/240	R-49	41	30	30	7:30	7:35				
239/237	5:06-5:10	"	"	"	"	EOS	Ed 239/240	42	30	30	7:30	7:35	LM			

Daily Total 2306

CQA Personnel: [signature]

GEOMEMBRANE SEAM LOG
AND NON DESTRUCTIVE TESTING

ESP ASSOCIATES, P.A.
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Project No. XH01.304
Project Name: Rural Hall Ash Landfill
Project Location: Rural Hall, N.C.

Material: 40 mil. LLDPE
Installer: ESI

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7-9-12

Seam Number	Weld Time	Tech ID	Machine ID	Machine Temp	Machine Speed or Preheat	Starting Point	Ending Point	Seam Length	Air Pressure Testing PSI Start	PSI Finish	Time Start	Time Finish	Tech Init.	Vac. Test	Tech. Init.	Test Date
234/253	8:03-8:04	CK	2030	800	9.0	TYN	TYN	57	30	30	8:05	8:10	LM			
253/255	8:04-8:06	WF	1993	860	8.0	TYN	End 254/255	36	30	29	8:10	8:15				
254/255	7:55-7:57	"	"	"	"	— Butt —		22	30	30	8:20	8:25				
253/254	8:06-8:07	"	"	"	"	End 254/255	TYN	17	30	30	8:10	8:15				
255/256	8:10-8:13	CK	"	"	9.0	TYN	West 254/255	36	30	30	8:20	8:25				
254/256	8:13-8:14	CK	"	"	"	West 254/255	TYN	21	30	30	8:20	8:25	LM			
256/257	8:12-8:16	WF	1993	860	8.0	TYN	TYN	57	30	30	8:26	8:31				
257/258	8:21-8:24	CK	2030	800	9.0	TYN	TYN	57	30	30	8:26	8:31				
258/259	8:20-8:24	WF	1993	860	8.0	TYN	TYN	50	30	30	8:27	8:32	LM			
TYN —	E slope	—														
215/253	8:45-8:47	WF	1993	860	8.0	End P-253	End 253/254	21	30	30	9:05	9:10	LM			
216/254	8:47-8:49	"	"	"	"	End 253/254	End 254/256	22	30	29	9:00	9:05				
217/256	8:49-8:51	"	"	"	"	End 254/256	End 256/257	22	30	29	9:00	9:05				
220/257	8:51-8:53	"	"	"	"	End 256/257	End 257/258	22	30	30	8:55	9:00				
221/258	8:53-8:56	"	"	"	"	End 257/258	End 258/259	22	30	29	8:55	9:00	LM			
203/253	8:50	CK	2030	800	8.0	West 234/253	End 202/203	6	30	30	9:15	9:20				
202/253	8:50-8:51	"	"	"	"	End 202/203	West 253/255	16	30	30	9:15	9:20				
202/255	8:51-8:52	"	"	"	"	West 253/255	End 202/200	16	30	29	9:16	9:21				
200/255	8:52-8:54	"	"	"	"	End 200/202	West 255/256	16	30	30	9:16	9:21	LM			

Daily Total

CQA Personnel:

GEOMEMBRANE SEAM LOG
AND NON DESTRUCTIVE TESTING

ESP ASSOCIATES, P.A.
engineering • managing • planning

Project No. XH01304
Project Name: RURAL HALL ASH Landfill
Project Location: RURAL HALL, N.C.

Material: 40 mil LLDPE
Installer: EST

7-9-12

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Seam Number	Weld Time	Tech ID	Machine ID	Machine Temp	Machine Speed or Preheat	Starting Point	Ending Point	Seam Length	Air Pressure Testing PSI Start	PSI Finish	Time Start	Time Finish	Tech Init.	Vac. Test	Tech. Init.	Test Date
TYN - E Slope																
200/256	8:54-8:55	CK	2030	800	8.0	Wed 255/256	End 200/199	10	30	29	9:22	9:27	LM			
199/256	8:55-8:56	"	"	"	"	End 199/200	Wed 256/257	12	30	30	9:22	9:27				
199/257	8:56-	"	"	"	"	Wed 255/256	End 199/198	8	30	29	9:22	9:27				
198/257	8:56-8:57	"	"	"	"	End 198/199	Wed 257/258	14	30	29	9:22	9:27				
198/258	8:57-	"	"	"	"	Wed 257/258	End 196/195	8	30	30	9:28	9:33				
196/258	8:57-8:58	"	"	"	"	End 196/198	Wed 258/259	14	30	29	9:28	9:33				
196/259	8:59	"	"	"	"	Wed 258/259	End 195/196	8	30	30	9:28	9:33				
195/259	8:59-9:01	"	"	"	"	End 195/196	End P-259	14	30	29	9:28	9:33	LM			
259/260	1:58-	CK	2030	800	9.0	TYN	TYN	60	30	30	2:15	2:20	LM			
260/261	2:00	WF	1993	860	8.0	TYN	TYN	59	30	30	2:24	2:29				
261/262	2:10	CK	2030	800	9.0	TYN	TYN	59	30	30	2:25	2:30				
262/263	2:10	WF	1993	860	8.0	TYN	TYN	58	30	30	2:31	2:36				
263/264		WF	1993	"	"	TYN	TYN	63	30	30	2:32	3:37	LM			
TYN -																
195/260	2:41-2:42	WF	1993	860	8.0	Wed 259/260	End 195/194	8	30	29	2:48	2:53	LM			
194/260	2:42-2:43	"	"	"	"	End 195/194	Wed 260/261	14	30	30	2:49	2:54	LM			
194/261	2:43-2:44	WF	"	"	"	Wed 260/261	End 194/193	8	30	30	2:50	2:55	LM			

Daily Total

CQA Personnel: [signature]

GEOMEMBRANE SEAM LOG
AND NON DESTRUCTIVE TESTING

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Project No. X140[illegible]304
Project Name: ROLAN HALL ASH LANDFILL
Project Location: ROLAN HALL, N.C.

Material: 40 M.2 ULDPE
Installer: ESI

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Seam Number	Weld Time	Tech ID	Machine ID	Machine Temp	Machine Speed or Preheat	Starting Point	Ending Point	Seam Length	Air Pressure Testing PSI Start	PSI Finish	Time Start	Time Finish	Tech Init.	Vac. Test	Tech. Init.	Test Date
193/261	2:44-2:46	WF	1993	860	8.0	End 193/194	W.d 261/262	14	30	30	2:50	2:55	LM			
193/262	2:46-2:47	WF	"	"	"	W.d 261/262	End 193/192	8	30	30	2:57	3:02				
192/262	2:47-2:48	"	"	"	"	End 193/192	W.d 262/263	14	30	30	2:57	3:02				
192/263	2:48-2:49	"	"	"	"	W.d 262/263	End 192/191	8	30	30	2:59	3:04				
191/263	2:49-2:51	"	"	"	"	End 192/191	P-264	14	30	30	2:58	3:03	LM			
TYN																
222/259	2:45-2:47	CK	2030	800	8.0	End 258/259	End 259/260	22	30	30	3:05	3:10	LM			
224/260	2:47-2:49	"	"	"	"	End 259/260	End 260/261	22	30	30	3:10	3:15				
225/261	2:49-2:51	"	"	"	"	End 260/261	End 261/262	22	30	30	3:11	3:16				
228/262	2:51-2:53	"	"	"	"	End 261/262	End 262/263	22	30/30	30/30	3:11/3:11	3:16/3:16				
229/263	2:53-	"	"	"	"	End 262/263	End 263/264	22	30	30	3:12	3:17	LM			
264/265	3:08-3:18	WF	1993	860	8.0	W Arch	EOS(TYN)	84	30	30	3:39	3:44	LM			
265/266	3:18-3:29	"	"	"	"	W Arch	EOS(TYN)	80	30	30	3:40	3:45	"			
266/267	3:30-3:40	"	"	"	"	W Arch	EOS(TYN)	76	30	30	3:40	3:45	LM			

Daily Total

CQA Personnel: [illegible]

GEOMEMBRANE SEAM LOG
AND NON DESTRUCTIVE TESTING

ESP ASSOCIATES, P.A.
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Project No. X101.304
Project Name: RURAL HALL LANDFILL
Project Location: RURAL HALL, N.C.

Material: 40 mil LLDPE
Installer: ESI

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Seam Number	Weld Time	Tech ID	Machine ID	Machine Temp	Machine Speed or Preheat	Starting Point	Ending Point	Seam Length	Air Pressure Testing PSI Start	PSI Finish	Time Start	Time Finish	Tech Init.	Vac. Test	Tech. Init.	Test Date
TYN																
187/264	4:05	WF	1593	860	8.0	Wadm	Sed 187/188	6	30	30	4:12	4:17	LM			
188/264	4:05-4:07	"	"	"	"	Sed 187/188	Sed 188/189	22	30	30	4:12	4:17				
189/264	4:07-4:09	"	"	"	"	Sed 188/189	Sed 189/190	22	30	30	4:13	4:18				
190/264	4:09-4:11	"	"	"	"	Sed 189/190	Sed 190/191	22	30	30	4:19	4:24				
191/264	4:11	"	"	"	"	Sed 190/191	Wed 263/264	20	30	30	4:19	4:24	LM			

Daily Total 1427

CQA Personnel: [signature]

GEOMEMBRANE SEAM LOG
AND NON DESTRUCTIVE TESTING

ESP ASSOCIATES, P.A.
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Project No. YH01.304
Project Name: Roxboro Ash Landfill
Project Location: Roxboro, N.C.

Material: 40 mil LLDPE
Installer: ESI

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Seam Number	Weld Time	Tech ID	Machine ID	Machine Temp	Machine Speed or Preheat	Starting Point	Ending Point	Seam Length	Air Pressure Testing PSI Start	Air Pressure Testing PSI Finish	Air Pressure Testing Time Start	Air Pressure Testing Time Finish	Tech Init.	Vac. Test	Tech. Init.	Test Date
239/268	10:15-10:55	WF	1993	860	8.0	TYN	End 239/239	365	30/30	30/30	10:28/10:57	10:53/11:02	LM			
237/268	10:55-10:56	"	"	"	"	End 237/268	CAP	10	30	30	10:57	11:02				
237/CAP	11:07-11:09	WF	1993	"	"	P-268	Anchor	20	30	30	11:15	11:20				
268/CAP	11:09-11:11	"	"	"	"	End 237/268	P-231	20	30	30	11:25	11:30				
231/CAP	11:15-11:17	"	"	"	"	P-268	Anchor	20	30	30	11:25	11:30				
268/CAP	11:25-11:26	"	"	860	8.0	CAP	P-235	31	30/30	30/30	11:30/11:36	11:35/11:41	LM			
268/269	11:29-11:32	CK	2030	800	9.0	Seal 269/270	TYN	27	30	30	11:06	11:11				
269/270	10:55-10:57	WF	1993	860	8.0	— Butt	—	22	30	30	11:05	11:10				
268/270	10:26-11:18	CK	2030	800	9.0	TYN	Seal 269/270	380	30/30	30/30	11:05/10:44	11:10/10:49				
270/273	11:16-11:26	CK	"	"	"	TYN	Seal 271/273	80	30	30	11:50	11:55				
271/273	11:30-11:32	"	"	"	"	Butt	—	22	30	30	11:50	11:55				
270/271	11:26-11:56	CK	"	"	"	Seal 271/273	Neal 269/270	300	30	30	1:50	1:55				
269/271	11:56	"	"	"	"	Neal 269/270	TYN	14	30	30	1:50	1:55				
271/272	12:15-12:20	WF	1993	860°	8.0	Seal 272/274	TYN	30	30	30	1:53	1:58				
272/274	11:48-11:50	CK	2030	800	9.0	— Butt —		22	30	30	2:15	2:30	LM			
271/274	11:45-12:15	WF	1993	860	8.0	Neal 271/273	Seal 272/274	273	30/30	30/30	1:30/1:40	1:35/1:45	30	30	1:30-1:35	
274/273	11:37-11:45	WF	1993	860	8.0	TYN	Neal 271/273	79	30	30	11:55	12:00	LM			
274/276	1:55-2:05	CK	2030	800	9.0	TYN	Seal 275/276	113	30	30	2:07	2:12				
275/276	1:50-1:51	CK	"	"	"	— Butt —		22	30	30	2:07	2:12				
274/275	2:05-2:30	CK	"	"	"	Seal 275/276	Neal 272/274	243	30	30	2:47	2:52	LM			

Daily Total

CQA Personnel:

GEOMEMBRANE SEAM LOG
AND NON DESTRUCTIVE TESTING

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Project No. XH01.304
Project Name: Rural Hall Ash Landfill
Project Location: Rural Hall, N.C.

Material: 40 mil. LLDPE
Installer: ESI

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Seam Number	Weld Time	Tech ID	Machine ID	Machine Temp	Machine Speed or Preheat	Starting Point	Ending Point	Seam Length	Air Pressure Testing PSI Start	PSI Finish	Time Start	Time Finish	Tech Init.	Vac. Test	Tech. Init.	Test Date
272/275	2:30-2:31	CK	2030	800	9.0	Nsd 272/274	TYN	16	30	30	2:48	2:53	LM			
275/278	2:33-2:35	WF	1993	860	8.0	Ssd 278/271	TYN	25	30	30	2:40	2:45	"			
~~277/278~~	~~2:40-2:42~~	~~WF~~	~~1993~~	~~860~~	~~8.0~~	— Butt	—	22	30	30	2:40	2:45	"			
275/277	2:08-2:33	WF	1993	860	8.0	Nsd 275/276	Ssd 277/278	222	30	30	2:40	2:45	LM			
276/277	1:54-2:08	WF	1993	860	8.0	TYN	Ssd 275/276	111	30	30	2:08	2:13	LM			
TYN —																
236/278	2:47-2:49	CK	2050	800	9.0	Nsd P.278	Esd 275/278	25	30	30	3:05	3:10	LM			
236/275	2:49-2:51	"	"	"	"	Esd 275/278	Esd 272/275	25	30	30	3:05	3:10				
236/272	2:51-2:53	"	"	"	"	Esd 272/275	Esd 271/272	25	30	30	3:06	3:11				
236/271	2:53-2:55	"	"	"	"	Esd 271/272	Esd 269/271	25	30	30	3:06	3:11				
236/269	2:55-2:56	"	"	"	"	Esd 269/271	Ssd 255/256	15	30	30	3:11	3:16				
235/269	2:56	"	"	"	"	Ssd 255/256	Esd 269/267	11	30	30	3:11	3:16				
235/268	2:56-2:58	"	"	"	"	Esd 268/269	Esd 268/270	26 (2641)	30	30	3:12	3:17	LM			
229/230	[illegible]	LP	252	500	300	Wsd 230/231	Esd 227/229	16	SEAM EXTRUDED					VB	S.V.	7-12
229/231	[illegible]	LP	"	500	300	Wsd 230/231	Esd 229/235	6	"	"	"			"	S.V.	
231/235	[illegible]	LP	"	"	"	Esd 229/235	Esd 268/235	26	"	"	"			"	S.V.	
					Daily Total											

CQA Personnel: [signature]

GEOMEMBRANE SEAM LOG
AND NON DESTRUCTIVE TESTING

ESP ASSOCIATES, P.A.
engineering • managing • planning

Project No. XH01.304
Project Name: RURAL HALL ASH LANDFILL
Project Location: RURAL HALL, N.C.

Material: 40 M.L. LLDPE
Installer: ESI

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Seam Number	Weld Time	Tech ID	Machine ID	Machine Temp	Machine Speed or Preheat	Starting Point	Ending Point	Seam Length	Air Pressure Testing PSI Start	PSI Finish	Time Start	Time Finish	Tech Init.	Vac. Test	Tech. Init.	Test Date
264/279	8:20-8:30	WF	1853	860	8.0	TYN	Seal 264/278	77	30/30	30/30	8:45/8:55	8:50/9:00	LM	30-30	9:01-9:06	
256/279	8:30-8:49	"	"	"	"	Seal 264/256	P-278	119	30/30	30/30	9:01/9:07	9:06/9:12				
									30/30	30/30	9:07/9:07	9:12/9:12				
279/280	8:48-8:50	CK	2030	800	8.0	Seal 280/281	TYN	24	30	30	9:12	9:17				
280/281	8:27-8:29	CK	"	"	"	— Bump —		22	30	30	9:12	9:17				
279/281	8:43-8:48	CK	"	"	"	TYN	Seal 280/281	162	30	30	9:12	9:17	LM			
281/282	8:55-9:06	CK	"	"	"	TYN	Seal 280/281	161	30	30	9:18	9:23				
280/282	9:06	CK	"	"	"	Seal 280/281	TYN	12	30	30	9:18	9:23				
282/287	9:51-9:53	"	"		"	Seal 287/286	TYN	34	30	30	9:57	10:02				
282/286	9:48-9:51	"	"		"	Seal 285/286	Seal 286/287	28	30	30	9:57	10:02				
285/286	9:10	CK	2030	800	8.0	— Bump —		15	30	30	9:24	9:29				
282/285	9:47-9:48	"	"	"	"	Seal 284/285	Seal 285/286	16	30	30	9:51	9:56	LM			
282/284	9:43-9:47	"	"	"	"	Seal 283/284	Seal 284/285	46	30	30	9:51	9:56				
282/283	9:40-9:43	CK	"	"	"	TYN	Seal 283/284	39	30	30	9:45	9:50				
283/284	9:20-9:23	CK	"	"	"	TYN	P-282	39	30	30	9:37	9:42				
284/294	11:01-11:03	CK	"	"	"	— Bump —		22	30	30	11:30	11:35				
285/294	11:00	CK	"	"	"	TYN	Seal 284/294	11	30	30	11:29	11:34	LM			
284/285	9:25-9:33	CK	"	"	9.0	Seal 284/294	P-282	79	30	30	9:30	9:35				
285/287	9:07-9:19	WF	1993	860	8.0	TYN	Seal 285/286	103	30	30	9:24	9:29				
286/287	9:19-9:22	WF	"	"	"	Seal 285/286	P-282	27	30	30	9:24	9:29	LM			

Daily Total

CQA Personnel: EJ

GEOMEMBRANE SEAM LOG
AND NON DESTRUCTIVE TESTING

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Project No. XH01.304
Project Name: ROLAND HALL ASH LANDFILL
Project Location: ROLAND HALL, N.C.

Material: 40 MIL. LLDPE
Installer: ESI

Page 14 of 18 17th 7-13-12

Seam Number	Weld Time	Tech ID	Machine ID	Machine Temp	Machine Speed or Preheat	Starting Point	Ending Point	Seam Length	Air Pressure Testing PSI Start	PSI Finish	Time Start	Time Finish	Tech Init.	Vac. Test	Tech. Init.	Test Date
287/288	9:30-9:49	WF	1993	860	8.0	TYN	P-277	157	30	30	10:03	10:08	LM			
288/290	10:05-11:02	WF	"	/	/	TYN	Nd 289/290	86	30	30	10:17	10:22	/			
288/289	11:02-11:06	"	"	/	/	Nd 289/290	P-277	39	30	30	10:19	10:24	/			
289/290	9:54-9:56	WF	"	860	8.0	— Butt	—	22	30	30	10:17	10:22	/			
290/291	10:06-10:13	CK	2030	800	9.0	TYN	P-277	94'	30	30	10:27	10:32	/			
291/293	10:21-10:23	CK	"	"	"	TYN	Nd 292/293	23	30	30	11:15	11:20	/			
291/292	10:23-10:27	CK	"	"	"	Nd 292/293	P-277	40	30/30	30/30	11:15/11:09	11:20/11:09	/			
292/293	10:17-10:18	CK	"	"	"	— Butt	—	22	30	30	11:10	11:15	LM			
— TYN —																
278/279	10:31	WF	1993	860	8.0	P-236	Nd 278/277	11	30	30	10:37	10:42	LM			
277/279	10:31-10:32	"	"	"	"	Nd 278/277	End 279/280	10	30	30	10:37	10:42	/			
277/280	10:32-10:34	"	"	"	"	End 279/280	End 280/282	26	30	30	10:43	10:48	/			
277/282	10:34-10:36	"	"	"	"	End 280/282	End 282/287	26	30	30	10:48	10:53	/			
277/287	10:36	"	"	"	"	End 282/287	End 287/288	11	30	30	10:48	10:53	/			
277/288	10:36-10:41	WF	1993	"	"	End 287/288	End 288/289	45	30	30	10:53	10:58	/			
277/289	10:41-10:46	"	"	"	"	End 288/289	End 290/291	45	30	30	11:58	11:03	/			
277/291	10:46-10:49	"	"	"	"	End 290/291	End 291/292	45	30	30	11:04	11:09	/			
277/292	10:49-10:51	"	"	"	"	End 291/292	End 292/293	45	30/30	30/30	11:09/11:10	11:09/11:15	/			
277/298	2:17-2:19	"	"	"	"	End 292/293	End 298/299	24	30	30	2:47	2:52	LM			

Daily Total

CQA Personnel: ESI

GEOMEMBRANE SEAM LOG
AND NON DESTRUCTIVE TESTING

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Project No. XH01.304
Project Name: RURAL HALL ASH Landfill
Project Location: RURAL HALL, N.C.

Material: 40 mil. LLDPE
Installer: ES

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7-13-12

Seam Number	Weld Time	Tech ID	Machine ID	Machine Temp	Machine Speed or Preheat	Starting Point	Ending Point	Seam Length	Air Pressure Testing PSI Start	PSI Finish	Time Start	Time Finish	Tech Init.	Vac. Test	Tech. Init.	Test Date
277/299	2:19-2:21	WF	1993	860	8.0	Sed 298/299	Sed 299/295	16	30	30	2:53	2:58	LM			
277/295	2:21-2:23	"	"			Sed 299/295	Ed 295/310	25	30/30	30/30	2:53/2:59	2:58/3:04				
279/310	2:23-2:25	"	"			Bed 295/310	EOS	22	30	30	2:59	3:04				
295/299	2:10-2:12	WF	"			P-277	Ned 298/298	22	30	30	2:53	2:58				
293/298	2:15-2:18	WF	"			Ned 298/299	P-277	29	30	30	2:44	2:49	LM			
298/299	2:12	"	"	860	8.0	— Butt	—	16	30	30	2:44	2:49				
293/295	10:44-10:46	CK	2030	800	8.0	Sed 293/298	Wed 292/293	23	30	30	11:16	11:21				
291/295	10:46-10:48	"	"	"	"	Wed 291/293	Wed 290/291	22	30	30	11:16	11:21				
290/295	10:48-10:50	CK	"	"	"	Wed 291/290	Wed 289/290	22	30	30	11:22	11:27				
288/295	10:50-10:52	"	"	"	"	Wed 289/290	Wed 287/288	22	30	30	11:22	11:27				
287/295	10:52-10:54	"	"	"	"	Wed 287/288	Wed 285/287	22	30	30	11:23	11:28				
285/295	10:54-10:56	"	"	"	"	Wed 285/287	Wed 285/294	22	30	30	11:23	11:28				
294/295	10:56-10:58	CK	"	"	"	Wed 285/294	EOS	22	30	30	11:29	11:34	LM			
279/265	1:12-1:14	CK	"	"	"	Wed 264/279	Wed 279/281	22	30	30	1:20	1:25				
266/281	1:14-1:16	CK	"	"	"	Wed 279/281	Wed 281/282	22	30	30	1:20	1:25				
267/282	1:16-1:18	CK	"	"	"	Wed 281/282	Wed 282/295	22	30	30	1:21	1:26				
267/295	1:18-1:20	"	"	"	"	Wed 282/285	Ned 295/296	22	30/30	30/30	3:45/3:45	3:50/3:50				
267/296	1:22-1:25	"	"	"	"	Ned 295/296	Ned 296/300	23	30	30	3:45	3:50				
267/300	1:25-1:28	"	"	"	"	Ned 296/300	WArchin	23	30/30	30/30	3:46/3:46	3:51/3:51				
295/297	1:00-1:15	WF	1993	860	8.0	P-310	End 296/297	155	30	30	1:28	1:32	LM			

Daily Total

CQA Personnel: ES

GEOMEMBRANE SEAM LOG
AND NON DESTRUCTIVE TESTING

ESP ASSOCIATES, P.A.
engineering • managing • planning

Project No. XH01.304
Project Name: RURAL HALL ASL Landfill
Project Location: RURAL HALL, N.C.

Material: 40 mil LLDPE
Installer: ESI

Page 16 of ~~18~~ 12 mp

7-13-12

Seam Number	Weld Time	Tech ID	Machine ID	Machine Temp	Machine Speed or Preheat	Starting Point	Ending Point	Seam Length	Air Pressure Testing PSI Start	PSI Finish	Time Start	Time Finish	Tech Init.	Vac. Test	Tech. Init.	Test Date
296/297	1:15-1:17	WF	1993	860	8.0	Butt	—	22	30	30	1:28	1:32	LM			
295/296	11:12-11:18	CK	2030	800	8.0	End 294/295	P-267	67	30	30	12:43	12:48				
300/301	1:22-1:24	CK	"	"	9.0	P-296	WArdm	24	30	30	1:35	1:40				
301/302	1:28-1:31	CK	"	"	"	P-296	WArdm	28	30	30	1:40	1:45				
302/303	1:33-1:36	"	"	"	"	P-296	WArdm	32	30	30	1:40	1:45				
303/304	1:39-1:42	"	"	"	"	P-297	WArdm	38	30	30	1:45	1:50				
304/305	1:56-2:01	"	"	"	"	P-297	WArdm	45	30/30	30/30	3:03/3:05	3:03/3:08				
304/306	2:04-2:05	CK	"	"		P-297	P-308	17	30	30	2:28	2:33	LM			
305/308	2:05-2:09	"	"	"	"	End 305/306	WArdm	57	30/30	30/30	2:26/2:26	2:31/2:31				
307/308	1:39-1:40	WF	1993	860	8.0	Butt	—	22	30	30	1:58	2:03				
306/307	2:16	CK	2030	800	8.0	P-297	Ned 307/308	7	30	30	2:28	2:33				
306/308	2:16-2:17	"	"	"	"	Ned 308/307	Ned 305/306	15	30	30	2:28	2:33				
307/309	1:45-1:48	WF	1993	860	8.0	P-297	Sed 307/308	28	30	30	1:58	2:03				
308/309	1:48-1:51	"	"	"	"	Sed 307/308	WArdm	46	30	30	1:58	2:03				
295/310	2:31	WF	"	"	"	P-277	Sed 295/297	7	30	30	3:05	3:10	LM			
297/310	2:31-2:34	"	"	"	"	Sed 295/297	Sed 297/309	79	30	30	3:05	3:10				
309/310	1:25-1:32	"	"	"	"	Sed 297/309	WArdm	81	30/30	30/30	1:50/1:50	1:55/1:55				
309/297	2:50-2:54	"	"	"	"	End 309/310	End 307/309	31	— OK	+ PETP		—				
297/307	2:54-2:58	"	"	"	"	End 307/309	End 306/307	30	30	30	3:06	3:11				
297/306	2:58					End 306/307	End 305/306	13	30	30	3:11	3:16				

Daily Total

CQA Personnel: Ed

GEOMEMBRANE SEAM LOG
AND NON DESTRUCTIVE TESTING

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Project No. XH01.304
Project Name: RULAL HALL ASH LANDFILL
Project Location: RULAL HALL, NC

Material: 40 m.L. LLDPE
Installer: EST

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7-13-12

Seam Number	Weld Time	Tech ID	Machine ID	Machine Temp	Machine Speed or Preheat	Starting Point	Ending Point	Seam Length	Air Pressure Testing PSI Start	PSI Finish	Time Start	Time Finish	Tech Init.	Vac. Test	Tech. Init.	Test Date
297/305	2:56-2:58	WF	1993	860	9.0	E end 305/306	E end 304/305	22	30	30	3:11	3:16	LM			
297/304	2:58-3:00	"	"	"	"	E end 304/305	E end 303/306	22	30	30	3:12	3:17				
297/303	3:00	"	"	"	"	E end 303/304	W end 296/297	14	30	30	3:12	3:17				
296/303	3:00-3:01	"	"	"	"	W end 296/297	E end 302/303	8	30	30	3:17	3:22				
296/302	3:01-3:03					E end 302/303	E end 301/302	22	30	30	"	"				
296/301	3:03-3:05	"	"	"	"	E end 301/302	E end 300/301	22	30	30	3:18	3:23	LM			
296/300	3:05-3:07	WF	1993	860	8.0	E end 300/301	P-267	22	30	30	3:18	3:23	LM			
247/311	3:40-3:43	CK	2080	800	8.0	P-249	TYN(EOS)	27	30	30	4:15	4:20	LM			
249/311	4:12-4:14	"	"	"	"	P-247	W end 249/251	23	30	30	4:15	4:20				
251/311	4:14	"	"	"	"	W end 249/251	E end 311/312	8	30	30	4:16	4:21				
311/312	3:48-3:50	"	"	"	"	— Butt	—	27	30	30	4:16	4:21				
251/312	4:14-4:15	"	"	"	"	E end 311/312	W end 251/313	14	30	30	4:22	4:27	LM			
312/313	3:55	"	"	"	"	W end 251/313	E Anchor	8	30	30	4:23	4:28	LM			
251/313	4:00-4:03	"	"	"	"	R-471	P-312	22	30	30	4:22	4:27	LM			
R-471/313	1:45-1:52	LP	252	500	300	P-251	P-252	10	— SEAM EXTRUDED —					VB	SV	7-15-12
313/252	2:00-2:08	LP	"	"	"	R-471	E Anchor	10	— SEAM EXTRUDED —					"	"	"

Daily Total 3302

CQA Personnel: [signature]

APPENDIX 8

FIELD LLDPE SEAM DESTRUCTIVE SAMPLE LOG

GEOMEMBRANE SEAM DESTRUCTIVE SAMPLE LOG

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Fusion | Extrusion

Date: 5-17-12
ESP Project No.: XH01.304
Project Name: RURAL HALL ASH LANDFILL
Project Location: RURAL HALL, NC
Page: 1 of 2

Sample Number	Seam	Machine Number	Date Sampled	Field Test Results: Peel Pass/Fail	Field Test Results: Shear Pass/Fail	CQA Initials	Lab Test Results: Peel Pass/Fail	Lab Test Results: Shear Pass/Fail	Date of Notification	Remarks
DS#1	1/2	~~93~~ 2030	5-17-12	P F	P F	TCL	P F	P F	5-20-12	59' E of W end S-1/2
DS#2	2/3	2030		P F	P F		P F	P F		125' E of W end S-2/3
DS#3	3/4	1995		P F	P F		P F	P F		315' E of W end S-3/4
DS#4	7/8	1995		P F	P F		P F	P F		4' N of S end 8/7
DS#5	7/9	93	5-17-12	P F	P F	TCL	P F	P F		30' E of W end 7/9
DS#6	10/12	93	5-18-12	P F	P F		P F	P F		160' E of W end 10/12
DS#7	15/13	1995		P F	P F		P F	P F		100' E of W end 15/13
DS#8	23/24	2030		P F	P F		P F	P F		23' N of S end 23/24
DS#9	34/36	93		P F	P F		P F	P F		25' N of S end 34/36
DS#10	41/45	93	5-18-12	P F	P F	TCL	P F	P F	5-20-12	15' W of E end 41/45
DS#11	44/52	2030	5-19-12	P F	P F		P F	P F	5-22-12	20' E of W end 44/52
DS#12	1/59	2030		P F	P F		P F	P F		45' E of W end 1/59
DS#13	59/61	93		P F	P F		P F	P F		130' E of W end 59/61
DS#14	62/63	93		P F	P F		P F	P F		90' E of W end 62/63
DS#15	63/65	2030	5-19-12	P F	P F	TCL	P F	P F	5-22-12	25' E of W end 63/65
DS#16	66/67	1995	5-23-12	P F	P F		P F	P F	5-24-12	297' E of W end 66/67
DS#17	67/68	93		P F	P F		P F	P F		215' E of W end 67/68
DS#18	70/71	2030		P F	P F		P F	P F		6' E of W end 70/71
DS#19	71/72	93		P F	P F		P F	P F		140' E of W end 71/72
DS#20	79/78	93	5-23-12	P F	P F	TCL	P F	P F	5-24-12	7' E of W end 79/78

5-19-12 - 115' left
5-22 - 207 left

CQA Personnel: [signature]

GEOMEMBRANE SEAM DESTRUCTIVE SAMPLE LOG

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Fusion	Extrusion

Date: 5-22-12
ESP Project No.: XH01.304
Project Name: RURAL HALL Ash Landfill
Project Location: RURAL HALL, N.C.
Page: 2 of 2

Sample Number	Seam	Machine Number	Date Sampled	Field Test Results: Peel Pass/Fail	Field Test Results: Shear Pass/Fail	CQA Initials	Lab Test Results: Peel Pass/Fail	Lab Test Results: Shear Pass/Fail	Date of Notification	Remarks
DS#21	87/88	2030	5-23-12	P F	P F	TDL	P F	P F	5-24-12	45' W of E end 87/88
DS#22	96/97	2030	"	P F	P F	"	P F	P F	"	48' W of E end 96/97
DS#23	106/107	93	5-23-12	P F	P F	TDL	P F	P F	5-24-12	10' S of N end 106/107
DS#24	118/119	1995	5-24-12	P F	P F	"	P F	P F	5-25-12	68' W of E end 118/119
DS#25	130/131	93	"	P F	P F	"	P F	P F	"	50 S of N end 130/131
DS#26	138/136	93	5-24-12	P F	P F	TDL	P F	P F	5-25-12	15' S of N end 138/136
DS#27	139/141	1995	5-25-12	P F	P F		P F	P F	5-29-12	45' E of W end 139/141
DS#28	144/145	1995		P F	P F		P F	P F		25' E of W end 144/145
DS#29	148/154	2030		P F	P F		P F	P F		25' E of W end 148/154
DS#30	150/156	2030		P F	P F		P F	P F		15' E of W end 150/156
DS#31	157/159	93		P F	P F		P F	P F		155' E of W end 157/159
DS#32	117/89	1995	5-25-12	P F	P F	TDL	P F	P F	5-29-12	8' S of W end 88/89 - or 89/117 @ TYN
DS#33	168/170	1995	5-30-12	P F	P F		P F	P F	6-1-12	10' W of E end 168/170
DS#34	176/177	2030		P F	P F		P F	P F		56' E of W end 176/177
DS#35	177/150	93		P F	P F		P F	P F		4' N of W end 150/152 @ TYN
DS#36	185/110	93		P F	P F		P F	P F		45' S of N end 185/110
DS#37	194/195	1995		P F	P F		P F	P F		20' E of W end 194/195
DS#38	199/198	93		P F	P F		P F	P F		45' E of W end 199/198
DS#39	137/197	93	5-30-12	P F	P F	TDL	P F	P F	6-1-12	12' N of W end 197/196 @ TYN
				P F	P F		P F	P F		

CQA Personnel: [signature]

GEOMEMBRANE SEAM DESTRUCTIVE SAMPLE LOG

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Fusion | Extrusion

Date: 7-6-12
ESP Project No.: XH01.304
Project Name: RURAL HALL ASH Landfill
Project Location: RURAL HALL, NC.
Page: 1 of 2

Sample Number	Seam	Machine Number	Date Sampled	Field Test Results: Peel Pass/Fail	Field Test Results: Shear Pass/Fail	Field Test Results: CQA Initials	Lab Test Results: Peel Pass/Fail	Lab Test Results: Shear Pass/Fail	Lab Test Results: Date of Notification	Remarks
DS#40	210/206	1993	7-6-12	P F	P F	TEL	P F	P F	7-8-12	10'E of W end 210/206
DS#41	209/216	2030	|	P F	P F	|	P F	P F	|	8'S of N end 209/216
DS#42	219/221	2030	|	P F	P F	|	P F	P F	|	148'E of W end 219/221
DS#43	222/223	2030	|	P F	P F	|	P F	P F	|	40'E of W end 222/223
DS#44	223/225	1993	|	P F	P F	|	P F	P F	|	75'E of W end 223/225
DS#45	228/229	1993	7-6-12	P F	P F	TEL	P F	P F	7-8-12	170'E of W end 228/229
DS#46	229/236	2030	7-12-12	P F	P F	|	P F	P F	7-13-12	85'E of W end 229/236
DS#47	239/240	1993	|	P F	P F	|	P F	P F	|	20'E of W end 239/240
DS#48	243/245	1993	|	P F	P F	|	P F	P F	|	100'E of W end 243/245
DS#49	249/251	2030	|	P F	P F	|	P F	P F	|	20'E of W end 249/251
DS#50	239/268	1993	|	P F	P F	|	P F	P F	|	30'E of W end 239/268
DS#51	268/270	2030	|	P F	P F	|	P F	P F	|	340'E of W end 268/270
DS#52	270/271	2030	|	P F	P F	|	P F	P F	|	50'E of W end 270/271
DS#53	271/274	1993	|	P F	P F	|	P F	P F	|	100'E of W end 271/274
DS#54	274/275	2030	|	P F	P F	|	P F	P F	|	135'E of W end 274/275
DS#55	276/277	1993	7-12-12	P F	P F	|	P F	P F	7-13-12	30'E of W end 276/277
DS#56	281/282	2030	7-13-12	P F	P F	|	P F	P F	7-15-12	125'E of W end 281/282
DS#57	287/288	1993	|	P F	P F	|	P F	P F	|	30'E of W end 287/288
DS#58	277/288	1993	|	P F	P F		P F	P F	|	4'S of N end 277/288
DS#59	295/297	1993	7-13-12	P F	P F	TEL	P F	P F	7-15-12	75'N of S end 295/297

CQA Personnel: EL

GEOMEMBRANE SEAM DESTRUCTIVE SAMPLE LOG

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Fusion	Extrusion

Date: 7-14-12
ESP Project No.: XH01.304
Project Name: RURAL HALL ASH LANDFILL
Project Location: RURAL HALL, N.C.
Page: 2 of 2

				Field Test Results			Lab Test Results			
Sample Number	Seam	Machine Number	Date Sampled	Peel Pass/Fail	Shear Pass/Fail	CQA Initials	Peel Pass/Fail	Shear Pass/Fail	Date of Notification	Remarks
DS#60	308/309	1993	7-13-12	(P) F	(P) F	TR	(P) F	(P) F	7-15-12	15' W of E end 308/309
				P F	P F		P F	P F		
				P F	P F		P F	P F		
				P F	P F		P F	P F		
				P F	P F		P F	P F		
				P F	P F		P F	P F		
				P F	P F		P F	P F		
				P F	P F		P F	P F		
				P F	P F		P F	P F		
				P F	P F		P F	P F		
				P F	P F		P F	P F		
				P F	P F		P F	P F		
				P F	P F		P F	P F		
				P F	P F		P F	P F		
				P F	P F		P F	P F		
				P F	P F		P F	P F		
				P F	P F		P F	P F		
				P F	P F		P F	P F		
				P F	P F		P F	P F		
				P F	P F		P F	P F		

CQA Personnel: _____

GEOMEMBRANE SEAM DESTRUCTIVE SAMPLE LOG

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Fusion	Extrusion

Date: 8-9-12
ESP Project No.: XH01.304
Project Name: RURAL HALL ASH LANDFILL
Project Location: RURAL HALL, N.C
Page: 1 of

Sample Number	Seam	Machine Number	Date Sampled	Field Test Results: Peel Pass/Fail	Field Test Results: Shear Pass/Fail	Field Test Results: CQA Initials	Lab Test Results: Peel Pass/Fail	Lab Test Results: Shear Pass/Fail	Lab Test Results: Date of Notification	Remarks
DS#61	314/315	1995	8-13-12	P F	P F	TBL	P F	P F	8-15-12	20'N of S end 314/315
DS#62	320/321	1993		P F	P F		P F	P F		50'N of S end 320/321
DS#63	322/323	1995		P F	P F		P F	P F		75'N of S end 322/323
DS#64	326/327	1993		P F	P F		P F	P F		40'N of S end 326/327
DS#65	329/330	1995		P F	P F		P F	P F		65'N of S end 329/330
DS#66	333/334	1993		P F	P F	TBL	P F	P F		75'N of S end 333/334
DS#67	316/337	1995		P F	P F		P F	P F		250' W of E end 316/337
DS#68	337/338	1993		P F	P F		P F	P F		25'W of E end 337/338
DS#69	338/340	1995	8-13-12	P F	P F		P F	P F	8-15-12	200'W of E end 338/340
DS#70	340/341	1993		P F	P F		P F	P F		150'W of E end 340/341
DS#71	345/346	1993		P F	P F		P F	P F		25'W of E end 345/346
DS#72	351/352	1995		P F	P F		P F	P F		35'S of N end 351/352
DS#73	356/357	1995		P F	P F		P F	P F		30'S of N end 356/357
DS#74	363/364	1995		P F	P F		P F	P F		125' W of E end 363/364
DS#75	370/371	1995		P F	P F		P F	P F		20'W of E end 370/371
DS#76	375/376	1995	8-13-12	P F	P F	TBL	P F	P F	8-15-12	28'N of S end 375/376
DS#77	357/364	1993	8-13-12	P F	P F		P F	P F		8'W of E end 357/364
DS#78	346/246	1995	8-13-12	P F	P F	TBL	P F	P F	8-15-12	12'S of N end 346/246
				P F	P F		P F	P F		
				P F	P F		P F	P F		

CQA Personnel: [signature]

APPENDIX 9

LLDPE DESTRUCTIVE TESTING RESULTS

TRI/Environmental, Inc.
A Texas Research International Company

Date: 2012-05-19

Mail To:
David Wasiela
ERM NC, Inc.
8000 Corporate Center Drive #200
Charlotte , NC , 28226

e-mail:dave.wasiela@erm.com

Bill To:

ERM NC, Inc.

Dear Mr. Wasiela,

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:	**Rural Hall Edwards Rd. Ash LF Cap**
TRI Job Reference Number:	**8297**
Material(s) Tested:	(10) 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,

Melissa Hunter

Melissa Hunter
Project Manager
Geosynthetic Services Division
http://www.geosyntheticstestinc.com

http://www.geosyntheticstesting.com
9063 Bee Caves Road / Austin, Tx. 78733 / 512.263.2101 / fax: 512.263.2558

DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: ERM NC, Inc.
Project: Rural Hall Edwards Rd. Ash LF Cap

Material: 40mil. LLDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 8297

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-1 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	90	85	94	97	94	**92**
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	
Side: B						**Peel B**
Peel Strength (ppi)	82	78	89	78	82	**82**
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	
Shear						**Shear**
Shear Strength (ppi)	102	104	101	105	102	**103**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-2 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	96	95	96	96	96	**96**
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	
Side: B						**Peel B**
Peel Strength (ppi)	97	90	90	79	85	**88**
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	
Shear						**Shear**
Shear Strength (ppi)	102	102	103	105	103	**103**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: ERM NC, Inc.
Project: Rural Hall Edwards Rd. Ash LF Cap

Material: 40mil. LLDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 8297

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-3 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	100	101	93	106	104	**101**
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	
Side: B						**Peel B**
Peel Strength (ppi)	84	96	91	91	91	**91**
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	
Shear						**Shear**
Shear Strength (ppi)	103	105	105	103	104	**104**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-4 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	108	101	98	102	98	**101**
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	
Side: B						**Peel B**
Peel Strength (ppi)	99	101	97	101	99	**99**
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	
Shear						**Shear**
Shear Strength (ppi)	98	96	101	100	101	**99**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: ERM NC, Inc.
Project: Rural Hall Edwards Rd. Ash LF Cap

Material: 40mil. LLDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 8297

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-5 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	101	100	103	97	100	**100**
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	
Side: B						**Peel B**
Peel Strength (ppi)	83	82	81	78	81	**81**
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	
Shear						**Shear**
Shear Strength (ppi)	107	107	105	108	108	**107**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-6 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	102	105	95	97	98	**99**
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	
Side: B						**Peel B**
Peel Strength (ppi)	76	92	81	86	82	**83**
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	
Shear						**Shear**
Shear Strength (ppi)	107	108	109	108	108	**108**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: ERM NC, Inc.
Project: Rural Hall Edwards Rd. Ash LF Cap

Material: 40mil. LLDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 8297

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-7 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	92	91	88	84	91	**89**
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	
Side: B						**Peel B**
Peel Strength (ppi)	88	91	99	90	87	**91**
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	
Shear						**Shear**
Shear Strength (ppi)	101	101	102	102	104	**102**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-8 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	92	96	89	88	89	**91**
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	
Side: B						**Peel B**
Peel Strength (ppi)	90	86	90	84	88	**88**
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	
Shear						**Shear**
Shear Strength (ppi)	108	112	107	114	108	**110**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: ERM NC, Inc.
Project: Rural Hall Edwards Rd. Ash LF Cap

Material: 40mil. LLDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 8297

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-9 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	96	96	87	94	79	**90**
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	
Side: B						**Peel B**
Peel Strength (ppi)	84	85	82	83	82	**83**
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	
Shear						**Shear**
Shear Strength (ppi)	108	108	108	111	109	**109**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-10 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	88	89	84	90	81	**86**
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	
Side: B						**Peel B**
Peel Strength (ppi)	99	94	97	95	94	**96**
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	
Shear						**Shear**
Shear Strength (ppi)	97	99	100	99	98	**99**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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TRI/Environmental, Inc.
A Texas Research International Company

Date: 2012-05-22

Mail To:
David Wasiela
ERM NC, Inc.
8000 Corporate Center Drive #200
Charlotte , NC , 28226

e-mail:dave.wasiela@erm.com

Bill To:

ERM NC, Inc.

Dear Mr. Wasiela,

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:	**Rural Hall Edwards Rd. Ash LF Cap**
TRI Job Reference Number:	**8308**
Material(s) Tested:	(5) 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,

Jennifer T. Tenney

Jennifer Tenney
Project Manager
Geosynthetic Services Division
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9063 Bee Caves Road / Austin, Tx. 78733 / 512.263.2101 / fax: 512.263.2558

DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: ERM NC, Inc.
Project: Rural Hall Edwards Rd. Ash LF Cap

Material: 40mil. LLDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 8308

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-11 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	93	88	91	90	93	**91**
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	
Side: B						**Peel B**
Peel Strength (ppi)	92	89	91	94	93	**92**
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	
Shear						**Shear**
Shear Strength (ppi)	100	98	101	98	101	**100**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-12 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	82	85	83	87	84	**84**
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	
Side: B						**Peel B**
Peel Strength (ppi)	84	91	88	85	94	**88**
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	
Shear						**Shear**
Shear Strength (ppi)	103	99	106	101	102	**102**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: ERM NC, Inc.
Project: Rural Hall Edwards Rd. Ash LF Cap

Material: 40mil. LLDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 8308

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-13 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	88	90	89	90	90	**89**
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	
Side: B						**Peel B**
Peel Strength (ppi)	88	88	83	90	87	**87**
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	
Shear						**Shear**
Shear Strength (ppi)	103	105	101	103	110	**104**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-14 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	86	80	77	85	79	**81**
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	
Side: B						**Peel B**
Peel Strength (ppi)	96	86	86	91	88	**89**
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	
Shear						**Shear**
Shear Strength (ppi)	106	108	104	109	105	**106**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: ERM NC, Inc.
Project: Rural Hall Edwards Rd. Ash LF Cap

Material: 40mil. LLDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 8308

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-15 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	90	90	86	86	89	**88**
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	
Side: B						**Peel B**
Peel Strength (ppi)	98	85	88	80	84	**87**
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	
Shear						**Shear**
Shear Strength (ppi)	110	105	109	107	110	**108**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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TRI/Environmental, Inc.
A Texas Research International Company

Date: 2012-05-24

Mail To:
David Wasiela
ERM NC, Inc.
8000 Corporate Center Drive #200
Charlotte , NC , 28226

e-mail:dave.wasiela@erm.com

Bill To:

ERM NC, Inc.

Dear Mr. Wasiela,

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:	**Rural Hall Edwards Rd. Ash LF Cap**
TRI Job Reference Number:	**8329**
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,

Jennifer T. Tenney

Jennifer Tenney
Project Manager
Geosynthetic Services Division
http://www.geosyntheticstestinc.com

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: ERM NC, Inc.
Project: Rural Hall Edwards Rd. Ash LF Cap

Material: 40mil. LLDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 8329

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-16 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	93	91	91	90	96	**92**
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	
Side: B						**Peel B**
Peel Strength (ppi)	85	85	89	89	85	**87**
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	
Shear						**Shear**
Shear Strength (ppi)	102	107	106	104	103	**104**
Shear Elongation @ Break (%)	>50	40	>50	>50	>50	
Sample ID: DS-17 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	91	91	94	94	90	**92**
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	
Side: B						**Peel B**
Peel Strength (ppi)	82	84	85	87	88	**85**
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	
Shear						**Shear**
Shear Strength (ppi)	104	106	110	106	107	**107**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: ERM NC, Inc.
Project: Rural Hall Edwards Rd. Ash LF Cap

Material: 40mil. LLDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 8329

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-18 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	94	94	89	92	96	**93**
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	
Side: B						**Peel B**
Peel Strength (ppi)	82	82	85	82	79	**82**
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	
Shear						**Shear**
Shear Strength (ppi)	107	112	107	106	111	**109**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-19 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	93	95	94	90	95	**93**
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	
Side: B						**Peel B**
Peel Strength (ppi)	76	77	79	78	80	**78**
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	
Shear						**Shear**
Shear Strength (ppi)	103	110	114	106	112	**109**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: ERM NC, Inc.
Project: Rural Hall Edwards Rd. Ash LF Cap

Material: 40mil. LLDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 8329

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-20 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	96	95	93	89	89	**92**
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	
Side: B						**Peel B**
Peel Strength (ppi)	83	80	80	82	84	**82**
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	
Shear						**Shear**
Shear Strength (ppi)	101	104	103	103	106	**103**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-21 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	89	86	91	95	99	**92**
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	
Side: B						**Peel B**
Peel Strength (ppi)	81	78	77	79	87	**80**
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	
Shear						**Shear**
Shear Strength (ppi)	106	107	107	108	110	**108**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: ERM NC, Inc.
Project: Rural Hall Edwards Rd. Ash LF Cap

Material: 40mil. LLDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 8329

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-22 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	86	83	83	84	85	**84**
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	
Side: B						**Peel B**
Peel Strength (ppi)	82	80	86	84	85	**83**
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	
Shear						**Shear**
Shear Strength (ppi)	105	107	108	108	109	**107**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-23 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	86	88	86	85	94	**88**
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	
Side: B						**Peel B**
Peel Strength (ppi)	88	93	91	90	95	**91**
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	
Shear						**Shear**
Shear Strength (ppi)	100	99	101	99	102	**100**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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TRI/Environmental, Inc.
A Texas Research International Company

Date: 2012-05-25

Mail To:
David Wasiela
ERM NC, Inc.
8000 Corporate Center Drive #200
Charlotte , NC , 28226

e-mail:dave.wasiela@erm.com

Bill To:

ERM NC, Inc.

Dear Mr. Wasiela,

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:	**Rural Hall Edwards Rd. Ash LF Cap**
TRI Job Reference Number:	**8342**
Material(s) Tested:	(3) 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,

Jennifer T. Tenney

Jennifer Tenney
Project Manager
Geosynthetic Services Division
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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: ERM NC, Inc.
Project: Rural Hall Edwards Rd. Ash LF Cap

Material: 40mil. LLDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 8342

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-24 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	84	91	86	90	85	**87**
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	
Side: B						**Peel B**
Peel Strength (ppi)	87	80	80	78	78	**81**
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	
Shear						**Shear**
Shear Strength (ppi)	107	108	104	109	106	**107**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-25 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	93	94	90	91	90	**92**
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	
Side: B						**Peel B**
Peel Strength (ppi)	79	81	88	79	74	**80**
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	
Shear						**Shear**
Shear Strength (ppi)	101	107	102	106	104	**104**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: ERM NC, Inc.
Project: Rural Hall Edwards Rd. Ash LF Cap

Material: 40mil. LLDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 8342

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-26 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	92	89	90	95	87	**91**
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	
Side: B						**Peel B**
Peel Strength (ppi)	77	76	77	78	75	**77**
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	
Shear						**Shear**
Shear Strength (ppi)	111	115	110	110	111	**111**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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TRI/Environmental, Inc.
A Texas Research International Company

Date: 2012-05-26

Mail To:
David Wasiela
ERM NC, Inc.
8000 Corporate Center Drive #200
Charlotte , NC , 28226

e-mail:dave.wasiela@erm.com

Bill To:

ERM NC, Inc.

Dear Mr. Wasiela,

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:	**Rural Hall Edwards Rd. Ash LF Cap**
TRI Job Reference Number:	**8349**
Material(s) Tested:	(6) 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,

Richard Lacey
Senior Engineer
Geosynthetic Services Division
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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: ERM NC, Inc.
Project: Rural Hall Edwards Rd. Ash LF Cap

Material: 40mil. LLDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 8349

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-27 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	91	93	98	92	83	**91**
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	
Side: B						**Peel B**
Peel Strength (ppi)	80	83	79	78	77	**79**
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	
Shear						**Shear**
Shear Strength (ppi)	108	108	112	108	108	**109**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-28 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	81	86	83	85	87	**84**
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	
Side: B						**Peel B**
Peel Strength (ppi)	87	93	90	91	87	**90**
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	
Shear						**Shear**
Shear Strength (ppi)	108	108	109	113	112	**110**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: ERM NC, Inc.
Project: Rural Hall Edwards Rd. Ash LF Cap

Material: 40mil. LLDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 8349

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-29 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	97	102	102	96	99	**99**
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	
Side: B						**Peel B**
Peel Strength (ppi)	93	91	99	92	99	**95**
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	
Shear						**Shear**
Shear Strength (ppi)	107	113	112	109	112	**111**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-30 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	77	82	83	83	83	**82**
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	
Side: B						**Peel B**
Peel Strength (ppi)	83	93	92	93	94	**91**
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	
Shear						**Shear**
Shear Strength (ppi)	94	101	96	98	97	**97**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: ERM NC, Inc.
Project: Rural Hall Edwards Rd. Ash LF Cap

Material: 40mil. LLDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 8349

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-31 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	93	92	91	97	95	**94**
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	
Side: B						**Peel B**
Peel Strength (ppi)	89	83	84	87	85	**86**
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	
Shear						**Shear**
Shear Strength (ppi)	103	105	105	107	105	**105**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-32 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	100	100	97	87	89	**95**
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	
Side: B						**Peel B**
Peel Strength (ppi)	100	98	98	96	94	**97**
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	
Shear						**Shear**
Shear Strength (ppi)	99	105	113	99	103	**104**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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TRI/Environmental, Inc.
A Texas Research International Company

Date: 2012-05-31

Mail To:
David Wasiela
ERM NC, Inc.
8000 Corporate Center Drive #200
Charlotte , NC , 28226

e-mail:dave.wasiela@erm.com

Bill To:

ERM NC, Inc.

Dear Mr. Wasiela,

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:	**Rural Hall Edwards Rd. Ash LF Cap**
TRI Job Reference Number:	**8372**
Material(s) Tested:	(7) 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,

Melissa Hunter

Melissa Hunter
Project Manager
Geosynthetic Services Division
http://www.geosyntheticstestinc.com

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: ERM NC, Inc.
Project: Rural Hall Edwards Rd. Ash LF Cap

Material: 40mil. LLDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 8372

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-33 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	77	81	79	84	79	**80**
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	
Side: B						**Peel B**
Peel Strength (ppi)	76	77	84	79	85	**80**
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	
Shear						**Shear**
Shear Strength (ppi)	108	107	107	111	104	**107**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-34 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	85	82	83	83	84	**83**
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	
Side: B						**Peel B**
Peel Strength (ppi)	89	89	91	89	89	**89**
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	
Shear						**Shear**
Shear Strength (ppi)	111	114	110	111	109	**111**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: ERM NC, Inc.
Project: Rural Hall Edwards Rd. Ash LF Cap

Material: 40mil. LLDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 8372

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-35 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	90	94	95	97	97	**95**
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	
Side: B						**Peel B**
Peel Strength (ppi)	97	93	98	101	100	**98**
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	
Shear						**Shear**
Shear Strength (ppi)	95	99	92	98	94	**96**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-36 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	86	83	86	83	85	**85**
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	
Side: B						**Peel B**
Peel Strength (ppi)	87	93	90	95	88	**91**
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	
Shear						**Shear**
Shear Strength (ppi)	112	110	108	107	106	**109**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: ERM NC, Inc.
Project: Rural Hall Edwards Rd. Ash LF Cap

Material: 40mil. LLDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 8372

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-37 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	96	99	102	93	99	**98**
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	
Side: B						**Peel B**
Peel Strength (ppi)	75	76	76	78	79	**77**
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	
Shear						**Shear**
Shear Strength (ppi)	109	112	109	108	107	**109**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-38 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	93	98	97	97	102	**97**
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	
Side: B						**Peel B**
Peel Strength (ppi)	83	89	86	89	90	**87**
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	
Shear						**Shear**
Shear Strength (ppi)	112	111	106	106	104	**108**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: ERM NC, Inc.
Project: Rural Hall Edwards Rd. Ash LF Cap

Material: 40mil. LLDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 8372

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-39 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	100	101	97	100	96	**99**
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	
Side: B						**Peel B**
Peel Strength (ppi)	95	86	93	109	99	**96**
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	
Shear						**Shear**
Shear Strength (ppi)	96	95	97	96	95	**96**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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TRI/Environmental, Inc.
A Texas Research International Company

Date: 2012-07-07

Mail To:
David Wasiela
ERM NC, Inc.
8000 Corporate Center Drive #200
Charlotte , NC , 28226

e-mail:dave.wasiela@erm.com

Bill To:

ERM NC, Inc.

Dear Mr. Wasiela,

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:	**Rural Hall Edwards Rd. Ash LF Cap**
TRI Job Reference Number:	**8710**
Material(s) Tested:	(6) 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,

Richard Lacey
Senior Engineer
Geosynthetic Services Division
http://www.geosyntheticstestinc.com

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: ERM NC, Inc.
Project: Rural Hall Edwards Rd. Ash LF Cap

Material: 40mil. LLDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 8710

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-40 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	96	95	99	97	102	**98**
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	
Side: B						**Peel B**
Peel Strength (ppi)	88	81	83	83	88	**85**
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	
Shear						**Shear**
Shear Strength (ppi)	105	106	111	112	109	**109**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-41 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	110	96	107	110	108	**106**
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	
Side: B						**Peel B**
Peel Strength (ppi)	113	102	109	112	112	**110**
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	
Shear						**Shear**
Shear Strength (ppi)	115	120	109	114	119	**115**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: ERM NC, Inc.
Project: Rural Hall Edwards Rd. Ash LF Cap

Material: 40mil. LLDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 8710

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-42 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	88	83	90	81	76	**84**
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	
Side: B						**Peel B**
Peel Strength (ppi)	87	93	91	84	87	**88**
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	
Shear						**Shear**
Shear Strength (ppi)	108	109	103	106	106	**106**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-43 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	76	75	73	77	76	**75**
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	
Side: B						**Peel B**
Peel Strength (ppi)	87	77	84	78	79	**81**
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	
Shear						**Shear**
Shear Strength (ppi)	110	109	109	112	113	**111**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: ERM NC, Inc.
Project: Rural Hall Edwards Rd. Ash LF Cap

Material: 40mil. LLDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 8710

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-44 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	98	98	100	106	98	**100**
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	
Side: B						**Peel B**
Peel Strength (ppi)	85	75	85	90	87	**84**
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	
Shear						**Shear**
Shear Strength (ppi)	112	113	109	110	111	**111**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-45 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	87	104	92	105	93	**96**
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	
Side: B						**Peel B**
Peel Strength (ppi)	85	85	90	97	85	**88**
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	
Shear						**Shear**
Shear Strength (ppi)	110	113	112	110	110	**111**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

The testing is based upon accepted industry practices 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 claims 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.

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TRI/Environmental, Inc.
A Texas Research International Company

Date: 2012-07-13

Mail To:
David Wasiela
ERM NC, Inc.
8000 Corporate Center Drive #200
Charlotte , NC , 28226

e-mail:dave.wasiela@erm.com

Bill To:

ERM NC, Inc.

Dear Mr. Wasiela,

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:	**Rural Hall Edwards Rd. Ash LF Cap**
TRI Job Reference Number:	**8785**
Material(s) Tested:	(10) 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,

Jennifer T. Tenney

Jennifer Tenney
Project Manager
Geosynthetic Services Division
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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: ERM NC, Inc.
Project: Rural Hall Edwards Rd. Ash LF Cap

Material: 40mil. LLDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 8785

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-46 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	85	85	82	85	83	**84**
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	
Side: B						**Peel B**
Peel Strength (ppi)	93	85	92	97	64	**86**
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	
Shear						**Shear**
Shear Strength (ppi)	105	97	105	104	98	**102**
Shear Elongation @ Break (%)	>50	21	23	>50	23	
Sample ID: DS-47 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	100	101	96	100	98	**99**
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	
Side: B						**Peel B**
Peel Strength (ppi)	82	86	85	80	84	**83**
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	
Shear						**Shear**
Shear Strength (ppi)	109	107	108	106	106	**107**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: ERM NC, Inc.
Project: Rural Hall Edwards Rd. Ash LF Cap

Material: 40mil. LLDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 8785

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-48 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	84	102	85	97	90	**92**
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	
Side: B						**Peel B**
Peel Strength (ppi)	86	92	85	87	87	**87**
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	
Shear						**Shear**
Shear Strength (ppi)	111	109	109	108	110	**109**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-49 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	77	76	83	76	67	**76**
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	
Side: B						**Peel B**
Peel Strength (ppi)	85	83	90	86	94	**88**
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	
Shear						**Shear**
Shear Strength (ppi)	110	111	111	109	115	**111**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: ERM NC, Inc.
Project: Rural Hall Edwards Rd. Ash LF Cap

Material: 40mil. LLDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 8785

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-50 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	85	87	92	91	94	**90**
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	
Side: B						**Peel B**
Peel Strength (ppi)	79	76	70	74	76	**75**
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	
Shear						**Shear**
Shear Strength (ppi)	105	108	108	112	108	**108**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-51 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	81	80	71	77	75	**77**
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	
Side: B						**Peel B**
Peel Strength (ppi)	82	91	91	94	89	**89**
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	
Shear						**Shear**
Shear Strength (ppi)	107	108	110	105	108	**108**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: ERM NC, Inc.
Project: Rural Hall Edwards Rd. Ash LF Cap

Material: 40mil. LLDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 8785

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-52 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	78	77	81	78	77	**78**
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	
Side: B						**Peel B**
Peel Strength (ppi)	88	91	90	93	85	**89**
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	
Shear						**Shear**
Shear Strength (ppi)	110	109	112	111	111	**111**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-53 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	93	96	94	87	92	**92**
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	
Side: B						**Peel B**
Peel Strength (ppi)	80	92	86	87	98	**89**
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	
Shear						**Shear**
Shear Strength (ppi)	110	110	109	112	111	**110**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: ERM NC, Inc.
Project: Rural Hall Edwards Rd. Ash LF Cap

Material: 40mil. LLDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 8785

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-54 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	92	87	91	84	94	**90**
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	
Side: B						**Peel B**
Peel Strength (ppi)	87	83	87	91	83	**86**
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	
Shear						**Shear**
Shear Strength (ppi)	101	109	102	104	102	**104**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-55 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	78	79	78	77	77	**78**
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	
Side: B						**Peel B**
Peel Strength (ppi)	84	85	87	85	87	**86**
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	
Shear						**Shear**
Shear Strength (ppi)	102	103	104	104	106	**104**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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TRI/Environmental, Inc.
A Texas Research International Company

Date: 2012-07-14

Mail To:
David Wasiela
ERM NC, Inc.
8000 Corporate Center Drive #200
Charlotte , NC , 28226

e-mail:dave.wasiela@erm.com

Bill To:

ERM NC, Inc.

Dear Mr. Wasiela,

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:	**Rural Hall Edwards Rd. Ash LF Cap**
TRI Job Reference Number:	**8802**
Material(s) Tested:	(5) 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,

Melissa Hunter

Melissa Hunter
Project Manager
Geosynthetic Services Division
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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: ERM NC, Inc.
Project: Rural Hall Edwards Rd. Ash LF Cap

Material: 40mil. LLDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 8802

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-56 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	74	76	79	81	78	**78**
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	
Side: B						**Peel B**
Peel Strength (ppi)	77	75	76	83	84	**79**
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	
Shear						**Shear**
Shear Strength (ppi)	111	109	109	109	111	**110**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-57 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	93	89	92	86	89	**90**
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	
Side: B						**Peel B**
Peel Strength (ppi)	88	93	91	90	84	**89**
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	
Shear						**Shear**
Shear Strength (ppi)	103	102	100	101	103	**102**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: ERM NC, Inc.
Project: Rural Hall Edwards Rd. Ash LF Cap

Material: 40mil. LLDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 8802

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-58 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	98	96	88	100	108	**98**
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	
Side: B						**Peel B**
Peel Strength (ppi)	91	94	91	91	88	**91**
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	
Shear						**Shear**
Shear Strength (ppi)	97	99	99	97	105	**99**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-59 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	92	85	87	91	88	**89**
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	
Side: B						**Peel B**
Peel Strength (ppi)	81	84	84	79	88	**83**
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	
Shear						**Shear**
Shear Strength (ppi)	103	105	105	104	104	**104**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: ERM NC, Inc.
Project: Rural Hall Edwards Rd. Ash LF Cap

Material: 40mil. LLDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 8802

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-60 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	90	78	85	80	85	**84**
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	
Side: B						**Peel B**
Peel Strength (ppi)	83	86	82	86	84	**84**
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	
Shear						**Shear**
Shear Strength (ppi)	106	100	103	101	102	**102**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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TRI/Environmental, Inc.
A Texas Research International Company

Date: 2012-08-14

Mail To:
David Wasiela
ERM NC, Inc.
8000 Corporate Center Drive #200
Charlotte , NC , 28226

e-mail:dave.wasiela@erm.com

Bill To:

ERM NC, Inc.

Dear Mr. Wasiela,

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:	**Rural Hall Edwards Rd. Ash LF Cap**
TRI Job Reference Number:	**9148**
Material(s) Tested:	(18) 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,

Melissa Hunter

Melissa Hunter
Project Manager
Geosynthetic Services Division
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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: ERM NC, Inc.
Project: Rural Hall Edwards Rd. Ash LF Cap

Material: 40mil. LLDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 9148

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-61 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	76	82	88	91	84	**84**
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	
Side: B						**Peel B**
Peel Strength (ppi)	83	82	82	84	80	**82**
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	
Shear						**Shear**
Shear Strength (ppi)	105	100	102	104	100	**102**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-62 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	90	92	81	89	82	**87**
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	
Side: B						**Peel B**
Peel Strength (ppi)	87	94	91	96	85	**91**
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	
Shear						**Shear**
Shear Strength (ppi)	103	98	105	103	107	**103**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: ERM NC, Inc.
Project: Rural Hall Edwards Rd. Ash LF Cap

Material: 40mil. LLDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 9148

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-63 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	96	91	91	80	89	**89**
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	
Side: B						**Peel B**
Peel Strength (ppi)	85	85	84	87	85	**85**
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	
Shear						**Shear**
Shear Strength (ppi)	109	104	109	106	115	**109**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-64 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	88	83	79	83	82	**83**
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	
Side: B						**Peel B**
Peel Strength (ppi)	91	95	92	96	83	**91**
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	
Shear						**Shear**
Shear Strength (ppi)	107	108	108	109	113	**109**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: ERM NC, Inc.
Project: Rural Hall Edwards Rd. Ash LF Cap

Material: 40mil. LLDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 9148

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-65 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	77	75	76	73	76	**75**
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	
Side: B						**Peel B**
Peel Strength (ppi)	84	83	81	84	83	**83**
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	
Shear						**Shear**
Shear Strength (ppi)	101	102	101	106	101	**102**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-66 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	79	89	75	79	78	**80**
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	
Side: B						**Peel B**
Peel Strength (ppi)	96	66	84	80	81	**81**
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	
Shear						**Shear**
Shear Strength (ppi)	106	109	111	111	107	**109**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: ERM NC, Inc.
Project: Rural Hall Edwards Rd. Ash LF Cap

Material: 40mil. LLDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 9148

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-67 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	87	72	89	74	86	**82**
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	
Side: B						**Peel B**
Peel Strength (ppi)	79	82	71	94	77	**81**
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	
Shear						**Shear**
Shear Strength (ppi)	103	103	104	106	108	**105**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-68 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	85	80	84	83	85	**83**
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	
Side: B						**Peel B**
Peel Strength (ppi)	81	83	85	84	83	**83**
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	
Shear						**Shear**
Shear Strength (ppi)	105	106	111	105	106	**107**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: ERM NC, Inc.
Project: Rural Hall Edwards Rd. Ash LF Cap

Material: 40mil. LLDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 9148

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-69 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	90	85	90	89	92	**89**
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	
Side: B						**Peel B**
Peel Strength (ppi)	81	82	84	84	82	**83**
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	
Shear						**Shear**
Shear Strength (ppi)	104	104	103	106	106	**105**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-70 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	82	83	81	82	79	**81**
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	
Side: B						**Peel B**
Peel Strength (ppi)	92	86	88	84	93	**89**
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	
Shear						**Shear**
Shear Strength (ppi)	104	102	105	103	108	**104**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: ERM NC, Inc.
Project: Rural Hall Edwards Rd. Ash LF Cap

Material: 40mil. LLDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 9148

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-71 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	80	86	82	86	87	**84**
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	
Side: B						**Peel B**
Peel Strength (ppi)	80	86	76	86	92	**84**
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	
Shear						**Shear**
Shear Strength (ppi)	99	96	96	98	100	**98**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-72 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	93	80	81	76	78	**82**
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	
Side: B						**Peel B**
Peel Strength (ppi)	74	81	81	86	80	**80**
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	
Shear						**Shear**
Shear Strength (ppi)	106	109	106	105	109	**107**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: ERM NC, Inc.
Project: Rural Hall Edwards Rd. Ash LF Cap

Material: 40mil. LLDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 9148

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-73 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	87	83	91	83	78	**84**
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	
Side: B						**Peel B**
Peel Strength (ppi)	78	76	79	79	79	**78**
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	
Shear						**Shear**
Shear Strength (ppi)	106	106	106	106	109	**107**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-74 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	92	75	94	77	87	**85**
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	
Side: B						**Peel B**
Peel Strength (ppi)	82	96	79	92	76	**85**
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	
Shear						**Shear**
Shear Strength (ppi)	103	103	107	104	105	**104**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: ERM NC, Inc.
Project: Rural Hall Edwards Rd. Ash LF Cap

Material: 40mil. LLDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 9148

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-75 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	83	79	85	92	82	**84**
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	
Side: B						**Peel B**
Peel Strength (ppi)	82	91	87	84	82	**85**
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	
Shear						**Shear**
Shear Strength (ppi)	105	106	104	103	104	**104**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-76 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	86	84	82	84	81	**83**
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	
Side: B						**Peel B**
Peel Strength (ppi)	97	94	93	98	90	**94**
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	
Shear						**Shear**
Shear Strength (ppi)	111	108	108	108	108	**109**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: ERM NC, Inc.
Project: Rural Hall Edwards Rd. Ash LF Cap

Material: 40mil. LLDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 9148

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-77 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	103	94	102	94	104	**99**
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	
Side: B						**Peel B**
Peel Strength (ppi)	96	81	96	88	84	**89**
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	
Shear						**Shear**
Shear Strength (ppi)	102	103	104	105	108	**104**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-78 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	100	91	100	95	103	**98**
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	
Side: B						**Peel B**
Peel Strength (ppi)	103	103	106	108	108	**106**
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	
Shear						**Shear**
Shear Strength (ppi)	106	107	114	109	105	**108**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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APPENDIX 10

FIELD LLDPE DEFECT AND REPAIR TESTING LOG

ESP ASSOCIATES, P.A.
engineering • surveying • planning

GEOMEMBRANE REPAIR TESTING LOG

Date: 5-17-12
ESP Project No.: XH01.304
Project Name: RURAL HALL ASH LANDFILL
Project Location: RURAL HALL, N.C.
Page: 1 of 18

Passing Trial Seams				
Number	1	12		
Time	7:50	1:32		
Tech Initials	JM	JM		
Machine #	5383	5383		

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R-1	P	2x2	JM	TGL	VB	SV	P F	TGL	3' E of W end 1/2
R-2	P	2x2					P F		185' E of W end 2/3
R-3	P	1.5x1.5					P F		173' E of W end 1/2
R-4	P	1x1					P F		185' E of W end 2/3
R-5	P	2x2					P F		180' E of W end 2/3
R-6	P	2x2	JM	TGL	VB	SV	P F		25' E of W end 3/5
R-7	P	2x2					P F		S end 4/5
R-8	P	2'x5'					P F		200' E of W end 3/4
R-9	DS#3	2x5					P F	TGL	DS#3 - 315' E of W end 3/4
R-10	P	2x2					P F		5' W of E end 3/4
R-11	P	1x1					P F		230' E of W end 4/6
R-12	P	2x2					P F		63' E of W end 4/6
R-13	P	2x2					P F		25' E of W end 4/6
R-14	P	2x2	JM	TGL	VB	SV	P F		N end 4/5
R-15	P	2x2					P F		30' E of W end 6/8
R-16	P	1x1					P F		48' E of W end 6/8
R-17	P	2x2					P F		70' E of W end 6/8
R-18	DS#4	2x4'					P F		4' N of S end 8/7
R-19	P	2x2					P F		S end 8/7
R-20	P	2x2	JM	TGL	VB	SV	P F	TGL	97' E of W end 6/7

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: _____

GEOMEMBRANE REPAIR TESTING LOG

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Date: 5-17-12
ESP Project No.: XH01.304
Project Name: RURAL HALL ASH LANDFILL
Project Location: RURAL HALL, N.C.
Page: 2 of 18

Passing Trial Seams				
Number				
Time				
Tech Initials				
Machine #				

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R-21	P	2x2	JM	TGL	VB	SV	P F	TGL	190' E of W end 6/7
R-22	P	1x1					P F		180' E of W end 7/9
R-23	DS#5	2x4					P F		30' E of W end 7/9
R-24	P	2x2					P F		N end 7/8
R-25	P	2x2					P F		S end 10/11
R-26	P	2x2					P F		5' W of E end 10/9
R-27	P	2x2					P F	TGL	5' W of E end 10/12
R-28	DS#6	2x4		TGL	VB	SV	P F		160' E of W end 10/12
R-29	P	2x2					P F		125' E of W end 10/12
R-30	P	2x2					P F		116' E of W end 10/12
R-31	P	2x2					P F		N end 10/11
R-32	P	2x2	JM				P F		N end 11/20
R-33	P	2x4					P F	TGL	S end 11/20
R-34	P	3x3					P F		50' E of W end 12/13
R-35	P	3x3			VB	SV	P F		63' E of W end 12/13
R-36	P	2x2					P F		90' E of W end 12/13
R-37	P	2x2					P F		10' E of W end 12/13
R-38	CAP	2x6					P F		10' E of W end 13/14
R-39	P	2x8					P F		S end 14/15
R-40	DS#7	2x4	JM	TGL	VB	SV	P F	TGL	100 E of W end 15/13

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: _____

ESP ASSOCIATES, P.A.
engineering • surveying • planning

GEOMEMBRANE REPAIR TESTING LOG

Date: 5-17-12
ESP Project No.: XH01.304
Project Name: RURAL ASH LANDFILL
Project Location: RURAL HALL N.C.
Page: 3 of 18

Passing Trial Seams				
Number	12			
Time	1:32			
Tech Initials	JM			
Machine #	5383			

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R-41	P	2x2	JM	TBL	VB	SV	P F	TBL	S end 15/16
R-42	DS#1	2x4	|	|	|	|	P F	|	59' E of W end 1/2
R-43	DS#2	2x4	|	|	|	|	P F	|	125' E of W end 2/3
R-44	CAP	2x20	|	|	|	|	P F	|	N END 15/16 to 5' PAST S end 17/18
R-45	P	2x2	JM	TBL	VB	SV	P F	TBL	N END 17/18
							P F		
							P F		
							P F		
							P F		
							P F		
							P F		
							P F		
							P F		
							P F		
							P F		
							P F		
							P F		
							P F		
							P F		
							P F		
							P F		

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: [signature]

GEOMEMBRANE REPAIR TESTING LOG

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Date: 5-18-12
ESP Project No.: XH01.304
Project Name: RUKAL HALL Ash Landfill
Project Location: RUKAL HALL, N.C.
Page: 4 of 18

Passing Trial Seams				
Number	1	12		
Time	7:50	1:32		
Tech Initials	JM	JM		
Machine #	5383	5383		

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R-46	P	2x2	JM	TGL	VB	SV	P F	TGL	50'E of 55 of W end 1/2
R-47	P	2x2	WF				P F		E end 24/25
R-48	DS#8	2x4	WF				P F		23' N of S end 23/24
R-49	P	2x2	WF				P F		W end 24/25
R-50	P	3x3	WF				P F		N end 28/33
R-51	P	25x4.5	WF			SV	P F		N end 28/29 + E end 29/32
R-52	P	2x2	WF	TGL			P F		N end 30/31
R-53	P	2x2	WF				P F		5' N of S end 32/31
R-54	P	2x2	WF		VB		P F		W end 29/32
R-55	DS#9	2x4	WF				P F	TGL	25' N of S end 34/36
R-56	P	2x2	WF				P F		W end 33/34
R-57	P	2x2	WF			SV	P F		E end 35/36
R-58	P	2x2	WF				P F		W end 35/36
R-59	P	1x1	WF				P F		1'S + 2'E of N end 37/38
R-60	P	1x3	WF				P F		3'S of N end 37/38
R-61	P	2x3	CK	TGL			P F		N end 39/40
R-62	P	2x2	WF				P F		60' N of S end 40/42
R-63	P	2x2	CK				P F		N of 41/42
R-64	P	2x2	CK				P F		S end 40/39
R-65	P	2x2	CK	TGL	VB	SV	P F	TGL	E end 44/45

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: _____

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GEOMEMBRANE REPAIR TESTING LOG

Date: 5-18-12
ESP Project No.: XH01.304
Project Name: RURAL HALL ASH CANOTILL
Project Location: RURAL HALL, N.C.
Page: 5 of 18

Passing Trial Seams				
Number				
Time				
Tech Initials				
Machine #				

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R-66	DS#10	1.5x3.5	CK	TOL	VB	SV	P F	TOL	15' W of E end 41/45
R-67	P	2x2	CK				P F		E end 45/46
R-68	P	1x3	MF				P F		10' E of W end 41/46
R-69	P	1x1	MF				P F		S end 41/42
R-70	P	1x1	MF				P F		E end 46/49
R-71	P	2x2	MF				P F		W end 50/47
R-72	P	2x2	CK	TOL			P F		E end 50/51
R-73	P	1x1	CK				P F		10' S of N end 51/42
R-74	P	2x2	CK		VB		P F	TOL	2' N of E end 50/51
R-75	P	1x1	CK			SV	P F		5' E of W end 49/50
R-76	P	1x1	CK				P F		N end 49/47
R-77	P	1x1	CK				P F		W end 49/48
R-78	P	1x1	CK	TOL			P F		S end 47/49
R-79	P	1x1	MF				P F		N end 46/48
R-80	P	1x1	MF				P F		S end 46/48
R-81	P	1x2	MF				P F		30' W from E end 45/48
R-82	P	1x1	WF				P F		W end 20/21 @ TYN
R-83	P	1x1	WF				P F		S end 28/27 @ TYN
R-84	P	2x3	WF				P F		N end 21/12 @ TYN
R-85	P	2x3	WF	TOL	VB		P F	TOL	W end 13/16 @ TYN

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: _____

GEOMEMBRANE REPAIR TESTING LOG

ESP ASSOCIATES, P.A.
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Date: 5-18-12
ESP Project No.: XH01.304
Project Name: RURAL HALL ASH Landfill
Project Location: RURAL HALL, N.C.
Page: 6 of 18

Passing Trial Seams				
Number				
Time				
Tech Initials				
Machine #				

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R-86	P	1x1	WF	TDL	VB	TDL	P F	TDL	S END 25/23 @ TYN
R-87	P	1x1	WF				P F		W END 16/18 @ TYN
R-88	P	1x1	WF				P F		S END 22/23 @ TYN
R-89	DS#11	2x4	WF	TDL			P F	TDL	20' E of W END 44/52
R-90	P	2x2	WF				P F		N end 55/54
R-91	P	2x2	WF				P F		3' S of N end 55/54
R-92	P	2x2	WF				P F		S end 55/54
R-93	DS#12	1.5x4	WF		VB	TDL	P F		45' E of W end 1/59
R-94	P	1x1	WF				P F		E end 11/59 @ Anchor
R-95	P	2x2	WF				P F		15' W & 5' S of E end 1/2
R-96	P	1x1	JM				P F		15' W & 7' S of E end 1/2
R-97	P	1x1	JM	TDL			P F	TDL	2' W & 16' N of E end 1/2
R-98	P	1x1	JM				P F		2' W & 18' N of E END 1/2
R-99	P	1x1	JM			TDL	P F		2' W of E end 2/3
R-100	P	2x12	JM		VB		P F		@ E END 2/3 into Anchor
R-101	P	"	JM				P F		10' W & 5' N end P-3
R-102	P	"	JM				P F		" 7' N " "
R-103	P	3x3	JM				P F		E END 4/6 @ Anchor
R-104	P	2x5	JM				P F		E END 6/7 @ Anchor
R-105	P	1x1	JM	TDL	VB	TDL	P F	TDL	12' W & 11' S of E end 7/9

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: _____

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GEOMEMBRANE REPAIR TESTING LOG

Date: 5-19-12
ESP Project No.: XH01.304
Project Name: RURAL HALL ASH LANDFILL
Project Location: RURAL HALL, N.C.
Page: 7 of 18

Passing Trial Seams					
Number	1	2	3	4	5
Time	7:30	8:00	7:49	1:18	1:30
Tech Initials	JM	CK	WF	CK	JM
Machine #	9153	0250	0252	0252	9153

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R-106	P	1x1	JM	TOL	VB	SV	P F	TOL	25' W & 10' of E end 9/10
R-107	P	1.5x2	JM				P F		N end 60/61
R-108	DS#13	1.5x4	CK				P F		130' E of W end 59/61
R-109	P	1x1	CK				P F		127' E of W end 59/61
R-110	P	1x1	JM		VB	SV	P F		S end 60/61
R-111	P	1x3	"				P F		E end 60/62 into Anchor
R-112	P	1x3	JM				P F		E end 62/63 into Anchor
R-113	DS#14	1.5x4	CK				P F		90' E of W end 62/63
R-114	P	2x4	JM	TOL			P F		80' E of W end 62/63
R-115	P	2x2	CK			SV	P F	TOL	N end 63/64
R-116	P	2x2	JM		VB		P F		S end 63/64
R-117	DS#15	1.5x3.5	CK				P F		25' E of W end 63/65
R-118	P	4x15	CK				P F		E end 12/13 into Anchor
R-119	P	1x1	CK				P F		32' W & 15' N of E end 12/13
R-120	P	1x3	WF				P F		N end 19/22 into Anchor
R-121	P	1x3	WF				P F		N end 23/24 into Anchor
R-122	P	1-3	CK	TOL	VB	SV	P F	TOL	W end 51/50 into Anchor
							P F		
							P F		
							P F		

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: _____

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GEOMEMBRANE REPAIR TESTING LOG

Date: 5-21-12
ESP Project No.: XH01,304
Project Name: RULAL HALL MSW Landfill
Project Location: RULAL HALL, NC.
Page: 8 of 18

Passing Trial Seams				
Number	2	7		
Time	7:55	2:00		
Tech Initials	LP	CK		
Machine #	0252	0252		

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R-123	P	2x2	LP	TBL	VB	SV	P F	TBL	N end 28/33
R-124	P	3x6					P F		S end 20/9
R-125	P	3X18					P F		N end TYN, E end 35/36
R-126	P	2X6					P F		W end 9/8, E end 35/37 @ TYN
R-127	P	2x2					P F		E end 38/37 @ TYN
R-128	P	3X6					P F		4' S of E end 38/37
R-129	P	2X3		TBL	VB	SV	P F		3' N of N end 39/41 on CAP
R-130	P	3X3					P F		W end 39/41 @ cap
R-131	P	3X4					P F	TBL	@ P-2 @ CAP
R-132	P	3X15					P F		Cap @ 59/1
R-133	P	1x1	LP				P F		9' W of end of 65/66
R-134	DS#16	2X4	CK				P F		297' E of W end 66/67
R-135	P	1X1					P F		262' E of W end 66/67
R-136	P	1X1				SV	P F		160' E of W end 66/67
R-137	P	2X2					P F		35' E of W end 67/68
R-138	P	2X2					P F		127' E of W end 67/68
R-139	DS#17	2X4					P F		215' E of W end 67/68
R-140	P	1X1					P F		212' E of W end 66/67
R-141	P	2X8					P F		10' W of E end 67/68
R-142	P	1X1	CK	TBL	VB	SV	P F	TBL	127' E of W end 68/69

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: EJ

GEOMEMBRANE REPAIR TESTING LOG

ESP ASSOCIATES, P.A.
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Date: 5-21-12
ESP Project No.: XH01304
Project Name: Koral Hall Ash Landfill
Project Location: Koral Hall, N.C.
Page: 9 of 18

Passing Trial Seams				
Number				
Time				
Tech Initials				
Machine #				

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R-143	P	1x1	CK	TR	VB	SV	P F	TR	N end 69/70
R-144	DS#18	2x4					P F		6'E of W end 70/71
R-145	P	1x1					P F		S end 69/70
R-146	P	1x1					P F		305' E of W end 69/71
R-147	P	1x10					P F		E end 69/71 @ Anchor
R-148	DS#19	2x4			VB		P F		140' E of W end 71/72
R-149	P	1x1	CK				P F		N end 72/73
R-150	P	2x3				SV	P F		W end 58/74 @ Anchor
R-151	P	1x1					P F	TR	35' W of E end 74/76
R-152	P	5x5		TR			P F		W end of P-75
R-153	P	2x3					P F		15' W of E end 77/78
R-154	P	1x1					P F		17' W " " " "
R-155	DS#20	2x4					P F		7' E of W end 78/79
R-156	DS#21	2x4	CK		VB	SV	P F		45' W of E end 87/88
R-157	P	1x1	CK				P F		65' W of E end 87/88
R-158	P	1x1	CK				P F		45' W of E end 91/92
R-159	P	1x3					P F		W end 94/95 @ Anchor
R-160	P	3x5					P F		W end of 95/96
R-161	DS#22	7x4	CK		VB	SV	P F		48' W of E end 96/97
R-162	P	4x4	CK	TR	VB	SV	P F	TR	S end 99/100 @ Anchor

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: _____

GEOMEMBRANE REPAIR TESTING LOG

ESP ASSOCIATES, P.A.
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Date: 5-22-19
ESP Project No.: XA01.304
Project Name: Lukal Hall Ash Landfill
Project Location: Lukal Hall N.C.
Page: 10 of 18

Passing Trial Seams				
Number	5			
Time	1:41			
Tech Initials	JM			
Machine #	0952			

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R-163	P	1X1	CK	TBL	VB	SV	P F	TBL	N end 101/100
R-164	P	1X3					P F		S end 104/105 @ Anchor
R-165	P	1X3					P F		S end 105/106 @ Anchor
R-166	P	2X2					P F		6" N of S end 106/108
R-167	DS#23	2X4					P F		10'5" of N end 106/107
R-168	P	2X3					P F		S end 107/108
R-169	P	1X1	CK				P F		S end 83/85
R-170	P	1X1	CK				P F		N end 83/85
R-171	P	1X1	CK	TBL	VB	SV	P F	TBL	S end 84/82
R-172	P	3X3	JM				P F		E end 81/83
R-173	P	2X2					P F		N end 84/82
R-174	P	1X3					P F		W end 80/81 @ Anchor
R-175	P	3X3					P F		W end 77/78
R-176	P	3X3					P F		E end 57/58 @ TYN
R-177	P	5X5					P F		E end 74/58 @ TYN
R-178	P	1X1					P F		E end 75/74 @ TYN
R-179	P	2X2					P F		N end 67/68 @ TYN
R-180	P	1X1					P F		6" W of E end 75/76
R-181	P	1X1					P F		6" W of E end 77/76
R-182	P	3X3	JM	TBL	VB	SV	P F	TBL	W end 78/77 @ TYN

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: Ed

GEOMEMBRANE REPAIR TESTING LOG

ESP ASSOCIATES, P.A.
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Date: 5-24-12
ESP Project No.: X4101.304
Project Name: Rural Hall Ash Landfill
Project Location: Rural Hall N.C.
Page: 11 of 18

Passing Trial Seams				
Number	1			
Time	1:30			
Tech Initials	JM			
Machine #	9153			

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R-183	P	2x6	JM	TR	VB	SV	P F	TR	W end 78/79 @ TYN
R-184	P	1x1					P F		3" E of W end 79/80
R-185	P	1x1					P F		S end 114/115
R-186	DS#24	2x4					P F		68' W of E end 118/119
R-187	P	1x1					P F		W end 120/124
R-188	P	2x3					P F		N end 123/124
R-189	P	1x1					P F		S end 123/124
R-190	P	1x1					P F	TR	N end 126/127
R-191	P	2x2	JM	TR	VB	SV	P F		E end 120/124
R-192	P	2x4					P F		E end 125/126
R-193	P	2x2					P F		N end 120/128
R-194	P	1x1					P F		E end 127/128
R-195	P	1x1					P F		E end 119/120 (Top of Slope)
R-196	DS#25	2x4					P F		50' S of N end 130/131
R-197	DS#26	2x4					P F		15 S of N end 138/136
R-198	P	3x3					P F		S end 134/135
R-199	P	1x1					P F		W end 137/138
R-200	P	2.5x2.5					P F		S end 136/138 @ TYN
R-201	P	" "					P F		S end 133/135 @ TYN
R-202	P	3x3	JM	TR	VB	SV	P F	TR	S end 132/133 @ TYN

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: _____

GEOMEMBRANE REPAIR TESTING LOG

ESP ASSOCIATES, P.A.
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Date: 5-24-12
ESP Project No.: XH.01.309
Project Name: Rural Hall Ash Landfill
Project Location: Rural Hall, NC.
Page: 12 of 18

Passing Trial Seams				
Number	8			
Time	6:03			
Tech Initials	JM			
Machine #	9153			

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R-203	P	3x4		TGL	VB	SV	P F	TGL	S Seal 129/130 @ TYN
R-204	P	3x4					P F		S Seal 129/127 @ TYN
R-205	P	2x2					P F		S Seal 126/127 @ TYN
R-206	P	10x10x5					P F		@ P-99
R-207	P	3x4					P F		S Seal 125/126 @ TYN
R-208	P	3x5					P F		N Seal 97/98 @ TYN
R-209	P	2x2	JM		VB	SV	P F		S Seal 123/122 @ TYN
R-210	P	4x4					P F	TGL	E Seal 96/93 @ TYN
R-211	P	2x4		TGL			P F		E 92/93 @ TYN
R-212	P	2x4	JM				P F		E Seal 89/90 @ TYN
R-213	P	2x3	JM				P F		E Seal 84/85 @ TYN
R-214	P	1x1	"				P F		S Seal 72/73
R-215	P	1x1	JM				P F		105' E Seal W Seal 139/72
R-216	P	1x1					P F		N Seal 139/140
R-217	P	3x3					P F		E Seal 144/140
R-218	P	4x8					P F		E Seal 144/72 - E Seal 144/145
R-219	P	3x8'	JM				P F		S Seal 139/140/W Seal 140/144
R-220	DS#27	2x4	"				P F		45' E Seal W Seal 139/141
R-221	P	1x1	JM	TGL	VB	SV	P F		N Seal 142/143
R-222	P	3x3	"	TGL	VB	SV	P F	TGL	E Seal 141/142

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: _____

GEOMEMBRANE REPAIR TESTING LOG

ESP ASSOCIATES, P.A.
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Date: 5-25-12
ESP Project No.: XH01.304
Project Name: Rural Hall Ash Landfill
Project Location: Rural Hall, NC.
Page: 13 of 18

Passing Trial Seams				
Number	B			
Time	1:55			
Tech Initials	JM			
Machine #	5383			

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R-223	P	3x3	JM	TOL	VB	SV	P F	TOL	20' E of E seam 141/142 & 25' of 144
R-224	P	2x2					P F		N seam 145/146
R-225	DS#28	2x4					P F		25' E of W seam 144/145
R-226	P	1x1					P F		N seam 147/148
R-227	P	1x1					P F		S seam 145/146
R-228	P	2x2					P F		137' E of W seam 148/149
R-229	P	1x1	JM	TOL	VB	SV	P F		N seam 148/154
R-230	DS#29	2x4					P F		25' W of W seam 148/154
R-231	P	3x8					P F		E seam 148/154 & E seam 154/156
R-232	P	3x5					P F	TOL	E seam 156/157 N seam 161/157
R-233	P	1x1					P F		S seam 149/154
R-234	P	2x2	JM	TOL	VB	SV	P F		E seam 149/150
R-235	P	1x1					P F		N seam 151/152
R-236	P	2x6					P F		E seam 150/151
R-237	P	4x4					P F		E seam 152/153; S seam 155/156
R-238	P	2x4					P F		E seam 151/150
R-239	DS#30	2x4					P F		15' E of W seam 150/156
R-240	P	1x1					P F		S seam 155/156
R-241	P	1x1					P F		12' N & 4' W of S seam 155/156 - P-155
R-242	P	2x2	JM	TOL	VB	SV	P F	TOL	N seam 157/158

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: _____

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GEOMEMBRANE REPAIR TESTING LOG

Date: 5-25-12
ESP Project No.: X1401.304
Project Name: Cheraw Coal Ash Landfill
Project Location: Cheraw Hall, NC
Page: 14 of 18

Passing Trial Seams				
Number	1			
Time	7:38			
Tech Initials	JM			
Machine #	5383			

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R-243	P	1X1	JM	TR	VB	SV	P F	TR	8' S of N end 157/158
R-244	P	2X2					P F		67' E of W end 157/159
R-245	DS#31	2X4					P F		155' E of W end 157/159
R-246	P	2X2					P F		E end 158/159, S end 157/161
R-247	P	3X3					P F		N end 162/163
R-248	P	22X5					P F		SE corner-160
R-249	DS#32	2X4	JM	TR	VB	SV	P F		8' S of N end 88/89 & 89/117 @ TYN
R-250	P	1X1					P F		N end 167/168
R-251	P	1X1					P F		N end 169/170
R-252	P	1X1					P F	TR	S end 167/168
R-253	DS#33	2X4					P F		10' W of E end 168/170
R-254	P	2X2					P F		E end 170/174
R-255	P	1X1					P F		S end 172/173
R-256	P	1X1					P F		N end 172/173
R-257	P	3X7					P F		S end 169/170 / E end 176/173
R-258	DS#34	2X4					P F		56' E of W end 176/177
R-259	P	1X1					P F		N end 178/179
R-260	P	1X1					P F		N end 181/182
R-261	P	1X1					P F		S end 178/179
R-262	P	1X1	JM	TR	VB	SV	P F	TR	N end 180/181

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: [signature]

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GEOMEMBRANE REPAIR TESTING LOG

Date: 5-30-12
ESP Project No.: XH01.304
Project Name: Kirkal Hill Rd Landfill
Project Location: Rural Hall, NC
Page: 15 of 18

Passing Trial Seams				
Number	8	9		
Time	1:14	1:19		
Tech Initials	JM	SK		
Machine #	9153	5358		

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R-263	P	2x5			VB	SV	P F	TR	E of 164/73
R-264	P	2x3					P F		E of 164/165 @ TYN
R-265	P	2x2					P F		E of 165/166 @ TYN
R-266	P	3x3					P F		E of 166/168 @ TYN
R-267	P	2x2					P F		3' N of E of 166/168
R-268	P	2x7					P F		E of 175/174
R-269	P	1.5x1.5			VB	SV	P F	TR	W of 148/149 @ TYN
R-270	P	2x2					P F		E of 177/179 @ TYN
R-271	P	2x2					P F		E of 179/182 @ TYN
R-272	CAP	2x9					P F		W of 153/155 to E of 182/184
R-273	P	1x1	SK				P F		N of 183/184
R-274	P	1x1					P F		S of 181/182
R-275	P	2x2	SK				P F		6'E; 10' N of S of 181/182
R-276	P	3x3					P F		W of 73/164 @ TYN
R-277	P	2x2					P F		E of 80/81 @ TYN
R-278	P	2x10					P F		E of 81/84; W of 165/166 @ TYN
R-279	P	2x8					P F		W of 169/171 @ TYN
R-280	P	2x2					P F		E of 114/115 @ TYN
R-281	P	2x8					P F		W of 172/174 @ TYN
R-282	P	4x4			VB	SV	P F	TR	W of 116/117 @ TYN

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: [signature]

GEOMEMBRANE REPAIR TESTING LOG

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Date: 5-30-12
ESP Project No.: XH01.304
Project Name: RURAL HALL ASH LANDFILL
Project Location: RURAL HALL, NC
Page: 16 of 18

Passing Trial Seams				
Number				
Time				
Tech Initials				
Machine #				

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R-283	DS#35	2x4	JM	TOL	VB	SV	P F	TOL	5' N of W seam 150/152
R-284	P	2x2	"				P F		E seam 138/110
R-285	DS#36	2x4	JM				P F		45' S of N seam 185/110
R-286	P	1x1	"				P F		W seam 186/187
R-287	P	1x1	SK				P F		E seam 186/187
R-288	P	2x2					P F		10' S of N seam 187/189
R-289	P	2x2					P F		N seam 188/187
R-290	P	1x1		TOL			P F		W seam 193/190
R-291	P	1x1			VB	SV	P F	TOL	N seam 186/189
R-292	P	1x1					P F		W seam 193/194
R-293	P	2x2					P F		W seam 194/195
R-294	P	2x2					P F		8' N of S seam 190/191
R-295	P	1x1	SK	TOL			P F		W seam 191/192
R-296	P	1x1	JM				P F		N seam 190/192
R-297	DS#37	2x4	JM				P F		20' E of W seam 194/195
R-298	DS#38	2x4	JM				P F		45' E of W seam 199/198
R-299	DS#39	2x4	SK				P F		12' N of W seam 197/196 @ T-Jt
R-300	P	2x4	"				P F		2' E of N seam 190/193
R-301	P	3x4	SK				P F		W seam 195/196
R-302	P	2x2	"	TOL	VB	SV	P F	TOL	S seam 198/197

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: _____

GEOMEMBRANE REPAIR TESTING LOG

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Date: 5-30-12
ESP Project No.: XH01.304
Project Name: Rural Hall Landfill
Project Location: Rural Hall, NC.
Page: 17 of 18

Passing Trial Seams				
Number				
Time				
Tech Initials				
Machine #				

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R-303	P	2X2	SK	TL	VB	SV	P F	TL	N end 197/198
R-304	P	1X1					P F		W end 197/199 @ TYN
R-305	P	1X1					P F		N end 136/137 @ TYN
R-306	P	1X1					P F		W end 196/197 @ TYN
R-307	P	1X1					P F		N end 136/185 @ TYN
R-308	P	2X2					P F		N end 185/186 @ TYN
R-309	P	3X2					P F		S end 201/202
R-310	P	3X3	SK			SV	P F		W end 201/200
R-311	P	2X2	JM		VB		P F		N end 201/202
R-312	P	2X2	JM	TL			P F	TL	E end 203/184
R-313	P	2X2	SK				P F		S end of 183/184
R-314	P	12X5	JM				P F		S end of 185/187 @ Anchs
R-315	P	6X6					P F		W end of 199/200 @ Top
R-316	P	1X1					P F		W end 0180/179
R-317	P	1X1				SV	P F		N end 133/134
R-318	P	1X1					P F		W end 177/178
R-319	P	1X1					P F		3' W of W end 177/178
R-320	P	1X1					P F		N end 133/132
R-321	P	1X1					P F		3' E of N end 133/132
R-322	P	1X1	JM	TL	VB	SV	P F	TL	5' from E end 204/205 to E end 204/205

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: _____

GEOMEMBRANE REPAIR TESTING LOG

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Date: 5-31-12
ESP Project No.: XH01.304
Project Name: Rural Hall Ash Landfill
Project Location: Rural Hall, N.C.
Page: 18 of 18

Passing Trial Seams				
Number	1	4		
Time	8:05	1:15		
Tech Initials	CK	CK		
Machine #	0252	0252		

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R-323	P	3x5	CK	TQL	VB	SV	(P) F	TQL	S end 205/118
R-324	P	3x3					(P) F		W end 204/205 ; E end 117/118
P-325	P	1x1					(P) F		S end P-204
P-326	P	2x5					(P) F		N end 204/117 ; W end 175/174 @ R-282
P-327	P	3x3					(P) F		W end 176/175 @ TOP
P-328	P	2x6					(P) F		E end 176/204
P-329	P	2x2					(P) F		W end 176/177
P-330	P	2x2					(P) F		W end 177/132
P-331	P	2x2					(P) F		N end 132/131
P-332	P	1x1	CK	TQL	VB	SV	(P) F	TQL	N end 130/131
							P F		
							P F		
							P F		
							P F		
							P F		
							P F		
							P F		
							P F		
							P F		
							P F		

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: _____

GEOMEMBRANE REPAIR TESTING LOG

ESP ASSOCIATES, P.A.
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Date: 7-5-14
ESP Project No.: XH01.304
Project Name: Rural Hall Ash Landfill
Project Location: Rural Hall, N.C.
Page: 1 of 13

Passing Trial Seams				
Number	1	2	3	
Time	7:40	7:22	7:20	
Tech Initials	CK	WF	LP	
Machine #	252	5383	9153	

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R-333	P	2x2	LP	TBL	VB	SV	P F	TBL	N end 210/211
R-334	DS #40	4x4	LP				P F		10' E end 210/206
R-335	P	2x2	LP				P F		E of end 210/206
R-336	P	2x3	WF				P F		25' E end 206/212
R-337	P	1x1	WF				P F		N end 213/214
R-338	P	2x3					P F		N end 214/215
R-339	P	2x2					P F		16' E end 215/216
R-340	P	1x1	WF				P F		10' N & 64' W of S end 215/214
R-341	P	2x2	WF		VB		P F		S end 214/215
R-342	P	1x1	WF			SV	P F	TBL	S end 213/214
R-343	P	1x1	WF	TBL			P F		N end 209/216
R-344	DS #1	3x4	WF				P F		8' S of N end 209/216
R-345	P	2x2	WF				P F		S end 209/216
R-346	P	2x2					P F		19' E of W end 216/217
R-347	P	1x1					P F		18' E of W end 217/220
R-348	P	1x1					P F		N end 219/220
R-349	P	2x2	WF				P F		9' E of W end 217/219
R-350	P	1x1	WF				P F		22' E of W end 217/219
R-351	P	1x1					P F		160' E of W end 217/219
R-352	P	2x2		TBL	VB	SV	P F	TBL	172' E of W end 217/219

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: _____

GEOMEMBRANE REPAIR TESTING LOG

ESP ASSOCIATES, P.A.
engineering • surveying • planning

Date: 7-5-12
ESP Project No.: XH01.304
Project Name: RURAL HALL ASH Landfill
Project Location: RURAL HALL, N.C.
Page: 2 of 13

Passing Trial Seams				
Number				
Time				
Tech Initials				
Machine #				

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R-353	P	1x1	CK	TGL	VB	SV	P F	TGL	N end 218/219
R-354	CAP	2x6					P F		E end 218/221
R-355	P	2x2					P F		S end 218/219
R-356	DS#42	2x4	CK				P F		148' E of W end 219/221
R-357	P	4x4	CK				P F		108' E of " " " "
R-358	P	3x3	WF		VB		P F		23' E of W end 219/221
R-359	P	2x2	WF				P F		S end O 219/220
R-360	P	2x3	CK				P F	TGL	155' E of W end 221/222
R-361	P	1x1					P F		177' E of W end 221/222
R-362	P	3x3		TGL			P F		14' W of E end 222/223
R-363	DS#43	2x4				SV	P F		40' E of W end 222/223
R-364	P	2x8	CK				P F		N end 223/224
R-365	P	1x1					P F		33' E of W end 224/225
R-366	P	1x1					P F		157' E of W " " " "
R-367	P	2x3			VB		P F		7' N of S end 224/223
R-368	P	2x2	CK				P F		S end 225/224
R-369	DS#44	2x4					P F		75' E of W end 223/225
R-370	P	2x2					P F		N end 227/228
R-371	P	2x3					P F		85' of W end 227/228
R-372	P	2x3	CK	TGL	VB	SV	P F	TGL	180' E of W end 228/229

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: _____

ESP ASSOCIATES, P.A.
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GEOMEMBRANE REPAIR TESTING LOG

Date: 7-5-12
ESP Project No.: XH01.304
Project Name: Rural Hall ASL Landfill
Project Location: Rural Hall, N.C.
Page: 3 of 13

Passing Trial Seams				
Number				
Time				
Tech Initials				
Machine #				

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R-373	DS#45	2x4	CK	TOL	VB	SV	P F	TOL	170' E of Weld 228/229
R-374	P	1x1					P F		S end 227/228
R-375	P	2x3					P F		W end 230/231
R-376	P	2x5					P F		E end 230/231
R-377	P	1x1					P F		E end 227/229
R-378	P	2x2					P F		E end 225/227
R-379	P	2x6					P F		6' S of N end 222/208
R-380	P	3x5			VB		P F		E end 222/223
R-381	P	3x15	CK				P F	TOL	E end 223/225 to Anchor
R-382	P	4x15	WF	TOL			P F		E end 221/222; W end 207/208
R-383	CAP	17'					P F		S- 221/207 @ TYN/E end 21[illegible]
R-384	P	2x3				SV	P F		E end 207/208 @ Anchor
R-385	P	2x2					P F		22' S of N end 218/207
R-386	CAP	3x29					P F		Seam 217/207
R-387	P	2x2	WF				P F		4' N of S end 207/209
R-388	P	2x3	WF				P F		E end 213/209
R-389	P	3x8	WF				P F		S-207/212; W end 206/207
R-390	P	3x5					P F		S end 210/232
R-391	P	3x8					P F		W end 233/234 @ TYN
R-392	P	3x3	WF	TOL	VB	SV	P F	TOL	N end 212/234

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: _____

GEOMEMBRANE REPAIR TESTING LOG

ESP ASSOCIATES, P.A.
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Date: 7-6-12
ESP Project No.: X401.304
Project Name: Rural Hall Ash Landfill
Project Location: Rural Hall NC
Page: 4 of 13

Passing Trial Seams				
Number	1	6		
Time	7:43	10:05		
Tech Initials	CK	LP		
Machine #	252	252		

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R-393	P	3x10	LP	TR	VB	SV	P F	TR	N of 232/233 @ TYN
R-394	P	3x4					P F		S of 159/160 @ TYN
R-395	P	3x4					P F		W of 211/232 @ TYN
R-396	P	3x4	LP		VB		P F		S of 160/163 @ TYN
R-397	P	2x4					P F		N of 211/206
R-398	P	4x8					P F		Horse Shoe Into Anchor @ P-163
R-399	P	10' DIA	LP	TR	VB	SV	P F	TR	N of 252/210 ; S of 211/206
R-400	P	2x2					P F		45' E of W of 229/236
R-401	DS#46	2x4					P F		85' E of W of 229/236
R-402	P	2x4					P F		135' E of W of 229/236
R-403	P	2x2					P F		N of 235/236
R-404	P	2x3			VB		P F		38' E of W of 235/229
R-405	P	1x1	LP	TR			P F	TR	140' E of W of 239/242 @ P-239
R-406	P	2x8	CK			SV	P F		N of 241/242
R-407	P	2x3					P F		N of 240/241
R-408	DS#47	2x4					P F		20' E of W of 239/240
R-409	P	2x4					P F		S of 240/241
R-410	P	2x2					P F		S of 241/242
R-411	P	2x6					P F		N of 245/246
R-412	DS#48	2x4	CK	TR	VB	SV	P F	TR	100' E of W of 243/245

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: _____

ESP ASSOCIATES, P.A.
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GEOMEMBRANE REPAIR TESTING LOG

Date: 7-6-12
ESP Project No.: RURAL HALL ASH Landfill
Project Name: RURAL HALL N.C
Project Location: YH01.304
Page: 5 of 13

Passing Trial Seams				
Number				
Time				
Tech Initials				
Machine #				

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R-413	P	1X1	LP	TBL	VB	SV	P F	TBL	160' E of W end 243/245
R-414	P	2X2					P F		N end 244/245
R-415	P	2X2					P F		S end 245/246
R-416	CAP	2X25					P F		W end 247/249
R-417	P	1X1	LP				P F		N end 248/249
R-418	DS#49	2X4	CK				P F		20' E of W end 249/251
R-419	P	2X2	CK				P F		N end 250/251
R-420	P	3X3					P F		E end 251/252
R-421	P	2X9		TBL	VB	SV	P F	TBL	S-238/252
R-422	P	2X3					P F		E end 247/250 @ TYN
R-423	P	2X3					P F		S end 248/249 @ TYN
R-424	P	2X6					P F		4' E of S end 248/249 on TYN
R-425	P	2X3					P F		E end 247/248 @ TYN
R-426	P	2X2					P F		E end 245/247 @ TYN
R-427	P	4X5					P F		S end 244/245 @ TYN
R-428	P	2X2					P F		E end 243/244 @ TYN
R-429	P	10X10					P F		N end 238/237; E end 241/242
R-430	P	2X2		TBL	VB		P F	TBL	E end 239/240 @ TYN
R-431	P	2X4		"	"		P F		E end 254/255
R-432	P	2X2	CK	TBL	VB	SV	P F		W end 254/255

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: _____

GEOMEMBRANE REPAIR TESTING LOG

ESP ASSOCIATES, P.A.
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Date: 7-9-12
ESP Project No.: XH01.304
Project Name: RURAL HALL ASH Landfill
Project Location: RURAL HALL, NC.
Page: 6 of 12

Passing Trial Seams				
Number	11	12		
Time	3:20	3:25		
Tech Initials	LP	CK		
Machine #	252	9153		

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R-433	P	3x8	LP	TOL	VB	SV	P F	TOL	E Side 234/253 @ TIN
R-434	P	2x2					P F		E Side 253/254 " "
R-435	P	2x2					P F		E Side 254/256 " "
R-436	P	2x4					P F		E Side 256/257 " "
R-437	P	2x2					P F		E Side 257/258 " "
R-438	P	2x8					P F		W Side 234/253 " "
R-439	P	2x3			VB	SV	P F	TOL	E Side 202/203 " "
R-440	P	2x2	LP				P F		W Side 253/254 " "
R-441	P	2x2	CK				P F		E Side 202/200 " "
R-442	P	2x2		TOL			P F		W Side 255/256 " "
R-443	P	2x2					P F		E Side 200/199 " "
R-444	P	2x2					P F		W Side 256/257 " "
R-445	P	2x2	LP				P F		E Side 198/199 " "
R-446	P	2x6	LP			SV	P F	TOL	W Side 257/258 " "
R-447	P	2x2			VB		P F		E Side 196/198 " "
R-448	P	2x3					P F		W Side 258/259 " "
R-449	P	2x2					P F		E Side 195/196 " "
R-450	P	3x3					P F		W Side 259/260 " "
R-451	P	3x3					P F		E Side 194/195 " "
R-452	CAP	3x15'	CK	TOL	VB	SV	P F	TOL	W Side 260/261 " "

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: _____

GEOMEMBRANE REPAIR TESTING LOG

ESP ASSOCIATES, P.A.
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Date: 7-12-12
ESP Project No.: X#01.304
Project Name: RURAL HALL Ash Landfill
Project Location: RURAL HALL, NC.
Page: 7 of 13

Passing Trial Seams				
Number	1			
Time	1:00			
Tech Initials	CK			
Machine #	252			

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R-453	P	2X2	LP	TGL	VB	SV	P F	TGL	E of 193/194 @ TYN
R-454	P	2X2					P F		W of 261/262 @ TYN
R-455	P	2X2					P F		E of 192/193 " "
R-456	P	3X3					P F		W of 262/263 " "
R-457	P	2X2	LP				P F		E of 191/192 " "
R-458	P	3X4	CK				P F		E of 258/259 " "
R-459	P	2X6	CK				P F		E of 259/260 " "
R-460	P	2X6	"		VB	SV	P F	TGL	E of 260/261 " "
R-461	P	2X8					P F		E of 261/262 " "
R-462	P	2X2		TGL			P F		10' N of S of 228/262
R-463	P	2X2					P F		E of 262/263
R-464	P	2X6					P F		TYN @ W Anchor @ P-187
R-465	P	2X2					P F		S of 187/188 @ TYN
R-466	P	2X3					P F		S of 188/189 @ TYN
R-467	P	2X2					P F		12' E of S of 188/189 on TYN
R-468	P	2X2					P F		S of 189/190 @ TYN
R-469	P	2X2					P F		S of 190/191 @ TYN
R-470	P	2X15					P F		W of 263/264 @ TYN TO EH
R-471	P	3X12	CK			SV	P F		W of 251/252
R-472	DS#50	2X4	WF	TGL	VB	SV	P F	TGL	30 E of W of 239/268

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: Ed

GEOMEMBRANE REPAIR TESTING LOG

ESP ASSOCIATES, P.A.
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Date: 7-12-12
ESP Project No.: XH01.304
Project Name: RUCAL HALL ASH Landfill
Project Location: RUCAL HALL N.C.
Page: 8 of 13

Passing Trial Seams				
Number	1	2		
Time	7:30	8:10		
Tech Initials	CK	WF		
Machine #	0252	9153		

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R-473	P	2X2	WF	TBL	VB	SV	P F	TBL	E of 257/259
R-474	CAP	6X22	WF				P F		over 231/237 AROA
P-475	P	3X3					P F		E of 234/268 @ CAP
P-476	P	3X3					P F		W corner of 231 @ CAP
P-477	CAP	3X30					P F		E of PL 268
R-478	P	2X2				SV	P F		S of 269/270
R-479	P	2X3			VB		P F		350' E of W of 268/270
R-480	DS#57	2X4	WF	TBL			P F		340' E of W of 268/270
R-481	P	2X5	CK				P F	TBL	187' E of W of 268/270
R-482	P	2X2					P F		S of 271/273
R-483	DS#52	7X4					P F		50' E of W of 270/271
R-484	P	2X2					P F		N of 269/270
R-485	P	2X2			VB	SV	P F		S of 272/274
R-486	P	2X3					P F		12' W of S of 272/274
R-487	DS#53	2X4		TBL			P F		100' E of W of 271/274
R-488	P	2X2					P F		60' E of W of 271/274
R-489	P	2X2	CK				P F		10' E of W of 271/274
R-490	P	2X2	WF				P F		N of 271/273
R-491	P	2X2					P F		S of 275/276
R-492	DS#54	2X4		TBL	VB	SV	P F	TBL	135' E of W of 274/275

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: _____

GEOMEMBRANE REPAIR TESTING LOG

ESP ASSOCIATES, P.A.
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Date: 7-12-12
ESP Project No.: XH01.304
Project Name: Rural Hall Ash Landfill
Project Location: Rural Hall, N.C.
Page: 9 of 13

Passing Trial Seams				
Number	11	12		
Time	2:15	3:00		
Tech Initials	LP	WF		
Machine #	5383	252		

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R-493	P	2X2	WF	TDL	VB	SV	P F	TDL	N of 272/274
R-494	P	2X8	|	|	|	|	P F	|	S of 277/278
R-495	P	3X3	|	|	|	|	P F	|	15' N & 1' W of S of 277/278
R-496	P	2X4	|	|	|	|	P F	|	N of 275/276
R-497	DS#55	2X4	WF	|	|	|	P F	|	30' E of W of 276/277
R-498	P	2X2	|	|	|	|	P F	|	E of 275/278
R-499	P	2X3	|	|	|	|	P F	|	E of 272/275
R-500	P	1X6	|	|	|	|	P F	|	E of 271/272
R-501	P	1X3	WF	|	|	|	P F	|	E of 269/271
R-502	P	2X3	LP	|	|	|	P F	|	S of 235/236
R-503	P	1X1	"	|	|	|	P F		E of 268/269
R-504	P	2X3	LP	TDL	VB	SV	P F	TDL	E of 235/268
R-505	P	5X8	LP				P F		E of 229/235
R-506	P	1X1	"	|	|	|	P F	|	35' E of W of 268/270
R-507	P	3X3	LP	|	|	|	P F	|	W of 264/279 @ TYN
R-508	P	2X6		|	|	|	P F	|	6' E of W of 264/279
R-509	P	2X2	|	|	|	|	P F	|	69' E of W of 264/279
R-510	P	3X6	|	|	|	|	P F	|	E of 264/279
R-511	P	2X2	|	|	|	|	P F	|	78' E of W of 236/279
R-512	P	2X12	LP	TW	VB	SV	P F	TDL	83' E of W of 236/279

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: _____

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GEOMEMBRANE REPAIR TESTING LOG

Date: 7-13-12
ESP Project No.: X401.304
Project Name: Roxboro Ash Landfill
Project Location: Roxboro, NC
Page: 10 of 13

Passing Trial Seams				
Number	6	14	15	
Time	10:50	2:10	3:00	
Tech Initials	5383	5383	0252	
Machine #	LP	LP	CK	

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R-513	P	2x7	LP	TBL	VB	SV	P F	TBL	E of 236/279
R-514	P	2x2					P F		N of 280/281
R-515	DS#56	2x4					P F		125' E of N of 281/282
R-516	P	2x2					P F		S of 280/281
R-517	P	2x2					P F		E of 286/287
R-518	P	2x2			VB		P F		N of 285/286
R-519	P	3x3	LP			SV	P F		3'5 & 2' W of N of 285/286
R-520	P	2x2	CK				P F	TBL	E of 284/285
R-521	P	2x2		TBL			P F		E of 283/284
R-522	P	2x5					P F		S of 284/294
R-523	P	2x2	CK				P F		S of 285/286
R-524	DS#57	2x4	"				P F		30' E of W of 287/288
R-525	P	2x2	CK				P F		N of 289/290
R-526	P	2x2			VB		P F	TBL	N of 292/293
R-527	P	2x4					P F		22' E of W of 291/292
R-528	P	2x3					P F		N of 276/277
R-529	P	2x2					P F		E of 279/280
R-530	P	2x6					P F		E of 280/282
R-531	P	2x2					P F		E of 282/287
R-532	P	2x4	LP	TBL	VB	SV	P F	TBL	E of 287/288

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: _____

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GEOMEMBRANE REPAIR TESTING LOG

Date: 7-13-12
ESP Project No.: XH01.304
Project Name: Tuckal Hall Ash Landfill
Project Location: Tuckal Hall, NC.
Page: 11 of 13

Passing Trial Seams				
Number	16			
Time	3:00			
Tech Initials	WF			
Machine #	0252			

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R-533	DS#58	2x4	CK	TR	VB	SV	P F	TR	4'S of N end 277/288
R-534	P	2x2					P F		E end 288/289
R-535	P	2x2					P F		E end 290/291
R-536	P	2x3	CK				P F		E end 291/292
R-537	P	2x2	"				P F		34' N of S end 277/292
R-538	P	3x3	CK				P F		S end 292/293 @ TYN
R-539	P	2x2	WF		VB	SV	P F		S end 298/299
R-540	DS#59	2x4					P F		75' N of S end 297/295
R-541	DS#60	2x4		TR			P F	TR	15' W of E end 308/309
R-542	P	2x2	WF				P F		S end 295/299'
R-543	P	2x2					P F		5' N of S end 277/275
R-544	P	2x3					P F		E end 295/310
R-545	P	3x3					P F		S end 295/297
R-546	P	3' Dia	WF			SV	P F		W end 298/299
R-547	P	2x2		TR			P F		W end 291/293
R-548	P	2x2					P F		W end 290/291
R-549	P	2x2					P F		W end 288/290
R-550	P	2x2					P F		W end 287/288
R-551	P	2x2					P F		W end 285/287
R-552	P	2x2	WF	TR	VB	SV	P F	TR	W end 285/294

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: _____

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GEOMEMBRANE REPAIR TESTING LOG

Date: 7-13-12
ESP Project No.: XH01.301
Project Name: Rural Hall Ash Landfill
Project Location: Rural Hall NC
Page: 12 of 13

Passing Trial Seams				
Number	16			
Time	3:00			
Tech Initials	WF			
Machine #	0252			

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R-553	P	4X10	LP	TDL	VB	SV	P F	TDL	W of 283/284
R-554	P	2X6	LP	TDL	VB	SV	P F		W of 279/281
R-555	P	2X4					P F		W of 281/282
R-556	P	1X1					P F		3' E of W of 282/283
R-557	P	2X2					P F		3' W of E of 267/295
R-558	P	1X1					P F		9' W of E of 267/295
R-559	P	3X3					P F		N of W 295/296
R-560	P	2X2					P F		N of 296/300
R-561	P	2X2	LP	TDL	VB	SV	P F	TDL	15' E of W of 267/300
R-562	P	2X4	WF				P F		W of 267/300 @ Anchor
R-563	P	2X2					P F		E of 296/297
R-564	P	2X2					P F		15' E of W of 304/305
R-565	P	2X2					P F		15 E of W of 305/308
R-566	P	2X2					P F		W of 305/306
R-567	P	2X2					P F		N of 307/308
R-568	P	2X2	WF	TDL	VB	SV	P F		S of 307/308
R-569	P	2X2	WF	TDL	VB	SV	P F		61' W of E of 309/310
R-570	CAP	2X31	WF				P F		S-309/297
R-571	P	2X4					P F		E of 306/307
R-572	P	2X2		TDL	VB	SV	P F	TDL	E of 305/306

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: _____

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GEOMEMBRANE REPAIR TESTING LOG

Date: 7-13-12
ESP Project No.: X401.304
Project Name: Rural Hall Ash Landfill
Project Location: Rural Hall, N.C.
Page: 13 of 13

Passing Trial Seams				
Number	1	2		
Time	7:25	8:02		
Tech Initials	WF	LP		
Machine #	5383	252		

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R-573	P	2x2	WF	TDL	VB	SV	P F	TDL	E end 304/305
R-574	P	2x2					P F		E end 303/304
R-575	P	2x2					P F		W end 296/297
R-576	P	2x2					P F		E end 302/303
R-577	P	2x2					P F		E end 301/302
R-578	P	2x2	WF	TDL	VB	SV	P F	TDL	E end 300/301
R-579	P	3x3	LP				P F		W end 311/249
R-580	P	2x2					P F		W end 249/257
R-581	P	3x3					P F		E end 311/312
R-582	P	3x3					P F		W end 251/313
R-583	P	3x3	LP	TDL	VB	SV	P F	TDL	E end 251/513
R-584	P	3x3	LP	TDL	"	"	P F		E end 229/236
R-585	P	3x3	LP	TDL	"	"	P F		E end 263/269
							P F		
							P F		
							P F		
							P F		
							P F		
							P F		
							P F		

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: _____

GEOMEMBRANE REPAIR TESTING LOG

ESP ASSOCIATES, P.A.
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Date: 8-9-12
ESP Project No.: XH01.304
Project Name: RURAL HALL ASL Landfill
Project Location: RURAL HALL N.C.
Page: 1 of 1

Passing Trial Seams				
Number	1	2	3	4
Time	7:13	7:20	7:20	1:20
Tech Initials	CK	WF	LP	CK
Machine #	252	5383	9153	252

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R-586	P	2x3	LP	TOL	VB	LP	P F	TOL	N of 310/314
R-587	DS#61	2x4					P F		20' N of S of 314/315
R-588	P	2x10					P F		W of 315/319 & 319/320
R-589	P	2x10	LP				P F		E of 315/319 & 314/319
R-590	P	3x3					P F		S of 318/320
R-591	CAP	2x10					P F		W of 317/320
R-592	DS#62	2x4					P F		50' N of S of 320/321
R-593	P	2x2			VB		P F		10' N of S of 317/321
R-594	P	2x4	LP			LP	P F	TOL	E of 316/317
R-595	P	1x3					P F		E of 317/318
R-596	P	3x3					P F		E of 314/318
R-597	P	2x2		TOL			P F		N of 321/322 @ Anchor
R-598	P	2x6					P F		85' N of S of 322/323
R-599	DS#63	2x4					P F		75' N of S of 322/323
R-600	P	2x3			VB		P F		E of 324/325
R-601	P	2x2					P F		W of 324/325
R-602	DS#64	2x4					P F		40' N of S of 326/327
R-603	P	2x2					P F		50' N of S of 327/328
R-604	P	2x2					P F		35' N of S of " "
R-605	DS#65	2x4	LP	TOL	VB	LP	P F	TOL	65' N of S of 329/330

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: _____

ESP ASSOCIATES, P.A.
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GEOMEMBRANE REPAIR TESTING LOG

Date: 8-9-12
ESP Project No.: XH01.304
Project Name: RURAL HALL ASL Landfill
Project Location: RURAL HALL, N.C.
Page: 2 of 6

Passing Trial Seams				
Number				
Time				
Tech Initials				
Machine #				

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R-606	P	2X3	CK	TBZ	VB	MC	P F	TBZ	E end 330/331
R-607	P	2X2					P F		26' N + 2' E of S end 331/332
R-608	P	2X2					P F		38' N + 2' E " " " "
R-609	P	2X2					P F		W end 330/331
R-610	P	2X4					P F		30 N of S end 330/332
R-611	DS66	2X4					P F		75' N of S end 333/334
R-612	P	2X3					P F		S end 334/335
R-613	P	2X2			VB		P F		S end 333/334
R-614	P	2X3		TBZ			P F	TBZ	S end 332/333
R-615	P	2X2				MC	P F		S end 331/332
R-616	P	2X2	CK				P F		S end 329/331
R-617	P	2X2	LP				P F		S end 328/329
R-618	P	2X2					P F		S end 327/328
R-619	P	2X2					P F		S end 326/327
R-620	P	2X2			VB		P F		S end 325/326
R-621	P	2X2					P F		S end 323/325
R-622	P	2X2					P F		S end 322/323
R-623	P	2X2					P F		S end 321/322
R-624	P	4X4					P F		S end 317/321
R-625	DS+67	2X4	LP	TBZ	VB	MC	P F	TBZ	250' W of S end 316/337

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: _____

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GEOMEMBRANE REPAIR TESTING LOG

Date: 8-10-12
ESP Project No.: X401.304
Project Name: Rural Hall Ash Landfill
Project Location: Rural Hall, N.C.
Page: 3 of 6

Passing Trial Seams				
Number				
Time				
Tech Initials				
Machine #				

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R-626	P	2x2	WF	TDL	VB	MC	P F	TDL	N end 336/337
R-627	DS#68	2x4	"	|	|		P F	|	25' W of E end 337/338
R-628	P	2x3	WF	|	|	|	P F	|	S end of 336/337
R-629	DS#69	2x4	"	|	|	|	P F	|	200' W of E end 338/340
R-630	P	2x2	WF	|	|	|	P F	|	N end 339 & 340
R-631	P	2x2	|	|	|	|	P F	|	S end 339/340
R-632	DS#70	2x4	|	|	|	|	P F	|	150' W of E end 340/341
R-633	P	2x2	|	|	VB	|	P F	|	N end of 342/343
R-634	P	2x2	WF	TDL	|	|	P F	|	S end of 342/343
R-635	DS#71	2x4	"	|	|	MC	P F	TDL	25' W of E end 345/346
R-636	P	2x2	CK	|	|		P F	|	W end of 345/346
R-637	P	2x10	"	|	|	|	P F	|	S end of 346/351
R-638	DS#72	2x4	CK	|	|	|	P F	|	35' S of N end 351/352
R-639	DS#73	2x4	|	|	|	|	P F	|	30' S of N end 356/357
R-640	P	1x1	|	|	|	|	P F	|	35' S of N end 357/358
R-641	P	2x2	CK	|	|	|	P F	|	S end of 362/363
R-642	DS#74	2x4	WF	|	|	|	P F	|	125' W of E end 363/364
R-643	P	2x2	WF	|	|	|	P F	|	N end of 364/365
R-644	P	3x3	W	|	|	|	P F	|	N end of 362/363
R-645	P	2x3	"	TDL	VB	MC	P F	TDL	200' W of E end 341/363

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: _____

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GEOMEMBRANE REPAIR TESTING LOG

Date: 8-10-12
ESP Project No.: XH01.304
Project Name: Rural Hall Ash Landfill
Project Location: Rural Hall, NC
Page: 4 of 6

Passing Trial Seams				
Number				
Time				
Tech Initials				
Machine #				

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R-646	P	2X2	WF	TGL	VB	LP	P F	TGL	N of 366/Patch
R-647	DS#75	2X4					P F		20' W of E of 370/371
R-648	P	2X2					P F		E of 379/380
R-649	P	3X3					P F		E of 379/381
R-650	P	2X2	WF				P F		E of 377/378
R-651	P	2X2	WF				P F		S of 376/381
R-652	DS#76	2X4	WF	TGL	VB		P F	TGL	28' N of S of 375/376
R-653	P	4X4	WF				P F		S of O 335/375
R-654	P	2X2	WF				P F		S of 375/376
R-655	P	3X4	WF				P F		E of 373/374
R-656	P	3X3	CK			LP	P F		W of 316/355
R-657	P	3X3	CK			MC	P F		E of 372/373
R-658	P	2X2	CK				P F		W of 316/337
R-659	P	2X3	WF				P F		E of 371/372
R-660	P	2X4					P F		E of 370/371
R-661	P	3X10					P F		W of 340/341 & E of 369/370
R-662	P	2X2					P F		W of 341/363
R-663	P	2X2					P F		E of 368/369
R-664	P	2X6					P F		W of 363/365
R-665	P	2X4	WF	TGL	VB	MC	P F	TGL	E of 366/367 & W of 364/365

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: _____

GEOMEMBRANE REPAIR TESTING LOG

ESP ASSOCIATES, P.A.
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Date: 8-10-12
ESP Project No.: XH01.304
Project Name: RURAL HALL ASL Landfill
Project Location: RURAL HALL, N.C.
Page: 5 of 6

Passing Trial Seams				
Number				
Time				
Tech Initials				
Machine #				

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R-666	P	2X6	CK	TR	VB	MC	P F	TR	N of 343/362
R-667	P	2X2	"				P F		W of 343/344
R-668	P	3X3	CK				P F		E of 351/364
R-669	P	2X2	"				P F		N of 351/352
R-670	P	2X2	CK				P F		N of 352/353
R-671	P	2X2					P F		N of 353/354
R-672	P	2X2			VB		P F		N of 354/355
R-673	P	2X2				MC	P F		N of 355/356
R-674	P	2X2	WF	TR			P F		N of 356/357
R-675	115#77	2X4	WF				P F	TR	8' W of E of 357/364
R-676	P	2X2	WF				P F		N of 357/358
R-677	P	2X2	CK				P F		N of 358/359
R-678	P	2X2					P F		N of 359/360
R-679	P	2X2			VB		P F		N of 360/361
R-680	P	2X2					P F		S of 364/365
R-681	P	2X2					P F		N of 347/348
R-682	P	2X2					P F		N of 348/349
R-683	P	2X2	CK				P F		N of 349/350
R-684	P	3X3	LP				P F		E of 316/336
R-685	P	2X2	LP	TR	VB	MC	P F	TR	E of 336/338

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: _____

ESP ASSOCIATES, P.A.
engineering • surveying • planning

GEOMEMBRANE REPAIR TESTING LOG

Passing Trial Seams				
Number				
Time				
Tech Initials				
Machine #				

Date: 8-10-12
ESP Project No.: XH01.304
Project Name: RUTHERFORD ASH Landfill
Project Location: RUTHERFORD, N.C.
Page: 6 of 6

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R-686	P	2x2	LP	TOL	VB	MC	P F	TOL	E end 338/339
R-687	P	2x2					P F		E end 339/341
R-688	P	2x2					P F		E end 341/342
R-689	P	2x2					P F		E end 342/344
R-690	P	2x2					P F		E end 344/345
R-691	P	2x2					P F		E end 345/346
R-692	P	2x2					P F		E end 346/347
R-693	P	2x2					P F		W end 247/311
R-694	P	2x3					P F		16' S of N end 311/347
R-695	P	2x3					P F		W end 311/312
R-696	DS#78	2x4	LP	TOL	VB	MC	P F	TOL	12' S of N end 346/246
R697	P	2x2	CK	TOL	VB	MC	P F	TOL	W end 337/338
							P F		
							P F		
							P F		
							P F		
							P F		
							P F		
							P F		
							P F		

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: _____

APPENDIX 11

GEOCOMPOSITE MATERIAL CERTIFICATIONS

SKAPS Industries

571 Industrial Parkway
Commerce GA 30529
Phone (770)564-1857

DRAINAGE PRODUCT DESCRIPTION SHEET

TRANSNET 270-2-6

Transnet 270-2-6 is a superior quality drainage media made by extruding two sets of HDPE strands together to form a diamond shaped net. The net is then heat laminated to a 6 ounce non-woven fabric. This three dimensional structure provides excellent planar liquid flow. The Transnet 270-2-6 conforms to the physical property values listed below:

NET PROPERTY	TEST METHOD	UNITS	MINIMUM AVERAGE ROLL VALUE
Mass Per Unit Area	ASTM D-5261	lbs/ft^2	0.240
Thickness	ASTM D-5199	inches	0.270 +/- 0.02
Density of Polymer	ASTM D-1505	g/cm^2	0.94
Carbon Black	ASTM D-1603	%	2-3
Tensile Strength	ASTM D-5035	lb/in	75
Transmissivity (Composite)	ASTM D-4716	m^2/sec	5×10^{-4} *
Ply Adhesion	ASTM F-904	lbs/in	1

*Transmissivity measured using water at 20 Degrees C with the gradient of 0.25, between steel plates, under a confining pressure of 10,000 psf, after 24 hours. Values may vary based on dimension of the transmissivity specimen and specific laboratory.

STYLE SKAPS GE160

SKAPS GE160 is a superior quality, nonwoven geotextile produced by needlepunching together 100% polypropylene staple fibers in a random network to form a high strength dimensionally stable fabric. The polypropylene fibers are specially formulated to resist ultraviolet light deterioration, and are inert to commonly encountered soil chemicals. The fabric will not mildew, is non-biodegradable, and is resistant to damage from insects and rodents. Polypropylene is stable within a ph range of 2 to 13. SKAPS GE160 conforms to the physical property values below:

FABRIC PROPERTY	TEST METHOD	UNITS	MINIMUM AVERAGE ROLL VALUE
Weight	ASTM D-5261	oz	6.0
Grab Tensile	ASTM D-4632	lbs	160
Grab Elongation	ASTM D-4632	%	50
Trap Tear	ASTM D-4533	lbs	65
Puncture	ASTM D-4833	lbs	90
Water Flow Rate	ATMD D-4491	gpm/ft^2	125
Permittivity*	ASTM D-4491	sec^{-1}	1.63
AOS	ASTM D-4751	US Sieve	70 max
UV Resistance	ASTM D-4355	% hrs	70 @ 500

*At time of manufacturing; handling may change these properties.

To the best of our knowledge the information contained herein is accurate. However, ESP, Inc. cannot anticipate all conditions under which ESP's product information and our products, or the products of other manufacturers in combination with our products, may be used. We accept no responsibility for results obtained by the application of this information or the safety or suitability of our products either alone or in combination with other products. Final determination of the suitability of any information or material for the use contemplated, of its manner of use, and whether the suggested use infringes any patents is the sole responsibility of the user.

SKAPS INDUSTRIES
GEONET DIVISION

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QUALITY CONTROL

PROGRAM OUTLINE

SKAPS INDUSTRIES
GEONET DIVISION

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GENERAL

Scope

The following describes parameters for the manufacture, supply, and installation of SKAPS Industries Drainage Net and Geocomposite. SKAPS Industries is dedicated to manufacturing the finest quality geosynthetics under the most rigorous testing protocol.

Qualifications

SKAPS Industries has successfully manufactured over 100,000,000 square feet of polyethylene drainage net each of the past ten years. SKAPS Industries operates three state-of-the-art Geonet Extrusion Lines. This ensures that our customers who have special project-specific requirements are serviced without interfering with standard daily production.

Manufacturing Quality Assurance

SKAPS Industries maintains laboratories at each of our manufacturing facilities. These Facilities maintain strict quality control over our products using the best and latest in testing equipment and techniques. The quality control testing laboratory is designed around the latest GRI and ASTM procedures and standards.

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MATERIALS

Drainage Net

The drainage net is manufactured by extruding two sets of polyethylene strands to form a three dimensional structure to provide for planar flow. The drainage net is manufactured with virgin polyethylene resin manufactured specifically for the intended application. The natural polyethylene resin without the carbon black shall meet the following requirements:

Property Test Method Requirements
Density, g/cc ASTM D 1505 > 0.94
Melt Index, g/10 min. ASTM D 1238 < 1.0

The drainage net is manufactured in Commerce GA. Labels on each roll shall identify the thickness of the material, the width and length of the roll, roll number, and name of the manufacturer.

Geotextile

The geotextile shall be a non-woven, needle punched polypropylene fabric manufactured by SKAPS Industries. SKAPS nonwoven geotextile is a superior quality, nonwoven geotextile produced by needlepunching together 100% polypropylene staple fibers in a random network to form a high strength dimensionally stable fabric. The polypropylene fibers are specially formulated to resist ultraviolet light deterioration, and are inert to commonly encountered soil chemicals. The fabric will not mildew, is non-biodegradable, and is resistant to damage from insects and rodents. Polypropylene is stable within a ph range of 2 to 13.

Geocomposite

The geocomposite shall consist of the SKAPS Industries HDPE drainage net heat bonded to one layer or sandwiched between two layers of geotextile to create a single-sided or double-sided geocomposite. The geotextiles shall extend 6 inches beyond the edges of drainage net on both sides of the geocomposite roll.

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GEONET / GEOCOMPOSITE TESTING PROCEDURES

QC Sampling Schedule

All tests are performed every 35,000 square feet of production except for compressibility, which is tested once per shift (approximately every 250,000 square feet of production). Transmissivity is done on a requested basis.

Weight / Area (ASTM D 5261)

The width is determined by measuring the sample in three places--once across each cut end and once across the center. The three measurements are then averaged and reported in inches. The length is also determined by measuring three places--along both edges and along the center. These values are averaged and reported in inches. Samples are then taken and weighed to the nearest .001 lb/sf. The weight is divided by the average width to obtain a weight per length value. The weight/length number is divided by the average width value to obtain weight per area. The value is reported in lbs/sf.

Thickness (ASTM D 5199)

Five specimens are cut from across the width of the lab sample. A thickness gauge with a ¾ inch presser foot is used to measure the thickness of each specimen. The values are recorded and reported as an average in inches.

Tensile Strength (ASTM D 5035)

Five specimens are cut from across the width of the lab sample. They are then placed in the jaws of the Instron Machine and a load is applied at a constant strain of 12 in/min until yield. The results of the tensile test are then averaged and recorded.

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% Carbon Black (ASTM D 4218)

The carbon black test determines the percent by weight of the product that is carbon black. The percent of carbon black is the ratio of the residue weight after pyrolysis in a muffle furnace compared to the weight of input specimen. Two grams of the net are cut and placed in aluminum dishes. The samples are then placed in a muffle furnace for ten minutes at 600 degrees centigrade. The samples are removed and allowed to cool. The carbon black percentage is calculated and recorded.

Ply Adhesion (ASTM D 7005)

Five specimens are cut from across the entire width of the composite sample, each measuring one inch wide by ten inches long. The strain rate for the test is 10 in/min. The fabric is clamped in one jaw of the Instron machine while the net is clamped in the other. The fabric is pulled away from the net to test the adhesion of the fabric to the net.

Transmissivity (ASTM D 4716)

The transmissivity test for the composite is identical to the test for the geonet.

Melt Index (ASTM D 1238)

The melt index determines the rate of the extrusion of the molten resin through a die of specified length and diameter at a temperature of 190 degrees centigrade under a load of 2.16 kg and is measured in g/10min. A sample of approximately 2.5 grams of geonet is then put through the melt plastometer to verify flow rates.

Density of Polymer (ASTM D 1505)

Taking samples from the melt index test, small strands are cut and measured in a density column. A mixture of distilled water and isopropyl alcohol is used as the suspension fluid.

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Transmissivity (ASTM D 4716)

The transmissivity test measures the inplane flow of water across the net sample. In the standard test, the sample is placed between two steel plates with the water temperature at 20 degrees centigrade. Different gradients and loads are applied to the sample. The values are then calculated and converted to gallons per min/ft, or meters^2/sec. Transmissivity is not a standard manufacturing quality control test but rather a design indicator and is tested on a per project request basis.

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TRANSNET

DRAINAGE NET

GEOCOMPOSITE

HANDLING AND INSTALLATION MANUAL

SKAPS INDUSTRIES
GEONET DIVISION

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Introduction

Geocomposites provide a solution to various drainage problems. As with any synthetic product, the quality assurance and quality control does not stop once the product is shipped from the factory. Whether the product has been specified for vertical wall hydrostatic relief or horizontal flow zones for landfill cells/closure and roadways, care in handling and installation is critical to the future functioning of the product.

TRANSNET is manufactured utilizing high quality HDPE resin and lamination of high strength to weight ratio nonwoven geotextiles. The lamination process is completed at the same location where the net is manufactured, minimizing additional handling and allowing for supply of custom lengths. TRANSNET can have one or both sides laminated in order to meet the design specification.

Manufacturing

TRANSNET is manufactured utilizing state-of-the-art counter rotating dies and the highest quality resin. TRANSNET is manufactured with the addition of carbon black to stabilize against degradation from UV exposure.

Packaging

Upon completion of the lamination process, the geocomposite will be wrapped in an opaque wrap to prevent exposure to UV and for protection from the weather, dust, etc. In the event only TRANSNET is required, shipping in a wrapper is not necessary.

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Each roll will be labeled or tagged so that the following information is available at all times from the manufacturer:

- **Manufacturer's Name**
- **Product Identification**
- **Lot Number**
- **Roll Dimensions**

Shipping and Storage

Geocomposite rolls will be shipped in original packaging. In the event the packaging is damaged during shipment, repairs should be made to ensure protection against UV and weather. Care should be used during the off loading to ensure that the machinery used does not penetrate packaging.

Storage of the rolls prior to installation should be in an area where they are not in standing water. For storage longer than 30 days, rolls should be elevated off the ground with tires, pallets or 2x4's to prevent water from saturating the bottom row. The stack should then be covered with a material that will give additional protection from the elements. Should the product be exposed to excessive dust, the product should be washed prior to installation.

Site Preparation

The design engineer will determine how and where the geocomposite is to be utilized. With any application, care should be used in placing net or composite so that it is not damaged by stones or other protrusions that may compromise the functionality of the product.

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Installation

TRANSNET should be installed by hand. Once the roll is delivered to the installation location via rubber-tired loader or other appropriate machinery, the rolls should be inspected for any damage from shipping or handling. Once the rolls are positioned, they should be unrolled by hand. For slope applications, the rolls should be rolled from top to bottom and hand tightened to remove any wrinkles. The TRANSNET portion of adjacent rolls shall be overlapped two to four inches or according to the Engineer's recommendation. When placing TRANSNET end to end, overlap in shingle placement fashion a minimum of one foot. For end-to-end placement, the top layer of geotextile shall be peeled back and excess TRANSNET will be trimmed so that the top layer of geotextile covers the attachment of the two layers of geocomposite. The TRANSNET will be attached to adjacent rolls utilizing plastic wire ties. These ties will be placed at a maximum spacing of 5 feet along the sides of the rolls and a maximum of 2 feet for end to end attachment, or according to the Engineer's specification.

Metal ties or hog rings are not to be used.

Anchoring

For slope applications, TRANSNET should be placed in a trench so that pull out or slippage is prevented. The trench should be in accordance with the Design Engineer's requirements. Sand bags should be on hand at all times and placed on edges not seamed to prevent uplift from the wind. Welding of the TRANSNET to HDPE liner or any other geomembrane is not recommended.

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INSTALLATION GUIDELINES

Nonwoven Geotextile, Nets and Composites

Heat Seaming

Nonwoven Separate or Laminated

Nonwoven geotextiles can be joined together by using fusion seaming methods. The minimum overlap for this type of welding is four inches. Prior to fusion seaming the geotextile together, the installer must demonstrate to the Field Engineer the ability to perform this type of installation method. Areas burned through that are damaged by fusion welding shall be properly repaired. Care should be taken during installation to prevent damage to the geotextile. Torn or punctured material shall be patched with sufficient overlap to prevent separation.

Sewing Procedure

Nonwoven Separate or Laminated

Fabric layers should be placed on the ground (preferably firm ground) so that the edges to be sewn are parallel and overlapping. The sewing operation typically requires three men--a machine operator and a man on each side of the machine. The lead man should hold the fabric edges evenly together and feed the fabric into the sewing machine head or folder. The man behind the machine should hold tension on the fabric so the machine operator has a taut and straight edge to sew across. If the machine misses a stictch or runs off the fabric, terminate the seam by cutting and tying the thread. Begin a new seam approximately one foot behind the broken seam.

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Overlapping

Nonwoven Separate or Laminated

Roll goods form of geotextile should be overlapped a minimum of 12". Care should be taken that roll goods remain parallel to each other. Extreme care should be taken to assure that soil does not intrude into the composite structure thus clogging the drainage net.

APPENDIX 12

GEOCOMPOSITE CONFORMANCE TESTING

April 27, 2012

Mail To:	**Bill To:**
David W. Wasiela **ERM NC, Inc.** 8000 Corporate Center Drive, Suite 200 Charlotte, NC 28226	**<= Same**

email: Dave.Wasiela@erm.com

Dear Mr. Wasiela:

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

Project:	**RJ Reynolds Ash Landfill Closure Rural Hall, NC**
TRI Job Reference Number:	E2366-51-07
Material(s) Tested:	9, Skaps TN270 Geonet(s)
Test(s) Requested:	Thickness (ASTM D 5199) Mass Per Unit Area (ASTM D 3776 , Option C) Density (ASTM D 1505) Carbon Content (ASTM D 1603, mod.) Strip Tensile (ASTM D 5035)

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

Sincerely,

MPatel

Mansukh Patel
Sr. Laboratory Coordinator
Geosynthetic Services Division
www.GeosyntheticTesting.com

cc: Sam R. Allen, Vice President and Division Manager

GeosyntheticTesting.com
9063 Bee Caves Road / Austin, TX 78733 / 512 263 2101 / fax: 512 263 2558

GEONET TEST RESULTS

TRI Client: ERM NC, Inc.
Project: RJ Reynolds Ash Landfill Closure Rural Hall, NC

Material: Skaps TN270 Geonet
Sample Identification: 0047241010002
TRI Log #: E2366-51-07

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STD. DEV.	PROJ. SPEC.
Thickness (ASTM D 5199)													
Thickness (mils)	277	339	287	295	282	287	283	303	298	297	**295**	18	
Thickness (inch)	0.277	0.339	0.287	0.295	0.282	0.287	0.283	0.303	0.298	0.297	**0.295**	0.018	0.25 min
Mass/Unit Area (ASTM D 3776)													
5 in diameter Circle - Mass (grams)	15.19	15.86	16.18	15.33	15.74	16.56	14.96	16.26	15.48	16.64			
Mass/unit area (lbs./sq.ft)	0.25	0.26	0.26	0.25	0.25	0.27	0.24	0.26	0.25	0.27	**0.26**	0.01	0.16 min
Density (ASTM D 1505)													
Density (g/cm3)	0.956	0.956	0.956								**0.956**	0.000	0.940 min
Carbon Black Content (ASTM D 1603, mod.)													
% Carbon Black	2.27	2.24									**2.26**	0.02	2.0-3.0%
Strip Tensile Properties (ASTM D 5035, 12 ipm strain rate)													
MD Max. Strength (ppi)	111	112	88	92	118						**104**	13	55 min
MD Elong. @ Max. Strength (%)	25	25	19	17	28						**23**	5	

MD Machine Direction TD Transverse Direction

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.

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GEONET TEST RESULTS

TRI Client: ERM NC, Inc.
Project: RJ Reynolds Ash Landfill Closure Rural Hall, NC

Material: Skaps TN270 Geonet
Sample Identification: 0047241010038
TRI Log #: E2366-51-07

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STD. DEV.	PROJ. SPEC.
Thickness (ASTM D 5199)													
Thickness (mils)	296	301	298	299	299	296	285	312	288	285	**296**	8	
Thickness (inch)	0.296	0.301	0.298	0.299	0.299	0.296	0.285	0.312	0.288	0.285	**0.296**	0.008	0.25 min
Mass/Unit Area (ASTM D 3776)													
5 in diameter Circle - Mass (grams)	17.34	17.16	16.44	16.01	17.09	16.69	15.97	16.68	15.79	15.78			
Mass/unit area (lbs./sq.ft)	0.28	0.28	0.27	0.26	0.28	0.27	0.26	0.27	0.26	0.26	**0.27**	0.01	0.16 min
Density (ASTM D 1505)													
Density (g/cm3)	0.955	0.955	0.955								**0.955**	0.000	0.940 min
Carbon Black Content (ASTM D 1603, mod.)													
% Carbon Black	2.41	2.37									**2.39**	0.03	2.0-3.0%
Strip Tensile Properties (ASTM D 5035, 12 ipm strain rate)													
MD Max. Strength (ppi)	116	118	115	117	102						**114**	6	55 min
MD Elong. @ Max. Strength (%)	23	27	25	23	24						**24**	2	

MD Machine Direction TD Transverse Direction

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GEONET TEST RESULTS

TRI Client: ERM NC, Inc.
Project: RJ Reynolds Ash Landfill Closure Rural Hall, NC

Material: Skaps TN270 Geonet
Sample Identification: 0047241010074
TRI Log #: E2366-51-07

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STD. DEV.	PROJ. SPEC.
Thickness (ASTM D 5199)													
Thickness (mils)	289	305	326	297	281	278	278	271	276	282	**288**	17	
Thickness (inch)	0.289	0.305	0.326	0.297	0.281	0.278	0.278	0.271	0.276	0.282	**0.288**	0.017	0.25 min
Mass/Unit Area (ASTM D 3776)													
5 in diameter Circle - Mass (grams)	14.34	15.64	16.64	16.97	16.03	14.35	15.49	15.38	15.30	15.56			
Mass/unit area (lbs./sq.ft)	0.23	0.25	0.27	0.27	0.26	0.23	0.25	0.25	0.25	0.25	**0.25**	0.01	0.16 min
Density (ASTM D 1505)													
Density (g/cm3)	0.951	0.951	0.951								**0.951**	0.000	0.940 min
Carbon Black Content (ASTM D 1603, mod.)													
% Carbon Black	2.29	2.22									**2.26**	0.05	2.0-3.0%
Strip Tensile Properties (ASTM D 5035, 12 ipm strain rate)													
MD Max. Strength (ppi)	102	110	111	101	88						**102**	9	55 min
MD Elong. @ Max. Strength (%)	21	28	24	21	19						**23**	4	

MD Machine Direction TD Transverse Direction

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GEONET TEST RESULTS

TRI Client: ERM NC, Inc.
Project: RJ Reynolds Ash Landfill Closure Rural Hall, NC

Material: Skaps TN270 Geonet
Sample Identification: 0047241010110
TRI Log #: E2366-51-07

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STD. DEV.	PROJ. SPEC.
Thickness (ASTM D 5199)													
Thickness (mils)	284	288	297	286	293	268	281	299	263	288	**285**	12	
Thickness (inch)	0.284	0.288	0.297	0.286	0.293	0.268	0.281	0.299	0.263	0.288	**0.285**	0.012	0.25 min
Mass/Unit Area (ASTM D 3776)													
5 in diameter Circle - Mass (grams)	15.67	15.36	15.48	15.70	15.96	14.32	14.50	15.81	14.55	14.92			
Mass/unit area (lbs./sq.ft)	0.25	0.25	0.25	0.25	0.26	0.23	0.23	0.26	0.24	0.24	**0.25**	0.01	0.16 min
Density (ASTM D 1505)													
Density (g/cm3)	0.954	0.954	0.954								**0.954**	0.000	0.940 min
Carbon Black Content (ASTM D 1603, mod.)													
% Carbon Black	2.17	2.19									**2.18**	0.01	2.0-3.0%
Strip Tensile Properties (ASTM D 5035, 12 ipm strain rate)													
MD Max. Strength (ppi)	96	91	105	107	111						**102**	8	55 min
MD Elong. @ Max. Strength (%)	21	21	27	21	25						**23**	3	

MD Machine Direction TD Transverse Direction

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GEONET TEST RESULTS

TRI Client: ERM NC, Inc.
Project: RJ Reynolds Ash Landfill Closure Rural Hall, NC

Material: Skaps TN270 Geonet
Sample Identification: 0047241010147
TRI Log #: E2366-51-07

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STD. DEV.	PROJ. SPEC.
Thickness (ASTM D 5199)													
Thickness (mils)	294	291	285	289	281	285	285	298	282	286	**288**	5	
Thickness (inch)	0.294	0.291	0.285	0.289	0.281	0.285	0.285	0.298	0.282	0.286	**0.288**	0.005	0.25 min
Mass/Unit Area (ASTM D 3776)													
5 in diameter Circle - Mass (grams)	15.97	16.20	15.84	15.59	15.36	16.16	15.48	16.80	15.78	15.17			
Mass/unit area (lbs./sq.ft)	0.26	0.26	0.26	0.25	0.25	0.26	0.25	0.27	0.26	0.25	**0.26**	0.01	0.16 min
Density (ASTM D 1505)													
Density (g/cm3)	0.956	0.956	0.956								**0.956**	0.000	0.940 min
Carbon Black Content (ASTM D 1603, mod.)													
% Carbon Black	2.15	2.23									**2.19**	0.06	2.0-3.0%
Strip Tensile Properties (ASTM D 5035, 12 ipm strain rate)													
MD Max. Strength (ppi)	102	118	86	83	116						**101**	16	55 min
MD Elong. @ Max. Strength (%)	25	27	21	18	26						**23**	4	

MD Machine Direction TD Transverse Direction

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.

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GEONET TEST RESULTS

TRI Client: ERM NC, Inc.
Project: RJ Reynolds Ash Landfill Closure Rural Hall, NC

Material: Skaps TN270 Geonet
Sample Identification: 0047241010182
TRI Log #: E2366-51-07

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STD. DEV.	PROJ. SPEC.
Thickness (ASTM D 5199)													
Thickness (mils)	277	293	285	288	287	302	299	298	284	299	**291**	8	
Thickness (inch)	0.277	0.293	0.285	0.288	0.287	0.302	0.299	0.298	0.284	0.299	**0.291**	0.008	0.25 min
Mass/Unit Area (ASTM D 3776)													
5 in diameter Circle - Mass (grams)	14.56	16.19	15.69	15.66	15.01	16.01	15.77	15.83	15.42	15.55			
Mass/unit area (lbs./sq.ft)	0.24	0.26	0.25	0.25	0.24	0.26	0.26	0.26	0.25	0.25	**0.25**	0.01	0.16 min
Density (ASTM D 1505)													
Density (g/cm3)	0.955	0.955	0.954								**0.955**	0.001	0.940 min
Carbon Black Content (ASTM D 1603, mod.)													
% Carbon Black	2.08	2.01									**2.05**	0.05	2.0-3.0%
Strip Tensile Properties (ASTM D 5035, 12 ipm strain rate)													
MD Max. Strength (ppi)	102	93	107	102	96						**100**	6	55 min
MD Elong. @ Max. Strength (%)	25	17	27	22	23						**23**	3	

MD Machine Direction TD Transverse Direction

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GEONET TEST RESULTS

TRI Client: ERM NC, Inc.
Project: RJ Reynolds Ash Landfill Closure Rural Hall, NC

Material: Skaps TN270 Geonet
Sample Identification: 0047241010219
TRI Log #: E2366-51-07

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STD. DEV.	PROJ. SPEC.
Thickness (ASTM D 5199)													
Thickness (mils)	302	289	288	283	304	299	313	277	295	290	**294**	11	
Thickness (inch)	0.302	0.289	0.288	0.283	0.304	0.299	0.313	0.277	0.295	0.290	**0.294**	0.011	0.25 min
Mass/Unit Area (ASTM D 3776)													
5 in diameter Circle - Mass (grams)	16.61	15.27	15.24	14.98	14.78	14.55	16.48	15.25	16.95	16.62			
Mass/unit area (lbs./sq.ft)	0.27	0.25	0.25	0.24	0.24	0.24	0.27	0.25	0.27	0.27	**0.25**	0.01	0.16 min
Density (ASTM D 1505)													
Density (g/cm3)	0.957	0.957	0.957								**0.957**	0.000	0.940 min
Carbon Black Content (ASTM D 1603, mod.)													
% Carbon Black	2.21	2.19									**2.20**	0.01	2.0-3.0%
Strip Tensile Properties (ASTM D 5035, 12 ipm strain rate)													
MD Max. Strength (ppi)	106	111	106	90	110						**105**	9	55 min
MD Elong. @ Max. Strength (%)	23	22	22	25	25						**23**	2	

MD Machine Direction TD Transverse Direction

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GEONET TEST RESULTS

TRI Client: ERM NC, Inc.
Project: RJ Reynolds Ash Landfill Closure Rural Hall, NC

Material: Skaps TN270 Geonet
Sample Identification: 0047241010269
TRI Log #: E2366-51-07

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STD. DEV.	PROJ. SPEC.
Thickness (ASTM D 5199)													
Thickness (mils)	300	284	279	300	280	327	291	296	301	268	**293**	16	
Thickness (inch)	0.300	0.284	0.279	0.300	0.280	0.327	0.291	0.296	0.301	0.268	**0.293**	0.016	0.25 min
Mass/Unit Area (ASTM D 3776)													
5 in diameter Circle - Mass (grams)	15.61	15.02	15.11	16.47	15.73	15.63	15.99	17.03	16.13	14.76			
Mass/unit area (lbs./sq.ft)	0.25	0.24	0.24	0.27	0.25	0.25	0.26	0.28	0.26	0.24	**0.26**	0.01	0.16 min
Density (ASTM D 1505)													
Density (g/cm3)	0.955	0.956	0.955								**0.955**	0.001	0.940 min
Carbon Black Content (ASTM D 1603, mod.)													
% Carbon Black	2.00	2.02									**2.01**	0.01	2.0-3.0%
Strip Tensile Properties (ASTM D 5035, 12 ipm strain rate)													
MD Max. Strength (ppi)	106	102	129	91	116						**109**	14	55 min
MD Elong. @ Max. Strength (%)	21	23	25	19	29						**23**	4	

MD Machine Direction TD Transverse Direction

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GEONET TEST RESULTS

TRI Client: ERM NC, Inc.
Project: RJ Reynolds Ash Landfill Closure Rural Hall, NC

Material: Skaps TN270 Geonet
Sample Identification: 0047241010308
TRI Log #: E2366-51-07

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STD. DEV.	PROJ. SPEC.
Thickness (ASTM D 5199)													
Thickness (mils)	287	296	290	291	285	283	293	288	280	279	**287**	6	
Thickness (inch)	0.287	0.296	0.290	0.291	0.285	0.283	0.293	0.288	0.280	0.279	**0.287**	0.006	0.25 min
Mass/Unit Area (ASTM D 3776)													
5 in diameter Circle - Mass (grams)	15.39	16.37	15.98	16.96	15.01	15.27	15.92	16.27	15.45	15.58			
Mass/unit area (lbs./sq.ft)	0.25	0.27	0.26	0.27	0.24	0.25	0.26	0.26	0.25	0.25	**0.26**	0.01	0.16 min
Density (ASTM D 1505)													
Density (g/cm3)	0.954	0.954	0.954								**0.954**	0.000	0.940 min
Carbon Black Content (ASTM D 1603, mod.)													
% Carbon Black	2.20	2.22									**2.21**	0.01	2.0-3.0%
Strip Tensile Properties (ASTM D 5035, 12 ipm strain rate)													
MD Max. Strength (ppi)	110	104	84	114	111						**104**	12	55 min
MD Elong. @ Max. Strength (%)	24	27	21	25	25						**25**	2	

MD Machine Direction TD Transverse Direction

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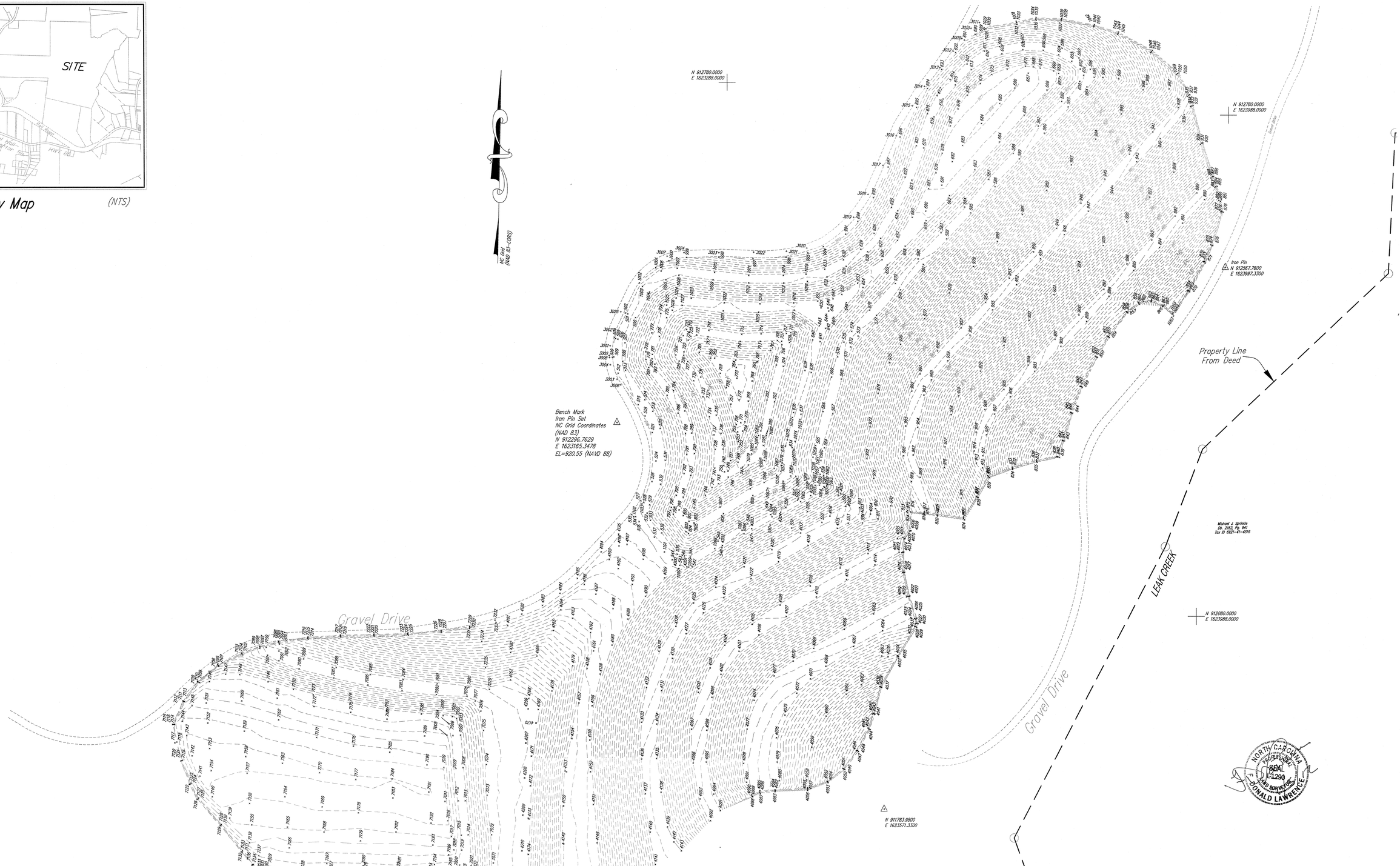
APPENDIX 13

SURVEY CERTIFICATION DRAWINGS; SUBGRADE & COVER

Vicinity Map (NTS)



-60 0 30 60

(IN FEET)
1 inch = 60 ft.

LAWRENCE ASSOCIATES
106 W. Jefferson St.
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Sheet 1

REVISIONS

Grade Verification Survey

Property of R.J. Reynolds Tobacco Company

Forsyth County, North Carolina

Orig. scale: 1" = 60' Date: August 30, 2012 Drawn By: MCM

Job No. 2497 Drawing file: Phase 2-3 Grades.dwg Drawing no. 12/160

J:\Mon\proj\2497 Rural Hall\gdt\landfill\Phase 2-3 Grades.dwg 9/4/2012 7:50:54 AM EDT

Vicinity Map

(NTS)

Verified Subgrade Point	EL	Verified Cover PT	EL	Subgrade-Cover Difference
400	927.42			
500	918.71	1500	920.71	2.50
501	919.10	1501	919.92	2.15
502	916.43	1502	918.53	2.10
503	916.61	1503	918.94	2.33
504	916.98	1504	919.71	2.73
505	917.74	1505	919.91	2.17
506	918.15	1507	920.56	2.40
508	918.05	1508	920.74	2.69
509	917.46	1509	919.79	2.33
510	917.34	1510	919.37	2.03
511	917.65	1512	919.89	2.24
513	918.10	1513	920.74	2.64
514	918.31	1514	920.75	2.44
515	918.11	1516	920.41	2.30
518	918.06	1518	920.52	2.46
519	918.31	1519	920.95	2.64
520	918.64	1520	921.21	2.57
521	918.43	1521	920.65	2.22
524	918.06	1524	920.63	2.57
526	918.26	1526	921.00	2.74
527	920.34			
528	918.00			
529	918.53			
530	918.41	1530	921.15	2.64
531	918.44	1531	921.20	2.76
532	918.76			
533	919.05			
534	919.65			
535	919.80			
536	919.80			
537	919.03			
538	918.94			
539	918.49			
540	918.59			
543	918.49			
544	918.40			
545	918.42			
546	918.42			
547	918.22			
548	918.21			
549	918.51			
550	918.36			
551	918.18			
552	918.36			
553	918.78			
554	919.07			
555	919.26			
556	918.76			
557	920.00			
558	919.49			
559	918.54			
560	917.98			
561	915.90			
562	911.44			
563	906.49			
564	917.87	1564	919.84	2.11
565	918.40	1565	920.70	2.21
566	918.76	1566	921.23	2.47
567	917.88	1567	920.31	2.35
568	918.18	1568	920.62	2.44
569	918.49	1569	920.93	2.44
570	918.46	1570	920.81	2.35
571	917.51	1571	920.31	2.80
572	917.61	1572	920.32	2.71
573	917.91	1573	920.29	2.50
574	918.17	1574	920.80	2.63
575	918.29	1575	920.78	2.50
576	918.08	1576	921.01	2.93
577	918.11	1577	920.98	2.87
578	918.23	1578	920.81	2.58
579	918.42	1579	920.81	2.39
580	918.06	1580	920.38	2.32
581	917.66	1581	920.41	2.75
582	918.25	1582	920.81	2.56
583	917.58	1583	920.45	2.87
584	917.50	1584	919.68	2.18
585	917.49	1585	919.64	2.15
586	917.59	1586	920.08	2.49
587	918.11	1587	920.97	2.86
588	918.19	1588	920.31	2.12
589	918.20	1589	920.12	2.12
590	918.04	1590	920.73	2.69
601	918.04	1601	920.73	2.69
602	918.15	1602	920.90	2.75
603	918.18	1603	920.72	2.54
604	918.50	1604	920.87	2.37
605	918.52	1605	920.73	2.21
606	918.63	1606	921.11	2.48
607	918.78	1607	920.53	2.75
608	918.67	1608	921.42	2.75
609	918.61	1609	921.10	2.49
610	918.61	1610	921.34	2.73
611	918.61	1611	920.51	2.90
612	918.51	1612	920.69	2.12
613	918.51	1613	920.94	2.43
614	917.87	1614	920.22	2.35
615	918.60	1615	921.04	2.44
616	918.51	1616	920.89	2.38
617	918.29	1617	920.42	2.11
618	918.18	1618	920.30	2.12
619	918.45	1619	920.53	2.08
620	918.36	1620	920.66	2.30
621	918.18	1621	920.51	2.33
622	917.87	1622	920.35	2.48
623	918.62	1623	920.80	2.18
624	918.69	1624	920.87	2.18
625	918.54	1625	920.44	2.36
626	917.83	1626	920.31	2.48
627	918.59	1627	921.08	2.49
628	918.43	1628	920.84	2.41
629	917.93	1629	920.65	2.72
630	917.78	1630	920.02	2.24
631	917.98	1631	920.71	2.73
632	917.93	1632	920.44	2.50
633	917.83	1633	920.13	2.30
634	922.56			
635	922.56			
636	918.10	1636	920.32	2.22
637	917.69	1637	920.04	2.35
638	917.92	1638	920.16	2.24
639	918.37	1639	920.93	2.56
640	917.67	1640	920.12	2.45
641	917.80	1641	920.31	2.51
642	917.74	1642	920.98	3.24
643	917.61	1643	920.91	3.30
644	917.63	1644	920.93	3.30
645	917.65	1645	920.86	3.21

Verified Subgrade Point	EL	Verified Cover PT	EL	Subgrade-Cover Difference
646	917.76	1646	920.83	3.07
647	917.76	1647	920.00	2.24
648	917.77	1648	920.41	2.64
649	917.87	1649	920.33	2.46
650	917.85	1650	920.31	2.46
651	917.93	1651	920.75	2.82
652	917.80	1652	920.07	2.27
653	917.73	1653	920.23	2.50
654	926.67	1654	928.74	2.07
655	925.70	1655	927.41	1.71
656	923.03	1656	927.64	2.61
657	923.09	1657	927.31	2.22
658	923.21	1658	927.33	2.10
659	923.83	1659	926.00	2.16
660	923.73	1660	927.89	2.16
661	927.95	1661	929.18	1.23
662	926.54	1662	928.78	2.24
663	926.30	1663	928.43	2.13
664	926.26	1664	928.38	2.12
665	925.88	1665	928.12	2.24
666	926.54	1666	928.44	2.10
667	925.86	1667	928.03	2.17
668	925.84	1668	927.94	2.10
669	926.11	1669	928.43	2.32
670	926.71	1670	929.02	2.31
671	926.98	1671	929.23	2.25
672	926.38	1672	928.50	2.12
673	926.13	1673	928.34	2.21
674	926.21	1674	928.47	2.26
675	926.26	1675	928.47	2.21
676	926.50	1676	928.67	2.17
677	926.76	1677	928.92	2.16
678	927.14	1678	929.31	2.17
679	927.33	1679	929.47	2.14
680	926.08	1680	928.13	2.05
681	926.13	1681	928.36	2.23
682	927.72	1682	930.07	2.35
683	927.68	1683	929.91	2.23
684	927.61	1684	929.63	2.02
685	928.18	1685	930.19	2.01
686	928.95	1686	930.15	2.20
687	927.85	1687	929.91	2.06
688	927.91	1688	929.33	1.42
689	929.13	1689	931.53	2.40
690	929.76	1690	932.60	2.84
691	910.54	1691	912.57	2.03
692	911.43	1692	913.53	2.04
693	912.61	1693	914.64	2.01
694	913.97	1694	914.98	1.01
695	912.98	1695	914.94	2.06
696	913.43	1696	912.56	2.13
697	909.19	1697	911.52	2.33
698	908.68	1698	910.69	2.01
699	908.57	1699	910.70	2.13
700	937.15	1700	940.09	2.94
701	938.06	1701	940.33	2.27
702	937.82	1702	940.16	2.34
703	937.12	1703	939.81	2.69
704	937.52	1704	939.96	2.44
705	937.94	1705	940.43	2.49
706	937.94	1706	940.50	2.56
707	937.89	1707	940.04	2.15
708	937.95	1708	940.19	2.24
709	938.06	1709	940.39	2.33
710	937.76	1710	939.83	2.07
711	937.71	1711	939.68	1.97
712	937.79	1712	939.87	2.08
713	937.84	1713	940.19	2.35
714	937.50	1714	939.65	2.15
715	937.54	1715	939.78	2.24
716	937.84	1716	940.09	2.25
717	937.88	1717	940.17	2.29
718	937.68	1718	939.72	2.04
719	937.68	1719	939.77	2.09
720	937.62	1720	940.16	2.54
721	937.12	1721	939.81	2.69
722	937.29	1722	940.07	2.78
723	938.11	1723	940.11	2.00
724	938.17	1724	940.21	2.04
725	938.12	1725	940.17	2.05
726	938.17	1726	940.20	2.03
727	938.22	1727	940.31	2.09
728	938.30	1728	940.37	2.07
729	938.34	1729	940.37	2.03
730	938.36	1730	940.44	2.08
731	938.04	1731	940.27	2.23
732	937.80	1732	939.95	2.15
733	937.83	1733	939.94	2.11
734	937.83	1734	940.26	2.43
735	937.83	1735	940.13	2.30
736	937.83	1736	940.26	2.43
737	937.83	1737	940.13	2.30
738	937.83	1738	940.13	2.30
739	937.83	1739	940.13	2.30
740	937.83	1740	940.13	2.30
741	937.49	1741	939.68	2.19
742	937.47	1742	939.62	2.15
743	937.47	1743	939.59	2.12
744	936.65	1744	938.75	2.10
745	933.83	1745	936.05	2.22
746	937.45	1746	939.55	2.10
747	938.09	1747	940.16	2.07
748	938.05	1748	940.12	2.07
749	937.75	1749	939.96	2.21
750	937.62	1750	939.77	2.15
751	937.70	1751	940.08	2.38
752	944.12	1752	946.20	2.08
753	944.32	1753	946.23	1.91
754	945.51	1754	947.77	2.26
755	945.67	1755	948.11	2.44
756	946.30	1756	948.42	2.12
757	946.41	1757	948.57	2.16
758	946.53	1758	948.73	2.20
759	946.78	1759	948.91	2.13
760	946.66	1760	948.80	2.14
761	944.55	1761	946.65	2.10
762	946.87	1762	949.00	2.13
763	946.48	1763	948.59	2.11
764	947.26	1764	949.50	2.24
765	946.62	1765	948.72	2.10
766	946.52	1766	948.66	2.14
767	941.77	1767	944.16	2.39
768	946.71	1768	948.80	2.09
769	946.63	1769	948.73	2.10
770	946.14	1770	948.23	2.09
771	946.33	1771	948.50	2.17
772	941.06	1772	943.15	2.09
773	941.49	1773	943.74	2.25
774	927.99	1774	930.07	2.08
775	928.11	1775	930.11	2.00
776	928.17	1776	930.20	2.03
777	927.92	1777	930.11	2.19
778	928.16	1778	930.44	2.28
779	928.30	1779	930.77	2.47
780	927.88	1780	930.39	2.51
781	928.30	1781	930.81	2.51
782	928.25	1782	930.58	2.33
783	928.19	1783	930.46	2.27
784	928.24	1784	930.52	2.28
785	927.36	1785	929.71	2.35
786	927.90	1786	930.38	2.48
787	928.35	1787	930.69	2.34

Verified Subgrade Point	EL	Verified Cover PT	EL	Subgrade-Cover Difference
788	928.03	1788	930.40	2.36
789	928.46	1789	930.95	2.49
790	928.17	1790	930.71	2.54
791	928.03	1791	930.27	2.24
792	927.76	1792	930.17	2.41
793	927.95	1793	930.19	2.24
794	927.84	1794	930.18	2.34
795	927.67	1795	929.99	2.32
796	927.83	1796	930.11	2.28
797	927.67	1797	929.89	2.22
798	928.11	1798	930.23	2.12
799	928.22	1799	930.42	2.20
800	928.20	1800	930.58	2.38
801	928.41	1801	930.65	2.24
802	927.99	1802	930.15	2.16
803	928.05	1803	930.36	2.31
804	927.84	1804	930.43	2.59
805	927.92	1805	930.06	2.14
806	927.95	1806	930.09	2.14
807	927.84	1807	930.34	2.50
808	927.81	1808	930.08	2.27
809	927.68	1809	929.80	2.12
810	901.43			
811	900.30			
812	889.25			
813	888.12			
814	886.81			
815	888.74			
816	885.45			
817	882.11	1817	884.25	2.14
818	882.44	1818	884.65	2.21
819	882.25			
820	879.34	1820	882.65	3.31
821	879.42	1821	882.57	3.15
822	877.42			
823	860.58	1823	872.68	3.10
824	863.57	1824	872.68	3.09
825	863.12			
826	858.59			
827	860.67	1827	862.95	2.28
828	860.42	1828	862.53	2.11
829	851.34	1829	854.09	2.75
830	851.49	1830	855.39	3.90
831	849.80			
832	849.12			
833	838.91	1833	842.05	3.14
834	839.04	1834	841.93	2.89
835	827.01	1835	829.19	2.18
836	826.92	1836	830.00	3.08
837	825.54			
838	820.05	1838	823.24	2.85
839	820.66	1839	822.72	2.06
840	819.10			
841	819.10			
842	820.15	1842	824.72	1.57
843	820.78	1843	823.80	3.04
844	826.42	1844	828.86	2.44
845	826.81	1845	829.88	3.07
846	825.12			
847	830.07			
848	831.69	1848	834.77	3.08
849	833.33	1849	834.04	0.71
850	836.38	1850	838.72	2.34
851	835.10			
852	836.25	1852	839.05	2.80
853	841.03	1853	843.21	2.18
854	840.25	1854	842.84	2.11
855	839.19			
856	840.99			
857	842.86	1857	845.03	2.17
858	842.75	1858	845.06	2.31
859	843.49	1859	847.12	3.63
860	839.24	1860	841.30	2.06
861	837.46			
862	837.12			
863	833.66	1863	837.18	3.52
864	836.69	1864	839.49	2.80
865	828.43	1865	831.44	3.01
866	828.91	1866	831.65	2.74
867	827.18			
868	825.66	1868	827.75	2.09
869	823.10			
870	825.66	1870	828.20	2.32
871	828.62	1871	830.97	2.15
872	828.65	1872	830.91	2.26
873	828.90			
874	829.57			
875	831.22	1875	833.53	2.31
876	831.07	1876	833.27	2.20
877	838.73	1877	841.33	2.60
878	839.08	1878	841.17	2.11
879	837.23			
880	841.56			
881	843.10	1881	845.25	2.15
882	842.37	1882	844.52	2.15
883	843.42	1883	851.61	3.19
884	846.65			
885	846.41	1885	851.03	2.62
886	850.98	1886	854.51	3.53
887	849.15			
888	850.38	1888	853.06	2.68
889	849.78	1889	852.21	2.43
890	849.11	1890	851.87	2.76
891	848.39	1891	851.96	3.57
892	849.29	1892	852.23	2.94
893	850.15	1893	852.25	2.10
894	849.00	1894	852.15	3.15
895	849.05	1895	852.12	3.07
896	851.18	1896	853.18	2.00
897	850.61	1897	853.16	2.55
898	850.09	1898	853.65	3.56
899	850.73	1899	853.62	2.89
900	851.47	1900	853.78	2.31
901	850.93	1901	852.60	1.67
902	850.25	1902	853.20	3.15
903	850.22	1903	853.37	3.15
904	853.99	1904	855.11	2.12
905	853.61	1905	855.84	2.23
906	855.41	1906	856.08	0.67
907	853.77	1907	856.47	2.70
908	854.13	1908	856.83	2.70
909	854.19	1909	856.65	2.46
910	855.29	1910	856.38	1.09
911	855.30	1911	856.38	1.08
912	855.74	1912	856.79	1.05
913	855.80	1913	856.88	1.08
914	855.59	1914	856.60	1.01
915	857.00	1915	859.33	2.33
916	862.25	1916	865.39	3.14
917	863.11	1917	865.38	2.27
918	867.79	1918	869.56	1.77
919	867.35	1919	869.62	2.27
920	867.70	1920	870.01	2.31
921	867.76	1921	870.03	2.27
922	867.74	1922	869.39	1.65
923	866.50	1923	868.77	2.27
924	865.67	1924	867.96	2.29
925	865.11	1925	867.33	2.22
926	864.44	1926	866.60	2.16
927	864.33	1927	866.35	2.02
928	864.24	1928	866.36	2.12
929	864.08	1929	867.13	3.05

Verified Subgrade Point	EL	Verified Cover PT	EL	Subgrade-Cover Difference
930	867.80	1930	867.27	1.47
931	870.55			
932	872.60	1932	881.74	3.74
933	872.29			
934	872.29	1933	881.60	3.31
935	872.29			
936	872.29	1936	881.88	2.15
937	872.29			
938	880.19	1938	882.33	2.14
939	878.74	1939	881.92	3.18
940	879.69	1940	883.02	3.33
941	880.67	1941	883.30	2.63
942	881.31	1942	883.60	2.29
943	881.50	1943	883.48	2.00
944	881.11	1944	883.92	2.79
945	882.99	1945	884.37	2.37
946	883.37	1946	884.53	2.16
947	881.36	1947	884.32	2.96
948	881.95	1948	884.70	2.75
949	882.73	1949	884.83	2.10
950	883.42	1950	885.56	2.14
951	882.50	1951	885.57	3.07
952	882.41	1952	885.50	3.09
953	883.11	1953	885.41	2.30
954	883.70	1954	885.97	2.27
955	882.86	1955	885.68	1.02
956	882.74	1956	885.70	2.96
957	883.80	1957	886.23	2.43
958	884.74	1958	886.33	1.59
959	882.74	1959	885.30	2.56
960	882.29	1960	885.45	3.16
961	881.53	1961	886.14	2.61
962	883.43	1962	885.86	2.43
963	881.60	1963	885.67	3.07
964	880.83	1964	884.39	3.56
965	882.30	1965	884.47	2.17
966	880.83	1966	884.39	3.56
967	880.31	1967	883.79	3.48
968	880.31	1968	883.79	3.48
969	880.31	1969	883.79	3.48
970	880.31			
971	897.16	1971	899.40	2.24
972	897.70	1972	899.93	2.23
973	898.96	1973	901.25	2.29
974	899.13	1974	901.42	2.29
975	898.35	1975	900.77	2.42
976	900.09	1976	902.14	2.05
977	899.95	1977	902.05	2.10
978	899.95	1978	902.05	2.10
979	899.70	1979	901.83	2.13
980	899.50	1980	901.54	2.04
981	899.39	1981	901.54	2.15
982	898.92	1982	900.86	2.14
983	897.97	1983	900.25	2.28
984	898.15	1984	900.39	2.24
985	897.98	1985	900.19	2.21
986	898.95	1986	898.95	2.03
987	897.81	1987	899.84	2.03
988	898.15	1988	899.72	2.02
989	898.15	1989	899.72	2.02
990	914.31	1990	916.46	2.15
991	908.51	1991	910.74	2.23
992	908.19	1992	910.36	2.29
993	908.19	1993	910.61	2.42
994	908.19	1994	910.36	2.29
995	908.50	1995	910.64	2.14
996	908.80	1996	910.84	2.04
997	909.39	1997	911.54	2.15
998	910.41	1998	912.71	2.30
999	910.41	1999	914.32	3.91
1000	912.86	2000	916.31	3.45
1001	913.26	2001	915.36	2.10
1002	913.26	2002	915.36	2.10
1003	913.26	2003	915.36	2.10
1004	913.26	2004	915.36	2.10
1005	916.02			
1006	917.06	2006	920.38	3.32
1007	917.06	2007	920.08	3.02
1008	918.56	2008	921.64	3.08
1009	917.67	2009	920.49	2.82
1010	917.56	2010	920.30	2.74
1011	917.49	2011	919.90	2.41
1012	917.63	2012	920.36	2.73
1013	917.63	2013	920.34	2.72
1014	917.63	2014	919.91	2.28
1015	917.63	2015	920.38	2.75
1016	918.94	2016	920.49	2.55
1017	917.95	2017	920.40	2.45
1018	918.07	2018	920.15	2.08
1019	917.78	2019	920.97	3.19
1020	917.85	2020	920.71	2.86
1021	918.11	2021	920.52	2.41
1022	918.05	2022	920.19	2.14
1023	917.46	2023	919.86	2.40
1024	917.85	2024	920.36	2.51
1025	917.89	2025	920.10	2.21
1026	917.90	2026	920.49	2.59
1027	917.89	2027	920.42	2.53
1028	917.89	2028	920.42	2.53
1029	919.04	2029	911.16	0.12
1030	917.25			
1031	906.85	2031	911.02	4.17
1032	906.85	2032	911.48	4.63
1033	911.44			
1034	911.44			
1035	910.26	2035	910.03	2.33
1036	906.49	2036	910.38	3.90
1037	906.49	2037	909.95	3.46
1038	905.58	2038	907.83	2.25
1039	903.07			
1040	899.89			
1041	901.15	2041	903.50	2.15
1042	902.07	2042	904.50	2.43
1043	898.71	2043	900.36	2.15
1044	897.67	2044	900.06	2.39
1045	898.14			
1046	898.98			
1047	890.61	2047	892.85	2.02
1048	890.67	2048	892.92	2.25
1049	883.38	2049	886.28	2.90
1050	883.51	2050	885.98	2.47
1051	881.80			
1052	825.65	2052	827.76	2.10
1053	825.65	2053	827.56	2.11
1054	803.51			
1055	918.11			
1056	918.09			
1057	918.07			
1058	918.20	2058	920.51	2.31
1059	918.51	2059	921.11	2.60
1060	917.27	2060	919.89	2.62
1061	917.56	2061	920.02	2.46
1062	917.84			
1063	918.05			
1064	917.79			
1065	917.62	2065	920.36	2.74
1066	917.56	2066	920.20	2.64
1067	917.56	2067	920.03	2.47
1068	917.09	2068	919.85	2.76
1069	917.09	2069	919.85	2.76
1070	917.09	2070	919.85	2.76
1071	917.17	2071	919.82	2.65

Verified Subgrade Point	EL	Verified Cover PT	EL	Subgrade-Cover Difference
1072	918.11	2072	919.71	2.60
1073	917.83	2073	920.05	2.22
1074	917.83	2074	920.65	2.82
1075	917.97	2075	920.14	2.17
1076	917.94	2076	920.13	2.19
1077	918.03	2077	920.15	2.12
1078	918.11	2078	919.41	1.30
1079	917.36	2079	919.94	2.58
1080	917.47	2080	919.73	2.26
1081	917.25	2081	940.08	2.83
1082	917.29	2082	940.00	2.71
1083	918.21	2083	940.41	2.20
1084	918.05	2084	940.26	2.21
1085	918.08	2085	940.28	2.20
1086	918.21	2086	937.81	2.06
1087	917.25	2087	933.44	2.24

Verified Subgrade Point	EL	Verified Cover PT	EL	Subgrade-Cover Difference
4000	917.69	5000	920.27	2.58
4001	917.46	5001	919.85	2.39
4002	905.64	5002	908.24	2.60
4003	903.61	5003	907.17	3.56
4004	901.96	5004	905.05	3.09
4005	901.81	5005	905.43	3.

APPENDIX 14

PHOTOGRAPHS

Edwards Road Landfill Cap Modification - Photographs

Facing North – Landfill conditions prior to stripping and regrading of ash – March 14, 2012

Facing North – Stripping of cover soils complete, start to regrade ash – April 24, 2012

Edwards Road Landfill Cap Modification - Photographs

Facing Southwest – Ash on East Slope regraded – May 3, 2012

Facing North – Ash regraded at north end of landfill - May 10, 2012

Edwards Road Landfill Cap Modification - Photographs

Facing North – First panels of 40-mil LLDPE liner placed and welded on east slope – May 17, 2012

Facing North – 40-mil LLDPE liner in place on east slope - May 22, 2012

Edwards Road Landfill Cap Modification - Photographs

Facing North – 40-mil LLDPE liner placed across the top of the landfill on north end – May 22, 2012

Facing North – Anchor trench along west slope at north end; NCDOT #57 washed stone, perforated PE pipe - May 24, 2012

Edwards Road Landfill Cap Modification - Photographs

Facing North – 40-mil LLDPE liner placed on east slope and across the top of the landfill on north end – May 24, 2012

Facing North – Geocomposite placed above LLDPE liner along west slope and across the top of north end of landfill - May 29, 2012

Edwards Road Landfill Cap Modification - Photographs

Facing South – Geocomposite in place above LLDPE liner on east slope, anchor trench with stone exposed – May 30, 2012

Facing North – Placing cover soil over geocomposite at north end of landfill – May 30, 2012

Edwards Road Landfill Cap Modification - Photographs

Facing North – Installing underdrain in east slope area following removal of approximately 10,000 cy of ash – June 20, 2012

Facing East – Underdrain installation complete – June 20, 2012

Edwards Road Landfill Cap Modification - Photographs

Facing North – 40-mil LLDPE liner installed, geocompoiste installed, cover soils placed, grass beginning to grow – July 9, 2012

Facing North – Cover soils in place with grass growing on north end of landfill – August 20, 2012

Edwards Road Landfill Cap Modification - Photographs

Facing Northeast – 40-mil LLDPE liner and geocomposite installation complete – South end – August 20, 2012

Facing North – Cover soils in place with grass growing on north end of landfill – September 13, 2012

Edwards Road Landfill Cap Modification - Photographs

Facing South – East slope with grass on cover soils – September 13, 2012

Facing South – Cover soils in place with grass growing on south end of landfill – September 13, 2012