Haley Griffith (adpce.ad)

Subject: RE: Georgia-Pacific Consumer Operations - Final Cover CQA Report ePortal Submission ID HQ3-N1CS-02TVF

From: Richard Bennett (adpce.ad) <Richard.Bennett@arkansas.gov>
Sent: Wednesday, August 28, 2024 9:15 AM
To: Ross, Sarah M <Sarah.Ross@GAPAC.com>
Subject: RE: Georgia-Pacific Consumer Operations - Final Cover CQA Report ePortal Submission ID HQ3-N1CS-02TVF

Sent by an external sender

All I need is the Tables missing from CQA Plan (Doc ID 80812), they are not in the file on our website.

From: Ross, Sarah M <Sarah.Ross@gapac.com>
Sent: Wednesday, August 28, 2024 9:12 AM
To: Richard Bennett (adpce.ad) <Richard.Bennett@arkansas.gov>
Subject: RE: Georgia-Pacific Consumer Operations - Final Cover CQA Report ePortal Submission ID HQ3-N1CS-02TVF

MS Outlook is not allowing me upload the 593-page report that is in ePortal. How many pages does the copy you are looking at have?

From: Richard Bennett (adpce.ad) <Richard.Bennett@arkansas.gov>
Sent: Tuesday, August 27, 2024 1:23 PM
To: Ross, Sarah M <Sarah.Ross@gapac.com>
Subject: Georgia-Pacific Consumer Operations - Final Cover CQA Report ePortal Submission ID HQ3-N1CS-02TVF

Sent by an external sender

Ms. Ross I have been looking at the item above and I found the CQA that was used for it (Doc ID 80812) but it appears it is missing the Tables. Can you send them to me? There is a chance they were with submittal but somehow did not get scanned.

Richard Bennett | Engineer, PE
Regulated Waste Operations
Division of Environmental Quality | **Office of Land Resources**
5301 Northshore Drive | North Little Rock, AR 72118
t: 501.682.0861 | e:richard.bennett@adeq.state .ar.us

ARKANSAS ENERGY & ENVIRONMENT

Haley Griffith (adpce.ad)

Subject: RE: Questions about your permit modification for Georgia Pacific

From: Ross, Sarah M <Sarah.Ross@GAPAC.com>
Sent: Wednesday, August 28, 2024 2:21 PM
To: Richard Bennett (adpce.ad) <Richard.Bennett@arkansas.gov>
Subject: FW: Questions about your permit modification for Georgia Pacific

Richard, to follow-up your email and our telephone discussion from this afternoon, the tables were sent separately on October 1, 2021 (please see below).

Sincerely,
Sarah Ross, GP Crossett Env & Compliance Leader
Sarah.Ross@gapac.com or (870) 415-6363

From: Ross, Sarah M
Sent: Friday, October 1, 2021 1:43 PM
To: Bennett, Richard <BENNETT@adeq.state.ar.us>
Subject: RE: Questions about your permit modification for Georgia Pacific

Attached are the CQA Tables. I'm working on your other question. Thanks!

Sincerely,
Sarah Ross, GP Crossett Env & Compliance Leader
Sarah.Ross@gapac.com or (870) 415-6363

From: Bennett, Richard <BENNETT@adeq.state.ar.us>
Sent: Wednesday, September 29, 2021 10:09 AM
To: Ross, Sarah M <Sarah.Ross@GAPAC.com>
Subject: RE: Questions about your permit modification for Georgia Pacific

Sent by an external sender

I do not see any of the tables (Tables 1-5) listed in the table of Contents in the CQA. It appears they were left out. Can you look into this for me?

Richard Bennett | Engineer, PE
Regulated Waste Operations
Division of Environmental Quality | **Office of Land Resources**
5301 Northshore Drive | North Little Rock, AR 72118
t: 501.682.0861 | e:bennett@adeq.state .ar.us

ARKANSAS
ENERGY & ENVIRONMENT

From: Ross, Sarah M [mailto:Sarah.Ross@GAPAC.com]
Sent: Monday, September 20, 2021 1:45 PM
To: Bennett, Richard
Subject: RE: Questions about your permit modification for Georgia Pacific

Yes, we can. I am available all day except for 10am-11am.

Sincerely,
Sarah Ross, GP Crossett Env & Compliance Leader
Sarah.Ross@gapac.com or (870) 415-6363

From: Bennett, Richard <BENNETT@adeq.state.ar.us>
Sent: Monday, September 20, 2021 1:25 PM
To: Ross, Sarah M <Sarah.Ross@GAPAC.com>
Subject: Questions about your permit modification for Georgia Pacific

Sent by an external sender

I am reviewing your permit modification for closing the 3N North Landfill and got a few questions. Can we speak tomorrow about the modification request?

Richard Bennett | Engineer, PE
Regulated Waste Operations
Division of Environmental Quality | Office of Land Resources
5301 Northshore Drive | North Little Rock, AR 72118
t: 501.682.0861 | e:bennett@adeq.state .ar.us

ARKANSAS
ENERGY & ENVIRONMENT

Table 1
Minimum Protective Soil Thickness

Equipment Ground Pressure (psi)	Minimum Lift Thickness (in.)
<= 5	12
5 - 8	18
8 - 16	24
>16	36

Table 1 is based off of EPA technical guidance document from "Quality Assurance and Quality Control for Waste Containment Facilities", EPA/600/R-93/182, dated September 1993, page 167, Table 3.7. Although this facility is also incorporating a geocomposite to protect the geomembrane, this guidance should be followed during construction and operation.

TABLE 2
Pre-construction & Construction Testing of Clay Liner Materials

Test	Method(1)	Testing Frequency	Min. Requirements
Pre-Construction Testing			
Clay Liner and Cover Material			
Soil Classification	ASTM D 2487	1 test per 20,000 yd^3 or change of material or borrow area	CL or CH
Standard Proctor	ASTM D698	1 test per source	Not Applicable
Atterberg Limits	ASTM D4318	1 test per source	P.I. >10
Percent Passing No. 200 Sieve	ASTM D1140 and D 422	1 test per source	90% passing No. 4 sieve and more than 50% passing No. 200 sieve.
Moisture	ASTM D2216	1 test per source	0 to 10% above optimum moisture
Permeability	ASTM D5084	1 test per source; Tests are to be run at a compaction and moisture content that simulates the standards outlined in the technical specifications.	1.0×10^{-7} cm/sec (or slower)
Construction Testing			
Clay Liner and Cover Material			
In-Place Field Density/Moisture	ASTM D6938	12 test per acre per lift of liner placed	95% and 0% to 10% of OMC(2)
Soil Classification	ASTM D2487	1 test per 1,000 yd^3 or change of material or borrow area.	CL or CH
Standard Proctor	ASTM D698	1 test per 5,000 yd^3 or change of material or borrow area.	Not Applicable
Moisture	ASTM D2216	1 test per 1,000 yd^3 or change of material or borrow area.	0 to 10% above optimum moisture
Atterberg Limits	ASTM D4318	1 test per 1,000 yd^3 or change of material or borrow area.	P.I. >10
Percent Passing No. 200 Sieve	ASTM D1140 and D 422	1 test per 1,000 yd^3 or change of material or borrow area.	90% passing No. 4 sieve and more than 50% passing No. 200 sieve.
Permeability	ASTM D5084	1 test per lift per acre	1.0×10^{-7} cm/sec (or slower)

1. Test to be performed according to the latest test method as approved by the certifying engineer.

2. Optimum Moisture Content as determined by ASTM D 698 in Pre-Construction testing

TABLE 3A
40 mil LLDPE Textured MQC Specifications

Resin Manufacturer (1)			
Test	**Method(2)**	**Testing Frequency**	**Min. Requirements (5)**
Density	ASTM D 1505 ASTM 792, Meth B	200,000 lb and per batch	$\geq$ 0.915 g/cm^3
Melt Flow Index	ASTM D 1238 (190°C/2.16 kg)	200,000 lb and per batch	≤ 1.0 g / 10 min.
Manufacturer's Quality Control			
Thickness, nominal	ASTM D 5994	Each Roll	40 mil
Thickness, Min. ave	ASTM D 5994	Each Roll	38 mil
Thickness, lowest indiv. For 8 of 10 spec.	ASTM D 5994	Each Roll	36 mil
Thickness, lowest indiv. For 1 of 10 spec.	ASTM D 5994	Each Roll	34 mil
Asperity Height (Min. ave.) [3]	GRI GM13 ASTM D 7466	Each Roll	16 mil
Density	ASTM D 1505	Per 200,000 lb.	≤ 0.939 g/cm^3
Carbon Black Dispersion [4]	ASTM D 5596	Per 45,000 lb	Category 1 or 2
Carbon Black Content [6]	ASTM D 1603 ASTM D 4218	Per 20,000 lb	2 to 3 %
Tensile Properties:			
Break Strength Elongation	ASTM D 6693 Type IV Dumbbell, 2 ipm G.L. = 2.0 inches	Per 20,000 lb	 60 lb/in 250%
Tear Resistance	ASTM D 1004	Per 45,000 lb	22 lb
Puncture Resistance	ASTM D 4833	Per 45,000 lb	44 lb
Oxidation Induction Time (OIT)			
Standard OIT	ASTM D 3895	200,000 lb and per batch	100 min
High Pressure OIT	ASTM D 5885		400 min
Oven Aging @ 85^{0}C			
Standard OIT	ASTM D 3895	Per each formulation	35%
High Pressure OIT	ASTM D 5885		60%
UV Resistance			
High Pressure OIT	ASTM D 5885	Per each formulation	35%

1. The polyethylene resin from which the geomembrane is made will generally be in the density range of 0.926 g/ml or lower, and have a melt index value per ASTM D1238 of less than 1.0 g/10 min. This refers to the natural, i.e., nonformulated, resin. The resin shall be virgin material with no more than 10% rework. If rework is used, it must be a similar HDPE as the parent material. No post consumer resin (PCR) of any type shall be added to the formulation.

2. Test to be performed according to the latest test method as approved by the certifying engineer.

3. Textured geomembrane shall generally have uniform texturing appearance. It shall be free from agglomerated texturing material and such defects that would affect the specified properties of the geomembrane.

4. Dispersion only applies to near spherical agglomerates. 9 of 10 views shall be Category 1 or 2. No more than 1 view from Category 3.

5. If 40-mil LLDPE smooth is used, it must meet GRI-GM17 standards. Use of smooth geomembrane instead of textured geomembrane must be approved by the certifying engineer.

6. Other methods such as D 4218 (muffle furnace) or microwave methods are acceptable if an appropriate correlation to D 1603 (tube furnace) can be established.

TABLE 3B
40 mil LLDPE Textured Conformance and Field Testing Specifications

Test	Method(1)	Testing Frequency	Min. Requirements
Conformance Testing by CQA Engineer			
Thickness, nominal	ASTM D 5994	1 per 100,000 sf	40 mil
Thickness, Min. ave	ASTM D 5994		38 mil
Thickness, lowest indiv. For 8 of 10 spec.	ASTM D 5994		36 mil
Thickness, lowest indiv. For 1 of 10 spec.	ASTM D 5994		34 mil
Asperity Height (Min. ave.)	GRI GM13 ASTM D 7466	1 per 100,000 sf	16 mil
Density	ASTM D 1505	1 per 100,000 sf	≤ 0.939 g/cm^3
Carbon Black Dispersion [2]	ASTM D 5596	1 per 100,000 sf	Category 1 or 2
Carbon Black Content [3]	ASTM D 1603	1 per 100,000 sf	2 to 3 %
Tensile Properties:			
Break Strength Elongation	ASTM D 6693 Type IV Dumbbell, 2 ipm G.L. = 2.0 inches	1 per 100,000 sf	 60 lb/in 250%
Tear Resistance	ASTM D 1004	1 per 100,000 sf	22 lb
Trial Seams			
Shear	ASTM D 6392 GRI GM 19	Every 5 (five) hours of seaming.	Shear 60 ppi
Peel Fusion[4]			Peel 50 ppi
Peel Extrusion[4]			Peel 44 ppi
Destructive Seam Testing			
Shear	ASTM D 6392 GRI GM 19	1 per 500 linear feet (LF) of seam	Shear 60 ppi
Peel Fusion[4]			Peel 50 ppi
Peel Extrusion[4]			Peel 44 ppi
Shear Elongation at break	GRI GM19	1 per 500 linear feet (LF) of seam	
Fusion [4]			50%
Extrusion [4]			50%
Peel Separation	GRI GM19	1 per 500 linear feet (LF) of seam	
Fusion			25% (max)
Extrusion			25% (max)
Non-destructive Seam Field Testing			
Air Pressure	GRI GM6	Dual track fusion weld seams	Min 30 psi, held for 5 minutes; losing < 4 psi; puncture opposite end after test to check for continuity
Vacuum	ASTM D 4437	Extrusion Seams	4 to 8 psi held for ≥ 10 sec.

1. Test to be performed according to the latest test method as approved by the certifying engineer.

2. Dispersion only applies to near spherical agglomerates. 9 of 10 views shall be Category 1 or 2. No more than 1 view from Category 3.

3. Other methods such as D 4218 (muffle furnace) or microwave methods are acceptable if an appropriate correlation to D 1603 (tube furnace) can be established.

4. Five (5) out of five (5) specimens must meet the requirements for peel, shear, and peel separation. For peel adhesion, seam separation shall not extend more than 25 percent in the same interface. Testing shall be discontinued when the sample has visually yielded a sample. Elongation measurements should be omitted for field testing.

TABLE 4A
60 mil HDPE Textured MQC Specifications

Resin Manufacturer (1)			
Test	**Method(2)**	**Testing Frequency**	**Min. Requirements (5)**
Density	ASTM D 1505 ASTM 792, Meth B	200,000 lb and per batch	≥ 0.932 g/cm^3
Melt Flow Index	ASTM D 1238 (190°C/2.16 kg)	200,000 lb and per batch	≤ 1.0 g / 10 min.
Manufacturer's Quality Control			
Thickness, nominal	ASTM D 5994	Each Roll	60 mil
Thickness, Min. ave	ASTM D 5994	Each Roll	57 mil
Thickness, lowest indiv. For 8 of 10 spec.	ASTM D 5994	Each Roll	54 mil
Thickness, lowest indiv. For 1 of 10 spec.	ASTM D 5994	Each Roll	51 mil
Asperity Height (Min. ave.) [3]	GRI GM13 ASTM D 7466	Each Roll	16 mil
Density	ASTM D 1505	Per 200,000 lb.	≥ 0.94 g/cm^3
Carbon Black Dispersion	ASTM D 5596	Per 45,000 lb	Category 1 or 2
Carbon Black Content [6]	ASTM D 1603 ASTM D 4218	Per 20,000 lb	2 to 3 %
Tensile Properties:			
Break Strength Elongation	ASTM D 6693 Type IV Dumbbell, 2 ipm G.L. = 2.0 inches	Per 20,000 lb	 90 lb/in 100%
Yield Strength Elongation			 126 lb/in 12%
Tear Resistance	ASTM D 1004	Per 45,000 lb	42 lb
Puncture Resistance	ASTM D 4833	Per 45,000 lb	90 lb
Oxidation Induction Time (OIT)			
Standard OIT	ASTM D 3895	200,000 lb and per batch	100 min
High Pressure OIT	ASTM D 5885		400 min
Oven Aging @ 85^{0}C			
Standard OIT	ASTM D 3895	Per each formulation	55%
High Pressure OIT	ASTM D 5885		80%
UV Resistance			
High Pressure OIT	ASTM D 5885	Per each formulation	50%

1. The resin shall be virgin material with no more than 10% rework. If rework is used, it must be a similar HDPE as the parent material. No post consumer resin (PCR) of any type shall be added to the formulation.

2. Test to be performed according to the latest test method as approved by the certifying engineer.

3. Textured geomembrane shall generally have uniform texturing appearance. It shall be free from agglomerated texturing material and such defects that would affect the specified properties of the geomembrane.

4. Dispersion only applies to near spherical agglomerates. 9 of 10 views shall be Category 1 or 2. No more than 1 view from Category 3.

5. If 60-mil HDPE smooth is used, it must meet GRI-GM13 standards. Use of smooth geomembrane instead of textured geomembrane must be approved by the certifying engineer.

6. Other methods such as D 4218 (muffle furnace) or microwave methods are acceptable if an appropriate correlation to D 1603 (tube furnace) can be established.

TABLE 4B
60 mil HDPE Textured Conformance & Field Tesing Specifications

Test	Method(1)	Testing Frequency	Min. Requirements
Conformance Testing by CQA Engineer			
Thickness, nominal	ASTM D 5994	1 per 100,000 sf	60 mil
Thickness, Min. ave	ASTM D 5994		57 mil
Thickness, lowest indiv. For 8 of 10 spec.	ASTM D 5994		54 mil
Thickness, lowest indiv. For 1 of 10 spec.	ASTM D 5994		51 mil
Asperity Height (Min. ave.)	GRI GM13 ASTM D 7466	1 per 100,000 sf	16 mil
Density	ASTM D 1505	1 per 100,000 sf	≥ 0.94 g/cm^3
Carbon Black Dispersion [2]	ASTM D 5596	1 per 100,000 sf	A-1, A-2 or B-1 rating
Carbon Black Content [3]	ASTM D 1603	1 per 100,000 sf	2 to 3 %
Tensile Properties:			
Break Strength Elongation Yield Strength Elongation	ASTM D 6693 Type IV Dumbbell, 2 ipm G.L. = 2.0 inches	1 per 100,000 sf	 90 lb/in 100% 126 lb/in 12%
Tear Resistance	ASTM D 1004	1 per 100,000 sf	42 lb
Trial Seams			
Shear	ASTM D 6392 GRI GM 19	Every 5 (five) hours of seaming.	Shear 120 ppi
Peel Fusion[4]			Peel 91 ppi
Peel Extrusion[4]			Peel 78 ppi
Destructive Seam Testing			
Shear	ASTM D 6392 GRI GM 19	1 per 500 linear feet (LF) of seam	Shear 120 ppi
Peel Fusion[4]			Peel 91 ppi
Peel Extrusion[4]			Peel 78 ppi
Shear Elongation at break	GRI GM19	1 per 500 linear feet (LF) of seam	
Fusion [4]			50%
Extrusion [4]			50%
Peel Separation	GRI GM19	1 per 500 linear feet (LF) of seam	
Fusion			25% (max)
Extrusion			25% (max)
Non-destructive Seam Field Testing			
Air Pressure	GRI GM6	Dual track fusion weld seams	Min 30 psi, held for 5 minutes; losing < 4 psi; puncture opposite end after test to check for continuity
Vacuum	ASTM D 4437	Extrusion Seams	4 to 8 psi held for ≥ 10 sec.

1. Test to be performed according to the latest test method as approved by the certifying engineer.

2. Dispersion only applies to near spherical agglomerates. 9 of 10 views shall be Category 1 or 2. No more than 1 view from Category 3.

3. Other methods such as D 4218 (muffle furnace) or microwave methods are acceptable if an appropriate correlation to D 1603 (tube furnace) can be established.

4. Five (5) out of five (5) specimens must meet the requirements for peel, shear, and peel separation. For peel adhesion, seam separation shall not extend more than 25 percent in the same interface. Testing shall be discontinued when the sample has visually yielded a sample. Elongation measurements should be omitted for field testing.

TABLE 5
Geonet, Geotextile, & Geocomposite MQC & Conformance Testing Specifications

Manufacturer's Quality Control			
Geonet			
Test	**Method (1)**	**Testing Frequency**	**Min. Requirements**
Thickness	ASTM D5199	1/50,000 sf	200±20 mil
Density	ASTM D1505	1/50,000 sf	0.94 g/cm^3
Tensile Strength (2)	ASTM D5035	1/50,000 sf	45 lb/in
Transmissivity (3)	ASTM D4716	1/540,000 sf	2.0 x 10^{-3} m^2/s
Carbon Black Content	ASTM D1603[3]/4218	1/50,000 sf	2%
Geotextile			
Mass per Unit Area	ASTM D 5261	1/90,000 sf	≥8 oz/sq. yd.
Grab Tensile	ASTM D 4632	1/90,000 sf	220 lbs.
Grab Elongation	ASTM D 4632	1/90,000 sf	50%
Trapezoid Tear Strength	ASTM D 4533	1/90,000 sf	90 lbs.
Puncture Strength	ASTM D 4833/6241	1/90,000 sf	120/575 lbs.
Permittivity, T	ASTM D 4491	1/540,000 sf	1.26 Sec^{-1}
AOS (largest opening size)	ASTM D 4751	1/540,000 sf	80 Sieve Size
Geocomposite			
Ply Adhesion	ASTM D 7005	1/50,000 sf	1.0 lb./in (MARV)
Transmissivity (3)	ASTM D 4716	1/540,000 sf	1.0 x 10^{-4} m^2/s
Conformance Testing by CQA Engineer			
Geonet			
Test	**Method**	**Testing Frequency**	**Min. Requirements**
Thickness	ASTM D5199	1/100,000 sf	200±20 mil
Density	ASTM D1505	1/100,000 sf	0.94 g/cm^3
Tensile Strength (1)	ASTM D5035	1/100,000 sf	45 lb/in
Transmissivity (4)	ASTM D4716	1/100,000 sf	2.0 x 10^{-3} m^2/s
Carbon Black Content	ASTM D1603/4218	1/100,000 sf	2%
Geotextile			
Mass per Unit Area	ASTM D 5261	1/100,000 sf	≥8 oz/sq. yd.
Grab Tensile	ASTM D 4632	1/100,000 sf	220 lbs.
Grab Elongation	ASTM D 4632	1/100,000 sf	50%
Puncture Strength	ASTM D 4833/6241	1/100,000 sf	120/575 lbs.
AOS (largest opening size)	ASTM D 4751	1/100,000 sf	80 Sieve Size
Geocomposite			
Ply Adhesion	ASTM D 7005	1/100,000 sf	1.0 lb./in (MARV)
Transmissivity (4)	ASTM D 4716	1/100,000 sf	1.0 x 10^{-4} m^2/s

1. Test to be performed according to the latest test method as approved by the certifying engineer.
2. Machine Direction
3. Measured using water @ 20^{o} C with a gradient of 0.1, between two steel plates, after 15 minutes. Confining pressure 10,000 psf.
4. Transmissivity conformance testing only required on the geonet when the geonet and geotextile are installed separately. If a geocomposite is used, then the transmissivity testing will be performed on the geocomposite material.