NATURAL RESOURCE TECHNOLOGY
ENVIRONMENTAL CONSULTANTS

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Mr. Mark Kelly
Midwest Generation, LLC
Powerton Station
13082 East Manito Road
Pekin, IL 61554

July 21, 2014
(2113.2)

RE: Construction Documentation Transmittal
Secondary Ash Settling Basin Liner Replacement
Midwest Generation Powerton Generation Station

Dear Mr. Kelly:

Natural Resource Technology, Inc. (NRT) has prepared this correspondence to transmit construction record documents for the liner replacement completed in 2013 for the Secondary Ash Settling Basin at the Powerton Station.

Documentation of the major construction components, including field reports, laboratory test results, and documentation drawings are attached to this letter.

Please contact NRT if you have any questions or comments regarding this transmittal.

Sincerely,

NATURAL RESOURCE TECHNOLOGY, INC.

Eric J. Tlachac, PE
Senior Engineer

Joseph R. Ridgway, PE
Environmental Engineer

ATTACHMENTS:

Attachment A: Daily Field Reports
Attachment B: Structural Fill
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ATTACHMENT A

DAILY FIELD REPORTS

FIELD NOTE SUMMARY

Project Number / Task: 2113.2 / 3.2
Project Names: Secondary Ash Settling Basin Liner Replacement

Date:	April 11, 2013
Work Scope:	Dewatering and excavation, subgrade preparation at Secondary Ash Settling Basin
NRT Staff:	Joseph R. Ridgway
Contractors:	Terra Contracting
Weather:	40s and cloudy with intermittent rain
Equipment:	Digital camera

Field Comments:	• Arrive onsite around 08:00, check in at guard shack
	• Met John Roark (for MWG) and Dennis Allred (Terra)
	• Basin was dewatered yesterday, 3 inches of rain fell overnight, continuing dewatering efforts
	  o Using 8" grinder pump in temporary sump at northwestern corner of basin, pumping to Ash Surge Basin
	• Excavating material and floor of basin with long-stick excavator and loading into off-road trucks for staging in Limestone Basin
	• Planning to add fly ash in Secondary Ash Settling from southeastern corner to solidify sludge for excavation
	• Sandy subgrade encountered, some clay along bottom of basin – Joseph confirmed that cohesive material at bottom is not Poz-O-Pac
	• Hypalon liner is being removed as work progresses – it is easily torn by equipment and removal is not challenging
	• 11 rolls of HDPE staged south of former Sand Filter building, all Roll Numbers identified
	• 18 rolls of geotextile at staging area near HDPE
	• Old geotextile rolls present at staging area, confirmed for Terra that old geotextile shouldn't be used
	• Schedule update from Dennis
	  o Finish excavation middle of next week, around 04/17/13
	  o Finish subgrade prep end of next week/early the following week, around 04/19/13 – 04/22/13
	• Joseph participates in meeting with Bill Gaynor (MWG), Mark Kelly (MWG), John Roark (for MWG), various other MWG employees, Craig Wilson (Terra), Jeffrey Brown (Terra) to discuss plans for Ash Surge Basin including construction planning, contracting, and scheduling
	• Offsite around 13:00

Scope Changes:	• Solidification of sludge with fly ash to be tested • Dredged material being stockpiled in Limestone Basin instead of south of weir in Ash Surge Basin

Site Conditions: Very wet after rain event

Signature: JRR
Joseph R. Ridgway, PE

Date: 04/12/13

Southwest-facing view of: excavation activities with long-stick loading off-road truck in center; smaller excavator pushing material towards 8" pump located in the northwest corner (top right); and skid steer assisting with miscellaneous tasks (bottom right)

FIELD NOTE SUMMARY

Project Number / Task: 2113.2 / 3.2
Project Names: Secondary Ash Settling Basin Liner Replacement

Date:	April 17, 2013
Work Scope:	Dewatering and excavation, subgrade preparation at Secondary Ash Settling Basin
NRT Staff:	Joseph R. Ridgway
Contractors:	Terra Contracting
Weather:	40s and cloudy with intermittent rain
Equipment:	Digital camera

Field Comments:	• Arrive onsite around 08:00, check in at guard shack
	• Status update from John Roark (for MWG) and Dennis Allred (Terra)
	• Dewatering continuing to be issue, more rain events at site and groundwater continues to enter basin
	  o Using 8" grinder pump in temporary sump at northwestern corner of basin, pumping to Ash Surge Basin
	• Fly ash solidification is working well, dredging almost complete
	  o Continue to load trucks with long-stick for stockpiling in Limestone Basin
	• Concern about getting dry subgrade
	  o Discuss various options to fix this, including point dewatering system, raising elevation of basin bottom, and waiting for dryer season
	  o To discuss with group
	• Discuss design grade, Joseph clarifies that design bottom to be flat, not sloped like existing conditions
	• Offsite around 12:00

Scope Changes:	Changes not defined yet, but are anticipated to obtain dry subgrade suitable for liner construction
Site Conditions:	Very wet after rain events

Signature: JRR
Joseph R. Ridgway, PE

Date: 04/18/13

FIELD NOTE SUMMARY

Project Number / Task: 2113.2 / 3.2
Project Names: Secondary Ash Settling Basin Liner Replacement

Date:	May 9, 2013
Work Scope:	Dewatering and excavation, subgrade preparation, slope stabilization layer construction
NRT Staff:	Joseph R. Ridgway
Contractors:	Terra Contracting
Weather:	60s and cloudy
Equipment:	Digital camera

Field Comments:	• Arrive onsite around 08:00, check in at guard shack
	• Status update from Dennis Allred (Terra)
	• Constructing riprap stabilization layer on east slope and southeast corner of slope, partially in the wet
	  o Bottom portion of eastern slope excavated, old geotextile placed, riprap layer placed, begin placing additional layer of geotextile on top of riprap
	• Dennis shows various portions of the site impacted by floodwater including flooded overflow area and Old Intake Channel, road/levee that required repair after flooding
	• Discuss geotextile amounts needed for additional drainage and stability layers
	• MWG ordered 500 tons of riprap for stabilization layer, will be more than enough
	• Discuss surveying plan
	  o NRT requests subgrade survey before drainage layer as first survey, and as-built as planned
	  o NRT approved surveying side-chute bottom point during first survey and top point during as-built survey, to account for project sequencing
	• Side-chute will be 2-foot by 4-foot trench with 1-foot piping in it – will allow placement of 6" suction hose which can be upgraded to 8" if needed
	• Sump will be located at southwest corner of basin bottom and will be approximately 15- to 20-foot in circumference and at least 2 feet deep
	• Bottom of drainage layer to slope towards sump in southwest corner of basin
	• Terra using 2-foot overlap of geotextile, no seeming/welding
	• Schedule update:
	  o Finish slope on 05/10/13
	  o Dewatering basin from 05/13/13 to 05/15/13 – will continue dewatering efforts to maintain levels below basin bottom
	  o Re-grade basin bottom for drainage layer construction from 05/15/13 to 05/22/13

	○ Start sump construction on 05/22/13 and have Survey performed ○ Drainage layer construction – geotextile, drain tile, stone, geotextile, and cushion material placement, and compaction – from 05/22/13 to 06/05/13 ○ HDPE liner construction on 06/05/13 or the following week of 06/10/13 – depends on CAAW ○ Leak detection survey the following week of 06/17/13 • Offsite around 11:30
Scope Changes:	• Slope stabilization layer • Side-chute and sump • Drainage layer
Site Conditions:	Very wet

Signature: JRR _____ Date: 05/10/13

Joseph R. Ridgway, PE

Northeastern view of slope stabilization layer construction along eastern slope

Northwestern view of high water mark on northern slope of Old Intake Channel, west of Secondary Ash Settling Basin

FIELD NOTE SUMMARY

Project Number / Task: 2113.2 / 3.2
Project Names: Secondary Ash Settling Basin Liner Replacement

Date:	May 22, 2013
Work Scope:	Dewatering and excavation, subgrade preparation, slope stabilization layer construction
NRT Staff:	Joseph R. Ridgway
Contractors:	Terra Contracting
Weather:	60s and cloudy with intermittent rain early, clear skies and 70s later
Equipment:	Digital camera

Field Comments:	• Arrive onsite around 07:45, check in at guard shack
	• Status update from Dennis Allred (Terra)
	• Finishing construction of riprap stabilization layer around entire basin except access points at center of northern slope and the southwest corner slope
	  o Northern access point to allow removal and loading of material into off-road trucks without negative impacts to riprap layer
	  o Southwestern access point to allow dewatering to continue until drainage layer partially finished
	• Temporary benching in place from west to central portion of northern slope to grant long-stick excavator access to slope to facilitate dredging/excavation
	• Dewatering with 6" pump from temporary sump in southwest corner of basin
	• Digging ~1-ft trench along entire slope bottom to facilitate draining water from riprap layer to sump, will backfill with stone
	• Basin bottom excavated to ~439' on west side and ~440' on east side,
	  o Will be checked by surveyor
	  o Sloped towards sump to enhance drainage
	  o Bottom elevation to ensure that, with drainage layer, 18-ft basin depth can be maintained
	  o Thicker drainage and cushion layer to be placed along western portion of basin, transitioning to less thick layers on eastern portion
	• Placing geotextile and soil (not cushion material) at northeastern corner of basin to allow vehicular access to basin – will be covered with cushion for subgrade
	• Excavating sump in southwest portion of basin bottom
	• Surveyor to establish control points today and perform survey of subgrade tomorrow (05/23/13)
	• Survey will include re-graded, sloped basin bottom, completed riprap stabilization layer; will not include upper portions of slopes – access point areas will be surveyed as planned riprap layers and photos will

	document actual riprap layer for those portions • Drain tile and side chute materials onsite, staged to the southeast of Secondary Ash Settling Basin • Stone material for drainage layer and materials for Ash Surge Basin onsite and staged to the southeast of Ash Surge Basin • Additional off-road truck mobilized to site as Terra plans to bring another crew to continue dredging efforts at Ash Surge Basin • Schedule update: o Drainage layer construction: will start placing bottom geotextile, tile, and stone this week and early next week; to be followed by additional geotextile and cushion material placement and compaction o Complete drainage layer/subgrade two weeks from Friday (06/07/13) o CAAW to complete geotextile placement and HDPE liner construction the following week of 06/10/13 o Leak detection survey the following week of 06/17/13 • Offsite around 11:30
Scope Changes:	• Riprap stabilization layer will not be completed in access areas until subgrade survey has been completed and drainage layer construction has begun • Drainage trench to be constructed along base of slope to facilitate drainage of water that enters through the riprap stabilization layer
Site Conditions:	Very wet after rain event

Signature: JRR _____ Date: 05/23/13

Joseph R. Ridgway, PE

Northeaster view of benched northern slope, northern access point, 6" dewatering pump, and southern access point at the Secondary Ash Settling Basin, facing northeast.

Northern view of: construction of access ramp at northeastern corner of basin; riprap stabilization layer one east slope; and beginnings of slope base drainage trench along eastern and southern slopes

FIELD NOTE SUMMARY

Project Number / Task: 2113.2 / 3.2
Project Name: Secondary Ash Settling Basin Liner Replacement

Date:	May 30, 2013
Work Scope:	Drainage layer construction and subgrade preparation
NRT Staff:	Joseph R. Ridgway, Edwards Effiong
Contractors:	Terra Contracting
Weather:	80s and clear skies with rain forecasted
Equipment:	Digital camera

Field Comments:	• Joseph onsite around 08:00
	• Edwards onsite around 08:30.
	• Tailgate meeting with Joseph Ridgway on general site safety, including stepwise review of the H&S plan
	• Check in at guard shack
	• Status update from Dennis Allred (Terra)
	• Construction of drainage and cushion layers ongoing from east to west
	• Dewatering continuing with 6" pump from sump in southwest corner of basin
	• Placing geotextile on riprap layer along eastern slope for cushion placement
	• Vacuum excavation to expose potential underground utilities in southwest portion of basin, in conjunction with construction of side chute – no utilities identified
	• Discuss Ash Surge Basin specs with Dennis, Rich Anson (Terra), and Ricky Burnett (Terra)
	  o Plans to create temporary access roads to provide adequate cushion for rubber-tired machinery working on the HDPE liner – road to provide a minimum of 3 feet of cushion above liner
	  o Confirm that Poz-o-Pac is to remain in place except along side slopes and near weir
	  o Terra suggested adding cement to the warning layer to form an more stable layer for future dredging activities – Terra to provide cost estimate
	• Discuss project schedule and updates with Mark Kelly and Bill Gaynor
	• Offsite around 12:30

Scope Changes:	• There are concerns of the basin slope deviating from the 3H:1V technical specifications – NRT to review and provide feedback to Terra
Site Conditions:	Site in good condition, rain anticipated

Signature: ETE _____ Date: 05/30/13

Edwards Effiong

View of drainage layer progress on west side of basin with: subgrade, geotextile, and some drain tile on left; stone drainage layer in middle; and additional geotextile layer and cushion material on right

View of geotextile placement above riprap stabilization layer on eastern slope

View of ongoing trench vacuum excavation for side-chute

FIELD NOTE SUMMARY

Project Number / Task: 2113.2 / 3.2
Project Name: Secondary Ash Settling Basin Liner Replacement

Date:	June 6, 2013
Work Scope:	Inspect subgrade
NRT Staff:	Ryan J. Baeten & Erin C. Berns
Contractors:	Terra Contracting
Weather:	High 70s and sunny with rain in the morning
Equipment:	Digital Camera

Field Comments:	• Arrive onsite around 11:00 AM, check in at guard shack
	• Received status update from Dennis Allred (Terra)
	• Discussed with Dennis the following:
	  o Riprap to be placed around the structures, placed over 16 oz/sy nonwoven geotextile on top of the geomembrane (specifications only call for riprap to be installed around the inlet structure, however, the drawing sheets do not indicate the placement extents)
	  o Anchor trench drawings lack width dimensions so Terra plans to construct the trench to be 1-foot wide
	  o Flattening the slope between the circular concrete overflow structure at north end of west slope up to the anchor trench
	  o Depth of water in pond for liner integrity survey (need to coordinate with leak location services - specs currently at 1 ft). The grounding effects of the service water recycle discharge structure should specifically be considered because the inlet invert elevation is at the same elevation at the pond floor. Standing water in contact with the concrete structure will allow current to flow above and below the geomembrane (essentially acting as a very large "hole") greatly reducing the effectiveness of the equipment to detect leaks.
	• Contractor Personnel: 7 operators, 2 laborers, 1 superintendent, 1 foreman, 1 administrative
	• Observations made:
	  o Sand placed over entire pond subgrade
	  o Crest of slope needs to be covered with sand subgrade material, currently has stones on surface (Terra plans to complete before Monday)
	  o Anchor trench will need to be constructed around structures (monitoring well on top of north slope, power pole on top of south slope, and building on west slope) Plans show the power pole penetrating the liner.
	• Geotextile roll inventory:
	  o Total rolls present: 88
	  o Missing from bill of lading: 8 (used on subgrade underdrain)

	○ Rolls used to construct subgrade drain: 03, 06, 31, 37, 40, 45, 51, and 70 (truncated roll numbers used, full numbers in the form of "29606.__") ○ Terra anticipates additional geotextile to be delivered next week for the primary ash settling basin. • 12:30 PM - Updated Joseph on subbase inspection and discussed timing for Monday's training • 12:30 PM - Terra began work to reshaped the top of west slope and sand around outlet structure on west side of south slope • 1:15 PM - Whitney and Associates technician arrived on site to density test the pipe backfill soil (sand) ○ Two tests on first lift, both greater than 96% compaction ○ Second lift near the toe 97.2% compaction ○ Second lift near the top 96.4% compaction • 2:00 PM - RJB and ECB offsite
Scope Changes:	• Batten strip on pump slab instead of anchor trench due to lack of equipment access and presence of grounding wires on the pond side of the slab.
Site Conditions:	Dry due to pumping of water from underdrain

Signature: RJB _____ Date: 06/06/13

Ryan Baeten, PE

FIELD NOTE SUMMARY

Project Number / Task: 2113.2 / 3.2
Project Name: Secondary Ash Settling Basin Liner Replacement

Date:	June 10, 2013
Work Scope:	Liner construction preparation
NRT Staff:	Joseph Ridgway, Edwards Effiong, Ryan Baeten
Contractors:	Terra Contracting
Weather:	70s and clear skies
Equipment:	Digital camera
Field Comments:	• Edwards and Ryan onsite around 0725 • Joseph onsite around 08:30 • Contractor safety orientation meeting at 0800, CAAW employees, Ryan, and Edwards in attendance • Check in at guard shack • Joseph holds tailgate H&S meeting on plant emergency communications and general site H&S • Status update from John Roark (for MWG) • Some water accumulated in basin over the weekend due to pump failure • Basin dried by dewatering with 6" pump from sump • CAAW filled sandbags for use during liner construction • 42 rolls of geotextile delivered at 1330 • NRT gave approval for Terra to begin digging anchor trench; NRT verified trench depth approximately 3ft • Terra did a confirmation bottom survey of the basin – basin depth greater than 18 feet at all locations • Approximate basin area measured; 91,000 ft^2 • NRT offsite around 1628 • NRT approves digging anchor trench ahead of liner construction activities
Scope Changes:	None
Site Conditions:	Site in good condition, very dusty

Signature: ETE
Edwards Effiong

Date: 06/10/13

Western view of anchor trench excavation on top of south slope

Southeastern view of the basin

FIELD NOTE SUMMARY

Project Number / Task: 2113.2 / 3.3
Project Name: Secondary Ash Settling Basin Liner Replacement

Date:	June 11, 2013
Work Scope:	Liner construction
NRT Staff:	Joseph R. Ridgway, Edwards Effiong, Ryan Baeten
Contractors:	Terra Contracting
Weather:	Low 60s increased to 70s, clear skies, mid-day rain
Equipment:	Digital camera, Measuring Tape

Field Comments:	• Arrive onsite at 0630
	• Joseph holds tailgate H&S meeting on traffic observation in tight working area
	• John Roark (for MWG) requests clarification on Leak Location Contractor's checklist; Ryan provides information
	• Joseph discusses potential difficulties with construction activities around pump platform with John Roark; John to coordinate relocation of temporary scaffolding from area
	• Dewatering continues with 6" pump from under-drain sump
	• NRT measured total length of anchor trench accomplished Monday; 426 ft were completed
	• Concrete-encased utilities encountered in anchor trench along center of north slope; minor adjustment of anchor trench needed; NRT approves
	• Grounding wires encountered near pump platform
	• Placing geotextile commenced at 0720 working from west to east of the basin
	• Discuss solution for wet slope on the east side of the Recycle Discharge Structure with Terra; plan to remove wet sand, attempt to fix drainage, and replace cushion sand
	• Discuss plan to use batten strip along pump platform
	• 18 rolls of geotextile were used before break at noon
	  o First geotextile of the day was a partial roll with no serial number
	  o NRT kept material tracking including serial numbers
	• Brief rain at 1300
	• Work is called off at 1320 due to lightening; CAAW call off work for the day, in anticipation of more rain
	• Offsite around 1413

Scope Changes:	Batten bar to be used to connect liner to pump platform

Site Conditions:	Site in good condition

Signature: ETE
Edwards Effiong

Date: 06/11/13

CAAW begins deployment of geotextile

CAAW placing geotextile in the anchor trench

Heat bonding the geotextile panel seams

Northern view of placed geotextile at end of day

FIELD NOTE SUMMARY

Project Number / Task: 2113.2 / 3.2
Project Name: Secondary Ash Settling Basin Liner Replacement

Date:	June 12, 2013
Work Scope:	Geosynthetics installation
NRT Staff:	Joseph Ridgway, Edwards Effiong, Ryan Baeten
Contractors:	Terra Contracting
Weather:	90s and clear skies
Equipment:	Digital camera, measuring tape, caliper
Field Comments:	• Arrive onsite at 0630 • Joseph holds tailgate H&S meeting with focus on heat stress • Terra replaced wet material and regarded slope at southeastern corner of Recycle Discharge Structure – no additional groundwater discharge observed at that location • 8 rolls of HDPE used today with first placement starting at 0717 and the last at 1445 o 44 panels cut, placed, and welded between 0717 and 1503 • NRT monitors and documents liner installation activities including panel placement, seam welding, non-destructive testing, trial weld testing (see documentation forms) • Thong (CAAW) requests approval to use 4-wheeled ATVs to deploy HDPE liner from west to east along basin bottom – NRT approves with the understanding that no vehicles are allowed on HDPE liner and vehicles operated slowly and carefully • Dewatering continues with 6" pump from under-drain sump • Offsite around 1640
Scope Changes:	None
Site Conditions:	Site in good condition

Signature: ETE
Edwards Effiong

Date: 06/12/13

Deployment of HDPE liner on southern slope (looking southeast)

Fusion welding HDPE panel seams (looking south)

Overview of the basin at the end of day (looking west)

FIELD NOTE SUMMARY

Project Number / Task: 2113.2 / 3.2
Project Name: Secondary Ash Settling Basin Liner Replacement

Date:	June 13, 2013
Work Scope:	Geosynthetics installation
NRT Staff:	Joseph Ridgway, Edwards Effiong, Ryan Baeten
Contractors:	Terra Contracting
Weather:	80s and clear skies
Equipment:	Digital camera, measuring tape, caliper
Field Comments:	• Arrived onsite at 0630 • Joseph holds tailgate H&S meeting with focus on slips, trips, and falls • CAAW continues panel deployment, fusion welding, and non-destructive testing and begins extrusion welding • 6 rolls of HDPE used – entire basin covered with HDPE • NRT monitors and documents liner installation activities including panel placement, seam welding, non-destructive testing, trial weld testing (see documentation forms) • Dewatering continues with 6" pump from under-drain sump • Offsite around 1730
Scope Changes:	None
Site Conditions:	Site in good condition

Signature: ETE
Edwards Effiong

Date: 06/13/13

Non-destructive air testing of fusion welds

Extrusion welding patch over a repair location

View of the basin at the end of day (looking northeast)

FIELD NOTE SUMMARY

Project Number / Task: 2113.2 / 3.2
Project Name: Secondary Ash Settling Basin Liner Replacement

Date:	June 14, 2013
Work Scope:	Geosynthetics installation
NRT Staff:	Joseph Ridgway, Edwards Effiong
Contractors:	Terra Contracting
Weather:	80s and clear skies
Equipment:	Digital camera, measuring tape, caliper
Field Comments:	• Arrived onsite 0630 • Joseph holds tailgate H&S meeting with focus on sores and cuts, and sun exposure/burns • CAAW continues fusion welding, non-destructive testing, extrusion welding, and work around structures • NRT monitors and documents liner installation activities including seam welding, non-destructive testing, trial weld testing • CAAW questions inclusion of upslope portion HDPE abrasion liner at Inlet Structure – Joseph confirms specifications and directs field team to include as specified • Dewatering continues with 6" pump from under-drain sump • Electrical leak location survey completed on the floor of the basin – no leaks detected • Joseph offsite around 1600 • Edwards offsite around 2030
Scope Changes:	None
Site Conditions:	Site in good condition

Signature: ETE
Edwards Effiong

Date: 06/14/13

Leak location survey along bottom of basin

Vacuum testing on extrusion welds

Basin overflow/discharge structure liner attachment – two offset clamps used, extrusion weld (spark tested)

FIELD NOTE SUMMARY

Project Number / Task: 2113.2 / 3.2
Project Name: Secondary Ash Settling Basin Liner Replacement

Date:	June 15, 2013
Work Scope:	Liner construction
NRT Staff:	Edwards Effiong
Contractors:	Terra Contracting
Weather:	70s and cloudy, slight early morning thunderstorm
Equipment:	Digital camera, measuring tape, caliper
Field Comments:	• Arrive onsite at 0515 • Leak test started on the basin walls at 0549, completed 0730 – no leaks detected • All repairs completed around the structures • Vacuum and spark tests conducted on repair locations • All inspection and work completed at 1130 • Dewatering continues with 6" pump from under-drain sump • Offsite around 1200
Scope Changes:	None
Site Conditions:	Site in good condition.

Signature: ETE _____ Date: 06/15/13

Edwards Effiong

Batten strip attachment to structure (looking southeast)

Spark testing on extrusion welds at structure (looking southwest)

Leak location test being performed on basin slopes (looking east)

Batten strip attachment to pump pad structure (looking southeast)

ATTACHMENT B

STRUCTURAL FILL

TELEPHONE
309-673-2131

TESTS * INVESTIGATIONS
ANALYSIS * DESIGN * EVALUATIONS
CONSULTATION * REPORTS * INSPECTIONS
ARBITRATION * EXPERT WITNESS TESTIMONY
SOILS * PORTLAND CEMENT CONCRETE
BITUMINOUS CONCRETE * STEEL
ASPHALT * AGGREGATES * EMULSIONS
POZOLANIC MATERIALS * LIME

WHITNEY & ASSOCIATES
INCORPORATED
2406 West Nebraska Avenue
PEORIA, ILLINOIS 61604

TELEFAX
309-673-3050

GEOTECHNICAL ENGINEERING
CONSTRUCTION QUALITY CONTROL
SUBSURFACE EXPLORATIONS
ENVIROMENTAL INVESTIGATIONS
MONITORING WELL INSTALLATIONS
BUILT-UP ROOF INVESTIGATIONS
WELDER CERTIFICATIONS
INSURANCE INVESTIGATIONS

CLIENT:
Mr. Dennis Allred
Terra Contracting Services, LLC
5787 Stadium Drive
Kalamazoo, Michigan 49009

W. & A. FILE NO 6373001
DATE 06/06/13

PROJECT:
Midwest Generation Powerton
Power Station - Secondary Ash
Settling Basin Liner Replacement
Pekin, Illinois PO #P224825

REPORT OF FIELD COMPACTION OBSERVATIONS AND TESTS

METHOD OF TEST: Nuclear Method

CONSTRUCTION OBSERVER: Donald M. Hanley

TEST NO.	DATE	TEST LOCATION	ELEV	PROCTOR NUMBER	FIELD CONDITIONS		STANDARD CONDITIONS		PERCENT COMPACTION	COMMENTS*
					IN PLACE MOISTURE	IN PLACE DRY DENSITY	OPTIMUM MOISTURE	MAXIMUM DRY DENSITY		
01	06/06/13	See Plan Sheet	455.0	1	3.3	107.1	9.4	110.7	96.8	A
02	06/06/13	See Plan Sheet	450.0	1	3.5	106.2	9.4	110.7	95.9	A
03	06/06/13	See Plan Sheet	445.0	1	2.4	107.5	9.4	110.7	97.7	A
04	06/06/13	See Plan Sheet	453.0	1	2.9	106.7	9.4	110.7	96.4	A

REMARKS:
SPECIFICATION REQUIREMENTS: 90% of ASTM D-698

All tests were performed on the trench backfill for the secondary ash settling basin. All elevations were estimated as no surveying equipment was available by the contractor during this site visit.

Elevation Reference: Bottom Basin Elevation 440.0

DISTRIBUTION:

NOTES:

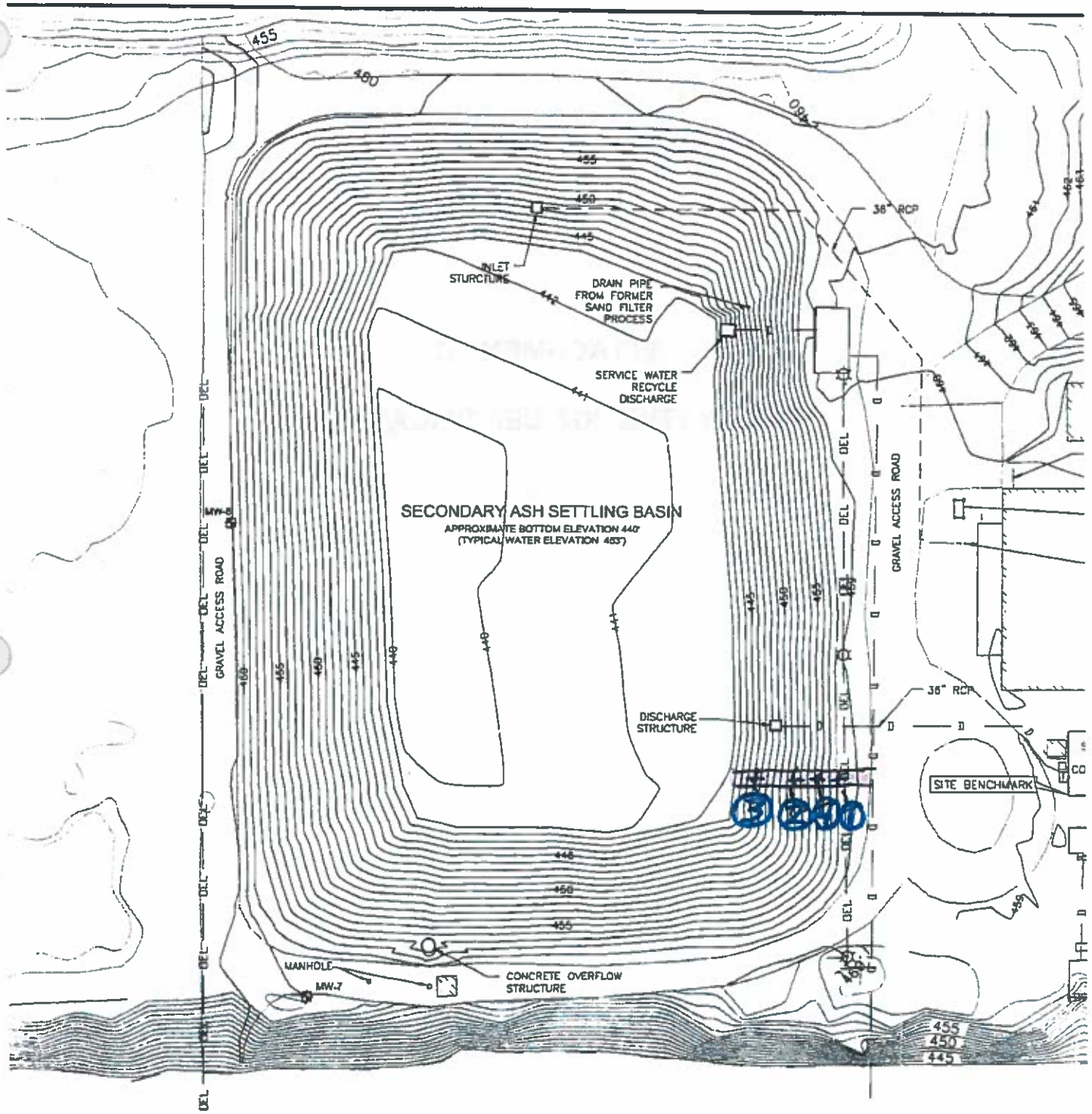
MOISTURE CONTENTS RECORDED ARE PERCENT OF DRY WEIGHT

DRY DENSITIES RECORDED ARE EXPRESSED IN POUNDS PER CUBIC FOOT.

*A. TEST RESULTS COMPLY WITH SPECIFICATIONS
B. RECOMPACTION IS REQUIRED
C. CHECK TEST PERFORMED AFTER RECOMPACTION.

THESE TEST RESULTS REPRESENT THE MATERIAL CONDITIONS ONLY AT THE DESIGNATED TEST LOCATIONS AND ELEVATIONS INDICATED AND DO NOT REFLECT THE OVERALL SITE CONDITIONS WHICH EXIST BEYOND THE LIMITS OF THESE SPECIFIC TEST LOCATIONS AND ELEVATIONS.

Respectfully submitted,
WHITNEY & ASSOCIATES



6-6-13

O- Compaction Test Locations

TRENCH

REVISION:	DATE:
2. ISSUED FOR CONSTRUCTION	03/12/13
1. ISSUED FOR BID	12/12/12
0. ISSUED FOR PERMIT	12/22/08

MWG13-15_34194

ATTACHMENT C

GEOSYNTHETICS CERTIFICATIONS

ATTACHMENT C1

GEOMEMBRANE CERTIFICATION

GSE Roll Allocation

Order 60728
Customer Clean Air and Water Systems, LLC
Site MWG-Powerton Station Metal Cleaning

Roll#	Resin Lot	Product Code	Description	Mfg. Date	Length
103176435	8290673	HDT-060AE-WBB-B-00	HDT060A010	12/13/2009	520
103176439	8290673	HDT-060AE-WBB-B-00	HDT060A010	12/13/2009	520
103176440	8290673	HDT-060AE-WBB-B-00	HDT060A010	12/14/2009	520
103176442	8290673	HDT-060AE-WBB-B-00	HDT060A010	12/14/2009	520
103176443	8290673	HDT-060AE-WBB-B-00	HDT060A010	12/14/2009	520
103176444	8290673	HDT-060AE-WBB-B-00	HDT060A010	12/14/2009	520
~~103176445~~	~~8290673~~	~~HDT-060AE-WBB-B-00~~	~~HDT060A010~~	~~12/14/2009~~	~~520~~
~~103176446~~	~~8290673~~	~~HDT-060AE-WBB-B-00~~	~~HDT060A010~~	~~12/14/2009~~	~~520~~
~~103176448~~	~~8290673~~	~~HDT-060AE-WBB-B-00~~	~~HDT060A010~~	~~12/14/2009~~	~~520~~
~~103176449~~	~~8290673~~	~~HDT-060AE-WBB-B-00~~	~~HDT060A010~~	~~12/14/2009~~	~~520~~
~~103176450~~	~~8290673~~	~~HDT-060AE-WBB-B-00~~	~~HDT060A010~~	~~12/14/2009~~	~~520~~
~~103176451~~	~~8290673~~	~~HDT-060AE-WBB-B-00~~	~~HDT060A010~~	~~12/14/2009~~	~~520~~
~~103176452~~	~~8290673~~	~~HDT-060AE-WBB-B-00~~	~~HDT060A010~~	~~12/14/2009~~	~~520~~
103176453	8290673	HDT-060AE-WBB-B-00	HDT060A010	12/14/2009	520
103176454	8290673	HDT-060AE-WBB-B-00	HDT060A010	12/14/2009	520
103176455	8290673	HDT-060AE-WBB-B-00	HDT060A010	12/14/2009	520
103176456	8290673	HDT-060AE-WBB-B-00	HDT060A010	12/15/2009	520

Note:
The highlighted Rolls were installed in the Secondary Ash Settling Basin in 2013. Crossed-off Rolls were installed in the Metal Cleaning Basin in 2009.

GSE Lining Technology, Inc

Roll Test Data Report

Sales Order No.	Project Number	Customer Name	Project Location	Product Name	Report Date
60728		Clean Air and Water Systems, LLC	Pekin, IL	HDT-060AE-WBB-B-00	12/15/2009

GSE QC APPROVED

	ASTM D 5994		ASTM D638,Type IV / D6693								ASTM D 1004		ASTM D 4833	ASTM D 1505	ASTM D 4218/1603	ASTM D 5596	GRI GM 12	
	Average Thickness	Minimum Thickness	TD Strength @ Yield	MD Strength @ Yield	TD Strength @ Break	MD Strength @ Break	TD Elongation @ Yield	MD Elongation @ Yield	TD Elongation @ Break	MD Elongation @ Break	TD Tear Resistance	MD Tear Resistance	Puncture Resistance	Density	Carbon Black Content	Carbon Black Dispersion	Asperity Height Side A	Asperity Height Side B
	(mils)	(mils)	(ppi)	(ppi)	(ppi)	(ppi)	(%)	(%)	(%)	(%)	(lbs)	(lbs)	(lbs)	(g/cc)	(%)	Views in Cat1 - Cat2	(mils)	(mils)
Roll No.	every roll		every 4th								every 4th		every 4th	every 4th	every 4th	every 4th	every 2nd	
103176435	61	59	156	156	202	233	16	18	575	610	54	56	148	0.945	2.26	10	23	21
103176439	61	59	157	155	205	212	15	18	584	609	55	57	149	0.945	2.26	10	23	21
103176440	61	59	157	155	205	212	15	18	584	609	55	57	149	0.945	2.26	10	23	21
103176442	61	58	132	134	203	226	18	19	648	675	49	52	138	0.945	2.66	10	23	20
103176443	61	57	132	134	203	226	18	19	648	675	49	52	138	0.945	2.66	10	23	21
103176444	61	57	132	134	203	226	18	19	648	675	49	52	138	0.945	2.66	10	23	21
~~103176445~~	~~61~~	~~56~~	~~132~~	~~134~~	~~203~~	~~226~~	~~18~~	~~19~~	~~648~~	~~675~~	~~49~~	~~52~~	~~138~~	~~0.945~~	~~2.66~~	~~10~~	~~22~~	~~21~~
~~103176446~~	~~61~~	~~56~~	~~150~~	~~150~~	~~223~~	~~218~~	~~18~~	~~19~~	~~605~~	~~555~~	~~54~~	~~57~~	~~145~~	~~0.945~~	~~2.79~~	~~10~~	~~22~~	~~21~~
~~103176448~~	~~61~~	~~56~~	~~150~~	~~150~~	~~223~~	~~218~~	~~18~~	~~19~~	~~605~~	~~555~~	~~54~~	~~57~~	~~145~~	~~0.945~~	~~2.79~~	~~10~~	~~21~~	~~22~~
~~103176449~~	~~61~~	~~56~~	~~150~~	~~150~~	~~223~~	~~218~~	~~18~~	~~19~~	~~605~~	~~555~~	~~54~~	~~57~~	~~145~~	~~0.945~~	~~2.79~~	~~10~~	~~22~~	~~23~~
~~103176450~~	~~61~~	~~56~~	~~151~~	~~142~~	~~208~~	~~226~~	~~18~~	~~20~~	~~567~~	~~581~~	~~52~~	~~55~~	~~149~~	~~0.945~~	~~2.70~~	~~10~~	~~22~~	~~23~~
~~103176451~~	~~61~~	~~59~~	~~151~~	~~142~~	~~208~~	~~226~~	~~18~~	~~20~~	~~567~~	~~581~~	~~52~~	~~55~~	~~149~~	~~0.945~~	~~2.70~~	~~10~~	~~21~~	~~21~~
~~103176452~~	~~61~~	~~58~~	~~151~~	~~142~~	~~208~~	~~226~~	~~18~~	~~20~~	~~567~~	~~581~~	~~52~~	~~55~~	~~149~~	~~0.945~~	~~2.70~~	~~10~~	~~21~~	~~21~~
103176453	61	59	151	142	208	226	18	20	567	581	52	55	149	0.945	2.70	10	20	20
103176454	61	59	144	144	202	237	16	18	579	630	52	54	146	0.945	2.31	10	20	20
103176455	61	58	144	144	202	237	16	18	579	630	52	54	146	0.945	2.31	10	21	22
103176456	61	58	144	144	202	237	16	18	579	630	52	54	146	0.945	2.31	10	21	22

Laboratory Manager: Joel Allen

GSE-8.2.4-029 Rev – 03/05

19103 Gundle Road - Houston, Texas 77073

MWG13-15_34198

Report Date
1/17/2011

Quality Assurance Laboratory Test Results

Job Name: MWG - Powerton Station Metal Cleaning Basin
Sales Order: 60728

Required Testing: ASTM D 5397 - Standard Test Method for Evaluation of Stress Crack Resistance of Polyolefin Geomembranes Using Notched Constant Tensile Load Test

Custom Frequency: 1/Resin Lot

Custom Criteria: 1000 hours

Product Code	Resin Lot Number	Test Results
HDT-060AE-WBB-B-00	8290673	PASS

Approved By:	Debra Gortemiller
Date Approved:	December 15, 2009

Report Date
1/17/2011

Quality Assurance Laboratory Test Results

Job Name: MWG - Powerton Station Metal Cleaning Basin
Sales Order: 60728

Required Testing: ASTM D 3895 – Standard Test Method for Oxidative Induction Time of Polyolefins by Differential Scanning Calorimetry

Custom Frequency: 1/200,000 lbs.

Custom Criteria: 140 Minutes

Product Code	Resin Lot Number	Test Results
HDT-060AE-WBB-B-00	8290673	PASS

Approved By:	Debra Gortemiller
Date Approved:	December 15, 2009

Report Date
1/17/2011

Quality Assurance Laboratory Test Results

Job Name: MWG - Powerton Station Metal Cleaning Basin
SO Number: 60728

The table below summarizes additive performance of GSE Houston products as perceived by OIT retention after Oven and UV Aging per GRI Test Method GM13:

		Oven Aging @ 85° C (ASTM D 5721)				UV Resistance per GRI GM11			
		90 days per ASTM D 5885				1600 hours UV Aging per ASTM D 5885			
Product Type	**Formulation**	Initial HP OIT (min)	Final HP OIT (min)	Retained (%)	GRI Criteria (%)	Initial HP OIT (min)	Final HP OIT (min)	Retained (%)	GRI Criteria (%)
HDPE Geomembrane	Chevron Phillips Marlex® K306 + Carbon Black	697	661	94	80	697	565	81	50

Approved By: Debra Gortemiller
Date: December 15, 2009

CoA Date: 10/27/2009

Certificate of Analysis

Shipped To: CHEVRON PHILLIPS CHEM. CO LP: GSE
19103 GUNDLE ROAD
WESTFIELD TX 77090
USA

Recipient: UP TRACK 14732 Phouangsavanh
Fax:

CPC Delivery #: 87945749
PO #: 46822
Weight: 188300 LB
Ship Date: 10/27/2009
Package: BULK
Mode: Hopper Car
Car #: GOCX058228
Seal No: 270565

Product:
MARLEX POLYETHYLENE K306 BULK

Lot Number: 8290673

Property	Test Method	Value	Unit
Melt Index	ASTM D1238	0.1	g/10mi
HLMI Flow Rate	ASTM D1238	12.1	g/10mi
Density	D1505 or D4883	0.937	g/cm3
Production Date		09/01/2009	

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.

Troy Griffin
Quality Systems Coordinator

For CoA questions contact Customer Service Representative at 800-231-1212

MWG13-15_34202

ATTACHMENT C2

GEOTEXTILE CERTIFICATION

SKAPS Industries (Nonwoven Division)
335, Athena Drive
Athens, GA 30601 (U.S.A.)
Phone (706) 354-3700 Fax (706) 354-3737
E-mail: info@skaps.com

Sales Office:
Engineered Synthetic Product Inc.
Phone: (770)564-1857
Fax: (770)564-1818

May 24, 2013
Clean Air & Water Systems
123 Elem Street, P.O. Box 337
Dousman, WI 53118
Ref : Midwest Generation / Powerton Generating Station
PO : 1023-13

Dear Sir/Madam:

This is to certify that SKAPS GE116 is a high quality needle-punched nonwoven geotextile made of 100% polypropylene staple fibers, randomly networked to form a high strength dimensionally stable fabric. SKAPS GE116 resists ultraviolet deterioration, rotting, biological degradation. The fabric is inert to commonly encountered soil chemicals. Polypropylene is stable within a pH range of 2 to 13. SKAPS GE116 conforms to the property values listed below:

PROPERTY	TEST METHOD	UNITS	M.A.R.V. Minimum Average Roll Value
Weight	ASTM D 5261	oz/sy (g/m^2)	16.00 (543)
Grab Tensile	ASTM D 4632	lbs (kN)	425 (1.89)
Grab Elongation	ASTM D 4632	%	50
Trapezoidal Tear	ASTM D 4533	lbs (kN)	150 (0.67)
CBR Puncture	ASTM D 6241	lbs (kN)	1200 (5.34)
Permittivity*	ASTM D 4491	sec^{-1}	0.57
Permeability*	ASTM D 4491	cm/sec	0.25
Water Flow*	ASTM D 4491	gpm/ft^2($l/min/m^2$)	45 (1834)
AOS*	ASTM D 4751	US Sieve (mm)	100 (0.15)
UV Resistance	ASTM D 4355	%/hrs	70/500

Notes:
* At the time of manufacturing. Handling may change these properties.

PALAK PATEL
QUALITY CONTROL MANAGER

Product : GE116-180

ROLL # ASTM METHOD UNITS TARGET	WEIGHT D5261 oz/sq yd 16.00	MD TENSILE D4632 lbs. 425	MD ELONG D4632 % 50	XMD TENSILE D4632 lbs 425	XMD ELONG D4632 % 50	MD TRAP D4533 lbs. 150	XMD TRAP D4533 lbs 150	CBR PUNCTURE D6241 lbs. 1200	AOS D4751 US Sieve 100	WATER FLOW D4491 gpm/ft^2 45	PERMEAB-ILITY D4491 cm/sec 0.25	PERMITT-IVITY D4491 sec^{-1} 0.57
29606.001	16.65	436	78	459	89	157	169	1232	100	47	0.29	0.63
29606.002	16.65	436	78	459	89	157	169	1232	100	47	0.29	0.63
29606.003	16.65	436	78	459	89	157	169	1232	100	47	0.29	0.63
29606.004	16.65	436	78	459	89	157	169	1232	100	47	0.29	0.63
29606.005	16.13	431	72	453	81	157	169	1232	100	47	0.29	0.63
29606.006	16.13	431	72	453	81	157	169	1232	100	47	0.29	0.63
29606.007	16.13	431	72	453	81	157	169	1232	100	47	0.29	0.63
29606.008	16.13	431	72	453	81	157	169	1232	100	47	0.29	0.63
29606.009	16.13	431	72	453	81	157	169	1232	100	47	0.29	0.63
29606.010	16.57	439	76	461	87	151	163	1206	100	47	0.29	0.63
29606.011	16.57	439	76	461	87	151	163	1206	100	47	0.29	0.63
29606.012	16.57	439	76	461	87	151	163	1206	100	47	0.29	0.63
29606.013	16.57	439	76	461	87	151	163	1206	100	47	0.29	0.63
29606.014	16.57	439	76	461	87	151	163	1206	100	47	0.29	0.63
29606.015	16.30	433	74	455	83	151	163	1206	100	47	0.29	0.63
29606.016	16.30	433	74	455	83	151	163	1206	100	47	0.29	0.63
29606.017	16.30	433	74	455	83	151	163	1206	100	47	0.29	0.63
29606.018	16.30	433	74	455	83	151	163	1206	100	47	0.29	0.63
29606.019	16.30	433	74	455	83	151	163	1206	100	47	0.29	0.63
29606.020	16.43	437	79	458	90	159	166	1227	100	47	0.29	0.63
29606.021	16.43	437	79	458	90	159	166	1227	100	47	0.29	0.63
29606.022	16.43	437	79	458	90	159	166	1227	100	47	0.29	0.63
29606.023	16.43	437	79	458	90	159	166	1227	100	47	0.29	0.63
29606.024	16.43	437	79	458	90	159	166	1227	100	47	0.29	0.63
29606.025	16.34	435	71	450	80	159	166	1227	100	47	0.29	0.63
29606.026	16.34	435	71	450	80	159	166	1227	100	47	0.29	0.63
29606.027	16.34	435	71	450	80	159	166	1227	100	47	0.29	0.63
29606.028	16.34	435	71	450	80	159	166	1227	100	47	0.29	0.63
29606.029	16.34	435	71	450	80	159	166	1227	100	47	0.29	0.63
29606.030	16.51	440	77	463	86	154	161	1211	100	47	0.29	0.63
29606.031	16.51	440	77	463	86	154	161	1211	100	47	0.29	0.63
29606.032	16.51	440	77	463	86	154	161	1211	100	47	0.29	0.63
29606.033	16.51	440	77	463	86	154	161	1211	100	47	0.29	0.63
29606.034	16.51	440	77	463	86	154	161	1211	100	47	0.29	0.63
29606.035	16.14	432	73	456	82	154	161	1211	100	47	0.29	0.63

MWG13-15_34205

*All values are MARV.

Product : GE116-180

ROLL # ASTM METHOD UNITS TARGET	WEIGHT D5261 oz/sq yd 16.00	MD TENSILE D4632 lbs. 425	MD ELONG D4632 % 50	XMD TENSILE D4632 lbs 425	XMD ELONG D4632 % 50	MD TRAP D4533 lbs. 150	XMD TRAP D4533 lbs 150	CBR PUNCTURE D6241 lbs. 1200	AOS D4751 US Sieve 100	WATER FLOW D4491 gpm/ft^2 45	PERMEAB-ILITY D4491 cm/sec 0.25	PERMITT-IVITY D4491 sec^{-1} 0.57
29606.036	16.14	432	73	456	82	154	161	1211	100	47	0.29	0.63
29606.037	16.14	432	73	456	82	154	161	1211	100	47	0.29	0.63
29606.038	16.14	432	73	456	82	154	161	1211	100	47	0.29	0.63
29606.039	16.14	432	73	456	82	154	161	1211	100	47	0.29	0.63
29606.040	16.56	438	80	465	88	156	170	1230	100	47	0.29	0.63
29606.041	16.56	438	80	465	88	156	170	1230	100	47	0.29	0.63
29606.042	16.56	438	80	465	88	156	170	1230	100	47	0.29	0.63
29606.043	16.56	438	80	465	88	156	170	1230	100	47	0.29	0.63
29606.044	16.56	438	80	465	88	156	170	1230	100	47	0.29	0.63
29606.045	16.21	430	70	454	84	156	170	1230	100	47	0.29	0.63
29606.046	16.21	430	70	454	84	156	170	1230	100	47	0.29	0.63
29606.047	16.21	430	70	454	84	156	170	1230	100	47	0.29	0.63
29606.048	16.21	430	70	454	84	156	170	1230	100	47	0.29	0.63
29606.049	16.21	430	70	454	84	156	170	1230	100	47	0.29	0.63
29606.050	16.48	436	76	460	90	152	164	1209	100	46	0.28	0.61
29606.051	16.48	436	76	460	90	152	164	1209	100	46	0.28	0.61
29606.052	16.48	436	76	460	90	152	164	1209	100	46	0.28	0.61
29606.053	16.48	436	76	460	90	152	164	1209	100	46	0.28	0.61
29606.054	16.48	436	76	460	90	152	164	1209	100	46	0.28	0.61
29606.055	16.19	434	72	452	81	152	164	1209	100	46	0.28	0.61
29606.056	16.19	434	72	452	81	152	164	1209	100	46	0.28	0.61
29606.057	16.19	434	72	452	81	152	164	1209	100	46	0.28	0.61
29606.058	16.19	434	72	452	81	152	164	1209	100	46	0.28	0.61
29606.059	16.19	434	72	452	81	152	164	1209	100	46	0.28	0.61
29606.060	16.42	439	78	458	87	160	168	1238	100	46	0.28	0.61
29606.061	16.42	439	78	458	87	160	168	1238	100	46	0.28	0.61
29606.062	16.42	439	78	458	87	160	168	1238	100	46	0.28	0.61
29606.063	16.42	439	78	458	87	160	168	1238	100	46	0.28	0.61
29606.064	16.42	439	78	458	87	160	168	1238	100	46	0.28	0.61
29606.065	16.33	431	74	450	83	160	168	1238	100	46	0.28	0.61
29606.066	16.33	431	74	450	83	160	168	1238	100	46	0.28	0.61
29606.067	16.33	431	74	450	83	160	168	1238	100	46	0.28	0.61
29606.068	16.33	431	74	450	83	160	168	1238	100	46	0.28	0.61
29606.069	16.33	431	74	450	83	160	168	1238	100	46	0.28	0.61
29606.070	16.50	437	80	462	89	150	162	1214	100	46	0.28	0.61

*All values are MARV.

MWG13-15_34206

Product : GE116-180

ROLL # ASTM METHOD UNITS TARGET	WEIGHT D5261 oz/sq yd 16.00	MD TENSILE D4632 lbs. 425	MD ELONG D4632 % 50	XMD TENSILE D4632 lbs 425	XMD ELONG D4632 % 50	MD TRAP D4533 lbs. 150	XMD TRAP D4533 lbs 150	CBR PUNCTURE D6241 lbs. 1200	AOS D4751 US Sieve 100	WATER FLOW D4491 gpm/ft^2 45	PERMEAB-ILITY D4491 cm/sec 0.25	PERMITT-IVITY D4491 sec^{-1} 0.57
29606.071	16.50	437	80	462	89	150	162	1214	100	46	0.28	0.61
29606.072	16.50	437	80	462	89	150	162	1214	100	46	0.28	0.61
29606.073	16.50	437	80	462	89	150	162	1214	100	46	0.28	0.61
29606.074	16.50	437	80	462	89	150	162	1214	100	46	0.28	0.61
29606.075	16.28	435	71	457	80	150	162	1214	100	46	0.28	0.61
29606.076	16.28	435	71	457	80	150	162	1214	100	46	0.28	0.61
29606.077	16.28	435	71	457	80	150	162	1214	100	46	0.28	0.61
29606.078	16.28	435	71	457	80	150	162	1214	100	46	0.28	0.61
29606.079	16.28	435	71	457	80	150	162	1214	100	46	0.28	0.61
29606.080	16.59	440	77	465	86	158	166	1234	100	46	0.28	0.61
29606.081	16.59	440	77	465	86	158	166	1234	100	46	0.28	0.61
29606.082	16.59	440	77	465	86	158	166	1234	100	46	0.28	0.61
29606.083	16.59	440	77	465	86	158	166	1234	100	46	0.28	0.61
29606.084	16.59	440	77	465	86	158	166	1234	100	46	0.28	0.61
29606.085	16.32	432	75	453	82	158	166	1234	100	46	0.28	0.61
29606.086	16.32	432	75	453	82	158	166	1234	100	46	0.28	0.61
29606.087	16.32	432	75	453	82	158	166	1234	100	46	0.28	0.61
29606.088	16.32	432	75	453	82	158	166	1234	100	46	0.28	0.61
29606.089	16.32	432	75	453	82	158	166	1234	100	46	0.28	0.61
29606.090	16.53	436	79	461	90	153	160	1211	100	46	0.28	0.61
29606.091	16.53	436	79	461	90	153	160	1211	100	46	0.28	0.61
29606.092	16.53	436	79	461	90	153	160	1211	100	46	0.28	0.61
29606.093	16.53	436	79	461	90	153	160	1211	100	46	0.28	0.61
29606.094	16.53	436	79	461	90	153	160	1211	100	46	0.28	0.61
29606.095	16.18	434	73	451	85	153	160	1211	100	46	0.28	0.61
29606.096	16.18	434	73	451	85	153	160	1211	100	46	0.28	0.61
29606.097	16.18	434	73	451	85	153	160	1211	100	46	0.28	0.61
29606.098	16.18	434	73	451	85	153	160	1211	100	46	0.28	0.61
29606.099	16.18	434	73	451	85	153	160	1211	100	46	0.28	0.61
29606.100	16.44	439	76	463	88	156	169	1221	100	48	0.29	0.64
29606.101	16.44	439	76	463	88	156	169	1221	100	48	0.29	0.64
29606.102	16.44	439	76	463	88	156	169	1221	100	48	0.29	0.64
29606.103	16.44	439	76	463	88	156	169	1221	100	48	0.29	0.64
29606.104	16.44	439	76	463	88	156	169	1221	100	48	0.29	0.64
29606.105	16.15	430	70	454	81	156	169	1221	100	48	0.29	0.64

MWG13-15_34207

*All values are MARV.

Product : GE116-180

ROLL # ASTM METHOD UNITS TARGET	WEIGHT D5261 oz/sq yd 16.00	MD TENSILE D4632 lbs. 425	MD ELONG D4632 % 50	XMD TENSILE D4632 lbs 425	XMD ELONG D4632 % 50	MD TRAP D4533 lbs. 150	XMD TRAP D4533 lbs 150	CBR PUNCTURE D6241 lbs. 1200	AOS D4751 US Sieve 100	WATER FLOW D4491 gpm/ft^2 45	PERMEAB-ILITY D4491 cm/sec 0.25	PERMITT-IVITY D4491 sec^{-1} 0.57
29606.106	16.15	430	70	454	81	156	169	1221	100	48	0.29	0.64
29606.107	16.15	430	70	454	81	156	169	1221	100	48	0.29	0.64
29606.108	16.15	430	70	454	81	156	169	1221	100	48	0.29	0.64
29606.109	16.15	430	70	454	81	156	169	1221	100	48	0.29	0.64
29606.110	16.59	437	78	460	86	151	165	1217	100	48	0.29	0.64
29606.111	16.59	437	78	460	86	151	165	1217	100	48	0.29	0.64
29606.112	16.59	437	78	460	86	151	165	1217	100	48	0.29	0.64
29606.113	16.59	437	78	460	86	151	165	1217	100	48	0.29	0.64
29606.114	16.59	437	78	460	86	151	165	1217	100	48	0.29	0.64
29606.115	16.10	432	72	452	84	151	165	1217	100	48	0.29	0.64
29606.116	16.10	432	72	452	84	151	165	1217	100	48	0.29	0.64
29606.117	16.10	432	72	452	84	151	165	1217	100	48	0.29	0.64
29606.118	16.10	432	72	452	84	151	165	1217	100	48	0.29	0.64
29606.119	16.10	432	72	452	84	151	165	1217	100	48	0.29	0.64
29606.120	16.67	440	80	464	89	159	167	1235	100	48	0.29	0.64
29606.121	16.67	440	80	464	89	159	167	1235	100	48	0.29	0.64
29606.122	16.67	440	80	464	89	159	167	1235	100	48	0.29	0.64
29606.123	16.67	440	80	464	89	159	167	1235	100	48	0.29	0.64
29606.124	16.67	440	80	464	89	159	167	1235	100	48	0.29	0.64
29606.125	16.14	435	74	455	82	159	167	1235	100	48	0.29	0.64
29606.126	16.14	435	74	455	82	159	167	1235	100	48	0.29	0.64
29606.127	16.14	435	74	455	82	159	167	1235	100	48	0.29	0.64
29606.128	16.14	435	74	455	82	159	167	1235	100	48	0.29	0.64
29606.129	16.14	435	74	455	82	159	167	1235	100	48	0.29	0.64
29606.130	16.69	438	77	459	87	155	160	1210	100	48	0.29	0.64
29606.131	16.69	438	77	459	87	155	160	1210	100	48	0.29	0.64
29606.132	16.69	438	77	459	87	155	160	1210	100	48	0.29	0.64
29606.133	16.69	438	77	459	87	155	160	1210	100	48	0.29	0.64
29606.134	16.69	438	77	459	87	155	160	1210	100	48	0.29	0.64
29606.135	16.11	431	71	453	80	155	160	1210	100	48	0.29	0.64
29606.136	16.11	431	71	453	80	155	160	1210	100	48	0.29	0.64
29606.137	16.11	431	71	453	80	155	160	1210	100	48	0.29	0.64
29606.138	16.11	431	71	453	80	155	160	1210	100	48	0.29	0.64
29606.139	16.11	431	71	453	80	155	160	1210	100	48	0.29	0.64
29606.140	16.41	436	79	461	90	157	170	1230	100	48	0.29	0.64

*All values are MARV.

MWG13-15_34208

Product : GE116-180

ROLL # ASTM METHOD UNITS TARGET	WEIGHT D5261 oz/sq yd 16.00	MD TENSILE D4632 lbs. 425	MD ELONG D4632 % 50	XMD TENSILE D4632 lbs 425	XMD ELONG D4632 % 50	MD TRAP D4533 lbs. 150	XMD TRAP D4533 lbs 150	CBR PUNCTURE D6241 lbs. 1200	AOS D4751 US Sieve 100	WATER FLOW D4491 gpm/ft^2 45	PERMEAB-ILITY D4491 cm/sec 0.25	PERMITT-IVITY D4491 sec^{-1} 0.57
29606.141	16.41	436	79	461	90	157	170	1230	100	48	0.29	0.64
29606.142	16.41	436	79	461	90	157	170	1230	100	48	0.29	0.64
29606.143	16.41	436	79	461	90	157	170	1230	100	48	0.29	0.64
29606.144	16.41	436	79	461	90	157	170	1230	100	48	0.29	0.64
29606.145	16.37	433	73	457	83	157	170	1230	100	48	0.29	0.64
29606.146	16.37	433	73	457	83	157	170	1230	100	48	0.29	0.64
29606.147	16.37	433	73	457	83	157	170	1230	100	48	0.29	0.64
29606.148	16.37	433	73	457	83	157	170	1230	100	48	0.29	0.64
29606.149	16.37	433	73	457	83	157	170	1230	100	48	0.29	0.64
29606.150	16.54	439	76	463	86	150	162	1215	100	46	0.29	0.62
29606.151	16.54	439	76	463	86	150	162	1215	100	46	0.29	0.62
29606.152	16.54	439	76	463	86	150	162	1215	100	46	0.29	0.62
29606.153	16.54	439	76	463	86	150	162	1215	100	46	0.29	0.62
29606.154	16.54	439	76	463	86	150	162	1215	100	46	0.29	0.62
29606.155	16.32	430	70	450	81	150	162	1215	100	46	0.29	0.62
29606.156	16.32	430	70	450	81	150	162	1215	100	46	0.29	0.62
29606.157	16.32	430	70	450	81	150	162	1215	100	46	0.29	0.62
29606.158	16.32	430	70	450	81	150	162	1215	100	46	0.29	0.62
29606.159	16.32	430	70	450	81	150	162	1215	100	46	0.29	0.62
29606.160	16.52	437	78	458	88	160	168	1224	100	46	0.29	0.62
29606.161	16.52	437	78	458	88	160	168	1224	100	46	0.29	0.62
29606.162	16.52	437	78	458	88	160	168	1224	100	46	0.29	0.62
29606.163	16.52	437	78	458	88	160	168	1224	100	46	0.29	0.62
29606.164	16.52	437	78	458	88	160	168	1224	100	46	0.29	0.62
29606.165	16.29	432	75	452	84	160	168	1224	100	46	0.29	0.62
29606.166	16.29	432	75	452	84	160	168	1224	100	46	0.29	0.62
29606.167	16.29	432	75	452	84	160	168	1224	100	46	0.29	0.62
29606.168	16.29	432	75	452	84	160	168	1224	100	46	0.29	0.62
29606.169	16.29	432	75	452	84	160	168	1224	100	46	0.29	0.62
29606.170	16.60	440	80	460	90	152	164	1213	100	46	0.29	0.62
29606.171	16.60	440	80	460	90	152	164	1213	100	46	0.29	0.62
29606.172	16.60	440	80	460	90	152	164	1213	100	46	0.29	0.62
29606.173	16.60	440	80	460	90	152	164	1213	100	46	0.29	0.62
29606.174	16.60	440	80	460	90	152	164	1213	100	46	0.29	0.62
29606.175	16.17	435	72	454	82	152	164	1213	100	46	0.29	0.62

MWG13-15_34209

*All values are MARV.

Product : GE116-180

ROLL # ASTM METHOD UNITS TARGET	WEIGHT D5261 oz/sq yd 16.00	MD TENSILE D4632 lbs. 425	MD ELONG D4632 % 50	XMD TENSILE D4632 lbs 425	XMD ELONG D4632 % 50	MD TRAP D4533 lbs. 150	XMD TRAP D4533 lbs 150	CBR PUNCTURE D6241 lbs. 1200	AOS D4751 US Sieve 100	WATER FLOW D4491 gpm/ft^2 45	PERMEAB-ILITY D4491 cm/sec 0.25	PERMITT-IVITY D4491 sec^{-1} 0.57
29606.176	16.17	435	72	454	82	152	164	1213	100	46	0.29	0.62
29606.177	16.17	435	72	454	82	152	164	1213	100	46	0.29	0.62
29606.178	16.17	435	72	454	82	152	164	1213	100	46	0.29	0.62
29606.179	16.17	435	72	454	82	152	164	1213	100	46	0.29	0.62
29606.180	16.63	438	77	465	87	158	166	1233	100	46	0.29	0.62
29606.181	16.63	438	77	465	87	158	166	1233	100	46	0.29	0.62
29606.182	16.63	438	77	465	87	158	166	1233	100	46	0.29	0.62
29606.183	16.63	438	77	465	87	158	166	1233	100	46	0.29	0.62
29606.184	16.63	438	77	465	87	158	166	1233	100	46	0.29	0.62
29606.185	16.12	433	74	451	80	158	166	1233	100	46	0.29	0.62
29606.186	16.12	433	74	451	80	158	166	1233	100	46	0.29	0.62

*All values are MARV.

ATTACHMENT D

GEOSYNTHETICS INSTALLER SUBMITTALS

ATTACHMENT D1

FIELD TENSIOMETER CALIBRATION

Demtech Services, Inc.

Placerville, California, USA

CALIBRATION CERTIFICATE

Clean Air and Water

Tensiometer Model: Pro-Tester T-0100

Device Calibrated: S-Type load cell
Range: 0 - 750 lbs. Tension
Model No: M2405-750#
Serial No: 668204

Calibration Apparatus:
Pro-Cal unit, model TC-0100/A

A/D Module Model No: T-029
A/D Module Serial No: 2911668204
Channel No: N/A

Dead Weight:

W1	2
W2	152
W3	302

Reference Cell:

R1	2
R2	152
R3	302

Indicator reading with no load: 0

Offset: 2.675813 Scale: 3.178533

Applied Force lbs.	Cell Response:	Deviation Error:
2	2	0.00
52	52	0.00
102	102	0.00
152	152	0.00
202	202	0.00
252	252	0.00
302	302	0.00

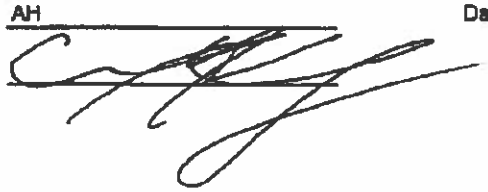
Total Deviation Error (%): 0.00%

Temperature at time of calibration: 73 degrees F
Exitation Voltage: 5 V DC

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

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

AH Date: 06/05/13



MWG13-15_34213

Demtech Services, Inc.

Placerville, California, USA

CALIBRATION CERTIFICATE

Clean Air and Water

Tensiometer Model: Pro-Tester T-0100

Device Calibrated: S-Type load cell
Range: 0 - 750 lbs. Tension
Model No: M2405-750#
Serial No: **681558**

Calibration Apparatus:
Pro-Cal unit, model TC-0100/A

A/D Module Model No: T-029
A/D Module Serial No: 2212681558
Channel No: N/A

Dead Weight:

W1	2
W2	152
W3	302

Reference Cell:

R1	2
R2	152
R3	302

Indicator reading with no load: 0

Offset: **1.624357** Scale: **3.179799**

Applied Force lbs.	Cell Response:	Deviation Error:
2	2	0.00
52	52	0.00
102	102	0.00
152	152	0.00
202	202	0.00
252	252	0.00
302	302	0.00

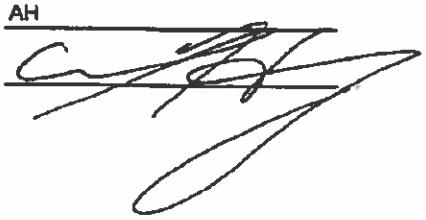
Total Deviation Error (%): 0.00%

Temperature at time of calibration: 73 degrees F
Exitation Voltage: 5 V DC

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

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

AH



Date: 06/05/13

MWG13-15_34214

ATTACHMENT D2

INSTALLER CREW RESUMES

RESUME FOR: Thong Ingels

Thong has been a Superintendent in the flexible membrane liner industry for >20 years. Below is his combined total square footage of flexible membrane liners installed under his management.

EXPERIENCE: Combined Square Footage: >100,000,000

LININGS INSTALLED: HDPE, LLDPE, Polypropylene, Hypalon, PVC, Geonet, Composites, Geosynthetic Clay, Geotextiles and XR-5.

TYPES OF PROJECTS: Heap Leach Pads, Landfills, Ponds, Landfill Caps, Secondary Containment Structures, Underliners and Methane Barriers.

EQUIPMENT KNOWLEDGE: Has extensive knowledge in maintaining and/or operating the following equipment:

- Wedge Welder
- Extrusion Welder
- Sewing Machines
- Tensiometer

TRAINING:

- CPR/First Aid Certified – American Heart Association Heartsaver Course
- 40 Hour HAZMAT - OSHA 29 CFR1910.120 & 1926.65
- OSHA 8 hour refresher (annual)
- 40 Hour MSHA Training
- Hertz Heavy Equipment Training

FIELD RESUME FOR: Sengratana Sengsay

Sengratana's main duty for CAAW Systems, LLC is as Quality Control Technician, and has been in the Flexible Membrane Liner industry for over 10 years. Below is his combined total square footage of Flexible Membrane Liners installed, this number may not include previous employment square footage.

EXPERIENCE: Combined Square Footage: >10,000,000

LININGS INSTALLED: HDPE, LLDPE, Polypropylene, Hypalon, PVC, Geonet, Composites, Geosynthetic Clay, Geotextiles and XR-5.

TYPES OF PROJECTS: Heap Leach Pads, Landfills, Ponds, Landfill Caps, Secondary Containment Structures, Underliners and Methane Barriers.

EQUIPMENT KNOWLEDGE: Has extensive knowledge in maintaining and/or operating the following equipment:

- Wedge Welder
- Extrusion Welder
- Sewing Machines
- Tensiometer

TRAINING:

- In-Field QC Training
- 40 Hr HAZMAT - OSHA 20CFR1910.120

FIELD RESUME FOR: Pheth Vongphrachanh

Pheth's main duty for CAAW Systems, LLC is as a Technician, and has been in the Flexible Membrane Liner industry for over 10 years. Below is his combined total square footage of Flexible Membrane Liners installed, this number may not include previous employment square footage.

EXPERIENCE: Combined Square Footage: >10,000,000

LININGS INSTALLED: HDPE, LLDPE, Polypropylene, Hypalon, PVC, Geonet, Composites, Geosynthetic Clay, Geotextiles and XR-5.

TYPES OF PROJECTS: Heap Leach Pads, Landfills, Ponds, Landfill Caps, Secondary Containment Structures, Underliners and Methane Barriers.

EQUIPMENT KNOWLEDGE: Has extensive knowledge in maintaining and/or operating the following equipment:

- Wedge Welder
- Extrusion Welder
- Sewing Machines
- Tensiometer

TRAINING:

- In-Field Training
- 40 Hr HAZMAT - OSHA 20CFR1910.120

FIELD RESUME FOR: So Khanthavong

So's main duty for CAAW Systems, LLC is as a Technician, and has been in the Flexible Membrane Liner industry for over 10 years. Below is his combined total square footage of Flexible Membrane Liners installed, this number may not include previous employment square footage.

EXPERIENCE: Combined Square Footage: >10,000,000

LININGS INSTALLED: HDPE, LLDPE, Polypropylene, Hypalon, PVC, Geonet, Composites, Geosynthetic Clay, Geotextiles and XR-5.

TYPES OF PROJECTS: Heap Leach Pads, Landfills, Ponds, Landfill Caps, Secondary Containment Structures, Underliners and Methane Barriers.

EQUIPMENT KNOWLEDGE: Has extensive knowledge in maintaining and/or operating the following equipment:

- Wedge Welder
- Extrusion Welder
- Sewing Machines
- Tensiometer

TRAINING:

- In-Field Training
- 40 Hr HAZMAT - OSHA 20CFR1910.120

FIELD RESUME FOR: Phouvanh Xaysana

Phouvanh's main duty for CAAW Systems, LLC is as a Technician, and has been in the Flexible Membrane Liner industry for over 10 years. Below is his combined total square footage of Flexible Membrane Liners installed, this number may not include previous employment square footage.

EXPERIENCE: Combined Square Footage: >10,000,000

LININGS INSTALLED: HDPE, LLDPE, Polypropylene, Hypalon, PVC, Geonet, Composites, Geosynthetic Clay, Geotextiles and XR-5.

TYPES OF PROJECTS: Heap Leach Pads, Landfills, Ponds, Landfill Caps, Secondary Containment Structures, Underliners and Methane Barriers.

EQUIPMENT KNOWLEDGE: Has extensive knowledge in maintaining and/or operating the following equipment:

- Wedge Welder
- Extrusion Welder
- Sewing Machines
- Tensiometer

TRAINING:

- In-Field Training
- 40 Hr HAZMAT - OSHA 20CFR1910.120

123 Elm Street • Dousman, WI 53118 • 262-965-4366 • Fax: 262-965-4369
www.caawsystems.com

FIELD RESUME FOR: Khammy Kounnorath

Khammy's main duty for CAAW Systems, LLC is as a Technician, and has been in the Flexible Membrane Liner industry for over 10 years. Below is his combined total square footage of Flexible Membrane Liners installed, this number may not include previous employment square footage.

EXPERIENCE: Combined Square Footage: >10,000,000

LININGS INSTALLED: HDPE, LLDPE, Polypropylene, Hypalon, PVC, Geonet, Composites, Geosynthetic Clay, Geotextiles and XR-5.

TYPES OF PROJECTS: Heap Leach Pads, Landfills, Ponds, Landfill Caps, Secondary Containment Structures, Underliners and Methane Barriers.

EQUIPMENT KNOWLEDGE: Has extensive knowledge in maintaining and/or operating the following equipment:

- Wedge Welder
- Extrusion Welder
- Sewing Machines
- Tensiometer

TRAINING:

- In-Field Training
- 40 Hr HAZMAT - OSHA 20CFR1910.120

FIELD RESUME FOR: Heum NLN

Heum's main duty for CAAW Systems, LLC is as a Technician, and has been in the Flexible Membrane Liner industry for over 10 years. Below is his combined total square footage of Flexible Membrane Liners installed, this number may not include previous employment square footage.

EXPERIENCE: Combined Square Footage: >10,000,000

LININGS INSTALLED: HDPE, LLDPE, Polypropylene, Hypalon, PVC, Geonet, Composites, Geosynthetic Clay, Geotextiles and XR-5.

TYPES OF PROJECTS: Heap Leach Pads, Landfills, Ponds, Landfill Caps, Secondary Containment Structures, Underliners and Methane Barriers.

EQUIPMENT KNOWLEDGE: Has extensive knowledge in maintaining and/or operating the following equipment:

- Wedge Welder
- Extrusion Welder
- Sewing Machines
- Tensiometer

TRAINING:

- In-Field Training
- 40 Hr HAZMAT - OSHA 20CFR1910.120

FIELD RESUME FOR: Ketsana Vongphanchan

Ketsana's main duty for CAAW Systems, LLC is as a Technician, and has been in the Flexible Membrane Liner industry for over 10 years. Below is his combined total square footage of Flexible Membrane Liners installed, this number may not include previous employment square footage.

EXPERIENCE: Combined Square Footage: >10,000,000

LININGS INSTALLED: HDPE, LLDPE, Polypropylene, Hypalon, PVC, Geonet, Composites, Geosynthetic Clay, Geotextiles and XR-5.

TYPES OF PROJECTS: Heap Leach Pads, Landfills, Ponds, Landfill Caps, Secondary Containment Structures, Underliners and Methane Barriers.

EQUIPMENT KNOWLEDGE: Has extensive knowledge in maintaining and/or operating the following equipment:

- Wedge Welder
- Extrusion Welder
- Sewing Machines
- Tensiometer

TRAINING:

- In-Field Training
- 40 Hr HAZMAT - OSHA 20CFR1910.120

FIELD RESUME FOR: Moon Kala

Moon's main duty for CAAW Systems, LLC is as a Technician, and has been in the Flexible Membrane Liner industry for over 10 years. Below is his combined total square footage of Flexible Membrane Liners installed, this number may not include previous employment square footage.

EXPERIENCE: Combined Square Footage: >10,000,000

LININGS INSTALLED: HDPE, LLDPE, Polypropylene, Hypalon, PVC, Geonet, Composites, Geosynthetic Clay, Geotextiles and XR-5.

TYPES OF PROJECTS: Heap Leach Pads, Landfills, Ponds, Landfill Caps, Secondary Containment Structures, Underliners and Methane Barriers.

EQUIPMENT KNOWLEDGE: Has extensive knowledge in maintaining and/or operating the following equipment:

- Wedge Welder
- Extrusion Welder
- Sewing Machines
- Tensiometer

TRAINING:

- In-Field Training
- 40 Hr HAZMAT - OSHA 20CFR1910.120

FIELD RESUME FOR: Bounloth Lounnarath

Bounloth's main duty for CAAW Systems, LLC is as a Technician, and has been in the Flexible Membrane Liner industry for over 10 years. Below is her combined total square footage of Flexible Membrane Liners installed, this number may not include previous employment square footage.

EXPERIENCE: Combined Square Footage: >10,000,000

LININGS INSTALLED: HDPE, LLDPE, Polypropylene, Hypalon, PVC, Geonet, Composites, Geosynthetic Clay, Geotextiles and XR-5.

TYPES OF PROJECTS: Heap Leach Pads, Landfills, Ponds, Landfill Caps, Secondary Containment Structures, Underliners and Methane Barriers.

EQUIPMENT KNOWLEDGE: Has extensive knowledge in maintaining and/or operating the following equipment:

- Wedge Welder
- Extrusion Welder
- Sewing Machines
- Tensiometer

TRAINING:

- In-Field QC Training
- 40 Hr HAZMAT - OSHA 20CFR1910.120

FIELD RESUME FOR: Detphongsone Outhaaphay

Detphongsone's main duty for CAAW Systems, LLC is as a Technician, and has been in the Flexible Membrane Liner industry for over 10 years. Below is her combined total square footage of Flexible Membrane Liners installed, this number may not include previous employment square footage.

EXPERIENCE: Combined Square Footage: >10,000,000

LININGS INSTALLED: HDPE, LLDPE, Polypropylene, Hypalon, PVC, Geonet, Composites, Geosynthetic Clay, Geotextiles and XR-5.

TYPES OF PROJECTS: Heap Leach Pads, Landfills, Ponds, Landfill Caps, Secondary Containment Structures, Underliners and Methane Barriers.

EQUIPMENT KNOWLEDGE: Has extensive knowledge in maintaining and/or operating the following equipment:

- Wedge Welder
- Extrusion Welder
- Sewing Machines
- Tensiometer

TRAINING:

- In-Field QC Training
- 40 Hr HAZMAT - OSHA 20CFR1910.120

ATTACHMENT D3

SUBGRADE ACCEPTANCE

CERTIFICATE OF ACCEPTANCE OF SUBGRADE SURFACE PREPARATION FOR GEOMEMBRANE INSTALLATION

PROJECT NAME: Midwest Gen Powerton - Secondary Ash Settling Basin

LOCATION: Pekin, IL

JOB NUMBER: 201308 CLIENT: _____

AREA ACCEPTED: 91,866 sq ft

COMMENTS: _____

INSTALLER: The undersigned authorized representative of CAAW Systems certifies that he or she has visually inspected the subgrade surface of the area described above and has found the surface to be acceptable for installation of the geosynthetic materials.

CAAW Systems shall be responsible for the integrity of finished geosynthetic material until completion of the installation or demobilization from site.

This certification is based on observations of the subgrade surface conditions only. CAAW Systems has made no subterrain inspections or tests and makes no representations or warranties as to the conditions that may exist below the surface of the subgrade.

CERTIFICATE APPROVED BY:

Installers Acceptance		Inspectors Acceptance	
Company:	Clean Air And Water Systems, LLC	Company:	Natural Resource Technology
By:	[signature]	By:	Edwards Effiong
Title:	PM	Title:	Env. Engr.
Date:	6-14-13	Date:	6-14-13

ATTACHMENT E

GEOSYNTHETICS INSTALLATION

ATTACHMENT E1

TRIAL WELD SUMMARY

Trial Weld Summary

NATURAL RESOURCE TECHNOLOGY

Project Number: 2113.2 Powerton Secondary Ash Settling Basin

Project Specifications: Fusion Peel: 91 ppi Extrusion Peel: 78 ppi Shear: 120 ppi

Test No.	Date	Time	Weather (Cloudy/ Sunny)	Amb. Temp. (°F)	Welder I.D.	Machine Number	Temp. Setting/ Speed	Weld Type	PEEL (ppi)				SHEAR (ppi)		Test Result (P/F)	Comments
									Outside		Inside					
									1	2	1	2	1	2		
TW1	6/12/2013	7:30	Cloudy	73	KK	402	850/4.5	Fus	125	120	134	127	163	160	P	
TW2	6/12/2013	7:30	Cloudy	73	VP	140	850/5.5	Fus	--	--	--	--	--	--	F	peel incursion
TW3	6/12/2013	7:25	Cloudy	73	HN	69	850/4.3	Fus	145	130	133	128	167	166	P	
TW4	6/12/2013	7:40	Cloudy	73	VP	140	850/5.0	Fus	115	112	117	110	155	156	P	
TW5	6/12/2013	8:25	Sunny	78	VP	401	850/5.3	Fus	126	117	134	123	146	154	P	
TW6	6/12/2013	12:45	Sunny	88	HN	69	850/5.0	Fus	137	132	123	134	130	148	P	
TW7	6/12/2013	12:48	Sunny	88	VP	401	850/6.0	Fus	125	124	111	112	149	152	P	
TW8	6/12/2013	13:00	Sunny	88	KK	402	850/4.5	Fus	129	124	122	126	140	142	P	
TW9	6/13/2013	9:40	Clear	69	HN	69	850/5.0	Fus	137	140	141	138	169	160	P	
TW10	6/13/2013	9:40	Clear	69	KK	402	850/4.5	Fus	133	131	132	137	153	164	P	
TW11	6/13/2013	9:49	Clear	69	VP	401	850/5.5	Fus	127	126	120	120	151	149	P	
TW12	6/13/2013	13:00	Clear	78	VP	401	850/6.0	Fus	129	143	115	132	166	164	P	
TW13	6/13/2013	13:01	Clear	78	HN	69	850/5.0	Fus	132	137	123	134	164	163	P	
TW14	6/13/2013	13:47	Clear	80	VK	46	525/435	Ext	98	99	--	--	154	153	P	
TW15	6/13/2013	14:24	Clear	80	VP	10	500/400	Ext	115	113	--	--	146	158	P	
TW16	6/14/2013	7:25	Clear	59	VK	46	525/435	Ext	121	98	--	--	172	170	P	
TW17	6/14/2013	7:20	Clear	59	PX	10	500/435	Ext	108	94	--	--	169	168	P	
TW18	6/14/2013	13:12	Sunny	74	VK	46	535/425	Ext	115	123	--	--	134	139	P	
TW19	6/14/2013	17:45	Cloudy	77	PX	10	450/500	Ext	103	102	--	--	133	135	P	
TW20	6/15/2013	6:55	Cloudy	70	PX	10	500/500	Ext	104	108	--	--	159	170	P	

ATTACHMENT E2

PANEL PLACEMENT SUMMARY

Panel Placement Summary

Project Number: 2113.2 Powerton Secondary Ash Settling Basin

Panel Number	Date	Time	Roll Number	Mat. Id.	Final Length (Feet)	Width	Thickness (mils)		Final Area (Sq. Ft.)	COMMENTS
P1	6/12/2013	7:17	*6456	HDPE	64	21	70	68	1,344	
P2	6/12/2013	7:22	*6456	HDPE	65	22	72	76	1,430	
P3	6/12/2013	7:26	*6456	HDPE	67	22	74	78	1,474	
P4	6/12/2013	7:30	*6456	HDPE	68	23	68	70	1,564	
P5	6/12/2013	7:33	*6456	HDPE	65	22	68	78	1,430	
P6	6/12/2013	7:35	*6456	HDPE	65	21	76	77	1,365	
P7	6/12/2013	7:42	*6456	HDPE	65	22	75	73	1,430	
P8	6/12/2013	8:07	*6442	HDPE	66	22	72	78	1,452	
P9	6/12/2013	8:17	*6442	HDPE	68	21	74	76	1,428	
P10	6/12/2013	8:22	*6442	HDPE	67	22	89	81	1,474	
P11	6/12/2013	8:28	*6442	HDPE	70	23	72	91	1,610	
P12	6/12/2013	8:31	*6442	HDPE	31	21	76	73	651	
P13	6/12/2013	8:35	*6442	HDPE	12	22	81	84	264	
P14	6/12/2013	8:38	*6442	HDPE	70	22	74	72	1,540	
P15	6/12/2013	8:44	*6442	HDPE	72	22	64	78	1,584	
P16	6/12/2013	9:00	*6455	HDPE	73	22	73	78	1,606	
P17	6/12/2013	9:03	*6455	HDPE	76	22	76	74	1,672	
P18	6/12/2013	9:27	*6455	HDPE	86	22	72	72	1,892	
P19	6/12/2013	9:32	*6455	HDPE	61	22	74	79	1,342	
P20	6/12/2013	9:40	*6455	HDPE	58	23	75	80	1,334	
P21	6/12/2013	9:50	*6455	HDPE	33	22	--	--	726	
P22	6/12/2013	9:52	*6455	HDPE	40	21	--	--	840	
P23	6/12/2013	9:53	*6455	HDPE	7	10	--	--	70	
P24	6/12/2013	10:10	*6455	HDPE	5	3	--	--	15	
P25	6/12/2013	10:16	*6440	HDPE	84	25	--	--	2,100	
P26	6/12/2013	10:20	*6440	HDPE	83	22	--	--	1,826	
P27	6/12/2013	10:24	*6440	HDPE	81	22	--	--	1,782	
P28	6/12/2013	10:32	*6440	HDPE	80	23	--	--	1,840	
P29	6/12/2013	10:36	*6440	HDPE	79	22	76	79	1,738	
P30	6/12/2013	10:54	*6454	HDPE	78	22	82	70	1,716	
P31	6/12/2013	11:02	*6454	HDPE	79	23	80	72	1,817	
P32	6/12/2013	11:05	*6454	HDPE	77	22	84	85	1,694	
P33	6/12/2013	12:57	*6440	HDPE	68	22	70	79	1,496	
P34	6/12/2013	13:00	*6454	HDPE	132	22	--	--	2,904	
P35	6/12/2013	13:16	*6454	HDPE	138	21	--	--	2,898	
P36	6/12/2013	13:35	*6443	HDPE	55	22	--	--	1,210	
P37	6/12/2013	13:50	*6443	HDPE	193	22	--	--	4,246	
P38	6/12/2013	14:20	*6443	HDPE	122	22	--	--	2,684	
P39	6/12/2013	14:20	*6443	HDPE	71	22	--	--	1,562	
P40	6/12/2013	14:36	*6443	HDPE	89	22	--	--	1,958	
P41	6/12/2013	14:45	*6453	HDPE	70	22	--	--	1,540	
P42	6/12/2013	15:00	*6453	HDPE	34	11/3	--	--	238	
P43	6/12/2013	15:01	*6453	HDPE	79	7	--	--	553	
P44	6/12/2013	15:03	*6453	HDPE	75	7	--	--	525	
P45	6/13/2013	10:17	*6453	HDPE	72	22	82	76	1,584	

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Panel Placement Summary

Project Number: 2113.2 Powerton Secondary Ash Settling Basin

Panel Number	Date	Time	Roll Number	Mat. Id.	Final Length (Feet)	Width	Thickness (mils)		Final Area (Sq. Ft.)	COMMENTS
P46	6/13/2013	10:19	*6454	HDPE	71	21	74	72	1,491	
P47	6/13/2013	10:32	*6435	HDPE	108	21	82	78	2,268	
P48	6/13/2013	10:35	*6435	HDPE	64	21	76	--	1,344	
P49	6/13/2013	10:40	*6435	HDPE	42	22	--	--	924	
P50	6/13/2013	10:43	*6435	HDPE	35	23	77	--	805	
P51	6/13/2013	10:45	*6435	HDPE	105	21	--	--	2,205	
P52	6/13/2013	10:48	*6435	HDPE	102	23	78	--	2,346	
P53	6/13/2013	10:57	*6453	HDPE	30	22	--	--	660	
P54	6/13/2013	11:09	*6439	HDPE	101	21	74	77	2,121	
P55	6/13/2013	11:18	*6439	HDPE	101	21	73	--	2,121	
P56	6/13/2013	11:24	*6439	HDPE	101	22	76	--	2,222	
P57	6/13/2013	11:35	*6439	HDPE	67	22	74	--	1,474	
P58	6/13/2013	11:46	*6439	HDPE	52	22	81	--	1,144	
P59	6/13/2013	11:50	*6439	HDPE	49	21	76	--	1,029	
P60	6/13/2013	13:10	*6444	HDPE	44	21	78	81	924	
P61	6/13/2013	13:13	*6453	HDPE	24	21	76	--	504	
P62	6/13/2013	13:14	*6453	HDPE	20	18	79	--	360	
								Total:	91,390	SF

ATTACHMENT E3

PANEL SEAMING SUMMARY

Panel Seaming Summary

Project Number: 2113.2 Powerton Secondary Ash Settling Basin

Seam Number	Date Seamed	Final Seam Length (Feet)	Welder Id.	Weld Type	Machine Number	Machine Temp/ Speed or Preheat	Time		Ambient Temp. (°F)	Comments
							Start	Stop		
P1 / P2	6/12/2013	64	KK	Fus	402	850/4.5	7:48	8:00	80s	
P1 / P44	6/12/2013	21	VP	Fus	401	850/6.0	16:06	16:09		
P1 / P57	6/13/2013	60	HN	Fus	69	850/5.0	11:57	12:06	85	Operator switch to Thong
P2 / P3	6/12/2013	66	HN	Fus	69	850/4.3	7:50	8:02	80s	
P2 / P44	6/12/2013	22	VP	Fus	401	850/6.0	16:04	16:06		
P3 / P4	6/12/2013	69	HN	Fus	69	850/4.3	8:06	8:19	80s	
P3 / P43	6/12/2013	13	VP	Fus	401	850/6.0	16:00	16:02		
P3 / P44	6/12/2013	7	VP	Fus	401	850/6.0	16:02	16:04		
P4 / P5	6/12/2013	67	VP	Fus	401	850/5.0	7:58	8:06	80s	
P4 / P5	6/12/2013	68	VP	Fus	401	850/5.3	8:35	8:38	80s	
P4 / P43	6/12/2013	22	VP	Fus	401	850/6.0	15:58	16:00		
P5 / P6	6/12/2013	63	KK	Fus	402	850/4.5	8:06	8:19	80s	
P5 / P43	6/12/2013	22	VP	Fus	401	850/6.0	15:55	15:58		
P6 / P7	6/12/2013	67	KK	Fus	402	850/4.5	8:26	8:37	80s	
P6 / P43	6/12/2013	23	VP	Fus	401	850/6.0	15:53	15:55		
P7 / P8	6/12/2013	63	KK	Fus	402	850/4.5	8:44	8:55	80s	
P7 / P42	6/12/2013	20	HN	Fus	69	850/5.0		15:50	98	
P8 / P9	6/12/2013	70	HN	Fus	69	850/4.3	8:35	8:48	80s	
P8 / P10	6/12/2013	6		Fus						
P8 / P42	6/12/2013	14	HN	Fus	69	850/5.0	15:40		98	
P9 / P10	6/12/2013	22	KK	Fus	402	850/4.5				

Panel Seaming Summary

Project Number: 2113.2 Powerton Secondary Ash Settling Basin

Seam Number	Date Seamed	Final Seam Length (Feet)	Welder Id.	Weld Type	Machine Number	Machine Temp/ Speed or Preheat	Time		Ambient Temp. (°F)	Comments
							Start	Stop		
P9 / P11	6/12/2013	23	HN	Fus	69	850/4.3	9:23	9:36	80s	
P9 / P12	6/12/2013	24	HN	Fus	69	850/5.0				
P9 / P13	6/12/2013	20	HN	Fus	69	850/5.0				
P10 / P11	6/12/2013	22	KK	Fus	402	850/4.5	9:08	9:21	80s	
P10 / P14	6/12/2013	70	VP	Fus	401	850/5.3	8:46	8:56	80s	
P10 / P40	6/12/2013	17	HN	Fus	69	850/5.0	16:00	16:05		
P10 / P42	6/12/2013	5	--	--	--	--	--	--		Patch
P11 / P12	6/12/2013	36	HN	Fus	69	850/4.3	9:07	9:14	80s	
P12 / P13	6/12/2013	22	HN	Fus	69	850/4.3	8:55	9:01	80s	
P14 / P15	6/12/2013	71	VP	Fus	401	850/5.3	9:00	9:11	80s	
P14 / P39	6/12/2013	18	KK	Fus	402	850/4.5	15:55	16:00	95	
P14 / P40	6/12/2013	4	HN	Fus	69	850/5.0	16:00	16:00		
P15 / P16	6/12/2013	73	VP	Fus	401	850/5.3	9:14	9:24	80s	
P15 / P37	6/12/2013	22	HN	Fus	69	850/5.0	15:50	15:55		
P15 / P39	6/12/2013	3	HN	Fus	69	850/5.0	15:55	15:55		
P16 / P17	6/12/2013	74	VP	Fus	401	850/5.3	9:33	9:43	80s	
P16 / P36	6/12/2013	18	HN	Fus	69	850/5.0	15:45	15:50		
P16 / P37	6/12/2013	3	HN	Fus	69	850/5.0	15:50	15:50		
P17 / P18	6/12/2013	16	KK	Fus	402	850/4.5	9:40	9:44	85	
P17 / P19	6/12/2013	62	KK	Fus	402	850/4.5	9:44	9:53	85	
P17 / P34	6/12/2013	19	HN	Fus	69	850/5.0	15:40	15:45		

Panel Seaming Summary

NATURAL RESOURCE TECHNOLOGY

Project Number: 2113.2 Powerton Secondary Ash Settling Basin

Seam Number	Date Seamed	Final Seam Length (Feet)	Welder Id.	Weld Type	Machine Number	Machine Temp/ Speed or Preheat	Time		Ambient Temp. (°F)	Comments
							Start	Stop		
P17 / P36	6/12/2013	3	KK	Fus	402	850/4.5			98	
P18 / P19	6/12/2013	22	VP	Fus	401	850/5.3	10:04		85	
P18 / P20	6/12/2013	22	VP	Fus	401	850/5.3	10:05	10:11	85	
P18 / P21	6/12/2013	45	VP	Fus	401	850/5.3	9:53	10:01	85	
P18 / P25	6/12/2013	84	VP	Fus	401	850/5.3	10:20	10:28	85	
P18 / P34	6/12/2013	22	KK	Fus	402	850/4.5	13:56	13:59	95	E-W
~~P18 / P34~~	~~6/12/2013~~	4	~~KK~~	~~Fus~~	~~402~~	~~850/4.5~~			~~98~~	R44
P19 / P20	6/12/2013	60	HN	Fus	69	850/4.3	9:52	10:04	85	
P20 / P21	6/12/2013	22	KK	Fus	402	850/4.5	10:22	10:23	85	
P20 / P22	6/12/2013	22	KK	Fus	402	850/4.5	10:23	10:27	85	
P20 / P23	6/12/2013	12	KK	Fus	402	850/4.5	10:27	10:31	85	
P21 / P22	6/12/2013	45	KK	Fus	402	850/4.5	10:07	10:14	85	
P22 / P23	6/12/2013	35	HN	Fus	69	850/4.3	10:22	10:30	85	
P22 / P24	6/12/2013	8	HN	Fus	69	850/4.3	10:20	10:22	85	
P23 / P24	6/12/2013	3	HN	Fus	69	850/4.3	10:14	10:16	85	
P25 / P26	6/12/2013	84	VP	Fus	401	850/5.3	10:36	10:47	85	
P25 / P34	6/12/2013	25	KK	Fus	402	850/4.5	13:55	13:58	95	
P26 / P27	6/12/2013	82	KK	Fus	402	850/4.5	10:43	10:58	85	
P26 / P34	6/12/2013	22	KK	Fus	402	850/4.5	13:51	13:55	95	
P27 / P28	6/12/2013	81	HN	Fus	69	850/4.3	10:38	10:53	85	
P27 / P34	6/12/2013	22	KK	Fus	402	850/4.5	13:47	13:51	95	

Panel Seaming Summary

Project Number: 2113.2 Powerton Secondary Ash Settling Basin

Seam Number	Date Seamed	Final Seam Length (Feet)	Welder Id.	Weld Type	Machine Number	Machine Temp/ Speed or Preheat	Time		Ambient Temp. (°F)	Comments
							Start	Stop		
P28 / P29	6/12/2013	80	VP	Fus	401	850/5.3	10:52	11:02	90	
P28 / P34	6/12/2013	23	KK	Fus	402	850/4.5	13:45	13:47	95	
P29 / P30	6/12/2013	78	HN	Fus	69	850/4.3	11:03	11:19	90	
P29 / P34	6/12/2013	22	KK	Fus	402	850/4.5	13:40	13:45	95	
P30 / P31	6/12/2013	79	KK	Fus	402	850/4.5	11:14	11:28	90	
P30 / P33	6/12/2013	22	KK	Fus	402	850/4.5	13:38	13:40	95	
P31 / P32	6/12/2013	79	VP	Fus	401	850/5.3	11:16	11:23	90	
P31 / P33	6/12/2013	23	KK	Fus	402	850/4.5	13:34	13:38	95	
P32 / P33	6/12/2013	22	KK	Fus	402	850/4.5	13:30	13:34	95	
P32 / P45	6/13/2013	75	HN	Fus	69	850/5.0	10:20	10:31	80	
P33 / P34	6/12/2013	22	HN	Fus	69	850/5.0	13:13	13:20	90	
P33 / P35	6/12/2013	68	HN	Fus	69	850/5.0	13:35	13:43	95	
P33 / P47	6/13/2013	20	VP	Fus	401	850/6.0	14:00	14:05	85	
P33 / P51	6/13/2013	1	VP	Fus	401	850/6.0	14:00	14:00	85	R38
P34 / P35	6/12/2013	78	HN	Fus	69	850/5.0	13:43	13:53	95	
P34 / P36	6/12/2013	54	HN	Fus	69	850/5.0	14:25	14:35	98	
P35 / P36	6/12/2013	22	HN	Fus	69	850/5.0	14:14	14:19	95	
P35 / P37	6/12/2013	138	VP	Fus	401	850/6.0	14:21	14:38	98	
P35 / P51	6/13/2013	20	VP	Fus	401	850/6.0	13:57	14:00	85	
P35 / P52	6/13/2013	1	VP	Fus	401	850/6.0	13:55	13:57	85	R37
P36 / P37	6/12/2013	56	VP	Fus	401	850/6.0	14:15	14:21	98	

Panel Seaming Summary

Project Number: 2113.2 Powerton Secondary Ash Settling Basin

Seam Number	Date Seamed	Final Seam Length (Feet)	Welder Id.	Weld Type	Machine Number	Machine Temp/ Speed or Preheat	Time		Ambient Temp. (°F)	Comments
							Start	Stop		
P37 / P38	6/12/2013	122	KK	Fus	402	850/4.5	14:50	15:06	98	
P37 / P39	6/12/2013	71	KK	Fus	402	850/4.5	14:41	14:50	98	
P37 / P52	6/13/2013	21	VP	Fus	401	850/6.0	13:50	13:54	85	
P37 / P54	6/13/2013	1	VP	Fus	401	850/6.0	13:50	13:50	85	R79
P38 / P39	6/12/2013	22	VP	Fus	401	850/6.0	14:42	14:44	98	
P38 / P41	6/12/2013	222	HN	Fus	69	850/5.0	15:05	15:25	98	
P38 / P54	6/13/2013	19	VP	Fus	401	850/6.0	13:42	13:50	85	
P38 / P55	6/13/2013	3	VP	Fus	401	850/6.0	13:41	13:42	85	R78
P39 / P40	6/12/2013	70	HN	Fus	69	850/5.0	14:56	13:05	98	
P40 / P41	6/12/2013	22	VP	Fus	401	850/6.0	14:58	15:00	98	
P40 / P42	6/12/2013	38	VP	Fus	401	850/6.0	15:12	15:25	98	
P40 / P43	6/12/2013	30	VP	Fus	401	850/6.0	15:25	15:28	98	
P41 / P43	6/12/2013	49	VP	Fus	401	850/6.0	15:28	15:30	98	
P41 / P44	6/12/2013	75	VP	Fus	401	850/6.0		15:45	98	
P41 / P55	6/13/2013	19	VP	Fus	401	850/6.0	13:42	13:49	85	
P41 / P56	6/13/2013	3	VP	Fus	401	850/6.0	13:42	13:42	85	R64
P42 / P43	6/12/2013		VP	Fus	401	850/6.0	15:45		98	
P43 / P44	6/12/2013	7	VP	Fus	401	850/6.0	15:30	15:32	98	
P44 / P56	6/13/2013	7	VP	Fus	401	850/6.0	13:39	13:41	85	
P44 / P57	6/13/2013	21	VP	Fus	401	850/6.0	13:29	13:34	85	
P45 / P46	6/13/2013	73	KK	Fus	402	850/4.5	10:23	10:37	80	

Panel Seaming Summary

NATURAL RESOURCE TECHNOLOGY

Project Number: 2113.2 Powerton Secondary Ash Settling Basin

Seam Number	Date Seamed	Final Seam Length (Feet)	Welder Id.	Weld Type	Machine Number	Machine Temp/ Speed or Preheat	Time		Ambient Temp. (°F)	Comments
							Start	Stop		
P45 / P47	6/13/2013	22	HN	Fus	69	850/5.0	10:55	11:00	80	
P46 / P47	6/13/2013	21	HN	Fus	69	850/5.0	10:51	10:55	80	
P46 / P48	6/13/2013	21	KK	Fus	402	850/4.5	11:50	11:53	83	
P46 / P49	6/13/2013	49	KK	Fus	402	850/4.5	10:45	10:54	80	
P47 / P48	6/13/2013	66	HN	Fus	69	850/5.0	11:03	11:16	80	
P47 / P51	6/13/2013	107	VP	Fus	401	850/5.5	10:50	11:02	80	
P48 / P49	6/13/2013	22	KK	Fus	402	850/4.5	11:43	11:50	80	
P48 / P50	6/13/2013	40	KK	Fus	402	850/4.5	11:30	11:43	80	
P49 / P50	6/13/2013	23	KK	Fus	402	850/4.5	11:14	11:19	80	
P49 / P53	6/13/2013	22	KK	Fus	402	850/4.5	11:19	11:22	80	
P50 / P53	6/13/2013	30	KK	Fus	402	850/4.5	11:00	11:10	80	
P51 / P52	6/13/2013	104	VP	Fus	401	850/5.5	11:04	11:23	80	
P52 / P54	6/13/2013	101	HN	Fus	69	850/5.0	11:27	11:43	80	BOS-structure
P52 / P54	6/13/2013	101	HN	Fus	69	850/5.0	11:44	11:49	85	
P54 / P55	6/13/2013	101	VP	Fus	401	850/5.5	11:32	11:40	80	
P55 / P56	6/13/2013	101	VP	Fus	401	850/5.5	11:47	12:02	85	
P56 / P57	6/13/2013	6	VP	Fus	401	850/6.0	13:38	13:39	85	
P56 / P58	6/13/2013	22	HN	Fus	69	850/5.0	13:39	13:47	85	
P56 / P59	6/13/2013	21	HN	Fus	69	850/5.0	13:48	13:52	85	
P56 / P60	6/13/2013	21	HN	Fus	69	850/5.0	13:52	13:55	85	
P56 / P61	6/13/2013	28	HN	Fus	69	850/5.0	13:55	14:05	85	

Panel Seaming Summary

Project Number: 2113.2 Powerton Secondary Ash Settling Basin

Seam Number	Date Seamed	Final Seam Length (Feet)	Welder Id.	Weld Type	Machine Number	Machine Temp/ Speed or Preheat	Time		Ambient Temp. (°F)	Comments
							Start	Stop		
P57 / P58	6/13/2013	54	VP	Fus	401	850/6.0	13:16	13:23	85	
P58 / P59	6/13/2013	50	VP	Fus	401	850/5.5	12:07	12:13	85	
P59 / P60	6/13/2013	48	HN	Fus	69	850/5.0	13:10	13:20	85	
P60 / P61	6/13/2013	21	HN	Fus	69	850/5.0	13:35	13:37	85	
P60 / P62	6/13/2013	18	HN	Fus	69	850/5.0	13:28	13:35	85	
P61 / P62	6/13/2013	20	HN	Fus	69	850/5.0	13:21	13:30	85	

ATTACHMENT E4

REPAIR SUMMARY

Repair Summary

NATURAL RESOURCE TECHNOLOGY

Project Number: 2113.2 Powerton Secondary Ash Settling Basin

Repair Number	Date	Time	Oper./Mach.	Repair Location North East	Description	Size of Repair (ft)	Date Vacuum Tested	Vac. Test Results (P/F)
R1	6/14/2013	7:45	PX/10	P4/P5, 13' from anchor trench	Machine in/out	3x4	6/14/2013	P
R2	6/14/2013	14:00	VK/46	P7, 33 ft center of panel	Structure	35' dia.	6/15/2013	P*
R3	6/13/2013	15:05	VK/46	P8/P9, 20' from COT	Air Test Hole	1x1	6/14/2013	P
R4	6/13/2013	15:00	VK/46	P9/P12/P13	Tee	2x3	6/14/2013	P
R5	6/13/2013	15:10	VK/46	P9/P13, 2' from COT	No Seam Overlap	3x3	6/14/2013	P
R6	6/13/2013	14:54	VK/46	P9/P11/P12, 43' from COT	Tee	2x3	6/14/2013	P
R7	6/13/2013	14:50	VK/46	P9/P10/P11	Tee	2x2	6/14/2013	P
R8	6/13/2013	14:40		P8/P9/P10	Tee	1x2	6/14/2013	P
R9	6/13/2013			P8/P10/P42	Tee	1x2	6/14/2013	P
R10	6/13/2013	14:35	VK/46	P10/P40/P42	Tee	2x8	6/14/2013	P
R11	6/13/2013	14:30	VK/46	P7/P8/P42	Tee	1x2	6/14/2013	P
R12	6/13/2013	14:20	VK/46	P6/P7/P42/P43	Tee	8x8	6/14/2013	P
R13	6/13/2013	14:45	VK/46	P40/P42/P43	Tee	1x3	6/14/2013	P
R14	6/13/2013	14:05	VK/46	P4/P5/P43	Tee	1x2	6/14/2013	P
R15	6/13/2013	14:00	VK/46	P3/P4/P43	Tee	2x2	6/14/2013	P
R16	6/13/2013	13:50	VK/46	P3/P43/P44	Tee	1x2	6/14/2013	P
R17	6/14/2013	7:50	PX/10	P41/P43/P44	Tee	2x2	6/14/2013	P
R18	6/13/2013	13:45	VK/46	P2/P3/P44	Tee	1x2	6/14/2013	P
R19	6/13/2013	13:40	VK/46	P1/P2/P44	Tee	1x1	6/14/2013	P
R20	6/14/2013	7:33	PX/10	P38/P39/P40/P41	Tee	2x3	6/14/2013	P
R21	6/13/2013	15:15	VK/46	P10/P14/P40	Tee	1x1	6/14/2013	P
R22	6/13/2013	15:15	VK/46	P14/P39/P40	Tee	1x1	6/14/2013	P

COT = Crest of Trench
P* = Spark Tested

MWG13-15_34244

Repair Summary

NATURAL RESOURCE TECHNOLOGY

Project Number: 2113.2 Powerton Secondary Ash Settling Basin

Repair Number	Date	Time	Oper./Mach.	Repair Location North East	Description	Size of Repair (ft)	Date Vacuum Tested	Vac. Test Results (P/F)
R23	6/13/2013	15:20	VK/46	P14/P15/P39	Tee	1x1	6/14/2013	P
R24	6/13/2013	15:22	VK/46	P15/P37/P39	Tee	1x1	6/14/2013	P
R25	6/14/2013	7:37	PX/10	P37/P38/P39	Tee	2x2	6/14/2013	P
R26	6/13/2013	17:09	VP/10	P35/P36/P37	Tee	1x2	6/14/2013	P
R27	6/13/2013	15:25	VK/46	P15/P16/P37	Tee	1x1	6/14/2013	P
R28	6/13/2013	15:30	VK/46	P16/P17/P34/P36	Tee	2x5	6/14/2013	P
R29	6/13/2013	15:30	VP/10	P17/P18/P34	Tee	1x2	6/14/2013	P
R30	6/13/2013	15:22	VP/10	P18/P25/P34	Tee	1x2	6/14/2013	P
R31	6/13/2013	15:19	VP/10	P25/P26/P34	Tee	1x1	6/14/2013	P
R32	6/13/2013	15:02	VP/10	P26/P27/P34	Tee	1x1	6/14/2013	P
R33	6/13/2013	14:56	VP/10	P27/P28/P34	Tee	1x1	6/14/2013	P
R34	6/13/2013	17:07	VP/10	P34/P35/P36	Tee	1x2	6/14/2013	P
R35	6/14/2013	7:30	VK/46	P17/P19, 27' to 32' from COT	No Seam Overlap	2x10	6/14/2013	P
R36	6/13/2013	14:42	VP/10	P33/P34/P35	Tee	1x1	6/14/2013	P
R37	6/14/2013	9:15	PX/10	P35/P37/P51/P52	Tee	2x3	6/14/2013	P
R38	6/14/2013	9:20	PX/10	P33/P35/P47/P51	Tee	1x3	6/14/2013	P
R39	6/14/2013	9:25	PX/10	P32/P33/P45/P47	Tee	3x4	6/14/2013	P
R40	6/13/2013	14:47	VP/10	P31/P32/P33	Tee	1x1	6/14/2013	P
R41	6/13/2013	14:45	VP/10	P30/P31/P33	Tee	1x1	6/14/2013	P
R42	6/13/2013	14:39	VP/10	P29/P30/P33/P34	Tee	1x1	6/14/2013	P
R43	6/13/2013	14:52	VP/10	P28/P29/P34	Tee	1x1	6/14/2013	P
R44	6/13/2013	15:35	VP/10	P18/P34	Tee	1x6	6/14/2013	P

COT = Crest of Trench
P* = Spark Tested

Repair Summary

Project Number: 2113.2 Powerton Secondary Ash Settling Basin

Repair Number	Date	Time	Oper./Mach.	Repair Location North East	Description	Size of Repair (ft)	Date Vacuum Tested	Vac. Test Results (P/F)
R45	6/13/2013	15:48	VP/10	P17/P18/P19	Tee	1x2	6/14/2013	P
R46	6/13/2013	15:50	VP/10	P18/P19/P20	Tee	1x1	6/14/2013	P
R47	6/13/2013	15:55	VP/10	P18/P20/P21	Tee	1x1	6/14/2013	P
R48	6/13/2013	15:59	VP/10	P20/P21/P22	Tee	2x2	6/14/2013	P
R49	6/13/2013	16:04	VP/10	P20/P22/P23	Tee	1x3	6/14/2013	P
R50	6/13/2013	16:15	VP/10	P22/P23/P24	Tee	1x2	6/14/2013	P
R51	6/14/2013	11:30	VK/46	P22/P24, COT	No Seam Overlap	1x3	6/14/2013	P
R52	6/14/2013	9:40	PX/10	P45/P46/P47	Tee	2x2	6/14/2013	P
R53	6/14/2013	9:45	PX/10	P46/P47/P48	Tee	2x3	6/14/2013	P
R54	6/14/2013	9:35	PX/10	P46/P48/P49	Tee	2x3	6/14/2013	P
R55	6/14/2013	9:58	PX/10	P48/P49/P50	Tee	1x2	6/14/2013	P
R56	6/14/2013	10:03	PX/10	P49/P50/P53	Tee	1x2	6/14/2013	P
R57	6/14/2013	19:37	VK/46	P52/P54, 325' from COT	Inlet Structure	20x20	6/14/2013	P*
R58	6/14/2013	9:10	PX/10	P37, 131'N 258'E	Puncture	3x4	6/14/2013	P
R59	6/14/2013	9:05	PX/10	P37, 128'N 259'E	Puncture	1x1	6/14/2013	P
R60	6/14/2013	9:00	PX/10	P37, 120'N 256'E	Puncture	1x2	6/14/2013	P
R61	6/14/2013	8:50	PX/10	P38, 110'N 259'E	Puncture	1x2	6/14/2013	P
R62	6/14/2013	8:04	PX/10	P38, 107'N 256'E	Puncture	1x2	6/14/2013	P
R63	6/14/2013	8:36	PX/10	P38, 99'N 259'E	Puncture	1x1	6/14/2013	P
R64	6/14/2013	8:15	PX/10	P41/P44/P55/P56	Tee	2x4	6/14/2013	P
R65	6/14/2013	8:08	PX/10	P44/P56/P57	Tee	1x2	6/14/2013	P
R66	6/14/2013	8:03	PX/10	P1/P44/P57	Tee	3x4	6/14/2013	P

COT = Crest of Trench
P* = Spark Tested

Repair Summary

Project Number: 2113.2 Powerton Secondary Ash Settling Basin

Repair Number	Date	Time	Oper./Mach.	Repair Location North East	Description	Size of Repair (ft)	Date Vacuum Tested	Vac. Test Results (P/F)
R67	6/14/2013	10:58	PX/10	P56/P57/P58	Tee	1x3	6/14/2013	P
R68	6/14/2013	18:20	VT/46	P58, 40'E	Discharge Structure	30' dia.	6/15/2013	P*
R69	6/14/2013	10:50	PX/10	P56/P58/P59	Tee	2x3	6/14/2013	P
R70	6/14/2013	10:36	PX/10	P56/P59/P60	Tee	2x2	6/14/2013	P
R71	6/14/2013	10:28	PX/10	P56/P60/P61	Tee	1x2	6/14/2013	P
R72	6/14/2013	10:20	PX/10	P60/P61/P62	Tee	1x2	6/14/2013	P
R73	6/14/2013	11:10	PX/10	P1/P57, 3' thru anchor trench	No Seam Overlap	3x7	6/14/2013	P
R74	6/14/2013	7:55	PX/10	P34, NE corner 192'E	Puncture	2x3	6/14/2013	P
R75	6/13/2013	15:25	VK/46	P16/P36/P37	Tee	1x1	6/14/2013	P
R76	6/13/2013	14:15	VK/46	P5/P6/P43	Tee	2x2	6/14/2013	P
R77	6/13/2013	14:10	VK/46	P40/P41/P43	Tee	1x1	6/14/2013	P
R78	6/14/2013	8:34	PX/10	P38/P41/P54/P55	Tee	1x4	6/14/2013	P
R79	6/14/2013	8:55	PX/10	P37/P38/P52/P54	Tee	2x4	6/14/2013	P
R80	6/14/2013	--	--	--	Same as R81	--	--	--
R81	6/14/2013	9:35	PX/10	P45, center of panel, 72'S 270'E	Puncture	1x1	6/14/2013	P
R82	6/14/2013	10:13	PX/10	P49/P53, NE corner of pond	Corner	1x9	6/14/2013	P
R83	6/14/2013	10:53	PX/10	P58, center of panel @ 55'N	Puncture	1x1	6/14/2013	P
R84	6/14/2013	11:20	VK/46	P19/P20, 2'E	Wrinkle	3x6	6/14/2013	P
R85	6/14/2013	10:30	VK/46	P19, overflow structure	Overflow Structure	15x15	6/14/2013	P
R86	6/15/2013	17:43	VK/46	P58, around structure	Wrinkle	2x2	6/15/2013	P
R87	6/15/2013	8:23	PX/10	P7/R2	Pinhole		6/15/2013	P
R88	6/15/2013	8:40	PX/10	SE corner of pump platform	Pump Platform	2x4	6/15/2013	P

COT = Crest of Trench
P* = Spark Tested

Repair Summary

Project Number: 2113.2 Powerton Secondary Ash Settling Basin

Repair Number	Date	Time	Oper./Mach.	Repair Location North East	Description	Size of Repair (ft)	Date Vacuum Tested	Vac. Test Results (P/F)
R89	6/15/2013	8:30	PX/10	Center of pump platform	Pump Platform	1x1	6/15/2013	P*
R90	6/15/2013	10:40	PX/10	East lowner on pump platform	Pump Platform	2x3	6/15/2013	P*
R91	6/15/2013	8:35	PX/10	Center of pump platform	Pump Platform	1x1	6/15/2013	P*

COT = Crest of Trench
P* = Spark Tested

ATTACHMENT E5

NON-DESTRUCTIVE TEST SUMMARY

Non-Destructive Test Summary

Project Number: 2113.2 Powerton Secondary Ash Settling Basin

Seam Number	Distance/ Location	Air Test: 27-30 psi for 5 min, < 3 psi loss						Vacuum Test		Comments
		Date Air Tested	Air Pressure				Air Test Results	Date Vacuum Tested	Vac. Test Results (P/F)	
			Start		End					
			PSI	Time	PSI	Time				
P1 / P2	BOS-EOS	6/12/2013	30	9:27	30	9:32	P			
P1 / P44	BOS-EOS	6/13/2013	30	8:41	30	8:46	P			
P1 / P57	BOS-EOS	6/14/2013	30	7:08	30	7:13	P			
P2 / P3	BOS-EOS	6/12/2013	30	9:30	30	9:35	P			
P2 / P44	BOS-EOS	6/13/2013	30	8:44	29	8:49	P			
P3 / P4	BOS-EOS	6/12/2013	30	9:32	30	9:37	P			
P3 / P43	BOS-EOS	6/13/2013	30	8:55	30	9:00	P			
P3 / P44	BOS-EOS	6/13/2013	30	8:47	29	8:52	P			
P4 / P5	BOS-13'	6/12/2013	30	9:34	30	9:39	P			
P4 / P5	13'-EOS	6/12/2013	30	9:42	30	9:47	P			
P4 / P43	BOS-EOS	6/13/2013	30	8:56	30	9:01	P			
P5 / P6	BOS-EOS	6/12/2013	30	9:52	30	9:57	P			
P5 / P43	BOS-EOS	6/13/2013	30	9:07	30	9:12	P			
~~P6 / P7~~	~~BOS-EOS~~	~~6/12/2013~~	~~30~~	~~9:53~~	~~19~~	~~9:58~~	Fail			
~~P6 / P7~~	~~BOS-EOS~~	~~6/12/2013~~	~~30~~	~~10:18~~	~~20~~	~~10:23~~	Fail			
P6 / P7	BOS-EOS	6/13/2013	30	9:18	30	9:23	P			
P6 / P43	BOS-EOS	6/13/2013	30	9:15	30	9:20	P			
P7 / P8	BOS-EOS	6/12/2013	30	9:54	30	9:59	P			
P7 / P42	BOS-EOS	6/13/2013	30	9:30	30	9:35	P			
~~P8 / P9~~	~~BOS-EOS~~	~~6/12/2013~~	~~30~~	~~10:26~~	~~29~~	~~10:31~~	Fail			Pressure did not drop when cut

BOS: Beginning of Seam
EOS: End of Seam

MWG13-15_34250

Non-Destructive Test Summary

Project Number: 2113.2 Powerton Secondary Ash Settling Basin

Seam Number	Distance/ Location	Air Test: 27-30 psi for 5 min, < 3 psi loss						Vacuum Test		Comments
		Date Air Tested	Air Pressure				Air Test Results	Date Vacuum Tested	Vac. Test Results (P/F)	
			Start		End					
			PSI	Time	PSI	Time				
P8 / P9	BOS-22'	6/12/2013	30	10:44	30	10:49	P			
P8 / P9	22'-EOS	6/12/2013	30	10:49	30	10:54	P			
P8 / P10	BOS-EOS	6/12/2013	30	10:35	30	10:40	P			
P8 / P42	BOS-EOS	6/13/2013	30	9:30	30	9:35	P			
P9 / P10	BOS-EOS	6/12/2013	30	10:43	30	10:48	P			
P9 / P11	BOS-EOS	6/12/2013	30	10:55	30	11:00	P			
P9 / P12	BOS-EOS	6/12/2013	30	10:57	30	11:02	P			
P9 / P13	BOS-EOS	6/12/2013	30	11:06	30	11:11	P			
P10 / P11	BOS-EOS	6/12/2013	30	11:20	30	11:25	P			
P10 / P14	BOS-EOS	6/13/2013	30	9:41	30	9:46	P			
P10 / P40	BOS-EOS	6/13/2013	30	9:40	30	9:45	P			
~~P10 / P42~~	~~BOS-EOS~~	~~6/13/2013~~	~~30~~	~~9:32~~	–	~~9:37~~	Fail			Capped
P11 / P12	BOS-EOS	6/12/2013	30	10:56	30	11:01	P			
P12 / P13	BOS-EOS	6/12/2013	30	11:05	30	11:10	P			
P14 / P15	BOS-EOS	6/13/2013	30	10:08	30	10:13	P			
P14 / P39	BOS-EOS	6/13/2013	30	10:08	30	10:13	P			
P14 / P40	BOS-EOS	6/13/2013	30	9:42	30	9:47	P			
P15 / P16	BOS-EOS	6/13/2013	30	10:16	30	10:21	P			
P15 / P37	BOS-EOS	6/13/2013	30	10:28	30	10:33	P			
P15 / P39	BOS-EOS	6/13/2013	30	10:09	28	10:14	P			

BOS: Beginning of Seam
EOS: End of Seam

Non-Destructive Test Summary

Project Number: 2113.2 Powerton Secondary Ash Settling Basin

Seam Number	Distance/ Location	Air Test: 27-30 psi for 5 min, < 3 psi loss						Vacuum Test		Comments
		Date Air Tested	Air Pressure				Air Test Results	Date Vacuum Tested	Vac. Test Results (P/F)	
			Start		End					
			PSI	Time	PSI	Time				
P16 / P17	BOS-EOS	6/13/2013	30	10:27	30	10:32	P			
P16 / P36	BOS-EOS	6/13/2013	30	10:25	30	10:30	P			
P16 / P37	BOS-EOS	6/13/2013	30	10:22	30	10:27	P			
P17 / P18	BOS-EOS	6/13/2013	30	10:48	30	10:53	P			
P17 / P19	BOS-32'	6/12/2013	30	14:47	30	14:52	P			
~~P17 / P19~~	~~27'-32'~~	~~6/12/2013~~	--	--	--	--	Fail			R35
P17 / P19	27'-EOS	6/12/2013	30	14:58	30	15:03	P			
P17 / P34	BOS-EOS	6/13/2013	30	10:37	29	10:42	P			
P17 / P36	BOS-EOS	6/13/2013	30	10:30	30	10:35	P			
P18 / P19	BOS-EOS	6/12/2013	30	14:22	28	14:27	P			
P18 / P20	BOS-EOS	6/12/2013	30	14:20	30	14:25	P			
P18 / P21	BOS-EOS	6/12/2013	30	13:35	30	13:40	P			
P18 / P25	BOS-EOS	6/12/2013	30	15:07	29	15:12	P			
P18 / P34	BOS-EOS	6/12/2013	30	15:18	30	15:23	P			
P19 / P20	BOS-3'	6/12/2013	30	14:21	30	14:26	P			
P19 / P20	3'-EOS	6/12/2013	30	14:29	30	14:34	P			
P20 / P21	BOS-EOS	6/12/2013	30	13:34	30	13:39	P			
P20 / P22	BOS-EOS	6/12/2013	30	13:28	30	13:33	P			
P20 / P23	BOS-EOS	6/12/2013	30	13:26	29	13:31	P			
P21 / P22	BOS-EOS	6/12/2013	30	13:33	30	13:38	P			

BOS: Beginning of Seam
EOS: End of Seam

Non-Destructive Test Summary

Project Number: 2113.2 Powerton Secondary Ash Settling Basin

Seam Number	Distance/ Location	Air Test: 27-30 psi for 5 min, < 3 psi loss						Vacuum Test		Comments
		Date Air Tested	Air Pressure				Air Test Results	Date Vacuum Tested	Vac. Test Results (P/F)	
			Start		End					
			PSI	Time	PSI	Time				
P22 / P23	BOS-EOS	6/12/2013	30	13:20	30	13:25	P			
P22 / P24	BOS-EOS	6/12/2013	30	13:19	30	13:24	P			
P23 / P24	BOS-EOS	6/12/2013	30	13:20	30	13:25	P			
P25 / P26	BOS-EOS	6/13/2013	30	7:14	30	7:19	P			
P25 / P34	BOS-EOS	6/12/2013	30	15:17	29	15:22	P			
~~P26 / P27~~	~~BOS-EOS~~	~~6/13/2013~~	~~30~~	~~7:14~~	–	~~7:19~~	Fail			
P26 / P27	BOS-EOS	6/13/2013	30	7:28	30	7:33	P			
P26 / P34	BOS-EOS	6/13/2013	30	7:39	30	7:44	P			
P27 / P28	BOS-EOS	6/13/2013	30	7:32	30	7:37	P			
P27 / P34	BOS-EOS	6/13/2013	30	7:17	30	7:22	P			
P28 / P29	BOS-EOS	6/13/2013	30	7:36	30	7:41	P			
P28 / P34	BOS-EOS	6/13/2013	30	10:40	30	10:45	P			
P29 / P30	BOS-EOS	6/13/2013	30	8:10	30	8:15	P			
P29 / P34	BOS-EOS	6/13/2013	30	8:09	28	8:14	P			
P30 / P31	BOS-EOS	6/13/2013	30	8:19	30	8:24	P			
P30 / P33	BOS-EOS	6/13/2013	30	8:11	30	8:16	P			
P31 / P32	BOS-EOS	6/13/2013	30	11:04	30	11:09	P			
P31 / P33	BOS-EOS	6/13/2013	30	11:00	30	11:05	P			
P32 / P33	BOS-EOS	6/13/2013	30	11:02	30	11:07	P			
P32 / P45	BOS-EOS	6/13/2013	30	11:06	30	11:11	P			

BOS: Beginning of Seam
EOS: End of Seam

Non-Destructive Test Summary

Project Number: 2113.2 Powerton Secondary Ash Settling Basin

Seam Number	Distance/ Location	Air Test: 27-30 psi for 5 min, < 3 psi loss						Vacuum Test		Comments
		Date Air Tested	Air Pressure				Air Test Results	Date Vacuum Tested	Vac. Test Results (P/F)	
			Start		End					
			PSI	Time	PSI	Time				
P33 / P34	BOS-EOS	6/13/2013	30	10:56	30	11:01	P			
P33 / P35	BOS-EOS	6/13/2013	30	11:21	30	11:26	P			
P33 / P47	BOS-EOS	6/13/2013	30	15:41	30	15:46	P			
P34 / P35	BOS-EOS	6/13/2013	30	10:54	30	10:59	P			
P34 / P36	BOS-EOS	6/13/2013	30	10:46	30	10:51	P			
P35 / P36	BOS-EOS	6/13/2013	30	10:47	30	10:52	P			
P35 / P37	BOS-EOS	6/13/2013	30	11:23	30	11:28	P			
P35 / P51	BOS-EOS	6/13/2013	30	15:44	28	15:49	P			
P36 / P37	BOS-EOS	6/13/2013	30	10:52	30	10:57	P			
P37 / P38	BOS-EOS	6/13/2013	30	11:51	30	11:56	P			
P37 / P39	BOS-EOS	6/13/2013	30	11:24	30	11:29	P			
P37 / P52	BOS-EOS	6/13/2013	30	15:54	28	15:59	P			
P38 / P39	BOS-EOS	6/13/2013	30	11:30	30	11:35	P			
P38 / P41	BOS-EOS	6/13/2013	30	14:15	30	14:20	P			
P38 / P54	BOS-EOS	6/13/2013	30	15:55	29	16:00	P			
P39 / P40	BOS-EOS	6/13/2013	30	11:30	30	11:35	P			
P40 / P41	BOS-EOS	6/13/2013	30	11:33	30	11:38	P			
P40 / P42	BOS-EOS	6/13/2013	30	11:43	30	11:48	P			
P40 / P43	BOS-EOS	6/13/2013	30	11:41	30	11:46	P			
P41 / P43	BOS-EOS	6/13/2013	30	11:41	30	11:46	P			

BOS: Beginning of Seam
EOS: End of Seam

Non-Destructive Test Summary

Project Number: 2113.2 Powerton Secondary Ash Settling Basin

Seam Number	Distance/ Location	Air Test: 27-30 psi for 5 min, < 3 psi loss						Vacuum Test		Comments
		Date Air Tested	Air Pressure				Air Test Results	Date Vacuum Tested	Vac. Test Results (P/F)	
			Start		End					
			PSI	Time	PSI	Time				
P41 / P44	BOS-EOS	6/13/2013	30	14:27	30	14:32	P			
P41 / P55	BOS-EOS	6/13/2013	30	16:25	30	16:30	P			
P42 / P43	BOS-EOS	6/13/2013	30	9:16	30	9:21	P			
P43 / P44	BOS-EOS	6/13/2013	30	8:54	30	8:59	P			
P44 / P56	BOS-EOS	6/13/2013	30	16:10	28	16:15	P			
P44 / P57	BOS-EOS	6/14/2013	30	7:09	30	7:14	P			
P45 / P46	BOS-EOS	6/13/2013	30	15:18	30	15:23	P			
P45 / P47	BOS-EOS	6/13/2013	30	15:17	30	15:22	P			
P46 / P47	BOS-EOS	6/13/2013	30	15:19	30	15:24	P			
P46 / P48	BOS-EOS	6/13/2013	30	15:22	30	15:27	P			
P46 / P49	BOS-EOS	6/13/2013	30	15:29	30	15:34	P			
P47 / P48	BOS-EOS	6/13/2013	30	15:20	30	15:25	P			
P47 / P51	BOS-EOS	6/13/2013	30	15:42	30	15:47	P			
P48 / P49	BOS-EOS	6/13/2013	30	15:30	30	15:35	P			
P48 / P50	BOS-EOS	6/13/2013	30	15:30	29	15:35	P			
P49 / P50	BOS-EOS	6/13/2013	30	15:30	30	15:35	P			
P49 / P53	BOS-EOS	6/13/2013	30	15:40	30	15:45	P			
P50 / P53	BOS-EOS	6/13/2013	30	15:31	29	15:36	P			
P51 / P52	BOS-EOS	6/13/2013	30	15:48	30	15:53	P			
P52 / P54	BOS-339'	6/13/2013	30	15:55	30	16:00	P			

BOS: Beginning of Seam
EOS: End of Seam

Non-Destructive Test Summary

Project Number: 2113.2 Powerton Secondary Ash Settling Basin

Seam Number	Distance/ Location	Air Test: 27-30 psi for 5 min, < 3 psi loss						Vacuum Test		Comments
		Date Air Tested	Air Pressure				Air Test Results	Date Vacuum Tested	Vac. Test Results (P/F)	
			Start		End					
			PSI	Time	PSI	Time				
P52 / P54	339'-EOS	6/13/2013	30	15:58	30	16:03	P			
P54 / P55	BOS-EOS	6/13/2013	30	16:07	30	16:12	P			
P55 / P56	BOS-EOS	6/13/2013	30	16:07	30	16:12	P			
P56 / P57	BOS-EOS	6/14/2013	30	7:10	30	7:15	P			
P56 / P58	BOS-EOS	6/14/2013	30	7:20	30	7:25	P			
P56 / P59	BOS-EOS	6/14/2013	30	7:22	30	7:27	P			
P56 / P60	BOS-EOS	6/14/2013	30	8:11	30	8:16	P			
P56 / P61	BOS-EOS	6/14/2013	30	8:32	30	8:37	P			
P57 / P58	BOS-46'	6/14/2013	30	8:29	30	8:34	P			
P57 / P58	46'-EOS	6/14/2013	30	7:11	30	7:16	P			
P58 / P59	BOS-EOS	6/14/2013	30	8:22	30	8:27	P			
P59 / P60	BOS-EOS	6/14/2013	30	8:10	30	8:15	P			
P60 / P61	BOS-EOS	6/14/2013	30	8:31	30	8:36	P			
P60 / P62	BOS-EOS	6/14/2013	30	8:41	30	8:46	P			
P61 / P62	BOS-EOS	6/14/2013	30	8:40	30	8:45	P			

BOS: Beginning of Seam
EOS: End of Seam

ATTACHMENT F

LINER INTEGRITY SURVEY REPORT

LEAK LOCATION SERVICES, INC.

16124 UNIVERSITY OAK • SAN ANTONIO, TEXAS 78249 • (210) 408-1241 / FAX (210) 408-1242

June 18, 2013

Sheila Keltsch
Terra Contracting Services, LLC
5787 Stadium Drive
Kalamazoo, MI 49009

Email: skeltsch@terracontracting.net

Subject: Report for "Geomembrane Leak Location Survey of the Secondary Ash Settling Basin at the Powerton Power Station in Pekin, Illinois;" LLSI Project 1847

Dear Ms. Keltsch:

On June 14 and 15, 2013, Edgar Barraza of Leak Location Services, Inc. (LLSI) conducted a geomembrane leak location survey of the Secondary Ash Settling Basin. The impoundment has an approximate area of 88,000 square feet and is lined from the bottom up with a prepared subgrade, 16 ounce geotextile and 60-mil white textured HDPE geomembrane. This report documents the results of the survey.

I. RESULTS

No leaks were found during the water puddle survey of the Secondary Ash Settling Basin. The leak location equipment was tested to document the leak detection sensitivity by placing a 0.04-inch diameter hole in the geomembrane of the impoundment. The leak probe was placed on the geomembrane and a small amount of water was sprayed on the liner to verify proper operation of the equipment. This test was successfully conducted at the beginning and end of survey. The probe was also periodically touched to earth ground to verify operation. The test leak was indicated with a greater than full scale meter deflection.

II. TECHNIQUE

A. General

The electrical leak location method detects electrical paths through the liner caused by water or moisture in the leaks. A voltage is connected to one electrode placed in a conducting media covering the liner and another electrode placed in contact with earth ground. Electrical current flowing through the leaks in the liner produces localized anomalous areas of high current density near the leaks. These areas are located by making electrical potential measurement scans in or on the electrically conductive material on the geomembrane.

B. Water Puddle Survey

The water puddle survey method detects electrical current flowing through holes in the geomembrane liner using a small amount of water that is put in contact with the liner. A squeegee is used to push the water over the liner. A low voltage electrical supply is connected to earth ground and to the leak detector. When a hole in the liner is encountered, electrical current will flow through water in the leak contacting earth ground. The current is monitored using an electronic detector that converts the increase in the current to an audible tone indication.

The bare geomembrane was surveyed using the water puddle survey method. The geomembranes were surveyed using a custom-designed squeegee sensor. The liner area was systematically scanned with overlapping coverage. When a leak is detected, the leak is located and the position marked for repair. The location of the leaks are also documented by field personnel.

If there are any questions regarding the electrical survey or this report, please contact us at (210) 408-1241. We appreciate this opportunity to have been of service to Terra Contracting.

Respectfully,

Matthew Kemnitz
Senior Project Manager

Approved by:

Daren L. Laine
President

ATTACHMENT G

CONSTRUCTION DOCUMENTATION DRAWING SET