REPORT

Annual Inspection

Stanton Station - Bottom Ash CCR Landfill

Submitted to:

Great River Energy
2875 Third Street SW
Underwood, North Dakota 58576

Submitted by:

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1894194

January 2020

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FIGURES

APPENDICES

1.0 INTRODUCTION

As part of 40 CFR Part 257 of the Subtitle D solid waste provisions under the Resource Conservation and Recovery Act (RCRA), utilities are required to complete annual inspections for surface impoundments and landfills containing Coal Combustion Residuals (CCR). This report has been prepared by Golder Associates Inc. (Golder) for Great River Energy (GRE) to satisfy the annual inspection requirements for CCR landfills under 40 CFR Part 257.84.

Stanton Station was a coal-fired electric generation facility located in Section 16 and 21, Township 144N and Range 84W of Mercer County, approximately three miles southeast of Stanton, North Dakota. There are two facilities located at Stanton Station that fall under the CCR rule requirements (Figure 1). These facilities include the Bottom Ash CCR Landfill (Bottom Ash Landfill) and the Bottom Ash CCR Surface Impoundment (Bottom Ash Impoundment). Stanton Station ceased operation in February 2017. Deconstruction and demolition of plant facilities was completed in 2019 and ongoing site restoration activities will continue into 2020, after which ongoing maintenance of the site will be performed to facilitate post-closure care.

At the time of inspection, the Bottom Ash Landfill and the south cell of the Bottom Ash Impoundment remain open for disposal of residual CCR or construction and demolition debris associated with plant deconstruction and site restoration. This report presents a review of available facility information and findings of the inspection of the Bottom Ash Landfill performed on September 26, 2019.

2.0 REVIEW OF EXISTING INFORMATION

2.1 Geological Conditions

Stanton Station is located in the Missouri Slope district of the glaciated Missouri Plateau of the Great Plains physiographic province (NDDH 2005). The Bottom Ash Landfill is constructed in Missouri River alluvial deposits. The alluvial deposits have two distinct subunits: upper and lower. The upper subunit consists of a silty sand and clay and the lower subunit is an outwash sand and gravel (Barr 2010).

2.2 Site History and Subgrade

The Bottom Ash Landfill (see Figure 1 and Figure 2) is located adjacent to the Bottom Ash Impoundment south of the former plant site. The north and south cells of the Bottom Ash Impoundment were active cells used for dewatering bottom ash and the center cell functioned as a retention cell, until the plant ceased operation in 2017. Bottom ash was historically excavated and hauled from the north and south cells of the Bottom Ash Impoundment to the eastern half of the Bottom Ash Landfill as needed (see Figure 2).

Stanton Station originally burned North Dakota lignite before being converted in November 2004 to use fuel from the Powder River Basin in Wyoming. All ash was originally wet sluiced into a series of ash ponds (Ponds A, B, and C) (Stone & Webster 1994b). In the mid-1990s, Stanton Station converted to a dry fly ash handling system, and the historic CCR management units were reconfigured.

CCRs from the 1970s ash disposal area and Pond A were excavated and hauled to Ponds B and C for disposal. Ponds B and C were further consolidated and closed. Pond A was reconfigured to include a composite-lined surface impoundment with three cells on the east side and the Bottom Ash Landfill on the west side. Prior to the placement of bottom ash, the Bottom Ash Landfill was re-graded to promote drainage of contact water to the east side, and soil and/or ash fill was placed over the active placement area to bring the floor above groundwater. The historic Pond A perimeter soil berms were used as the perimeter berms for the Bottom Ash Landfill. Additional

information regarding the design of the Bottom Ash Impoundment and Bottom Ash Landfill is included in the original design report (Stone & Webster 1994a). Select construction and permit drawings are included in Appendix A.

2.3 Site Closure and Restoration

Between 2017 and 2019, the remaining bottom ash and economizer ash from the plant and Bottom Ash Impoundment (north and center cells) has been placed in the south cell of the Bottom Ash Impoundment. Construction and Demolition (C&D) material from plant demolition activities as well as coal and coal yard soil, and clayey soils underlying the geomembrane of the north and center cells excavated during site restoration have been placed in the Bottom Ash Landfill or the south cell of the Bottom Ash Impoundment (as approved through the North Dakota Department of Environmental Quality (NDDEQ) state permit program). Site restoration activities began in the summer of 2019 and are expected to be completed in 2020. These activities primarily include consolidating waste materials into the Bottom Ash Impoundment south cell and Bottom Ash Landfill, re-grading the site to promote drainage and vegetative growth, and closing active surface impoundments.

2.4 Site Geometry

The perimeter berms surrounding the Bottom Ash Landfill on the north, west, and south sides consist of the historic Pond A soil embankments and have top elevations of approximately 1708 feet above mean sea level (amsl). The east berm is a shared berm with the Bottom Ash Impoundment and was constructed out of embankment fill in 1994 and 1995 to a top elevation of approximately 1720 feet amsl. The crest of the east berm is a gravel surfaced roadway that supports both light passenger vehicles and some heavy construction equipment. The original bottom elevation of the Bottom Ash Landfill varies between approximately 1698 feet amsl and 1701 feet amsl based on as-built survey (see Appendix A). The berm upstream and berm downstream slopes are 3:1. Current top of waste elevations range between approximately 1700 feet amsl and 1720 feet amsl based on site observations during the inspection. Contact water generally flows to a low area on the west side of the Bottom Ash Landfill.

2.5 Changes in Geometry

Materials, which may include CCR, soil, and C&D material associated with plant deconstruction and site restoration activities, were being consolidated on the east side of the Bottom Ash Landfill at the time of the inspection. In addition, the perimeter berms on the west portion of the Bottom Ash Landfill were being re-graded to tie in with future site restoration grades and a new containment berm was being constructed in the Bottom Ash Landfill area. The facility's Closure and Post-Closure Plan (Golder 2019b) discusses the closure of the Bottom Ash Landfill, but in general, remaining permitted waste (as approved through the state permit program) from site restoration activities will be disposed of in the south cell of the Bottom Ash Impoundment or the Bottom Ash Landfill. The landfill will be closed with the permitted wastes remaining in-place and in accordance with the final cover design outlined in the Closure and Post-Closure Plan. Select site restoration drawings are included in Appendix A.

2.6 Existing CCR Volume

Up until February 2017, Stanton Station produced approximately 10,600 cubic yards (CY) of bottom ash and economizer ash (herein referred to as bottom ash) per year that was sluiced to the Bottom Ash Impoundment. This bottom ash was periodically excavated and hauled to the Bottom Ash Landfill. Bottom ash was last placed in

the Bottom Ash Landfill in 2014 prior to being surveyed. Based on site observations and the 2014 survey, approximately 150,000 CY of material was contained in the Bottom Ash Landfill at the time of inspection.

2.7 Permits

The Bottom Ash Landfill is currently permitted with the NDDEQ under Permit Number 0043.

2.8 Summary of 2019 Weekly Inspections

GRE performed weekly inspections of the Bottom Ash Landfill throughout 2019. Based on a review of the available inspection forms, the following items were noted:

- Generally good site maintenance.
- No signs of significant seepage, settlement, or cracking of the berm downstream slopes.

2.9 Summary of Previous Inspections

The previous annual professional engineer inspection of the Bottom Ash Landfill was performed by Golder in September of 2018 (Golder 2019a) and a summary of the observations of that inspection are as follows:

- Generally good vegetation and site maintenance.
- Animal burrows were noted on berm downstream slopes.
- Stormwater and/or contact water control features to control run-on and runoff were not well-established along isolated areas of the facility boundary.
- Minor erosion within CCR placement areas.
- Isolated and minor woody vegetation was growing on berm downstream slopes and near the toe of slopes.

3.0 2019 ANNUAL INSPECTION

On September 26, 2019, Craig Schuettpelz, and Kayla Moden of Golder performed an inspection of the Bottom Ash Landfill per United States Environmental Protection Agency (USEPA) Regulation 40 CFR Part 257.84(b) requirements. The inspection consisted of visual observations while walking around the facility traversing up and down the perimeter berm and CCR placement areas. An annual inspection checklist used during the inspection is presented in Appendix B. Photographs were taken and are presented in Appendix C. The following presents a summary of the observations made during the 2019 annual inspection.

3.1 Perimeter Berm

3.1.1 Berm Upstream Slope

Where visible, the berm upstream slopes appeared to match the design slopes of 3:1 with no observed section of significant slope movement. The west berm upstream slopes are generally bare soil since they are in the process of being removed as a part of site restoration re-grading. Contact water continues to be directed toward the west side of the facility and will be managed as a part of site restoration activities. The berm upstream slopes of the landfill appear to be in good condition. A new west berm of the Bottom Ash Landfill will be constructed to contain a smaller, consolidated quantity of bottom ash and other permitted materials. This berm was not yet constructed at the time of the inspection.

3.1.2 Berm Crest

The east berm crest and part of the north berm crest of the Bottom Ash Landfill are surfaced with gravel at elevations between approximately 1715 feet amsl and 1720 feet amsl. These roads are primarily used for light vehicle traffic. As previously mentioned, berms on the west portion of the facility are undergoing re-grading. Bottom Ash Landfill berm crests appeared to be in good condition.

3.1.3 Berm Downstream Slope

The berm downstream slopes on the north, west, and south sides are between approximately 5 feet and 10 feet high and have slopes of approximately 3:1. Slopes that are not anticipated to be affected by site restoration re-grading are well vegetated with grass but do contain numerous, but mostly small, animal burrows. Two small trees were also observed on the berm downstream slope on the south side of the facility. These trees along with any other woody vegetation should be removed from the landfill. The berm downstream slopes of the Bottom Ash Landfill appear to be in fair condition.

3.1.4 Toe

The toe of the west and south perimeter berms is in a surface water drainage ditch that has some marshy vegetation and standing water. Some small animal burrows were noted near the toe of the slope, but there were no observed indications of seepage, settlement, or excessive vegetation at the toe of these slopes. The toes of the berm downstream slopes are in good condition.

3.2 CCR Placement

The Bottom Ash Landfill will be closed with CCR and other permitted waste in place and covered in 2020. After receipt of any remaining permitted wastes, the Bottom Ash Landfill will undergo final closure. As necessary, the final grades for the Bottom Ash Landfill will be adjusted to accommodate the actual amount of permitted materials required to be contained as part of plant demolition and site restoration activities. No cracks, settlement, or seepage was observed on the CCR slopes.

3.3 Signs of Structural Weakness or Other Observations that Could Affect Stability

No signs of structural weakness or other observations that could affect the stability of the Bottom Ash Landfill were observed during the site inspection in September 2019.

4.0 SUMMARY AND CONCLUSIONS

An annual inspection was performed for the Bottom Ash Landfill at Stanton Station on September 26, 2019. The inspection met the requirements for CCR landfills under 40 CFR Part 257.84.

The Bottom Ash Landfill was receiving remaining demolition and site restoration waste at the time of inspection to establish final waste grades in preparation for final cover to be constructed in 2020. The Bottom Ash Landfill will be closed with permitted wastes remaining in-place and in accordance with the final cover design outlined in the Closure and Post-Closure Plan (Golder 2019b).

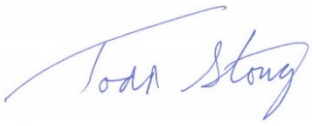
As applicable for areas not affected by site restoration and/or closure activities, Golder observed good vegetation and site maintenance and did not identify significant deficiencies such as seepage, excessive erosion or settlement, or cracking during visual observations.

In addition to annual inspections of applicable portions of the facility by the Professional Engineer, trained and qualified site personnel will continue to perform the required weekly facility inspections (while the facility is active) to look for signs of potential structural weaknesses.

Minor maintenance items that may need to be continually addressed include repairing larger animal burrows as they appear, repairing stormwater and/or contact water control features to control run-on and runoff, monitoring vegetative success of berm downstream slopes and slopes that have received final cover (when it has been completed in 2020), and removal of any woody vegetation growing on the berm downstream slopes.

Golder Associates Inc.

Craig Schuettpelz, PE
Senior Engineer



Todd Stong, PE
Associate and Senior Consultant

CCS/TJS/ds

5.0 REFERENCES

Barr, 2010. 2010 Annual Groundwater Monitoring Report, Stanton Station Ash Disposal Facility, NDDH Solid Waste Permit # SP043. Prepared for Great River Energy, February 2011.

Golder Associates Inc. Golder 2019a. Annual Inspection Report – Great River Energy – Stanton Station – Bottom Ash CCR Landfill. January 2019.

Golder Associates Inc. Golder 2019b. Closure and Post-Closure Plan, Revision 1 – Bottom Ash CCR Landfill – Stanton Station. September 2019.

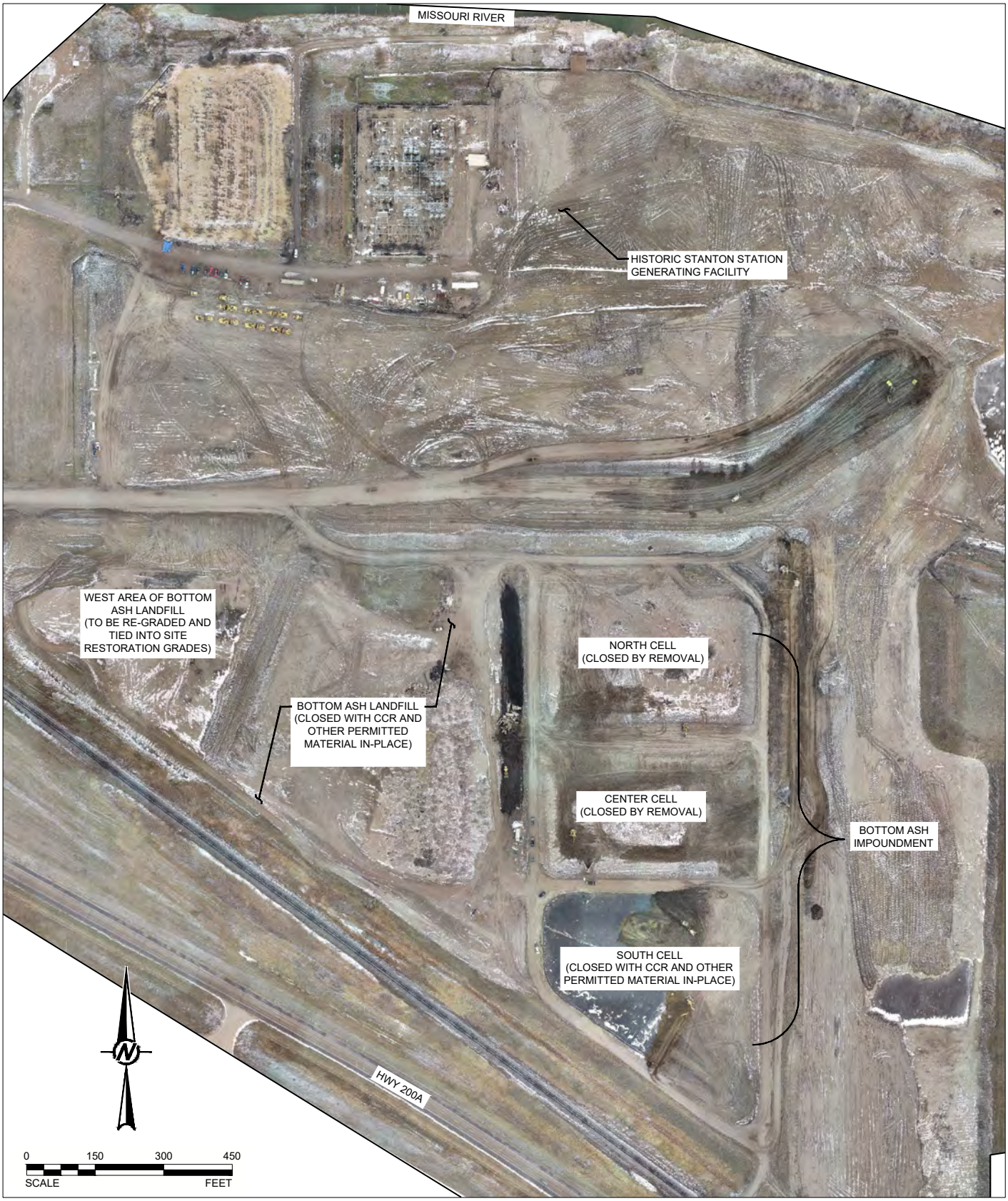
Great River Energy – Stanton Station. GRE 2015. Permit Renewal Document, Permit No. SP-043. Original Permit Renewal dated February 2, 2015.

North Dakota Department of Health, 2017. Permit for a Solid Waste Management Facility, North Dakota Department of Health – Division of Waste Management Permit No. 0043. November 29, 2017.

Stone & Webster, 1994a. *Design Report Stanton Station Ash Pond Modifications.* Prepared for United Power Association, Project No. 4177. April 25, 1994.

Stone & Webster, 1994b. *Stanton Station Ash Pond Modifications, Project No. 4177 Design Drawings Rev. 2.* Prepared for United Power Association, June 1994.

Figures



REFERENCE(S)

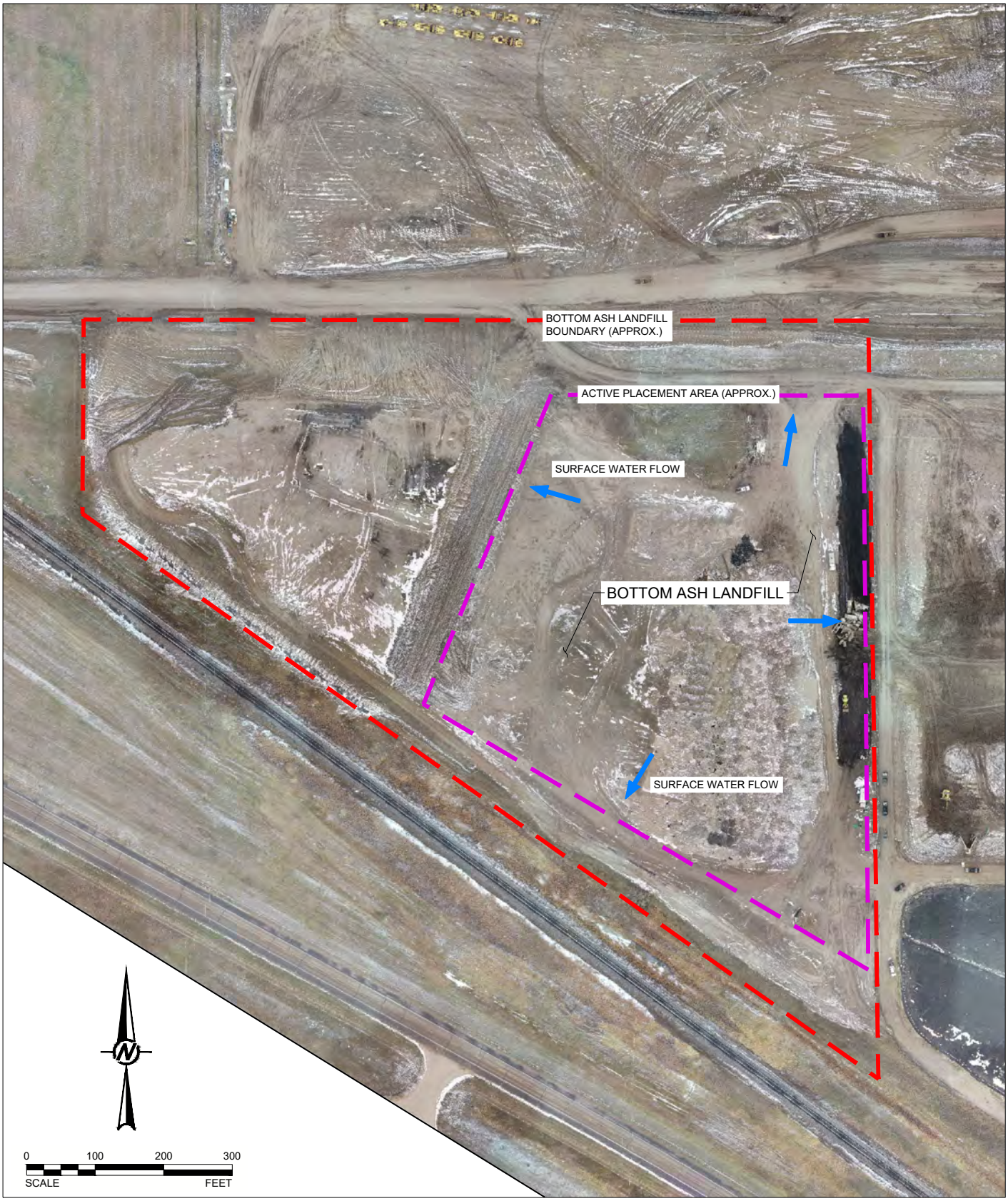
1. AERIAL IMAGE FROM GREAT RIVER ENERGY PHOTOGRAPH NOVEMBER 2019.

GOLDER

GREAT RIVER ENERGY - STANTON STATION
2019 ANNUAL CCR FACILITY INSPECTION REPORT
STANTON STATION SITE OVERVIEW

FIGURE 1

Path: \\Denver\acad\GREAT RIVER ENERGY\STANTON\99_PROJECTS\18941941\Annual Inspections\ | File Name: 2019 Annual Insp_Figs.dwg



REFERENCE(S)

1. AERIAL IMAGE FROM GREAT RIVER ENERGY PHOTOGRAPH NOVEMBER 2019.

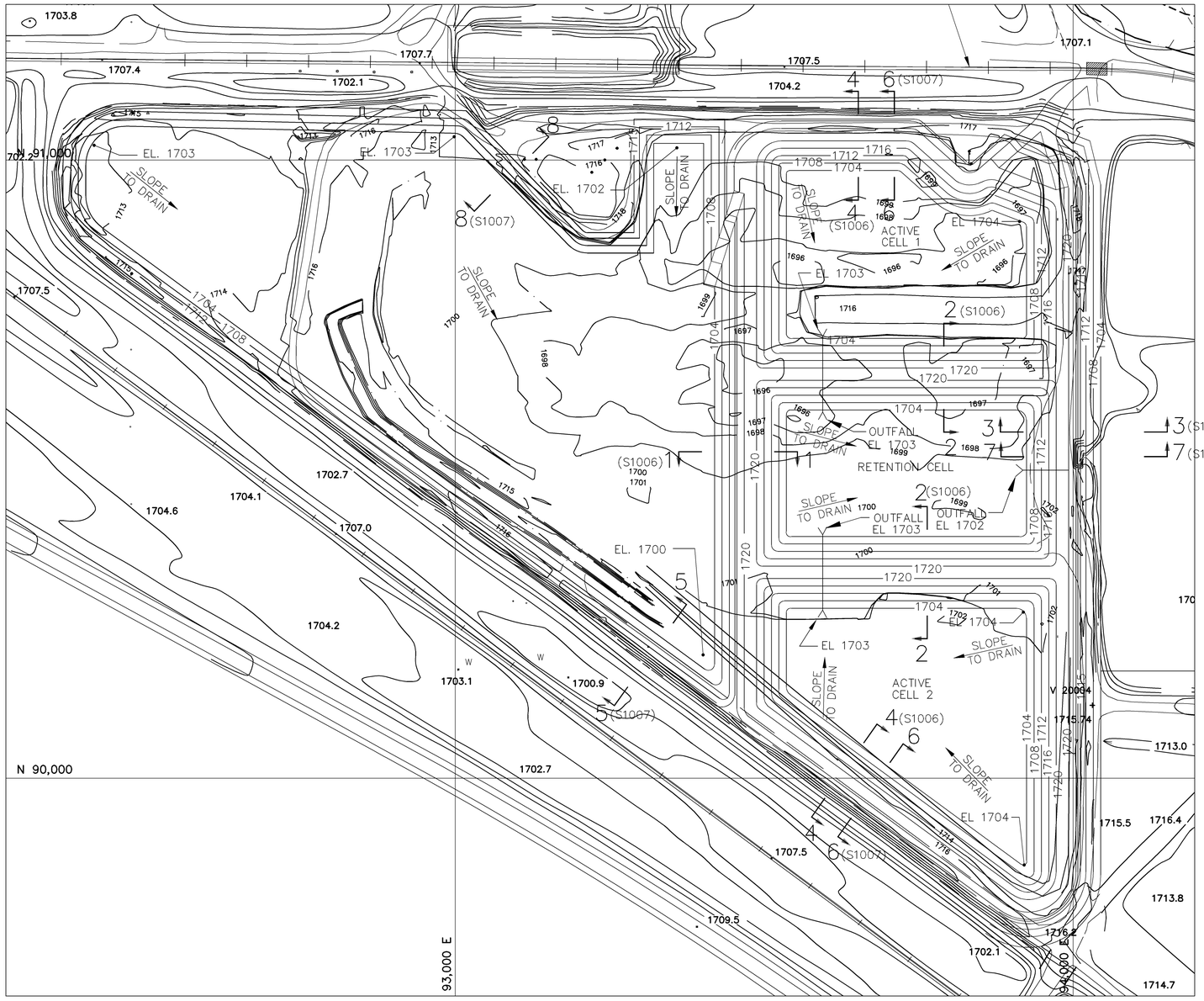
GOLDER

GREAT RIVER ENERGY - STANTON STATION
2019 ANNUAL CCR FACILITY INSPECTION REPORT
BOTTOM ASH LANDFILL SITE OVERVIEW

FIGURE 2

APPENDIX A

Selected Construction Drawings and Permit Drawings



N

SCALE 1" = 100'

100 50 0 100 200 300

LEGEND:

EXISTING GROUND ELEVATION CONTOUR

NEW GROUND ELEVATION CONTOUR

NOTES:

1. SEE GENERAL NOTES, DRAWING S1002.
2. ELEVATIONS SHOWN AT THE BOTTOM OF IMPOUNDMENT CELLS ARE OF THE TOP OF THE CLAY FILL.

REFERENCE DRAWINGS:

S1002	FACILITIES SITE PLAN
S1006	POND A SECTIONS & DETAILS – SH. 1
S1007	POND A SECTIONS & DETAILS – SH. 2
S1008	POND A SECTIONS & DETAILS – SH. 3
S1009	OUTFALL STRUCTURES OUTLINE – PLAN & SECTIONS
S1010	OUTFALL STRUCTURES – REINFORCEMENT SH. 1
S1011	OUTFALL STRUCTURES – REINFORCEMENT SH. 2

ISSUE	DESCRIPTION	CHKD	CORRECT	APPR. DATE
3				
2				
1	FOR CONSTRUCTION			
0	ORIGINAL ISSUE FOR UPA REVIEW	WLZ	SGG KWC 4-13-94	

UPA PROJECT 4177	UNITED POWER ASSOCIATION STANTON STATION ASH POND MODIFICATIONS	DRAWING NO. S1005	REV 1
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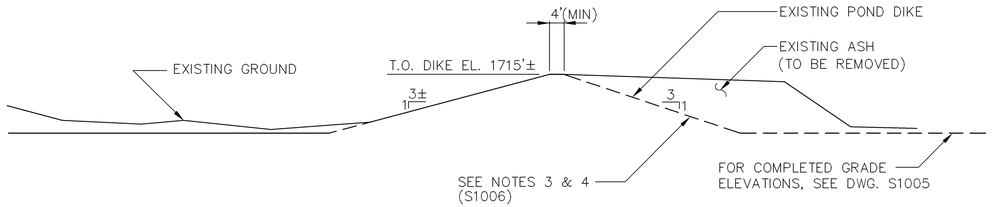
	STONE & WEBSTER ENGINEERING CORPORATION DENVER, CO.		

ISSUE | HALF-SIZE | APP. CARD

CAD FILE UPAS1005.DWG



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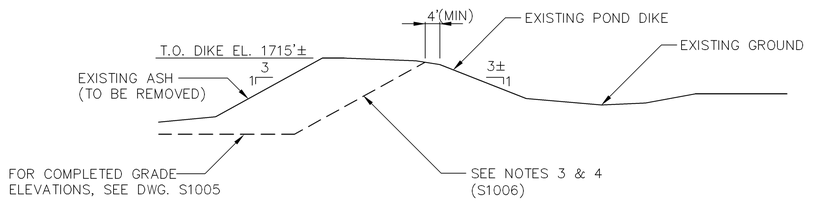
(S1005)



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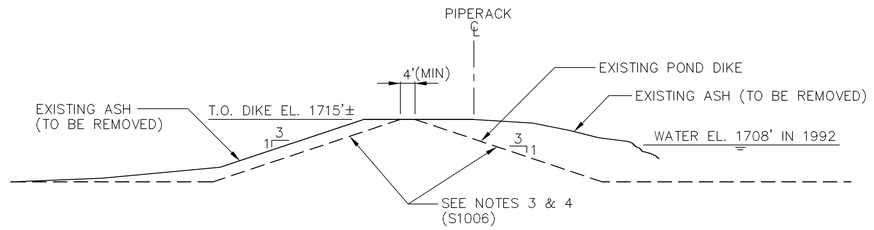

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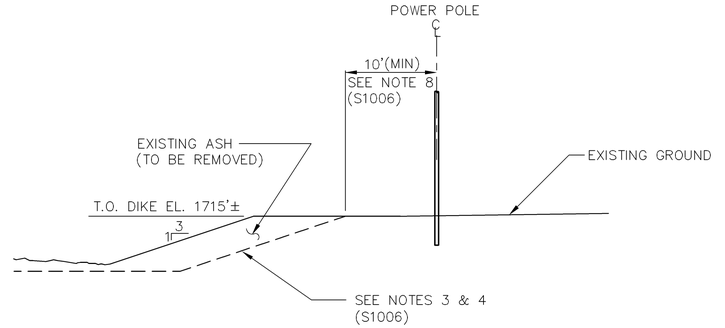

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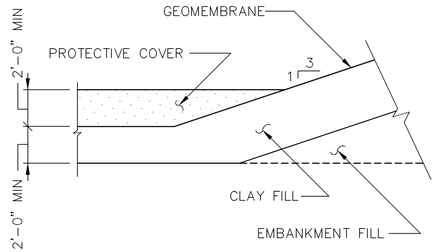
(S1005)



DETAIL A
(S1006)
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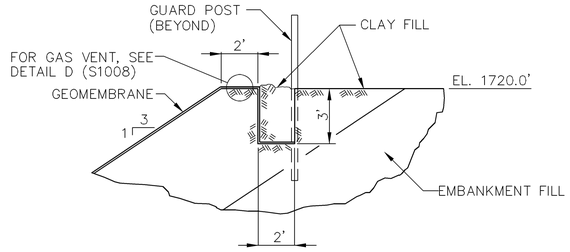

DETAIL B
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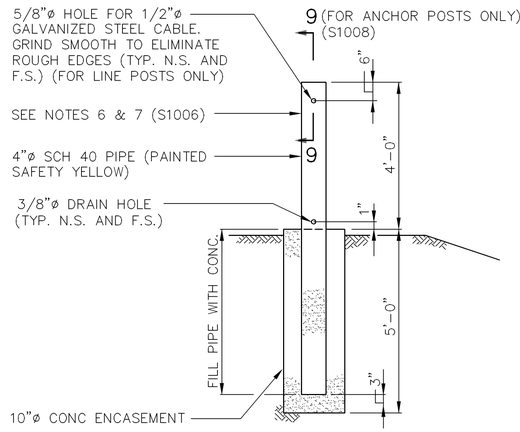


DETAIL C
(S1006)
NTS

NOTES:

1. SCALE: 1" = 20' UNLESS NOTED.
2. SEE GENERAL NOTES, DRAWING S1002.
3. FOR ADDITIONAL NOTES, SEE DRAWING S1006.

REFERENCE DRAWINGS:

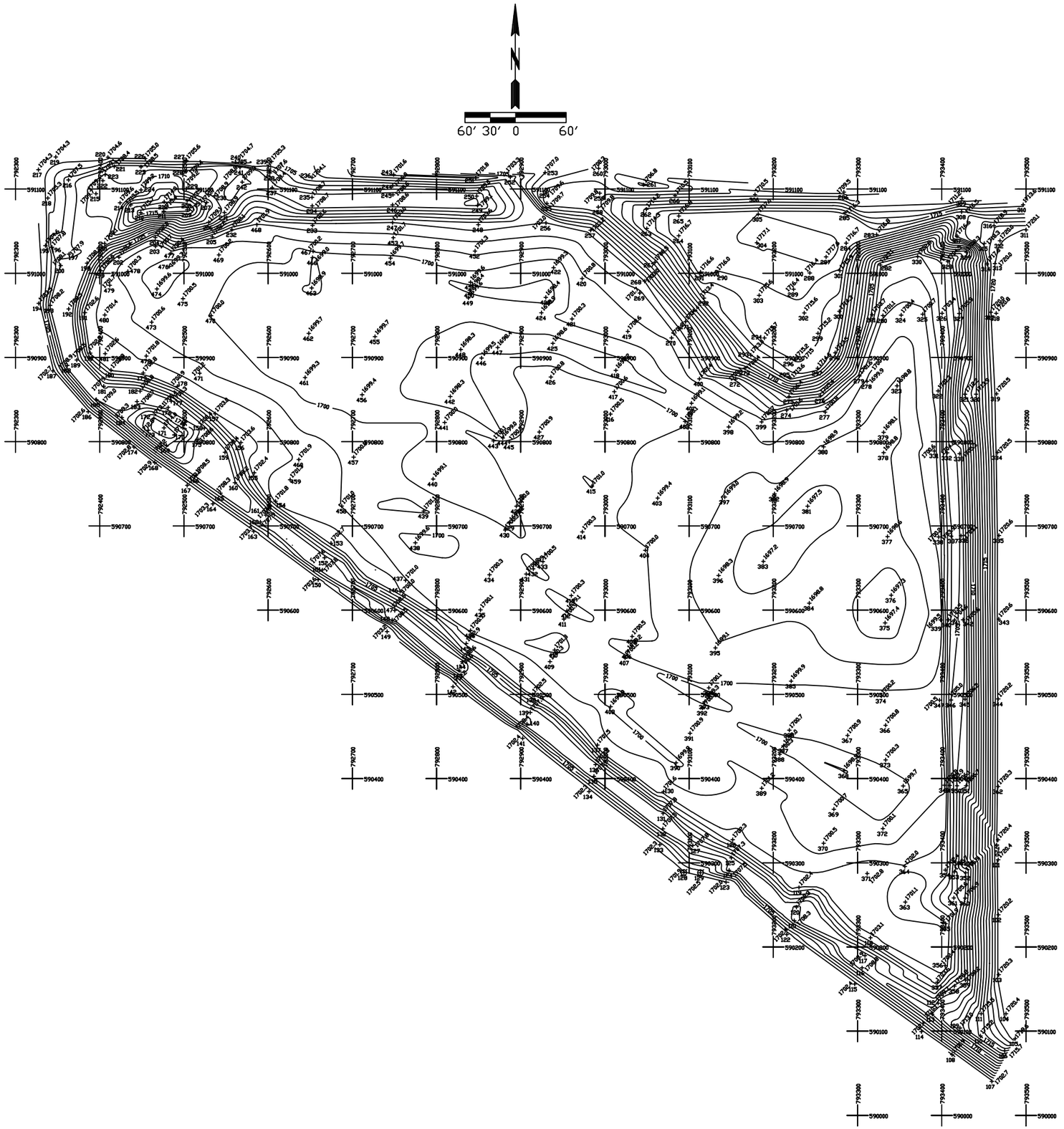
S1002	FACILITIES SITE PLAN
S1005	POND A CONVERSION PLAN
S1006	POND A SECTIONS & DETAILS – SH. 1
S1008	POND A SECTIONS & DETAILS – SH. 3

ISSUE	DESCRIPTION	CHKD	CORRECT	APPR. DATE
3				
2				
1	FOR CONSTRUCTION			
0	ORIGINAL ISSUE FOR UPA REVIEW	WLZ	SGG KWC 4-13-94	

UPA PROJECT	UNITED POWER ASSOCIATION STANTON STATION ASH POND MODIFICATIONS	DRAWING NO.	REV
4177	POND A SECTIONS & DETAILS – SH. 2	S1007	1

STONE & WEBSTER ENGINEERING CORPORATION
DENVER, CO.

ISSUE
HALF-SIZE
APP. CARD
CAD FILE
UPAS1007.DWG



AS CONSTRUCTED POND A

FIELD SURVEYED 27 OCT. 1997

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REV.	DATE	DESCRIPTION	BY
1			
2			
3			
4			

UPA ASH POND MODIFICATIONS
STANTON, NORTH DAKOTA

AS BUILT TOPO OF POND A

ULTEIG ENGINEERS, INC. CONSULTING ENGINEERS FARGO • BISMARCK • MINNEAPOLIS

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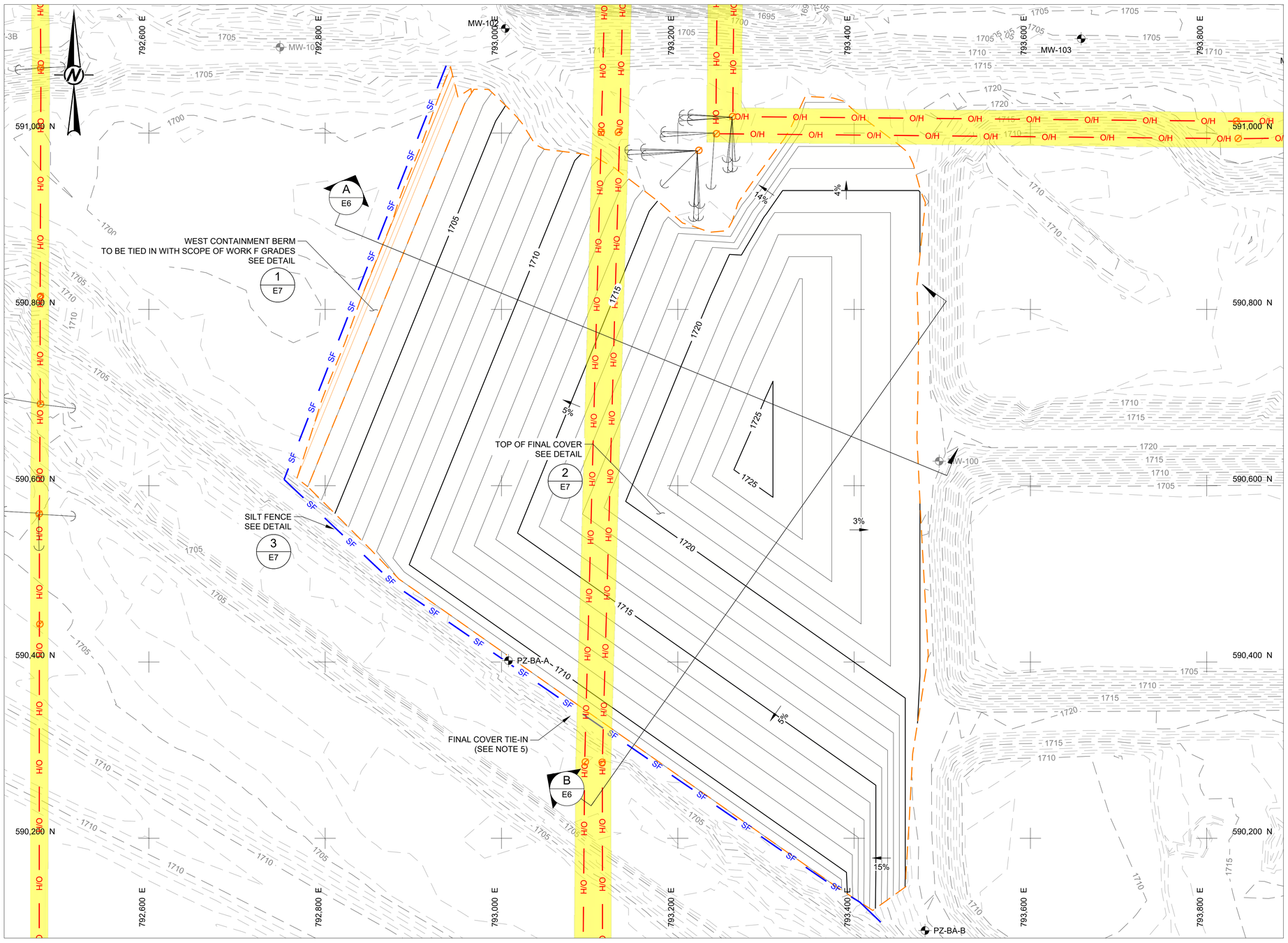
CHECKED BY:	DATE: 13 NOV. 1997	SHEET 1 of 1
APPROVED BY:		



LEGEND

- EXISTING GROUND TOPOGRAPHY (REFERENCES 2 AND 3)
- TOP OF FINAL COVER GRADES (NOTES 1 AND 2) (REFERENCE 3)
- WEST CONTAINMENT BERM GRADES
- APPROXIMATE TIE-IN LOCATION TO SCOPE OF WORK D NORTH AND CENTER CELLS CLOSURE AND SCOPE OF WORK F SITE RESTORATION GRADING AND SCOPE OF WORK G SOUTH CELL CLOSURE (NOTE 4)
- SF — SILT FENCE (AS REQUIRED) (NOTE 3)
- MW-10 — MONITORING WELLS/PIEZOMETERS (NOTE 6)
- MW-10 — MONITORING WELLS/PIEZOMETERS TO BE ABANDONED (BY OTHERS)
- EXISTING POWER POLES (NOTE 7)
- O/H — OVERHEAD ELECTRIC LINE (ACTIVE) (NOTE 7)

NOTE(S)

1. THE AREA RECEIVING FINAL COVER IS APPROXIMATE. ALL AREAS OF WASTE PLACEMENT SHALL RECEIVE FINAL COVER.
2. TOP OF FINAL COVER GRADES ARE APPROXIMATE AND THE FINAL SLOPES MAY VARY DEPENDING ON THE AMOUNT OF MATERIAL REQUIRED TO BE CONTAINED AS A PART OF THE STANTON STATION SITE RESTORATION CONSTRUCTION. ALL AREAS OF WASTE PLACEMENT WILL RECEIVE FINAL COVER. TOP OF FINAL COVER GRADES SHALL NOT BE LESS THAN 3% OR GREATER THAN 15% UNLESS OTHERWISE APPROVED BY THE OWNER'S REPRESENTATIVE.
3. CONTRACTOR SHALL FOLLOW BEST MANAGEMENT PRACTICES FOR INSTALLATION AND MAINTENANCE OF EROSION CONTROL MEASURES. ALL PERMANENT AND TEMPORARY EROSION CONTROL FEATURES ARE SUBJECT TO REVIEW FOR EFFECTIVENESS AND NECESSARY ADJUSTMENTS WILL BE MADE AS DIRECTED BY THE OWNER'S REPRESENTATIVE.
4. BOTTOM ASH LANDFILL GRADING SHALL TIE INTO THE SCOPE OF WORK D, F AND G ALONG THE APPROXIMATE TIE-IN LINE INDICATED. SCOPE OF WORK D, F AND G GRADING IS NOT SHOWN FOR CLARITY. TEMPORARY SLOPES BETWEEN SUBGRADE GRADES SHOWN AND EXISTING GROUND (PRIOR TO SITE REGRADING) SHALL NOT BE STEEPER THAN 3H:1V.
5. THE FINAL COVER SHALL BE TIED INTO THE EXISTING SOUTH PERIMETER BERM AS REQUIRED TO MAINTAIN 2 FEET OF COVER OVER WASTE AREAS AND TO PROMOTE SURFACE WATER FLOW OFF OF THE BOTTOM ASH LANDFILL.
6. CARE SHALL BE TAKEN WHEN WORKING NEAR EXISTING MONITORING WELLS/PIEZOMETERS. ANY DAMAGE TO MONITORING WELLS/PIEZOMETERS IS THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE REPAIRED BY THE CONTRACTOR TO THE SATISFACTION OF THE OWNER'S REPRESENTATIVE.
7. CONTRACTOR SHALL TAKE CARE WHEN WORKING NEAR ACTIVE OVERHEAD ELECTRIC LINES. APPROPRIATE VERTICAL AND HORIZONTAL OFFSETS FROM OVERHEAD POWER LINES, GUY WIRES, AND POLES/STRUCTURES SHALL BE MAINTAINED (A MINIMUM OF TWENTY (20) FEET VERTICAL AND TEN (10) FEET HORIZONTAL) AS DIRECTED BY THE OWNING UTILITY.

REFERENCE(S)

1. SITE LOCATION: T144N, R84W, MERCER COUNTY, NORTH DAKOTA.
2. EXISTING GROUND TOPOGRAPHY IS FROM AN AERIAL SURVEY PERFORMED BY KBM, INC. ON APRIL 27, 2001 (SITE WIDE), A GROUND SURVEY PERFORMED BY INTERSTATE ENGINEERING IN 2014 (BOTTOM ASH IMPOUNDMENT AND LANDFILL AREA), A GROUND SURVEY PERFORMED BY INTERSTATE ENGINEERING IN 2017 (COAL PILE AREA), AND A GROUND SURVEY PERFORMED BY INTERSTATE ENGINEERING IN 2018.
3. EXISTING GROUND TOPOGRAPHY AND TOP OF FINAL COVER CONTOUR INTERVAL IS ONE (1) FOOT.

0 60 120
1" = 60' FEET

REV.	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
0	2019-07-19	ISSUED FOR CONSTRUCTION	CCS	CCS	RFS	TJS

SEAL

REGISTERED PROFESSIONAL ENGINEER
TODD J. STONG
PE-6144
DATE 7/19/19
NORTH DAKOTA

CLIENT
GREAT RIVER ENERGY
STANTON STATION
STANTON, NORTH DAKOTA

CONSULTANT
GOLDER ASSOCIATES INC.
7245 W ALASKA DR., SUITE 200
LAKEWOOD, COLORADO
USA
(303) 980-0540
www.golder.com

PROJECT
STANTON SITE RESTORATION
BOTTOM ASH LANDFILL CLOSURE

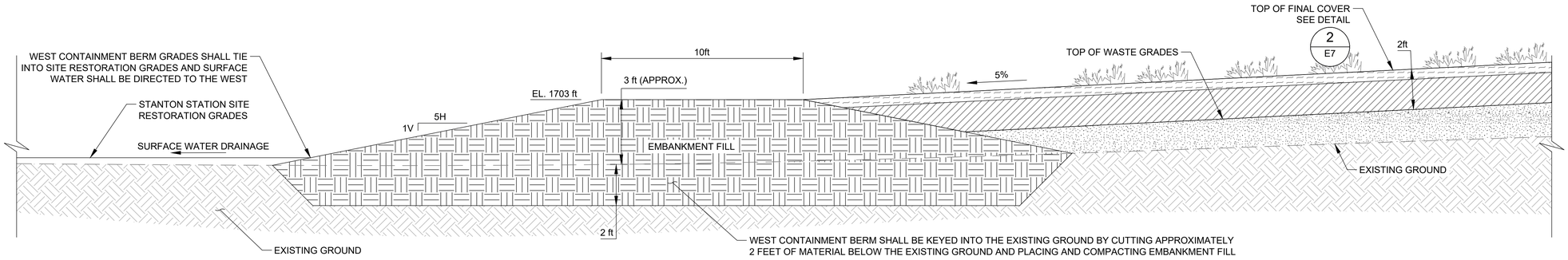
TITLE
TOP OF FINAL COVER

PROJECT NO. 1775717 | REV. 0 | E5 of E7 | DRAWING E5

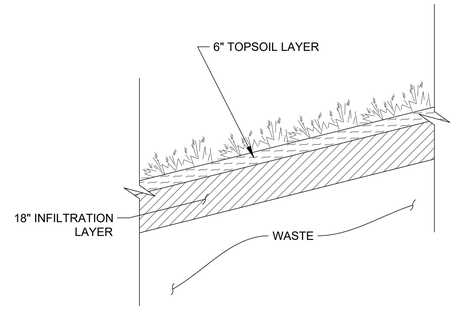
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI D

1 in

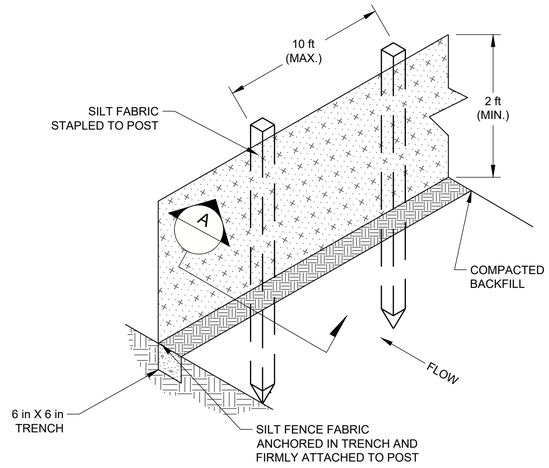
Path: \\Denver\acad\GREAT RIVER ENERGY\STANTON\99_PROJECTS\1775717\SITE RESTORATION_E - Bottom Ash Landfill Closure\02_PRODUCTION\DWG\ | File Name: 1894194\904.dwg | Last Edited By: bpurcell Date: 2019-07-16 Time:10:42:36 AM | Printed By: BPurcell Date: 2019-07-16 Time:11:51:27 AM



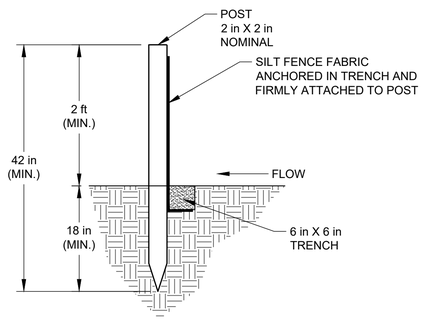
NTS 1 E7 WEST CONTAINMENT BERM DETAIL



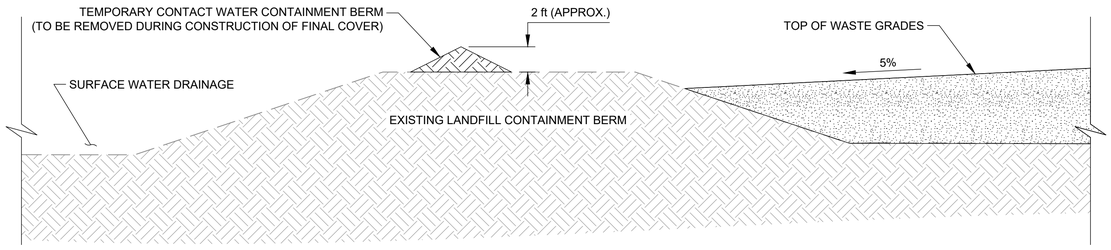
NTS 2 E7 FINAL COVER DETAIL



NTS 3 E7 SILT FENCE DETAIL



SECTION A



NTS 4 E7 TEMPORARY CONTACT WATER BERM

REV.	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
0	2019-07-19	ISSUED FOR CONSTRUCTION	MRS	MRS	RFS	TJS

SEAL

REGISTERED PROFESSIONAL ENGINEER — TODD J. STONG — PE-6144 — NORTH DAKOTA — DATE 7/19/19

CLIENT
GREAT RIVER ENERGY
STANTON STATION
STANTON, NORTH DAKOTA

CONSULTANT
GOLDER ASSOCIATES INC.
7245 W ALASKA DR., SUITE 200
LAKEWOOD, COLORADO
USA
(303) 980-0540
www.golder.com

PROJECT
STANTON SITE RESTORATION
BOTTOM ASH LANDFILL CLOSURE

TITLE
DETAILS

PROJECT NO. 1775717 | REV. 0 | E7 of E7 | DRAWING E7

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI D

0 1 in

Path: \\Denver\acad\GREAT RIVER ENERGY\STANTON\99_PROJECTS\1775717\SITE RESTORATION_E - Bottom Ash Landfill Closure\02_PRODUCTION\DWG\ | File Name: 1894194#006.dwg | Last Edited By: bpurcell Date: 2019-07-16 Time:10:43:13 AM | Printed By: BPurcell Date: 2019-07-16 Time:11:51:53 AM

APPENDIX B

Visual Observations Checklist

INSPECTION CHECKLIST

GOLDER

Facility Name: Bottom Ash Landfill
Owner and Address: Great River Energy – Stanton Station
Purpose of Facility: CCR Storage and Disposal
Legal: Section 21 **Township:** 144N **Range:** 84W
County: Mercer
Inspected By: Craig Schuettpelz, PE and Kayla Moden **Inspection Date:** September 26, 2019
Weather: Sunny, 50-60°F, low wind, no precipitation

ITEM	Y	N	N/A	REMARKS
1. Contact Water Controls				
a. Water level in contact water control area	X			Minor standing water collected in area west of Bottom Ash Landfill (to be removed via pumping)
b. Sump & pump in good condition			X	
c. Containment controls working		X		West containment berm of BAL not yet constructed (part of site restoration activities)
d. Ponding water outside of control area		X		
e. Erosion protection in control area			X	
2. CCR Placement				
a. Significant erosion		X		Minor erosion on east side of the facility
b. Cracking/settlement		X		
c. Seepage		X		
3. Upstream Slope				
a. Erosion/liner exposed		X		
b. Rodent burrows		X		
c. Vegetation		X		Some grass on east and north slopes
d. Cracks/settlement		X		
4. Crest				
a. Soil condition	X			
b. Compared to design width	X			
c. Vegetation	X			Grass on south crest
d. Rodent burrows		X		
e. Exposed to heavy traffic	X			Site restoration re-grading
f. Damage from vehicles/equipment		X		
5. Downstream Slope				
a. Erosion		X		
b. Vegetation	X			Most of south side is well-vegetated; northwest, west, southwest sides have been cleared and grubbed as a part of site restoration construction
c. Rodent burrows	X			Few animal burrows along south slope
d. Cracks/settlement/scarps		X		
e. Seepage		X		
7. Toe				
a. Vegetation	X			Grass (two small trees on south side)
b. Rodent burrows	X			Animal burrows on south side
c. Settlement		X		
d. Drainage conditions	X			Good condition drainage ditches on west and south
e. Seepage		X		

General Remarks: Site is being re-graded and closed as a part of site restoration activities; minor ongoing maintenance to control/repair burrows, remove woody vegetation, and manage contact water.

Name of Engineer (Engineer Firm):
Craig Schuettpelz, PE (Golder Associates, Inc.)
Date: 9/26/19
Signature:

REGISTERED PROFESSIONAL ENGINEER
CRAIG C. SCHUETTPELZ
PE-9220
DATE 9/26/19
NORTH DAKOTA

APPENDIX C

Photographs

LEGEND

1 PHOTOGRAPH NUMBER AND LOCATION

REFERENCE(S)

1. AERIAL IMAGE FROM GREAT RIVER ENERGY PHOTOGRAPH NOVEMBER 2019.

GOLDER

GREAT RIVER ENERGY - STANTON STATION
2019 ANNUAL INSPECTION - PHOTOGRAPH LOCATIONS
BOTTOM ASH LANDFILL

FIGURE 1

Bottom Ash Landfill

Photograph 1 (NW berm crest)
North crest and contact water at west end of Bottom Ash Landfill (north berm to be removed as part of restoration) (panoramic view - 1 of 3) (DSCF0620.JPG)

Photograph 2 (NW berm crest)
Contact water in west end of Bottom Ash Landfill (previously cleared and grubbed as part of restoration) (panoramic view - 2 of 3) (DSCF0621.JPG)

Bottom Ash Landfill

Photograph 3 (NW berm crest)
Contact water in west end of Bottom Ash Landfill (previously cleared and grubbed as part of restoration) (panoramic view - 3 of 3) (DSCF0622.JPG)

Photograph 4 (West downstream slope)
West downstream slope (previously cleared and grubbed as part of restoration) (DSCF0623.JPG)

Bottom Ash Landfill

Photograph 5 (South downstream slope)
South downstream slope and surface water ditch (previously cleared and grubbed as part of restoration) (DSCF0625.JPG)

Photograph 6 (South berm crest)
Approximate west end of consolidated Bottom Ash Landfill footprint to be closed with permitted material remaining in place (containment berm to be constructed as part of site restoration) (DSCF0626.JPG)

Bottom Ash Landfill

Photograph 7 (South downstream slope)
Tree to be removed with site restoration activities (DSCF0628.JPG)

Photograph 8 (South downstream slope)
Grass vegetation on the south downstream slope and woody vegetation to be removed as part of site restoration (DSCF0630.JPG)

Bottom Ash Landfill

Photograph 9 (South toe)
Large animal burrow, approximately 8" in diameter, planned to be repaired as part of site restoration (DSCF0631.JPG)

Photograph 10 (SE corner)
Interior Bottom Ash Landfill from the southeast corner (panoramic view - 1 of 2) (DSCF0632.JPG)

Bottom Ash Landfill

Photograph 11 (SE corner)
Interior Bottom Ash Landfill from the southeast corner (panoramic view - 2 of 2) (DSCF0633.JPG)

Photograph 12 (SE berm crest)
Bottom Ash Landfill east berm crest (shared berm to Bottom Ash Impoundment) (DSCF0634.JPG)

Bottom Ash Landfill

Photograph 13 (NE corner/east berm)
Interior Bottom Ash Landfill restoration activities (DSCF0636.JPG)

Photograph 14 (North downstream slope)
Grass vegetation on the north downstream slope (DSCF0637.JPG)

Bottom Ash Landfill

Photograph 15 (North berm crest)
Interior Bottom Ash Landfill berm construction (DSCF0638.JPG)

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