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 2021

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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 site restoration were completed in 2020. Ongoing maintenance of the site will be performed in accordance with the Closure and Post-Closure Plan (Golder 2019).

Both the Bottom Ash Landfill and the Bottom Ash Impoundment were closed in 2020 as part of the site closure and restoration activities. This report presents a review of available facility information and findings of the inspection of the Bottom Ash Landfill performed on July 21, 2020 (after closure was complete).

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 2017). 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 historic plant. 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 removed and new facilities constructed.

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 reconstructed 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. Soil and/or ash fill was placed over the 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) was 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 were 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 were completed in the summer of 2020. These activities primarily included 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 remaining portions of the active surface impoundment and landfill.

2.4 Original Site Geometry

The original 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 and the west berm was constructed to an elevation of 1703 feet amsl during site restoration activities and consolidation of the Bottom Ash Landfill footprint. 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 surveyed grades (see Appendix A). The berm upstream and berm downstream slopes are three horizontal units to one vertical unit (3:1). Current top of waste elevations range between approximately 1700 feet amsl and 1725 feet amsl based on as-built surveyed grades (see Appendix A).

2.5 Changes in Geometry

Perimeter berms on the west portion of the Bottom Ash Landfill were re-graded to tie in with site restoration grades and a new containment berm was constructed in the Bottom Ash Landfill area after consolidation of the Bottom Ash Landfill footprint. This new west containment berm has a crest elevation of 1703 feet amsl. The facility's Closure and Post-Closure Plan (Golder 2019) 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 was disposed of in the south cell of the Bottom Ash Impoundment or the Bottom Ash Landfill. The landfill was 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 and final construction grades are included in Appendix A.

2.6 Existing CCR Volume

Bottom ash was last placed in the Bottom Ash Landfill in 2014. Based on a survey of final waste grades performed during 2020 site restoration activities, approximately 160,000 CY of material is contained in the Bottom Ash Landfill.

2.7 Permits

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

2.8 Summary of 2020 Weekly Inspections

GRE performed weekly inspections of the Bottom Ash Landfill throughout 2020. 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 2019 (Golder 2020) and a summary of the observations of that inspection are as follows:

- The Bottom Ash Landfill was actively undergoing construction during the 2019 inspection as part of the site restoration
- Generally good vegetation and site maintenance were applicable.
- 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.
- Isolated and minor woody vegetation was growing on berm downstream slopes and near the toe of slopes.

3.0 2020 ANNUAL INSPECTION

On July 21, 2020, Craig Schuettpelz 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 2020 annual inspection.

3.1 FINAL COVER

Construction of the final cover system was completed in 2020 and the area was seeded and mulched prior to performing the annual inspection. At the time of inspection, vegetation had not yet started growing in recently seeded areas. The final cover will be monitored for vegetative success during future inspections in accordance with the Closure and Post-Closure Plan (Golder 2019).

3.2 Perimeter Berm

3.2.1 Berm Upstream Slope

Due to site closure and restoration activities, the berm upstream slopes of the Bottom Ash Landfill were not visible during the inspection.

3.2.2 Berm Crest

The remaining berm crests east and north of the landfill are surfaced with soil and/or gravel at elevations between approximately 1715 feet amsl and 1720 feet amsl. The crest roadway is primarily used for light vehicle traffic but was exposed to heavy construction equipment when the north and south cells were cleaned out and during site restoration activities. Some surficial gravel has been removed as a part of site restoration activities. The berm crest appears to be in good condition with minimal weedy vegetation, no animal burrows, and no settlement.

3.2.3 Berm Downstream Slope

Part of the berm downstream slope east of the landfill was regraded during site closure and restoration activities (associated with closure by removal of CCR within the north and center cells of the Bottom Ash Impoundment). The berm is approximately 20-feet high and graded at approximate 5:1 slopes. The berm was recently seeded and mulched as part of site closure and restoration activities.

The berm downstream slopes on the north and south sides are between approximately 5 feet and 10 feet high and have slopes of approximately 3:1. Slopes that were not impacted by site restoration grading are well vegetated with grass but do contain numerous, but mostly small, animal burrows.

As part of closure, a new three-foot high soil berm was constructed on the west end of the consolidated landfill footprint. The downstream slopes for this new west berm were recently seeded and mulched as part of site closure and restoration activities. At the time of inspection, this berm appeared to be experiencing minor erosion as noted by several erosion rills along the slope.

The berm downstream slopes of the Bottom Ash Landfill appear to be in fair condition. Recently seeded and mulched slopes will be monitored for erosion and vegetative success during future inspections in accordance with the Closure and Post-Closure Plan (Golder 2019). Additional soil will be added and the area re-seeded as required during the post-closure period.

3.2.4 Toe

The toe of the south perimeter berm 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 toe of the east, north, and west perimeter berms were recently seeded and mulched as part of site closure and restoration activities. The toes of the berm downstream slopes are in good condition. Recently seeded and mulched areas will be monitored for erosion and vegetative success during future inspections in accordance with the Closure and Post-Closure Plan (Golder 2019).

3.3 CCR Placement

The Bottom Ash Landfill was closed with CCR and other permitted waste in place and covered in 2020. No active placement was occurring and no exposed CCR or other permitted waste was observed.

3.4 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 July 2020.

4.0 SUMMARY AND CONCLUSIONS

An annual inspection was performed for the Bottom Ash Landfill at Stanton Station on July 21, 2020. The inspection met the requirements for CCR landfills under 40 CFR Part 257.84.

The Bottom Ash Landfill was closed in 2020 with permitted wastes remaining in-place and in accordance with the final cover design outlined in the Closure and Post-Closure Plan (Golder 2019).

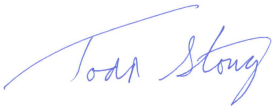
As applicable for areas not affected by site restoration and/or closure activities, Golder observed good vegetation and site maintenance and did not identify significant deficiencies such as seepage, excessive erosion or settlement, or cracking during visual observations. Significant portions of the facility were recently seeded and mulched prior to the annual inspection and will be monitored for erosion and vegetative success moving forward.

In addition to annual inspections of applicable portions of the Bottom Ash Landfill by a Professional Engineer, trained and qualified site personnel will perform semi-annual facility inspections, typically in the spring and fall, for the first five years of the post-closure period. These inspections will focus on erosion of soil on the perimeter berms and the final cover as well as vegetative success. Minor maintenance items that may need to be continually addressed include repairing larger animal burrows as they appear, repairing erosion caused by stormwater, monitoring vegetative success of berm downstream slopes and slopes that have received final cover, and removal of any woody vegetation growing on the berm downstream slopes or final cover areas.

Golder Associates Inc.

Brendan Purcell
Staff Engineer

Craig Schuettpelz, PE
Senior Engineer



Todd Stong, PE
Associate and Senior Consultant

BJP/CCS/mp

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 2020. 2019 Annual Inspection Report – Great River Energy – Stanton Station – Bottom Ash CCR Landfill. January 2020.

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

Great River Energy – Coal Creek 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)

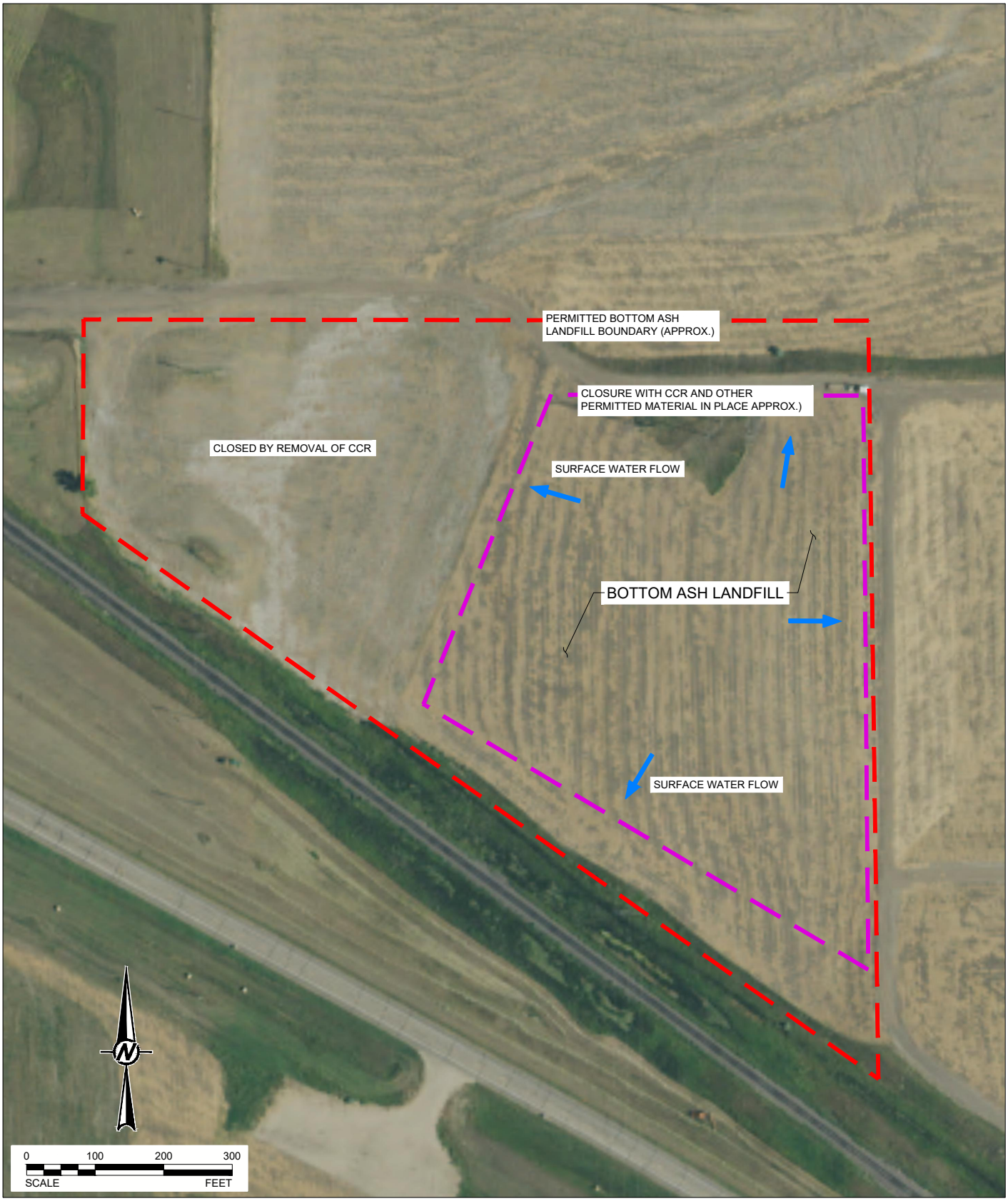
1. AERIAL IMAGE FROM UNITED STATES DEPARTMENT OF AGRICULTURE NATIONAL AGRICULTURE IMAGERY PROGRAM, 2020.

GOLDER

GREAT RIVER ENERGY - STANTON STATION
2020 ANNUAL CCR FACILITY INSPECTION REPORT
STANTON STATION SITE OVERVIEW

FIGURE 1

Path: \\Denver.golder.gds\acad\GREAT RIVER ENERGY\STANTON\99_PROJECTS\1894194\Annual Inspections\ | File Name: 2020 Annual Insp_Fig1.dwg



REFERENCE(S)

1. AERIAL IMAGE FROM UNITED STATES DEPARTMENT OF AGRICULTURE NATIONAL AGRICULTURE IMAGERY PROGRAM, 2020.

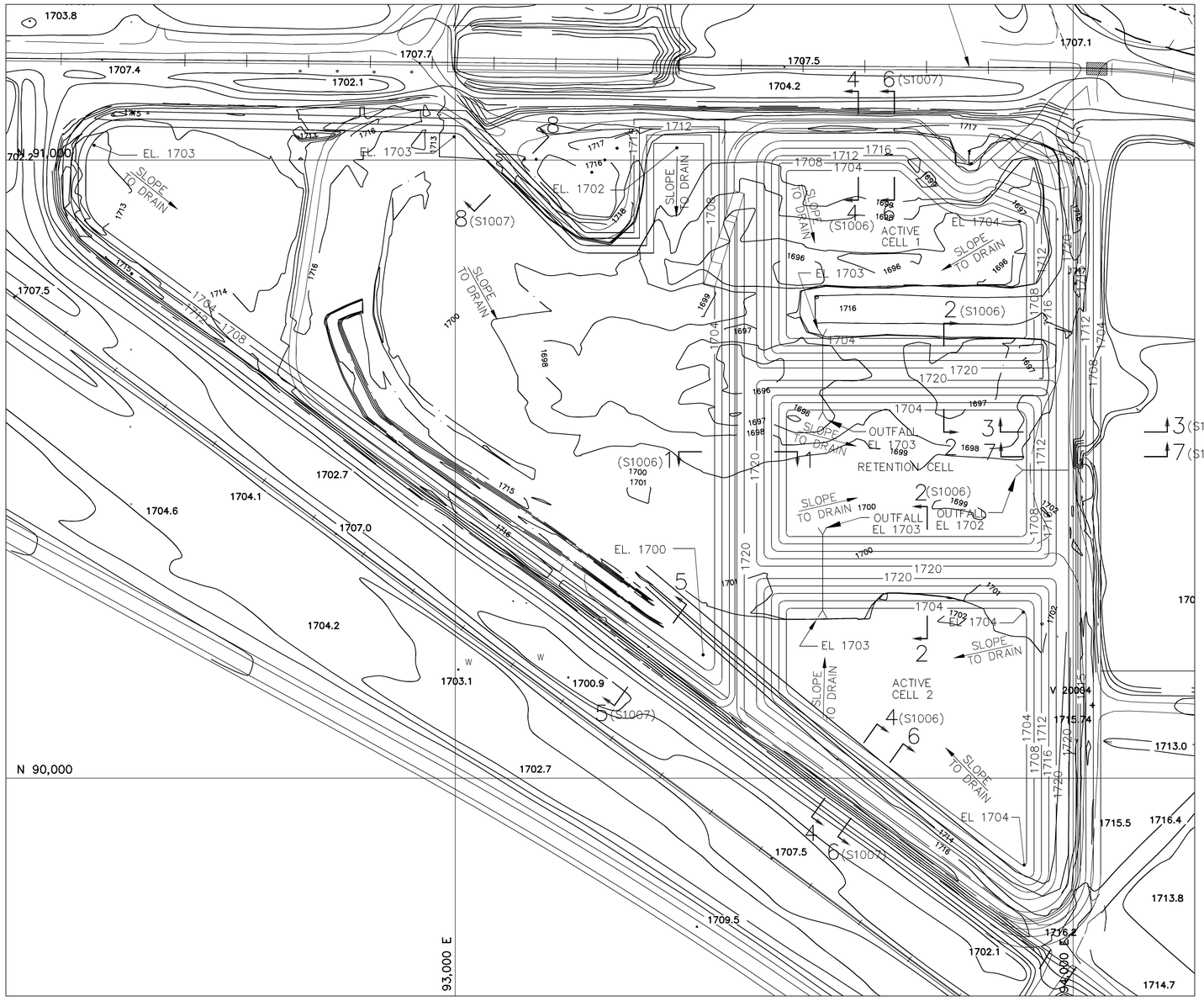
GOLDER

GREAT RIVER ENERGY - STANTON STATION
2020 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:

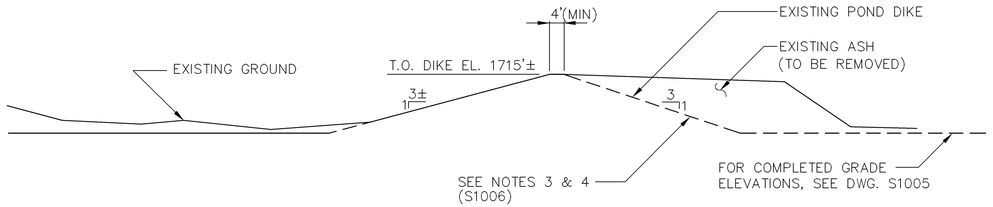
S1002	FACILITIES SITE PLAN
S1006	POND A SECTIONS & DETAILS – SH. 1
S1007	POND A SECTIONS & DETAILS – SH. 2
S1008	POND A SECTIONS & DETAILS – SH. 3
S1009	OUTFALL STRUCTURES OUTLINE – PLAN & SECTIONS
S1010	OUTFALL STRUCTURES – REINFORCEMENT SH. 1
S1011	OUTFALL STRUCTURES – REINFORCEMENT SH. 2

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
	POND A CONVERSION PLAN		
	STONE & WEBSTER ENGINEERING CORPORATION DENVER, CO.		

ISSUE | HALF-SIZE | APP. CARD

CAD FILE UPAS1005.DWG



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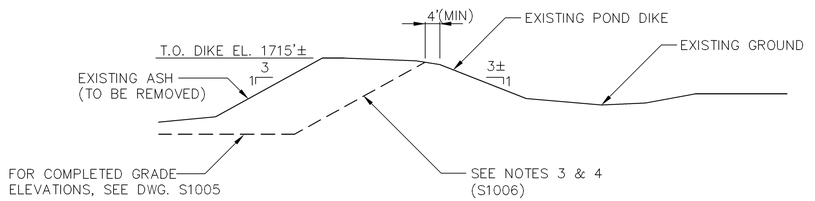
(S1005)



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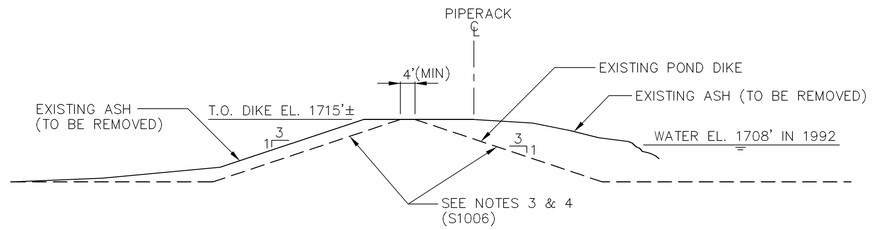

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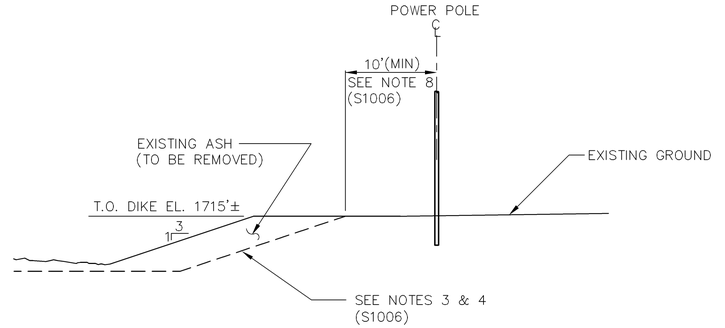
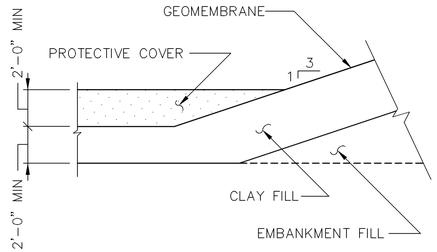


8–8
(S1005)



DETAIL A
(S1006)
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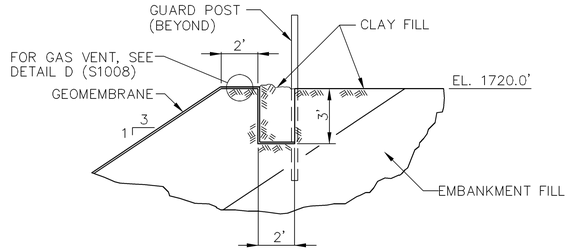

DETAIL B
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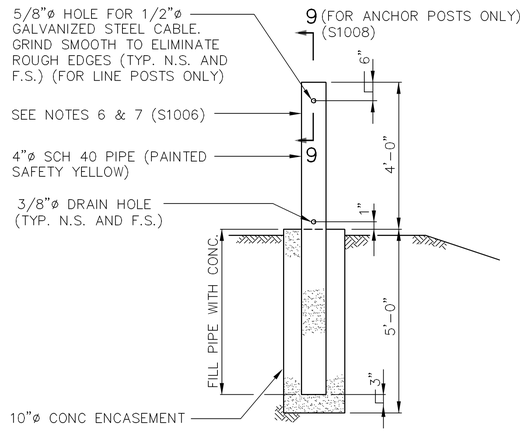


DETAIL C
(S1006)
NTS

NOTES:

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

REFERENCE DRAWINGS:

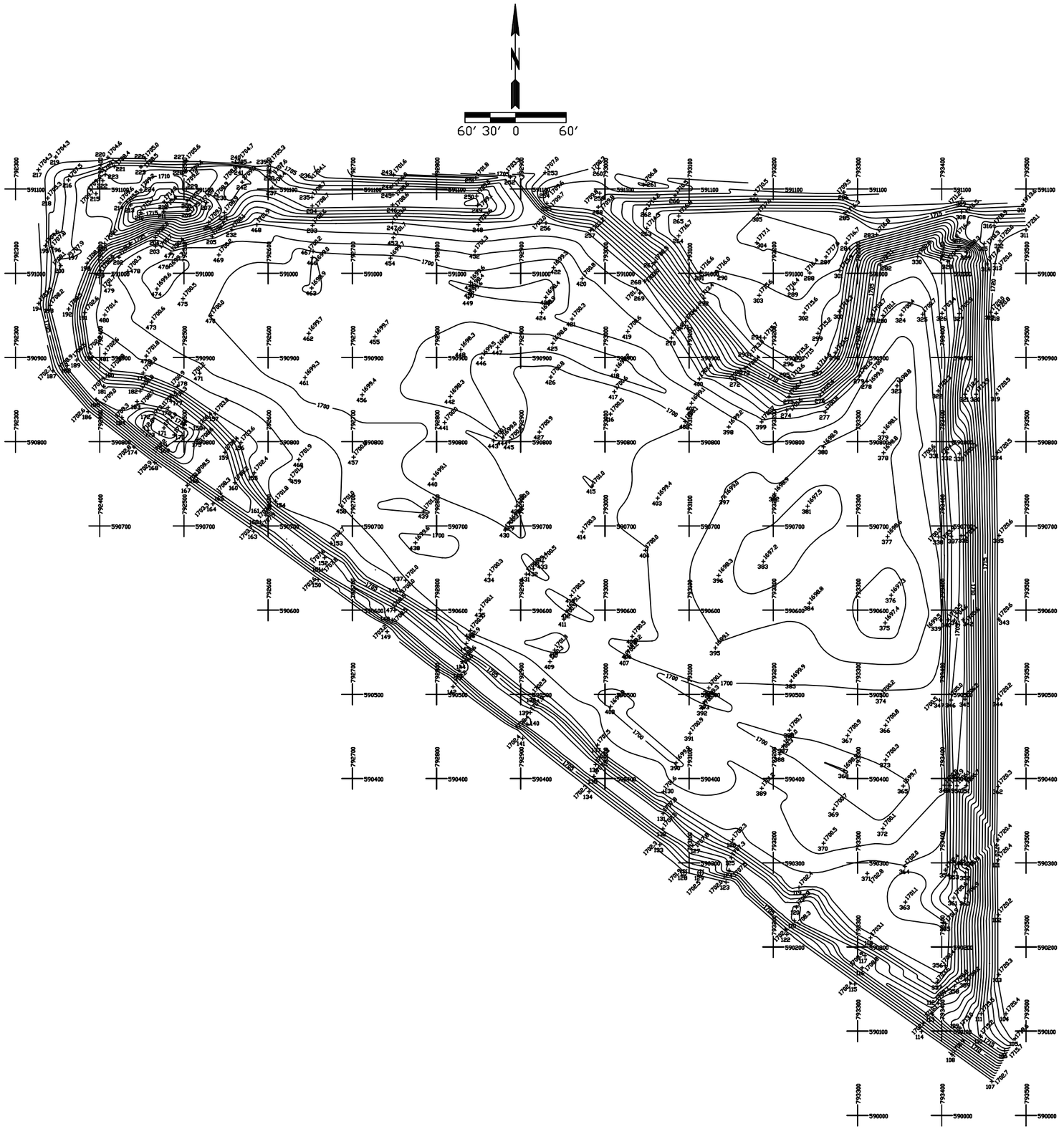
S1002	FACILITIES SITE PLAN
S1005	POND A CONVERSION PLAN
S1006	POND A SECTIONS & DETAILS – SH. 1
S1008	POND A SECTIONS & DETAILS – SH. 3

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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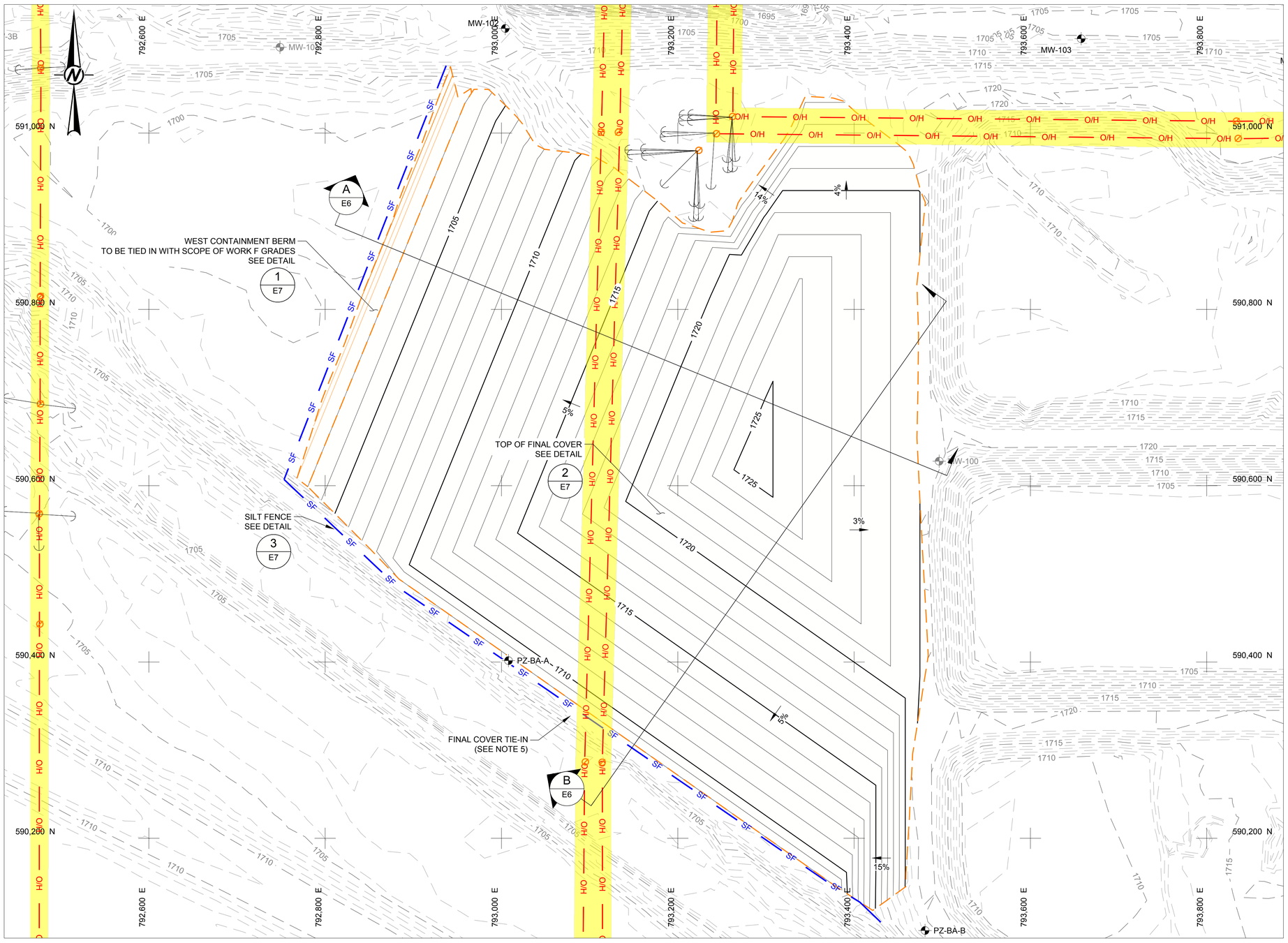
REV.	DATE	DESCRIPTION	BY
1			
2			
3			
4			

UPA ASH POND MODIFICATIONS
STANTON, NORTH DAKOTA

AS BUILT TOPO OF POND A

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

DRAWN BY: A.W.E.	SCALE: AS SHOWN	PROJECT NO. 97866
CHECKED BY:	DATE: 13 NOV. 1997	SHEET 1 of 1
APPROVED BY:		



LEGEND

- 3600 — EXISTING GROUND TOPOGRAPHY (REFERENCES 2 AND 3)
- 3600 — TOP OF FINAL COVER GRADES (NOTES 1 AND 2) (REFERENCE 3)
- 3600 — 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

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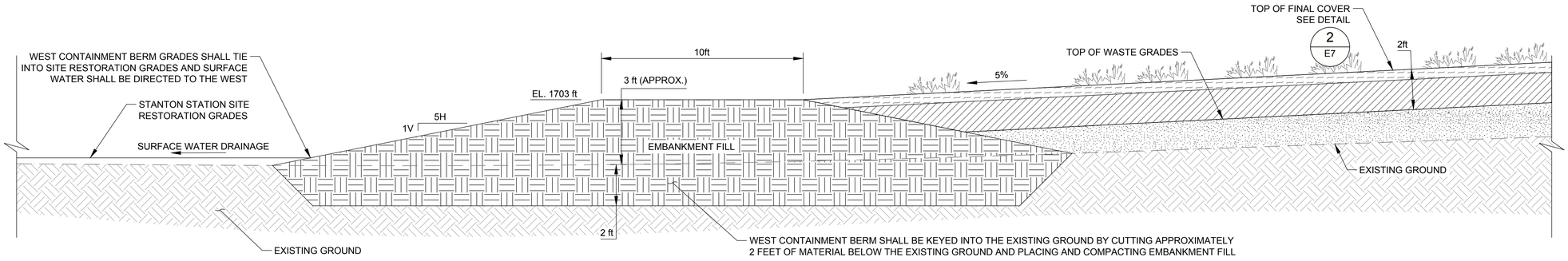
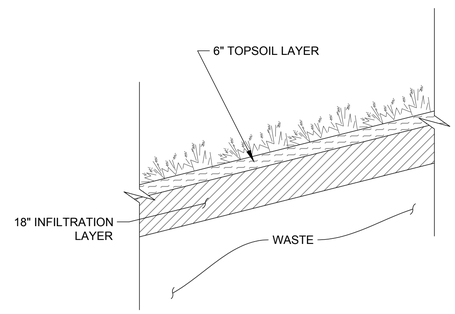
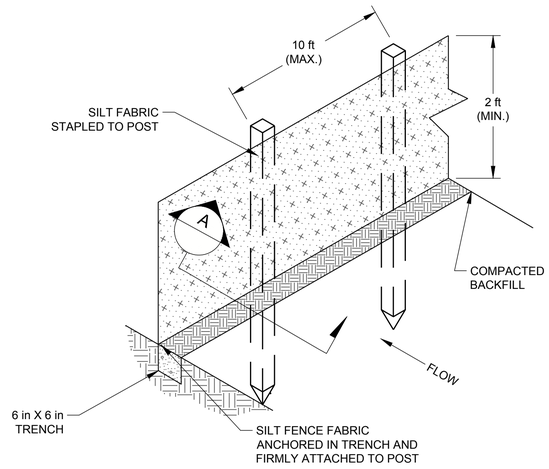
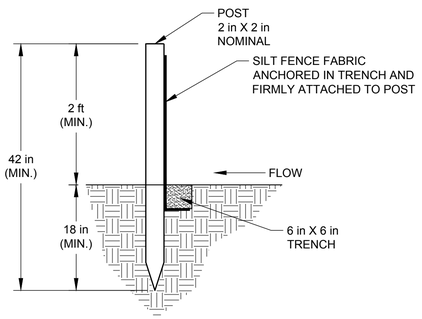


NTS 1 E7 WEST CONTAINMENT BERM DETAIL



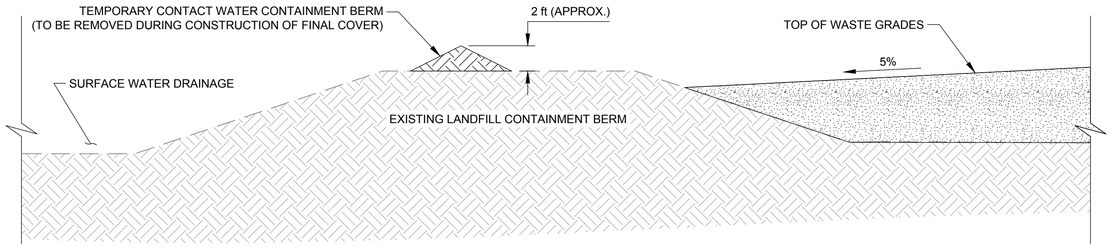
NTS 2 E7 FINAL COVER DETAIL





SECTION A

NTS 3 E7 SILT FENCE DETAIL



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 — DATE 7/17/19 — 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
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 1in

Infiltration layer thickness was verified to be a minimum of 18 inches.

REGISTERED PROFESSIONAL ENGINEER & LAND SURVEYOR
DAREN PETERKA
PE-4358
LS-4358
DATE 09-28-2020
NORTH DAKOTA

N

75′ 0 75′

Revision No.	Date	By	Description

Great River Energy - Stanton Station
Stanton Site Restoration
Stanton, North Dakota

SOW E - Bottom Ash Landfill - Infiltration Layer As-Built

Drawn By: Daren Peterka Project No.: 19-08-027

Checked By: Daren Peterka Date: September 28, 2020

Interstate Engineering, Inc.
P.O. Box 2035
1900 12th Ave. S.W.
Jamestown, N.D., 58402-2035
Ph (701) 252-0234
Fax (701) 252-0203
www.interstateeeng.com
Other offices in Minnesota, Montana and South Dakota

INTERSTATE ENGINEERING
Professionals you need, people you trust

1
SHEET NO.

Revision No.	Date	By	Description

Great River Energy - Stanton Station
Stanton Site Restoration
Stanton, North Dakota

SOW E - Bottom Ash Landfill - Top of Waste As-Built

Drawn By: Daren Peterka | Project No.: 19-08-027

Checked By: Daren Peterka | Date: September 28, 2020

Interstate Engineering, Inc.
P.O. Box 2035
1903 12th Ave. S.W.
Jamestown, N.D. 58402-2035
Ph: (701) 252-0234
Fax: (701) 252-0203
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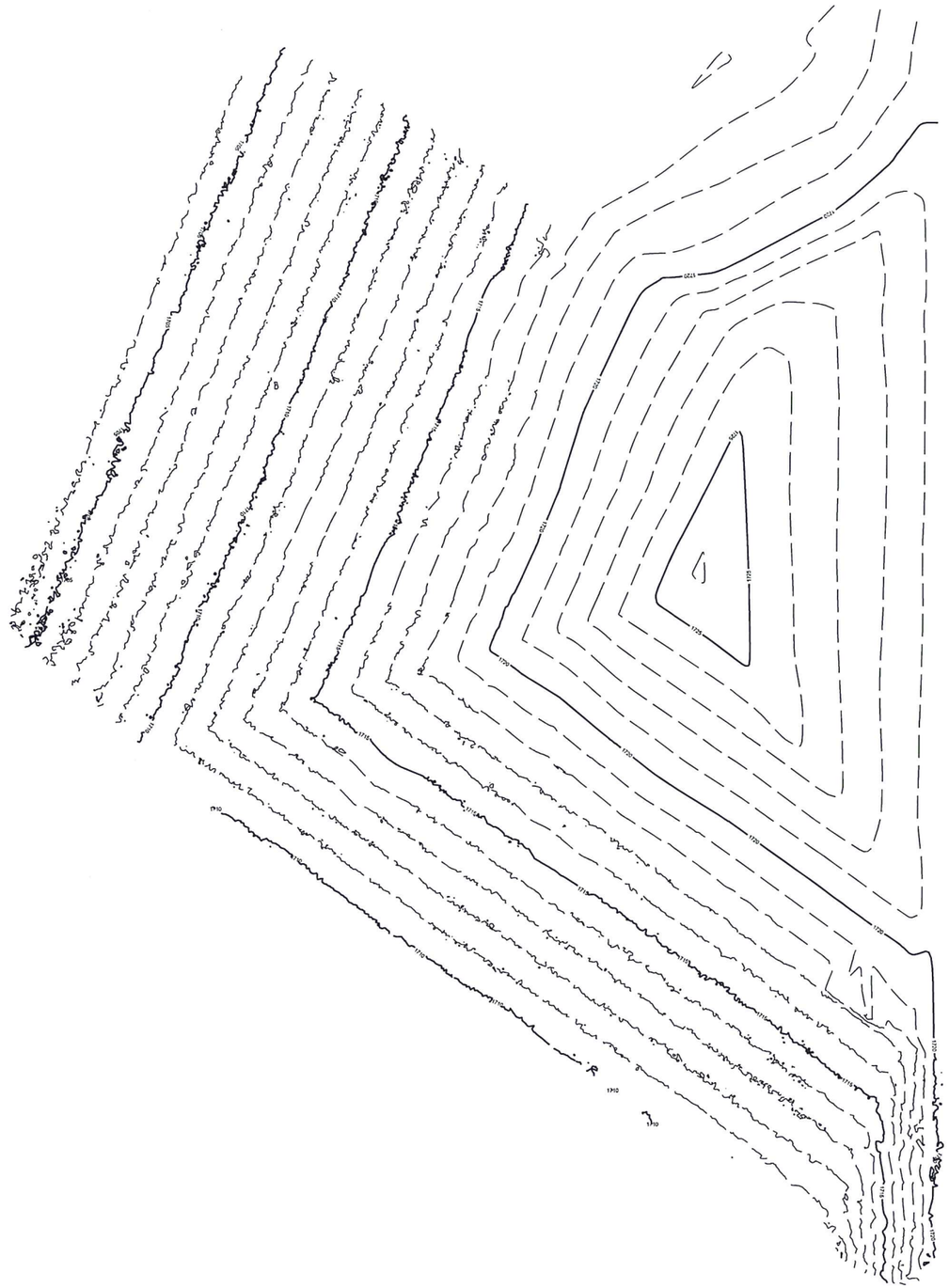
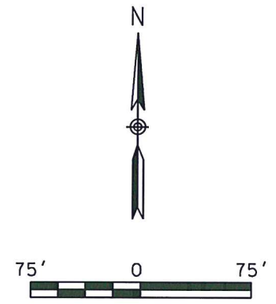
SHEET NO.



Topsoil thickness was verified
to be a minimum of 6 inches.



Revision No.	Date	By	Description

Great River Energy - Stanton Station
Stanton Site Restoration
Stanton, North Dakota

SOW E - Bottom Ash Landfill - Topsoil As-Built

Drawn By: Daren Peterka | Project No.: 19-08-027
Checked By: Daren Peterka | Date: September 28, 2020

Interstate Engineering, Inc.
P.O. Box 2035
1903 12th Ave. S.W.
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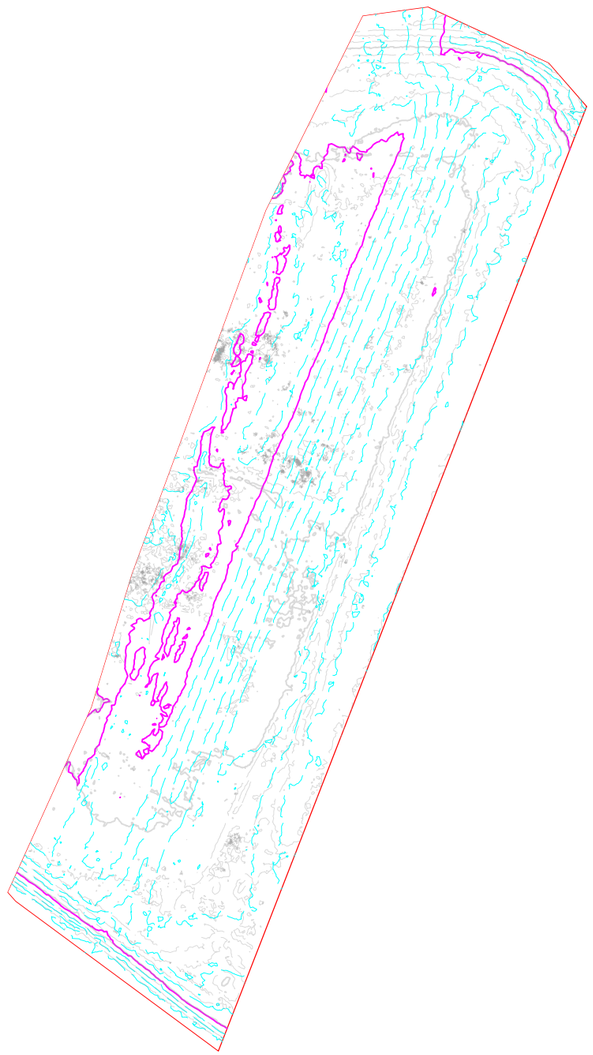
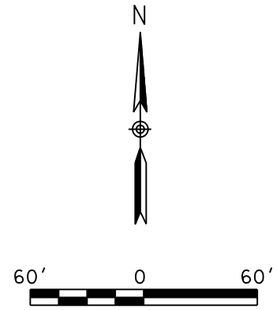
SHEET NO.






```
**********************************************************************
**                                                                  **
** TIN to TIN Volume Report -- Tue Jul 07 16:53:19 2020             **
**                                                                  **
** From TIN <Berm Orig 2019-10-09.tin> to TIN <Berm Top 2020-05-06.tin>
**                                                                  **
** Prismoidal Volume                                                **
**                                                                  **
**                                                                  **
**********************************************************************
**                                                                  **
**  Total Cut =       438.423 Cubic Yards                           **
**  Total Fill =      2441.375 Cubic Yards                          **
**  Area =            7886.392 Sq Yards                             **
**  Balance =                -2002.952 Cubic Yards                  **
**                                                                  **
** Boundary Polygon Used                                            **
**********************************************************************
```

Revision No.	Date	By	Description

Great River Energy - Stanton Station
Stanton Site Restoration
Stanton, North Dakota
SOW E - Berm Quantity

Drawn By: Daren Peterka
Checked By: Daren Peterka
Project No.: 19-08-027
Date: July 8, 2020

Interstate Engineering, Inc.
P.O. Box 2035
1903 12th Ave. S.W.
Jamestown, N.D., 58402-2035
Ph. (701) 252-0234
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www.interstateeng.com
Other offices in Minnesota, Montana and South Dakota

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1
SHEET NO.

APPENDIX B

Visual Observations Checklist

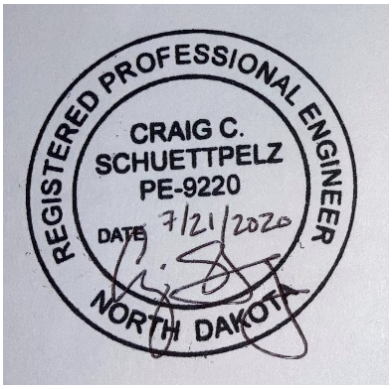
INSPECTION CHECKLIST

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 **Inspection Date:** July 21, 2020
Weather: Sunny, 70-80°F, low wind, no precipitation

ITEM	Y	N	N/A	REMARKS
1. CCR Placement *(Landfill closed, no CCR placement or exposed CCR)*				
a. Significant erosion			X	
b. Cracking/settlement			X	
c. Seepage			X	
2. Final Cover Area				
a. Erosion/liner exposed		X		
b. Rodent burrows		X		
c. Vegetation	X			Recently seeded and mulched, Some grass on east and north slopes as of October 2020
d. Cracks/settlement		X		
3. Perimeter Berm Crest				
a. Soil condition	X			Gravel and soil road on north and east sides
b. Compared to design width	X			
c. Vegetation		X		West and south sides recently seeded and mulched
d. Rodent burrows		X		
e. Exposed to heavy traffic	X			During closure
f. Damage from vehicles/equipment		X		
4. Downstream Slope				
a. Erosion	X			Minor erosion on west slope
b. Vegetation	X			Most of south side is well-vegetated; northwest, west, southwest sides have been recently seeded as a part of site restoration activities
c. Rodent burrows	X			Few 2” to 4” animal burrows along south slope
d. Cracks/settlement/scarps		X		
e. Seepage		X		
5. Toe				
a. Vegetation	X			
b. Rodent burrows	X			Few 2” to 4” animal burrows along south slope toe
c. Settlement		X		
d. Drainage conditions	X			Good condition drainage ditch on south side and restoration grading draining away from facility on other sides
e. Seepage		X		

General Remarks: Site was consolidated, re-graded, and closed as a part of site restoration activities; minor ongoing maintenance may include control/repair of burrows, establishing vegetation, removal of woody vegetation; no sign of instability.

Name of Engineer (Engineer Firm):
Craig Schuettpelz, PE (Golder Associates, Inc.)
Date: *July 21, 2020*
Signature:



APPENDIX C

Photographs

LEGEND

1 PHOTOGRAPH NUMBER AND LOCATION

REFERENCE(S)

1. AERIAL IMAGE FROM UNITED STATES DEPARTMENT OF AGRICULTURE NATIONAL AGRICULTURE IMAGERY PROGRAM, 2020.

GOLDER

GREAT RIVER ENERGY - STANTON STATION
2020 ANNUAL INSPECTION - PHOTOGRAPH LOCATIONS
BOTTOM ASH LANDFILL

FIGURE 1

CCR Bottom Ash Landfill

Photograph 1 (East Final Cover Slope)
Bottom ash landfill closed and covered. (IMG_DSCF1005.JPG)

Photograph 2 (South Perimeter Berm Toe)
Vegetation in surface water drainge ditch. (IMG_DSCF1024.JPG)

CCR Bottom Ash Landfill

Photograph 3 (South Perimeter Berm Downstream Slope)
Small rodent burrows on the slope and near the toe of the facility. (IMG_DSCF1011.JPG)

Photograph 4 (South Perimeter Berm Downstream Slope)
Minor erosion and bare vegetation on the southern downstream slope. (IMG_DSCF1014.JPG)

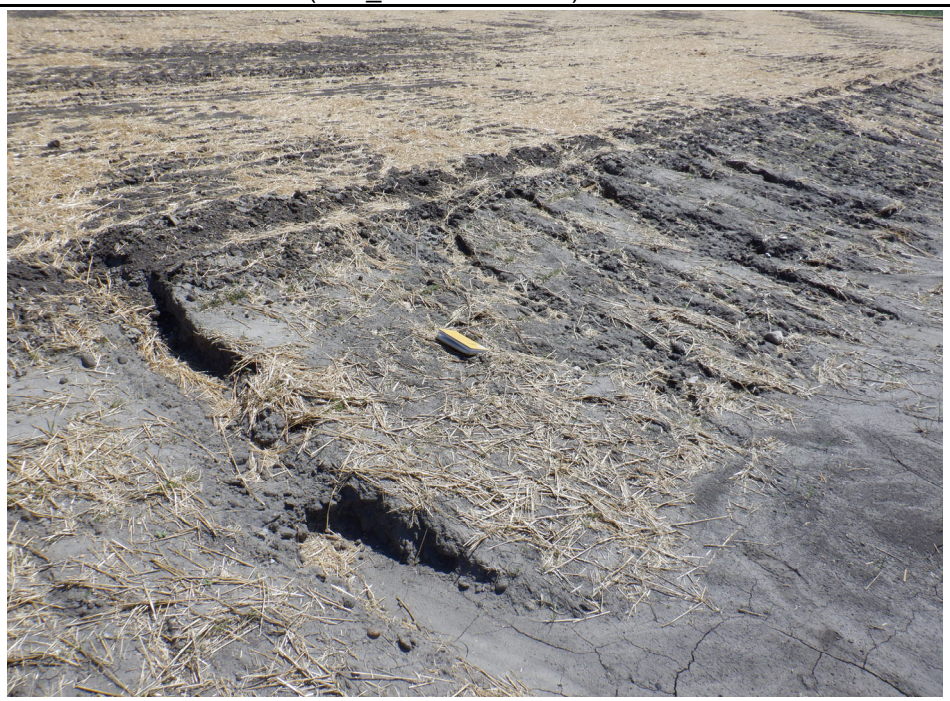
CCR Bottom Ash Landfill

Photograph 5 (West Perimeter Berm Downstream Slope and Toe)
Recently seeded and mulched downstream slope/toe and final cover (background). (IMG_DSCF1039.JPG)

Photograph 6 (North Perimeter Berm Downstream Slope and Toe)
Well vegetated perimeter berm downstream slope and recently seeded and mulched toe.
(IMG_DSCF1041.JPG)

CCR Bottom Ash Landfill

Photograph 7 (Final Cover)
Recently seeded and mulched final cover. (IMG_DSCF1048.JPG)



Photograph 8 (West Perimeter Berm Downstream Slope)
Minor erosion of recently seeded and mulched perimeter berm downstream slope. (IMG_DSCF1038.JPG)

CCR Bottom Ash Landfill

Photograph 9 (East Perimeter Berm Downstream Slope and Toe) Recently seeded and mulched area (vegetation beginning to grow, October 2020). (IMG_7387.JPG)

Photograph 10 (South Final Cover Slope) Recently seeded and mulched area (vegetation beginning to grow, October 2020). (IMG_7391.JPG)

CCR Bottom Ash Landfill

Photograph 11 (South Final Cover Slope) Recently seeded and mulched area (vegetation beginning to grow, October 2020). (IMG_7399.JPG)

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