REPORT

Annual Inspection

Stanton Station - Bottom Ash CCR Surface Impoundment

Submitted to:

Great River Energy

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Submitted by:

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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 surface impoundments under 40 CFR Part 257.83.

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 Impoundment 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 Impoundment 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 Liner Systems

The Bottom Ash Impoundment is divided into three cells, named the north, center, and south cells (see Figure 1 and Figure 2). The north and south cells were active cells used for dewatering bottom ash and the center cell functioned as a retention cell. Bottom ash was placed into one of the active cells until the cell reached capacity. Once capacity was reached bottom ash deposition was directed to the other active cell and the filled cell was dewatered. Bottom ash remaining in the dewatered active cell was excavated and hauled to the adjacent Bottom Ash Landfill for containment. Each active cell was sized to hold at least two years of plant bottom ash production (Stone & Webster 1994c).

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 and the Bottom Ash Landfill. The Bottom Ash Impoundment cells have floor liners consisting of two feet of protective cover, a 60-mil high density polyethylene (HDPE) geomembrane, and

two feet of compacted clay fill (top to bottom). The liner along the side slopes consists of a 60-mil HDPE geomembrane and approximately 3.2 feet of compacted clay (10 feet horizontal width). Select construction 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 and landfills.

2.4 Site Geometry

The berm surrounding the Bottom Ash Impoundment and two interior berms have a top elevation of 1720 feet above mean sea level (amsl). The bottom elevation of the cells varies between 1700 feet amsl and 1704 feet amsl according to original construction drawings. The perimeter berm along the north, east, and south sides of the impoundment complex consists of a historic embankment to elevation 1715 feet amsl with a berm extension to 1720 feet amsl. The west perimeter berm and two interior berms were completely new construction. The berm extension and new berms were constructed in 1994 and 1995. The berm upstream and downstream slopes are 3:1. The crest is a gravel surfaced roadway supporting both light passenger vehicles and some heavy construction equipment.

2.5 Changes in Geometry

The north cell and center cell of the Bottom Ash Impoundment were being closed by removal of CCRs and liner systems at the time of inspection. The facility's Closure and Post-Closure Plan (Golder 2019b) discusses the closure of the north and center cells in detail, but in general, the remaining bottom ash and clayey soil associated with the protective cover on the floor and the geomembrane liner (including the uppermost approximately 6 inches of saturated and/or visually affected clay liner) will be excavated and disposed of in the south cell of the Bottom Ash Impoundment or within the Bottom Ash Landfill. Structures and piping associated with the cells will also be removed (if not already done so) and the north and center cell berms will be regraded to tie in with overall site restoration grading plans. Select site restoration drawings are included in Appendix A.

The south cell of the Bottom Ash Impoundment was receiving the remaining C&D and site restoration waste materials at the time of inspection to establish the final waste grades in preparation for final cover construction to be completed in the fall of 2019. The south cell 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).

2.6 Storage Capacity and Volumes

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. The bottom ash was sluiced to the surface impoundment with water pumped from the Missouri River. The Bottom Ash Impoundment also provided containment for demineralizer reject water, boiler blowdown water, and water from the plant's stormwater

retention pond, coal unloading pit sump, and miscellaneous plant drains. Since the north and center cells of the Bottom Ash Impoundment were being closed by removal of CCR and liner systems at the time of inspection, storage capacities and volumes associated with these cells are not presented below.

The capacity of the south cell of the Bottom Ash Impoundment to elevation 1720 feet amsl is 75,600 CY. The south cell contained approximately 75,000 CY of bottom ash at the time of the inspection. Above elevation 1720 feet amsl, the grades will be crowned at an approximately 7% grade to accommodate remaining waste from site restoration activities. Including the 7% crown, the total capacity of the facility is expected to be approximately 88,000 CY. Therefore, approximately 13,000 CY of capacity remains between the material in place at the time of inspection and the anticipated final grades of the south cell.

2.7 Impounded Water

Water levels in the Bottom Ash Impoundment cells were historically controlled by stop logs at the inlet and outlet structures between the cells and at the discharge location. The liner and protective cover soil were removed from the north cell and no water was noted at the time of inspection. Geomembrane liner on the side slopes of the center cell was removed at the time of inspection and only nominal amounts of water remained in the center cell of the Bottom Ash Impoundment due to ongoing removal and transport of that contact water to GRE's Coal Creek Station. The south cell was in the process of being filled with waste at the time of inspection and water was being managed to allow for filling. Negligible ponded water was noted in the south cell at the time of inspection.

2.8 Permits

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

2.9 Summary of 2019 Weekly Inspections

Routine weekly inspections of the Bottom Ash Impoundment were completed by GRE throughout 2019 as a part of the final CCR Rule. 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.

2.10 Summary of Previous Inspections

The previous annual professional engineer inspection of the Bottom Ash Impoundment 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 of berm downstream slopes.
- Minor erosion and/or lack of robust grass vegetation.
- Animal burrows.
- Berm upstream slopes were in generally fair condition due to minor movement of soils underlying the geomembrane liner. Between 2012 and 2015, GRE performed repairs to the geomembrane and clay liner systems.
- Generally good condition of embankment crests, including the access roads.
- No signs of significant seepage, settlement, or cracking of the berm downstream slopes.

A previous “Coal Ash Impoundment Site Assessment Report” performed by Kleinfelder in 2011 (Kleinfelder 2012) under contract with the United States Environmental Protection Agency (USEPA) assigned the facility a “Less than Low” hazard rating and had similar observations with respect to facility stability.

3.0 2019 ANNUAL INSPECTION

On September 26, 2019, Craig Schuettpelz and Kayla Moden of Golder performed an inspection of the Bottom Ash Impoundment per USEPA Regulation 40 CFR Part 257.83(b) requirements. The inspection consisted of visual observations while walking around the facility traversing up and down the perimeter berm. 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 Hydraulic Structures

3.1.1 North Cell

The retention pond inlet pipe and the coal pit sump inlet pipe were visible at the surface; however, these pipes have previously been abandoned below grade and the surface protrusions of this piping is to be removed as a part of site restoration activities. Outflow from the north cell was through the concrete outflow structure located on the south berm upstream slope. The structure was present at the time of inspection but is also going to be removed in 2019 as a part of site restoration activities.

3.1.2 Center Cell

Inflow to the center cell is through the outflow structures from the north cell and the south cell located on the north and south berm upstream slopes, respectively. These structures are closed and will no longer be operated during closure of the Bottom Ash Impoundment. The outflow structure from the north cell is planned to be removed as a part of site restoration activities in 2019 and the outflow structure from the south cell will be sealed and buried in place.

Outflow from the center cell was through the outfall structure located on the east berm upstream slope. Outfall piping from this structure has been abandoned and the concrete structure will be removed as a part of site restoration activities.

3.1.3 South Cell

Inflow piping to the south cell has previously been abandoned and was not visible during the inspection.

Outflow from the south cell was through the concrete outflow structure located on the north berm upstream slope. Piping connecting this structure to the center cell has previously been plugged and abandoned. Some potential minor leakage through the plugged pipe was observed during site closure activities and the outlet end of the piping was sealed with bentonite and concrete. The outflow structure is planned to be used as a sump to remove free water during closure of the south cell of the Bottom Ash Impoundment. The structure and sump piping visible during the inspection was in good condition with no signs of corrosion, erosion, or cracking.

3.2 Berm Upstream Slope

3.2.1 North Cell and Center Cell

At the time of inspection, the north and center cell berm upstream slopes had been cleared of geomembrane and underlying soil as part of the closure by removal and site restoration activities. The berms associated with the north cell will be re-graded as a part of site restoration activities.

3.2.2 South Cell

Only a small portion of the berm upstream slopes above the waste contained in the south cell (above elevation 1715 feet amsl) were visible during the inspection. The upstream geomembrane slopes were covered with bottom ash protective cover placed earlier in 2019 in preparation for closure of the south cell and were in generally good condition.

3.3 Berm Crest

The berm crest around the Bottom Ash Impoundment is surfaced with soil and/or gravel at a constant elevation of 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. There was minor rutting along the berm crest road, but the rutting is limited to small areas and was most likely caused by construction equipment operating during site restoration activities and light vehicle traffic during wet conditions.

3.4 Berm Downstream Slope

3.4.1 North Cell

The berm downstream slopes on the north and east sides are approximately 20 feet high and the berm downstream slope on the west side is approximately 5 feet high; the slopes are graded at approximately 3:1. The north-facing slope is mostly well vegetated with grass, with a few small areas of bare ground along the east portion of the north-facing slope that may be susceptible to erosion. Small to medium size animal burrows were observed on the north berm downstream slopes. At the time of inspection, the east-facing slope had been cleared and grubbed and topsoil had been removed in preparation for re-grading associated with site restoration activities. This berm will be removed as a part of site restoration activities and grading will be tied in with overall site restoration grades. Berm downstream slopes are generally in good condition.

3.4.2 Center Cell

The berm downstream slope on the east side is approximately 20 feet high and the downstream slope on the west side is approximately 5 feet high; the slopes are graded at approximately 3:1. At the time of inspection, the east-facing slope had been cleared and grubbed and topsoil had been removed in preparation for re-grading associated with site restoration activities. This berm will be removed as a part of site restoration activities and grading will be tied in with overall site restoration grades. Berm downstream slopes are generally in good condition.

3.4.3 South Cell

The berm downstream slope on the east and south side is approximately 20 feet high and the berm downstream slope on the west side is approximately 5 feet high. The east and south-facing slopes are graded at approximately 3:1 and are well vegetated with grass, with a few small areas of bare ground along the east and south sides of the

impoundment that are susceptible to erosion. A small tree was observed on the east-facing slope that should be removed. Several larger-sized (6 to 10-inch diameter) animal burrows were observed on the south berm downstream slopes and should be repaired. Berm downstream slopes are generally in fair condition due to the animal burrows noted during the inspection.

3.5 Toe

3.5.1 North Cell

The toe of the west berm downstream slope is in the Bottom Ash Landfill deposition area and has no observed seepage, standing water, animal burrows, settlement, or excessive vegetation. A temporary topsoil stockpile that is part of site restoration activities exists at the toe of the north berm downstream slope and obscured a portion of the original berm toe of slope at the time of inspection. The toe of the east berm downstream slope has no observed seepage, standing water, animal burrows, settlement, or excessive vegetation and has been affected by re-grading associated with site restoration activities. The toe of the berm downstream slopes around the north cell is in good condition.

3.5.2 Center Cell

The toe of the west berm downstream slope is in the Bottom Ash Landfill deposition area and has no observed seepage, standing water, animal burrows, settlement, or excessive vegetation. The toe of the east berm downstream slopes has no observed seepage, standing water, animal burrows, settlement, or excessive vegetation and has been affected by re-grading associated with site restoration activities. The toe of the berm downstream slopes around the center cell is in good condition.

3.5.3 South Cell

The toe of the west berm downstream slope is in the Bottom Ash Landfill deposition area and has no observed seepage, standing water, animal burrows, settlement, or excessive vegetation. The toe of the east berm downstream slopes has no observed seepage, standing water, animal burrows, settlement, or excessive vegetation and has been affected by re-grading of the low area east of the south cell associated with site restoration activities. The toe of the south berm downstream slope is in a surface water drainage ditch that has some marshy vegetation. There were a few observed small animal burrows during the inspection but no observed indications of seepage, settlement, or excessive vegetation. The toe of the berm downstream slopes around the south cell is in good condition.

3.6 Instrumentation

The Bottom Ash Impoundment has two piezometers (P-1 and P-2) on the berm downstream slope on the east side of the center cell that have not been measured since 2017 due to negligible amounts of water in the center cell, minimal risk for leakage, and site restoration construction associated with closing the center cell and re-grading the area. These piezometers will be removed as a part of site restoration activities in the fall of 2019.

3.7 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 Impoundment were observed during the site inspection in September 2019.

4.0 SUMMARY AND CONCLUSIONS

An annual inspection was performed for the Bottom Ash Impoundment at Stanton Station on September 26, 2019. The inspection met the requirements for CCR surface impoundments under 40 CFR Part 257.83.

The north cell and center cell of the Bottom Ash Impoundment were being closed by removal of CCR and liner systems at the time of inspection. The south cell of the Bottom Ash Impoundment 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 the fall of 2019. The south cell 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).

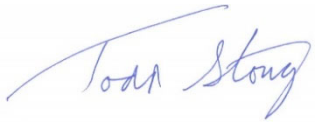
As applicable for areas not affected by site restoration and/or closure activities, Golder observed good vegetation and site maintenance and did not identify significant deficiencies such as seepage, excessive erosion or settlement, or cracking during visual observations.

In addition to annual inspections of applicable portions of the facility by a 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. Once the north and center cells are closed by removal of CCR, the south cell will be the only portion of the facility evaluated as a part of the CCR rule.

Minor maintenance items that may need to be continually addressed include repairing larger animal burrows as they appear, 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.

Golder Associates Inc.

Craig Schuettpelz, PE
Senior Engineer



Todd Stong, PE
Associate and Senior Consultant

CCS/TJS/ds

https://golderassociates.sharepoint.com/sites/23291g/technical work/ccr inspections/bottom ash impoundment 2019/_final rpt/1894194_bai_ccrinspreport_fnl_27jan20.docx

5.0 REFERENCES

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

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Kleinfelder. Kleinfelder 2012. Coal Ash Impoundment Site Assessment Final Report, dated October 26, 2012.

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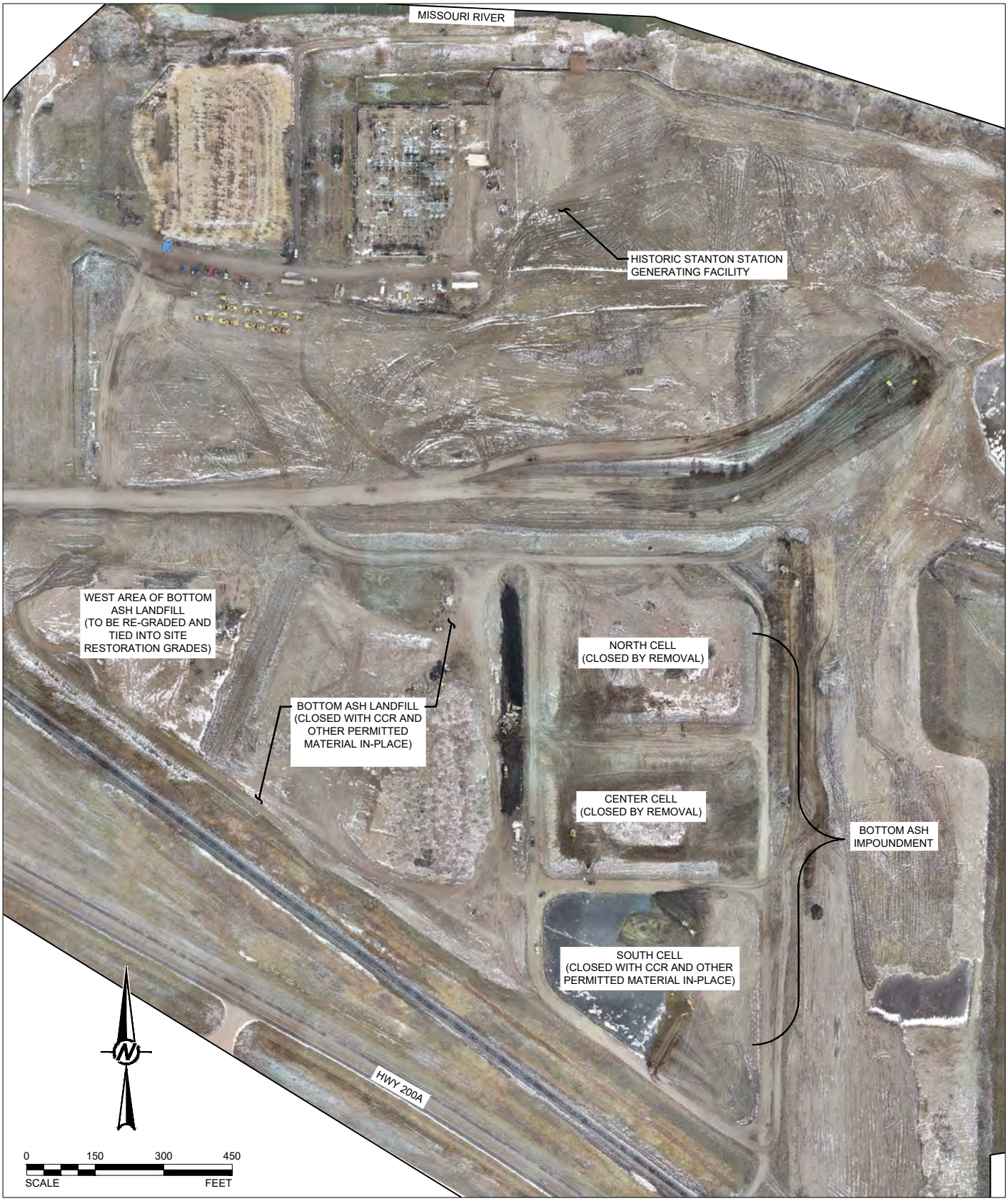
Stone & Webster, 1994a. Design Report Stanton Station Ash Pond Modifications. Prepared for United Power Association, Project No. 4177. April 25, 1994.

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

Stone & Webster, 1994c. Plan of Operations Stanton Station Bottom Ash Surface Impoundment and Bottom Ash Landfill. Prepared for United Power Association, Project No. 4177. 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

REFERENCE(S)

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

GOLDER

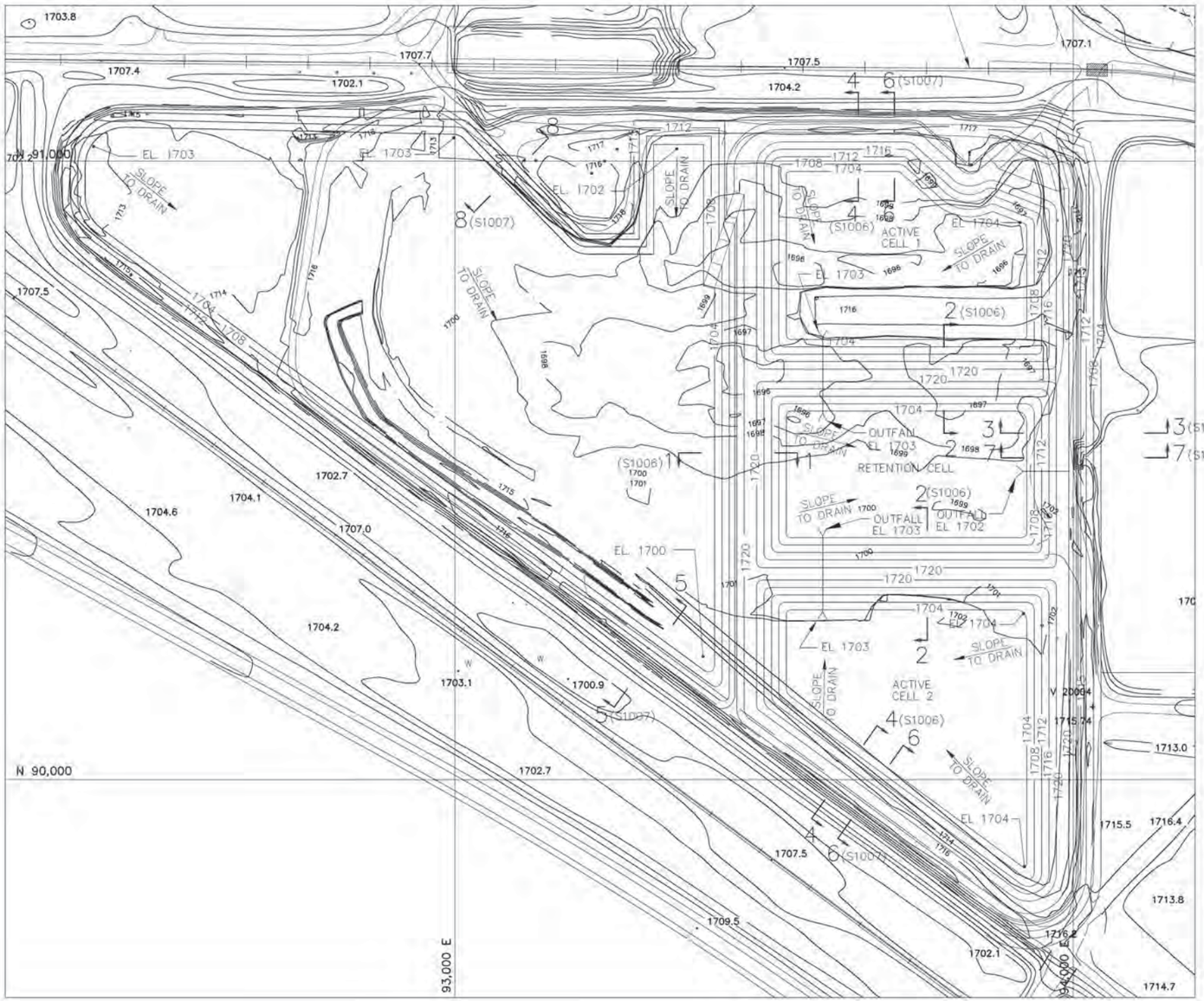
GREAT RIVER ENERGY - STANTON STATION
2019 ANNUAL CCR FACILITY INSPECTION REPORT
BOTTOM ASH IMPOUNDMENT SITE OVERVIEW

FIGURE 2

Path: \\Denverlacad\GREAT RIVER ENERGY\STANTON\99_PROJECTS\189419\4Annual Inspections\BA\ | File Name: 2019 Annual Insp_Fig2_BA\.dwg

APPENDIX A

Selected Construction Drawings and Permit Drawings



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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

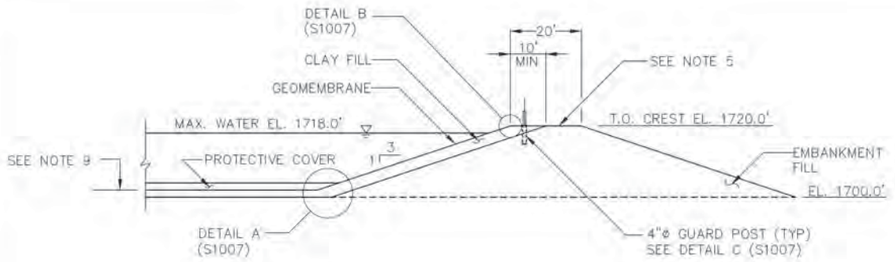
ISSUE	DESCRIPTION	CHKD	CORRECT	APPR
3				
2				
1	FOR CONSTRUCTION			
0	ORIGINAL ISSUE. FOR UPA REVIEW	WLZ	RGC	KWC 4-13-94

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



1–1
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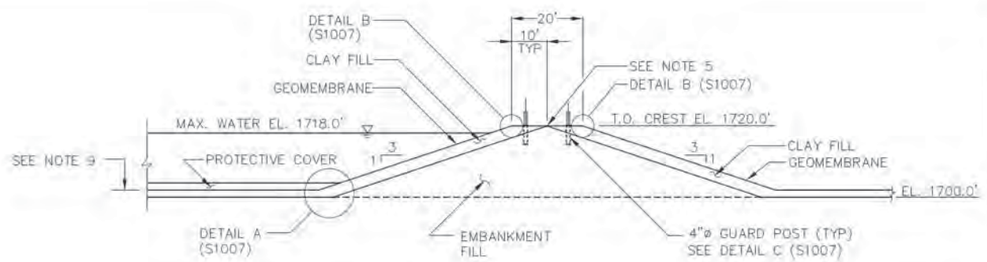

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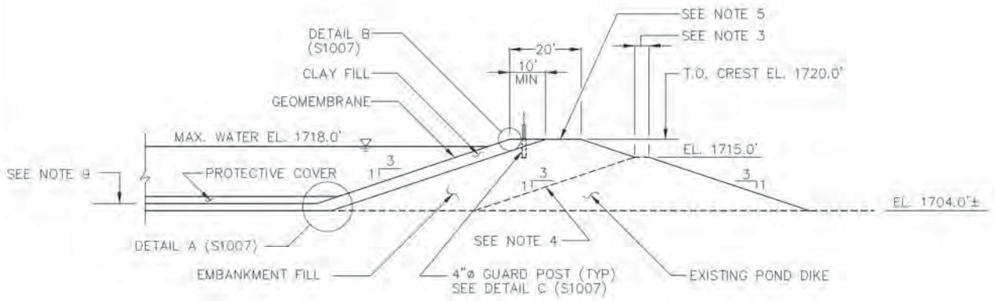

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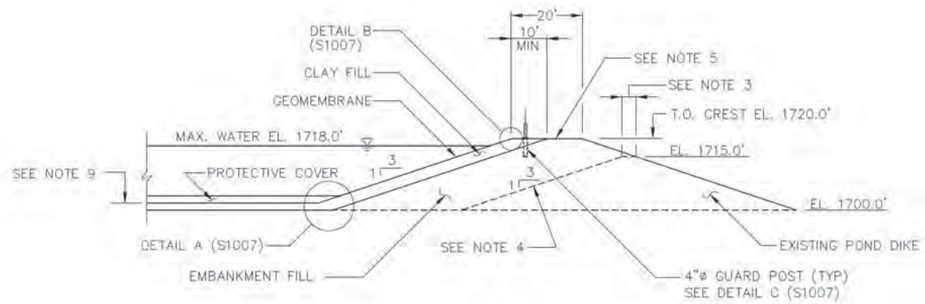


4–4
(S1005)

NOTES:

1. SCALE: 1" = 20' UNLESS NOTED.
2. SEE GENERAL NOTES, DRAWING S1002.
3. THE EXISTING POND DIKES WERE REPORTEDLY CONSTRUCTED TO HAVE 4 FOOT WIDE CRESTS AT ELEVATION 1715 FEET, AND 3:1 (HORIZONTAL VERTICAL) SIDE SLOPES. ACTUAL POND DIKE WIDTHS, ELEVATIONS AND SLOPES MAY VARY.
4. ASH, PVC LININGS AND OTHER NON–SOIL MATERIALS FOUND ALONG THE INSIDE OF EXISTING POND A DIKES SHALL BE REMOVED TO EXPOSE THE EXISTING DIKE SOIL FILL. EMBANKMENT FILL SHALL BE PLACED, AS NEEDED, TO FILL AREAS WHERE EXCAVATIONS TO REMOVE THE ASH, LININGS AND OTHER NON–SOIL MATERIALS EXTEND BEYOND THE LINE SHOWN.
5. THE TOP OF THE EMBANKMENT FILL OF THE SURFACE IMPOUNDMENT EMBANKMENTS SHALL BE GRADED TO BE AT ELEVATION 1720'–3" AT THE CENTERLINE AND TO SLOPE TO ELEVATION 1720'–0" AT 6 FEET EITHER SIDE OF THE CENTERLINE, AND SHALL BE COVERED WITH 6 INCHES OF COMPACTED BASE COURSE.
6. AN ANCHOR GUARD POST FOR THE SAFETY CABLE SHALL BE LOCATED AT EACH CORNER OF EACH IMPOUNDMENT CELL. LINE GUARD POSTS SHALL BE SPACED AT INTERVALS NO WIDER THAN 50 FEET BETWEEN THE CORNER ANCHOR POSTS. ANCHOR GUARD POSTS SHALL ALSO BE PLACED TO PROVIDE A 20 FOOT WIDE OPENING ALONG THE EAST SIDE OF ACTIVE CELLS 1 AND 2, AND A 10 FOOT WIDE OPENING AT EACH OUTFALL LOCATION, AS DIRECTED BY THE OWNER. THE WIRE ROPE SHALL BE INSTALLED TO BE A MINIMUM OF 3 FEET ABOVE THE GROUND SURFACE.
7. A ONE INCH DIAMETER, POLYPROPYLENE, TWISTED ROPE SHALL BE FASTENED TO THE BOTTOM OF EACH GUARD POST. THE ROPE SHALL BE FASTENED TO THE POSTS USING CABLE CLAMPS OR AN EQUIVALENT FITTING APPROVED BY THE OWNER. THE BOTTOM OF THE ROPE SHALL BE SECURELY ATTACHED TO A HEAVY DUTY POLYPROPYLENE BAG FILLED WITH A MINIMUM OF 50 LBS. OF CLEAN SAND, AND SHALL EXTEND TO WITHIN 3 FEET OF THE BOTTOM OF THE ADJACENT IMPOUNDMENT CELL.
8. IF ASH EXTENDS TO WITHIN 10 FEET OF EXISTING POWER POLES, THE POLES SHALL BE TEMPORARILY SUPPORTED WHILE THE ASH IS REMOVED AND THE EXCAVATION IS REFILLED WITH EMBANKMENT FILL.
9. SEE DRAWING S1005 FOR COMPLETED GRADE ELEVATIONS.

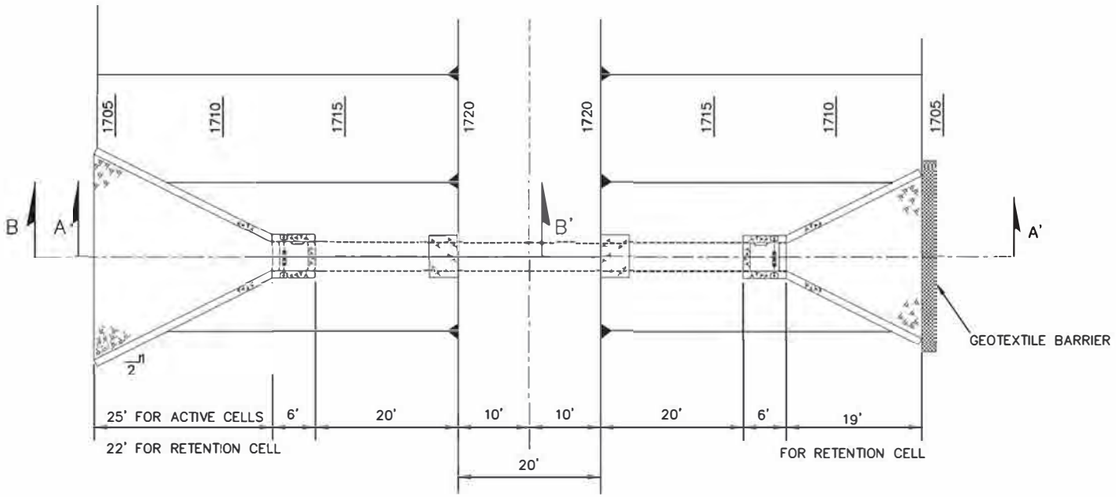
REFERENCE DRAWINGS:

S1002	FACILITIES SITE PLAN
S1005	POND A CONVERSION PLAN
S1007	POND A SECTIONS & DETAILS – SH.2
S1008	POND A SECTIONS & DETAILS – SH.3

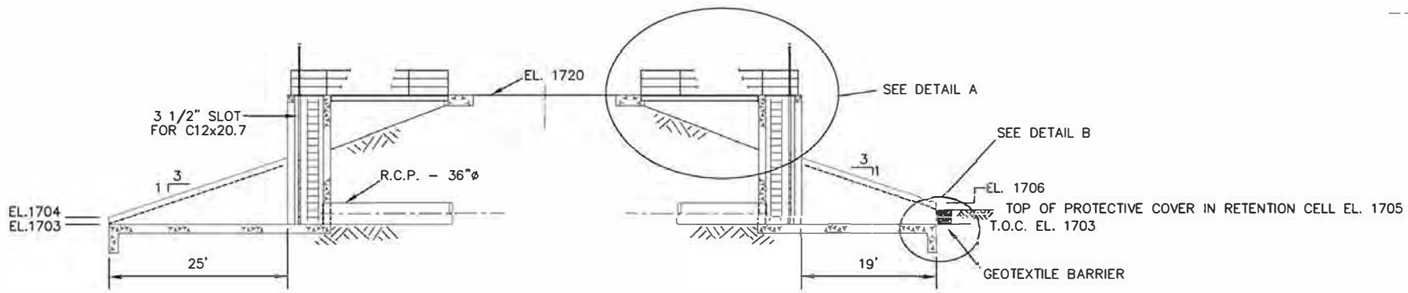
ISSUE	DESCRIPTION	CHKD	CORRECT	APPR–DATE
3				
2				
1	FOR CONSTRUCTION			
0	ORIGINAL ISSUE FOR UPA REVIEW	WLZ	SQG KWC 4-13-04	

UPA PROJECT 4177	UNITED POWER ASSOCIATION STANTON STATION ASH POND MODIFICATIONS	DRAWING NO. S1006	REV 1
	POND A SECTIONS & DETAILS – SH. 1		
	STONE & WEBSTER ENGINEERING CORPORATION DENVER, CO.		

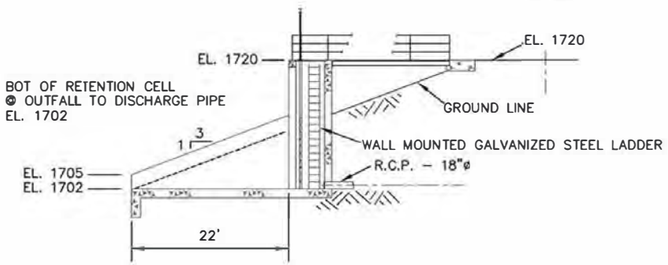
ISSUE | HALF–SIZE | APPR. CARD
CAD FILE UPAS1006.DWG



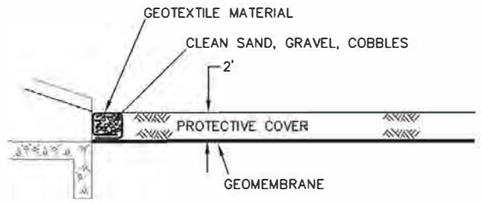
GENERAL PLAN
1"=10'



ELEVATION A–A'
ACTIVE CELL & RETENTION CELL
1"=10'

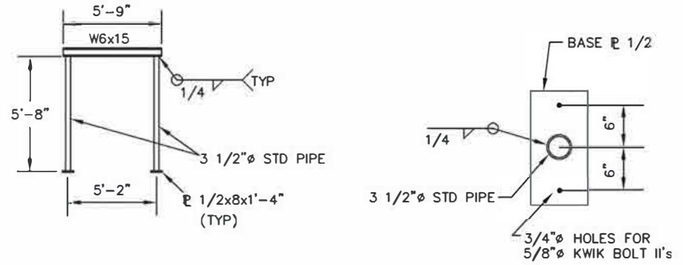


ELEVATION B–B'
OUTFALL OF RETENTION CELL
1"=10'

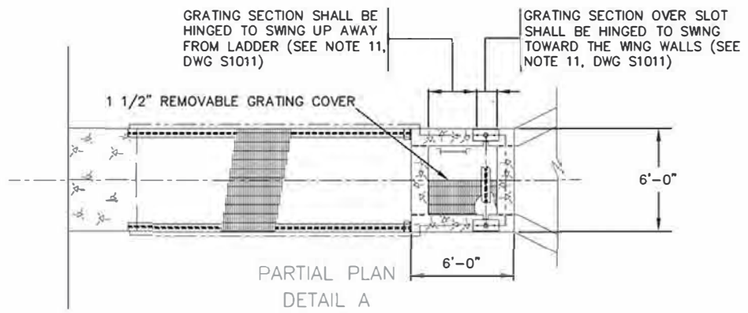


NOTE: THE GEOTEXTILE BARRIER SHALL EXTEND 2 FEET BEYOND THE RETENTION CELL OUTFALL WINGWALLS.

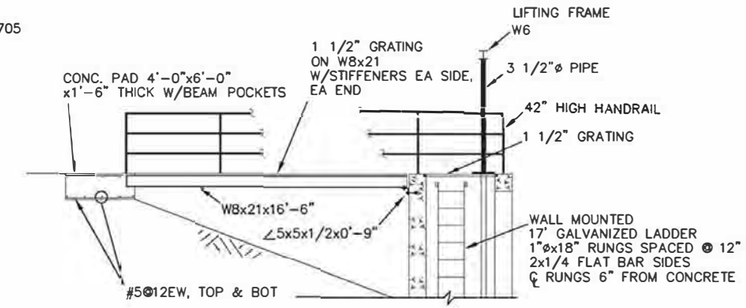
PARTIAL ELEV.
DETAIL B
N.T.S.



STOPLOG LIFTING FRAME
(5 – REQ'D)
N.T.S.



PARTIAL PLAN
DETAIL A
N.T.S.



PARTIAL ELEV.
DETAIL A
N.T.S.

NOTES:

1. SCALE: AS NOTED
2. FOR ADDITIONAL NOTES, SEE DRAWING S1011

REFERENCE DRAWINGS:

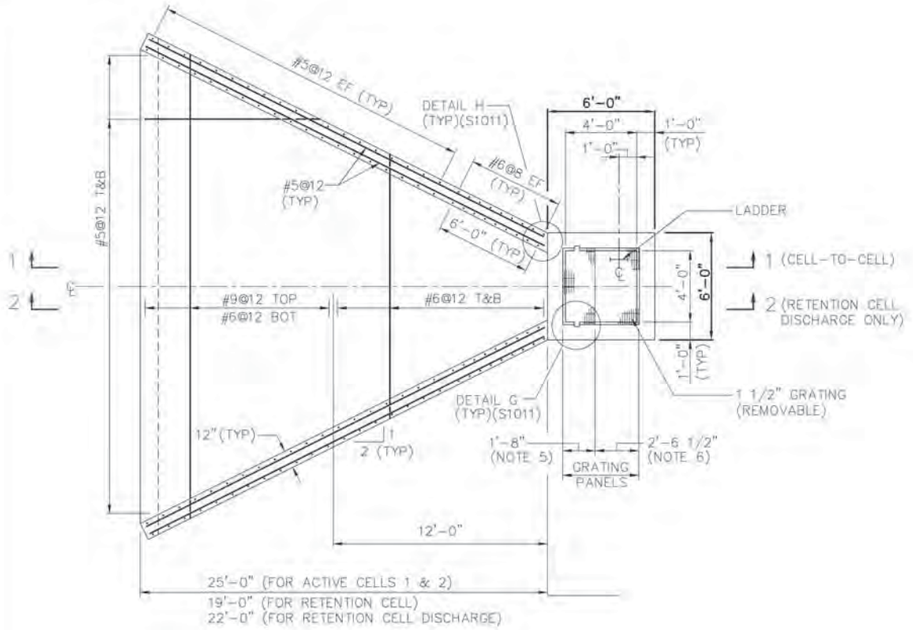
S1011 OUTFALL STRUCTURES REINFORCEMENT, SHEET 2

ISSUE	DESCRIPTION	CHKD	CORRECT	APPR. DATE
3				
2	FOR CONSTRUCTION REVISED PER ADDENDUM 1			
1	FOR CONSTRUCTION	WLZ	MEB KWC/WLZ 6-8-94	
0	ORIGINAL ISSUE FOR UPA REVIEW	RLP	MEB KWC 4-19-94	

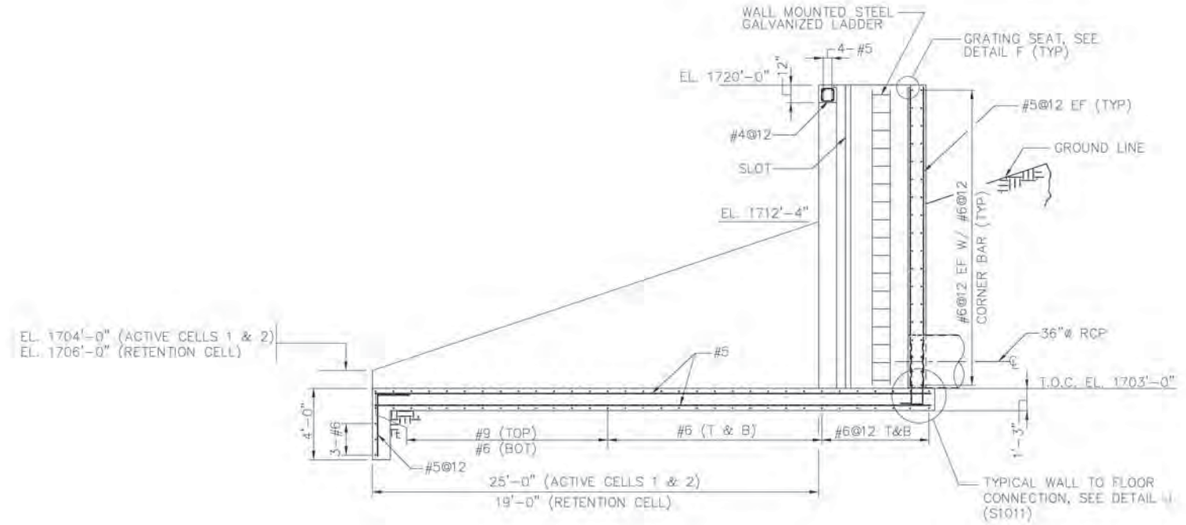
UPA PROJECT		DRAWING NO.	REV
4177	UNITED POWER ASSOCIATION STANTON STATION ASH POND MODIFICATIONS OUTFALL STRUCTURES OUTLINE PLAN AND SECTIONS	S1009	2

STONE & WEBSTER ENGINEERING CORPORATION
DENVER, CO.

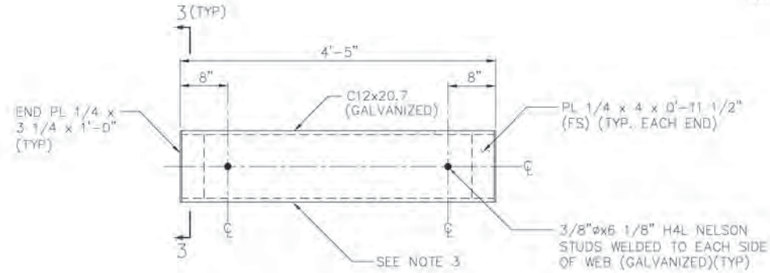
ISSUE
HALF-SIZE
APPR. CARD
CAD FILE UPAS1009.DWG



OUTFALL STRUCTURES – PLAN
SCALE: 1/4" = 1'-0"



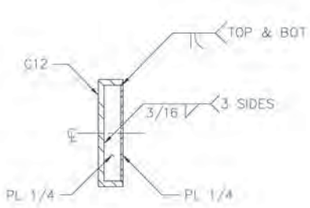
1–1
SCALE: 1/4" = 1'-0"



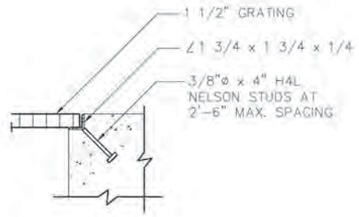
TYPICAL STOP LOG DETAIL
(76 REQUIRED)
SCALE: 1" = 1'-0"

NOTES:

1. SCALE: AS NOTED
2. FOR ADDITIONAL NOTES, SEE DRAWING S1011.
3. PLACE 40 MIL x 2 1/2" STRIP PVC ON TOP AND BOTTOM OF C12 WITH WATER RESISTANT ADHESIVE.
4. THE FABRICATOR SHALL VERIFY AND CONNECT, AS REQUIRED, THE SWEEP OF THE CHANNEL STOP LOGS TO WITHIN 3/16", AND THE CAMBER TO WITHIN 1/16". THE VARIATION OF OUT OF SQUARE OF THE FLANGES SHALL BE VERIFIED TO BE LESS THAN THE 1/32" THAT IS PERMISSIBLE BY STANDARD MILL PRACTICE.
5. THE GRATING SECTION OVER THE SLOT SHALL BE HINGED TO SWING TOWARD THE WING WALLS.
6. THE GRATING SECTION SHALL BE HINGED TO SWING UP AWAY FROM THE LADDER.



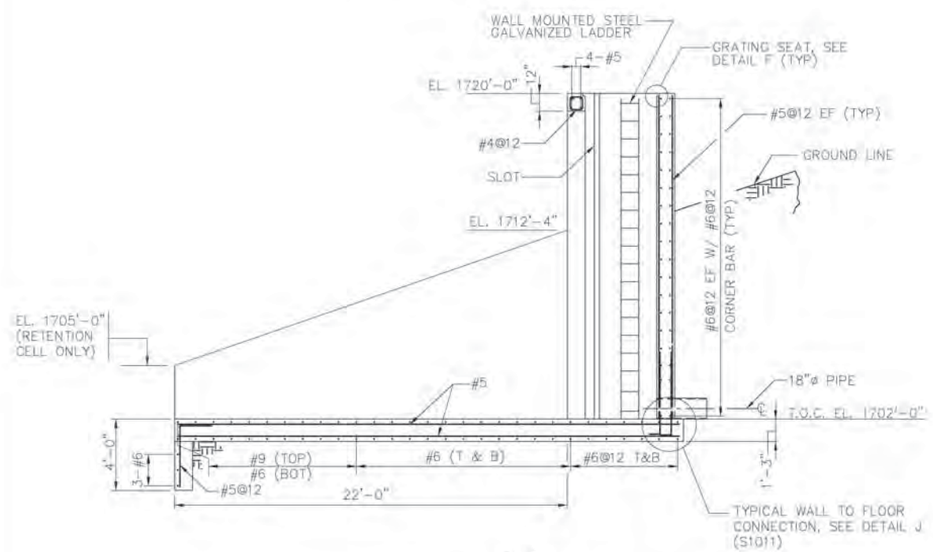
3–3
SCALE: 1 1/2" = 1'-0"



DETAIL F
SCALE: 1 1/2" = 1'-0"

REFERENCE DRAWINGS:

S1009	OUTFALL STRUCTURES OUTLINE PLANS AND SECTIONS
S1011	OUTFALL STRUCTURES REINFORCEMENT, SHEET 2



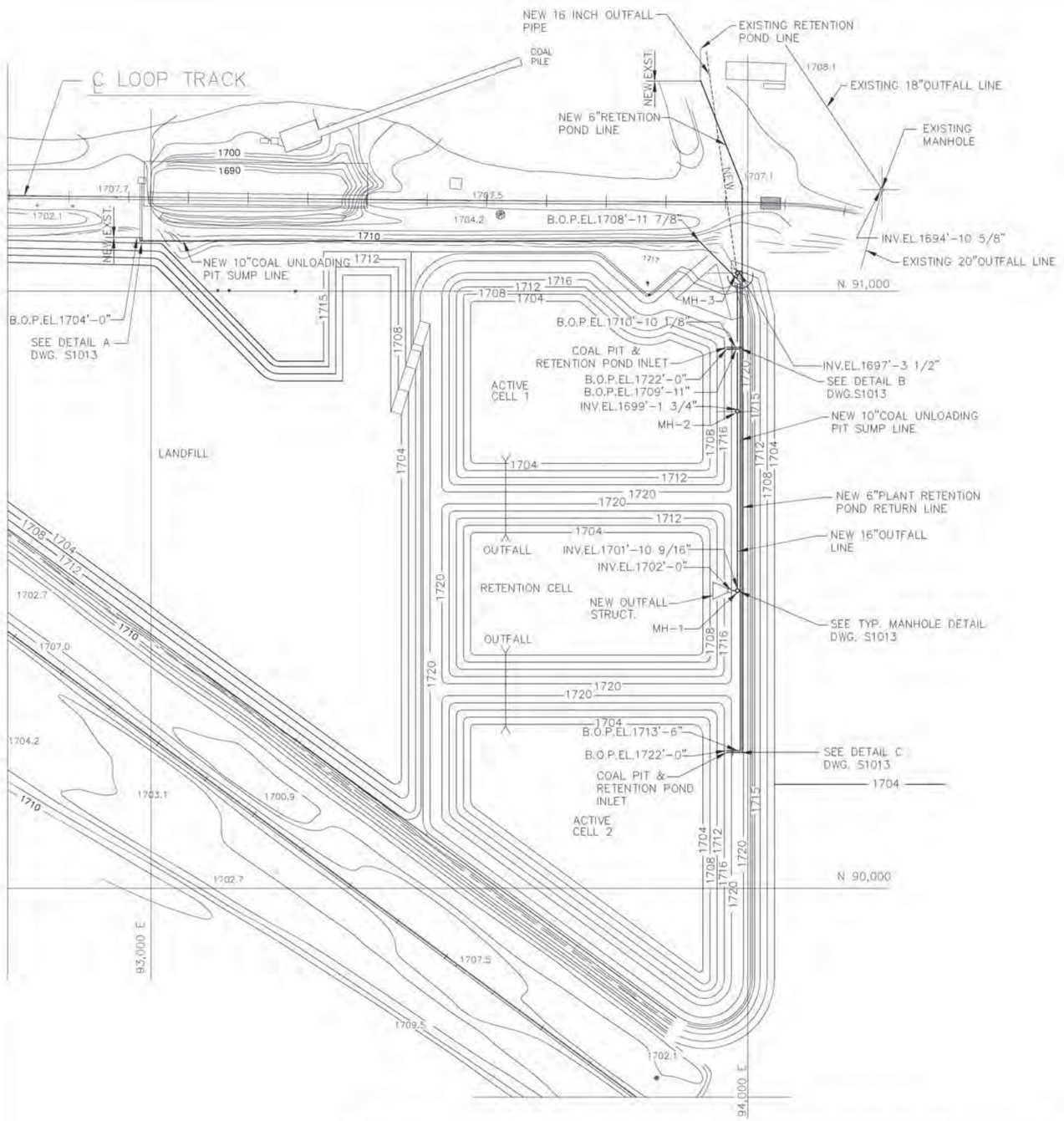
2–2
SCALE: 1/4" = 1'-0"

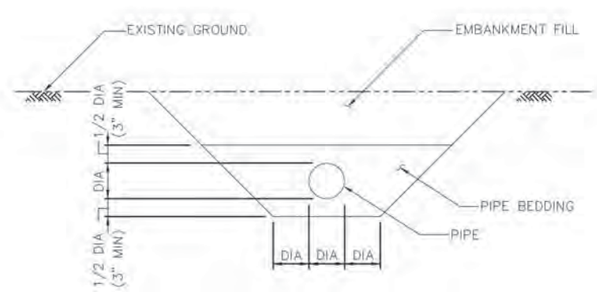
ISSUE	DESCRIPTION	CHKD	CORRECT	APPR—DATE
3				
2	FOR CONSTRUCTION. REVISED PER ADDENDUM 1			
1	FOR CONSTRUCTION	WLZ	SGG 6-8-94	KWC / WLZ 6-8-94
0	ORIGINAL ISSUE FOR UPA REVIEW	RLP	SGG 4-19-94	KWC 4-19-94

UPA PROJECT		DRAWING NO.	REV
4177	UNITED POWER ASSOCIATION STANTON STATION ASH POND MODIFICATIONS OUTFALL STRUCTURES REINFORCEMENT – SH. 1	S1010	2

STONE & WEBSTER ENGINEERING CORPORATION
DENVER, CO.

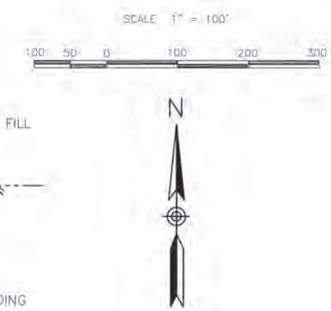
ISSUE
HALF-SIZE
APP. CARD
CAD FILE UPAS1010.DWG





PIPE AND CULVERT TRENCH DETAIL
NTS

NOTE: PIPES AND/OR CULVERTS IN A SINGLE TRENCH SHALL HAVE A MINIMUM SPACING OF 12 INCHES (WALL-TO-WALL) BETWEEN ADJACENT PIPES.



NOTES:
1. FOR GENERAL NOTES, SEE DRAWING S1002.

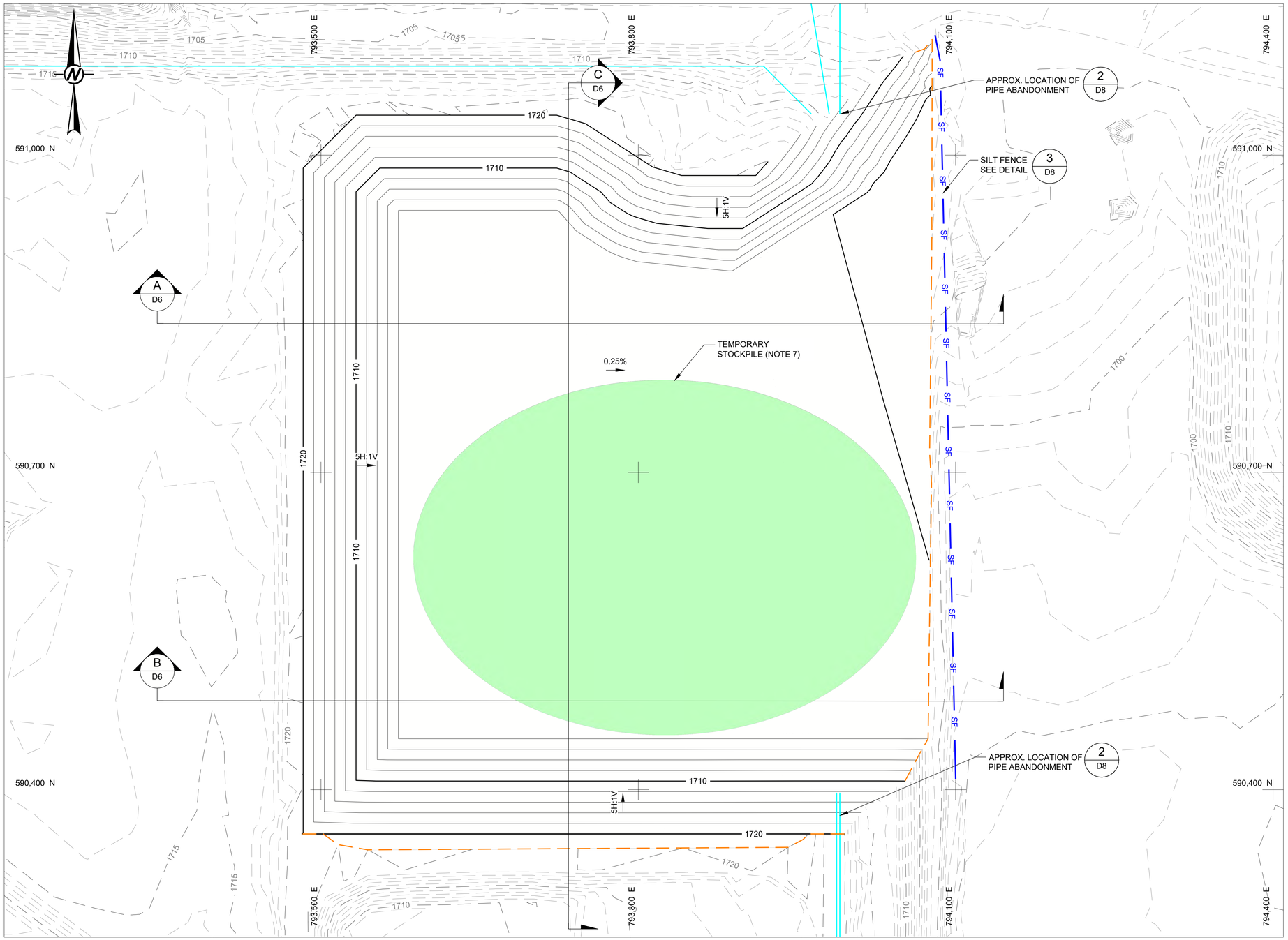
REFERENCE DRAWINGS:
S1002 FACILITIES SITE PLAN
S1013 PIPING DETAILS
S1027 BOTTOM ASH SURFACE IMPOUNDMENT OUTFALL PIPING PLAN

ISSUE	DESCRIPTION	CHKD	CORRECT	APPR—DATE
3				
2	FOR CONSTRUCTION REVISED PER ADDENDUM 1			
1	FOR CONSTRUCTION	WLZ	WWG / WLZ 6-9-94	KWC / WLZ 6-9-94
0	ORIGINAL ISSUE FOR UPA REVIEW	KWC	WWG	KWC 4-19-94

UPA PROJECT		DRAWING NO.	REV
4177	UNITED POWER ASSOCIATION STANTON STATION ASH POND MODIFICATIONS	S1012	2
	POND A PIPING PLAN		

STONE & WEBSTER ENGINEERING CORPORATION
DENVER, CO.

CAD FILE UPAS1012.DWG | HALF-SIZE | APP. CARD | ISSUE



LEGEND

- 3600 — EXISTING GROUND TOPOGRAPHY (REFERENCES 2 AND 3)
- 3600 — TOP OF SUBGRADE (NOTE 1 AND REFERENCE 3)
- SF — SILT FENCE (AS REQUIRED) (NOTE 2)
- APPROXIMATE TIE-IN LOCATION TO SCOPE OF WORK E BOTTOM ASH LANDFILL CLOSURE AND SCOPE OF WORK F SITE RESTORATION GRADING AND SCOPE OF WORK G SOUTH CELL CLOSURE (NOTE 6)
- BURIED PIPING
- TEMPORARY STOCKPILE (NOTE 7)

NOTE(S)

1. THE TOP 12-INCHES OF GENERAL FILL, EMBANKMENT FILL, OR CUT AREA SHALL BE SOIL SUITABLE FOR PLANT ROOTING AS APPROVED BY THE OWNER'S REPRESENTATIVE. SOIL FOR THIS PURPOSE IS CLASSIFIED AS HAVING A MINIMUM OF 20 PERCENT FINES (PASSING THE #200 SIEVE) AND NO MORE THAN 15 PERCENT GRAVEL (RETAINED ON THE #4 SIEVE) OR AS APPROVED BY THE OWNER'S REPRESENTATIVE.
2. SUBCUTTING MAY BE REQUIRED IN AREAS OF CUT OR AREAS WITH LESS THAN ONE (1) FOOT OF FILL WHERE SUBGRADE DOES NOT MEET THE SPECIFICATION FOR SOIL SUITABLE FOR PLANT ROOTING AS DETERMINED 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. TOPSOIL SHALL BE PLACED OVER SUBGRADE IN ACCORDANCE WITH THE DRAWINGS AND SPECIFICATIONS (DESIGN TOPOGRAPHY NOT SHOWN).
5. REMOVAL OF IMPACTED CLAY BENEATH THE GEOMEMBRANE MAY EXCEED THE ASSUMED 6-INCH THICKNESS BASED ON VISUAL OBSERVATION AS DIRECTED BY THE OWNER'S REPRESENTATIVE.
6. NORTH AND CENTER CELL GRADING SHALL TIE INTO THE SCOPE OF WORK E, F AND G ALONG THE APPROXIMATE TIE-IN LINE INDICATED. SCOPE OF WORK E, 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.
7. EXCESS EXCAVATED SOIL FROM SCOPE OF WORK D AND OTHER SCOPES OF WORK SHALL BE STOCKPILED ABOVE TOP OF SUBGRADE GRADES FOR USE IN CONSTRUCTION OF OTHER SCOPE OF WORK. PLACEMENT OF FERTILIZER, TOPSOIL , AND SEED AND MULCH IN THIS AREA WILL NOT BE COMPLETED UNTIL THE STOCKPILE IS REMOVED OR FINAL GRADING HAS BEEN COMPLETED.
8. MUCH OF THE SOIL CUT FROM SCOPE OF WORK D WILL GO DIRECTLY TO SCOPE OF WORK E FILL.
9. PRIOR TO PLACEMENT OF TOPSOIL OR GENERAL FILL, REMOVAL OF BOTTOM ASH, PROTECTIVE COVER, GEOMEMBRANE LINER, IMPACTED CLAY SOIL, AND INFRASTRUCTURE MUST BE VERIFIED BY THE OWNER'S ENGINEER.

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 SUBGRADE CONTOUR INTERVAL IS ONE (1) FOOT.

0 50 100
1" = 50' FEET

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 7/19/19
NORTH DAKOTA

CLIENT
GREAT RIVER ENERGY
STANTON STATION
STANTON, NORTH DAKOTA

CONSULTANT

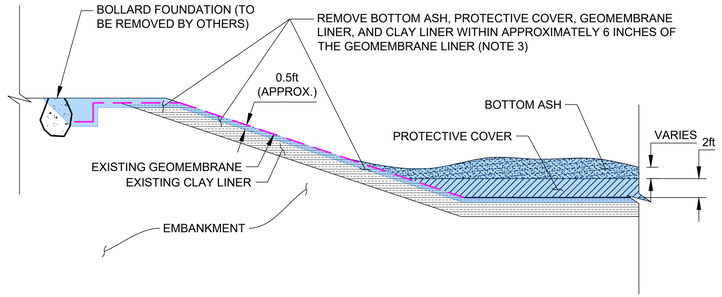
GOLDER ASSOCIATES INC.
7245 W ALASKA DR., SUITE 200
LAKEWOOD, COLORADO
USA
(303) 980-0540
www.golder.com

PROJECT
STANTON SITE RESTORATION
NORTH AND CENTER CELLS CLOSURE

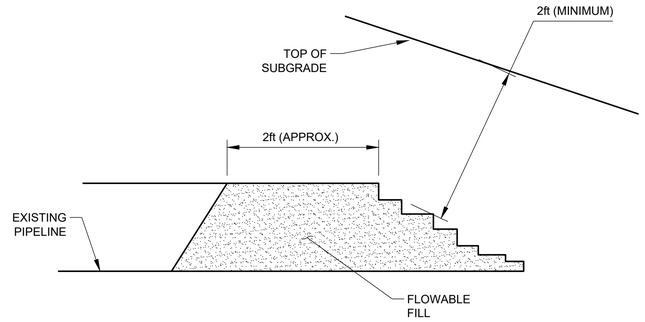
TITLE
TOP OF SUBGRADE PLAN

PROJECT NO. 1775717 | REV. 0 | D5 of D8 | DRAWING D5

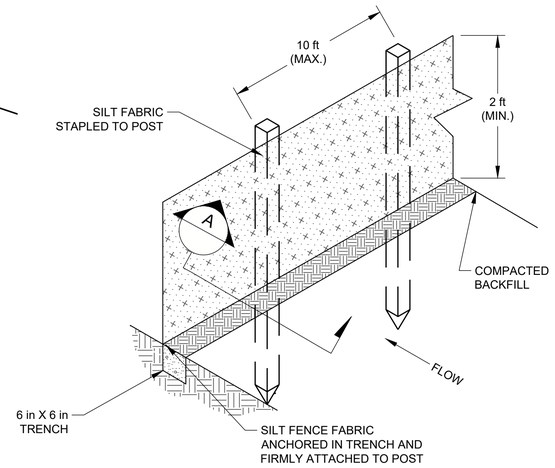
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI D

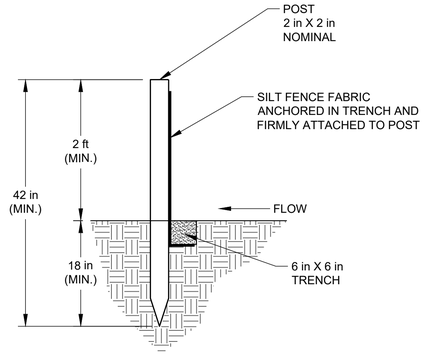


NTS 1 D8 NORTH AND CENTER CELLS CLOSURE BY REMOVAL DETAIL



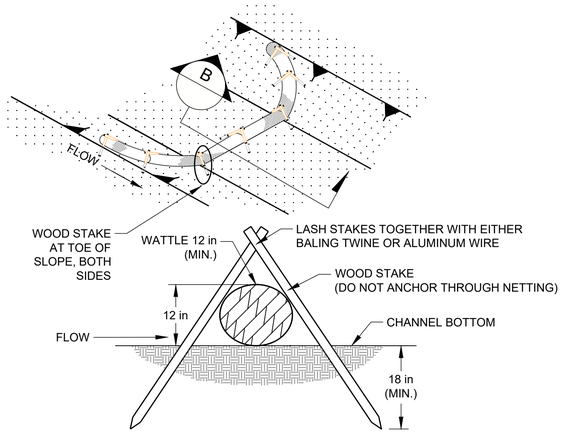
NTS 2 D8 PIPE ABANDONMENT DETAIL





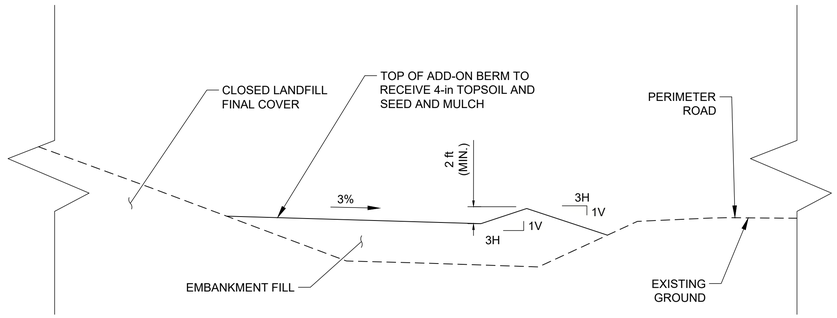
SECTION A

NTS 3 D8 SILT FENCE DETAIL

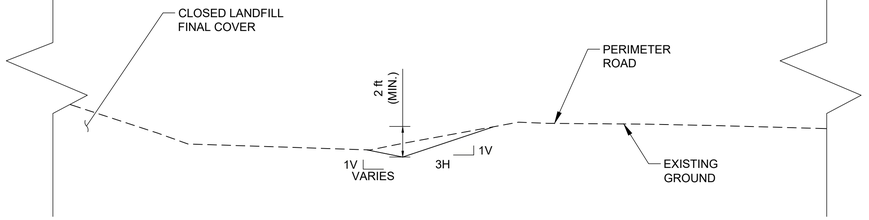


SECTION B

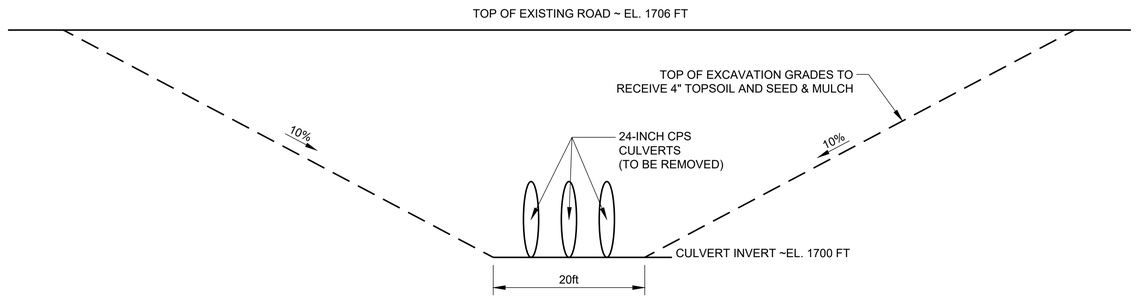
NTS 4 D8 STRAW WATTLE



NTS D D7 SECTION D-D'



NTS E D7 SECTION E-E'



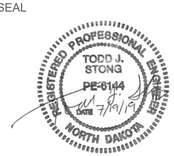
NTS F D8 LOW WATER CROSSING (PLAN)
5X VERTICAL EXAGGERATION

NOTE(S)

1. 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.
2. ANY STRUCTURES OR PIPING THAT IS NOT COMPLETELY REMOVED SHALL BE REMOVED TO WITHIN TWO (2) FEET OF FINAL GRADES. REMAINING STRUCTURE AND PIPING SHALL BE INFILLED WITH FLOWABLE FILL OR ALTERNATIVE APPROVED BY THE OWNER'S REPRESENTATIVE AND THEN COVERED WITH APPROVED SOIL.
3. REMOVAL OF IMPACTED CLAY BENEATH THE GEOMEMBRANE MAY EXCEED THE ASSUMED 6-INCH THICKNESS BASED ON VISUAL OBSERVATION AS DIRECTED BY THE OWNERS' REPRESENTATIVE.

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

SEAL



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
NORTH AND CENTER CELLS CLOSURE

TITLE
DETAILS

PROJECT NO. 1775717 | REV. 0 | D8 of D8 | DRAWING D8

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

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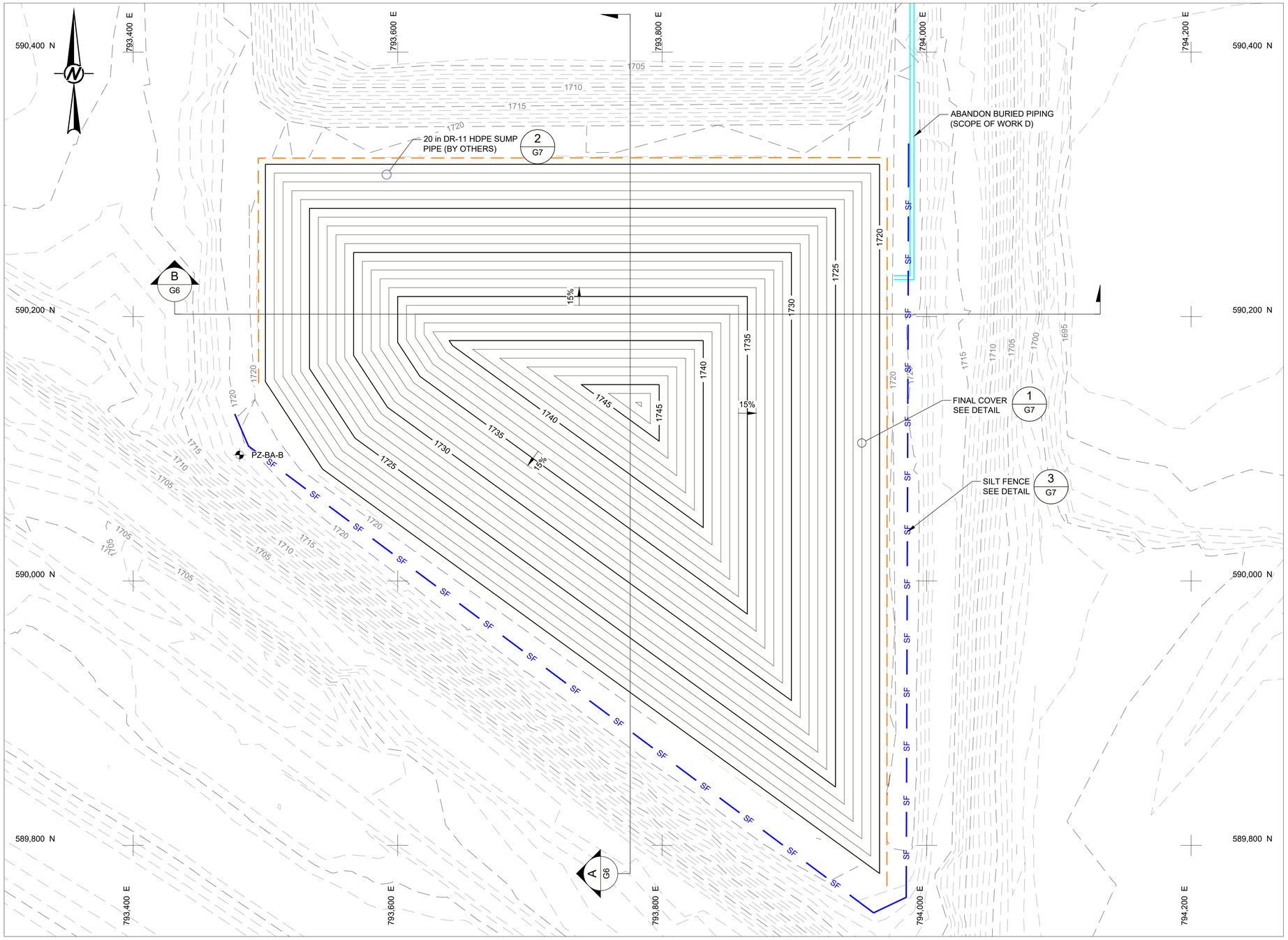


LEGEND

- EXISTING GROUND TOPOGRAPHY (REFERENCES 2 AND 3)
- TOP OF FINAL COVER GRADES (NOTES 1 AND 2) (REFERENCE 3)
- APPROXIMATE TIE-IN LOCATION TO SCOPE OF WORK D NORTH, CENTER CELLS CLOSURE AND SCOPE OF WORK E BOTTOM ASH LANDFILL CLOSURE AND SCOPE OF WORK F SITE RESTORATION GRADING (NOTE 4)
- SF — SILT FENCE (AS REQUIRED) (NOTE 3)
- WATER PIPING (BURIED)
- 20 in DR-11 HDPE SUMP PIPE PENETRATION
- MW-10 — MONITORING WELLS/PIEZOMETERS (NOTE 5)

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. SOUTH CELL CLOSURE GRADING SHALL TIE INTO THE SCOPE OF WORK D, E AND F ALONG THE APPROXIMATE TIE-IN LINE INDICATED. SCOPE OF WORK D, E AND F GRADING IS NOT SHOWN FOR CLARITY.
5. 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.

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 40 80
1" = 40' FEET

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 7/9/19
NORTH DAKOTA

CLIENT
GREAT RIVER ENERGY
STANTON STATION
STANTON, NORTH DAKOTA

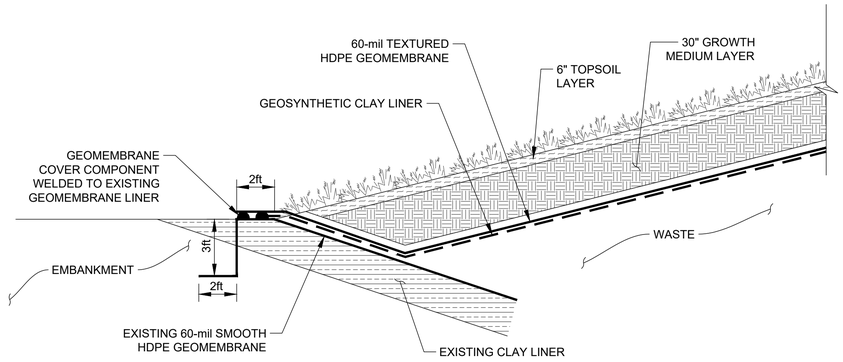
CONSULTANT
GOLDER

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

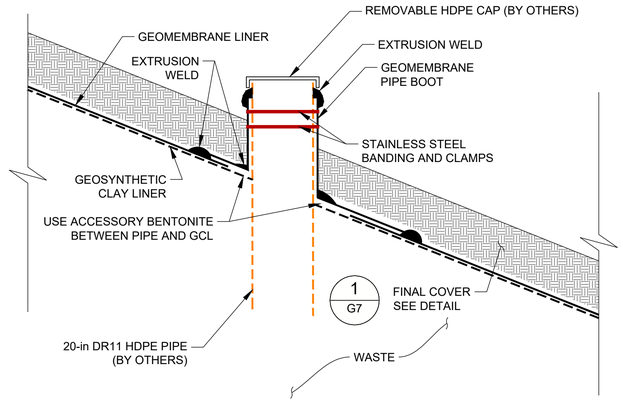
PROJECT
STANTON SITE RESTORATION
SOUTH CELL CLOSURE

TITLE
TOP OF FINAL COVER

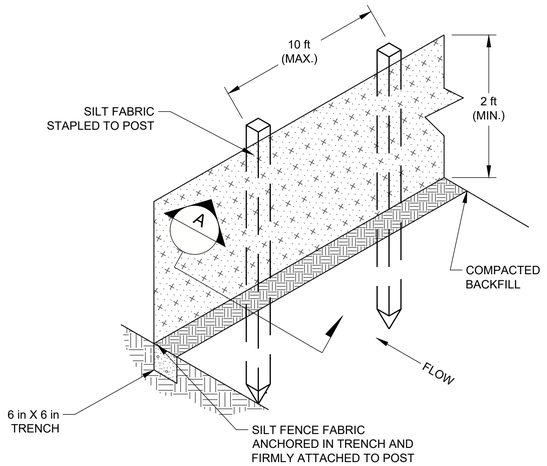
PROJECT NO. 1775717 | REV. 0 | G5 of G7 | DRAWING G5

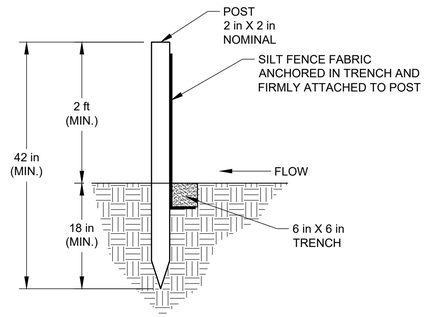


NTS 1 G7 SOUTH CELL COMPOSITE FINAL COVER



NTS 2 G7 SUMP PIPE PENETRATION DETAIL





SECTION A

NTS 3 G7 SILT FENCE DETAIL

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 7/19/19
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
SOUTH CELL CLOSURE

TITLE
DETAILS

PROJECT NO. 1775717 | REV. 0 | G7 of G7 | DRAWING G7

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

0 1 in

APPENDIX B

Visual Observation Checklist

INSPECTION CHECKLIST

GOLDER

Facility Name: Bottom Ash Impoundment
Owner and Address: Great River Energy – Stanton Station
Purpose of Facility: CCR Dewatering and process water storage clarification
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. Water levels				
a. High water mark			X	El: N/A
b. Current water level			X	Previously dewatered or active dewatering as a part of site restoration
2. Inflow structure *(not used at time of inspection)*				
a. Settlement		X		
b. Cracking		X		
c. Corrosion		X		
d. Obstacles in inlet		X		South cell to center cell structure plugged as a part of site restoration
e. Riprap/erosion control			X	
3. Outflow structure *(not used at time of inspection)*				
a. Settlement		X		
b. Cracking		X		
c. Corrosion		X		
d. Obstacles in outlet		X		
e. Riprap/erosion control			X	
4. Upstream slope				
a. Erosion – liner exposed?			X	North and center cell liners removed; south cell liner covered with bottom ash protective cover
b. Rodent burrows		X		
c. Vegetation	X			Minor vegetation within center cell
d. Cracks/settlement		X		
e. Riprap/other erosion protection			X	
5. Crest				
a. Soil condition	X			Gravel and soil road, no significant settlement/cracking
b. Comparable to design width	X			
c. Vegetation		X		
d. Rodent burrows		X		
e. Exposed to heavy traffic	X			
f. Damage from vehicles/machinery		X		Site restoration occurring
6. Downstream slope				
a. Erosion	X			Minor erosion
b. Vegetation	X			Grass, few bare spots, minor woody vegetation
c. Rodent burrows	X			Mostly small
d. Cracks/settlement/scarps		X		
e. Drain conditions			X	
f. Seepage		X		
7. Toe				
a. Vegetation	X			Grass
b. Rodent burrows	X			Mostly small
c. Settlement		X		
d. Drainage conditions	X			Surface water drainages/ponding areas
e. Seepage		X		

General Remarks: Site is being closed as a part of site restoration activities (south cell closed with material in place, north and center cells closed by removal of material); minor ongoing maintenance to control/repair burrows and remove woody vegetation; no sign of instability.

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 IMPOUNDMENT

FIGURE 1

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

Bottom Ash Impoundment

Photograph 1 (NW berm crest)
Interior of north cell (bottom ash and liner system removed during restoration activities) (DSCF0639.JPG)

Photograph 2 (North downstream slope)
Grass vegetation on north downstream slope and temporary stockpile at toe of slope related to site restoration activities (DSCF0641.JPG)

Bottom Ash Impoundment

Photograph 3 (North upstream slope)
Animal burrows on north downstream slope (DSCF0643.JPG)

Photograph 4 (NE berm crest)
Historic inflow to the north cell (to be removed during restoration activities) (DSCF0645.JPG)

Bottom Ash Impoundment

Photograph 5 (East downstream slope)
Lower east downstream slope of the north cell (DSCF0647.JPG)

Photograph 6 (SE center cell berm crest)
Interior of center cell (actively being dewatered during the inspection and geomembrane liner on side slopes removed as a part of restoration) (DSCF0650.JPG)

Bottom Ash Impoundment

Photograph 7 (East downstream slope)
Upper east downstream slope (DSCF0652.JPG)

Photograph 8 (East downstream slope)
Lower east downstream slope (DSCF0653.JPG)

Bottom Ash Impoundment

Photograph 9 (East downstream slope)
Woody vegetation on east downstream slope of south cell (DSCF0656.JPG)

Photograph 10 (SE corner of south cell)
Grass vegetation on south downstream slope (DSCF0657.JPG)

Bottom Ash Impoundment

Photograph 11 (South berm crest)
Interior of south cell (contact water control ditch and grading to achieve top of waste grades in preparation for closure) (DSCF0660.JPG)

Photograph 12 (South downstream slope)
Large animal burrow on south downstream slope (DSCF0662.JPG)

Bottom Ash Impoundment

Photograph 13 (SW south cell berm crest)
Interior of south cell (CCR, CCR mixed soils, and geomembrane liner being placed to achieve closure grades during restoration activities) and south cell dewatering sump shown in the background at the existing concrete outfall structure (DSCF0663.JPG)

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