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Memphis District

FLOOD CONTROL
ST. FRANCIS RIVER

ST. FRANCIS RIVER LEVEE, ARK

Design Documentation Report
for
Below Piggott Seepage Study
Clay and Greene Counties, Arkansas
Stations 17/14+00 to 28/25+00

U.S. Army Engineer District, Memphis

Corps of Engineers

November 22, 2019

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Design Document Report

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Section 1 General Project Information

1.1 Project Location

This project is located in Arkansas on the right descending bank of the St. Francis River from Mile 17/14+00 to 28/25+00. The overall project length is approximately 11 miles and is located south of Piggott, AR and west of Kennett, MO along the Missouri and Arkansas border. Figure 1 is a project location map.

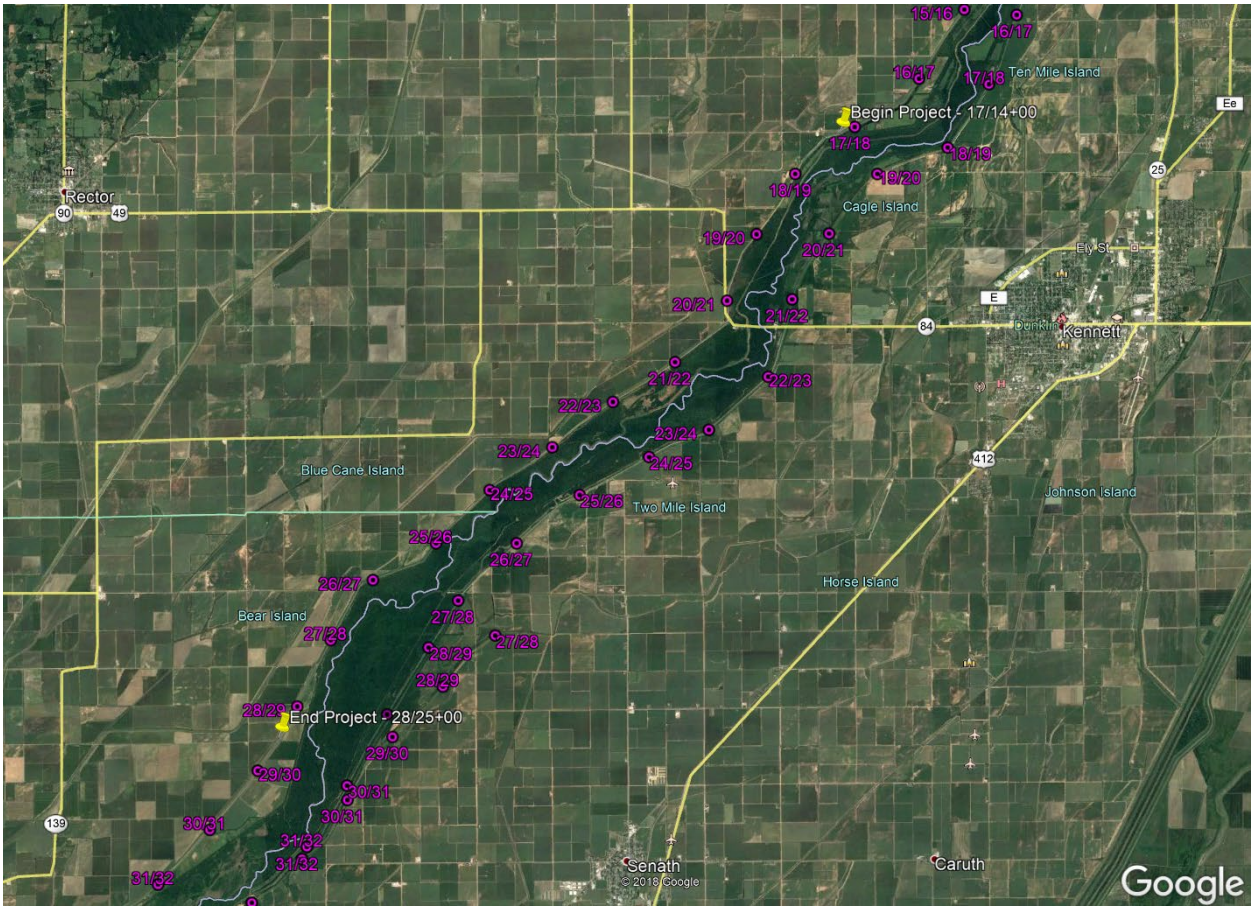

Figure 1. Project Location Map

1.2 Project Description

The project described herein provides for the maintenance of authorized facilities for the protection against headwater floods of the St. Francis River by means of a levee system. Major maintenance is a Federal responsibility. This project provides protection to numerous transportation systems, agricultural areas, lightly populated urban areas, and industries which are subject to flooding from the project flood.

1.3 Project Purpose

The purpose of this project is to reduce flood risk, flood damages, and flood protection costs resulting from flood events on the St. Francis River.

The project will bring the existing infrastructure into compliance with current Engineering Manuals (EMs) and Engineering Regulations (ERs). The project will also provide the Levee District with infrastructure that will receive passing grades on future inspections and will be more easily maintainable.

1.4 Project Authorization

Work within this project is authorized by the Flood Control Act of 15 May 1928, as amended.

1.5 Local Interests

The St. Francis Drainage District of Clay and Greene Counties, Arkansas is the local sponsor for this segment of levee. Local interests are responsible for minor maintenance. The name, address, and telephone number for the Point of Contact (POC) with the local sponsor is provided below:

St. Francis Drainage District of Clay and Greene Counties, Arkansas
Mr. Vance Whaley - (870) 598-4825
141 North 2nd Avenue
Piggott, AR 72454

Section 2 Project Features

2.1 Overview of the Project

The objective of this project is to mitigate against future seepage issues occurring at the landside levee toe and within the adjacent landside ditches during the design 100-yr flood event. The current design solution is to build seepage berms in areas where seepage calculations indicated unacceptable conditions at the landside levee toe. In areas of the project the seepage berm construction will fill in existing ditches, and new ditches will be constructed approximately 10 feet to the landside of the berms. In areas where a seepage berm is not required but the existing ditches do not comply with seepage design requirements, the existing ditches will be filled in and moved out in line with the new ditches beyond the seepage berms. Large portions of the new ditches also do not comply with the seepage criteria for unfiltered ditches. To help mitigate the potential seepage issues in the bottom of the new ditches, an inverted filter system will be constructed to mitigate transport of fines from the natural soils in the bottom of the ditches. The inverted filter will consist of a nonwoven geotextile fabric and two gradations of gravel. Specific details of the seepage analyses are provided in the Geotechnical Report in Appendix B.

2.2 Purpose and Scope

This Design Documentation Report (DDR) presents the essential data, assumptions, criteria, and computations for developing the construction documents for the project.

Section 3 Design Development

3.1 Project History and Investigations

The northern mile of the project area was previously evaluated for underseepage in 2004. This 2004 seepage study recommended a total of 274 relief wells be constructed between Levee Miles 8/8+00 to 17/54+40. Due to concerns over the functionality of the relief wells because of the thin blanket, a test reach of approximately 50 relief wells was constructed from approximately LM 15/52+00 to 17/10+00.

3.2 Construction Site Access

Access to the site will generally be from Hwy 90 with the contractor mainly traversing the project site using the gravel road on the levee crown. The contractor may also be able to access the northern portion of the site using Clay County Road 528 and access the southern portion using Greene County Road 807. The contractor will be required to utilize appropriate traffic control measures to protect the construction workers at all times of construction.

3.3 Value Engineering

A VE study was conducted by the district the week of 15 April 2019. Several cost savings proposals were developed for consideration, which included reconfiguring the small berm at the top bank of the new ditches and steepening the side slopes of the ditches and small berm. The PDT evaluated these proposals and determined the proposals were not implementable due to previous agreements with the levee district for the small berm configuration and based on standard design practice for long term stability and maintenance of slope configurations. The VE report is attached in Appendix D.

Section 4 Hydrology and Hydraulics

4.1 Introduction

The hydraulic design predominately focused on designing new ditches to provide equivalent drainage to the adjacent cultivated fields. Detailed information related to the hydraulic and hydrologic design of the project can be found in **Appendix A**. The hydraulic design effort involves collaboration with Geotechnical and Civil Sections to minimize the ditch depths.

Section 5 Geotechnical Engineering

5.1 Introduction

The main geotechnical design considerations for this project included the determination of the geological/geotechnical conditions and evaluation of seepage measures to mitigate areas that did not comply with design requirements. Detailed information related to the geotechnical design criteria, design cases, and other information related to geotechnical design can be found in **Appendix B**.

Section 6 Civil Engineering

Detailed information related to the civil design of the project can be found in **Appendix C**.

Section 7 Structural Engineering

NA

Section 8 Mechanical Engineering

NA

Section 9 Environmental Considerations

9.1 Introduction

Areas of existing ditches will be filled and associated woody vegetation will be removed for the construction of the new seepage berm and ditches for this project. The vast majority of the areas to be filled consist of cultivated fields. The borrow pits for this project are not finalized at this point; however, it appears likely that most of the borrow soils will come from the adjacent channel cleanout project on the St. Francis River (Below Hwy 90 Channel Cleanout). Other potential borrow sources are under consideration but have not been finalized at this point.

The Environmental Branch will be conducting an Environmental Assessment (EA) for this project to determine mitigation needs, NEPA compliance, and cultural resource requirements or issues. The EA is not complete at this point in time.

9.2 Mitigation

Due to the planned construction activities, there will be mitigation required for this project. The extent of mitigation required will be determined as part of the EA, which is still under development.

9.3 NEPA Compliance

All NEPA requirements will be coordinated, as indicated in the EA.

9.4 Cultural Resources

Appropriate actions will be taken in regards to any cultural resource issues indicated in the EA.

Section 10 Constructability

10.1 Ditch Construction

The new ditches will require excavation prior to seepage berm construction. The new ditch construction will include placement of the inverted filter and also construction of the silt berm. Once the new ditches are constructed, the seepage berm may be constructed, which includes filling of the existing ditches.

10.2 Fill Placement

Acceptable fill soils consist of sands, silts, or clays. Prior to any fill placement, the areas will be stripped of vegetation and topsoil and then scarified to a minimum depth of 6 inches. The scarified subgrade will be compacted using semi-compaction effort prior to placing new fill soils. The new fill soils will be placed in approximately 12-inch uncompacted lifts and then compacted in place using semi-compaction efforts using multiple passes in orthogonal directions of a tracked piece of construction equipment. The striped topsoil will be placed over the new fill soils and seeded with an appropriate seasonal seed mixture.

Section 11 Project Delivery Team

The Project Delivery Team (PDT) is an inclusive term that is meant to include all parties involved in the design, review, and approval of the products produced by a definable work effort; this includes USACE personnel, non-federal sponsor personnel, and in some instances key stakeholders. The members assigned have extensive professional and technical experience in their assigned areas of responsibility.

11.1 Project Delivery Team

Table 1: Project Delivery Team

Project Delivery Team				
Name	District/Org	Discipline/Role	Phone	Email
Mark Mazzone	CEMVM-OD-O	Project Manager	901-544-3482	mark.b.mazzone@usace.army.mil
James Evans	CEMVM-EC-G	Technical Lead-Geotechnical Engineer	901-544-3921	james.m.evans@usace.army.mil
Jon Korneliussen	CEMVM-EC-D	Civil Engineer	901-544-3479	jon.e.korneliussen@usace.army.mil
Holly Enlow	CEMVM-EC-H	Hydraulic Engineer	901-544-0664	holly.k.enlow@usace.army.mil
Kevin Pigott	CEMVN-PDC-UDC	Environmental	901-544-4309	kevin.r.pigott@usace.army.mil
Pam Lieb	CEMVN-PDC-UDC	Archaeologist	901-544-0710	pamela.d.lieb@usace.army.mil

11.2 District Quality Control (DQC) Review

The DQC Review commenced on 06 March 2019. A total of 38 comments were received from the reviewers. The comments have been evaluated by the PDT and backchecked by the reviewers. The reviewers have closed all comments. A DQC Certification letter is located in Appendix E.

11.3 Biddability Constructability Operability Environmental and Sustainability (BCOES) Review

The first BCOES review commenced on 01 May 2019. A total of 60 comments were received from the reviewers. The comments have been evaluated by the PDT and backchecked by the reviewers. The reviewers have closed all comments.

A second BCOES review commenced on 05 July 2019 after this project was combined with the Below Highway 90 Cleanout Project for construction purposes. The Plans and DDR for each project remain independent of each other, with the Specs being combined for construction and bidding purposes. A total of 112 comments were received from the reviewers. The comments have been evaluated by the PDT and backchecked by the reviewers. The reviewers have closed all comments.

11.4 Agency Technical Review (ATR)

The ATR review for the combined projects formally began on 09 September 2019 with a kickoff meeting. Updated documents for review were provided on 24 September 2019. A total of 111 comments were received from the reviewers. The comments have been evaluated by the PDT, and the reviewers are currently backchecking the evaluations.

DDR - Appendix A

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Appendix A: Hydrology and Hydraulics Design & Criteria

Below Piggott Seepage Remediation
Clay and Greene Counties, Arkansas

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Appendix A: Hydrology and Hydraulics Design and Criteria

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Appendix A: Hydrology and Hydraulics Design & Criteria

A.1. Introduction

The St. Francis River right bank levee from Mile 17/0+00 to Mile 27/40+00 has a history of seepage issues that have become a risk to the integrity of the levee. Approximately, 7.5 miles of seepage berm is proposed along 10.5 miles of levee to ensure levee safety and reduce the likelihood of sand boils. The primary land use in the area is for agricultural production and many fields are graded to drain to existing drainage ditches that run along the toe of the levee.

Location

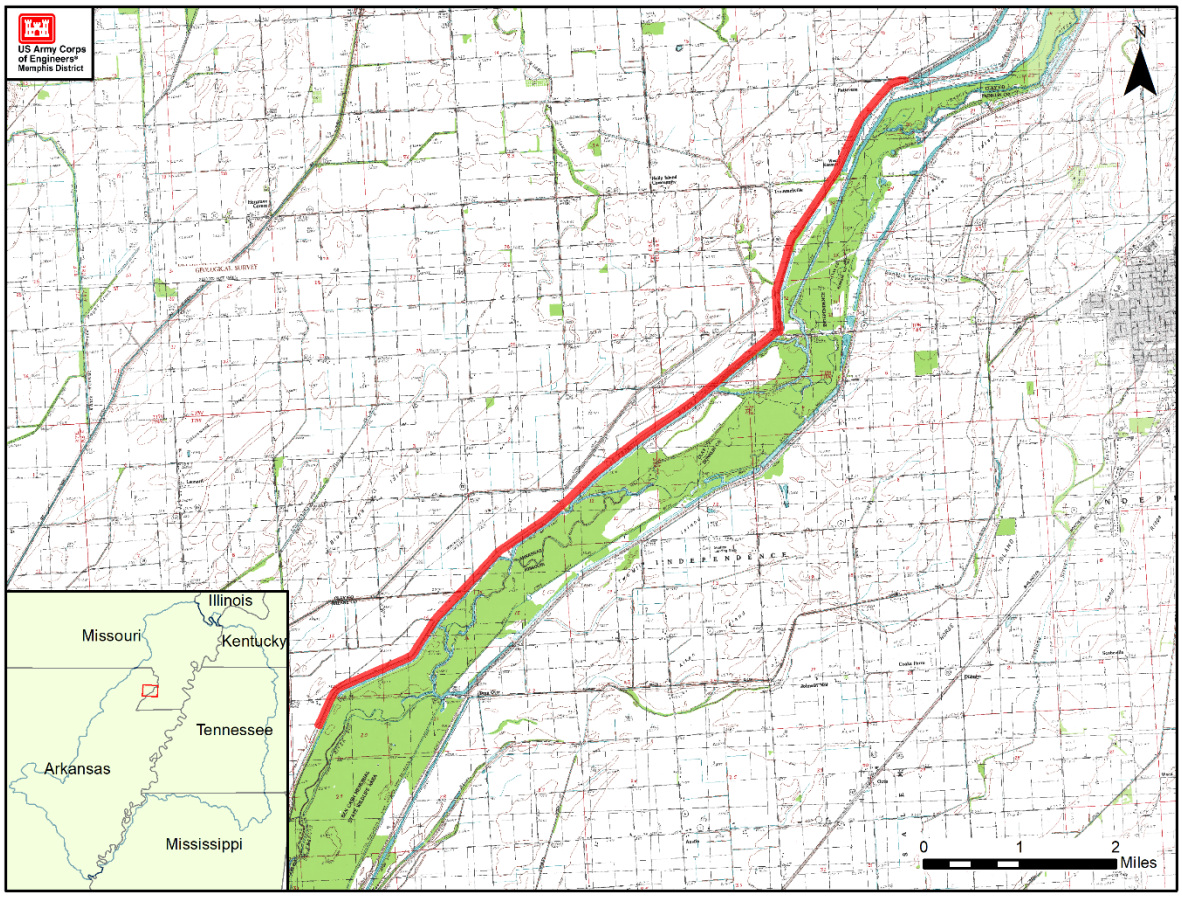


Figure A.1. Map showing location of Below Piggott Seepage Remediation

A.1.1. Design Guidance and Reference

All design, guidance, regulations, and project references are listed below:

US Army Corps of Engineers, Memphis District, General Design Memo No. 104 Flood Control, Mississippi River and Tributaries, St. Francis Basin; Upper St. Francis River

MVM H&H Branch, Hydraulic Note-007, Small Ditch Design

USDA NRCS:

National Engineering Handbook-Part 650 Engineering Field Handbook, Chapter 14 Water Management (Drainage)

NEH Section 16 Drainage of Agricultural Land, Chapter 5, Open Ditches for Drainage –Design, Construction and Maintenance

NRCS MO-14-1 Drainage Runoff Curves

TX-SCS (1985) Engineering Technical Note No. 210-18-TX8, Guide to Determine Instantaneous Peak Flow For Flatland Areas

A.1.2. Project Management Summary and Constraints

Local landowners have requested that ditches be replaced along the toe of the levee to reduce impacts to productive farm land. Geotechnical engineering has requested that ditches running next to the levee be as shallow as possible to reduce further seepage issues.

A.1.3. Description of Problem and H&H Goals

The primary land use in the area is for agricultural production and many fields are graded to drain to existing drainage ditches that run along the toe of the levee. These ditches will be covered by the seepage berm impacting drainage for approximately 900 acres adjacent to the levee. The primary H&H goals are to evaluate drainage areas and design the new ditches to drain the areas impacted by the seepage berm.

A.2. Background Information

The St. Francis River flowline in the project area is authorized by GDM 104 Flood Control, Mississippi River and Tributaries St. Francis Basin-Upper St. Francis (USACE, 1964). Further frequency analysis was completed for the 2009 Levee System Certification to determine flowlines for other frequency events.

Table A.1. gives the flowline values from 2009 Levee System Evaluation Report was provided to the Geotechnical Engineering Branch to be used in the seepage analysis.

Table A.1 Project Design Flood flowline for the project area

River Mile	Levee Mile	1% Annual Chance Exceedance Flowline
		(ft)
147.20	18	271.3
146.20	19	269.7
145.40	20	268.5
144.94	20/17+00	268.5
144.92	20/18+00	267.7
143.65	21	265.6
142.65	22	264.9
141.65	23	263.7
140.55	24	262.1
140.00	24/24+50	261.4
139.40	25	260.6
138.30	26	258.4
136.75	27	256.9
135.60	28	255.5
135.00	28/25+50	255.0

A.3. Hydrology

Based on design recommendations from the Geotechnical Engineer, existing ditches that will be impacted by the seepage berm were identified. Areas that drain to the impacted ditches were determined using 1-m LiDAR obtained for the St. Francis basin in 2016 and based on conversations with the local landowners. Six ditches were identified to be replaced. Several iterations of drainage layout were discussed with the PDT and the local levee board. Ultimately, it was determined to keep the same drainage layout and move the ditches to the toe of the berm. See Figure A.2 for drainage layout.

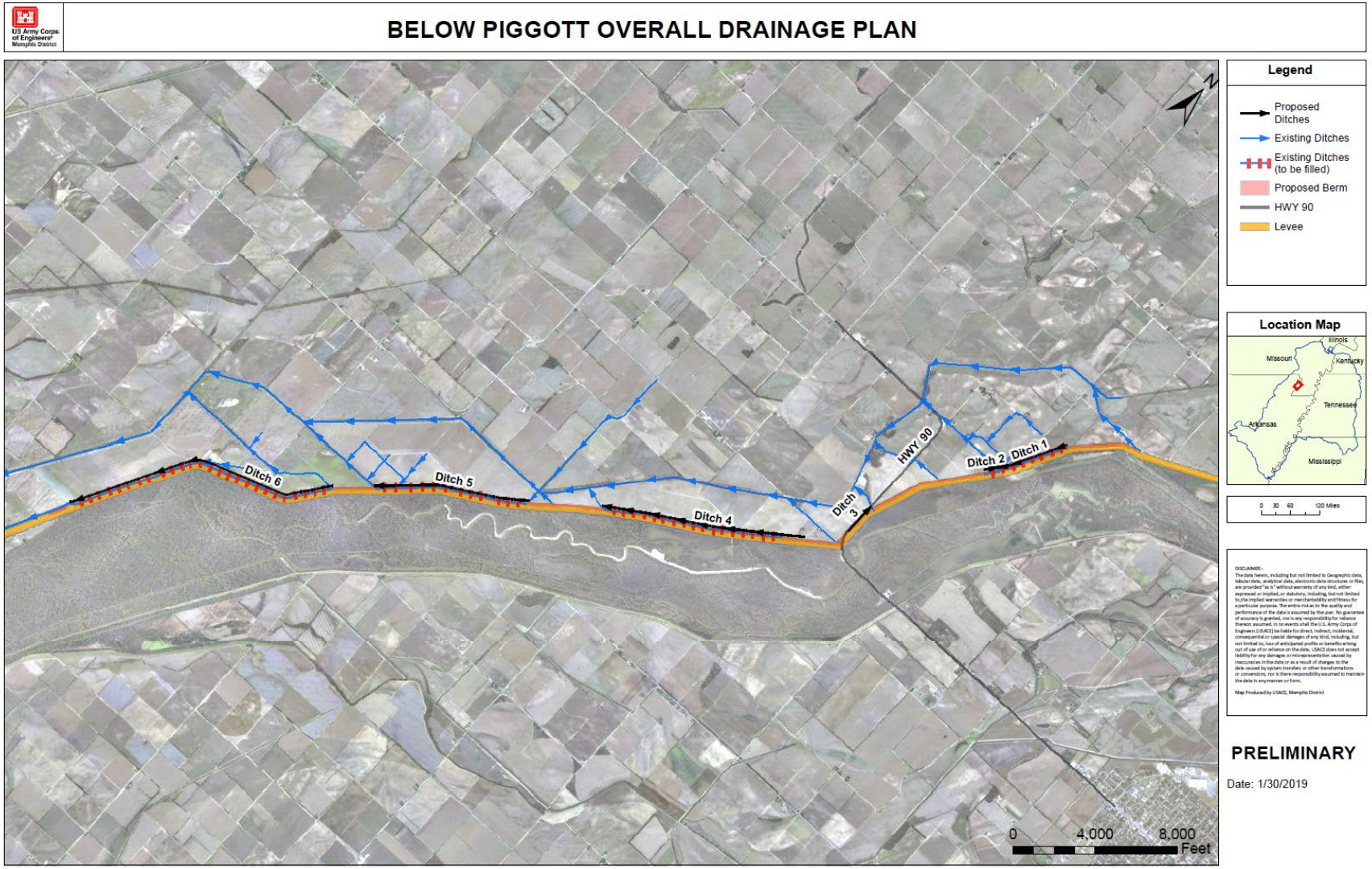


Figure A.2. Overall drainage plan for Below Piggott Seepage remediation

A.3.1. Methodology

Design discharges for agricultural ditches are generally based on an average removal rate for a 24 hour period rather than a peak flow (Figure A.3) and based on the area to be drained. The Cypress Creek equation is often used for design capacity of drainage ditches in the St. Francis Basin.

The Cypress Creek equation is as follows:

$$Q = CM^x$$

Where

Q = Flowrate (cfs)

C = Coefficient from NRCS drainage curve

M = Drainage area in square miles

x = Cypress creek exponent, typically 5/6

A coefficient (*C*) of 45-75 is typically used for the drainage design in Memphis District. NRCS recommends *C*=45 for cultivated land in the region. Drainage curves used for the Missouri Bootheel, which is across the St. Francis River from the project area, were obtained from Missouri NRCS (Figure A.4). The curve indicated "Good Agricultural Drainage" corresponds with recommendations from the National NRCS guidance and the typical values used by the Memphis District. Therefore, this curve was selected to be used in the hydrologic analysis for this project.

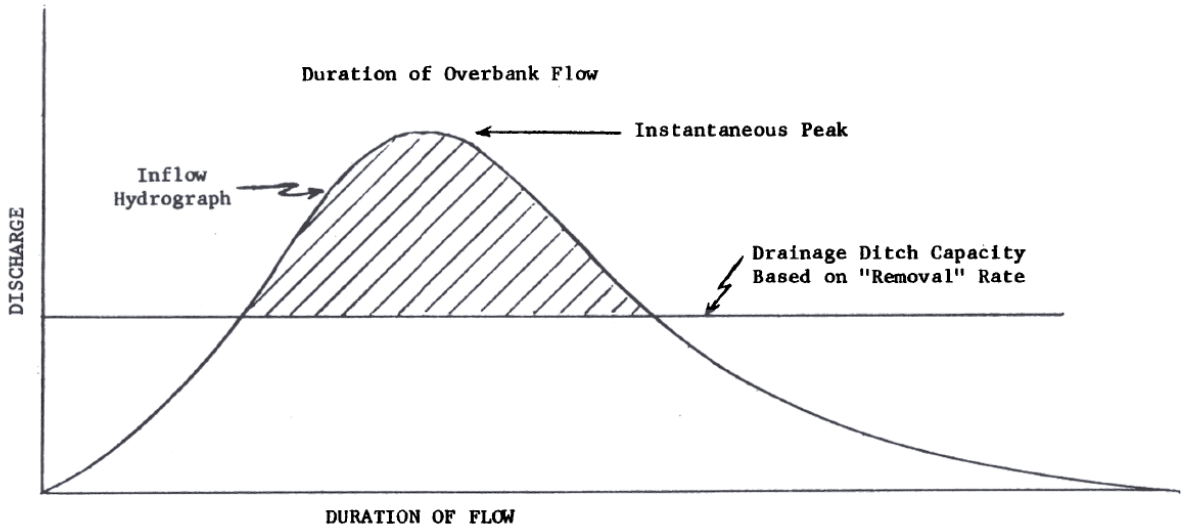


Figure A.3. Relationship between peak flow and average removal rate typically used for drainage ditch capacity (From TX-SCS 1985).

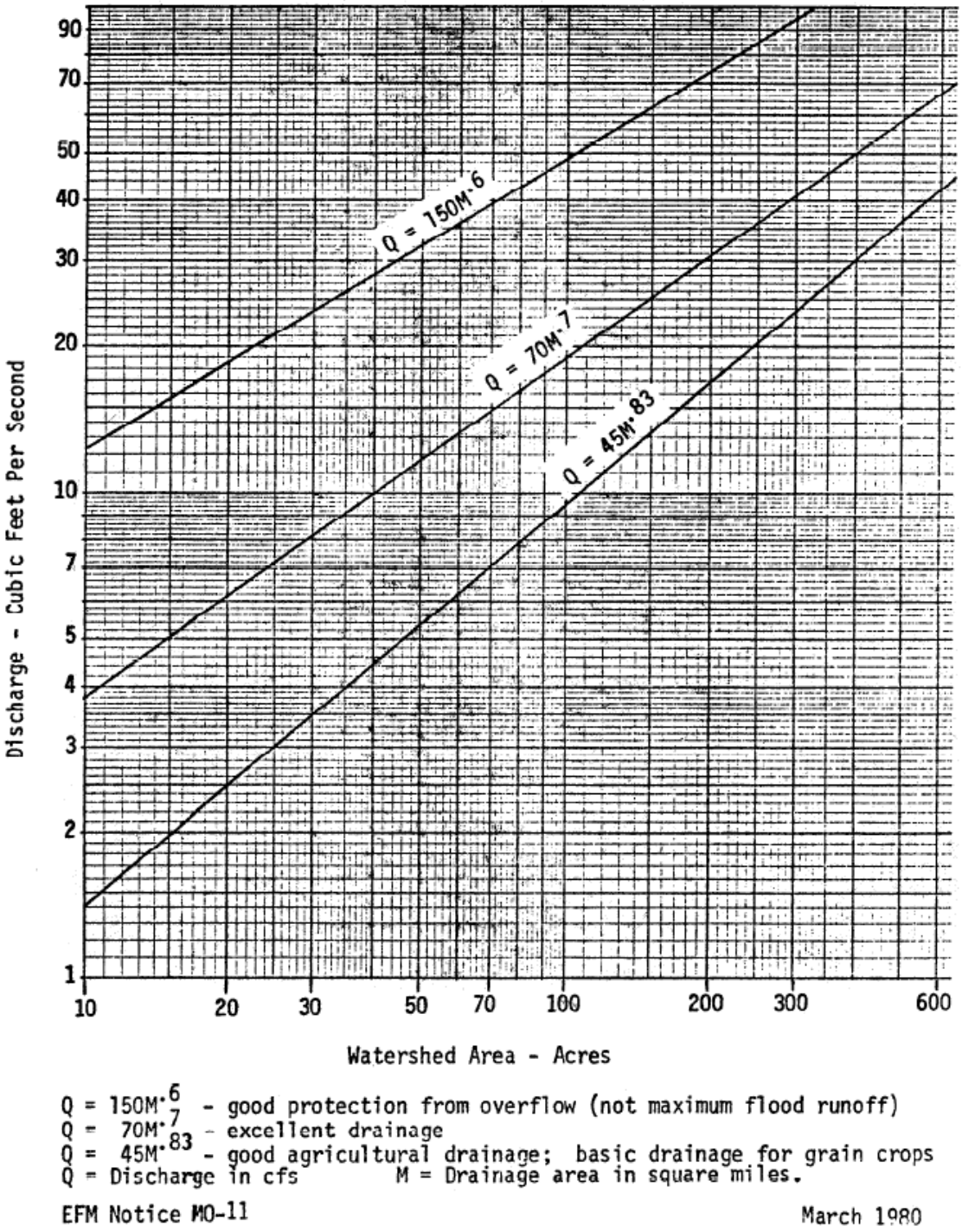


Figure A.4. Drainage curves obtained from Missouri NRCS typically used for drainage design in the Missouri Bootheel.

The Cypress Creek equation was used for determining discharges for all ditches except Ditch 3. Ditch 3 runs along Arkansas Hwy 90. AR DOT requires roadside ditches to be able to convey the 25-year storm event. The rational method was used to compute the associated runoff from various design storms in Ditch 3. The rational method estimates a design discharge for a small watershed, typically less than 90 acres.

In the rational method, the associated peak runoff is computed using the following equation:

$$Q = C * i * A$$

Q = Design discharge (cfs)

C = Runoff coefficient (dimensionless) indicates the amount of runoff generated by a watershed

i = Design rainfall intensity (in/hr) or the average rainfall intensity for a particular length of time (the time of concentration)

A = Watershed drainage area

A.3.2. Results

Drainage areas for each impacted ditch are shown in Figures A.5-A.10 and Table A.2.

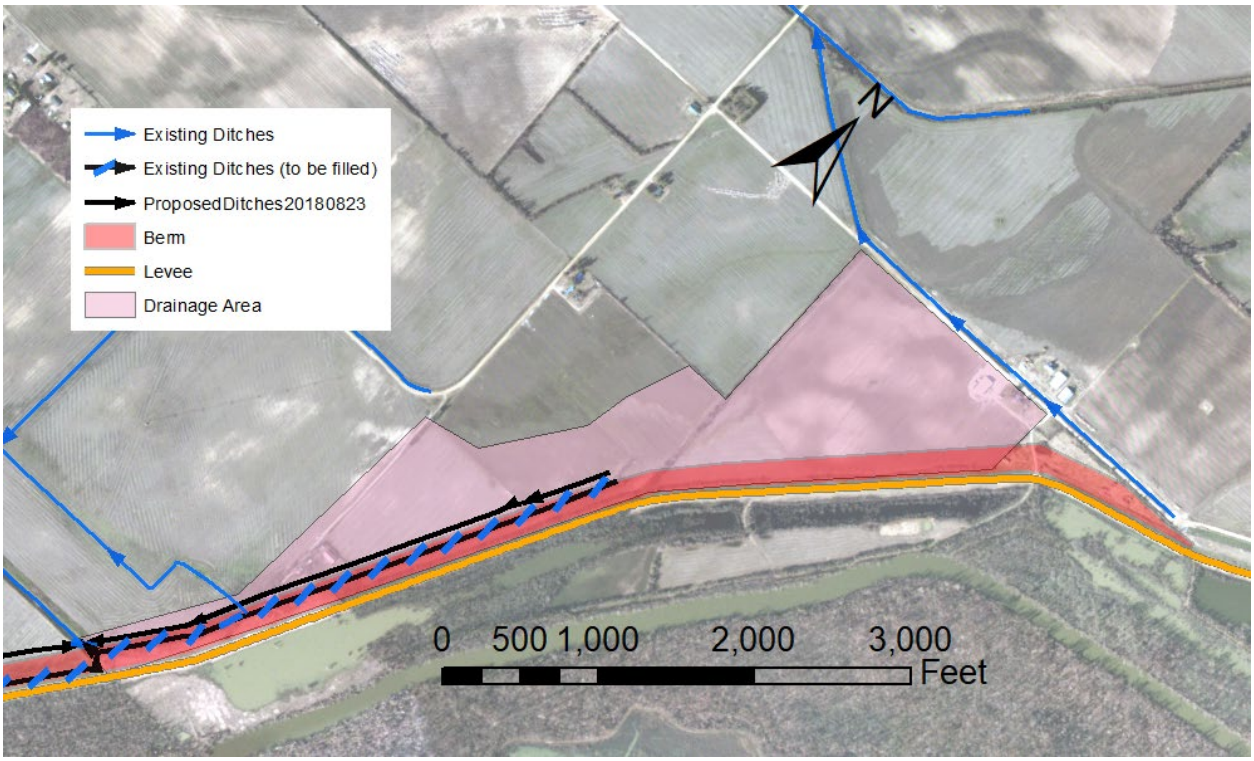


Figure A.5. Drainage area for Ditch 1

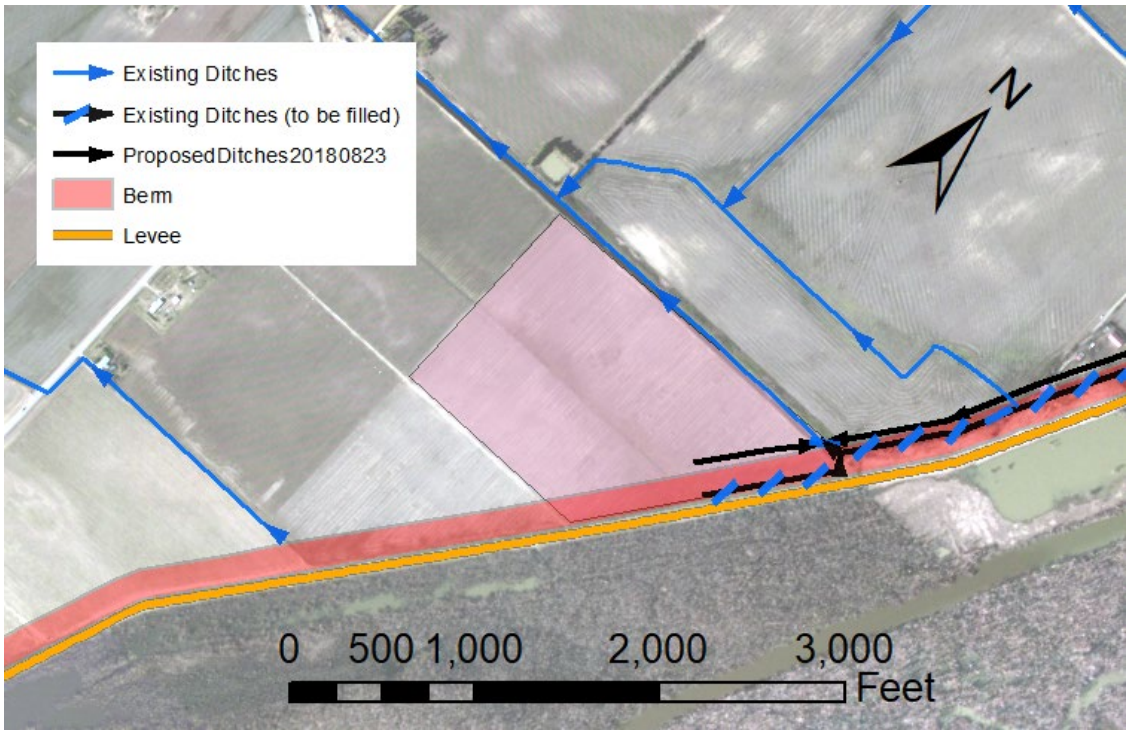


Figure A.6. Drainage area for Ditch 2

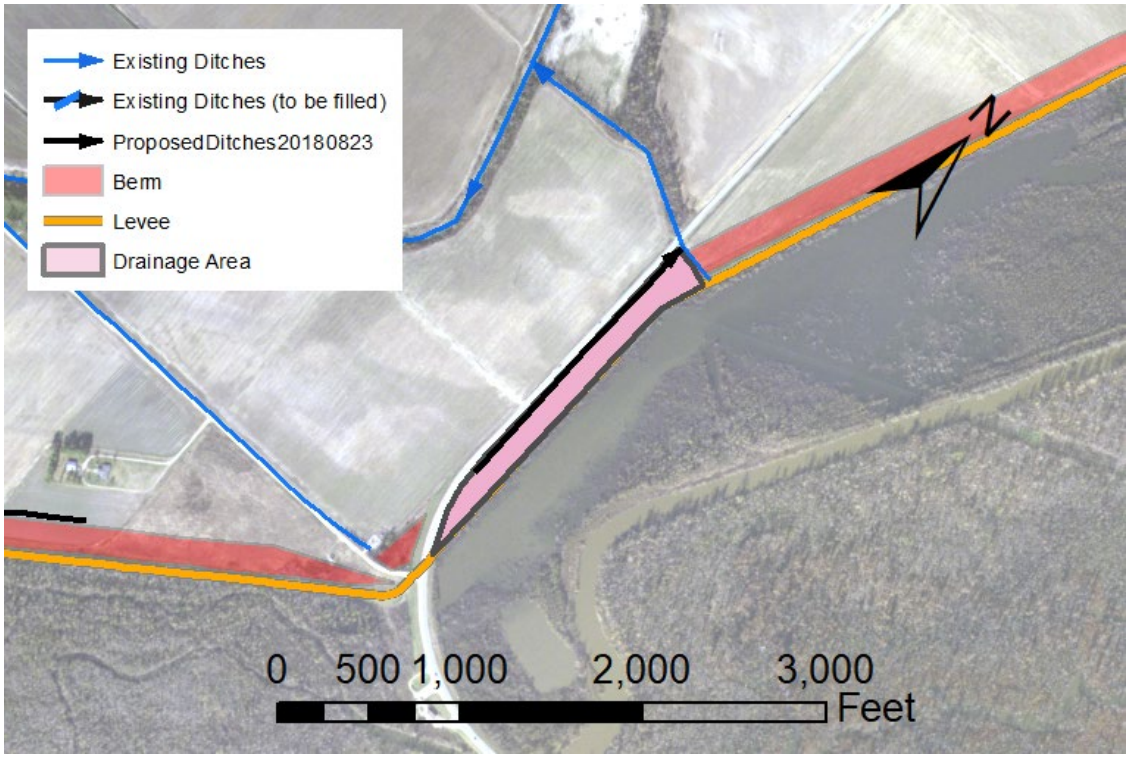


Figure A.7. Drainage area for Ditch 3

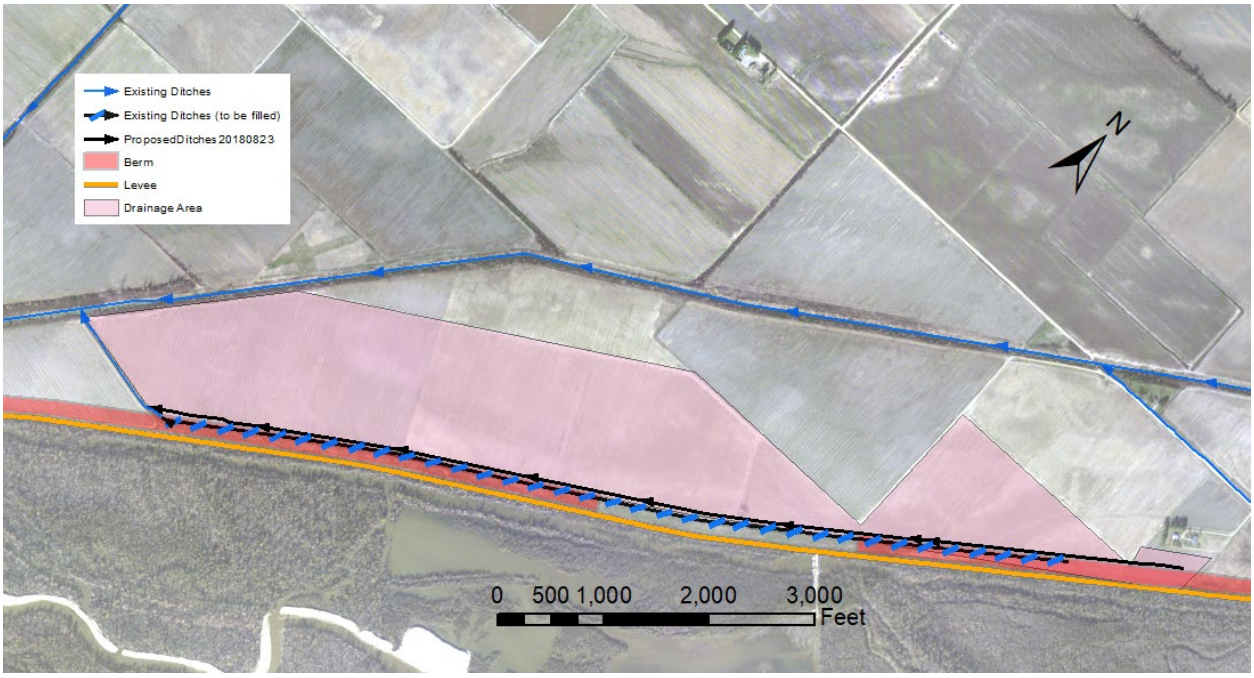


Figure A.8. Drainage area for Ditch 4

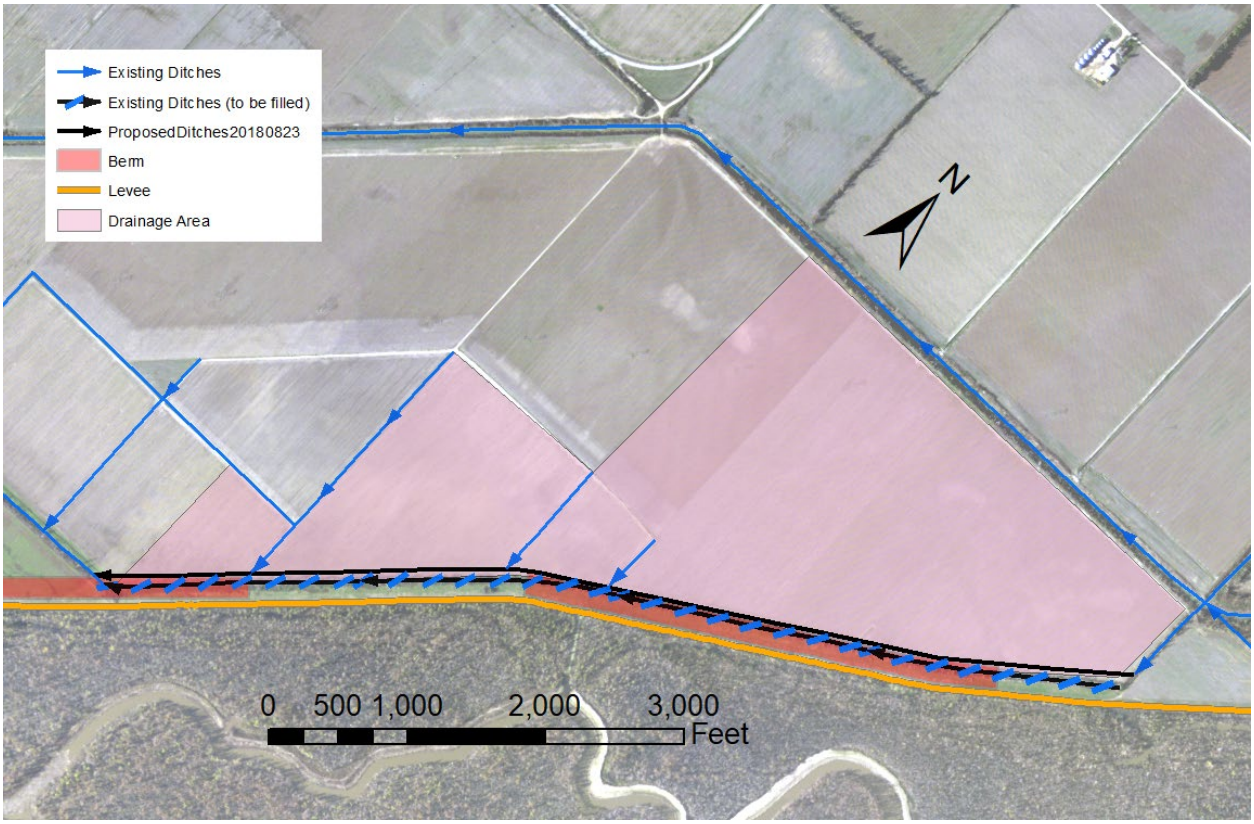


Figure A.9. Drainage area for Ditch 5

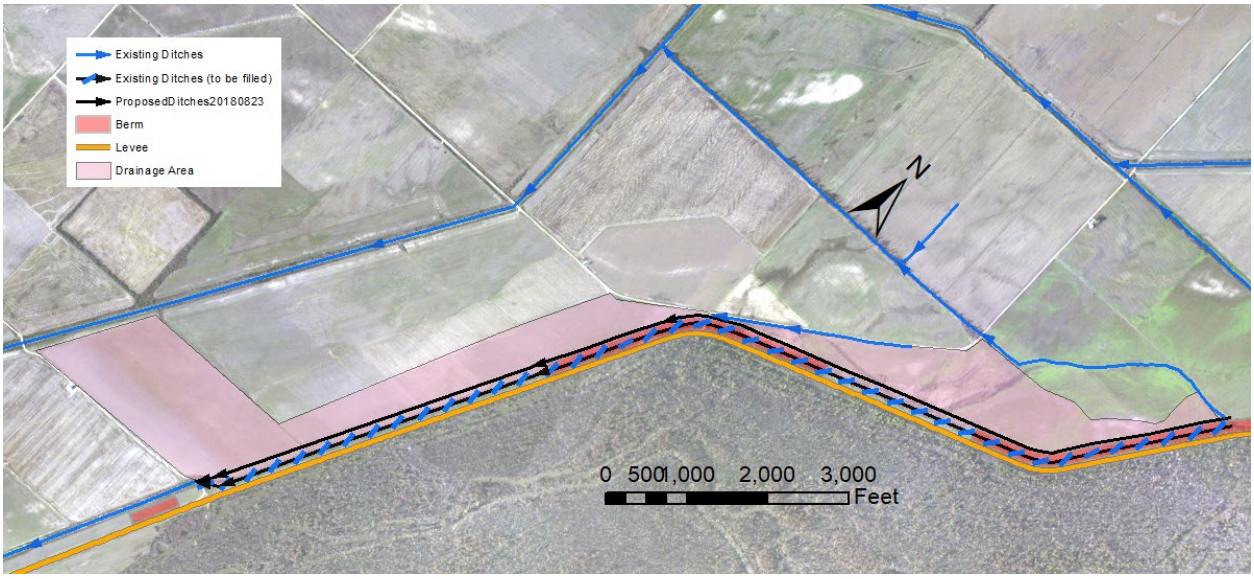


Figure A.10. Drainage area for Ditch 6

Table A.2. Drainage area for each proposed ditch.

Ditch #	Drainage Area (Acres)
1	87
2	46
3	7
4	250
5	236
6	244

The rational equation runoff coefficient, *C,* was determined using Module 206 D – Peak Discharge document from the NRCS. According to the USDA web soil survey, the soil texture is silt loam. LiDAR data confirmed that the topography for the subarea is flat. According to the table below, the runoff coefficient is 0.3 given the topography and soil texture of the subarea.

Table A.3. NRCS Runoff Coefficient, *C*, for various soil textures and topographies.

	Soil Texture		
Pasture	**Open Sandy Loam**	**Clay and Silt Loam**	**Tight Clay**
Flat (0-5% slope)	0.10	0.30	0.44
Rolling (5-10% slope)	0.16	0.36	0.55
Hilly (10-30% slope)	0.22	0.42	0.60

The design rainfall intensity was determined using the point precipitation frequency estimates published in the National Oceanic and Atmospheric Administration's (NOAA) Atlas 14. The point precipitation frequency estimates for Rector, Arkansas were used. In the rational method, the intensity is selected for the same duration as the time of concentration.

The time of concentration was calculated using the TR-55 method. The Natural Resources Conservation Service WinTR-55 Watershed Hydrology computer model version 1.00.10 was used to compute the time of concentration, t_c, and the inputs are provided in the table below.

Table A.4. Time of Concentration (T_c) Input into WinTR-55

Sub Area	Flow Type	Length (ft)	Slope (ft/ft)	Manning's *n*
Ditch 3	Sheet	40	0.25	0.15
	Shallow Concentrated	1000	0.0014	Unpaved
	Channel	800	0.001	0.04

The slopes were determined from the LiDAR data. A Manning's *n* was selected based off of the WinTR-55 recommended *n* value for the subarea's surface. Satellite imagery confirmed a high *n* value for the subarea. The time of concentration, t_c, for the subarea is 0.63 hours or 38 minutes.

As there are no estimates for a 38-minute rainfall event, the intensity estimates for a 30-minute precipitation event were chosen. The table below provides the rainfall intensity estimates for a 30-minute storm event.

Table A.5. NOAA Atlas 14, Volume 8, Version 2 Point Precipitation Frequency Estimates for a 30-min event

Return Interval	Rainfall Intensity (in/hr)
25-yr	4.14
100-yr	5.20

The associated runoff for the 4% and 1% chance exceedance events (25-yr and 100-yr storm events) using the rational method is provided below for the Ditch 3 drainage area is shown in Table A.2. Note that the 1% flood has a 1 in 100 chance of being exceeded in an given year and the 4% flood has a 1 in 25 chance of being exceeded in any given year.

Table A.6. Rainfall runoff in Ditch 5 for various design storms

% Chance Exceedance	Runoff from Subarea 1
4%	9.3
1%	11.7

Design discharges from the Cypress Creek equation and rational method are shown in Table A.7. These design discharges were used to size the proposed ditches in Section A.4.

Table A.7. Total runoff from drainage area used as design discharge for each ditch.

Ditch #	Approx. Levee Station Start	Approx. Levee Station End	Drainage Area (Acres)	Design Discharge (cfs)
1	17/51+00	18/30+00	87	9.4
2	18/30+00	18/39+00	46	5.0
3	19/46+00	20/14+50	7	9.3*
4	20/40+00	22/20+00	250	20.5
5	23/04+00	24/26+00	236	19.9
6	24/48+00	27/20+00	244	20.0

*Determined using rational method rather than Cypress Creek

A.4. Hydraulics

A.4.1. Methodology

Design discharges in Table A.7 and channel slopes obtained from the Civil Design PDT member were used to size the proposed ditches. Each drainage area was divided into multiple subareas and ditch segments were designed based on increasing flow. Initial normal depths were calculated using Bentley Culvertmaster. A Manning's n of 0.04 was assumed. The ditches were designed under the assumption that they will be maintained by the sponsor to prevent brush growth. A minimum of 6" of freeboard was added to the normal depth. HEC-RAS version 5.0.5 was used to develop steady flow water surface profile for each ditch under design flow conditions. HEC-GeoRAS was used to cut cross-sections from the terrain and the channel modification tool was used to project the design cross-section along the slope. Culverts are needed in Ditches 1 and 6 to allow flow under a levee access ramp. The steady flow HEC-RAS was used to size the culverts. A normal depth downstream boundary conditions were used for each steady flow analysis.

A.4.2. Results

All sections of all ditches should be trapezoidal or triangular in shape with a bottom with of *b* (ft) and 3:1 side slopes. A minimum depth of *d* (ft) was calculated for each section. Note this value includes 0.5 ft of freeboard. Recommended dimensions are shown in Table X. Steady flow profiles from HEC-RAS can be found in Section A.7.

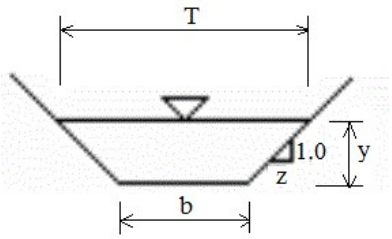


Figure A.11. Trapezoidal channel cross-section.

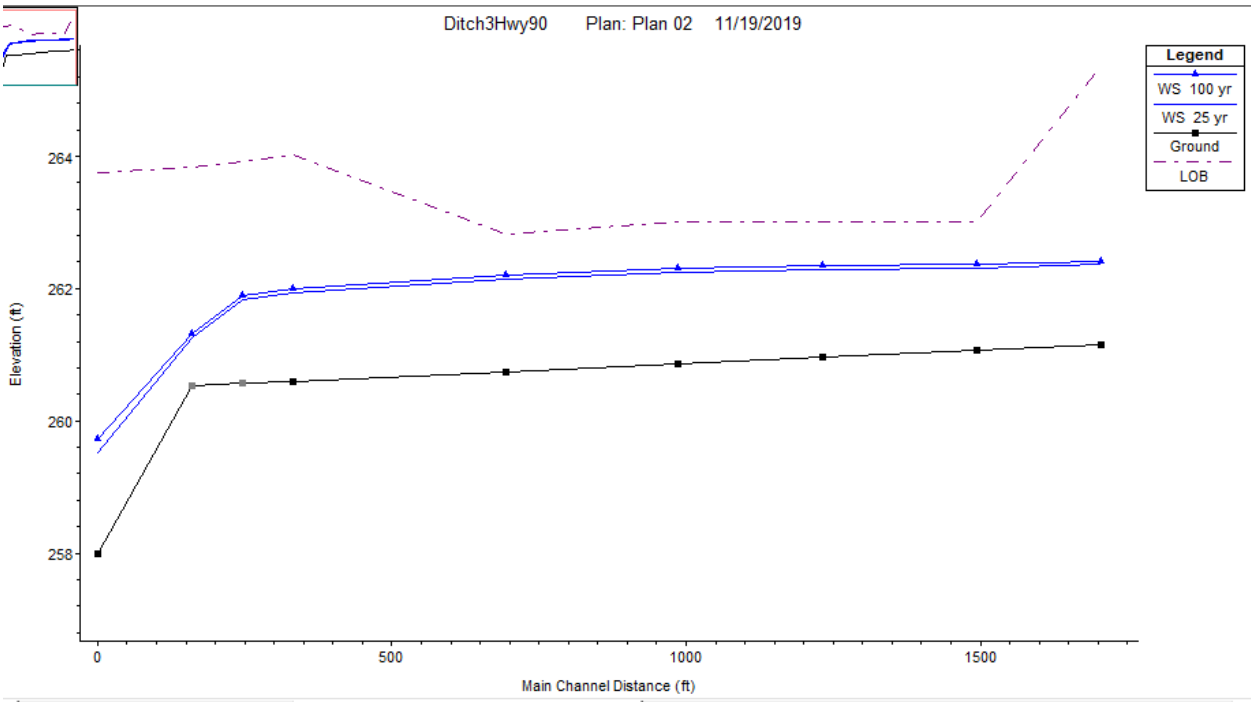
Table A.8. Recommended Channel Dimensions.

Ditch No.	Segment No.	Approx. Levee Station Start	Approx. Levee Station End	Discharge (cfs)	Channel Slope (ft/ft)	Bottom Width (b) (ft)	Min. Depth (d) (ft)
1	1	17/51+00	18/01+50	5	0.0006	3	1.5
	2	18/03+00	18/08+00	7.6	0.0006	4	1.5
	3	18/08+00	18/21+00	12.3	0.0006	4	2
		18/17+90	18/18+50	12.3		30” CMP Culvert	
	4	18/24+00	18/30+00	13.6	0.0013	6	2
2	1	18/30+00	18/39+00	5	0.001	2	1.5
4	1	20/40+00	20/60+00	1.7	0.0013	0	1.5
	2	20/60+00	21/04+00	3.4	0.0013	3	1.5
	3	21/04+00	21/40+00	4.7	0.0002	3	2
	4	21/40+00	22/10+00	12.6	0.00088	6	2
	5	22/10+00	22/20+00	19.5	0.00088	10	2
5	1	23/04+00	23/16+00	1.74	0.0011	0	1.5
	2	23/16+00	23/26+00	3.5	0.0011	3	1.5
	3	23/26+00	23/44+00	13.9	0.00046	8	2
	4	23/44+00	23/50+00	14.8	0.00046	8	2
	5	23/50+00	24/12+00	18.8	0.00046	10	2
	6	24/12+00	24/26+00	19.9	0.00046	12	2
6	1	24/48+00	24/52+00	0.9	0.0016	0	1.5
	2	24/52+00	25/14+00	4.4	0.00038	5	1.5
	3	25/14+00	25/30+00	7.4	0.00052	6	2
	4	25/30+00	26/8+10	8.5	0.00032	6	2
	5	26/8+10	26/12+50	10.9	0.0002	2x 24" CMP culvert	
	6	26/12+50	26/34+00	13.3	0.0006	8	2
	7	26/34+00	27/20+00	14.7	0.0006	8	2
	8	27/20+00	27/25+00	20	0.0006	**	**

**Tie into existing ditch

A.4.3. Ditch 3

Design of a v-ditch for Ditch 3 was coordinated with the Geotechnical and Civil design PDT members, as well as engineers from Arkansas Department of Transportation (ARDOT). This ditch requires fill to meet seepage requirements. The left side slope was ~7.5:1 and the right side slope was 3:1. The 25-yr and 100-yr discharge were checked using HEC-RAS to meet ARDOT’s requirements. See figure below for 25-yr and 100-yr water surface profiles.



A.5. Erosion Protection

A rock drop structure will be needed for Ditch 3 to reach existing grade. A 20:1 drop was suggested by the PDT for this structure. Bentley Flowmaster was used to determine the velocity on the in the rock chute. A maximum velocity of 5.2 ft/s was determined for the 25-yr event using Flowmaster. The size of stone was determined based on geotechnical recommendations for the inverted filter. The size of stone was checked using Isbash's eqn:

$$D = \frac{V^2}{2gC^2(S-1)}$$

C = Isbash constant

D = Median diameter of spherical stone or rock. Also known as D50 (ft)

g = Acceleration due to gravity, 32.2 ft/s^2

S = Specific gravity of stone or rock

V = Water velocity approaching the riprap (ft/s)

The Isbash constant is 0.86 and 1.20 for high and low turbulence, respectively. The specific weight of stone was assumed to be 2.65.

For the drop structure at Ditch 3:

$$D_{50} = \frac{5.2^2}{2 * 32.2 * (1.2)^2(2.65-1)} = 0.17\ ft = 2.1"$$

A.5.1. Methodology

A.5.2. Results

A.6. Design Recommendations

Design Recommendations for each ditch are found in Table A.8. The culvert in ditch 6 should be double barrel 24” CMP. A potato berm should be built along the top of bank on the field side of the drainage ditches to reduce siltation. NRCS pipe drops will be sized to allow for drainage through the potato berm.

A.7. Plates

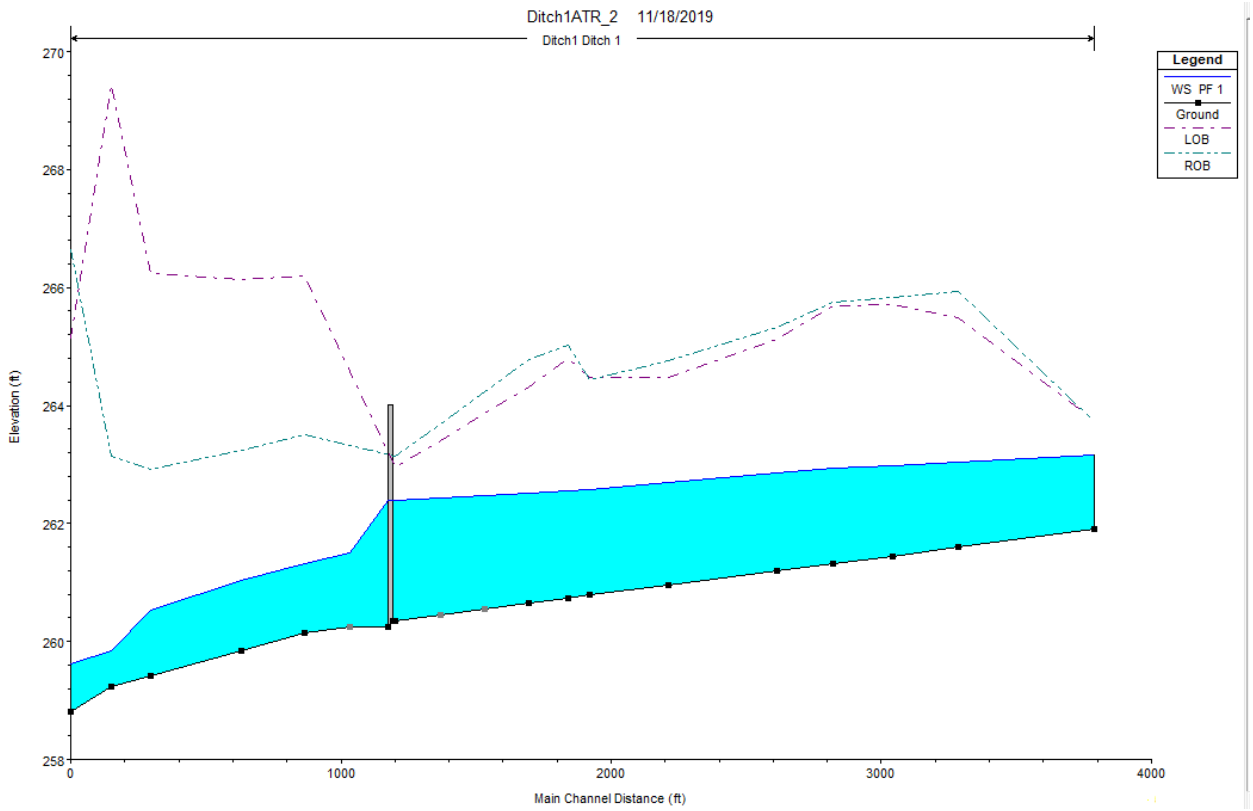


Figure A.12. Water surface profile for Ditch 1

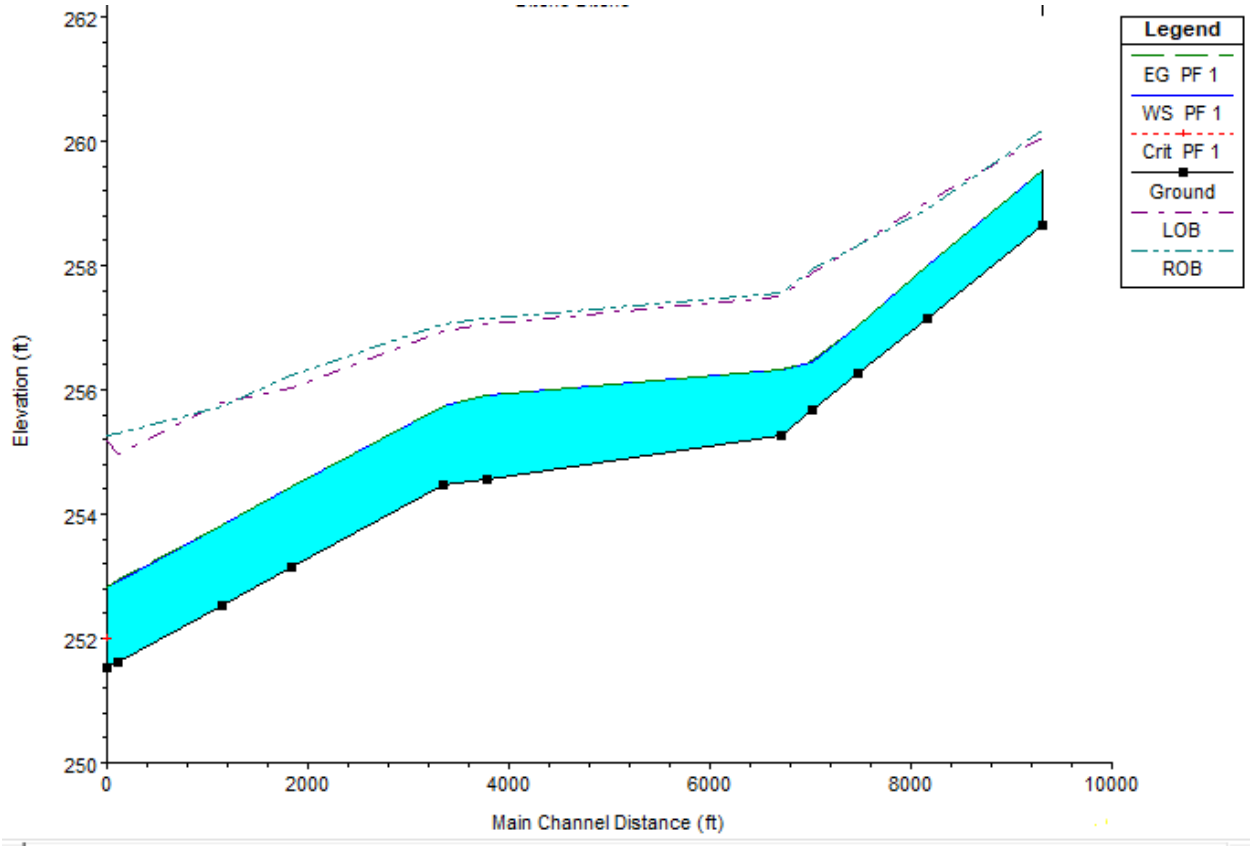


Figure A.13. Water surface profile for Ditch 4

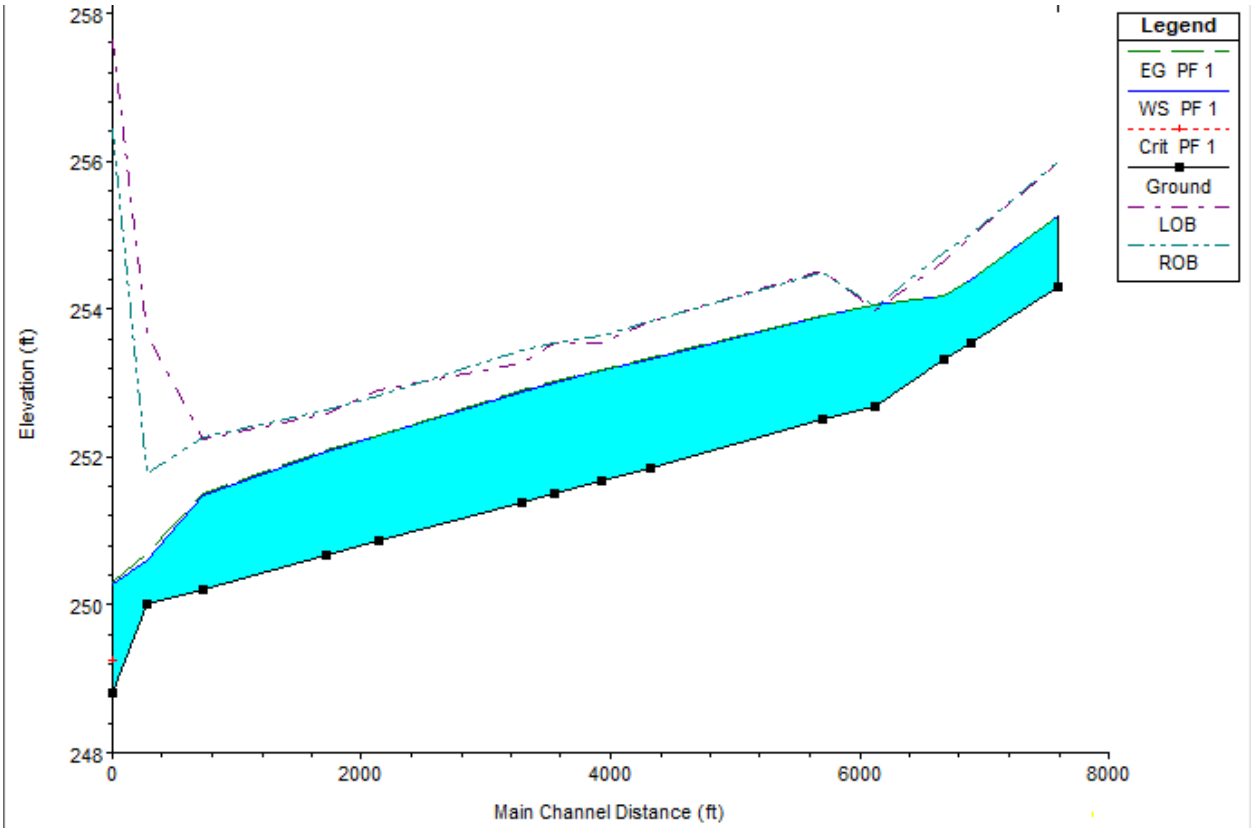


Figure A.14. Water surface profile for Ditch 5

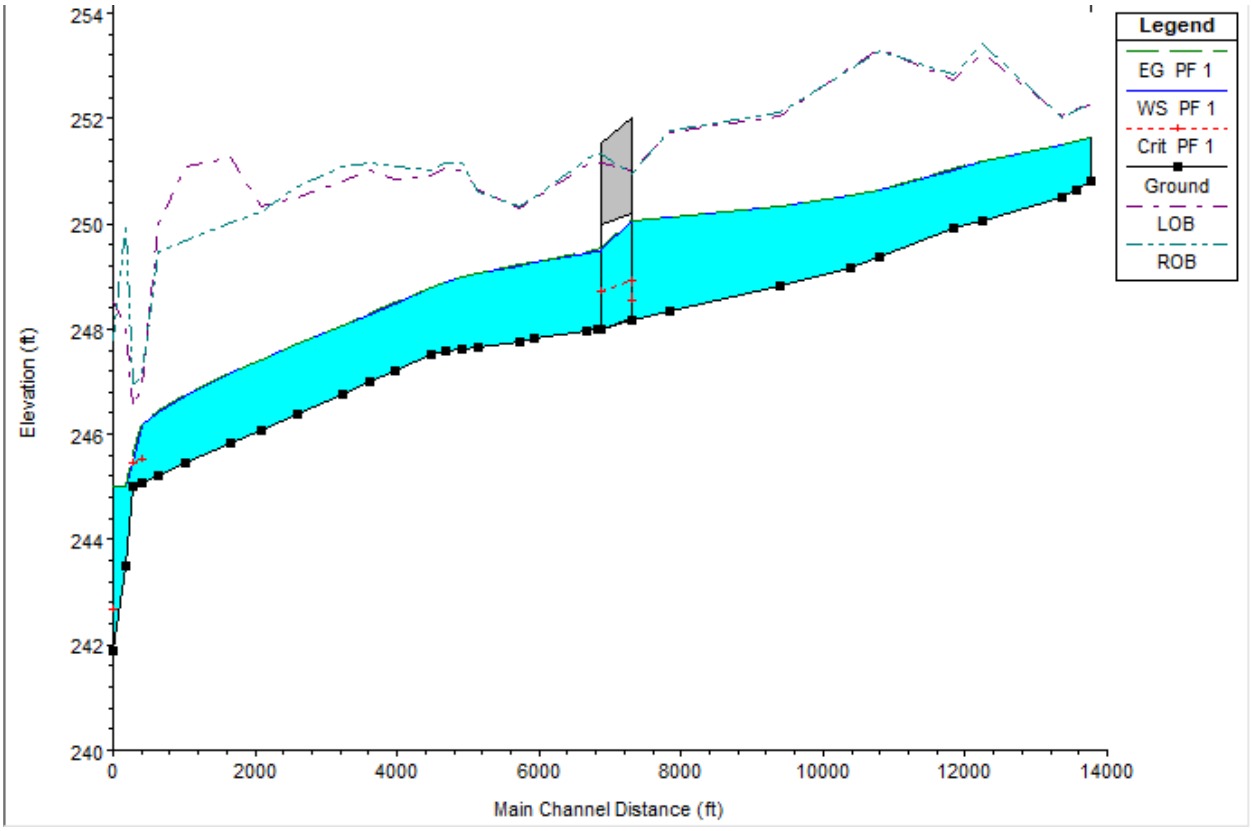


Figure A.15. Water surface profile for Ditch 6. Ditch 6 drains to an abandoned borrow pit that is along the toe of the levee. This borrow pit has significant capacity to receive the water from Ditch 6.

DDR - Appendix B

Below Piggott, Arkansas

St. Francis River

Seepage Study

Levee Miles 17/14+00 -28/25+00

Geotechnical Engineering Branch

Memphis District

April 2019

Below Piggott, Arkansas

St. Francis River

Seepage Study

Levee Miles 17/14+00 to 28/25+00

1. Introduction. The purpose of this report is to estimate seepage potential due to the design flood loading and provide recommendations for seepage control measures along approximately 11 miles of the St. Francis River between Levee Miles 17/14+00 to 28/25+00. The study area is located south of Piggott, AR and west of Kennett, MO on the western, right descending St. Francis River Levee. The site location map is included in Appendix A.

   The seepage study was performed using design procedures presented in DIVR 1110-1-400, Change 2 dated 12 December 1998 and EM 1110-2-1913 dated 30 April 2000. These regulations provides the guidelines and procedures for design of the landside seepage berms and are based on design recommendations presented in WES TM No, 3-424, "Investigation of Underseepage and It's Control, Lower Mississippi River Levees" October 1956.

2. Geology. The study area is located on braided relict alluvial fan deposits. The surface material within the braided relict deposits generally consists of approximately 5 to 10 feet of clay with occasional layers of fine sand and silt. In the first 5 miles of the study area fine grained soils were not observed at the surface in several reaches. The Geologic Map for the study area is included in Appendix A.

3. Site Investigation. a. Borings. Borings were taken to determine specific soil stratification and characteristics pertinent to the seepage study. The boring program for this portion of the study area consisted of 262 general borings taken in 2010 and 2011 and 16 borings taken in 1999. Borings were spaced at 500-ft intervals landside and riverside of the levee and at 1,500-ft intervals along the centerline of the levee. Landside and riverside borings were drilled to a depth of 30 feet and the centerline borings were drilled to a depth of 45 feet. A total of 38 Tertiary borings were drilled in 2011 on the landside at approximate 1,500-ft intervals, and 1 Tertiary boring drilled in 1999 was utilized. Borings provided information related to the soil stratification landside and riverside of the levee, continuity of the soil stratification from the landside to the

riverside and the levee soil composition. Boring logs are presented in Appendix B. The boring location plan sheets are presented in Appendix B.

b. Soil Profile. Landside and riverside soil profiles are presented in Appendix C. These profiles were plotted to clearly define soil stratification and continuity of the stratification both parallel and perpendicular to the levee. As can be seen on the profiles, the landside and riverside blankets are not continuous for large portions of the study area.

c. Cross Sections. Levee cross sections were surveyed between levee miles 17/14+00 and 18/0+00 in 2018 and between levee miles 18/0+00 and 28/25+00 in 2011. The sections were taken perpendicular to the levee and were spaced approximately every 500 feet along the centerline of the levee. Average landside and riverside elevations obtained from the sections were used to estimate the blanket thicknesses and to determine the differential pressure heads used in the design procedure. Additional features such as borrow pits and landside ditches were also located and defined by the survey data. The survey cross sections are presented in Appendix D.

4. Seepage History. Seepage history for the study area was obtained from flood fight reports written after major high water events on the Upper St. Francis River in 2011, 2015, and 2017. These reports indicate the following specific concentrated seepage issues:

Year	Location (Levee Mile)	Seepage Issue Noted
2011	18/15+50	Sand boil located 60 feet from levee toe
2011	18/35+00	Multiple boils in seepage ditch 20 feet from levee toe
2011	19/37+00	Two medium sand boils in heavy seepage area
2011	19/38+60	Three medium sand boils at levee toe
2011	19/41+75	Three medium sand boils at levee toe
2011	21/6+50	Medium sand boils in landside ditch
2011	21/39+50	Medium sand boils in landside ditch
2011	22/8+00	Pin boils at the levee toe
2011	24/28+20	Single sand boil at levee toe
2015	18/34+00	Medium sand boil in landside ditch
2017	18/34+00	Multiple pin boils in landside ditch
2017	19/37+50	Medium sand boil at levee toe
2017	21/3+15	Pin boil at levee toe
2017	23/49+60	Pin boils at levee toe
2017	24/24+30	Pin boils at levee toe

The seepage issues in 2011 occurred during river elevations slightly greater than the 100-year flood event. The seepage issues noted in 2015 occurred during a flood slightly less than the 10-year event, and the issues noted in 2017 occurred during a flood approximately equal to the 100-year flood event.

5. Existing Seepage Control Measures. There are no existing seepage control measures for this study item; however, a stretch of test relief wells were installed in 2009 which terminate at the northern (upstream) extent of this underseepage study.

6. Seepage Analysis and Design. a. General. Design manuals EM 1110-2-1913 and DIVR 1110-1-400 were used to determine the levee seepage potential. The individual analyses were conducted at 500-foot intervals in line with the survey section and soil test borings intervals. The analyses were performed based on St. Francis River flooding associated with the 100-year flood event elevation as determined by the Hydraulic and Hydrology Branch. This flood event is in the range of 5-6 feet below the levee crown. The following notations were used in the seepage analyses and seepage berm design.

Z_{br} = Effective thickness of riverside top stratum
K_{br} = Vertical permeability of riverside top stratum
X_1 = Effective length of riverside blanket
L_1 = Distance from the riverside levee toe to the riverbank
L_2 = Base width of the levee
S = Distance from landside levee toe to effective source of seepage entry
H = Total net head on levee
Z_{bl} = Effective thickness of landside top stratum
K_{bl} = Vertical permeability of landside top stratum
K_f = Permeability of pervious substratum (See Plate 3)
D = Thickness of pervious substratum
X_3 = Distance from landside toe of levee to effective seepage exit
Z_t = Critical thickness of landside top stratum
h_0 = Net head above tailwater beneath top stratum at landside toe of levee
i_0 = Upward gradient at landside toe of levee
X_{sp} = Design or required width of landside seepage berm (semi-pervious)
t = Design or required thickness of landside seepage berm at levee toe
h_t = Net head above tailwater beneath top stratum at landside toe of levee
i_t = Upward gradient at toe of berm

The results are presented in Appendix E, and they indicated that seepage remediation measures are required over a large percentage of the project length.

Several types of control for excessive seepage were considered which included riverside blankets, impervious cutoff wall, relief wells, and seepage berms. Riverside blankets were not considered practical due to the adverse environmental effects and the close proximity to the St. Francis River. An impervious cutoff wall was not considered feasible or economical due to the extreme depth to the base of the aquifer. Relief wells were not considered economical because of the low landside heads which would require dropping the well discharge elevations below the ground surface in order to provide enough pressure head to drive artesian flow. The relief wells would also have to be very closely spaced to provide the required head dissipation. A test section of relief wells were constructed from approximately Levee Mile 15/52+00 to Levee Mile 17/14+00 (approximately 1.3-miles in length), and the landside and riverside soil conditions are quite similar to those in this study area. The cost of the test reach of relief wells was in excess of $2 million compared to an estimated cost for landside berms of $1.3 million. The above discussion of the various alternatives indicates that the remedial measures typically utilized (riverside blanket, cutoff wall, and relief wells) are poor solutions based on environmental, cost, and constructability issues. As a result, the best alternative for seepage control was determined to be landside seepage berms.

b. Seepage Berms. The seepage berms were designed using criteria set forth in EM 1110-2-1913 and DIVR 1110-1-400, Change 2. The seepage berms were designed as semi-pervious berms with an allowable gradients varying from 0.3 at the levee toe and increasing linearly to an allowable gradient of 0.8 at a distance of 150 feet from the levee toe. The potential influence of seepage entrance and exit conditions from adjacent reaches were considered in each analysis by comparing the hypotenuse distance [based on the leg X_1 or X_3 distances of adjacent reaches and the analyses reach lengths of 500' (square root of the sum of the squares)] to the actual calculated X_1 and X_3 distances for the design reach. A minimum berm section of 150 feet width and 5 feet thickness at the levee toe was generally used for this project; however, at three locations the berm width and/or thickness were reduced to sections less than this typical minimum berm section (but still meeting the allowable gradients at levee toe and berm toe) in order to avoid costly modifications to existing roadways at Hwy 90, CCR-528, and GCR-807.

The final determination of the need for berms was based on factors which included: levee toe gradient for existing conditions greater than 0.5, areas with gradients at the levee toe less than 0.5 but identified as having boil activity in previous flood events, seepage flow under the levee (Q_s) exceeding 200 gpm per 100 feet of levee, and/or extending berms for continuity reasons through relatively short segments (~1,000 feet) that passed all of these criteria. Table 1 in Appendix E contains a summary of the recommended areas and dimensions of all proposed berms. The following table defines the limits of each segment of seepage berm. The ends of the berm segments were

extended 100 feet beyond the theoretical 500-ft design reach segment in order to transition into soil conditions which did not warrant the need for a seepage berm.

Seepage Berm Segment	Begin Station	End Station	Approximate Length (ft)
1	17/13+10	21/5+00	21,033
2	21/28+00	22/38+00	6,205
3	23/13+25	23/50+25	3,700
4	24/15+00	25/29+00	6,699
5	25/47+00	26/31+00	3,704
6	27/26+00	27/33+00	700
			42,041

c. Landside Ditches. Landside ditches evaluated for this project consisted of both existing ditches and also proposed ditches required in association with construction of the proposed seepage berms. The ditches were evaluated for conditions where the water levels in the ditches were dry, full, and half full. Due to the anticipated backwater in the ditch network associated with the design flood event in association with the relatively poor drainage in the general area, the final ditch designs were based on the ditches being half full.

Existing landside ditches are generally located within 50 to 100 feet of the toe of the existing levee for large portions of the study extent. The seepage potential at these existing ditches was determined based on the existing site conditions. Most of the existing ditches will be filled in with the construction of the proposed seepage berms, and new ditches will be constructed beyond the berm toe. In stretches were seepage berms are not required the existing ditches will be filled in and new ditches constructed further away from the levee toe in line with the ditches of adjacent areas with berms. This will maintain a straight ditch line and reduce potential risk of seepage issues. The top bank of the new ditches will be located 10 feet from the toe of the proposed seepage berms for maintenance considerations. The proposed ditches have been designed by the Hydraulic and Hydrology Branch, and these ditches will be maintained as shallow as possible and still provide adequate drainage as required. The results of the seepage analyses of the ditches are provided in Appendix E.

The analyses for the existing and proposed ditches indicated some areas will have excessive gradients at the ditch bottom level. These ditches could be moved further away from the levee such that an acceptable gradient is achieved; however, this would

require moving the ditches an excessive and undesirable distance from the levee. Alternatively, it is recommended that the ditches be relocated to be in line with the berm toe (approximately 170 feet from the landside levee toe) and an inverted filter system be constructed in the ditch bottom, where required, to manage the seepage flow exiting into the base of the ditches. The inverted filter will mitigate the transport of finer natural soil particles due to the upward flow of seepage water into the ditch bottoms.

The inverted filter will consist of a base layer of non-woven geotextile filter fabric overlain by two layers of graded stone. The base filter fabric was designed for soil retention and permeability performance in accordance with design procedures in "Designing with Geosynthetics" by Robert M. Koerner and are provided in Appendix E. The filter fabric will contact silty sand, silt, and clay soils and must be properly designed for retention of these soils during flood events. Based on various design procedures, the Apparent Opening Size (AOS) of 0.18mm (#80 sieve) of the Mirafi 180N (or equal) will adequately retain the clay, silt, and silty sand soils. The permeability of the filter was checked against the worst case seepage flow condition based on all reaches requiring a ditch. This analysis indicated the Mirafi 180N will provide more than enough flow capacity. The filter fabric will be overlain by a minimum 6-inch layer of #57 stone overlain by a 9-inch layer of #1 surge stone (gradations below). The two gravel layers have very high flow capacities relative to the filter fabric and as such are mainly intended to provide confinement and protection of the filter fabric and allow ease of flow of water passing through the filter fabric. The use of #1 surge stone as the upper layer will also allow for ease of maintenance vehicles traversing the ditches as necessary to maintain the ditch section and control vegetation growth.

#1 Surge Stone	
US Sieve Size	Percent Passing
4"	100
3.5"	90-100
2.5"	25-60
1.5"	0-15
0.75"	0-5

#57 Stone	
US Sieve Size	Percent Passing
1.5"	100
1"	95-100
0.5"	25-60
#4	0-10
#8	0-5

The landside ditch which begins at approximately Levee Mile 27/23+00 extends for several miles beyond the southern project limit is a borrow pit for the existing levee. Virtually all the surficial clay (blanket) soils have been excavated in this borrow pit leaving the underlying sands exposed. In reaches where no blanket soils remain in the

pit, Bligh's Creep Ratio calculations were performed and the results indicated acceptable values for any gradation of sand. Several design reaches appeared to still have some blanket soils in the bottom of this borrow pit, and seepage analyses in these reaches do not meet the gradient design criteria. Internal discussions of the MVM Geotechnical Branch concluded that remedial measures will not be provided for this borrow pit at this time due to: the Bligh's CR results, the length of the borrow pit which extends well beyond this study limits, the borrow pit usually being full of water during flood events, and seepage issues have not been observed in past floods (to the extent possible in a ditch full of water). This area will be monitored during future flood events for any emergency remedial actions needed during the flood fight operations and any potential recommended permanent remedial actions for the entire borrow pit in this project reach and beyond.

The existing ditch at CCR-528 also appears to have little if any blanket soils remaining in the ditch bottom. Bligh's Creep Ratio calculations indicate acceptable values for all gradations of sand. The inverted filter is not required in this ditch.

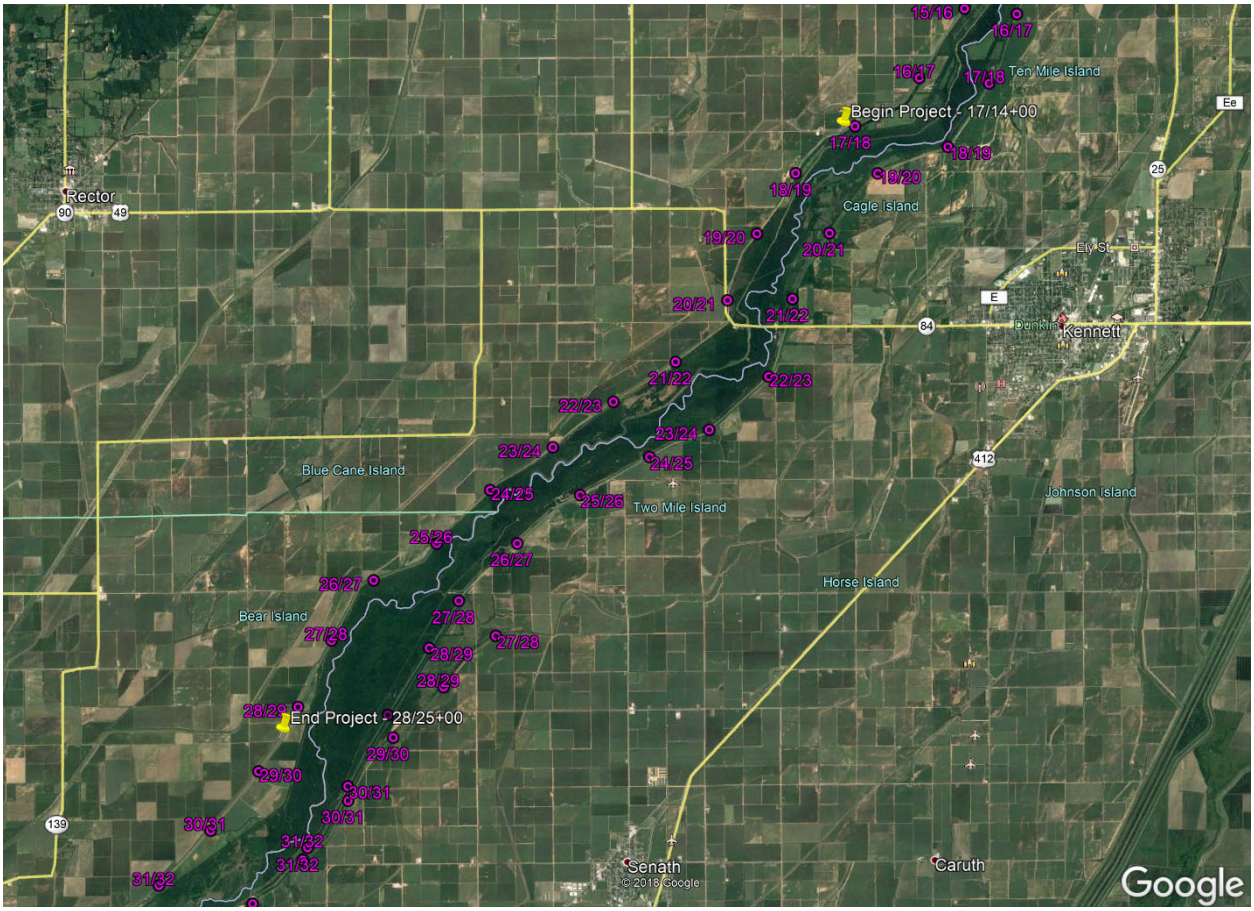
d. Through Seepage. It should be noted that several reaches of the levee embankment are composed of silty sand. In these reaches the elevation of the flow line used in the analysis is only 3-5 feet above the elevation of the proposed berm where it ties into the levee embankment. Because of this minimal head difference, the phreatic line will remain within or at the seepage berm and levee embankment and through seepage should not be an issue. Also, no reports of through seepage were documented in previous flood fight reports (See paragraph 4).

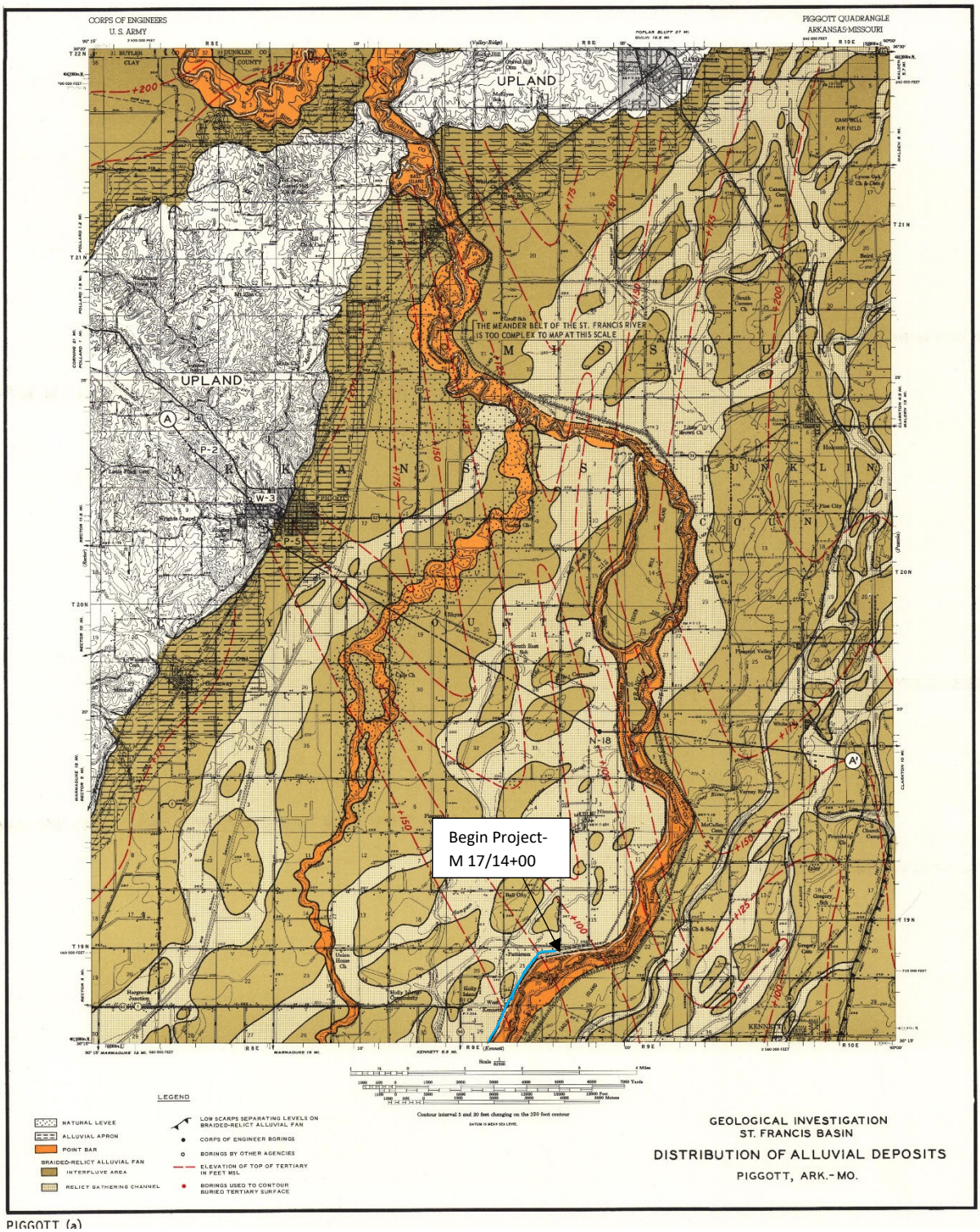
e. Design Recommendations. It is recommended that the landside seepage berms be constructed as indicated in Table 1.

7. Environmental Impacts. Construction of a landside berm would require that suitable soils be obtained from off-site borrow areas. In addition, landside berms would require the removal of areas of hardwood trees. The Environmental Assessment report should be reviewed for more specific information related to this project.

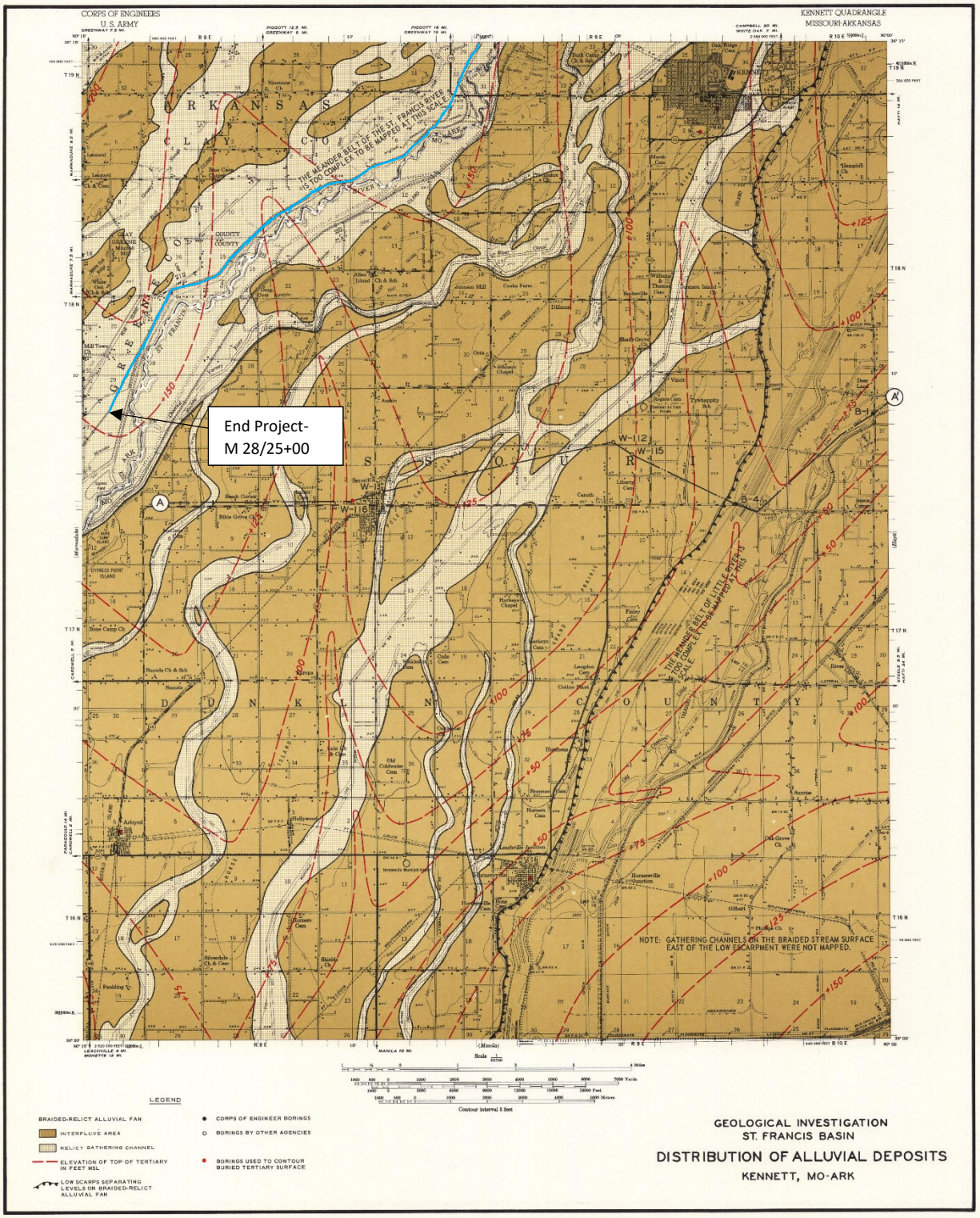
Appendix A

Site Location Map – Below Piggott Seepage Study



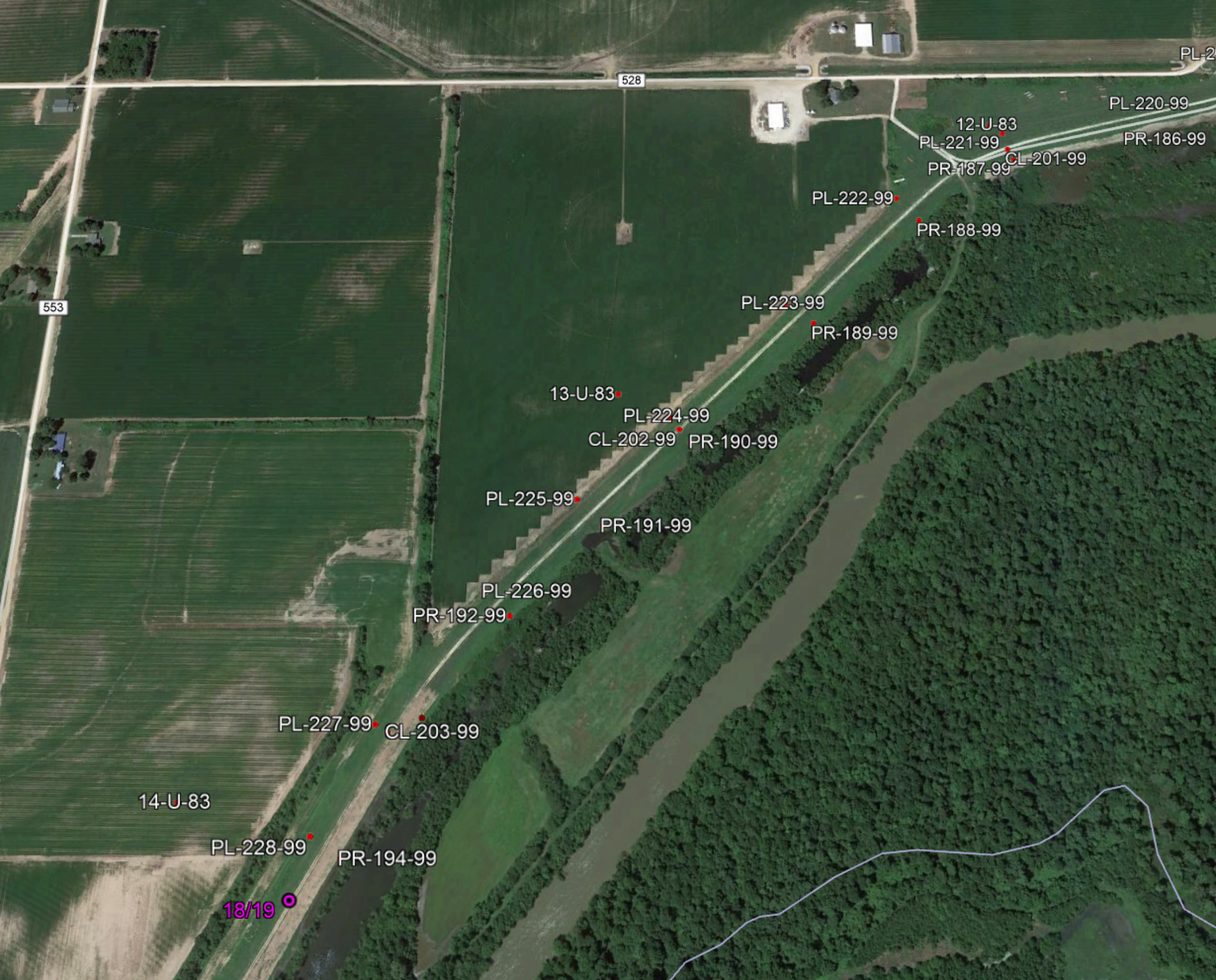

CORPS OF ENGINEERS
U. S. ARMY
PIGGOTT QUADRANGLE
ARKANSAS-MISSOURI
UPLAND
UPLAND
THE MEANDER BELT OF THE ST. FRANCIS RIVER IS TOO COMPLEX TO MAP AT THIS SCALE
Begin Project-
M 17/14+00
LEGEND
NATURAL LEVEE
ALLUVIAL APRON
POINT BAR
BRAIDED-RELICT ALLUVIAL FAN INTERFLUVE AREA
RELICT GATHERING CHANNEL
LOW SCARPS SEPARATING LEVELS ON BRAIDED-RELICT ALLUVIAL FAN
CORPS OF ENGINEER BORINGS
BORINGS BY OTHER AGENCIES
ELEVATION OF TOP OF TERTIARY IN FEET MSL
BORINGS USED TO CONTOUR BURIED TERTIARY SURFACE
Contour interval 5 and 20 feet changing on the 220 foot contour
GEOLOGICAL INVESTIGATION
ST. FRANCIS BASIN
DISTRIBUTION OF ALLUVIAL DEPOSITS
PIGGOTT, ARK.-MO.

PIGGOTT (a)


CORPS OF ENGINEERS
U.S. ARMY
KENNETT QUADRANGLE
MISSOURI-ARKANSAS
ARKANSAS
CLAY COUNTY
DUNKLIN COUNTY
MISSOURI
THE MEANDER BELT OF THE ST. FRANCIS RIVER IS TOO COMPLEX TO BE MAPPED AT THIS SCALE
THE MEANDER BELT OF LITTLE RIVER IS TOO COMPLEX TO BE MAPPED AT THIS SCALE
End Project-
M 28/25+00
NOTE: GATHERING CHANNELS ON THE BRAIDED STREAM SURFACE EAST OF THE LOW ESCARPMENT WERE NOT MAPPED.
Contour interval 5 feet
LEGEND
BRAIDED-RELICT ALLUVIAL FAN
INTERFLUVE AREA
RELICT GATHERING CHANNEL
ELEVATION OF TOP OF TERTIARY IN FEET MSL
LOW SCARPS SEPARATING LEVELS ON BRAIDED-RELICT ALLUVIAL FAN
CORPS OF ENGINEER BORINGS
BORINGS BY OTHER AGENCIES
BORINGS USED TO CONTOUR BURIED TERTIARY SURFACE
GEOLOGICAL INVESTIGATION
ST. FRANCIS BASIN
DISTRIBUTION OF ALLUVIAL DEPOSITS
KENNETT, MO-ARK

KENNETT (a)

Appendix B


528
553
PL-2
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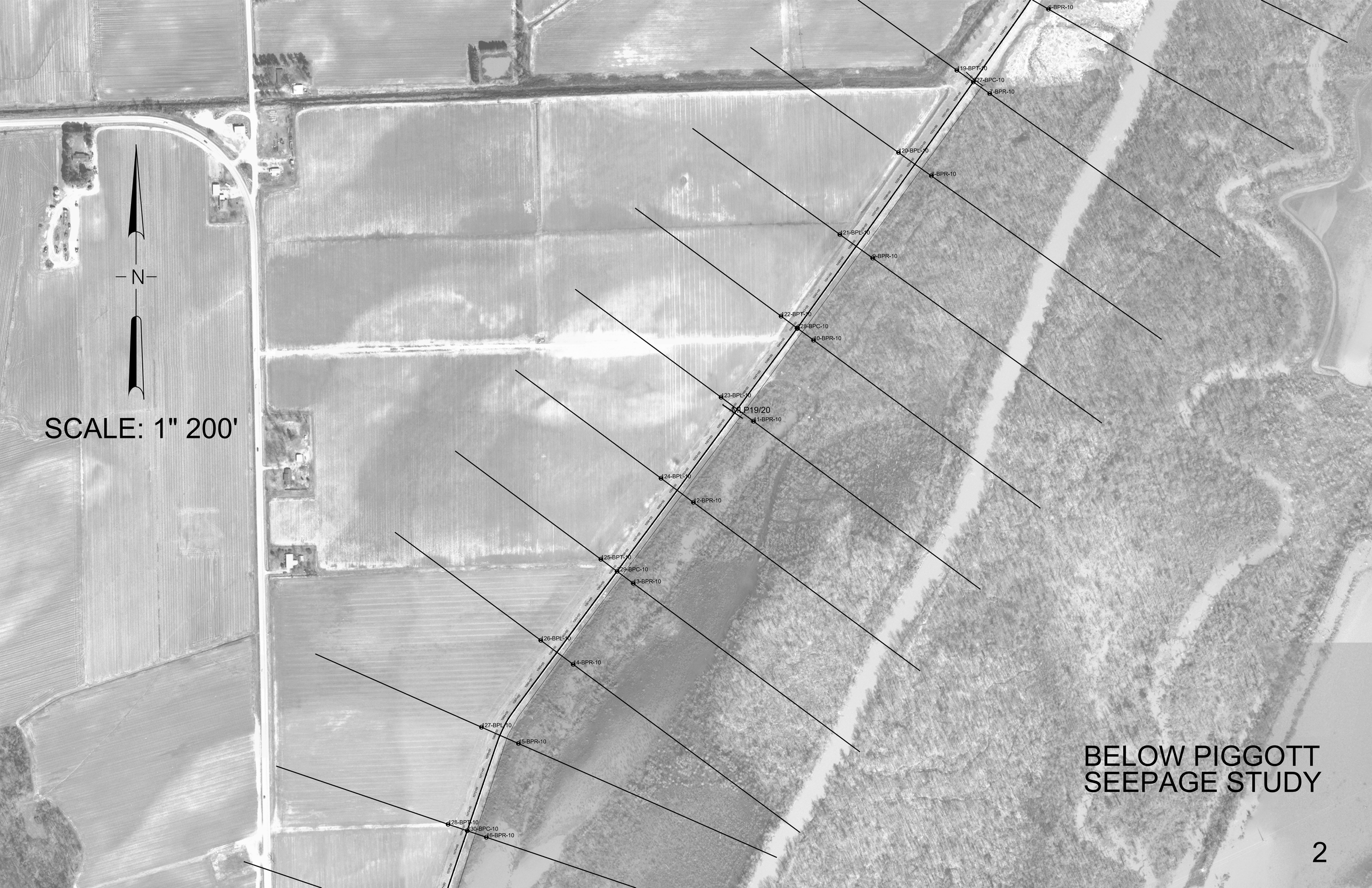
PL-223-99
PR-189-99
13-U-83
PL-224-99
CL-202-99
PR-190-99
PL-225-99
PR-191-99
PL-226-99
PR-192-99
PL-227-99
CL-203-99
14-U-83
PL-228-99
PR-194-99
18/19

N

SCALE: 1" 200'

13-BPT-10
26-BPC-10
1-BPR-10
14-BPL-10
2-BPR-10
15-BPL-10
3-BPR-10
16-BPT-10
26-BPC-10
4-BPR-10
17-BPL-10
5-BPR-10
18-BPL-10
6-BPR-10
19-BPT-10
27-BPC-10
7-BPR-10
20-BPL-10
8-BPR-10
21-BPL-10
9-BPR-10

BELOW PIGGOTT SEEPAGE STUDY


N
SCALE: 1" 200'
6-BPR-10
19-BPT-10
27-BPC-10
1-BPR-10
20-BPL-10
2-BPR-10
21-BPL-10
3-BPR-10
22-BPT-10
28-BPC-10
0-BPR-10
23-BPL-10
MLP19/20
1-BPR-10
24-BPL-10
12-BPR-10
25-BPT-10
29-BPC-10
13-BPR-10
26-BPL-10
14-BPR-10
27-BPL-10
15-BPR-10
28-BPT-10
30-BPC-10
16-BPR-10
BELOW PIGGOTT
SEEPAGE STUDY
2

127-BPL-10
15-BPR-10
128-BPL-10
130-BPC-10
16-BPR-10
129-BPL-10
17-BPR-10
130-BPL-10
18-BPR-10
131-BPL-10
131-BPC-10
19-BPR-10
132-BPL-10
20-BPR-10
133-BPL-10
21-BPR-10
MLP20/21
134-BPL-10
134-BPC-10
22-BPR-10
135-BPL-10
23-BPR-10

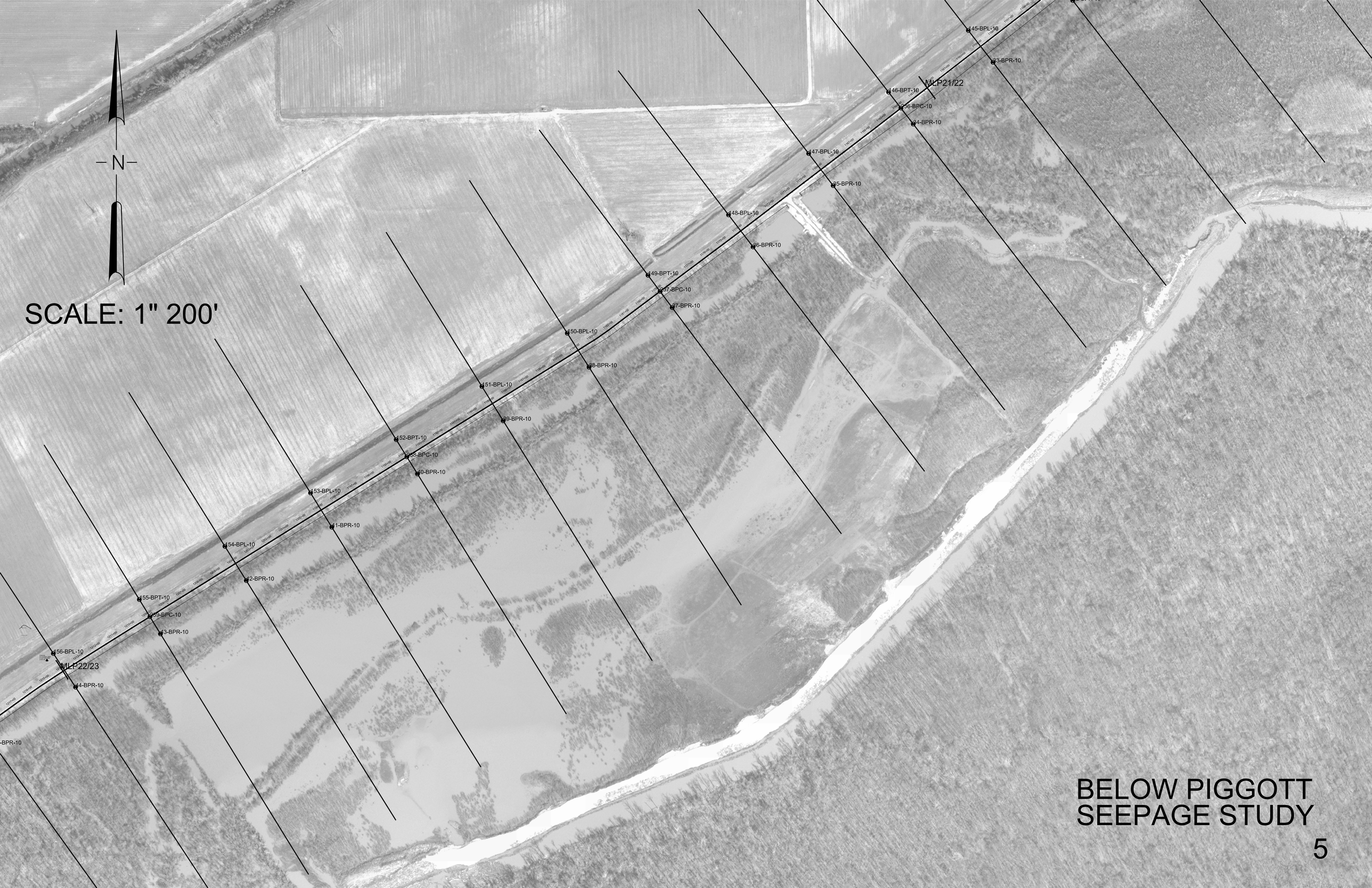
N

SCALE: 1" 200'

BELOW PIGGOTT
SEEPAGE STUDY

3

N
SCALE: 1" 200'
136-BPL-10
24-BPR-10
137-BPT-10
33-BPC-10
25-BPR-10
138-BPL-10
26-BPR-10
139-BPL-10
27-BPR-10
140-BPT-10
34-BPC-10
28-BPR-10
141-BPL-10
29-BPR-10
142-BPL-10
30-BPR-10
143-BPT-10
35-BPC-10
31-BPR-10
144-BPL-10
32-BPR-10
145-BPL-10
33-BPR-10
146-BPT-10
36-BPC-10
34-BPR-10
147-BPL-10
35-BPR-10
148-BPL-10
36-BPR-10
MLP21/22
BELOW PIGGOTT
SEEPAGE STUDY
4



BELOW PIGGOTT SEEPAGE STUDY

5

N

SCALE: 1" 200'

MLP22/23

MLP23/24

BELOW PIGGOTT
SEEPAGE STUDY

6

N
SCALE: 1" 200'
MLP23/24
163-BPL-10
161-BPR-10
164-BPT-10
162-BPC-10
162-BPR-10
165-BPL-10
163-BPR-10
166-BPL-10
164-BPR-10
167-BPT-10
163-BPC-10
165-BPR-10
168-BPL-10
166-BPR-10
169-BPL-10
167-BPR-10
170-BPT-10
164-BPC-10
168-BPR-10
171-BPL-10
169-BPR-10
172-BPL-10
160-BPR-10
173-BPT-10
165-BPC-10
161-BPR-10
174-BPL-10
162-BPR-10
175-BPL-10
163-BPR-10
176-BPT-10
165-BPC-10
164-BPR-10
BPR-10
BELOW PIGGOTT
SEEPAGE STUDY
7

BELOW PIGGOTT SEEPAGE STUDY

N

SCALE: 1" 200'

180-BPL-10
68-BPR-10
181-BPL-10
69-BPR-10
182-BPT-10
248-BPC-10
70-BPR-10
183-BPL-10
71-BPR-10
184-BPL-10
72-BPR-10
185-BPT-10
249-BPC-10
73-BPR-10
186-BPL-10
74-BPR-10
187-BPL-10
75-BPR-10
188-BPT-10
250-BPC-10
76-BPR-10
189-BPL-10
77-BPR-10
190-BPL-10
78-BPR-10
191-BPT-10
251-BPC-10
79-BPR-10

MLP25/26

BELOW PIGGOTT SEEPAGE STUDY

N
SCALE: 1" 200'
189-BPL-10
77-BPR-10
190-BPL-10
78-BPR-10
191-BPT-10
51-BPC-10
79-BPR-10
192-BPL-10
93-BPL-10
80-BPR-10
94-BPT-10
81-BPR-10
52-BPC-10
95-BPL-10
82-BPR-10
96-BPL-10
83-BPR-10
97-BPT-10
84-BPR-10
53-BPC-10
98-BPL-10
85-BPR-10
99-BPL-10
MLP26/27
86-BPR-10
200-BPT-10
87-BPR-10
54-BPC-10
88-BPR-10
201-BPL-10
89-BPR-10
202-BPL-10
90-BPR-10
203-BPT-10
55-BPC-10
91-BPR-10
BELOW PIGGOTT
SEEPAGE STUDY
10

BELOW PIGGOTT SEEPAGE STUDY

BELOW PIGGOTT SEEPAGE STUDY

BELOW PIGGOTT
SEEPAGE STUDY

CONDENSED SOIL DATA — WORK SHEET — SOIL LABORATORY

Site: Pissott, Ark Seepage Study | Location:

Date of Boring: 8/24 & 25/99 | Date Received: | Date Classified: | Type of Boring: SS | Elevation of Top: | Hole No.: 186-PR-99

W = Water Content in % of Dry Weight | L.L. = Liquid Limit | P.L. = Plastic Limit | ∅ = Angle of Internal Friction | c = Cohesion in Tons/Sq. Ft. | γd = Dry Density in Lbs./Cu. Ft.

U. S. STANDARD SIEVE	3"	3/4"	4	10	40	200
	COBBLES	GRAVEL Course	GRAVEL Fine	SAND Course	SAND Medium	SAND Fine	FINES (Clay or Silt)
GRAIN SIZE	3"	3/4"	4.76mm	2.0mm	0.42mm	0.074mm	

Sample No.	Depth Feet	Laboratory Classification	Strata Feet	W	L.L.	P.L.	∅	c	γd	Sand	Remarks
			0.0								WATER @ 7.0' 8/24/99
1	0.5-1.0	Br. SANDY LEAN CLAY, DRY & HARD	CL	X							TABLE @ 4.5' 8/25/99
			2.0								Mud @ 10.0'
2	3.5-4.0	Br. fine SAND, LENSES of CLAY, MOIST		X							
3	6.5-7.0	Br. fine SAND, WET.		X							D/10 = 0.1563
4	9.5-10.0	Do	SP	X							
5	13-14.5	Do		X							4 - 4 - 4
6	16-17.5	Br. fine SAND, SAT.		X							D/10 = 0.1611
											4 - 7 - 9
7	19-20.5	Do		X							12 - 17 - 20
			20.5								

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CONDENSED SOIL DATA | WORK SHEET | SOIL LABORATORY

Site: Pissott, AR Seepage Study | Location:

Date of Boring: 8/24/99 | Date Received: | Date Classified: | Type of Boring: SS | Elevation of Top: | Hole No.: 187-PR-99

W = Water Content in % of Dry Weight | L.L. = Liquid Limit | P.L. = Plastic Limit | ∅ = Angle of Internal Friction | c = Cohesion in Tons/Sq. Ft. | γd = Dry Density in Lbs./Cu. Ft.

U. S. STANDARD SIEVE	3"	3/4"	4	10	40	200
	COBBLES	GRAVEL Course	GRAVEL Fine	SAND Course	SAND Medium	SAND Fine	FINES (Clay or Silt)
GRAIN SIZE	3"	3/4"	4.76mm	2.0mm	0.42mm	0.074mm	

Sample No.	Depth Feet	Laboratory Classification	Strata Feet	W	L.L.	P.L.	∅	c	γd	Sand	Remarks
			0.0								WATER @ 9.0' 8/24/99
1	0.5-1.0	Br. silty sand, dry	SM	X							TABLE @ 5.7' 8/24/99
			2.0								mud @ 10.0'
2	3.5-4.0	Br. lean clay, lenses of sand, moist & med	CL	13							
3	6.5-7.0	Br. lean clay, lenses of sand, WET & soft	9.0	25							
4	9.5-10.0	Br. fine sand, SAT		X							D/10 = 0.1294
5	13-14.5	Do	SP	X							5 - 6 - 7
6	16-17.5	Do		X							5 - 5 - 5
7	19-20.5	Br. fine sand, SAT		X							D/10 = 0.1712 6 - 7 - 8
			20.5								

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CONDENSED SOIL DATA | WORK SHEET | SOIL LABORATORY

Site: Pissott, AR Seepage Study | Location:

Date of Boring: 8/24/99 | Date Received: | Date Classified: | Type of Boring: SS | Elevation of Top: | Hole No.: 188-PR-99

W = Water Content in % of Dry Weight | L.L. = Liquid Limit | P.L. = Plastic Limit | ∅ = Angle of Internal Friction | c = Cohesion in Tons/Sq. Ft. | γd = Dry Density in Lbs./Cu. Ft.

U. S. STANDARD SIEVE	3"	3/4"	4	10	40	200
	COBBLES	GRAVEL Course	GRAVEL Fine	SAND Course	SAND Medium	SAND Fine	FINES (Clay or Silt)
GRAIN SIZE	3"	3/4"	4.76mm	2.0mm	0.42mm	0.074mm	

Sample No.	Depth Feet	Laboratory Classification	Strata Feet	W	L.L.	P.L.	∅	c	γd	Sand	Remarks
			0.0								WATER @ 7.0' 8/24/99
1	0.5-1.0	Br. sandy silt, hard	ML	X							TABLE @ 5.1' 8/24/99
			3.0								mud @ 10.0'
2	3.5-4.0	Br. silty sand, lenses of clay, moist	SM	X							
			5.0								
3	6.5-7.0	Br. fine sand, lenses of clay, SAT		X							
4	9.5-10.0	Br. fine sand, SAT	SP	X							D/10 = 0.1873
5	13-14.5	Do		X							5 - 9 - 12
6	16-17.5	Br. fine sand, SAT.		X							D/10 = 0.1627
											9 - 12 - 11
7	19-20.5	Do		X							6 - 12 - 14
			20.5								

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CONDENSED SOIL DATA | WORK SHEET | SOIL LABORATORY

Site: Pissott, AtK Seepage Study | Location:

Date of Boring: 8-23-99 | Date Received: | Date Classified: | Type of Boring: S/S, 5" Box Auger | Elevation of Top: | Hole No.: 189-PR-99

W = Water Content in % of Dry Weight | L.L. = Liquid Limit | P.L. = Plastic Limit | ∅ = Angle of Internal Friction | c = Cohesion in Tons/Sq. Ft. | γd = Dry Density in Lbs./Cu. Ft.

U. S. STANDARD SIEVE	3"	3/4"	4	10	40	200
	COBBLES	GRAVEL Course	GRAVEL Fine	SAND Course	SAND Medium	SAND Fine	FINES (Clay or Silt)
GRAIN SIZE	3"	3/4"	4.76mm	2.0mm	0.42mm	0.074mm	

Sample No.	Depth Feet	Laboratory Classification	Strata Feet	W	L.L.	P.L.	∅	c	γd	Sand	Remarks
			0.0								WATER @ 7.0' 8/23/99
1	0.5-1.0	Br. sandy silT, dRy	ML	X							TABLE @ 5.0' 8/23/99
			3.0								mud @ 10.0'
2	3.5-4.0	Br lean clay, lenses of sand, moist & med	CL	16							
			6.0								
3	6.5-7.0	Br. fine sand, WET		X							D/10 = 0.1535
4	9.5-10.0	Do	SP	X							
5	13-14.5	Do		X							5 - 3 - 4
6	16-17.5	Br. fine sand, SAT.		X							D/10 = 0.1429
											3 - 5 - 5
7	19-20.5	Do		X							4 - 6 - 7
			20.5								

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CONDENSED SOIL DATA | WORK SHEET | SOIL LABORATORY

Site: Pissott, AR Seepage Study | Location:

Date of Boring: 8-23-99 | Date Received: | Date Classified: | Type of Boring: SS | Elevation of Top: | Hole No.: 190-PR-99

W = Water Content in % of Dry Weight | L.L. = Liquid Limit | P.L. = Plastic Limit | ∅ = Angle of Internal Friction | c = Cohesion in Tons/Sq. Ft. | γd = Dry Density in Lbs./Cu. Ft.

U. S. STANDARD SIEVE	3"	3/4"	4	10	40	200
	COBBLES	GRAVEL Course	GRAVEL Fine	SAND Course	SAND Medium	SAND Fine	FINES (Clay or Silt)
GRAIN SIZE	3"	3/4"	4.76mm	2.0mm	0.42mm	0.074mm	

Sample No.	Depth Feet	Laboratory Classification	Strata Feet	W	L.L.	P.L.	∅	c	γd	Sand	Remarks
			0.0								WATER @ 7.0' 8/23/99
1	0.5-1.0	Br. SANDY SILT, MOIST	ML	X							TABLE @ 4.7' 8/23/99
			3.5								mud @ 10.0'
2	3.5-4.0	Br. LEAN CLAY, MOIST & MED.	CL	21	34	18					
			5.0								
3	6.5-7.0	Br. FINE SAND, WET		X							D/10 = 0.1576
4	9.5-10.0	Do	SP	X							
5	13-14.5	Do		X							4 - 7 - 9
6	16-17.5	Br. FINE SAND, SAT.		X							D/10 = 0.1460
											8 - 15 - 18
7	19-20.5	Br. MED. SAND, SAT.		X							D/10 = 0.2131
			20.5								12 - 21 - 26

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CONDENSED SOIL DATA | WORK SHEET | SOIL LABORATORY

Site: Pissott, AR Seepage Study | Location:

Date of Boring: 8-19-99 | Date Received: | Date Classified: | Type of Boring: SS | Elevation of Top: | Hole No.: 191-PR-99

W = Water Content in % of Dry Weight | L.L. = Liquid Limit | P.L. = Plastic Limit | ∅ = Angle of Internal Friction | c = Cohesion in Tons/Sq. Ft. | γd = Dry Density in Lbs./Cu. Ft.

U. S. STANDARD SIEVE	3"	3/4"	4	10	40	200
	COBBLES	GRAVEL Course	GRAVEL Fine	SAND Course	SAND Medium	SAND Fine	FINES (Clay or Silt)
GRAIN SIZE	3"	3/4"	4.76mm	2.0mm	0.42mm	0.074mm	

Sample No.	Depth Feet	Laboratory Classification	Strata Feet	W	L.L.	P.L.	∅	c	γd	Sand	Remarks
											WATER @ 7.0' 8/19/99
1	0.5-1.0	Br. silty sand, dry		x							Table @ 6.4' 8/19/99
											mud @ 10.0'
2	3.5-4.0	Br. silty sand, dry		x							
3	6.5-7.0	Br. fine sand, WET		x							D/10 = 0.1219
4	9.5-10.0	Do		x							
5	13-14.5	Do		x							4 - 3 - 4
6	16-17.5	Br. med. sand, SAT		x							D/10 = 0.2173
											8 - 12 - 16
7	19-20.5	Do		x							9 - 15 - 19

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CONDENSED SOIL DATA | WORK SHEET | SOIL LABORATORY

Site: Pissott, AR Seepage Study | Location:

Date of Boring: 8-18-99 | Date Received: | Date Classified: | Type of Boring: SS | Elevation of Top: | Hole No.: 192-PR-99

W = Water Content in % of Dry Weight | L.L. = Liquid Limit | P.L. = Plastic Limit | ∅ = Angle of Internal Friction | c = Cohesion in Tons/Sq. Ft. | γd = Dry Density in Lbs./Cu. Ft.

U. S. STANDARD SIEVE	3"	3/4"	4	10	40	200
	COBBLES	GRAVEL Course	GRAVEL Fine	SAND Course	SAND Medium	SAND Fine	FINES (Clay or Silt)
GRAIN SIZE	3"	3/4"	4.76mm	2.0mm	0.42mm	0.074mm	

Sample No.	Depth Feet	Laboratory Classification	Strata Feet	W	L.L.	P.L.	∅	c	γd	Sand	Remarks
			0.0								WATER @ 6.0' 8/18/99
1	0.5-1.0	Br. sandy silt, dry		X							Table @ 5.1' 8/18/99
			ML								mud @ 10.0'
2	3.5-4.0	Br. sandy silt, moist									
			6.0								
3	6.5-7.0	Br. fine sand, WET		X							P/10 = 0.1271
4	9.5-10.0	Do	SP	X							
5	13-14.5	Do		X							5 - 6 - 7
6	16-17.5	Br med. To fine SAND, SAT.		X							P/10 = 0.1905 5 - 10 - 9
7	19-20.5	Br. fine SAND, SAT.		X							P/10 = 0.1590 7 - 12 - 14
			20.5								

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CONDENSED SOIL DATA | WORK SHEET | SOIL LABORATORY

Site: Pissott, AtK Seepage Study | Location:

Date of Boring: 8-19-99 | Date Received: | Date Classified: | Type of Boring: SS | Elevation of Top: | Hole No.: 193-PR-99

W = Water Content in % of Dry Weight | L.L. = Liquid Limit | P.L. = Plastic Limit | ∅ = Angle of Internal Friction | c = Cohesion in Tons/Sq. Ft. | γd = Dry Density in Lbs./Cu. Ft.

U. S. STANDARD SIEVE	3"	3/4"	4	10	40	200
	COBBLES	GRAVEL Course	GRAVEL Fine	SAND Course	SAND Medium	SAND Fine	FINES (Clay or Silt)
GRAIN SIZE	3"	3/4"	4.76mm	2.0mm	0.42mm	0.074mm	

Sample No.	Depth Feet	Laboratory Classification	Strata Feet	W	L.L.	P.L.	∅	c	γd	Sand	Remarks
			0.0								WATER @ 6.0' 8/19/99
1	0.5-1.0	Br. silty sand, dry	SM	X							Table @ 5.2' 8/19/99
			3.5								Mud @ 10.0'
2	3.5-4.0	Br. lean clay, moist & stiff	CL	22	37	18					
			5.0								
3	6.5-7.0	Br. fine sand, wet		X							D/10 = 0.1005
4	9.5-10.0	Do		X							
			SP								
5	13-14.5	Br. fine sand, sat		X							D/10 = 0.1614 6 - 7 - 8
6	16-17.5	Br. med. sand, sat		X							D/10 = 0.1820 5 - 7 - 8
7	19-20.5	Do		X							8 - 8 - 8
			20.5								

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CONDENSED SOIL DATA — WORK SHEET — SOIL LABORATORY

Site: Pigeon Ark Seepage Study			Location:		
Date of Boring: 11/9/99	Date Received:	Date Classified:	Type of Boring: Box Auger, SS	Elevation of Top:	Hole No.: 194 PR-99

W = Water Content in % of Dry Weight
L.L. = Liquid Limit
P.L. = Plastic Limit
ϕ = Angle of Internal Friction
c = Cohesion in Tons/Sq. Ft.
γd = Dry Density in Lbs./Cu. Ft.

U. S. STANDARD SIEVE	3"	3/4"	4	10	40	200
	COBBLES	GRAVEL Course / Fine		SAND Course / Medium / Fine		FINES (Clay or Silt)
GRAIN SIZE	3"	3/4"	4.76mm	2.0mm	0.42mm	0.074mm

Sample No.	Depth Feet	Laboratory Classification	Strata Feet	W	L.L.	P.L.	ϕ	c	γd	Sand	Remarks
			0.0								Mud 10.0
1	0.5-1.0	Br. sandy silt, w/clay, moist	ML	X							Depth to Water 10.0
			3.5								Water Table 6.7
2	3.5-4.0	Br. lean clay, moist + med	CL	24	34	17					
			6.0								
3	6.5-7.0	Br. fine sand, wet		X							D10 = 0.1614
4	9.5-10.0	Do		X							
			SP								
5	13-14.5	Br. fine sand, wet		X							D10 = 0.1639
											8, 12, 11
6	16-17.5	Do		X							8, 11, 14
7	19-20.5	Gr. fine sand	20.5								D10 = 0.1561
											9, 12, 16

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CONDENSED SOIL DATA — WORK SHEET — SOIL LABORATORY

Site: Pissott, AR Seepage Study | Location:

Date of Boring: 10-18-99 | Date Received: | Date Classified: | Type of Boring: SS & Auger | Elevation of Top: | Hole No.: 220-PL-99

W = Water Content in % of Dry Weight | L.L. = Liquid Limit | P.L. = Plastic Limit | ϕ = Angle of Internal Friction | c = Cohesion in Tons/Sq. Ft. | γd = Dry Density in Lbs./Cu. Ft.

U. S. STANDARD SIEVE	3"	3/4"	4	10	40	200
	COBBLES	GRAVEL Course	GRAVEL Fine	SAND Course	SAND Medium	SAND Fine	FINES (Clay or Silt)
GRAIN SIZE	3"	3/4"	4.76mm	2.0mm	0.42mm	0.074mm	

Sample No.	Depth Feet	Laboratory Classification	Strata Feet	W	L.L.	P.L.	ϕ	c	γd	Sand	Remarks
			0.0								WATER @ 9.0' 10/18/99
1	0.5-1.0	Br. sandy silt, moist		X							Table @ 7.0' 10/18/99
			ML								mud @ 10.0'
2	3.5-4.0	Br. sandy silt, moist		17							
			5.0								
3	6.5-7.0	Br. fine sand, WET		X							D/10 = 0.1335
4	9.5-10.0	Br. fine sand, SAT.		X							D/10 = 0.1561
			SP								
5	13-14.5	Do		X							6 - 10 - 12
6	16-17.5	Br. fine sand, SAT.		X							D/10 = 0.1801
7	19-20.5	Do		X							8 - 6 - 7
			20.5								7 - 10 - 11

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CONDENSED SOIL DATA | WORK SHEET | SOIL LABORATORY

Site: Pissott, Ark Seepage Study | Location:

Date of Boring: 10/18-19/99 | Date Received: | Date Classified: | Type of Boring: SS & Auger | Elevation of Top: | Hole No.: 221-PL-99

W = Water Content in % of Dry Weight | L.L. = Liquid Limit | P.L. = Plastic Limit | ∅ = Angle of Internal Friction | c = Cohesion in Tons/Sq. Ft. | γd = Dry Density in Lbs./Cu. Ft.

U. S. STANDARD SIEVE	3"	3/4"	4	10	40	200
	COBBLES	GRAVEL Course	GRAVEL Fine	SAND Course	SAND Medium	SAND Fine	FINES (Clay or Silt)
GRAIN SIZE	3"	3/4"	4.76mm	2.0mm	0.42mm	0.074mm	

Sample No.	Depth Feet	Laboratory Classification	Strata Feet	W	L.L.	P.L.	∅	c	γd	Sand	Remarks
			0.0								WATER @ 10.0' 10/18/99
1	0.5-1.0	Br. sandy silt, lenses of clay, moist	ML 3.0	X							Table @ 6.0' 10/19/99
											mud @ 10.0'
2	3.5-4.0	Br. silty sand, moist		X							
3	6.5-7.0	Br. silty sand, WET	SM	X							
4	9.5-10.0	Br. silty sand, lenses of clay, SAT	12.0	X							
5	13-14.5	Gr. fine sand, SAT		X							D/10 = 0.1354
			SP								6 - 9 - 11
6	16-17.5	Gr. fine sand, SAT		X							D/10 = 0.1805
											8 - 12 - 15
7	19-20.5	Gr. fine sand, SAT	20.5	X							D/10 = 0.1590
											11 - 17 - 21

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CONDENSED SOIL DATA — WORK SHEET — SOIL LABORATORY

Site: Pissott Ark. Seepage Study

Location:

Date of Boring: 10/27,28,29, 11/3/99 | Date Received: | Date Classified: | Type of Boring: Box Auger, SS, | Elevation of Top: | Hole No.: 222 PT-99

W = Water Content in % of Dry Weight

L.L. = Liquid Limit

P.L. = Plastic Limit

ϕ = Angle of Internal Friction

c = Cohesion in Tons/Sq. Ft.

γd = Dry Density in Lbs./Cu. Ft.

U. S. STANDARD SIEVE	3"	3/4"	4	10	40	200
	COBBLES	GRAVEL Course	GRAVEL Fine	SAND Course	SAND Medium	SAND Fine	FINES (Clay or Silt)
GRAIN SIZE	3"	3/4"	4.76mm	2.0mm	0.42mm	0.074mm	

Sample No.	Depth Feet	Laboratory Classification	Strata Feet	W	L.L.	P.L.	ϕ	c	γd	Sand	Remarks
			0.0								Mud 1.0
1	0.5-1.0	Br. sandy lean clay, moist	CL								10/27/99 Depth of water 7.0
		and med.	3.0								10/27/99 Water Table 6.2
2	3.5-4.0	Br. sandy silt, w/ clay, moist	ML	12							
			6.0								
3	6.5-7.0	Br. fine sand, sat									
											D10 = 0.1665
4	9.5-10.0	Do									
			SP								
5	13.0-14.5	Br. fine sand, wet									D10 = 0.0843 3,3,3
6	16.0-17.5	Br. fine sand, lignite									N.E.F.T. 2,5,4

159.0

LRH Form 23A
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CONDENSED SOIL DATA — WORK SHEET — SOIL LABORATORY

Site: Piggott, Ark — Location:

Date of Boring: | Date Received: | Date Classified: | Type of Boring: | Elevation of Top: | Hole No.: 222 PT 99

W = Water Content in % of Dry Weight | L.L. = Liquid Limit | P.L. = Plastic Limit | ∅ = Angle of Internal Friction | c = Cohesion in Tons/Sq. Ft. | γd = Dry Density in Lbs./Cu. Ft.

U. S. STANDARD SIEVE	3"	3/4"	4	10	40	200
	COBBLES	GRAVEL Course	GRAVEL Fine	SAND Course	SAND Medium	SAND Fine	FINES (Clay or Silt)
GRAIN SIZE	3"	3/4"	4.76mm	2.0mm	0.42mm	0.074mm	

Sample No.	Depth Feet	Laboratory Classification	Strata Feet 60	W	L.L.	P.L.	∅	c	γd	Sand	Remarks
7	19-20.5	Br. fine sand, sat.									D10 = 0.1624 5,6,7
8	24-25.5	Do									12,14,19
9	29-30.5	Gr. med. To fine sand	SP								D10 = 0.1998 9,11,15
10	39-40.5	Gr. med. sand									D10 = 0.1959 8,8,8
11	49-50.5	Gr. fine sand									D10 = 0.1658 9,10,11
12	59-60.5	Gr. fine sand									D10 = 0.1646 5,14,20

LMR Form 23A
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159.0

CONDENSED SOIL DATA — WORK SHEET — SOIL LABORATORY

Site: Pigott, Ark. | Location:

Date of Boring: | Date Received: | Date Classified: | Type of Boring: | Elevation of Top: | Hole No.: 222 PT99

W = Water Content in % of Dry Weight | L.L. = Liquid Limit | P.L. = Plastic Limit | ∅ = Angle of Internal Friction | c = Cohesion in Tons/Sq. Ft. | γd = Dry Density in Lbs./Cu. Ft.

U. S. STANDARD SIEVE	3"	3/4"	4	10	40	200
	COBBLES	GRAVEL Course	GRAVEL Fine	SAND Course	SAND Medium	SAND Fine	FINES (Clay or Silt)
GRAIN SIZE	3"	3/4"	4.76mm	2.0mm	0.42mm	0.074mm	

Sample No.	Depth Feet	Laboratory Classification	Strata Feet 6.0	W	L.L.	P.L.	∅	c	γd	Sand	Remarks
13	69-70.5	Gr. fine sand (Do)									8, 12, 16
14	79-80.5	Gr. fine sand, sat									D_{10}=0.1633 9, 23, 29
15	89-90.0	Do	SP								38, 20
16	99-99.5	Gr. fine sand, sat									D_{10}=0.1627 60
17	109-110.5	Gr. med. sand, sat									D_{10}=0.2427 18, 20, 26
18	119-120.5	Gr. med. sand, sat									D_{10}=0.2503 14, 16, 22

15910

LRH Form 23A
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CONDENSED SOIL DATA | WORK SHEET | SOIL LABORATORY

Site: Piggott, Ark | Location:

Date of Boring: | Date Received: | Date Classified: | Type of Boring: | Elevation of Top: | Hole No.: 222 PT 99

W = Water Content in % of Dry Weight | L.L. = Liquid Limit | P.L. = Plastic Limit | ∅ = Angle of Internal Friction | c = Cohesion in Tons/Sq. Ft. | γd = Dry Density in Lbs./Cu. Ft.

U. S. STANDARD SIEVE	3"	3/4"	4	10	40	200
	COBBLES	GRAVEL Course	GRAVEL Fine	SAND Course	SAND Medium	SAND Fine	FINES (Clay or Silt)
GRAIN SIZE	3"	3/4"	4.76mm	2.0mm	0.42mm	0.074mm	

Sample No.	Depth Feet	Laboratory Classification	Strata Feet	W	L.L.	P.L.	∅	c	γd	Sand	Remarks
			6.0								
19	129-129.5	Gr. med. sand, sat									D10=0.[redacted] 112 0.1912
20	139-140.0	Gr. med. To Fine sand, sat	SP								D10=0.1805 43, 60
21	149-150.5	Gr. gravelly sand, sat									D10=0.2155 35, 38, 48
			159.0								
22	159-160.0	Gr. silty sand, w/ clay, sat									35, 52
			SM								

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160.0

CONDENSED SOIL DATA | WORK SHEET | SOIL LABORATORY

Site: Pissott Ark Seepage Study | Location:

Date of Boring: 11/8/99 | Date Received: | Date Classified: | Type of Boring: Box Auger, SS | Elevation of Top: | Hole No.: 22 3 PL 99

W = Water Content in % of Dry Weight | L.L. = Liquid Limit | P.L. = Plastic Limit | ∅ = Angle of Internal Friction | c = Cohesion in Tons/Sq. Ft. | γd = Dry Density in Lbs./Cu. Ft.

U. S. STANDARD SIEVE	3"	3/4"	4	10	40	200
	COBBLES	GRAVEL Course	GRAVEL Fine	SAND Course	SAND Medium	SAND Fine	FINES (Clay or Silt)
GRAIN SIZE	3"	3/4"	4.76mm	2.0mm	0.42mm	0.074mm	

Sample No.	Depth Feet	Laboratory Classification	Strata Feet	W	L.L.	P.L.	∅	c	γd	Sand	Remarks
			0.0								Mud 10.0
1	0.5-1.0	Br. silty sand, w/clay, moist		X							Depth To Water 8.0
			SM								Water Table 6.6
2	3.5-4.0	Do		X							
			5.0								
3	6.5-7.0	Br. fine sand, wet		X							D10=0.1629
4	9.5-10.0	Do		X							
			SP								
5	13-14.5	Do		X							3,5,6
6	16-17.5	Br. fine sand, sat		X							D10=0.1627 3,5,7
7	19-20.5	Gr. med sand, sat		X							D10=0.1910 6,11,14
			20.5								

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CONDENSED SOIL DATA — WORK SHEET — SOIL LABORATORY

Site: Pissott Ark Seepage Study			Location:		
Date of Boring: 11/8/99	Date Received:	Date Classified:	Type of Boring: Box Auger, SS	Elevation of Top:	Hole No.: 224 PL 99

W = Water Content in % of Dry Weight
L.L. = Liquid Limit
P.L. = Plastic Limit
ϕ = Angle of Internal Friction
c = Cohesion in Tons/Sq. Ft.
γd = Dry Density in Lbs./Cu. Ft.

U. S. STANDARD SIEVE	3"	3/4"	4	10	40	200
	COBBLES	GRAVEL Course	GRAVEL Fine	SAND Course	SAND Medium	SAND Fine	FINES (Clay or Silt)
GRAIN SIZE	3"	3/4"	4.76mm	2.0mm	0.42mm	0.074mm	

Sample No.	Depth Feet	Laboratory Classification	Strata Feet	W	L.L.	P.L.	ϕ	c	γd	Sand	Remarks
			0.0								Mud 10.0
1	0.5-1.0	Br. silty sand, w/ clay, moist	SM	X							Depth to Water —
			2.5								Water Table —
2	3.5-4.0	Br. lean clay moist + med.	CL	18	30	13					
			6.0								
3	6.5-7.0	Br. fine sand, sat		X							D_{10} = 0.1605
4	9.5-10.0	Do	SP	X							
5	13-14.5	Do		X							5, 8, 12
6	16-17.5	Br. fine sand, sat		X							D_{10} = 0.1641 7, 12, 14
7	19-20.5	Do		X							3, 5, 8
			20.5								

LRH Form 23A
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CONDENSED SOIL DATA | WORK SHEET | SOIL LABORATORY

Site: Pissott Ark Seepage Study | Location:

Date of Boring: 11/8,9/99 | Date Received: | Date Classified: | Type of Boring: Box Auger SS | Elevation of Top: | Hole No.: 225 PL99

W = Water Content in % of Dry Weight | L.L. = Liquid Limit | P.L. = Plastic Limit | ∅ = Angle of Internal Friction | c = Cohesion in Tons/Sq. Ft. | γd = Dry Density in Lbs./Cu. Ft.

U. S. STANDARD SIEVE	3"	3/4"	4	10	40	200
	COBBLES	GRAVEL Course	GRAVEL Fine	SAND Course	SAND Medium	SAND Fine	FINES (Clay or Silt)
GRAIN SIZE	3"	3/4"	4.76mm	2.0mm	0.42mm	0.074mm	

Sample No.	Depth Feet	Laboratory Classification	Strata Feet	W	L.L.	P.L.	∅	c	γd	Sand	Remarks
			0.0								Mud 10.0
1	0.5-1.0	Br. silty sand, w/clay, moist		X							11/8/99 Depth To Water 10.0
			SM								11/9/99 Water Table 7.0
2	3.5-4.0	Br. silty sand		X							
			6.0								
3	6.5-7.0	Br. fine sand, moist		X							D10 = 0.1543
4	9.5-10.0	Br. fine to med sand, moist		X							D10 = 0.1344
			SP								
5	13-14.5	Br. fine sand, sat		X							D10 = 0.1663 4.516
6	16-17.5	Br. med sand, sat		X							D10 = 0.2244 5.8.10
7	19-20.5	Do		X							11.19.23
			20.5								

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CONDENSED SOIL DATA — WORK SHEET — SOIL LABORATORY

Site: Pigsott Ark Seepage Study			Location:		
Date of Boring: 11/9/99	Date Received:	Date Classified:	Type of Boring: Box Auger SS	Elevation of Top:	Hole No.: 226 PL99

W = Water Content in % of Dry Weight
L.L. = Liquid Limit
P.L. = Plastic Limit
ϕ = Angle of Internal Friction
c = Cohesion in Tons/Sq. Ft.
γd = Dry Density in Lbs./Cu. Ft.

U. S. STANDARD SIEVE	3"	3/4"	4	10	40	200
	COBBLES	GRAVEL Course	GRAVEL Fine	SAND Course	SAND Medium	SAND Fine	FINES (Clay or Silt)
GRAIN SIZE	3"	3/4"	4.76mm	2.0mm	0.42mm	0.074mm	

Sample No.	Depth Feet	Laboratory Classification	Strata Feet	W	L.L.	P.L.	ϕ	c	γd	Sand	Remarks
			0.0								Mud 10.0
1	0.5-1.0	Br. silt, w/ clay moist		X							11/9/99 Depth To Water 10.0
											11/9/99 Water Table 8.0
2	3.5-4.0	Br. silt, w/ clay, moist	ML	21							
			5.5								
3	6.5-7.0	Br. fine sand, wet		X							P_{10} = 0.1590
4	9.5-10.0	Do	SP	X							
5	13-14.5	Do		X							6, 11, 14
6	16-17.5	Br. med. To fine sand		X							P_{10} = 0.1954 5, 8, 10
7	19-20.5	Br. fine To med. sand		X							P_{10} = 0.1986 6, 12, 11
			20.5								

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CONDENSED SOIL DATA — WORK SHEET — SOIL LABORATORY

Site: Pissott Ark Seepage Study | Location:

Date of Boring: 11/9/99 | Date Received: | Date Classified: | Type of Boring: Bor Auger SS | Elevation of Top: | Hole No.: 22 7PL 9S

W = Water Content in % of Dry Weight | L.L. = Liquid Limit | P.L. = Plastic Limit | ∅ = Angle of Internal Friction | c = Cohesion in Tons/Sq. Ft. | γd = Dry Density in Lbs./Cu. Ft.

U. S. STANDARD SIEVE	3"	3/4"	4	10	40	200

	COBBLES	GRAVEL Course	GRAVEL Fine	SAND Course	SAND Medium	SAND Fine	FINES (Clay or Silt)
GRAIN SIZE	3"	3/4"	4.76mm	2.0mm		0.42mm	0.074mm

Sample No.	Depth Feet	Laboratory Classification	Strata Feet	W	L.L.	P.L.	∅	c	γd	Sand	Remarks
			0.0								Mud 10.0
1	0.5-1.0	Br. silty sandy MOIST	SM	X							Depth To Water —
			3.0								Water Table —
2	3.5-4.0	Br. sandy silt, w/ clay, MOIST	ML	16							
			6.0								
3	6.5-7.0	Br. fine sand, wet		X							D10 = 1545
4	9.5-10.0	Do		X							
			SP								
5	13-14.5	Do		X							5, 3, 3
6	16-17.5	Br. med. sandy sat		X							D10 = 0.2163 3.536
7	19-20.5	Do		X							6, 11, 15
			20.5								

LMH Form 23A
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CONDENSED SOIL DATA — WORK SHEET — SOIL LABORATORY

Site: Pissott Ark Seepage Study			Location:		
Date of Boring: 11/10/99	Date Received:	Date Classified:	Type of Boring: Box Auger SS	Elevation of Top:	Hole No.: 228 PL99

W = Water Content in % of Dry Weight — L.L. = Liquid Limit — P.L. = Plastic Limit — ∅ = Angle of Internal Friction — c = Cohesion in Tons/Sq. Ft. — γd = Dry Density in Lbs./Cu. Ft.

U. S. STANDARD SIEVE	3"	3/4"	4	10	40	200
	COBBLES	GRAVEL Course / Fine	SAND Course	Medium	Fine	FINES (Clay or Silt)
GRAIN SIZE	3"	3/4"	4.76mm	2.0mm	0.42mm	0.074mm

Sample No.	Depth Feet	Laboratory Classification	Strata Feet	W	L.L.	P.L.	∅	c	γd	Sand	Remarks
			0.0								Mud 1.0
1	0.5-1.0	Br. silty sand w/clay	SM	X							Depth To Water —
			3.0								Water Table —
2	3.5-4.0	Br. silty clay, ox, moist + med	CL	24	46	18					
			6.0								
3	6.5-7.0	Br. fine sand, wet		X							D10=0.1358
4	9.5-10.0	Do		X							
			SP								
5	13-14.5	Do		X							7,10,11
6	16-17.5	Gr. fine sand, sat		X							D10=0.1700 5,4,5
7	19-20.5	Do		X							5,9,12
			20.5								

LMS Form 23A
Rev 11 Aug 58

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)	INSTALLATION: Memphis District (CEMVM)	SHEET 1 OF 1 SHEETS	
1. PROJECT: Below Piggott - West Bank SFB Seepage Study	9. COORDINATE SYSTEM:	HORIZONTAL:	VERTICAL:
	10. SIZE AND TYPE OF BIT: 2.25" ID		
2. HOLE NUMBER: 001-BPR-10	LOCATION COORDINATES: N 13,180,234.4 E 2,489,826.7	11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45	
3. DRILLING AGENCY: Tri-State Testing Services, Inc.		12. TOTAL SAMPLES: 12	DISTURBED: 12 / UNDISTURBED: 0
4. NAME OF DRILLER: K. Roberts		13. TOTAL NUMBER CORE BOXES: 0	
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED	DEG FROM VERTICAL: --- / BEARING:	14. ELEVATION GROUND WATER: 255.5	9/20/10
		15. DATE BORING: STARTED 9/20/10	COMPLETED 9/20/10
6. THICKNESS OF OVERBURDEN		16. ELEVATION TOP OF BORING: 261.5	
7. DEPTH DRILLED INTO ROCK		17. TOTAL CORE RECOVERY FOR BORING: N/A	
8. TOTAL DEPTH OF BORING: 30.0		18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor	

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
258.5	3.0	☒	7 10 12	22		Silt (ML) Tan, very stiff, Oxidized	100	1							15.9					
256.0	5.5	☒	10 10 10	20		Silty Clay (CL-ML) Tan, very stiff	100	2					18	5	8.6					
		☒	4 9 9	18		Poorly-graded Sand (SP) Gray & Brown, Fine	100	3			4									
		☒	4 10 10	20		Poorly-graded Sand (SP) Gray & Brown, Fine	100	4	2	96	2	0.180								
		☒	6 10 10	20		Poorly-graded Sand (SP) Gray, Fine	100	5												
		☒	4 14 15	29		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	10 15 13	28		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	6 12 13	25		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	5 11 12	23		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	9												
		☒	16 16 18	34		Poorly-graded Sand (SP) Gray, Medium	100	10												
		☒	19 29 25	54		Poorly-graded Sand (SP) Gray, Medium	100	11												
231.5	30.0	☒	10 20 15	35		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 002-BPR-10
LOCATION COORDINATES: N 13,179,786.6 E 2,489,604.9
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 256.0 9/19/10
15. DATE BORING: STARTED 9/19/10 COMPLETED 9/19/10
16. ELEVATION TOP OF BORING: 262.0
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	8 10 12	22		Silty Sand (SM) Red, Fine, Rootlets	100	1												
		☒	5 8 7	15		Silty Sand (SM) Red, Fine	100	2			19									
256.5	5.5																			
		☒	5 6 6	12		Clayey Sand (SC) Red, Fine	100	3												
		☒	2 3 6	9		Clayey Sand (SC) Red, Fine	100	4												
251.5	10.5																			
		☒	7 8 7	15		Poorly-graded Sand (SP) Gray, Fine	100	5			4									
		☒	4 6 8	14		Poorly-graded Sand (SP) Brown, Fine	100	6	1	98	1	0.165								
		☒	3 4 3	7		Poorly-graded Sand (SP) Brown, Fine	100	7												
		☒	3 9 10	19		Poorly-graded Sand (SP) Brown, Fine	100	8												
		☒	5 8 8	16		Poorly-graded Sand (SP) Brown, Fine, Lignite Fragments	100	9												
		☒	2 3 5	8		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	9 18 24	42		Poorly-graded Sand (SP) Gray, Medium	100	11												
232.0	30.0	☒	30 30 36	66		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	12												

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
2. HOLE NUMBER: 003-BPR-10
LOCATION COORDINATES: N 13,179,339.0 E 2,489,382.3
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
4. NAME OF DRILLER: K. Roberts
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 257.3 9/19/10
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
15. DATE BORING: STARTED 9/19/10 COMPLETED 9/19/10
6. THICKNESS OF OVERBURDEN:
16. ELEVATION TOP OF BORING: 263.8
7. DEPTH DRILLED INTO ROCK:
17. TOTAL CORE RECOVERY FOR BORING: N/A
8. TOTAL DEPTH OF BORING: 30.0
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
260.8	3.0	☒	6 6 10	16		Silt (ML) Brown, very stiff, Oxidized, Fine	100	1							11.6					
258.3	5.5	☒	5 5 6	11		Silty Sand (SM) Brown, Oxidized, Fine	100	2			12									
255.8	8.0	☒	3 4 6	10		Poorly-graded Sand (SP) Brown, Fine	100	3	4	96	1	0.192								
253.3	10.5	☒	2 3 6	9		Poorly-graded Sand with Silt (SP-SM) Brown & Gray, Fine	100	4			5									
		☒	5 8 10	18		Poorly-graded Sand (SP) Brown & Gray, Fine	100	5												
		☒	3 5 9	14		Poorly-graded Sand (SP) Brown & Gray, Fine	100	6												
		☒	7 6 10	16		Poorly-graded Sand (SP) Brown, Fine	100	7												
243.3	20.5	☒	3 5 10	15		Poorly-graded Sand (SP) Brown, Fine	100	8												
240.8	23.0	☒	8 9 11	20		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	9												
		☒	7 10 13	23		Poorly-graded Sand (SP) Gray, Medium	100	10												
		☒	7 10 14	24		Poorly-graded Sand (SP) Gray, Fine	100	11												
233.8	30.0	☒	14 14 14	28		Poorly-graded Sand (SP) Gray, Medium	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)

INSTALLATION: Memphis District (CEMVM)

SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study

2. HOLE NUMBER: 004-BPR-10

LOCATION COORDINATES: N 13,178,890.9 E 2,489,161.4

3. DRILLING AGENCY: Tri-State Testing Services, Inc.

4. NAME OF DRILLER: K. Roberts

5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:

6. THICKNESS OF OVERBURDEN:

7. DEPTH DRILLED INTO ROCK:

8. TOTAL DEPTH OF BORING: 30.0

9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

10. SIZE AND TYPE OF BIT: 2.25" ID

11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45

12. TOTAL SAMPLES: 12; DISTURBED: 12; UNDISTURBED: 0

13. TOTAL NUMBER CORE BOXES: 0

14. ELEVATION GROUND WATER: 256.1 9/19/10

15. DATE BORING: STARTED 9/19/10; COMPLETED 9/19/10

16. ELEVATION TOP OF BORING: 261.6

17. TOTAL CORE RECOVERY FOR BORING: N/A

18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	10 6 7	13		Silt (ML) Brown & Gray, stiff, Fine	100	1							11.2					
258.6	3.0																			
		☒	2 3 4	7		Silty Clay (CL-ML) Gray, medium, Fine	100	2					22	7	17.7					
256.1 ▼	5.5																			
		☒	4 6 4	10		Poorly-graded Sand (SP) Brown, Fine	100	3	0	99	0	0.194								
		☒	1 3 6	9		Poorly-graded Sand (SP) Brown, Fine	100	4												
		☒	6 6 9	15		Poorly-graded Sand (SP) Gray, Fine	100	5												
		☒	5 7 9	16		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	7 9 9	18		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	3 6 9	15		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	11 19 20	39		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	12 15 19	34		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	13 13 13	26		Poorly-graded Sand (SP) Gray, Fine	100	11												
		☒	26 30 35	65		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	12												
231.6	30.0																			

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 005-BPR-10
LOCATION COORDINATES: N 13,178,442.2 E 2,488,940.4
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 255.9 9/19/10
15. DATE BORING: STARTED 9/19/10 COMPLETED 9/19/10
16. ELEVATION TOP OF BORING: 260.9
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
257.9	3.0	☒	8 6 8	14		Silty Sand (SM) Red, Fine	100	1												
255.4	5.5	☒	4 5 7	12		Poorly-graded Sand with Silt (SP-SM) Brown & Red, Fine	100	2			8									
		☒	3 5 7	12		Poorly-graded Sand (SP) Brown, Fine	100	3			2									
		☒	14 21 14	35		Poorly-graded Sand (SP) Brown, Fine	100	4	0	98	2	0.157								
		☒	10 7 10	17		Poorly-graded Sand (SP) Brown, Fine	100	5												
		☒	8 7 10	17		Poorly-graded Sand (SP) Brown, Fine	100	6												
		☒	5 9 9	18		Poorly-graded Sand (SP) Brown, Fine	100	7												
		☒	3 5 5	10		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	6 2 6	8		Poorly-graded Sand (SP) Brown, Fine	100	9												
		☒	10 4 10	14		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	16 12 18	30		Poorly-graded Sand (SP) Gray, Medium, Lignite Fragments	100	11												
230.9	30.0	☒	38 18 28	46		Poorly-graded Sand (SP) Gray, Medium	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 006-BPR-10
LOCATION COORDINATES: N 13,177,989.6 E 2,488,713.7
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 260.5 9/19/10
15. DATE BORING: STARTED 9/19/10 COMPLETED 9/19/10
16. ELEVATION TOP OF BORING: 266.5
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	4 4 5	9		Silt (ML) Brown, stiff	100	1							8.4					
		☒	2 2 4	6		Silt (ML) Brown & Gray, & Mottled, medium, Oxidized	100	2					26	3	17.6					
261.0	5.5																			
		☒	3 5 9	14		Poorly-graded Sand with Silt (SP-SM) Brown, Fine	100	3			7									
		☒	2 5 6	11		Poorly-graded Sand with Silt (SP-SM) Brown, Fine	100	4			8									
256.0	10.5																			
		☒	4 5 6	11		Poorly-graded Sand (SP) Brown, Fine	100	5	3	96	1	0.213								
		☒	11 9 11	20		Poorly-graded Sand (SP) Brown & Gray, Fine	100	6												
251.0	15.5																			
		☒	5 3 5	8		Poorly-graded Sand with Silt (SP-SM) Brown, Fine	100	7												
248.5	18.0																			
		☒	3 3 5	8		Poorly-graded Sand (SP) Brown, Fine	100	8												
		☒	4 3 4	7		Poorly-graded Sand (SP) Brown, Fine	100	9												
		☒	3 3 3	6		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	15 18 19	37		Poorly-graded Sand (SP) Brown, Medium	100	11												
236.5	30.0	☒	43 14 14	28		Poorly-graded Sand (SP) Brown, Medium	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)

INSTALLATION: Memphis District (CEMVM)

SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study

9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

10. SIZE AND TYPE OF BIT: 2.25" ID

2. HOLE NUMBER: 007-BPR-10

LOCATION COORDINATES: N 13,177,571.0 E 2,488,423.0

11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45

3. DRILLING AGENCY: Tri-State Testing Services, Inc.

12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0

4. NAME OF DRILLER: K. Roberts

13. TOTAL NUMBER CORE BOXES: 0

5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:

14. ELEVATION GROUND WATER: 258.9 9/18/10

15. DATE BORING: STARTED 9/18/10 COMPLETED 9/18/10

6. THICKNESS OF OVERBURDEN:

16. ELEVATION TOP OF BORING: 266.9

7. DEPTH DRILLED INTO ROCK:

17. TOTAL CORE RECOVERY FOR BORING: N/A

8. TOTAL DEPTH OF BORING: 30.0

18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	6 7 14	21		Silty Sand (SM) Brown, Fine	100	1												
		☒	8 10 16	26		Silty Sand (SM) Brown, Fine	100	2			23									
261.4	5.5																			
		☒	10 9 8	17		Poorly-graded Sand (SP) Brown, Fine	100	3												
258.9 ▼	8.0																			
		☒	5 9 6	15		Silty Sand (SM) Brown, Fine	100	4			17									
256.4	10.5																			
		☒	8 11 11	22		Poorly-graded Sand (SP) Brown, Fine	100	5	0	99	0	0.172								
		☒	10 13 16	29		Poorly-graded Sand (SP) Brown, Fine	100	6	0	99	1	0.169								
		☒	5 9 6	15		Poorly-graded Sand (SP) Gray & Brown, Fine	100	7												
		☒	6 7 8	15		Poorly-graded Sand (SP) Brown, Fine	100	8												
		☒	19 13 20	33		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	9												
		☒	9 14 12	26		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	1 2 2	4		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	11												
		☒	1 2 2	4		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	12												
236.9	30.0																			

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
2. HOLE NUMBER: 008-BPR-10
LOCATION COORDINATES: N 13,177,175.3 E 2,488,116.9
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
4. NAME OF DRILLER: K. Roberts
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 258.1 9/18/10
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
15. DATE BORING: STARTED 9/18/10 COMPLETED 9/18/10
6. THICKNESS OF OVERBURDEN:
16. ELEVATION TOP OF BORING: 264.1
7. DEPTH DRILLED INTO ROCK:
17. TOTAL CORE RECOVERY FOR BORING: N/A
8. TOTAL DEPTH OF BORING: 30.0
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
261.1	3.0	☒	8 8 23	31		Silt (ML) Brown, very stiff, Oxidized, Fine	100	1							11.9					
		☒	10 19 18	37		Silty Sand (SM) Brown, Oxidized, Fine	100	2			25									
256.1	8.0	☒	8 5 5	10		Silty Sand (SM) Gray, Fine	100	3												
253.6	10.5	☒	5 6 7	13		Poorly-graded Sand with Silt (SP-SM) Brown, Fine	100	4			5									
		☒	2 3 5	8		Poorly-graded Sand (SP) Brown, Fine	100	5	2	96	2	0.169								
		☒	2 3 3	6		Poorly-graded Sand (SP) Brown, Fine	100	6												
		☒	6 10 12	22		Poorly-graded Sand (SP) Brown & Gray, Fine	100	7												
		☒	7 12 12	24		Poorly-graded Sand (SP) Brown, Medium	100	8												
		☒	4 13 16	29		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	9 13 17	30		Poorly-graded Sand (SP) Gray, Medium	100	10												
		☒	10 17 22	39		Poorly-graded Sand (SP) Gray, Fine	100	11												
234.1	30.0	☒	25 21 22	43		Poorly-graded Sand (SP) Gray, Medium	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
2. HOLE NUMBER: 009-BPR-10
LOCATION COORDINATES: N 13,176,757.3 E 2,487,811.1
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
4. NAME OF DRILLER: K. Roberts
13. TOTAL NUMBER CORE BOXES: 0
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
14. ELEVATION GROUND WATER: 256.5 9/18/10
15. DATE BORING: STARTED 9/18/10 COMPLETED 9/18/10
6. THICKNESS OF OVERBURDEN:
16. ELEVATION TOP OF BORING: 264.5
7. DEPTH DRILLED INTO ROCK:
17. TOTAL CORE RECOVERY FOR BORING: N/A
8. TOTAL DEPTH OF BORING: 30.0
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	6 12 12	24		Silty Sand (SM) Brown, Fine	100	1			18									
		☒	4 8 8	16		Silty Sand (SM) Brown, Fine	100	2			39									
259.0	5.5																			
		☒	4 5 5	10		Poorly-graded Sand (SP) Brown, Fine	100	3	1	98	1	0.152								
		☒	4 5 2	7		Poorly-graded Sand (SP) Brown, Fine	100	4												
		☒	5 5 5	10		Poorly-graded Sand (SP) Brown, Fine	100	5												
		☒	2 4 6	10		Poorly-graded Sand (SP) Gray & Brown, Fine	100	6												
		☒	4 4 6	10		Poorly-graded Sand (SP) Gray & Brown, Fine	100	7												
		☒	4 6 8	14		Poorly-graded Sand (SP) Brown, Fine	100	8												
		☒	3 9 8	17		Poorly-graded Sand (SP) Brown, Fine	100	9												
		☒	2 6 8	14		Poorly-graded Sand (SP) Gray & Brown, Fine	100	10												
		☒	7 12 12	24		Poorly-graded Sand (SP) Gray, Fine, Traces, Lignite Fragments	100	11												
234.5	30.0	☒	7 13 17	30		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 010-BPR-10
LOCATION COORDINATES: N 13,176,362.7 E 2,487,518.9
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 257.5 9/18/10
15. DATE BORING: STARTED 9/18/10 COMPLETED 9/18/10
16. ELEVATION TOP OF BORING: 263.5
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	5 9 15	24		Silt (ML) Brown, very stiff	100	1							10.1					
		☒	4 10 11	21		Silt (ML) Brown, very stiff	100	2			23				5.5					
258.0	5.5																			
		☒	5 6 7	13		Silty Sand (SM) Gray & Brown, Fine	100	3												
		☒	2 3 7	10		Silty Sand (SM) Brown & Gray, Fine, Lignite Fragments	100	4												
253.0	10.5																			
		☒	6 10 10	20		Poorly-graded Sand with Silt (SP-SM) Gray & Brown, Fine	100	5			5									
250.5	13.0																			
		☒	4 4 7	11		Poorly-graded Sand (SP) Gray, Fine	100	6	0	99	1	0.166								
		☒	10 12 13	25		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	7												
		☒	5 7 8	15		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	4 6 11	17		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	9												
		☒	14 12 14	26		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	9 12 13	25		Poorly-graded Sand (SP) Gray, Fine	100	11												
233.5	30.0	☒	10 10 10	20		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 011-BPR-10
LOCATION COORDINATES: N 13,175,949.7 E 2,487,209.1
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 257.4 9/17/10
15. DATE BORING: STARTED 9/17/10 COMPLETED 9/17/10
16. ELEVATION TOP OF BORING: 263.4
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	8 10 12	22		Silty Sand (SM) Brown, Fine	100	1			20									
		☒	4 4 6	10		Silty Sand (SM) Brown, Fine	100	2			15									
257.9	5.5																			
		☒	4 6 4	10		Poorly-graded Sand with Silt (SP-SM) Brown, Fine	100	3	0	94	6	0.102								
255.4	8.0																			
		☒	1 4 4	8		Poorly-graded Sand (SP) Brown, Fine	100	4												
		☒	4 8 8	16		Poorly-graded Sand (SP) Brown, Fine	100	5												
		☒	10 9 8	17		Poorly-graded Sand (SP) Gray & Brown, Fine	100	6												
		☒	8 8 11	19		Poorly-graded Sand (SP) Gray & Brown, Fine	100	7												
		☒	3 3 9	12		Poorly-graded Sand (SP) Gray & Brown, Fine	100	8												
		☒	9 9 10	19		Poorly-graded Sand (SP) Gray & Brown, Fine	100	9												
		☒	5 5 5	10		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	10												
		☒	10 15 19	34		Poorly-graded Sand (SP) Gray, Fine	100	11												
		☒	7 15 16	31		Poorly-graded Sand (SP) Gray, Fine	100	12												
233.4	30.0																			

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)

INSTALLATION: Memphis District (CEMVM)

SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study

9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

10. SIZE AND TYPE OF BIT: 2.25" ID

2. HOLE NUMBER: 012-BPR-10

LOCATION COORDINATES: N 13,175,557.8 E 2,486,926.4

11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45

3. DRILLING AGENCY: Tri-State Testing Services, Inc.

12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0

4. NAME OF DRILLER: K. Roberts

13. TOTAL NUMBER CORE BOXES: 0

5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:

14. ELEVATION GROUND WATER: 256.5 9/17/10

15. DATE BORING: STARTED 9/17/10 COMPLETED 9/17/10

6. THICKNESS OF OVERBURDEN:

16. ELEVATION TOP OF BORING: 262.5

7. DEPTH DRILLED INTO ROCK:

17. TOTAL CORE RECOVERY FOR BORING: N/A

8. TOTAL DEPTH OF BORING: 30.0

18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
259.5	3.0	☒	10 10 12	22		Silt (ML) Gray & Tan, & Mottled, very stiff, Oxidized, Fine	100	1							9.5					
		☒	5 8 10	18		Silty Sand (SM) Red & Brown, Oxidized, Fine	100	2			13									
254.5	8.0	☒	5 5 5	10		Silty Sand (SM) Gray, Fine	100	3												
		☒	2 5 7	12		Poorly-graded Sand (SP) Gray, Fine	100	4			2									
		☒	4 5 6	11		Poorly-graded Sand (SP) Gray, Fine	100	5	3	96	1	0.194								
		☒	5 8 11	19		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	5 9 12	21		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	9 11 15	26		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	7 9 10	19		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	10 10 10	20		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	2 4 4	8		Poorly-graded Sand (SP) Gray, Fine	100	11												
232.5	30.0	☒	7 15 16	31		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)

INSTALLATION: Memphis District (CEMVM)

SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study

9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

10. SIZE AND TYPE OF BIT: 2.25" ID

2. HOLE NUMBER: 013-BPR-10

LOCATION COORDINATES: N 13,175,154.7 E 2,486,627.8

11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45

3. DRILLING AGENCY: Tri-State Testing Services, Inc.

12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0

4. NAME OF DRILLER: K. Roberts

13. TOTAL NUMBER CORE BOXES: 0

5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:

14. ELEVATION GROUND WATER: 256.7 9/17/10

15. DATE BORING: STARTED 9/17/10 COMPLETED 9/17/10

6. THICKNESS OF OVERBURDEN:

16. ELEVATION TOP OF BORING: 262.7

7. DEPTH DRILLED INTO ROCK:

17. TOTAL CORE RECOVERY FOR BORING: N/A

8. TOTAL DEPTH OF BORING: 30.0

18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	15 14 9	23		Silty Sand (SM) Brown, Fine, Oxidized	100	1												
		☒	4 6 6	12		Silty Sand (SM) Gray, Fine, Oxidized, Rootlets	100	2			20									
257.2	5.5																			
		☒	3 3 6	9		Poorly-graded Sand (SP) Gray, Fine	100	3			5									
		☒	5 7 8	15		Poorly-graded Sand (SP) Gray, Fine	100	4	0	98	2	0.164								
252.2	10.5																			
		☒	2 3 6	9		Silty Sand (SM) Brown, Fine	100	5												
249.7	13.0																			
		☒	3 3 2	5		Poorly-graded Sand (SP) Gray, Fine	100	6												
247.2	15.5																			
		☒	5 6 4	10		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	7												
244.7	18.0																			
		☒	3 5 9	14		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	4 10 12	22		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	4 8 10	18		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	6 9 12	21		Poorly-graded Sand (SP) Gray, Fine	100	11												
		☒	7 12 18	30		Poorly-graded Sand (SP) Gray, Fine	100	12												
232.7	30.0																			

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)	INSTALLATION: Memphis District (CEMVM)	SHEET 1 OF 1 SHEETS	
1. PROJECT: Below Piggott - West Bank SFB Seepage Study	9. COORDINATE SYSTEM:	HORIZONTAL:	VERTICAL:
	10. SIZE AND TYPE OF BIT: 2.25" ID		
2. HOLE NUMBER: 014-BPR-10	LOCATION COORDINATES: N 13,174,726.6 E 2,486,330.7	11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45	
3. DRILLING AGENCY: Tri-State Testing Services, Inc.		12. TOTAL SAMPLES: 12	DISTURBED: 12 / UNDISTURBED: 0
4. NAME OF DRILLER: K. Roberts		13. TOTAL NUMBER CORE BOXES: 0	
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED	DEG FROM VERTICAL: --- / BEARING:	14. ELEVATION GROUND WATER: 256.3	9/17/10
		15. DATE BORING: STARTED 9/17/10	COMPLETED 9/17/10
6. THICKNESS OF OVERBURDEN		16. ELEVATION TOP OF BORING: 262.3	
7. DEPTH DRILLED INTO ROCK		17. TOTAL CORE RECOVERY FOR BORING: N/A	
8. TOTAL DEPTH OF BORING: 30.0		18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor	

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	8 10 10	20		Silty Sand (SM) Brown, Fine	100	1												
		☒	4 7 11	18		Silty Sand (SM) Brown, Fine	100	2			15									
256.8	5.5																			
		☒	3 6 5	11		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	3												
		☒	4 9 9	18		Poorly-graded Sand with Silt (SP-SM) Brown, Fine	100	4			6									
251.8	10.5																			
		☒	5 6 7	13		Poorly-graded Sand (SP) Brown, Fine	100	5	0	97	3	0.172								
		☒	4 5 4	9		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	8 14 16	30		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	3 7 9	16		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	8												
		☒	6 10 10	20		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	3 6 9	15		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	13 22 24	46		Poorly-graded Sand (SP) Gray, Fine	100	11												
		☒	15 30 30	60		Poorly-graded Sand (SP) Gray & Brown, Fine	100	12												
232.3	30.0																			

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 015-BPR-10
LOCATION COORDINATES: N 13,174,333.9 E 2,486,051.0
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 256.9 9/16/10
15. DATE BORING: STARTED 9/16/10 COMPLETED 9/16/10
16. ELEVATION TOP OF BORING: 262.9
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	10 13 16	29		Silty Sand (SM) Brown, Fine	100	1												
		☒	4 7 9	16		Silty Sand (SM) Brown, Fine	100	2			22									
257.4	5.5																			
		☒	7 8 10	18		Poorly-graded Sand with Silt (SP-SM) Brown, Fine	100	3			8									
254.9	8.0																			
		☒	4 6 8	14		Poorly-graded Sand (SP) Brown, Fine	100	4	1	97	3	0.161								
		☒	7 5 11	16		Poorly-graded Sand (SP) Brown, Fine	100	5												
		☒	4 6 9	15		Poorly-graded Sand (SP) Gray & Brown, Fine	100	6												
		☒	10 13 16	29		Poorly-graded Sand (SP) Gray & Brown, Fine	100	7												
		☒	6 28 30	58		Poorly-graded Sand (SP) Brown, Fine	100	8												
		☒	9 13 15	28		Poorly-graded Sand (SP) Brown, Fine	100	9												
		☒	3 9 15	24		Poorly-graded Sand (SP) Brown, Fine	100	10												
		☒	33 30 35	65		Poorly-graded Sand (SP) Brown, Fine	100	11												
		☒	32 35 39	74		Poorly-graded Sand (SP) Brown, Medium	100	12												
232.9	30.0																			

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)

INSTALLATION: Memphis District (CEMVM)

SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study

9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

10. SIZE AND TYPE OF BIT: 2.25" ID

2. HOLE NUMBER: 016-BPR-10

LOCATION COORDINATES: N 13,173,844.0 E 2,485,915.0

11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45

3. DRILLING AGENCY: Tri-State Testing Services, Inc.

12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0

4. NAME OF DRILLER: K. Roberts

13. TOTAL NUMBER CORE BOXES: 0

5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:

14. ELEVATION GROUND WATER: 255.4 9/16/10

15. DATE BORING: STARTED 9/16/10 COMPLETED 9/16/10

6. THICKNESS OF OVERBURDEN:

16. ELEVATION TOP OF BORING: 261.4

7. DEPTH DRILLED INTO ROCK:

17. TOTAL CORE RECOVERY FOR BORING: N/A

8. TOTAL DEPTH OF BORING: 30.0

18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
258.4	3.0	☒	5 5 7	12		Clayey Sand (SC) Brown & Gray, & Mottled, Oxidized, Fine	100	1												
255.9	5.5	☒	2 4 4	8		Silty Sand (SM) Brown, Fine	100	2			16									
253.4	8.0	☒	1 2 4	6		Silt (ML) Gray, medium	100	3					34	10	48.7					
250.9	10.5	☒	2 4 6	10		Silty Sand (SM) Gray, Fine	100	4			32									
		☒	4 7 11	18		Poorly-graded Sand (SP) Gray, Fine	100	5	0	98	2	0.158								
		☒	7 7 7	14		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	4 8 10	18		Poorly-graded Sand (SP) Brown, Fine	100	7												
		☒	4 6 8	14		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	5 9 5	14		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	4 5 9	14		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	10												
		☒	6 17 16	33		Poorly-graded Sand (SP) Brown, Fine	100	11												
231.4	30.0	☒	54 28 26	54		Poorly-graded Sand (SP) Brown	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 017-BPR-10
LOCATION COORDINATES: N 13,173,424.5 E 2,485,746.4
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 255.1 9/16/10
15. DATE BORING STARTED: 9/16/10 COMPLETED: 9/16/10
16. ELEVATION TOP OF BORING: 261.1
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
258.1	3.0	☒	8 10 8	18		Silty Sand (SM) Brown, Fine	100	1			41									
255.6	5.5	☒	4 5 7	12		Lean Clay (CL) Sandy, Gray & Brown, stiff, Fine	100	2			61				22.3					
		☒	4 4 5	9		Poorly-graded Sand (SP) Gray, Fine	100	3	0	96	4	0.153								
		☒	3 5 7	12		Poorly-graded Sand (SP) Gray, Fine	100	4												
		☒	2 7 7	14		Poorly-graded Sand (SP) Gray, Fine	100	5												
		☒	4 7 7	14		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	2 4 4	8		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	7												
		☒	2 2 1	3		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	8												
		☒	4 7 7	14		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	7 17 17	34		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	8 10 22	32		Poorly-graded Sand (SP) Gray, Fine	100	11												
231.1	30.0	☒	7 11 17	28		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 018-BPR-10
LOCATION COORDINATES: N 13,172,940.3 E 2,485,568.9
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 254.3 9/16/10
15. DATE BORING STARTED: 9/16/10 COMPLETED: 9/16/10
16. ELEVATION TOP OF BORING: 260.3
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
257.3	3.0	☒	6 5 4	9		Fat Clay (CH) Gray, stiff, Oxidized	100	1							22.4					
254.8	5.5	☒	2 3 5	8		Lean Clay (CL) Gray, stiff	100	2					47	30	28.5					
		☒	4 2 8	10		Poorly-graded Sand with Silt (SP-SM) Dark Gray, Fine, Organic Matter	100	3			10									
		☒	5 8 10	18		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	4	1	95	5	0.113								
247.3	13.0	☒	7 10 15	25		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	5			7									
		☒	5 7 14	21		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	8 11 10	21		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	5 9 15	24		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	15 15 21	36		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	32 28 35	63		Poorly-graded Sand (SP) Gray, Medium	100	10												
		☒	31 33 30	63		Poorly-graded Sand (SP) Gray, Medium	100	11												
230.3	30.0	☒	22 28 28	56		Poorly-graded Sand (SP) Gray, Medium	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION	Mississippi Valley Division (MVD)
INSTALLATION	Memphis District (CEMVM)
SHEET	1 OF 1 SHEETS
1. PROJECT	Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER	019-BPR-10
LOCATION COORDINATES	N 13,172,459.9 E 2,485,405.1
3. DRILLING AGENCY	Tri-State Testing Services, Inc.
4. NAME OF DRILLER	K. Roberts
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG FROM VERTICAL	---
BEARING	
6. THICKNESS OF OVERBURDEN	
7. DEPTH DRILLED INTO ROCK	
8. TOTAL DEPTH OF BORING	30.0
9. COORDINATE SYSTEM	HORIZONTAL / VERTICAL
10. SIZE AND TYPE OF BIT:	2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL	CME 45
12. TOTAL SAMPLES	12 (DISTURBED 12 / UNDISTURBED 0)
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	254.7 9/14/10
15. DATE BORING	STARTED 9/14/10 COMPLETED 9/14/10
16. ELEVATION TOP OF BORING	260.7
17. TOTAL CORE RECOVERY FOR BORING	N/A
18. SIGNATURE AND TITLE OF INSPECTOR	Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_r	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
			4 5 5	10		Fat Clay (CH) Gray, stiff, Oxidized, Rootlets	100	1							21.6					
257.7	3.0																			
			3 4 5	9		Lean Clay (CL) Gray, stiff	100	2					43	30	22.6					
255.2	5.5																			
			4 8 8	16		Poorly-graded Sand (SP) Gray, Fine	100	3	0	99	1	0.173								
			7 10 10	20		Poorly-graded Sand (SP) Gray, Fine	100	4												
			4 4 5	9		Poorly-graded Sand (SP) Gray, Fine	100	5												
			2 2 5	7		Poorly-graded Sand (SP) Gray, Fine	100	6												
			7 12 16	28		Poorly-graded Sand (SP) Gray, Fine	100	7												
			7 10 12	22		Poorly-graded Sand (SP) Gray, Fine	100	8												
			10 18 22	40		Poorly-graded Sand (SP) Gray, Fine	100	9												
			7 15 21	36		Poorly-graded Sand (SP) Gray, Medium	100	10												
			10 15 18	33		Poorly-graded Sand (SP) Gray, Medium	100	11												
			19 19 19	38		Poorly-graded Sand (SP) Gray, Fine	100	12												
230.7	30.0																			

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)	INSTALLATION: Memphis District (CEMVM)	SHEET 1 OF 1 SHEETS	
1. PROJECT: Below Piggott - West Bank SFB Seepage Study	9. COORDINATE SYSTEM	HORIZONTAL	VERTICAL
	10. SIZE AND TYPE OF BIT: 2.25" ID		
2. HOLE NUMBER: 020-BPR-10	LOCATION COORDINATES: N 13,171,994.4 E 2,485,251.7	11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45	
3. DRILLING AGENCY: Tri-State Testing Services, Inc.	12. TOTAL SAMPLES: 12	DISTURBED: 12	UNDISTURBED: 0
4. NAME OF DRILLER: K. Roberts	13. TOTAL NUMBER CORE BOXES: 0		
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED	DEG FROM VERTICAL: ---	BEARING	14. ELEVATION GROUND WATER: 254.9 9/14/10
15. DATE BORING	STARTED: 9/14/10	COMPLETED: 9/14/10	
6. THICKNESS OF OVERBURDEN	16. ELEVATION TOP OF BORING: 260.9		
7. DEPTH DRILLED INTO ROCK	17. TOTAL CORE RECOVERY FOR BORING: N/A		
8. TOTAL DEPTH OF BORING: 30.0	18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor		

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
			3 5 5	10		Lean Clay (CL) Gray, stiff	100	1					36	23	16.1					
257.9	3.0																			
			2 3 5	8		Clayey Sand (SC) Gray, Fine	100	2			45				19.0					
255.4	5.5																			
			5 5 7	12		Poorly-graded Sand with Clay (SP-SC) Gray, Fine	100	3			7									
252.9	8.0																			
			5 4 6	10		Poorly-graded Sand (SP) Brown & Gray, Fine	100	4	0	98	2	0.140								
250.4	10.5																			
			6 6 8	14		Poorly-graded Sand with Silt (SP-SM) Brown & Gray, Fine	100	5												
			5 8 10	18		Poorly-graded Sand with Silt (SP-SM) Brown & Gray, Fine	100	6												
245.4	15.5																			
			5 8 13	21		Poorly-graded Sand (SP) Gray, Fine	100	7												
			8 13 12	25		Poorly-graded Sand (SP) Gray, Fine	100	8												
			7 13 15	28		Poorly-graded Sand (SP) Gray, Fine	100	9												
			5 9 11	20		Poorly-graded Sand (SP) Gray, Fine	100	10												
			4 16 21	37		Poorly-graded Sand (SP) Gray, Medium	100	11												
			9 15 15	30		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	12												
230.9	30.0																			

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 021-BPR-10
LOCATION COORDINATES: N 13,171,533.7 E 2,485,132.0
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 255.4 9/14/10
15. DATE BORING: STARTED 9/14/10 COMPLETED 9/14/10
16. ELEVATION TOP OF BORING: 261.4
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	4 6 7	13		Silty Sand (SM) Gray & Brown, Oxidized, Fine	100	1												
258.4	3.0																			
		☒	2 3 5	8		Poorly-graded Sand with Silt (SP-SM) Gray & Brown, Fine	100	2			12									
		☒	5 3 5	8		Poorly-graded Sand with Silt (SP-SM) Brown, Fine	100	3			6									
253.4	8.0																			
		☒	3 6 7	13		Poorly-graded Sand (SP) Gray, Fine	100	4	0	97	3	0.156								
		☒	8 7 9	16		Poorly-graded Sand (SP) Brown & Gray, Fine	100	5												
		☒	5 6 9	15		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	4 6 7	13		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	4 5 6	11		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	8												
		☒	13 13 9	22		Poorly-graded Sand (SP) Brown, Fine	100	9												
		☒	7 14 19	33		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	14 24 26	50		Poorly-graded Sand (SP) Gray, Fine	100	11												
		☒	4 4 11	15		Poorly-graded Sand (SP) Gray, Fine	100	12												
231.4	30.0																			

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)	INSTALLATION: Memphis District (CEMVM)	SHEET 1 OF 1 SHEETS	
1. PROJECT: Below Piggott - West Bank SFB Seepage Study	9. COORDINATE SYSTEM	HORIZONTAL	VERTICAL
	10. SIZE AND TYPE OF BIT: 2.25" ID		
2. HOLE NUMBER: 022-BPR-10	LOCATION COORDINATES: N 13,171,029.8 E 2,485,155.2	11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45	
3. DRILLING AGENCY: Tri-State Testing Services, Inc.	12. TOTAL SAMPLES: 12	DISTURBED: 12	UNDISTURBED: 0
4. NAME OF DRILLER: K. Roberts	13. TOTAL NUMBER CORE BOXES: 0		
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED	DEG FROM VERTICAL: ---	BEARING	14. ELEVATION GROUND WATER: 255.1 9/14/10
15. DATE BORING	STARTED: 9/14/10	COMPLETED: 9/14/10	
6. THICKNESS OF OVERBURDEN	16. ELEVATION TOP OF BORING: 261.1		
7. DEPTH DRILLED INTO ROCK	17. TOTAL CORE RECOVERY FOR BORING: N/A		
8. TOTAL DEPTH OF BORING: 30.0	18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor		

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	5 5 5	10		Silty Sand (SM) Gray & Brown, Oxidized, Fine	100	1												
		☒	2 3 5	8		Silty Sand (SM) Brown, Oxidized, Fine	100	2												
255.6	5.5																			
		☒	2 3 4	7		Poorly-graded Sand with Silt (SP-SM) Dark Gray, Fine	100	3			9									
253.1	8.0																			
		☒	2 5 4	9		Silty Sand (SM) Dark Gray, Fine	100	4			16									
250.6	10.5																			
		☒	7 10 13	23		Poorly-graded Sand (SP) Brown, Medium	100	5	1	98	1	0.210								
		☒	3 7 11	18		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	13 14 17	31		Poorly-graded Sand (SP) Gray & Brown, Fine	100	7												
		☒	9 21 21	42		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	4 6 8	14		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	9												
		☒	16 11 13	24		Poorly-graded Sand (SP) Brown & Gray, Fine	100	10												
		☒	14 25 17	42		Poorly-graded Sand (SP) Gray, Fine	100	11												
		☒	7 7 10	17		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	12												
231.1	30.0																			

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 023-BPR-10
LOCATION COORDINATES: N 13,170,542.3 E 2,485,147.9
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 254.6 9/14/10
15. DATE BORING: STARTED 9/14/10 COMPLETED 9/14/10
16. ELEVATION TOP OF BORING: 260.6
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	5 4 3	7		Clayey Sand (SC) Brown, Fine	100	1			32									
		☒	1 3 4	7		Clayey Sand (SC) Gray & Brown, Fine	100	2			18									
255.1	5.5																			
		☒	3 5 3	8		Poorly-graded Sand (SP) Gray, Fine	100	3	0	99	1	0.176								
		☒	2 4 8	12		Poorly-graded Sand (SP) Brown & Gray, Fine	100	4												
		☒	5 7 4	11		Poorly-graded Sand (SP) Brown & Gray, Fine	100	5												
		☒	2 7 6	13		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	6												
		☒	5 15 16	31		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	10 20 24	44		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	8 14 16	30		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	4 6 10	16		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	10												
		☒	14 25 24	49		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	11												
230.6	30.0	☒	5 11 14	25		Poorly-graded Sand (SP) Brown & Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
2. HOLE NUMBER: 024-BPR-10
LOCATION COORDINATES: N 13,170,049.9 E 2,485,144.8
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
4. NAME OF DRILLER: K. Roberts
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 256.6 9/13/10
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
15. DATE BORING: STARTED 9/13/10 COMPLETED 9/13/10
6. THICKNESS OF OVERBURDEN:
16. ELEVATION TOP OF BORING: 262.6
7. DEPTH DRILLED INTO ROCK:
17. TOTAL CORE RECOVERY FOR BORING: N/A
8. TOTAL DEPTH OF BORING: 30.0
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	12 7 8	15		Silty Sand (SM) Brown, Oxidized, Fine	100	1												
		☒	2 7 4	11		Silty Sand (SM) Brown, Oxidized, Fine	100	2												
257.1	5.5																			
		☒	1 3 3	6		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	3			11									
		☒	2 5 6	11		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	4			6									
252.1	10.5																			
		☒	7 8 9	17		Poorly-graded Sand (SP) Gray, Medium	100	5	0	99	1	0.225								
249.6	13.0																			
		☒	4 8 6	14		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	6												
247.1	15.5																			
		☒	9 10 13	23		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	5 10 11	21		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	7 11 13	24		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	7 9 12	21		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	7 8 12	20		Poorly-graded Sand (SP) Gray, Fine	100	11												
		☒	8 14 15	29		Poorly-graded Sand (SP) Gray, Fine	100	12												
232.6	30.0																			

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 3.25" ID
2. HOLE NUMBER: 025-BPR-11
LOCATION COORDINATES: N 13,169,519.0 E 2,485,201.7
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 75
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
4. NAME OF DRILLER: G. Baker
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 255.3 8/2/11
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
15. DATE BORING: STARTED 8/2/11 COMPLETED 8/2/11
6. THICKNESS OF OVERBURDEN:
16. ELEVATION TOP OF BORING: 264.3
7. DEPTH DRILLED INTO ROCK:
17. TOTAL CORE RECOVERY FOR BORING: N/A
8. TOTAL DEPTH OF BORING: 30.0
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
261.3	3.0	☒	3 5 8	13		Poorly-graded Sand with Silt (SP-SM) Brown, Fine	100	1												
258.8	5.5	☒	5 3 2	5		Poorly-graded Sand (SP) Brown & Gray, Fine	100	2												
256.3	8.0	☒	3 3 3	6		Silty Sand (SM) Brown, Fine	100	3			33									
253.8	10.5	☒	2 2 3	5		Poorly-graded Sand with Silt (SP-SM) Brown, Fine	100	4			8									
251.3	13.0	☒	3 4 3	7		Silty Sand (SM) Brown & Gray, Fine	100	5	0	75	25									
		☒	3 4 6	10		Poorly-graded Sand (SP) Brown, Fine	100	6												
		☒	4 5 8	13		Poorly-graded Sand (SP) Brown & Gray, Fine, Lignite Fragments	100	7												
		☒	3 6 8	14		Poorly-graded Sand (SP) Brown, Fine	100	8												
		☒	6 8 9	17		Poorly-graded Sand (SP) Brown, Fine	100	9												
		☒	5 7 11	18		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	7 9 11	20		Poorly-graded Sand (SP) Gray, Fine	100	11												
234.3	30.0	☒	8 10 13	23		Poorly-graded Sand (SP) Brown, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)	INSTALLATION: Memphis District (CEMVM)	SHEET 1 OF 1 SHEETS	
1. PROJECT: Below Piggott - West Bank SFB Seepage Study	9. COORDINATE SYSTEM	HORIZONTAL	VERTICAL
	10. SIZE AND TYPE OF BIT: 2.25" ID		
2. HOLE NUMBER: 026-BPR-10	LOCATION COORDINATES: N 13,169,183.0 E 2,484,788.0	11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45	
3. DRILLING AGENCY: Tri-State Testing Services, Inc.	12. TOTAL SAMPLES: 12	DISTURBED: 12	UNDISTURBED: 0
4. NAME OF DRILLER: K. Roberts	13. TOTAL NUMBER CORE BOXES: 0		
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED	DEG FROM VERTICAL: ---	BEARING	14. ELEVATION GROUND WATER: 255.7 9/20/10
15. DATE BORING	STARTED: 9/20/10	COMPLETED: 9/20/10	
6. THICKNESS OF OVERBURDEN	16. ELEVATION TOP OF BORING: 261.7		
7. DEPTH DRILLED INTO ROCK	17. TOTAL CORE RECOVERY FOR BORING: N/A		
8. TOTAL DEPTH OF BORING: 30.0	18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor		

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	10 16 16	32		Silty Sand (SM) Brown, Fine	100	1												
		☒	4 6 7	13		Silty Sand (SM) Brown, Fine	100	2												
256.2	5.5																			
		☒	2 3 4	7		Poorly-graded Sand with Silt (SP-SM) Brown, Fine	100	3			9									
253.7	8.0																			
		☒	2 5 5	10		Silty Sand (SM) Dark Gray, Fine	100	4			39				26.9					
		☒	4 10 14	24		Silty Sand (SM) Dark Brown, Fine	100	5	0	86	14									
248.7	13.0																			
		☒	6 12 16	28		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	6												
		☒	5 6 10	16		Poorly-graded Sand (SP) Brown, Fine	100	7												
		☒	4 6 9	15		Poorly-graded Sand (SP) Gray, Medium	100	8												
		☒	9 8 14	22		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	27 19 21	40		Poorly-graded Sand (SP) Brown, Medium	100	10												
		☒	20 31 25	56		Poorly-graded Sand (SP) Gray, Fine	100	11												
		☒	18 24 18	42		Poorly-graded Sand (SP) Gray, Fine	100	12												
231.7	30.0																			

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 027-BPR-10
LOCATION COORDINATES: N 13,168,871.4 E 2,484,366.6
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 253.1 9/20/10
15. DATE BORING: STARTED 9/20/10 COMPLETED 9/20/10
16. ELEVATION TOP OF BORING: 264.1
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
261.1	3.0	☒	13 8 12	20		Lean Clay (CL) Brown, very stiff	100	1					27	11	7.9					
258.6	5.5	☒	3 5 11	16		Silty Sand (SM) Brown, Fine	100	2			25									
256.1	8.0	☒	4 4 6	10		Poorly-graded Sand (SP) Brown, Fine	100	3												
253.6	10.5	☒	4 4 6	10		Poorly-graded Sand with Silt (SP-SM) Brown, Fine	100	4			7									
251.1	13.0	☒	4 5 7	12		Poorly-graded Sand (SP) Brown, Fine	100	5	0	99	1	0.169								
246.1	18.0	☒	5 7 6	13		Poorly-graded Sand with Silt (SP-SM) Brown, Fine	100	6												
		☒	4 7 7	14		Poorly-graded Sand with Silt (SP-SM) Brown, Fine	100	7												
		☒	5 11 14	25		Poorly-graded Sand (SP) Brown, Fine	100	8												
		☒	8 8 8	16		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	9												
		☒	6 9 12	21		Poorly-graded Sand (SP) Brown	100	10												
		☒	9 12 18	30		Poorly-graded Sand (SP) Brown & Gray, Fine	100	11												
234.1	30.0	☒	16 26 34	60		Poorly-graded Sand (SP) Brown & Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 028-BPR-10
LOCATION COORDINATES: N 13,168,568.2 E 2,483,962.2
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 256.2 9/20/10
15. DATE BORING: STARTED 9/20/10 COMPLETED 9/20/10
16. ELEVATION TOP OF BORING: 262.2
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	8 11 11	22		Silty Sand (SM) Red & Brown, Fine	100	1												
		☒	7 10 11	21		Silty Sand (SM) Brown, Fine	100	2												
		☒	3 5 8	13		Silty Sand (SM) Red & Gray, Fine	100	3												
254.2	8.0																			
		☒	3 5 5	10		Poorly-graded Sand (SP) Brown & Gray, Fine	100	4			3									
		☒	2 2 5	7		Poorly-graded Sand (SP) Brown, Fine	100	5			3									
		☒	7 5 4	9		Poorly-graded Sand (SP) Gray, Fine	100	6	0	97	3	0.094								
		☒	4 3 3	6		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	2 3 7	10		Poorly-graded Sand (SP) Brown, Fine	100	8												
		☒	9 7 17	24		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	9												
		☒	16 22 20	42		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	8 10 16	26		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	11												
232.2	30.0	☒	14 14 1	15		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
2. HOLE NUMBER: 029-BPR-10
LOCATION COORDINATES: N 13,168,250.9 E 2,483,575.3
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
4. NAME OF DRILLER: K. Roberts
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 255.0 9/21/10
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
15. DATE BORING: STARTED 9/21/10 COMPLETED 9/21/10
6. THICKNESS OF OVERBURDEN:
16. ELEVATION TOP OF BORING: 262.5
7. DEPTH DRILLED INTO ROCK:
17. TOTAL CORE RECOVERY FOR BORING: N/A
8. TOTAL DEPTH OF BORING: 30.0
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	13 13 13	26		Silty Sand (SM) Red & Brown, Fine	100	1												
		☒	4 4 6	10		Silty Sand (SM) Red & Brown, Fine	100	2			20									
257.0	5.5																			
		☒	3 5 7	12		Poorly-graded Sand with Silt (SP-SM) Red & Brown, Fine	100	3			9									
		☒	5 5 5	10		Poorly-graded Sand with Silt (SP-SM) Brown, Fine	100	4	1	93	7	0.114								
252.0	10.5																			
		☒	4 5 6	11		Poorly-graded Sand (SP) Brown, Fine	100	5	1	97	2	0.148								
		☒	6 9 10	19		Poorly-graded Sand (SP) Brown, Fine	100	6												
		☒	13 12 16	28		Poorly-graded Sand (SP) Brown, Fine	100	7												
		☒	9 11 11	22		Poorly-graded Sand (SP) Brown, Fine	100	8												
		☒	13 24 22	46		Poorly-graded Sand (SP) Brown, Fine	100	9												
		☒	8 11 11	22		Poorly-graded Sand (SP) Brown, Fine	100	10												
		☒	13 13 20	33		Poorly-graded Sand (SP) Brown, Medium	100	11												
232.5	30.0	☒	24 21 20	41		Poorly-graded Sand (SP) Brown, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 030-BPR-10
LOCATION COORDINATES: N 13,167,960.8 E 2,483,169.4
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 254.9 9/21/10
15. DATE BORING: STARTED 9/21/10 COMPLETED 9/21/10
16. ELEVATION TOP OF BORING: 261.9
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_r	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
258.9	3.0	☒	12 11 15	26		Poorly-graded Sand (SP) Brown, Fine	100	1												
256.4	5.5	☒	9 8 9	17		Silty Sand (SM) Brown, Fine	100	2	0	74	26									
253.9	8.0	☒	4 4 5	9		Lean Clay (CL) Sandy, Brown & Gray, stiff	100	3			63				25.1					
251.4	10.5	☒	1 3 6	9		Silty Sand (SM) Brown, Fine	100	4	0	87	13									
		☒	6 6 7	13		Poorly-graded Sand (SP) Brown, Fine	100	5												
		☒	7 9 9	18		Poorly-graded Sand (SP) Gray & Brown, Fine	100	6												
		☒	14 10 10	20		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	6 10 12	22		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	13 13 16	29		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	11 11 12	23		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	10												
		☒	8 13 13	26		Poorly-graded Sand (SP) Gray, Fine	100	11												
231.9	30.0	☒	9 11 10	21		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
2. HOLE NUMBER: 031-BPR-10
LOCATION COORDINATES: N 13,167,667.1 E 2,482,801.1
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
4. NAME OF DRILLER: K. Roberts
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 254.5 9/21/10
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
15. DATE BORING: STARTED 9/21/10 COMPLETED 9/21/10
6. THICKNESS OF OVERBURDEN:
16. ELEVATION TOP OF BORING: 260.5
7. DEPTH DRILLED INTO ROCK:
17. TOTAL CORE RECOVERY FOR BORING: N/A
8. TOTAL DEPTH OF BORING: 30.0
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	13 14 10	24		Lean Clay (CL) Gray & Brown, very stiff, Fine	100	1							14.8					
		☒	6 9 10	19		Lean Clay (CL) Gray & Brown, very stiff, Fine	100	2					31	15	10.3					
255.0	5.5																			
		☒	2 3 5	8		Poorly-graded Sand with Clay (SP-SC) Gray, Fine	100	3			10									
252.5	8.0																			
		☒	5 3 4	7		Poorly-graded Sand (SP) Gray, Medium	100	4	0	96	4	0.123								
250.0	10.5																			
		☒	4 5 7	12		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	5			6									
247.5	13.0																			
		☒	4 9 9	18		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	2 6 13	19		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	5 8 8	16		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	7 6 9	15		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	5 9 10	19		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	21 19 16	35		Poorly-graded Sand (SP) Gray, Fine	100	11												
		☒	7 9 14	23		Poorly-graded Sand (SP) Gray, Fine	100	12												
230.5	30.0																			

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
2. HOLE NUMBER: 032-BPR-10
LOCATION COORDINATES: N 13,167,344.6 E 2,482,389.8
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
4. NAME OF DRILLER: K. Roberts
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 254.4 9/21/10
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
15. DATE BORING: STARTED 9/21/10 COMPLETED 9/21/10
6. THICKNESS OF OVERBURDEN:
16. ELEVATION TOP OF BORING: 261.4
7. DEPTH DRILLED INTO ROCK:
17. TOTAL CORE RECOVERY FOR BORING: N/A
8. TOTAL DEPTH OF BORING: 30.0
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
258.4	3.0	☒	5 4 8	12		Silt (ML) Brown & Gray, & Mottled, stiff, Oxidized	100	1							12.5					
255.9	5.5	☒	3 6 9	15		Silty Clay (CL-ML) Brown & Tan, stiff	100	2					20	7	6.6					
253.4	8.0	☒	4 3 4	7		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	3			8									
250.9	10.5	☒	1 2 5	7		Silty Sand (SM) Gray, Fine	100	4												
		☒	5 6 8	14		Poorly-graded Sand (SP) Gray, Fine	100	5			3									
		☒	5 9 7	16		Poorly-graded Sand (SP) Gray, Fine	100	6	0	98	2	0.134								
		☒	4 8 10	18		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	7 9 9	18		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	19 24 21	45		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	16 24 26	50		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	28 26 28	54		Poorly-graded Sand (SP) Gray, Fine	100	11												
231.4	30.0	☒	16 18 21	39		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION	Mississippi Valley Division (MVD)
INSTALLATION	Memphis District (CEMVM)
SHEET	1 OF 1 SHEETS
1. PROJECT	Below Piggott - West Bank SFB Seepage Study
9. COORDINATE SYSTEM	HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT:	2.25" ID
2. HOLE NUMBER	033-BPR-10
LOCATION COORDINATES	N 13,167,050.1 E 2,481,988.2
11. MANUFACTURER'S DESIGNATION OF DRILL	CME 45
3. DRILLING AGENCY	Tri-State Testing Services, Inc.
12. TOTAL SAMPLES / DISTURBED / UNDISTURBED	12 / 12 / 0
4. NAME OF DRILLER	K. Roberts
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	253.8 9/21/10
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
15. DATE BORING	STARTED 9/21/10; COMPLETED 9/21/10
6. THICKNESS OF OVERBURDEN	
16. ELEVATION TOP OF BORING	260.8
7. DEPTH DRILLED INTO ROCK	
17. TOTAL CORE RECOVERY FOR BORING	N/A
8. TOTAL DEPTH OF BORING	30.0
18. SIGNATURE AND TITLE OF INSPECTOR	Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	1 2 4	6		Lean Clay (CL) Brown, medium, Oxidized, Fine	100	1							18.4					
		☒	2 2 5	7		Lean Clay (CL) Gray, medium	100	2					35	20	17.5					
255.3	5.5																			
		☒	4 4 5	9		Silty Sand (SM) Brown, Oxidized, Fine	100	3			17									
		☒	4 5 5	10		Silty Sand (SM) Gray, Fine	100	4												
		☒	3 5 9	14		Silty Sand (SM) Gray, Fine	100	5												
247.8	13.0																			
		☒	9 13 14	27		Poorly-graded Sand (SP) Gray, Fine	100	6			2									
		☒	4 7 11	18		Poorly-graded Sand (SP) Gray, Fine	100	7	2	97	1	0.191								
		☒	5 7 7	14		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	6 10 9	19		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	5 11 13	24		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	15 12 13	25		Poorly-graded Sand (SP) Gray, Fine	100	11												
		☒	20 13 15	28		Poorly-graded Sand (SP) Gray, Fine	100	12												
230.8	30.0																			

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
2. HOLE NUMBER: 034-BPR-10
LOCATION COORDINATES: N 13,166,753.7 E 2,481,617.7
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
4. NAME OF DRILLER: K. Roberts
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 255.2 9/27/10
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
15. DATE BORING: STARTED 9/27/10 COMPLETED 9/27/10
6. THICKNESS OF OVERBURDEN:
16. ELEVATION TOP OF BORING: 261.2
7. DEPTH DRILLED INTO ROCK:
17. TOTAL CORE RECOVERY FOR BORING: N/A
8. TOTAL DEPTH OF BORING: 30.0
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
			8 7 11	18		Lean Clay (CL) Dark Gray, medium, Fine	100	1							9.9					
			2 7 11	18		Lean Clay (CL) Dark Gray, very stiff, Fine	100	2					37	21	11.8					
255.7	5.5																			
			2 2 6	8		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	3			6									
			3 5 5	10		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	4			8									
250.7	10.5																			
			1 6 13	19		Poorly-graded Sand (SP) Gray, Fine	100	5	0	99	1	0.157								
			10 9 10	19		Poorly-graded Sand (SP) Gray, Fine	100	6												
			10 10 12	22		Poorly-graded Sand (SP) Gray, Fine	100	7												
			8 8 11	19		Poorly-graded Sand (SP) Gray, Fine	100	8												
			8 8 13	21		Poorly-graded Sand (SP) Gray, Fine	100	9												
			7 8 9	17		Poorly-graded Sand (SP) Gray, Fine	100	10												
			14 16 24	40		Poorly-graded Sand (SP) Gray, Fine	100	11												
			20 20 18	38		Poorly-graded Sand (SP) Gray, Fine	100	12												
231.2	30.0																			

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 035-BPR-10
LOCATION COORDINATES: N 13,166,436.0 E 2,481,194.3
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 254.0 9/27/10
15. DATE BORING: STARTED 9/27/10 COMPLETED 9/27/10
16. ELEVATION TOP OF BORING: 262.0
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
259.0	3.0	☒	10 15 16	31		Silty Sand (SM) Brown, Fine	100	1												
		☒	9 10 11	21		Clayey Sand (SC) Brown & Gray, Fine	100	2			32				6.9					
		☒	2 4 6	10		Clayey Sand (SC) Dark Gray, Oxidized	100	3			28									
254.0 ▼	8.0																			
		☒	2 3 5	8		Poorly-graded Sand with Clay (SP-SC) Dark Gray	100	4	12	82	6	0.085								
		☒	3 3 4	7		Poorly-graded Sand with Clay (SP-SC) Dark Gray, Fine	100	5												
249.0	13.0																			
		☒	2 7 9	16		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	5 7 10	17		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	5 9 12	21		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	5 11 12	23		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	7 14 22	36		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	14 14 12	26		Poorly-graded Sand (SP) Gray, Fine	100	11												
232.0	30.0	☒	15 15 15	30		Poorly-graded Sand (SP) Gray, Fine	100	12												

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)	INSTALLATION: Memphis District (CEMVM)	SHEET 1 OF 1 SHEETS	
1. PROJECT: Below Piggott - West Bank SFB Seepage Study	9. COORDINATE SYSTEM	HORIZONTAL	VERTICAL
	10. SIZE AND TYPE OF BIT: 2.25" ID		
2. HOLE NUMBER: 036-BPR-10	LOCATION COORDINATES: N 13,166,146.6 E 2,480,821.7	11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45	
3. DRILLING AGENCY: Tri-State Testing Services, Inc.	12. TOTAL SAMPLES: 12	DISTURBED: 12	UNDISTURBED: 0
4. NAME OF DRILLER: K. Roberts	13. TOTAL NUMBER CORE BOXES: 0		
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED	DEG FROM VERTICAL: --- BEARING:	14. ELEVATION GROUND WATER: 254.7	9/27/10
	15. DATE BORING	STARTED: 9/27/10	COMPLETED: 9/27/10
6. THICKNESS OF OVERBURDEN	16. ELEVATION TOP OF BORING: 262.2		
7. DEPTH DRILLED INTO ROCK	17. TOTAL CORE RECOVERY FOR BORING: N/A		
8. TOTAL DEPTH OF BORING: 30.0	18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor		

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	11 10 10	20		Silt (ML) Brown, very stiff	100	1							5.8					
259.2	3.0																			
		☒	7 10 12	22		Lean Clay (CL) Brown, very stiff	100	2					21	8	6.8					
256.7	5.5																			
		☒	4 5 5	10		Poorly-graded Sand with Silt (SP-SM) Brown, Fine	100	3			7									
		☒	2 3 5	8		Poorly-graded Sand with Silt (SP-SM) Brown, Fine	100	4			7									
		☒	9 8 12	20		Poorly-graded Sand with Silt (SP-SM) Brown, Fine	100	5	0	93	7	0.099								
249.2	13.0																			
		☒	5 5 7	12		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	2 6 9	15		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	9 10 10	20		Poorly-graded Sand (SP) Gray, Medium	100	8												
		☒	7 12 12	24		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	5 9 12	21		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	11 13 15	28		Poorly-graded Sand (SP) Gray, Fine	100	11												
		☒	10 15 15	30		Poorly-graded Sand (SP) Gray, Fine	100	12												
232.2	30.0																			

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 037-BPR-10
LOCATION COORDINATES: N 13,165,827.9 E 2,480,397.1
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 253.3 9/28/10
15. DATE BORING: STARTED 9/28/10 COMPLETED 9/28/10
16. ELEVATION TOP OF BORING: 261.3
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	15 15 15	30		Silt (ML) Brown, very stiff	100	1							7.1					
258.3	3.0																			
		☒	8 12 12	24		Silt (ML) Sandy, Brown, very stiff	100	2			54				6.8					
255.8	5.5																			
		☒	4 7 8	15		Silty Sand (SM) Brown, Fine	100	3												
253.3 ▼	8.0																			
		☒	2 4 5	9		Poorly-graded Sand with Silt (SP-SM) Brown, Fine	100	4			8									
250.8	10.5																			
		☒	3 3 5	8		Poorly-graded Sand (SP) Brown, Fine	100	5	0	99	1	0.164								
		☒	6 13 14	27		Poorly-graded Sand (SP) Brown, Fine	100	6												
		☒	7 6 8	14		Poorly-graded Sand (SP) Brown, Fine	100	7												
		☒	4 8 13	21		Poorly-graded Sand (SP) Gray & Brown, Fine	100	8												
		☒	11 13 13	26		Poorly-graded Sand (SP) Gray & Brown, Fine	100	9												
		☒	7 11 13	24		Poorly-graded Sand (SP) Gray & Brown, Fine	100	10												
		☒	6 11 12	23		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	11												
		☒	8 11 13	24		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	12												
231.3	30.0																			

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
2. HOLE NUMBER: 038-BPR-10
LOCATION COORDINATES: N 13,165,540.0 E 2,480,002.6
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
4. NAME OF DRILLER: K. Roberts
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 253.2 9/28/10
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
15. DATE BORING: STARTED 9/28/10 COMPLETED 9/28/10
6. THICKNESS OF OVERBURDEN:
16. ELEVATION TOP OF BORING: 261.7
7. DEPTH DRILLED INTO ROCK:
17. TOTAL CORE RECOVERY FOR BORING: N/A
8. TOTAL DEPTH OF BORING: 30.0
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	5 5 7	12		Silt (ML) Gray & Tan, & Mottled, stiff, Oxidized	100	1							11.9					
		☒	7 11 11	22		Silt (ML) Tan, medium, Oxidized	100	2							7.8					
256.2	5.5																			
		☒	5 6 10	16		Lean Clay (CL) Brown & Gray, stiff	100	3					21	8	13.3					
253.7	8.0																			
		☒	3 4 4	8		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	4			11									
251.2	10.5																			
		☒	3 5 5	10		Silty Sand (SM) Gray, Fine	100	5												
248.7	13.0																			
		☒	3 5 7	12		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	6			7									
246.2	15.5																			
		☒	3 5 6	11		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	7	1	98	1	0.174								
		☒	5 9 10	19		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	8												
		☒	3 4 5	9		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	9												
		☒	1 3 4	7		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	10 16 18	34		Poorly-graded Sand (SP) Brown, Fine	100	11												
		☒	26 22 22	44		Poorly-graded Sand (SP) Gray, Fine	100	12												
231.7	30.0																			

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)

INSTALLATION: Memphis District (CEMVM)

SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study

9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

10. SIZE AND TYPE OF BIT: 2.25" ID

2. HOLE NUMBER: 039-BPR-10

LOCATION COORDINATES: N 13,165,289.5 E 2,479,579.8

11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45

3. DRILLING AGENCY: Tri-State Testing Services, Inc.

12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0

4. NAME OF DRILLER: K. Roberts

13. TOTAL NUMBER CORE BOXES: 0

5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:

14. ELEVATION GROUND WATER: 255.0 9/28/10

15. DATE BORING: STARTED 9/28/10 COMPLETED 9/28/10

6. THICKNESS OF OVERBURDEN:

16. ELEVATION TOP OF BORING: 261.0

7. DEPTH DRILLED INTO ROCK:

17. TOTAL CORE RECOVERY FOR BORING: N/A

8. TOTAL DEPTH OF BORING: 30.0

18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	12 14 15	29		Silty Sand (SM) Brown, Fine	100	1			25									
		☒	4 6 8	14		Silty Sand (SM) Brown, Fine	100	2												
		☒	2 4 6	10		Silty Sand (SM) Brown, Fine	100	3			33									
253.0	8.0																			
		☒	1 5 6	11		Poorly-graded Sand (SP) Brown, Fine	100	4	0	98	2	0.171								
		☒	6 9 6	15		Poorly-graded Sand (SP) Brown, Fine	100	5												
		☒	5 7 9	16		Poorly-graded Sand (SP) Gray & Brown, Fine	100	6												
		☒	7 12 13	25		Poorly-graded Sand (SP) Gray & Brown, Fine	100	7												
		☒	5 8 11	19		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	10 12 11	23		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	5 8 10	18		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	20 14 14	28		Poorly-graded Sand (SP) Gray, Fine	100	11												
231.0	30.0	☒	19 21 25	46		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 040-BPR-10
LOCATION COORDINATES: N 13,165,019.9 E 2,479,165.7
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 253.9 9/28/10
15. DATE BORING: STARTED 9/28/10 COMPLETED 9/28/10
16. ELEVATION TOP OF BORING: 259.9
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
256.9	3.0	☒	14 13 12	25		Silt (ML) Brown, very stiff, Oxidized	100	1							9.1					
254.4	5.5	☒	4 6 8	14		Lean Clay (CL) Brown & Gray, stiff, Oxidized, Rootlets	100	2					32	20	13.3					
251.9	8.0	☒	2 3 5	8		Clayey Sand (SC) Gray, Fine, Rootlets	100	3			19									
		☒	2 3 6	9		Poorly-graded Sand (SP) Gray, Fine, Rootlets	100	4	0	96	3	0.112								
		☒	4 12 9	21		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	5												
		☒	3 7 10	17		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	3 6 9	15		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	4 6 9	15		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	15 12 12	24		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	12 13 15	28		Poorly-graded Sand (SP) Gray, Medium	100	10												
		☒	7 12 12	24		Poorly-graded Sand (SP) Gray, Fine	100	11												
229.9	30.0	☒	3 7 12	19		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
2. HOLE NUMBER: 041-BPR-10
LOCATION COORDINATES: N 13,164,738.9 E 2,478,704.7
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
4. NAME OF DRILLER: K. Roberts
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 254.6 9/28/10
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
15. DATE BORING: STARTED 9/28/10 COMPLETED 9/28/10
6. THICKNESS OF OVERBURDEN:
16. ELEVATION TOP OF BORING: 260.6
7. DEPTH DRILLED INTO ROCK:
17. TOTAL CORE RECOVERY FOR BORING: N/A
8. TOTAL DEPTH OF BORING: 30.0
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	10 7 10	17		Silty Sand (SM) Tan, Fine	100	1			37				7.0					
		☒	4 11 14	25		Silty Sand (SM) Tan, Fine, Rootlets	100	2			33									
		☒	5 6 9	15		Silty Sand (SM) Brown, Oxidized, Fine	100	3												
		☒	2 7 8	15		Silty Sand (SM) Brown, Fine	100	4												
		☒	5 5 5	10		Silty Sand (SM) Gray, Fine	100	5			26									
247.6	13.0																			
		☒	5 10 12	22		Poorly-graded Sand (SP) Gray, Fine	100	6	0	97	3	0.113								
		☒	8 9 9	18		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	3 5 5	10		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	8 11 9	20		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	9 14 12	26		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	9 13 13	26		Poorly-graded Sand (SP) Gray, Fine	100	11												
230.6	30.0	☒	16 17 16	33		Poorly-graded Sand (SP) Gray, Medium, Lignite Fragments	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 042-BPR-10
LOCATION COORDINATES: N 13,164,460.6 E 2,478,269.4
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 253.8 9/29/10
15. DATE BORING: STARTED 9/29/10 COMPLETED 9/29/10
16. ELEVATION TOP OF BORING: 259.8
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
256.8	3.0	☒	13 12 12	24		Silt (ML) Brown, very stiff, Oxidized	100	1							12.0					
254.3	5.5	☒	6 8 10	18		Silty Clay (CL-ML) Tan, very stiff	100	2					20	7	8.7					
		☒	5 7 5	12		Silty Sand (SM) Brown, Fine	100	3			19									
249.3	10.5	☒	5 6 8	14		Silty Sand (SM) Brown, Fine	100	4												
246.8	13.0	☒	5 6 8	14		Poorly-graded Sand with Silt (SP-SM) Brown, Fine	100	5			6									
		☒	6 13 13	26		Poorly-graded Sand (SP) Brown, Fine	100	6	0	98	2	0.156								
		☒	9 11 14	25		Poorly-graded Sand (SP) Brown, Fine	100	7												
		☒	4 5 6	11		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	3 4 7	11		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	14 15 21	36		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	13 16 20	36		Poorly-graded Sand (SP) Gray, Medium	100	11												
229.8	30.0	☒	30 31 34	65		Poorly-graded Sand (SP) Gray, Medium	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 043-BPR-10
LOCATION COORDINATES: N 13,164,219.1 E 2,477,872.2
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 252.3 9/29/10
15. DATE BORING: STARTED 9/29/10 COMPLETED 9/29/10
16. ELEVATION TOP OF BORING: 259.8
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	11 10 7	17		Silty Sand (SM) Brown, Fine	100	1												
		☒	4 4 5	9		Silty Sand (SM) Brown, Fine	100	2			30									
		☒	3 6 7	13		Silty Sand (SM) Brown & Gray, & Mottled, Oxidized, Fine	100	3												
251.8	8.0																			
		☒	5 6 5	11		Poorly-graded Sand (SP) Brown & Gray, Fine	100	4			3									
		☒	6 6 5	11		Poorly-graded Sand (SP) Gray, Fine	100	5	0	99	1	0.154								
		☒	5 7 7	14		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	6 14 19	33		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	14 9 10	19		Poorly-graded Sand (SP) Brown, Medium, Lignite Fragments	100	8												
		☒	4 6 5	11		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	9												
		☒	2 4 4	8		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	6 10 11	21		Poorly-graded Sand (SP) Gray, Medium	100	11												
229.8	30.0	☒	7 8 11	19		Poorly-graded Sand (SP) Gray, Medium	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 044-BPR-10
LOCATION COORDINATES: N 13,163,948.1 E 2,477,458.0
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 252.5 9/29/10
15. DATE BORING: STARTED 9/29/10 COMPLETED 9/29/10
16. ELEVATION TOP OF BORING: 260.5
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
			7 2 8	10		Silt (ML) Brown & Gray, stiff, Oxidized	100	1							26.6					
257.5	3.0																			
			5 5 6	11		Lean Clay (CL) Brown & Gray, stiff	100	2					23	9	17.9					
255.0	5.5																			
			2 3 5	8		Clayey Sand (SC) Gray	100	3			29				22.5					
			1 1 3	4		Clayey Sand (SC) Gray	100	4			18									
250.0	10.5																			
			4 2 5	7		Lean Clay (CL) Sandy, Gray, medium	100	5			69				57.3					
247.5	13.0																			
			4 10 11	21		Poorly-graded Sand with Silt (SP-SM) Brown & Gray, Fine	100	6	0	94	6	0.084								
245.0	15.5																			
			7 11 12	23		Poorly-graded Sand (SP) Gray, Fine	100	7												
			6 8 10	18		Poorly-graded Sand (SP) Gray, Fine	100	8												
			4 5 9	14		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	9												
			7 9 9	18		Poorly-graded Sand (SP) Gray, Fine	100	10												
			31 12 7	19		Poorly-graded Sand (SP) Gray, Fine	100	11												
			1 3 7	10		Poorly-graded Sand (SP) Gray, Fine	100	12												
230.5	30.0																			

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 045-BPR-10
LOCATION COORDINATES: N 13,163,670.1 E 2,477,034.4
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 253.4 9/29/10
15. DATE BORING: STARTED 9/29/10 COMPLETED 9/29/10
16. ELEVATION TOP OF BORING: 259.4
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
256.4	3.0	☒	3 4 4	8		Lean Clay (CL) Brown, medium, Oxidized, Fine	100	1							17.2					
		☒	3 4 5	9		Clayey Sand (SC) Gray & Brown	100	2			38				18.3					
251.4	8.0	☒	2 2 4	6		Clayey Sand (SC) Gray	100	3			19				24.5					
		☒	3 4 5	9		Poorly-graded Sand (SP) Gray, Fine	100	4	0	99	1	0.147								
		☒	6 6 7	13		Poorly-graded Sand (SP) Gray, Fine	100	5												
		☒	3 5 8	13		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	7 12 11	23		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	6 8 10	18		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	6 12 14	26		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	7 10 10	20		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	12 18 16	34		Poorly-graded Sand (SP) Gray, Fine	100	11												
229.4	30.0	☒	9 11 14	25		Poorly-graded Sand (SP) Gray, Medium	100	12												

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 046-BPR-10
LOCATION COORDINATES: N 13,163,364.1 E 2,476,625.8
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 250.3 9/29/10
15. DATE BORING: STARTED 9/29/10 COMPLETED 9/29/10
16. ELEVATION TOP OF BORING: 259.3
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
256.3	3.0	☒	1 0 4	4		Lean Clay (CL) Gray & Brown, soft	100	1							31.1					
253.8	5.5	☒	1 3 4	7		Fat Clay (CH) Brown & Gray, medium	100	2					61	38	29.2					
251.3	8.0	☒	2 3 3	6		Lean Clay (CL) Brown & Gray, medium	100	3							33.0					
248.8	10.5	☒	1 4 8	12		Silty Clay (CL-ML) Gray, stiff	100	4					21	4	20.6					
246.3	13.0	☒	4 9 12	21		Poorly-graded Sand with Clay (SP-SC) Gray, Fine, Lignite Fragments	100	5			8									
		☒	4 10 10	20		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	6	0	98	2	0.156								
		☒	8 14 18	32		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	5 8 8	16		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	8												
		☒	3 11 11	22		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	9												
		☒	9 9 9	18		Poorly-graded Sand (SP) Gray, Fine, Clay Strata or Lenses, Lignite Fragments	100	10												
		☒	10 10 14	24		Poorly-graded Sand (SP) Gray, Fine	100	11												
229.3	30.0	☒	8 10 13	23		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 047-BPR-10
LOCATION COORDINATES: N 13,163,089.0 E 2,476,235.3
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 250.8 9/30/10
15. DATE BORING: STARTED 9/30/10 COMPLETED 9/30/10
16. ELEVATION TOP OF BORING: 259.3
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
257.8	1.5	☒	2 3 5	8		Lean Clay (CL) Brown, medium, Fine	100	1												
256.3	3.0																			
253.8	5.5	☒	2 3 5	8		Lean Clay (CL) Gray & Brown, & Mottled, medium, Oxidized	100	2							32.1					
251.3	8.0	☒	2 3 5	8		Fat Clay (CH) Gray, medium, Oxidized, Rootlets	100	3					72	49	46.2					
		☒	1 1 5	6		Poorly-graded Sand (SP) Gray, Fine	100	4			4									
246.3	13.0	☒	4 9 13	22		Poorly-graded Sand (SP) Gray, Fine	100	5			4									
243.8	15.5	☒	4 10 10	20		Silty Sand (SM) Gray, Fine	100	6	0	83	17									
		☒	12 12 14	26		Poorly-graded Sand (SP) Gray, Medium	100	7												
		☒	9 12 14	26		Poorly-graded Sand (SP) Gray, Medium	100	8												
		☒	12 24 25	49		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	11 21 24	45		Poorly-graded Sand (SP) Gray, Medium	100	10												
		☒	14 16 17	33		Poorly-graded Sand (SP) Gray, Fine	100	11												
229.3	30.0	☒	17 31 26	57		Poorly-graded Sand (SP) Gray, Medium	100	12												

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 048-BPR-10
LOCATION COORDINATES: N 13,162,775.2 E 2,475,809.5
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 253.2 9/30/10
15. DATE BORING: STARTED 9/30/10 COMPLETED 9/30/10
16. ELEVATION TOP OF BORING: 259.2
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
256.2	3.0	☒	0 0 3	3		Silt (ML) Brown, soft, Fine	100	1							20.7					
253.7	5.5	☒	2 6 8	14		Fat Clay (CH) Brown & Gray, & Mottled, stiff, Oxidized, Fine	100	2							24.6					
251.2	8.0	☒	2 3 5	8		Lean Clay (CL) Brown & Gray, medium, Fine	100	3					31	18	22.5					
248.7	10.5	☒	3 3 3	6		Clayey Sand (SC) Gray & Green	100	4			20				26.0					
		☒	7 5 5	10		Silty Sand (SM) Gray, Fine	100	5			12									
243.7	15.5	☒	4 3 3	6		Silty Sand (SM) Gray, Fine	100	6	0	86	14									
		☒	7 10 10	20		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	5 10 11	21		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	7 9 12	21		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	8 6 14	20		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	9 12 12	24		Poorly-graded Sand (SP) Gray, Medium	100	11												
229.2	30.0	☒	10 12 14	26		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)	INSTALLATION: Memphis District (CEMVM)	SHEET 1 OF 1 SHEETS	
1. PROJECT: Below Piggott - West Bank SFB Seepage Study	9. COORDINATE SYSTEM	HORIZONTAL	VERTICAL
	10. SIZE AND TYPE OF BIT: 2.25" ID		
2. HOLE NUMBER: 049-BPR-10	LOCATION COORDINATES: N 13,162,502.7 E 2,475,429.6	11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45	
3. DRILLING AGENCY: Tri-State Testing Services, Inc.	12. TOTAL SAMPLES: 12	DISTURBED: 12	UNDISTURBED: 0
4. NAME OF DRILLER: K. Roberts	13. TOTAL NUMBER CORE BOXES: 0		
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED	DEG FROM VERTICAL: ---	BEARING	14. ELEVATION GROUND WATER: 253.7 9/30/10
	15. DATE BORING	STARTED: 9/30/10	COMPLETED: 9/30/10
6. THICKNESS OF OVERBURDEN	16. ELEVATION TOP OF BORING: 259.7		
7. DEPTH DRILLED INTO ROCK	17. TOTAL CORE RECOVERY FOR BORING: N/A		
8. TOTAL DEPTH OF BORING: 30.0	18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor		

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
256.7	3.0	☒	2 4 4	8		Fat Clay (CH) Brown & Gray, medium, Oxidized	100	1							17.4					
254.2	5.5	☒	2 4 5	9		Lean Clay (CL) Brown & Gray, stiff, Oxidized, Fine	100	2					29	18	17.7					
251.7	8.0	☒	3 3 4	7		Clayey Sand (SC) Brown & Gray, Oxidized, Fine	100	3			14									
249.2	10.5	☒	2 4 6	10		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	4			7									
246.7	13.0	☒	5 6 8	14		Poorly-graded Sand (SP) Gray, Fine	100	5	0	99	1	0.179								
244.2	15.5	☒	4 6 8	14		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	6												
		☒	61 21 56	77		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	7 12 12	24		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	5 10 11	21		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	7 10 12	22		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	10												
		☒	7 13 18	31		Poorly-graded Sand (SP) Gray, Fine	100	11												
229.7	30.0	☒	13 16 18	34		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 050-BPR-10
LOCATION COORDINATES: N 13,162,194.0 E 2,474,998.8
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 250.7 9/30/10
15. DATE BORING: STARTED 9/30/10 COMPLETED 9/30/10
16. ELEVATION TOP OF BORING: 259.7
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
256.7	3.0	☒	4 5 4	9		Lean Clay (CL) Gray & Brown, stiff, Fine	100	1							16.2					
254.2	5.5	☒	3 3 3	6		Silty Clay (CL-ML) Brown, medium, Fine	100	2					17	4	17.7					
251.7	8.0	☒	6 6 8	14		Silty Sand (SM) Brown, Oxidized, Fine	100	3			15									
249.2	10.5	☒	3 4 6	10		Poorly-graded Sand with Silt (SP-SM) Brown, Oxidized, Fine	100	4			7									
		☒	1 3 3	6		Poorly-graded Sand (SP) Gray, Fine	100	5	0	98	2	0.130								
		☒	5 6 8	14		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	2 2 2	4		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	10 15 10	25		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	12 11 12	23		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	12 16 18	34		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	24 23 24	47		Poorly-graded Sand (SP) Gray, Medium	100	11												
229.7	30.0	☒	28 24 30	54		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)	INSTALLATION: Memphis District (CEMVM)	SHEET 1 OF 1 SHEETS	
1. PROJECT: Below Piggott - West Bank SFB Seepage Study	9. COORDINATE SYSTEM:	HORIZONTAL:	VERTICAL:
	10. SIZE AND TYPE OF BIT: 2.25" ID		
2. HOLE NUMBER: 051-BPR-10	LOCATION COORDINATES: N 13,161,893.0 E 2,474,619.9	11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45	
3. DRILLING AGENCY: Tri-State Testing Services, Inc.		12. TOTAL SAMPLES: 12	DISTURBED: 12 / UNDISTURBED: 0
4. NAME OF DRILLER: K. Roberts		13. TOTAL NUMBER CORE BOXES: 0	
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED	DEG FROM VERTICAL: --- / BEARING:	14. ELEVATION GROUND WATER: 252.1	10/1/10
		15. DATE BORING: STARTED 10/1/10	COMPLETED 10/1/10
6. THICKNESS OF OVERBURDEN		16. ELEVATION TOP OF BORING: 259.1	
7. DEPTH DRILLED INTO ROCK		17. TOTAL CORE RECOVERY FOR BORING: N/A	
8. TOTAL DEPTH OF BORING: 30.0		18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor	

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	2 4 4	8		Lean Clay (CL) Brown & Gray, medium, Fine	100	1							17.9					
		☒	1 2 3	5		Lean Clay (CL) Brown & Gray, medium	100	2					26	14	22.0					
253.6	5.5																			
		☒	1 2 3	5		Clayey Sand (SC) Brown & Gray	100	3			19				23.1					
251.1	8.0																			
		☒	3 3 4	7		Poorly-graded Sand (SP) Gray	100	4			4									
		☒	3 4 5	9		Poorly-graded Sand (SP) Brown & Gray, Fine	100	5	0	99	1	0.140								
		☒	2 5 6	11		Poorly-graded Sand (SP) Brown & Gray, Fine	100	6												
		☒	9 7 9	16		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	5 9 11	20		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	8 10 9	19		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	9												
		☒	9 11 13	24		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	38 29 31	60		Poorly-graded Sand (SP) Gray, Fine	100	11												
		☒	35 36 38	74		Poorly-graded Sand (SP) Gray, Fine	100	12												
229.1	30.0																			

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)	INSTALLATION: Memphis District (CEMVM)	SHEET 1 OF 1 SHEETS	
1. PROJECT: Below Piggott - West Bank SFB Seepage Study	9. COORDINATE SYSTEM	HORIZONTAL	VERTICAL
	10. SIZE AND TYPE OF BIT: 2.25" ID		
2. HOLE NUMBER: 052-BPR-10	LOCATION COORDINATES: N 13,161,554.9 E 2,474,223.8	11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45	
3. DRILLING AGENCY: Tri-State Testing Services, Inc.	12. TOTAL SAMPLES: 12	DISTURBED: 12	UNDISTURBED: 0
4. NAME OF DRILLER: K. Roberts	13. TOTAL NUMBER CORE BOXES: 0		
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:	14. ELEVATION GROUND WATER: 250.5 10/1/10		
	15. DATE BORING: STARTED 10/1/10	COMPLETED 10/1/10	
6. THICKNESS OF OVERBURDEN	16. ELEVATION TOP OF BORING: 259.0		
7. DEPTH DRILLED INTO ROCK	17. TOTAL CORE RECOVERY FOR BORING: N/A		
8. TOTAL DEPTH OF BORING: 30.0	18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor		

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
256.0	3.0	☒	5 6 6	12		Fat Clay (CH) Brown & Gray, stiff, Oxidized, Lignite Fragments	100	1							16.2					
253.5	5.5	☒	4 3 4	7		Lean Clay (CL) Brown & Gray, medium	100	2					30	17	18.7					
251.0	8.0	☒	2 2 4	6		Clayey Sand (SC) Gray, Oxidized, Fine	100	3			21									
248.5	10.5	☒	3 4 9	13		Poorly-graded Sand with Clay (SP-SC) Gray, Fine	100	4			10									
		☒	4 8 12	20		Poorly-graded Sand (SP) Gray, Fine	100	5	0	98	2	0.135								
		☒	4 9 10	19		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	6 11 12	23		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	7 17 18	35		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	9 17 22	39		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	8 15 16	31		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	17 40 35	75		Poorly-graded Sand (SP) Gray, Fine	100	11												
229.0	30.0	☒	30 19 31	50		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)	INSTALLATION: Memphis District (CEMVM)	SHEET 1 OF 1 SHEETS	
1. PROJECT: Below Piggott - West Bank SFB Seepage Study	9. COORDINATE SYSTEM	HORIZONTAL	VERTICAL
	10. SIZE AND TYPE OF BIT: 2.25" ID		
2. HOLE NUMBER: 053-BPR-10	LOCATION COORDINATES: N 13,161,246.9 E 2,473,900.7	11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45	
3. DRILLING AGENCY: Tri-State Testing Services, Inc.	12. TOTAL SAMPLES: 12	DISTURBED: 12	UNDISTURBED: 0
4. NAME OF DRILLER: K. Roberts	13. TOTAL NUMBER CORE BOXES: 0		
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: --- ; BEARING:	14. ELEVATION GROUND WATER: 251.5 10/1/10		
	15. DATE BORING	STARTED: 10/1/10	COMPLETED: 10/1/10
6. THICKNESS OF OVERBURDEN	16. ELEVATION TOP OF BORING: 258.5		
7. DEPTH DRILLED INTO ROCK	17. TOTAL CORE RECOVERY FOR BORING: N/A		
8. TOTAL DEPTH OF BORING: 30.0	18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor		

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
255.5	3.0	☒	2 3 9	12		Lean Clay (CL) Brown & Gray, & Mottled, stiff, Oxidized	100	1					21	8	11.1					
		☒	7 3 6	9		Clayey Sand (SC) Brown & Gray, Oxidized, Fine	100	2			32									
250.5	8.0	☒	8 6 7	13		Clayey Sand (SC) Brown, Fine	100	3												
248.0	10.5	☒	3 5 7	12		Poorly-graded Sand with Clay (SP-SC) Gray, Fine	100	4			5									
		☒	4 3 2	5		Poorly-graded Sand (SP) Gray, Fine	100	5	0	99	1	0.177								
		☒	4 7 7	14		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	9 17 20	37		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	5 13 18	31		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	3 11 12	23		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	9												
		☒	4 9 10	19		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	9 16 15	31		Poorly-graded Sand (SP) Gray, Fine	100	11												
228.5	30.0	☒	9 11 13	24		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
2. HOLE NUMBER: 054-BPR-10
LOCATION COORDINATES: N 13,160,910.8 E 2,473,482.8
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
4. NAME OF DRILLER: K. Roberts
13. TOTAL NUMBER CORE BOXES: 0
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
14. ELEVATION GROUND WATER: 251.4 10/1/10
15. DATE BORING: STARTED 10/1/10 COMPLETED 10/1/10
6. THICKNESS OF OVERBURDEN:
16. ELEVATION TOP OF BORING: 258.4
7. DEPTH DRILLED INTO ROCK:
17. TOTAL CORE RECOVERY FOR BORING: N/A
8. TOTAL DEPTH OF BORING: 30.0
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
			6 3 5	8		Lean Clay (CL) Red & Brown, medium	100	1							16.3					
255.4	3.0																			
			2 2 3	5		Silty Sand (SM) Gray, Fine	100	2			28									
			3 4 5	9		Silty Sand (SM) Red & Gray, Fine	100	3												
250.4	8.0																			
			3 3 5	8		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	4			10									
247.9	10.5																			
			3 7 10	17		Poorly-graded Sand (SP) Gray, Fine	100	5	0	98	2	0.153								
			3 5 11	16		Poorly-graded Sand (SP) Gray, Fine	100	6												
			5 8 12	20		Poorly-graded Sand (SP) Gray, Fine	100	7												
			6 11 14	25		Poorly-graded Sand (SP) Gray, Fine	100	8												
			9 15 19	34		Poorly-graded Sand (SP) Brown, Fine	100	9												
			9 11 16	27		Poorly-graded Sand (SP) Brown, Fine	100	10												
			6 12 15	27		Poorly-graded Sand (SP) Gray, Fine	100	11												
			6 14 16	30		Poorly-graded Sand (SP) Gray, Medium	100	12												
228.4	30.0																			

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 055-BPR-10
LOCATION COORDINATES: N 13,160,575.9 E 2,473,107.0
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 251.8 10/1/10
15. DATE BORING: STARTED 10/1/10 COMPLETED 10/1/10
16. ELEVATION TOP OF BORING: 257.8
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
254.8	3.0	☒	2 5 5	10		Silt (ML) Brown, stiff, Oxidized	100	1							16.7					
252.3	5.5	☒	2 2 5	7		Silty Clay (CL-ML) Brown & Gray, stiff	100	2					19	6	16.7					
249.8	8.0	☒	4 5 9	14		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	3			6									
		☒	8 9 9	18		Poorly-graded Sand (SP) Brown, Fine	100	4	0	99	1	0.182								
		☒	4 10 10	20		Poorly-graded Sand (SP) Brown, Fine	100	5												
		☒	5 10 13	23		Poorly-graded Sand (SP) Brown, Fine	100	6												
		☒	11 13 15	28		Poorly-graded Sand (SP) Brown & Gray, Fine	100	7												
		☒	7 18 18	36		Poorly-graded Sand (SP) Brown, Fine	100	8												
		☒	7 10 16	26		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	16 20 16	36		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	10 18 17	35		Poorly-graded Sand (SP) Gray, Fine	100	11												
227.8	30.0	☒	6 16 12	28		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
2. HOLE NUMBER: 056-BPR-10
LOCATION COORDINATES: N 13,160,263.3 E 2,472,726.6
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
4. NAME OF DRILLER: K. Roberts
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 250.0 10/1/10
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
15. DATE BORING: STARTED 10/1/10 COMPLETED 10/1/10
6. THICKNESS OF OVERBURDEN:
16. ELEVATION TOP OF BORING: 262.0
7. DEPTH DRILLED INTO ROCK:
17. TOTAL CORE RECOVERY FOR BORING: N/A
8. TOTAL DEPTH OF BORING: 30.0
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
259.0	3.0	☒	19 12 11	23		Silt (ML) Brown, very stiff, Oxidized	100	1							17.1					
256.5	5.5	☒	4 8 8	16		Lean Clay (CL) Brown, very stiff	100	2					28	15	10.8					
254.0	8.0	☒	4 4 4	8		Poorly-graded Sand with Silt (SP-SM) Brown, Fine	100	3			10									
251.5	10.5	☒	1 3 4	7		Poorly-graded Sand (SP) Brown, Fine	100	4	0	99	1	0.158								
249.0	13.0	☒	3 6 5	11		Poorly-graded Sand with Silt (SP-SM) Brown, Fine	100	5			11									
		☒	10 11 13	24		Poorly-graded Sand (SP) Brown, Fine	100	6												
		☒	9 15 16	31		Poorly-graded Sand (SP) Brown, Fine	100	7												
		☒	6 9 9	18		Poorly-graded Sand (SP) Brown, Fine	100	8												
		☒	9 15 15	30		Poorly-graded Sand (SP) Gray & Brown, Fine	100	9												
		☒	7 17 17	34		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	10												
		☒	15 13 16	29		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	11												
232.0	30.0	☒	9 11 10	21		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
2. HOLE NUMBER: 057-BPR-10
LOCATION COORDINATES: N 13,159,961.7 E 2,472,339.8
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
4. NAME OF DRILLER: K. Roberts
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 253.5 10/2/10
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
15. DATE BORING: STARTED 10/2/10 COMPLETED 10/2/10
6. THICKNESS OF OVERBURDEN:
16. ELEVATION TOP OF BORING: 262.5
7. DEPTH DRILLED INTO ROCK:
17. TOTAL CORE RECOVERY FOR BORING: N/A
8. TOTAL DEPTH OF BORING: 30.0
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
			8 7 8	15		Lean Clay (CL) Gray & Brown, stiff	100	1							6.5					
			5 6 11	17		Lean Clay (CL) Gray & Brown, very stiff	100	2					38	19	14.7					
257.0	5.5																			
			2 4 6	10		Clayey Sand (SC) Gray & Brown, Fine	100	3			31									
			2 4 6	10		Clayey Sand (SC) Brown & Gray, Fine	100	4			30									
252.0	10.5																			
			3 5 2	7		Silty Sand (SM) Brown & Gray, Fine	100	5	0	86	14									
			3 2 3	5		Silty Sand (SM) Brown & Gray, Fine	100	6												
247.0	15.5																			
			9 9 14	23		Poorly-graded Sand (SP) Gray, Fine	100	7												
			10 15 20	35		Poorly-graded Sand (SP) Gray, Fine	100	8												
			7 13 19	32		Poorly-graded Sand (SP) Gray, Fine	100	9												
			13 17 21	38		Poorly-graded Sand (SP) Gray, Fine	100	10												
			15 16 18	34		Poorly-graded Sand (SP) Gray, Fine	100	11												
			8 17 28	45		Poorly-graded Sand (SP) Gray, Fine	100	12												
232.5	30.0																			

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)

INSTALLATION: Memphis District (CEMVM)

SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study

9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

10. SIZE AND TYPE OF BIT: 2.25" ID

2. HOLE NUMBER: 058-BPR-10

LOCATION COORDINATES: N 13,159,651.6 E 2,471,951.2

11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45

3. DRILLING AGENCY: Tri-State Testing Services, Inc.

12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0

4. NAME OF DRILLER: K. Roberts

13. TOTAL NUMBER CORE BOXES: 0

14. ELEVATION GROUND WATER: 251.1 10/2/10

5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:

15. DATE BORING: STARTED 10/2/10 COMPLETED 10/2/10

6. THICKNESS OF OVERBURDEN:

16. ELEVATION TOP OF BORING: 262.1

7. DEPTH DRILLED INTO ROCK:

17. TOTAL CORE RECOVERY FOR BORING: N/A

8. TOTAL DEPTH OF BORING: 30.0

18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	9 9 9	18		Fat Clay (CH) Tan & Gray, & Mottled, stiff, Oxidized, Lignite Fragments	100	1							17.8					
		☒	3 5 7	12		Fat Clay (CH) Gray, stiff, Oxidized, Lignite Fragments	100	2							20.3					
256.6	5.5	☒	3 3 4	7		Lean Clay (CL) Gray, medium, Oxidized, Lignite Fragments	100	3					44	25	23.5					
254.1	8.0	☒	3 4 3	7		Fat Clay (CH) Gray & Brown, medium, Oxidized	100	4							26.4					
251.6	10.5	☒	2 5 5	10		Clayey Sand (SC) Gray, Fine, Rootlets	100	5			23									
		☒	2 7 12	19		Clayey Sand (SC) Gray, Fine	100	6			21									
246.6	15.5	☒	4 9 16	25		Poorly-graded Sand (SP) Gray, Fine	100	7	0	97	3	0.162								
		☒	8 13 13	26		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	3 5 9	14		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	6 10 12	22		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	6 10 15	25		Poorly-graded Sand (SP) Gray, Fine	100	11												
232.1	30.0	☒	8 9 11	20		Poorly-graded Sand (SP) Gray, Fine	100	12												

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
2. HOLE NUMBER: 059-BPR-10
LOCATION COORDINATES: N 13,159,352.5 E 2,471,528.2
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
4. NAME OF DRILLER: K. Roberts
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 253.5 10/2/10
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
15. DATE BORING: STARTED 10/2/10 COMPLETED 10/2/10
6. THICKNESS OF OVERBURDEN:
16. ELEVATION TOP OF BORING: 261.5
7. DEPTH DRILLED INTO ROCK:
17. TOTAL CORE RECOVERY FOR BORING: N/A
8. TOTAL DEPTH OF BORING: 30.0
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
258.5	3.0	☒	5 5 7	12		Clayey Sand (SC) Red & Brown, Fine	100	1			26									
256.0	5.5	☒	5 4 5	9		Silty Sand (SM) Red & Brown, Fine	100	2			34									
		☒	1 3 4	7		Lean Clay (CL) Gray, medium, Oxidized, Fine	100	3					28	15	28.3					
		☒	2 3 3	6		Lean Clay (CL) Gray, medium, Oxidized, Fine	100	4					36	19	21.0					
248.5	13.0	☒	2 3 6	9		Lean Clay (CL) Gray, medium, Oxidized, Fine, Rootlets	100	5							30.5					
		☒	9 15 15	30		Poorly-graded Sand (SP) Gray, Fine	100	6	1	97	2	0.158								
		☒	9 13 13	26		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	10 12 15	27		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	10 12 12	24		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	10 13 16	29		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	6 10 15	25		Poorly-graded Sand (SP) Gray, Fine	100	11												
231.5	30.0	☒	8 10 16	26		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

Boring Designation 060-BPR-10

DRILLING LOG	DIVISION	INSTALLATION	SHEET / OF
	Mississippi Valley Division (MVD)	Memphis District (CEMVM)	1 of 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study		9. COORDINATE SYSTEM	HORIZONTAL / VERTICAL
		10. SIZE AND TYPE OF BIT: 2.25" ID	
2. HOLE NUMBER: 060-BPR-10	LOCATION COORDINATES: N 13,159,087.1 E 2,471,098.6	11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45	
3. DRILLING AGENCY: Tri-State Testing Services, Inc.		12. TOTAL SAMPLES: 12	DISTURBED: 12 / UNDISTURBED: 0
4. NAME OF DRILLER: K. Roberts		13. TOTAL NUMBER CORE BOXES: 0	
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED	DEG FROM VERTICAL: --- / BEARING	14. ELEVATION GROUND WATER: 249.7	10/2/10
		15. DATE BORING	STARTED: 10/2/10 / COMPLETED: 10/2/10
6. THICKNESS OF OVERBURDEN		16. ELEVATION TOP OF BORING: 261.7	
7. DEPTH DRILLED INTO ROCK		17. TOTAL CORE RECOVERY FOR BORING: N/A	
8. TOTAL DEPTH OF BORING: 30.0		18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor	

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
258.7	3.0	☒	4 4 5	9		Silty Sand (SM) Brown, Fine	100	1												
		☒	3 6 7	13		Lean Clay (CL) Gray, stiff, Oxidized, Fine, Lignite Fragments	100	2							16.7					
		☒	1 3 4	7		Lean Clay (CL) Gray, medium, Oxidized, Fine	100	3							21.3					
		☒	2 2 2	4		Lean Clay (CL) Gray, soft, Oxidized	100	4					45	26	27.2					
248.7	13.0	☒	3 3 3	6		Lean Clay (CL) Gray, medium, Rootlets	100	5							33.5					
246.2	15.5	☒	1 3 4	7		Poorly-graded Sand (SP) Gray, Fine, Rootlets, Lignite Fragments	100	6	0	98	2	0.158			40.6					
243.7	18.0	☒	12 10 12	22		Clayey Sand (SC) Gray, Fine, Rootlets	100	7			23									
		☒	10 10 12	22		Poorly-graded Sand (SP) Gray, Fine	100	8	3	95	2	0.175								
		☒	12 14 15	29		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	9												
		☒	19 15 21	36		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	20 19 16	35		Poorly-graded Sand (SP) Gray, Fine	100	11												
231.7	30.0	☒	18 21 19	40		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
2. HOLE NUMBER: 061-BPR-10
LOCATION COORDINATES: N 13,158,796.6 E 2,470,694.6
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
4. NAME OF DRILLER: K. Roberts
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 251.9 10/2/10
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
15. DATE BORING: STARTED 10/2/10 COMPLETED 10/2/10
6. THICKNESS OF OVERBURDEN:
16. ELEVATION TOP OF BORING: 257.9
7. DEPTH DRILLED INTO ROCK:
17. TOTAL CORE RECOVERY FOR BORING: N/A
8. TOTAL DEPTH OF BORING: 30.0
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	5 5 5	10		Poorly-graded Sand (SP) Brown, Fine	100	1												
		☒	3 5 5	10		Poorly-graded Sand (SP) Brown, Fine	100	2												
252.4	5.5																			
		☒	1 2 2	4		Lean Clay (CL) Gray, soft, Fine	100	3					30	15	29.4					
249.9	8.0																			
		☒	2 2 2	4		Clayey Sand (SC) Gray, Fine	100	4			22				31.5					
247.4	10.5																			
		☒	9 6 9	15		Poorly-graded Sand with Clay (SP-SC) Gray, Fine	100	5			9									
244.9	13.0																			
		☒	12 13 19	32		Poorly-graded Sand (SP) Gray, Fine	100	6	1	98	1	0.167								
		☒	14 14 14	28		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	8 17 22	39		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	13 14 15	29		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	9												
		☒	12 14 17	31		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	9 13 17	30		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	11												
		☒	10 16 16	32		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	12												
227.9	30.0																			

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)	INSTALLATION: Memphis District (CEMVM)	SHEET 1 OF 1 SHEETS	
1. PROJECT: Below Piggott - West Bank SFB Seepage Study	9. COORDINATE SYSTEM	HORIZONTAL	VERTICAL
	10. SIZE AND TYPE OF BIT: 2.25" ID		
2. HOLE NUMBER: 062-BPR-10 — LOCATION COORDINATES: N 13,158,573.6 E 2,470,271.7	11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45		
3. DRILLING AGENCY: Tri-State Testing Services, Inc.	12. TOTAL SAMPLES: 12	DISTURBED: 12	UNDISTURBED: 0
4. NAME OF DRILLER: K. Roberts	13. TOTAL NUMBER CORE BOXES: 0		
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED — DEG FROM VERTICAL: --- — BEARING:	14. ELEVATION GROUND WATER: 249.8	10/3/10	
	15. DATE BORING	STARTED: 10/3/10	COMPLETED: 10/3/10
6. THICKNESS OF OVERBURDEN	16. ELEVATION TOP OF BORING: 261.3		
7. DEPTH DRILLED INTO ROCK	17. TOTAL CORE RECOVERY FOR BORING: N/A		
8. TOTAL DEPTH OF BORING: 30.0	18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor		

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	9 6 8	14		Lean Clay (CL) Gray, stiff, Oxidized, Fine	100	1							16.9					
		☒	3 4 6	10		Lean Clay (CL) Gray, stiff, Oxidized, Fine	100	2					45	26	13.6					
255.8	5.5																			
		☒	6 9 8	17		Silt (ML) Sandy, Gray, very stiff, Fine	100	3			53									
253.3	8.0																			
		☒	4 8 7	15		Silty Sand (SM) Gray, Fine	100	4												
		☒	3 5 5	10		Silty Sand (SM) Gray, Fine	100	5												
248.3	13.0																			
		☒	4 6 10	16		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	6			9									
		☒	5 8 11	19		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	7	0	92	8	0.079								
243.3	18.0																			
		☒	4 13 18	31		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	7 11 14	25		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	8 14 15	29		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	6 8 9	17		Poorly-graded Sand (SP) Gray, Fine	100	11												
		☒	3 4 5	9		Poorly-graded Sand (SP) Gray, Fine	100	12												
231.3	30.0																			

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 063-BPR-10
LOCATION COORDINATES: N 13,158,267.1 E 2,469,845.0
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 247.7 10/3/10
15. DATE BORING: STARTED 10/3/10 COMPLETED 10/3/10
16. ELEVATION TOP OF BORING: 258.7
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	7 4 5	9		Silt (ML) Tan, stiff	100	1							9.3					
		☒	2 5 8	13		Silt (ML) Tan, stiff, Oxidized	100	2							9.9					
253.2	5.5																			
		☒	2 3 5	8		Lean Clay (CL) Dark Gray, medium	100	3					48	28	26.8					
250.7	8.0																			
		☒	2 3 4	7		Clayey Sand (SC) Dark Gray, Fine	100	4			42				25.0					
		☒	2 3 2	5		Clayey Sand (SC) Dark Gray, Fine	100	5			39				30.9					
245.7	13.0																			
		☒	2 3 3	6		Poorly-graded Sand with Silt (SP-SM) Dark Gray, Fine	100	6	14	76	10	0.077								
243.2	15.5																			
		☒	9 13 17	30		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	5 11 14	25		Poorly-graded Sand (SP) Gray, Fine	100	8												
238.2	20.5																			
		☒	3 1 5	6		Silty Sand (SM) Dark Gray, Fine	100	9												
235.7	23.0																			
		☒	4 7 5	12		Poorly-graded Sand (SP) Dark Gray, Fine	100	10												
		☒	6 11 11	22		Poorly-graded Sand (SP) Gray, Fine	100	11												
		☒	14 19 10	29		Poorly-graded Sand (SP) Gray, Fine	100	12												
228.7	30.0																			

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 064-BPR-10
LOCATION COORDINATES: N 13,158,006.9 E 2,469,413.3
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED
DEG FROM VERTICAL: ---
BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 249.9 10/3/10
15. DATE BORING: STARTED 10/3/10 COMPLETED 10/3/10
16. ELEVATION TOP OF BORING: 255.9
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	3 3 4	7		Lean Clay (CL) Gray & Brown, medium, Fine	100	1							17.4					
		☒	3 3 4	7		Lean Clay (CL) Gray & Brown, medium, Fine	100	2							17.0					
		☒	0 2 2	4		Lean Clay (CL) Gray, soft	100	3					49	32	37.2					
247.9	8.0																			
		☒	0 8 6	14		Lean Clay (CL) Sandy, Gray, stiff, Fine	100	4			51									
245.4	10.5																			
		☒	7 12 16	28		Poorly-graded Sand (SP) Gray, Fine	100	5	1	98	2	0.159								
		☒	11 11 11	22		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	8 11 13	24		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	4 10 10	20		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	7 9 12	21		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	9 12 15	27		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	9 15 18	33		Poorly-graded Sand (SP) Gray, Fine	100	11												
225.9	30.0	☒	12 15 16	31		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

Boring Designation 065-BPR-10

DRILLING LOG	DIVISION	INSTALLATION	SHEET / OF
	Mississippi Valley Division (MVD)	Memphis District (CEMVM)	1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study		9. COORDINATE SYSTEM	HORIZONTAL / VERTICAL
		10. SIZE AND TYPE OF BIT: 2.25" ID	
2. HOLE NUMBER: 065-BPR-10	LOCATION COORDINATES: N 13,157,706.9 E 2,469,055.9	11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45	
3. DRILLING AGENCY: Tri-State Testing Services, Inc.		12. TOTAL SAMPLES: 12	DISTURBED: 12 / UNDISTURBED: 0
4. NAME OF DRILLER: K. Roberts		13. TOTAL NUMBER CORE BOXES: 0	
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED	DEG FROM VERTICAL: --- / BEARING	14. ELEVATION GROUND WATER: 248.8	10/3/10
		15. DATE BORING	STARTED: 10/3/10 / COMPLETED: 10/3/10
6. THICKNESS OF OVERBURDEN		16. ELEVATION TOP OF BORING: 254.8	
7. DEPTH DRILLED INTO ROCK		17. TOTAL CORE RECOVERY FOR BORING: N/A	
8. TOTAL DEPTH OF BORING: 30.0		18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor	

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
257.8	-3.0		4 3 5	8		Poorly-graded Sand (SP) Brown, Fine	100	1												
251.8	3.0		2 2 6	8		Lean Clay (CL) Dark Brown, medium, Oxidized, Lignite Fragments	100	2					39	21	20.5					
249.3	5.5		4 4 7	11		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	3			6									
246.8	8.0		6 2 3	5		Poorly-graded Sand (SP) Gray, Fine	100	4			3									
			7 7 8	15		Poorly-graded Sand (SP) Gray, Fine	100	5	0	99	1	0.188								
239.3	15.5		10 18 13	31		Poorly-graded Sand (SP) Gray, Fine	100	6												
236.8	18.0		8 15 20	35		Poorly-graded Sand with Silt (SP-SM) Gray, Medium	100	7												
			10 12 18	30		Poorly-graded Sand (SP) Gray, Fine	100	8												
			7 8 10	18		Poorly-graded Sand (SP) Gray, Fine	100	9												
			10 14 15	29		Poorly-graded Sand (SP) Gray, Fine	100	10												
			7 9 9	18		Poorly-graded Sand (SP) Gray, Fine	100	11												
			7 12 10	22		Poorly-graded Sand (SP) Gray, Fine	100	12												

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)	INSTALLATION: Memphis District (CEMVM)	SHEET 1 OF 1 SHEETS	
1. PROJECT: Below Piggott - West Bank SFB Seepage Study	9. COORDINATE SYSTEM	HORIZONTAL	VERTICAL
	10. SIZE AND TYPE OF BIT: 2.25" ID		
2. HOLE NUMBER: 066-BPR-10	LOCATION COORDINATES: N 13,157,395.5 E 2,468,687.7	11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45	
3. DRILLING AGENCY: Tri-State Testing Services, Inc.	12. TOTAL SAMPLES: 12	DISTURBED: 12	UNDISTURBED: 0
4. NAME OF DRILLER: K. Roberts	13. TOTAL NUMBER CORE BOXES: 0		
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED	DEG FROM VERTICAL: ---	BEARING	14. ELEVATION GROUND WATER: 247.7 10/3/10
15. DATE BORING	STARTED: 10/3/10	COMPLETED: 10/3/10	
6. THICKNESS OF OVERBURDEN	16. ELEVATION TOP OF BORING: 258.7		
7. DEPTH DRILLED INTO ROCK	17. TOTAL CORE RECOVERY FOR BORING: N/A		
8. TOTAL DEPTH OF BORING: 30.0	18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor		

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	5 4 4	8		Poorly-graded Sand (SP) Brown, Fine	100	1												
254.7	4.0	☒	6 7 6	13		Poorly-graded Sand (SP) Brown, Fine	100	2												
253.2	5.5																			
		☒	5 7 7	14		Lean Clay (CL) Gray & Brown, & Mottled, stiff, Oxidized, Rootlets	100	3					31	17	14.5					
250.7	8.0																			
		☒	4 4 4	8		Clayey Sand (SC) Gray & Brown	100	4			48				26.3					
248.2	10.5																			
		☒	4 4 4	8		Poorly-graded Sand (SP) Gray, Fine	100	5	0	97	3	0.114								
		☒	6 6 8	14		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	10 14 18	32		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	7 12 21	33		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	8 14 13	27		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	9 13 8	21		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	19 19 20	39		Poorly-graded Sand (SP) Gray, Fine	100	11												
228.7	30.0	☒	22 24 25	49		Poorly-graded Sand (SP) Gray, Medium	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)	INSTALLATION: Memphis District (CEMVM)	SHEET 1 OF 1 SHEETS	
1. PROJECT: Below Piggott - West Bank SFB Seepage Study	9. COORDINATE SYSTEM	HORIZONTAL	VERTICAL
	10. SIZE AND TYPE OF BIT: 2.25" ID		
2. HOLE NUMBER: 067-BPR-10	LOCATION COORDINATES: N 13,157,041.8 E 2,468,320.3	11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45	
3. DRILLING AGENCY: Tri-State Testing Services, Inc.	12. TOTAL SAMPLES: 12	DISTURBED: 12	UNDISTURBED: 0
4. NAME OF DRILLER: K. Roberts	13. TOTAL NUMBER CORE BOXES: 0		
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED	DEG FROM VERTICAL: ---	BEARING	14. ELEVATION GROUND WATER: 245.2 10/4/10
15. DATE BORING	STARTED: 10/4/10	COMPLETED: 10/4/10	
6. THICKNESS OF OVERBURDEN	16. ELEVATION TOP OF BORING: 261.2		
7. DEPTH DRILLED INTO ROCK	17. TOTAL CORE RECOVERY FOR BORING: N/A		
8. TOTAL DEPTH OF BORING: 30.0	18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor		

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_r	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
			5 4 6	10		Fat Clay (CH) Gray, stiff, Oxidized, Rootlets	100	1							25.9					
			2 4 6	10		Fat Clay (CH) Brown & Gray, stiff	100	2							22.0					
			4 5 6	11		Fat Clay (CH) Brown & Gray, stiff, Fine	100	3							36.7					
			5 6 7	13		Fat Clay (CH) Gray, stiff, Oxidized	100	4							25.3					
			3 4 5	9		Fat Clay (CH) Gray, stiff, Organic Matter	100	5					75	46	45.8					
248.2	13.0																			
			2 2 2	4		Lean Clay (CL) Dark Gray, soft, Rootlets, Lignite Fragments	100	6					46	25	41.6					
245.7	15.5																			
			7 8 8	16		Poorly-graded Sand with Clay (SP-SC) Gray, Fine	100	7			11									
			10 9 10	19		Poorly-graded Sand with Clay (SP-SC) Gray, Fine	100	8			6									
240.7	20.5																			
			9 19 22	41		Poorly-graded Sand (SP) Gray, Medium	100	9	1	96	3	0.214								
			13 13 16	29		Poorly-graded Sand (SP) Gray, Fine	100	10												
235.7	25.5																			
			6 13 19	32		Clayey Sand (SC) Brown & Gray, Fine, Lignite Fragments	100	11												
233.2	28.0																			
			8 10 13	23		Poorly-graded Sand (SP) Dark Gray, Fine	100	12												
231.2	30.0																			

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 068-BPR-10
LOCATION COORDINATES: N 13,156,658.9 E 2,468,003.5
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER:
15. DATE BORING: STARTED 10/4/10 COMPLETED 10/4/10
16. ELEVATION TOP OF BORING: 255.7
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	4 6 7	13		Poorly-graded Sand (SP) Brown, Fine	100	1			2									
252.7	3.0																			
		☒	3 5 7	12		Lean Clay (CL) Gray & Brown, stiff	100	2							19.0					
		☒	2 3 3	6		Lean Clay (CL) Brown & Gray, medium	100	3					46	29	34.2					
		☒	1 4 5	9		Lean Clay (CL) Gray, stiff, Wood	100	4							32.3					
245.2	10.5																			
		☒	2 2 2	4		Poorly-graded Sand (SP) Gray, Fine	100	5			2									
		☒	4 4 4	8		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	6	7	91	2	0.111								
		☒	8 11 11	22		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	7												
		☒	8 6 6	12		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	8												
		☒	2 4 8	12		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	9												
		☒	8 10 11	21		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	10												
		☒	12 17 18	35		Poorly-graded Sand (SP) Gray, Fine	100	11												
		☒	29 29 31	60		Poorly-graded Sand (SP) Gray, Fine	100	12												
225.7	30.0																			

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)	INSTALLATION: Memphis District (CEMVM)	SHEET 1 OF 1 SHEETS	
1. PROJECT: Below Piggott - West Bank SFB Seepage Study	9. COORDINATE SYSTEM	HORIZONTAL	VERTICAL
	10. SIZE AND TYPE OF BIT: 2.25" ID		
2. HOLE NUMBER: 069-BPR-10 — LOCATION COORDINATES: N 13,156,300.7 E 2,467,639.0	11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45		
3. DRILLING AGENCY: Tri-State Testing Services, Inc.	12. TOTAL SAMPLES: 12	DISTURBED: 12	UNDISTURBED: 0
4. NAME OF DRILLER: K. Roberts	13. TOTAL NUMBER CORE BOXES: 0		
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED — DEG FROM VERTICAL: --- — BEARING:	14. ELEVATION GROUND WATER: 245.5 10/4/10		
	15. DATE BORING — STARTED: 10/4/10 — COMPLETED: 10/4/10		
6. THICKNESS OF OVERBURDEN	16. ELEVATION TOP OF BORING: 256.0		
7. DEPTH DRILLED INTO ROCK	17. TOTAL CORE RECOVERY FOR BORING: N/A		
8. TOTAL DEPTH OF BORING: 30.0	18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor		

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	7 4 5	9		Poorly-graded Sand (SP) Brown, Fine	100	1												
		☒	2 4 4	8		Poorly-graded Sand (SP) Brown, Fine	100	2			2									
250.5	5.5																			
		☒	2 4 4	8		Lean Clay (CL) Brown & Gray, medium, Fine	100	3					25	11	16.6					
248.0	8.0																			
		☒	1 3 2	5		Clayey Sand (SC) Gray	100	4			23				25.3					
245.5 ▼	10.5																			
		☒	4 2 2	4		Poorly-graded Sand (SP) Gray, Fine	100	5	0	97	3	0.093								
		☒	2 6 7	13		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	24 15 18	33		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	14 14 16	30		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	10 12 18	30		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	10 18 20	38		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	11 23 26	49		Poorly-graded Sand (SP) Gray, Fine	100	11												
		☒	13 19 26	45		Poorly-graded Sand (SP) Gray, Fine	100	12												
226.0	30.0																			

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION	Mississippi Valley Division (MVD)
INSTALLATION	Memphis District (CEMVM)
SHEET	1 OF 1 SHEETS
1. PROJECT	Below Piggott - West Bank SFB Seepage Study
9. COORDINATE SYSTEM	HORIZONTAL / VERTICAL
10. SIZE AND TYPE OF BIT	2.25" ID
2. HOLE NUMBER	070-BPR-10
LOCATION COORDINATES	N 13,155,946.4 E 2,467,289.7
11. MANUFACTURER'S DESIGNATION OF DRILL	CME 45
3. DRILLING AGENCY	Tri-State Testing Services, Inc.
12. TOTAL SAMPLES / DISTURBED / UNDISTURBED	12 / 12 / 0
4. NAME OF DRILLER	K. Roberts
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	245.9 10/4/10
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: --- ; BEARING:
15. DATE BORING	STARTED 10/4/10 COMPLETED 10/4/10
6. THICKNESS OF OVERBURDEN	
16. ELEVATION TOP OF BORING	255.4
7. DEPTH DRILLED INTO ROCK	
17. TOTAL CORE RECOVERY FOR BORING	N/A
8. TOTAL DEPTH OF BORING	30.0
18. SIGNATURE AND TITLE OF INSPECTOR	Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
252.4	3.0	☒	3 4 4	8		Poorly-graded Sand (SP) Brown, Fine	100	1												
249.9	5.5	☒	2 3 3	6		Lean Clay (CL) Brown & Gray, & Mottled, medium, Oxidized, Fine	100	2							20.6					
247.4	8.0	☒	3 3 3	6		Fat Clay (CH) Brown & Gray, medium, Fine	100	3					72	38	58.0					
244.9	10.5	☒	2 1 3	4		Clayey Sand (SC) Gray, Fine	100	4			13				40.5					
		☒	4 11 13	24		Poorly-graded Sand (SP) Gray, Fine	100	5	1	98	1	0.168								
		☒	8 11 12	23		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	6												
		☒	10 7 11	18		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	10 14 16	30		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	21 21 14	35		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	8 12 11	23		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	14 27 28	55		Poorly-graded Sand (SP) Gray, Fine	100	11												
225.4	30.0	☒	13 28 32	60		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 071-BPR-10
LOCATION COORDINATES: N 13,155,595.1 E 2,466,921.1
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 249.2 10/5/10
15. DATE BORING: STARTED 10/5/10 COMPLETED 10/5/10
16. ELEVATION TOP OF BORING: 255.2
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
252.2	3.0	☒	6 5 7	12		Silt (ML) Brown & Gray, & Mottled, stiff, Oxidized, Rootlets	100	1							14.2					
249.7	5.5	☒	5 7 8	15		Silty Sand (SM) Brown & Gray, Fine	100	2			40									
247.2	8.0	☒	1 6 7	13		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	3			6									
		☒	2 6 6	12		Poorly-graded Sand (SP) Gray, Fine	100	4	0	99	1	0.158								
		☒	5 6 7	13		Poorly-graded Sand (SP) Gray, Fine	100	5												
		☒	7 10 14	24		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	5 10 12	22		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	7 11 12	23		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	5 9 10	19		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	6 10 11	21		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	12 21 22	43		Poorly-graded Sand (SP) Gray, Medium	100	11												
225.2	30.0	☒	6 8 10	18		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
2. HOLE NUMBER: 072-BPR-10
LOCATION COORDINATES: N 13,155,231.5 E 2,466,526.3
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
4. NAME OF DRILLER: K. Roberts
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 249.0 10/5/10
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
15. DATE BORING: STARTED 10/5/10 COMPLETED 10/5/10
6. THICKNESS OF OVERBURDEN:
16. ELEVATION TOP OF BORING: 255.0
7. DEPTH DRILLED INTO ROCK:
17. TOTAL CORE RECOVERY FOR BORING: N/A
8. TOTAL DEPTH OF BORING: 30.0
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
252.0	3.0	☒	3 3 3	6		Clayey Sand (SC) Brown, Fine	100	1												
249.5	5.5	☒	3 3 3	6		Lean Clay (CL) Gray, medium, Oxidized, Lignite Fragments	100	2					32	19	17.4					
247.0	8.0	☒	2 4 4	8		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	3			6									
244.5	10.5	☒	3 5 5	10		Silty Sand (SM) Gray, Fine	100	4												
242.0	13.0	☒	2 5 7	12		Poorly-graded Sand with Silt (SP-SM) Brown, Fine	100	5												
		☒	3 4 7	11		Poorly-graded Sand (SP) Gray, Fine	100	6			3									
		☒	8 16 15	31		Poorly-graded Sand (SP) Gray, Fine	100	7	0	98	1	0.162								
		☒	8 12 15	27		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	8 13 17	30		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	4 8 8	16		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	5 8 12	20		Poorly-graded Sand (SP) Gray, Fine	100	11												
225.0	30.0	☒	8 12 16	28		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 073-BPR-10
LOCATION COORDINATES: N 13,154,901.4 E 2,466,184.8
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 249.3 10/5/10
15. DATE BORING: STARTED 10/5/10 COMPLETED 10/5/10
16. ELEVATION TOP OF BORING: 255.3
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
252.3	3.0	☒	7 5 6	11		Clayey Sand (SC) Brown, Fine	100	1												
		☒	3 3 3	6		Silty Sand (SM) Brown, Fine	100	2			14									
247.3	8.0	☒	5 4 4	8		Silty Sand (SM) Gray & Brown, Fine	100	3			34									
244.8	10.5	☒	2 5 4	9		Poorly-graded Sand with Silt (SP-SM) Brown, Medium	100	4	6	85	9	0.081								
		☒	7 13 13	26		Poorly-graded Sand (SP) Gray, Fine	100	5												
		☒	16 16 16	32		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	7 9 9	18		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	7 10 13	23		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	8												
		☒	5 7 9	16		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	9												
		☒	9 7 18	25		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	3 7 10	17		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	11												
225.3	30.0	☒	7 13 20	33		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 074-BPR-10
LOCATION COORDINATES: N 13,154,542.6 E 2,465,812.8
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 248.3 10/5/10
15. DATE BORING: STARTED 10/5/10 COMPLETED 10/5/10
16. ELEVATION TOP OF BORING: 255.3
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
252.3	3.0	☒	1 2 4	6		Lean Clay (CL) Brown, medium, Oxidized, Lignite Fragments	100	1							22.2					
249.8	5.5	☒	2 4 4	8		Fat Clay (CH) Dark Brown, medium, Oxidized, Lignite Fragments	100	2							22.5					
247.3	8.0	☒	1 3 6	9		Lean Clay (CL) Gray, medium, Fine	100	3					32	19	37.0					
		☒	6 9 10	19		Poorly-graded Sand (SP) Gray, Fine	100	4	0	98	2	0.139								
		☒	12 20 22	42		Poorly-graded Sand (SP) Gray, Fine	100	5												
		☒	3 6 7	13		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	7 7 9	16		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	9 13 14	27		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	7 16 16	32		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	6 16 18	34		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	5 10 16	26		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	11												
225.3	30.0	☒	9 10 14	24		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
2. HOLE NUMBER: 075-BPR-10
LOCATION COORDINATES: N 13,154,195.6 E 2,465,487.8
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
4. NAME OF DRILLER: K. Roberts
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 247.9 10/11/10
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
15. DATE BORING: STARTED 10/11/10 COMPLETED 10/11/10
6. THICKNESS OF OVERBURDEN:
16. ELEVATION TOP OF BORING: 254.9
7. DEPTH DRILLED INTO ROCK:
17. TOTAL CORE RECOVERY FOR BORING: N/A
8. TOTAL DEPTH OF BORING: 30.0
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	2 3 4	7		Fat Clay (CH) Dark Brown, medium, Oxidized, Organic Matter	100	1							23.9					
		☒	2 2 4	6		Fat Clay (CH) Dark Brown, medium, Oxidized, Organic Matter	100	2					52	31	24.8					
249.4	5.5																			
		☒	2 2 2	4		Lean Clay (CL) Brown, soft	100	3					49	29	34.6					
246.9	8.0																			
		☒	4 5 5	10		Silty Sand (SM) Brown	100	4												
244.4	10.5																			
		☒	6 6 9	15		Poorly-graded Sand (SP) Brown, Fine	100	5			2									
		☒	6 9 8	17		Poorly-graded Sand (SP) Brown, Fine	100	6	0	98	2	0.159								
		☒	6 6 10	16		Poorly-graded Sand (SP) Brown, Fine	100	7												
		☒	4 8 11	19		Poorly-graded Sand (SP) Brown, Fine	100	8												
		☒	8 14 17	31		Poorly-graded Sand (SP) Brown, Fine	100	9												
		☒	15 21 15	36		Poorly-graded Sand (SP) Brown, Fine	100	10												
		☒	22 21 21	42		Poorly-graded Sand (SP) Brown, Fine	100	11												
		☒	10 10 10	20		Poorly-graded Sand (SP) Brown, Fine	100	12												
224.9	30.0																			

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
2. HOLE NUMBER: 076-BPR-10
LOCATION COORDINATES: N 13,153,808.3 E 2,465,212.3
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
4. NAME OF DRILLER: K. Roberts
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 248.1 10/11/10
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
15. DATE BORING: STARTED 10/11/10 COMPLETED 10/11/10
6. THICKNESS OF OVERBURDEN:
16. ELEVATION TOP OF BORING: 254.1
7. DEPTH DRILLED INTO ROCK:
17. TOTAL CORE RECOVERY FOR BORING: N/A
8. TOTAL DEPTH OF BORING: 30.0
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
251.1	3.0	☒	4 2 4	6		Fat Clay (CH) Gray, medium, Oxidized	100	1							17.7					
248.6	5.5	☒	3 4 4	8		Lean Clay (CL) Gray, medium	100	2					42	25	21.7					
246.1	8.0	☒	2 2 3	5		Poorly-graded Sand with Clay (SP-SC) Gray, Fine	100	3			11									
		☒	1 1 3	4		Poorly-graded Sand (SP) Gray, Fine	100	4	1	94	4	0.088								
		☒	4 4 4	8		Poorly-graded Sand (SP) Gray, Fine	100	5												
		☒	2 6 10	16		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	3 2 2	4		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	2 2 4	6		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	4 2 4	6		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	6 8 11	19		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	10 15 18	33		Poorly-graded Sand (SP) Gray, Medium	100	11												
224.1	30.0	☒	14 18 22	40		Poorly-graded Sand (SP) Gray, Medium	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 077-BPR-10
LOCATION COORDINATES: N 13,153,377.8 E 2,464,910.6
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12; DISTURBED: 12; UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 248.3 10/12/10
15. DATE BORING: STARTED 10/12/10; COMPLETED 10/12/10
16. ELEVATION TOP OF BORING: 254.3
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
251.3	3.0	☒	3 5 6	11		Fat Clay (CH) Gray & Brown, stiff, Oxidized, Organic Matter	100	1							25.9					
248.8	5.5	☒	2 3 4	7		Lean Clay (CL) Gray & Brown, medium	100	2					45	30	24.7					
		☒	2 2 4	6		Poorly-graded Sand (SP) Gray, Fine	100	3	0	99	1	0.162								
		☒	3 7 7	14		Poorly-graded Sand (SP) Gray, Fine	100	4												
		☒	5 9 8	17		Poorly-graded Sand (SP) Gray, Fine	100	5												
		☒	1 1 1	2		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	9 9 9	18		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	7 10 12	22		Poorly-graded Sand (SP) Gray, Medium	100	8												
		☒	7 11 12	23		Poorly-graded Sand (SP) Brown, Medium	100	9												
		☒	30 13 18	31		Poorly-graded Sand (SP) Gray, Medium	100	10												
		☒	21 21 11	32		Poorly-graded Sand (SP) Gray, Medium	100	11												
224.3	30.0	☒	20 22 20	42		Poorly-graded Sand (SP) Gray, Medium	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 078-BPR-10
LOCATION COORDINATES: N 13,152,976.6 E 2,464,643.0
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 246.7 10/12/10
15. DATE BORING: STARTED 10/12/10 COMPLETED 10/12/10
16. ELEVATION TOP OF BORING: 252.7
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
249.7	3.0	☒	3 5 5	10		Silty Clay (CL-ML) Gray, stiff, Oxidized, Organic Matter	100	1							18.3					
247.2	5.5	☒	2 2 2	4		Clayey Sand (SC) Red & Brown	100	2			25				24.8					
		☒	2 2 2	4		Poorly-graded Sand (SP) Gray, Fine	100	3	0	99	1	0.138								
		☒	4 7 8	15		Poorly-graded Sand (SP) Gray, Fine	100	4												
		☒	4 7 9	16		Poorly-graded Sand (SP) Gray, Fine	100	5												
		☒	4 7 10	17		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	8 13 14	27		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	3 8 6	14		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	12 12 15	27		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	7 10 11	21		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	5 10 12	22		Poorly-graded Sand (SP) Gray, Fine	100	11												
222.7	30.0	☒	7 11 13	24		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 079-BPR-10
LOCATION COORDINATES: N 13,152,537.5 E 2,464,339.6
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 246.4 10/12/10
15. DATE BORING: STARTED 10/12/10 COMPLETED 10/12/10
16. ELEVATION TOP OF BORING: 252.4
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
249.4	3.0	☒	5 5 5	10		Silt (ML) Gray, stiff, Oxidized, Fine	100	1							14.8					
246.9	5.5	☒	3 5 5	10		Silty Sand (SM) Gray & Brown, Fine	100	2			15				14.5					
		☒	2 4 4	8		Poorly-graded Sand (SP) Gray, Fine, Organic Matter	100	3	0	99	1	0.159								
		☒	4 4 6	10		Poorly-graded Sand (SP) Gray, Fine	100	4												
		☒	9 8 8	16		Poorly-graded Sand (SP) Gray, Fine	100	5												
		☒	4 7 8	15		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	9 10 13	23		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	9 10 14	24		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	7 11 16	27		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	10 10 15	25		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	8 13 16	29		Poorly-graded Sand (SP) Gray, Fine	100	11												
222.4	30.0	☒	9 19 18	37		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)

INSTALLATION: Memphis District (CEMVM)

SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study

9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

10. SIZE AND TYPE OF BIT: 2.25" ID

2. HOLE NUMBER: 080-BPR-10

LOCATION COORDINATES: N 13,152,212.6 E 2,463,939.7

11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45

3. DRILLING AGENCY: Tri-State Testing Services, Inc.

12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0

4. NAME OF DRILLER: K. Roberts

13. TOTAL NUMBER CORE BOXES: 0

5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:

14. ELEVATION GROUND WATER: 248.1 10/12/10

15. DATE BORING: STARTED 10/12/10 COMPLETED 10/12/10

6. THICKNESS OF OVERBURDEN:

16. ELEVATION TOP OF BORING: 252.6

7. DEPTH DRILLED INTO ROCK:

17. TOTAL CORE RECOVERY FOR BORING: N/A

8. TOTAL DEPTH OF BORING: 30.0

18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_r	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
249.6	3.0	☒	2 2 4	6		Fat Clay (CH) Dark Brown, medium, Oxidized, Organic Matter	100	1							23.1					
247.1	5.5	☒	1 2 1	3		Clayey Sand (SC) Gray	100	2			36				30.6					
		☒	3 3 3	6		Poorly-graded Sand (SP) Gray, Fine	100	3	0	99	1	0.158								
		☒	7 9 12	21		Poorly-graded Sand (SP) Gray, Fine	100	4												
		☒	4 8 17	25		Poorly-graded Sand (SP) Gray, Fine	100	5												
		☒	7 12 14	26		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	7 10 13	23		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	4 7 13	20		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	7 15 15	30		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	6 6 13	19		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	7 10 14	24		Poorly-graded Sand (SP) Gray, Fine	100	11												
222.6	30.0	☒	7 10 17	27		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)

INSTALLATION: Memphis District (CEMVM)

SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study

9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

10. SIZE AND TYPE OF BIT: 2.25" ID

2. HOLE NUMBER: 081-BPR-10

LOCATION COORDINATES: N 13,152,023.5 E 2,463,458.4

11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45

3. DRILLING AGENCY: Tri-State Testing Services, Inc.

12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0

4. NAME OF DRILLER: K. Roberts

13. TOTAL NUMBER CORE BOXES: 0

5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:

14. ELEVATION GROUND WATER: 248.3 10/12/10

15. DATE BORING: STARTED 10/12/10 COMPLETED 10/12/10

6. THICKNESS OF OVERBURDEN:

16. ELEVATION TOP OF BORING: 253.3

7. DEPTH DRILLED INTO ROCK:

17. TOTAL CORE RECOVERY FOR BORING: N/A

8. TOTAL DEPTH OF BORING: 30.0

18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	3 3 4	7		Lean Clay (CL) Gray, medium, Oxidized, Rootlets	100	1							22.2					
		☒	3 4 5	9		Lean Clay (CL) Gray, stiff, Oxidized, Rootlets, Organic Matter	100	2					39	22	23.3					
247.8	5.5																			
		☒	3 10 10	20		Clayey Sand (SC) Gray	100	3			24									
245.3	8.0																			
		☒	3 10 9	19		Poorly-graded Sand (SP) Gray, Fine	100	4	0	98	2	0.152								
		☒	6 6 10	16		Poorly-graded Sand (SP) Gray, Fine	100	5												
		☒	5 8 11	19		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	2 12 13	25		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	7 11 14	25		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	13 13 13	26		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	13 15 16	31		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	13 15 18	33		Poorly-graded Sand (SP) Gray, Fine	100	11												
223.3	30.0	☒	6 10 16	26		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 082-BPR-10
LOCATION COORDINATES: N 13,151,863.1 E 2,463,010.3
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 247.2 10/13/10
15. DATE BORING: STARTED 10/13/10 COMPLETED 10/13/10
16. ELEVATION TOP OF BORING: 253.2
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	3 4 7	11		Fat Clay (CH) Gray, stiff, Oxidized	100	1							23.1					
		☒	3 4 6	10		Fat Clay (CH) Gray, stiff, Oxidized, Organic Matter	100	2					71	48	27.9					
247.7	5.5																			
		☒	4 6 8	14		Poorly-graded Sand (SP) Brown, Fine	100	3			3									
		☒	6 7 8	15		Poorly-graded Sand (SP) Brown, Fine	100	4	0	99	1	0.174								
		☒	7 8 10	18		Poorly-graded Sand (SP) Brown, Fine	100	5												
		☒	4 8 8	16		Poorly-graded Sand (SP) Brown, Fine	100	6												
		☒	6 6 4	10		Poorly-graded Sand (SP) Brown, Fine	100	7												
		☒	4 7 11	18		Poorly-graded Sand (SP) Brown, Fine	100	8												
		☒	9 13 18	31		Poorly-graded Sand (SP) Brown, Fine	100	9												
		☒	17 21 25	46		Poorly-graded Sand (SP) Brown, Fine	100	10												
		☒	8 10 8	18		Poorly-graded Sand (SP) Gray, Fine, Organic Matter	100	11												
223.2	30.0	☒	7 12 10	22		Poorly-graded Sand (SP) Gray, Fine, Organic Matter	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 083-BPR-10
LOCATION COORDINATES: N 13,151,683.9 E 2,462,566.5
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 247.0 10/13/10
15. DATE BORING: STARTED 10/13/10 COMPLETED 10/13/10
16. ELEVATION TOP OF BORING: 252.0
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
249.0	3.0	☒	3 4 4	8		Fat Clay (CH) Dark Brown, medium, Oxidized, Organic Matter	100	1					51	30	23.8					
246.5	5.5	☒	2 2 3	5		Clayey Sand (SC) Gray	100	2			39									
244.0	8.0	☒	3 5 6	11		Silty Sand (SM) Gray, Fine	100	3												
		☒	4 5 6	11		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	4			9									
239.0	13.0	☒	6 6 7	13		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	5	1	93	5	0.083								
		☒	7 8 9	17		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	7 10 10	20		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	8 9 10	19		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	6 10 15	25		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	5 10 9	19		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	7 11 13	24		Poorly-graded Sand (SP) Gray, Fine	100	11												
222.0	30.0	☒	10 11 11	22		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
2. HOLE NUMBER: 084-BPR-10
LOCATION COORDINATES: N 13,151,510.0 E 2,462,088.0
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
4. NAME OF DRILLER: K. Roberts
13. TOTAL NUMBER CORE BOXES: 0
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
14. ELEVATION GROUND WATER: 246.1 10/13/10
15. DATE BORING: STARTED 10/13/10 COMPLETED 10/13/10
6. THICKNESS OF OVERBURDEN:
16. ELEVATION TOP OF BORING: 251.6
7. DEPTH DRILLED INTO ROCK:
17. TOTAL CORE RECOVERY FOR BORING: N/A
8. TOTAL DEPTH OF BORING: 30.0
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_r	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
248.6	3.0	☒	2 1 4	5		Fat Clay (CH) Brown, medium, Oxidized, Organic Matter	100	1							51.8					
246.1 ▼	5.5	☒	2 3 3	6		Clayey Sand (SC) Gray, Fine, Organic Matter, Clay Strata or Lenses	100	2			18									
243.6	8.0	☒	2 1 3	4		Poorly-graded Sand with Clay (SP-SC) Gray, Fine	100	3	0	93	7	0.101								
241.1	10.5	☒	1 1 4	5		Clayey Sand (SC) Gray	100	4			50									
		☒	6 9 13	22		Poorly-graded Sand (SP) Gray, Fine	100	5	0	97	3	0.154								
		☒	16 14 14	28		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	10 12 11	23		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	6 10 9	19		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	16 19 21	40		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	21 32 38	70		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	12 19 27	46		Poorly-graded Sand (SP) Gray, Fine	100	11												
221.6	30.0	☒	10 10 14	24		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 085-BPR-10
LOCATION COORDINATES: N 13,151,309.9 E 2,461,594.7
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 247.2 10/13/10
15. DATE BORING: STARTED 10/13/10 COMPLETED 10/13/10
16. ELEVATION TOP OF BORING: 253.2
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
250.2	3.0	☒	6 8 10	18		Silty Sand (SM) Brown & Gray, Oxidized	100	1												
247.7	5.5	☒	3 7 9	16		Lean Clay (CL) Gray, very stiff	100	2					29	13	14.6					
		☒	4 3 3	6		Silty Sand (SM) Brown	100	3			25									
242.7	10.5	☒	2 2 3	5		Silty Sand (SM) Gray	100	4			29									
		☒	4 10 10	20		Poorly-graded Sand (SP) Gray, Medium	100	5	0	98	1	0.230								
		☒	5 12 12	24		Poorly-graded Sand (SP) Gray, Medium	100	6												
		☒	9 14 18	32		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	11 13 14	27		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	6 15 10	25		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	13 15 30	45		Poorly-graded Sand (SP) Gray, Medium	100	10												
		☒	21 21 22	43		Poorly-graded Sand (SP) Gray, Medium	100	11												
223.2	30.0	☒	20 17 30	47		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
2. HOLE NUMBER: 086-BPR-10
LOCATION COORDINATES: N 13,151,150.2 E 2,461,175.5
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
4. NAME OF DRILLER: K. Roberts
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 246.9 10/13/10
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
15. DATE BORING: STARTED 10/13/10 COMPLETED 10/13/10
6. THICKNESS OF OVERBURDEN:
16. ELEVATION TOP OF BORING: 252.9
7. DEPTH DRILLED INTO ROCK:
17. TOTAL CORE RECOVERY FOR BORING: N/A
8. TOTAL DEPTH OF BORING: 30.0
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	4 5 4	9		Silty Sand (SM) Gray, Oxidized	100	1			40									
		☒	2 3 5	8		Silty Sand (SM) Gray, Oxidized	100	2			37									
247.4	5.5																			
		☒	5 3 4	7		Poorly-graded Sand (SP) Brown, Fine	100	3			4									
		☒	2 4 6	10		Poorly-graded Sand (SP) Brown, Fine	100	4			3									
		☒	5 3 4	7		Poorly-graded Sand (SP) Brown, Fine	100	5			3									
		☒	4 4 6	10		Poorly-graded Sand (SP) Brown, Fine	100	6	1	97	1	0.160								
		☒	4 7 8	15		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	5 12 11	23		Poorly-graded Sand (SP) Gray, Medium	100	8												
		☒	23 23 21	44		Poorly-graded Sand (SP) Gray, Medium	100	9												
		☒	28 23 17	40		Poorly-graded Sand (SP) Gray, Medium	100	10												
		☒	25 20 20	40		Poorly-graded Sand (SP) Gray, Medium	100	11												
222.9	30.0	☒	8 8 12	20		Poorly-graded Sand (SP) Gray, Medium	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)	INSTALLATION: Memphis District (CEMVM)	SHEET 1 OF 1 SHEETS	
1. PROJECT: Below Piggott - West Bank SFB Seepage Study	9. COORDINATE SYSTEM	HORIZONTAL	VERTICAL
	10. SIZE AND TYPE OF BIT: 2.25" ID		
2. HOLE NUMBER: 087-BPR-10	LOCATION COORDINATES: N 13,150,976.0 E 2,460,712.2	11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45	
3. DRILLING AGENCY: Tri-State Testing Services, Inc.	12. TOTAL SAMPLES: 12	DISTURBED: 12	UNDISTURBED: 0
4. NAME OF DRILLER: K. Roberts	13. TOTAL NUMBER CORE BOXES: 0		
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED	DEG FROM VERTICAL: ---	BEARING	14. ELEVATION GROUND WATER: 246.4 10/14/10
15. DATE BORING	STARTED: 10/14/10	COMPLETED: 10/14/10	
6. THICKNESS OF OVERBURDEN	16. ELEVATION TOP OF BORING: 252.4		
7. DEPTH DRILLED INTO ROCK	17. TOTAL CORE RECOVERY FOR BORING: N/A		
8. TOTAL DEPTH OF BORING: 30.0	18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor		

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	4 4 6	10		Silty Sand (SM) Brown & Gray, Oxidized, Fine	100	1			30									
		☒	7 5 6	11		Silty Sand (SM) Gray, Oxidized, Fine	100	2			27									
246.9	5.5																			
		☒	3 3 5	8		Poorly-graded Sand with Silt (SP-SM) Brown, Fine	100	3			9									
		☒	7 9 14	23		Poorly-graded Sand with Silt (SP-SM) Brown, Fine	100	4			12									
241.9	10.5																			
		☒	9 10 16	26		Poorly-graded Sand (SP) Brown, Fine	100	5	1	99	1	0.167								
		☒	10 16 16	32		Poorly-graded Sand (SP) Dark Gray, Fine	100	6												
		☒	17 7 8	15		Poorly-graded Sand (SP) Dark Gray, Fine	100	7												
		☒	5 7 17	24		Poorly-graded Sand (SP) Dark Gray, Fine	100	8												
		☒	15 10 15	25		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	14 10 12	22		Poorly-graded Sand (SP) Gray, Medium	100	10												
		☒	10 10 13	23		Poorly-graded Sand (SP) Gray, Medium	100	11												
		☒	32 29 35	64		Poorly-graded Sand (SP) Gray, Medium	100	12												
222.4	30.0																			

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 088-BPR-10
LOCATION COORDINATES: N 13,150,749.4 E 2,460,234.8
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED
DEG FROM VERTICAL: ---
BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 244.5 10/14/10
15. DATE BORING: STARTED 10/14/10 COMPLETED 10/14/10
16. ELEVATION TOP OF BORING: 250.5
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	1 3 4	7		Fat Clay (CH) Brown, medium, Oxidized, Organic Matter	100	1							28.7					
		☒	2 3 5	8		Fat Clay (CH) Brown, medium, Oxidized, Organic Matter	100	2					60	38	28.2					
245.0	5.5																			
		☒	1 1 4	5		Silty Sand (SM) Gray, Fine	100	3			35				33.5					
242.5	8.0																			
		☒	5 7 5	12		Poorly-graded Sand (SP) Gray, Fine	100	4	0	97	3	0.174								
		☒	4 7 8	15		Poorly-graded Sand (SP) Gray, Fine	100	5												
		☒	11 11 14	25		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	6 10 9	19		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	6 9 9	18		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	15 15 16	31		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	16 9 25	34		Poorly-graded Sand (SP) Gray, Medium	100	10												
		☒	30 33 35	68		Poorly-graded Sand (SP) Gray, Medium	100	11												
		☒	30 30 39	69		Poorly-graded Sand (SP) Gray, Medium	100	12												
220.5	30.0																			

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 089-BPR-10
LOCATION COORDINATES: N 13,150,509.2 E 2,459,821.1
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 244.5 10/14/10
15. DATE BORING: STARTED 10/14/10 COMPLETED 10/14/10
16. ELEVATION TOP OF BORING: 252.5
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	3 3 5	8		Fat Clay (CH) Gray & Brown, medium, Oxidized, Organic Matter	100	1							22.0					
		☒	2 3 5	8		Fat Clay (CH) Gray & Brown, medium, Oxidized, Organic Matter	100	2							22.2					
247.0	5.5																			
		☒	3 4 4	8		Lean Clay (CL) Gray & Brown, medium	100	3					36	20	23.9					
244.5 ▼	8.0																			
		☒	1 2 5	7		Clayey Sand (SC) Gray	100	4			40									
242.0	10.5																			
		☒	3 5 6	11		Poorly-graded Sand (SP) Gray, Fine	100	5	0	98	2	0.113								
		☒	3 7 10	17		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	2 7 9	16		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	5 7 9	16		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	7 10 12	22		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	11 15 18	33		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	6 8 10	18		Poorly-graded Sand (SP) Gray, Fine	100	11												
222.5	30.0	☒	20 22 21	43		Poorly-graded Sand (SP) Gray, Fine	100	12												

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
2. HOLE NUMBER: 090-BPR-10
LOCATION COORDINATES: N 13,150,095.6 E 2,459,584.8
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
4. NAME OF DRILLER: K. Roberts
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 244.0 10/14/10
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
15. DATE BORING: STARTED 10/14/10 COMPLETED 10/14/10
6. THICKNESS OF OVERBURDEN:
16. ELEVATION TOP OF BORING: 251.0
7. DEPTH DRILLED INTO ROCK:
17. TOTAL CORE RECOVERY FOR BORING: N/A
8. TOTAL DEPTH OF BORING: 30.0
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	2 3 4	7		Fat Clay (CH) Gray, medium, Oxidized, Organic Matter	100	1							25.3					
		☒	2 2 4	6		Fat Clay (CH) Gray, medium, Oxidized, Organic Matter	100	2					66	43	28.8					
		☒	3 3 3	6		Fat Clay (CH) Sandy, Gray, medium	100	3			60				31.9					
243.0	8.0																			
		☒	2 2 4	6		Poorly-graded Sand (SP) Gray, Fine, Clay Strata or Lenses, Organic Matter	100	4	3	96	2	0.110								
		☒	7 7 8	15		Poorly-graded Sand (SP) Gray, Fine	100	5												
		☒	6 11 11	22		Poorly-graded Sand (SP) Gray, Fine, Clay Strata or Lenses	100	6												
		☒	8 13 17	30		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	14 26 24	50		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	14 24 24	48		Poorly-graded Sand (SP) Gray, Medium, Clay Strata or Lenses	100	9												
		☒	12 15 16	31		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	30 27 23	50		Poorly-graded Sand (SP) Gray, Fine	100	11												
221.0	30.0	☒	18 18 24	42		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 091-BPR-10
LOCATION COORDINATES: N 13,149,650.5 E 2,459,361.7
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 245.0 10/14/10
15. DATE BORING: STARTED 10/14/10 COMPLETED 10/14/10
16. ELEVATION TOP OF BORING: 251.0
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
248.0	3.0	☒	2 4 5	9		Fat Clay (CH) Gray & Brown, stiff, Oxidized, Organic Matter, Rootlets	100	1							22.3					
245.5	5.5	☒	2 3 4	7		Lean Clay (CL) Gray & Brown, medium	100	2					43	25	24.3					
243.0	8.0	☒	5 5 3	8		Silty Sand (SM) Gray, Fine	100	3			23									
		☒	2 2 5	7		Poorly-graded Sand (SP) Gray, Fine	100	4	0	95	5	0.098								
		☒	5 4 7	11		Poorly-graded Sand (SP) Gray, Fine	100	5												
		☒	3 5 7	12		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	7 9 9	18		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	9 9 11	20		Poorly-graded Sand (SP) Gray, Medium	100	8												
		☒	18 20 19	39		Poorly-graded Sand (SP) Gray, Medium	100	9												
		☒	19 24 23	47		Poorly-graded Sand (SP) Gray, Medium	100	10												
		☒	18 30 24	54		Poorly-graded Sand (SP) Gray, Fine	100	11												
221.0	30.0	☒	22 21 22	43		Poorly-graded Sand (SP) Gray, Medium	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
2. HOLE NUMBER: 092-BPR-10
LOCATION COORDINATES: N 13,149,211.2 E 2,459,155.2
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
4. NAME OF DRILLER: K. Roberts
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 245.7 10/15/10
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
15. DATE BORING: STARTED 10/15/10 COMPLETED 10/15/10
6. THICKNESS OF OVERBURDEN:
16. ELEVATION TOP OF BORING: 251.7
7. DEPTH DRILLED INTO ROCK:
17. TOTAL CORE RECOVERY FOR BORING: N/A
8. TOTAL DEPTH OF BORING: 30.0
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	2 2 4	6		Fat Clay (CH) Gray & Brown, medium, Oxidized, Organic Matter, Rootlets	100	1							15.2					
		☒	2 3 4	7		Fat Clay (CH) Gray & Brown, medium, Oxidized, Organic Matter	100	2					50	32	23.5					
246.2	5.5																			
		☒	2 3 4	7		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	3			6									
243.7	8.0																			
		☒	4 6 6	12		Poorly-graded Sand (SP) Gray, Fine	100	4	0	99	1	0.156								
		☒	1 2 3	5		Poorly-graded Sand (SP) Gray, Fine	100	5												
		☒	1 2 3	5		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	5 10 19	29		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	10 15 17	32		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	28 34 39	73		Poorly-graded Sand (SP) Gray, Medium	100	9												
		☒	15 22 23	45		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	18 20 26	46		Poorly-graded Sand (SP) Gray, Medium	100	11												
		☒	14 18 18	36		Poorly-graded Sand (SP) Gray, Fine	100	12												
221.7	30.0																			

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)

INSTALLATION: Memphis District (CEMVM)

SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study

9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

10. SIZE AND TYPE OF BIT: 2.25" ID

2. HOLE NUMBER: 093-BPR-10

LOCATION COORDINATES: N 13,148,746.3 E 2,458,913.8

11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45

3. DRILLING AGENCY: Tri-State Testing Services, Inc.

12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0

4. NAME OF DRILLER: K. Roberts

13. TOTAL NUMBER CORE BOXES: 0

14. ELEVATION GROUND WATER: 245.8 10/15/10

5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:

15. DATE BORING: STARTED 10/15/10 COMPLETED 10/15/10

6. THICKNESS OF OVERBURDEN:

16. ELEVATION TOP OF BORING: 251.8

7. DEPTH DRILLED INTO ROCK:

17. TOTAL CORE RECOVERY FOR BORING: N/A

8. TOTAL DEPTH OF BORING: 30.0

18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
248.8	3.0	☒	4 4 6	10		Fat Clay (CH) Gray, stiff, Oxidized, Organic Matter	100	1							21.5					
246.3	5.5	☒	3 4 5	9		Lean Clay (CL) Gray, stiff	100	2					43	23	19.4					
243.8	8.0	☒	3 6 8	14		Poorly-graded Sand with Clay (SP-SC) Gray, Fine	100	3			7									
		☒	2 4 8	12		Poorly-graded Sand (SP) Gray, Fine	100	4	1	98	1	0.199								
		☒	1 2 2	4		Poorly-graded Sand (SP) Gray, Fine	100	5												
		☒	1 2 5	7		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	5 9 10	19		Poorly-graded Sand (SP) Gray, Medium	100	7												
		☒	13 13 13	26		Poorly-graded Sand (SP) Gray, Medium	100	8												
		☒	15 12 15	27		Poorly-graded Sand (SP) Gray, Medium	100	9												
		☒	18 12 16	28		Poorly-graded Sand (SP) Gray, Medium	100	10												
		☒	20 33 21	54		Poorly-graded Sand (SP) Gray, Fine	100	11												
221.8	30.0	☒	12 12 15	27		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 094-BPR-10
LOCATION COORDINATES: N 13,148,306.5 E 2,458,693.7
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 245.5 10/15/10
15. DATE BORING: STARTED 10/15/10 COMPLETED 10/15/10
16. ELEVATION TOP OF BORING: 251.5
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
248.5	3.0	☒	2 3 5	8		Fat Clay (CH) Brown, medium, Oxidized, Organic Matter	100	1							18.9					
246.0	5.5	☒	1 2 2	4		Lean Clay (CL) Gray, soft, Oxidized, Organic Matter, Rootlets	100	2					43	26	23.5					
		☒	3 2 1	3		Clayey Sand (SC) Gray, soft	100	3			43				27.2					
241.0	10.5	☒	2 2 1	3		Clayey Sand (SC) Gray, Fine	100	4			16									
		☒	3 3 1	4		Poorly-graded Sand (SP) Gray, Fine	100	5	1	97	2	0.160								
		☒	2 2 2	4		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	3 8 8	16		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	8 9 14	23		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	12 11 14	25		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	12 18 22	40		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	13 15 16	31		Poorly-graded Sand (SP) Gray, Fine	100	11												
221.5	30.0	☒	11 14 18	32		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 095-BPR-10
LOCATION COORDINATES: N 13,147,882.3 E 2,458,477.5
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 244.2 10/15/10
15. DATE BORING: STARTED 10/15/10 COMPLETED 10/15/10
16. ELEVATION TOP OF BORING: 251.2
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	1 2 4	6		Fat Clay (CH) Gray & Brown, medium, Oxidized, Organic Matter, Rootlets	100	1							24.9					
		☒	2 3 3	6		Fat Clay (CH) Gray & Brown, medium, Oxidized, Organic Matter, Rootlets	100	2					53	34	22.7					
245.7	5.5																			
		☒	2 2 3	5		Poorly-graded Sand with Silt (SP-SM) Dark Gray, Fine	100	3			9									
		☒	3 3 3	6		Poorly-graded Sand with Silt (SP-SM) Dark Gray, Fine	100	4			6									
240.7	10.5																			
		☒	6 8 8	16		Poorly-graded Sand (SP) Gray, Fine	100	5	2	97	1	0.168								
		☒	8 9 8	17		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	6 10 10	20		Poorly-graded Sand (SP) Gray, Medium	100	7												
		☒	8 12 16	28		Poorly-graded Sand (SP) Gray, Medium	100	8												
		☒	9 16 16	32		Poorly-graded Sand (SP) Gray, Medium	100	9												
		☒	12 23 20	43		Poorly-graded Sand (SP) Gray, Medium	100	10												
		☒	11 17 18	35		Poorly-graded Sand (SP) Gray, Medium	100	11												
		☒	15 18 21	39		Poorly-graded Sand (SP) Gray, Medium	100	12												
221.2	30.0																			

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 096-BPR-10
LOCATION COORDINATES: N 13,147,393.8 E 2,458,242.7
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 244.0 10/16/10
15. DATE BORING: STARTED 10/16/10 COMPLETED 10/16/10
16. ELEVATION TOP OF BORING: 250.0
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	3 3 5	8		Lean Clay (CL) Gray & Brown, medium, Oxidized, Organic Matter	100	1							24.2					
246.0	4.0	☒	2 4 6	10		Lean Clay (CL) Brown, very soft	100	2												
		☒	7 7 7	14		Poorly-graded Sand (SP) Gray, Fine	100	3	0	99	1	0.104								
		☒	3 6 10	16		Poorly-graded Sand (SP) Gray, Fine	100	4												
		☒	1 2 4	6		Poorly-graded Sand (SP) Gray, Fine	100	5												
		☒	3 2 4	6		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	8 8 10	18		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	10 9 9	18		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	10 9 11	20		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	9 6 8	14		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	12 8 12	20		Poorly-graded Sand (SP) Gray, Fine	100	11												
220.0	30.0	☒	9 8 9	17		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 097-BPR-10
LOCATION COORDINATES: N 13,146,977.3 E 2,458,029.4
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 245.4 10/16/10
15. DATE BORING: STARTED 10/16/10 COMPLETED 10/16/10
16. ELEVATION TOP OF BORING: 250.9
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	3 2 3	5		Lean Clay (CL) Brown, medium, Fine	100	1							20.2					
		☒	1 2 2	4		Lean Clay (CL) Brown, soft	100	2					42	27	27.9					
245.4	5.5																			
		☒	10 10 10	20		Poorly-graded Sand (SP) Gray, Medium	100	3	0	99	1	0.244								
		☒	2 3 5	8		Poorly-graded Sand (SP) Gray, Medium	100	4												
		☒	7 11 12	23		Poorly-graded Sand (SP) Gray, Fine	100	5												
		☒	3 8 12	20		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	3 4 8	12		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	3 8 12	20		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	4 10 13	23		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	4 8 12	20		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	8 10 13	23		Poorly-graded Sand (SP) Gray, Medium	100	11												
220.9	30.0	☒	7 11 20	31		Poorly-graded Sand (SP) Gray, Medium	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 098-BPR-10
LOCATION COORDINATES: N 13,146,495.1 E 2,457,783.7
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 245.5 10/16/10
15. DATE BORING: STARTED 10/16/10 COMPLETED 10/16/10
16. ELEVATION TOP OF BORING: 250.5
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	2 3 5	8		Lean Clay (CL) Gray & Brown, medium, Organic Matter	100	1							24.6					
		☒	1 3 3	6		Lean Clay (CL) Gray, medium, Oxidized	100	2					26	24	23.0					
245.0	5.5																			
		☒	5 4 3	7		Silty Sand (SM) Gray	100	3			14									
242.5	8.0																			
		☒	1 1 2	3		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	4			8									
240.0	10.5																			
		☒	7 8 10	18		Poorly-graded Sand (SP) Gray, Fine	100	5	0	99	1	0.221								
		☒	7 10 10	20		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	10 13 13	26		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	10 15 16	31		Poorly-graded Sand (SP) Gray, Medium	100	8												
		☒	23 24 24	48		Poorly-graded Sand (SP) Gray, Medium	100	9												
		☒	15 17 21	38		Poorly-graded Sand (SP) Gray, Medium	100	10												
		☒	18 20 26	46		Poorly-graded Sand (SP) Gray, Fine	100	11												
		☒	20 20 20	40		Poorly-graded Sand (SP) Gray, Fine	100	12												
220.5	30.0																			

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 099-BPR-10
LOCATION COORDINATES: N 13,146,074.4 E 2,457,577.4
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 244.7 10/16/10
15. DATE BORING: STARTED 10/16/10 COMPLETED 10/16/10
16. ELEVATION TOP OF BORING: 250.7
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
247.7	3.0	☒	3 4 4	8		Fat Clay (CH) Gray, medium, Oxidized, Organic Matter	100	1							23.0					
245.2	5.5	☒	3 3 4	7		Lean Clay (CL) Gray, medium, Oxidized, Organic Matter	100	2					42	27	22.9					
242.7	8.0	☒	1 1 1	2		Clayey Sand (SC) Gray, very soft, Oxidized	100	3			20									
240.2	10.5	☒	1 1 3	4		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	4	0	94	6	0.101								
		☒	4 6 9	15		Poorly-graded Sand (SP) Gray, Fine	100	5												
		☒	6 9 9	18		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	6 8 8	16		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	4 4 10	14		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	6 12 14	26		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	9 12 15	27		Poorly-graded Sand (SP) Gray, Medium	100	10												
		☒	30 30 30	60		Poorly-graded Sand (SP) Gray, Medium	100	11												
220.7	30.0	☒	18 14 21	35		Poorly-graded Sand (SP) Gray, Medium	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)	INSTALLATION: Memphis District (CEMVM)	SHEET 1 OF 1 SHEETS	
1. PROJECT: Below Piggott - West Bank SFB Seepage Study	9. COORDINATE SYSTEM	HORIZONTAL	VERTICAL
	10. SIZE AND TYPE OF BIT: 2.25" ID		
2. HOLE NUMBER: 100-BPR-10 — LOCATION COORDINATES: N 13,145,647.3 E 2,457,361.5	11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45		
3. DRILLING AGENCY: Tri-State Testing Services, Inc.	12. TOTAL SAMPLES: 12	DISTURBED: 12	UNDISTURBED: 0
4. NAME OF DRILLER: K. Roberts	13. TOTAL NUMBER CORE BOXES: 0		
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED — DEG FROM VERTICAL: --- — BEARING:	14. ELEVATION GROUND WATER: 242.3 10/16/10		
	15. DATE BORING: STARTED 10/16/10	COMPLETED 10/16/10	
6. THICKNESS OF OVERBURDEN	16. ELEVATION TOP OF BORING: 250.3		
7. DEPTH DRILLED INTO ROCK	17. TOTAL CORE RECOVERY FOR BORING: N/A		
8. TOTAL DEPTH OF BORING: 30.0	18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor		

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_r	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	3 3 5	8		Fat Clay (CH) Gray, medium, Oxidized, Organic Matter	100	1							21.8					
		☒	2 3 3	6		Fat Clay (CH) Gray, medium, Oxidized, Organic Matter	100	2					50	33	25.4					
		☒	2 2 2	4		Fat Clay (CH) Gray, soft, Oxidized, Organic Matter	100	3							52.6					
242.3	8.0																			
		☒	1 1 1	2		Lean Clay (CL) Gray, very soft	100	4					37	21	24.3					
239.8	10.5																			
		☒	3 6 7	13		Clayey Sand (SC) Gray, stiff	100	5			30									
237.3	13.0																			
		☒	4 4 4	8		Poorly-graded Sand with Clay (SP-SC) Gray, Fine	100	6			9									
234.8	15.5																			
		☒	6 8 12	20		Poorly-graded Sand (SP) Brown, Medium	100	7	4	95	2	0.203								
		☒	10 15 17	32		Poorly-graded Sand (SP) Brown, Fine	100	8												
		☒	12 12 16	28		Poorly-graded Sand (SP) Brown, Fine	100	9												
		☒	8 20 21	41		Poorly-graded Sand (SP) Brown, Fine	100	10												
224.8	25.5																			
		☒	31 28 20	48		Poorly-graded Gravel (GP)	100	11												
222.3	28.0																			
		☒	16 26 20	46		Poorly-graded Sand (SP) Brown, Fine	100	12												
220.3	30.0																			

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION	Mississippi Valley Division (MVD)
INSTALLATION	Memphis District (CEMVM)
SHEET	1 OF 1 SHEETS
1. PROJECT	Below Piggott - West Bank SFB Seepage Study
9. COORDINATE SYSTEM	HORIZONTAL / VERTICAL
10. SIZE AND TYPE OF BIT	2.25" ID
2. HOLE NUMBER	101-BPR-10
LOCATION COORDINATES	N 13,145,163.5 E 2,457,124.7
11. MANUFACTURER'S DESIGNATION OF DRILL	CME 45
3. DRILLING AGENCY	Tri-State Testing Services, Inc.
12. TOTAL SAMPLES / DISTURBED / UNDISTURBED	12 / 12 / 0
4. NAME OF DRILLER	K. Roberts
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	244.9 10/17/10
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: --- ; BEARING:
15. DATE BORING STARTED / COMPLETED	10/17/10 / 10/17/10
6. THICKNESS OF OVERBURDEN	
16. ELEVATION TOP OF BORING	250.9
7. DEPTH DRILLED INTO ROCK	
17. TOTAL CORE RECOVERY FOR BORING	N/A
8. TOTAL DEPTH OF BORING	30.0
18. SIGNATURE AND TITLE OF INSPECTOR	Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	5 5 5	10		Lean Clay (CL) Gray, stiff, Oxidized	100	1							20.3					
		☒	3 4 6	10		Lean Clay (CL) Brown, stiff	100	2					42	26	16.8					
245.4	5.5																			
		☒	2 4 6	10		Poorly-graded Sand (SP) Gray, Fine, Organic Matter	100	3	0	99	1	0.181								
		☒	3 5 9	14		Poorly-graded Sand (SP) Gray, Fine	100	4												
		☒	5 10 12	22		Poorly-graded Sand (SP) Gray, Fine	100	5												
		☒	7 8 9	17		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	6 10 12	22		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	20 20 21	41		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	3 8 10	18		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	6 9 11	20		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	16 17 20	37		Poorly-graded Sand (SP) Gray, Fine	100	11												
220.9	30.0	☒	5 13 20	33		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 102-BPR-10
LOCATION COORDINATES: N 13,144,711.4 E 2,456,902.6
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 245.0 10/17/10
15. DATE BORING: STARTED 10/17/10 COMPLETED 10/17/10
16. ELEVATION TOP OF BORING: 251.0
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
248.0	3.0	☒	6 7 9	16		Silty Sand (SM) Gray, Oxidized, Organic Matter	100	1												
245.5	5.5	☒	3 5 5	10		Clayey Sand (SC) Brown, stiff, Fine	100	2			36				14.8					
243.0	8.0	☒	1 4 5	9		Poorly-graded Sand with Silt (SP-SM) Red, Fine	100	3			7									
		☒	2 3 6	9		Poorly-graded Sand (SP) Red, Fine	100	4	0	98	2	0.154								
		☒	2 11 12	23		Poorly-graded Sand (SP) Gray, Fine	100	5												
		☒	13 10 13	23		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	7 6 9	15		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	4 7 12	19		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	6 11 11	22		Poorly-graded Sand (SP) Gray, Fine, Organic Matter	100	9												
		☒	6 6 9	15		Poorly-graded Sand (SP) Gray, Fine, Organic Matter	100	10												
		☒	6 10 12	22		Poorly-graded Sand (SP) Gray, Fine, Organic Matter	100	11												
221.0	30.0	☒	7 13 14	27		Poorly-graded Sand (SP) Gray, Fine, Organic Matter	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)

INSTALLATION: Memphis District (CEMVM)

SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study

9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

10. SIZE AND TYPE OF BIT: 2.25" ID

2. HOLE NUMBER: 103-BPR-10

LOCATION COORDINATES: N 13,144,280.6 E 2,456,690.7

11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45

3. DRILLING AGENCY: Tri-State Testing Services, Inc.

12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0

4. NAME OF DRILLER: K. Roberts

13. TOTAL NUMBER CORE BOXES: 0

5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:

14. ELEVATION GROUND WATER: 245.0 10/17/10

15. DATE BORING: STARTED 10/17/10 COMPLETED 10/17/10

6. THICKNESS OF OVERBURDEN:

16. ELEVATION TOP OF BORING: 251.0

7. DEPTH DRILLED INTO ROCK:

17. TOTAL CORE RECOVERY FOR BORING: N/A

8. TOTAL DEPTH OF BORING: 30.0

18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
			10 5 5	10		Silty Sand (SM) Brown, Fine	100	1												
			3 5 5	10		Silty Sand (SM) Brown, Fine	100	2			14									
			2 2 2	4		Silty Sand (SM) Brown, Fine	100	3			33				30.2					
243.0	8.0																			
			1 1 2	3		Silt (ML) Sandy, Brown, soft	100	4			68				39.9					
240.5	10.5																			
			7 12 12	24		Poorly-graded Sand (SP) Gray, Fine	100	5	0	97	3	0.095								
			4 8 10	18		Poorly-graded Sand (SP) Gray, Fine, Clay Strata or Lenses	100	6												
			9 11 13	24		Poorly-graded Sand (SP) Gray, Fine	100	7												
			6 12 14	26		Poorly-graded Sand (SP) Gray, Medium	100	8												
			10 7 11	18		Poorly-graded Sand (SP) Gray, Medium	100	9												
			9 6 11	17		Poorly-graded Sand (SP) Gray, Medium	100	10												
			36 29 30	59		Poorly-graded Sand (SP) Gray, Medium	100	11												
221.0	30.0		6 15 16	31		Poorly-graded Sand (SP) Gray, Medium	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
2. HOLE NUMBER: 104-BPR-10
LOCATION COORDINATES: N 13,143,800.1 E 2,456,488.1
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
4. NAME OF DRILLER: K. Roberts
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 244.1 10/17/10
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
15. DATE BORING: STARTED 10/17/10 COMPLETED 10/17/10
6. THICKNESS OF OVERBURDEN:
16. ELEVATION TOP OF BORING: 250.1
7. DEPTH DRILLED INTO ROCK:
17. TOTAL CORE RECOVERY FOR BORING: N/A
8. TOTAL DEPTH OF BORING: 30.0
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	8 8 8	16		Silty Sand (SM) Light Brown, Fine	100	1												
		☒	6 8 7	15		Silty Sand (SM) Gray, Oxidized, Fine	100	2			21									
		☒	1 3 6	9		Silty Sand (SM) Gray, Fine	100	3			31									
242.1	8.0																			
		☒	3 4 4	8		Clayey Sand (SC) Gray	100	4			16				23.0					
239.6	10.5																			
		☒	10 17 16	33		Poorly-graded Sand (SP) Gray, Fine	100	5	1	98	1	0.164								
		☒	6 11 11	22		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	2 4 9	13		Poorly-graded Sand (SP) Gray, Fine, Organic Matter	100	7												
		☒	4 7 9	16		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	4 8 11	19		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	14 18 20	38		Poorly-graded Sand (SP) Gray, Medium	100	10												
		☒	7 15 15	30		Poorly-graded Sand (SP) Gray, Medium	100	11												
		☒	3 7 10	17		Poorly-graded Sand (SP) Gray, Fine	100	12												
220.1	30.0																			

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)	INSTALLATION: Memphis District (CEMVM)	SHEET 1 OF 1 SHEETS	
1. PROJECT: Below Piggott - West Bank SFB Seepage Study	9. COORDINATE SYSTEM	HORIZONTAL	VERTICAL
	10. SIZE AND TYPE OF BIT: 2.25" ID		
2. HOLE NUMBER: 105-BPR-10 — LOCATION COORDINATES: N 13,143,353.3 E 2,456,313.1	11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45		
3. DRILLING AGENCY: Tri-State Testing Services, Inc.	12. TOTAL SAMPLES: 12	DISTURBED: 12	UNDISTURBED: 0
4. NAME OF DRILLER: K. Roberts	13. TOTAL NUMBER CORE BOXES: 0		
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED — DEG FROM VERTICAL: --- — BEARING:	14. ELEVATION GROUND WATER: 244.8 10/18/10		
	15. DATE BORING — STARTED: 10/18/10 — COMPLETED: 10/18/10		
6. THICKNESS OF OVERBURDEN	16. ELEVATION TOP OF BORING: 249.8		
7. DEPTH DRILLED INTO ROCK	17. TOTAL CORE RECOVERY FOR BORING: N/A		
8. TOTAL DEPTH OF BORING: 30.0	18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor		

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	7 5 7	12		Silt (ML) Gray, Oxidized, Fine, Organic Matter	100	1							10.0					
		☒	2 5 5	10		Silt (ML) Gray, Oxidized, Fine, Organic Matter	100	2							19.7					
244.3	5.5																			
		☒	2 5 3	8		Silty Clay (CL-ML) Gray, medium	100	3					22	6	29.8					
241.8	8.0																			
		☒	1 1 2	3		Clayey Sand (SC) Gray, Fine	100	4			67									
239.3	10.5																			
		☒	2 3 5	8		Lean Clay (CL) Gray, medium	100	5					34	16	35.1					
236.8	13.0																			
		☒	3 4 7	11		Silty Sand (SM) Gray, Fine	100	6			17									
234.3	15.5																			
		☒	7 10 14	24		Poorly-graded Sand (SP) Gray, Fine	100	7	1	98	2	0.151								
231.8	18.0																			
		☒	9 12 12	24		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	9 12 12	24		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	4 7 12	19		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	8 11 14	25		Poorly-graded Sand (SP) Gray, Medium	100	11												
		☒	22 24 27	51		Poorly-graded Sand (SP) Gray, Medium	100	12												
219.8	30.0																			

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 106-BPR-10
LOCATION COORDINATES: N 13,142,899.9 E 2,456,102.2
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 243.8 10/18/10
15. DATE BORING: STARTED 10/18/10 COMPLETED 10/18/10
16. ELEVATION TOP OF BORING: 249.8
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	4 6 8	14		Fat Clay (CH) Gray, stiff, Oxidized, Organic Matter	100	1							17.2					
		☒	2 4 5	9		Fat Clay (CH) Gray, stiff, Oxidized, Organic Matter	100	2					50	33	23.3					
244.3	5.5																			
		☒	2 3 5	8		Poorly-graded Sand (SP) Gray, Fine	100	3	0	98	2	0.109								
		☒	2 4 4	8		Poorly-graded Sand (SP) Gray, Fine	100	4												
		☒	6 6 7	13		Poorly-graded Sand (SP) Gray, Fine	100	5												
		☒	4 6 10	16		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	4 8 8	16		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	4 9 12	21		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	8 17 17	34		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	14 15 15	30		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	13 17 18	35		Poorly-graded Sand (SP) Gray, Fine	100	11												
219.8	30.0	☒	14 17 20	37		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 107-BPR-10
LOCATION COORDINATES: N 13,142,449.2 E 2,455,865.9
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 244.0 10/18/10
15. DATE BORING: STARTED 10/18/10 COMPLETED 10/18/10
16. ELEVATION TOP OF BORING: 250.0
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
			4 2 9	11		Clayey Sand (SC) Brown	100	1			48									
			5 5 7	12		Clayey Sand (SC) Gray	100	2			43									
244.5	5.5																			
			4 7 8	15		Poorly-graded Sand (SP) Brown, Fine	100	3	0	98	2	0.151								
			5 5 3	8		Poorly-graded Sand (SP) Gray, Fine, Organic Matter	100	4												
			6 10 12	22		Poorly-graded Sand (SP) Gray, Fine	100	5												
			7 7 10	17		Poorly-graded Sand (SP) Gray, Fine	100	6												
			7 13 16	29		Poorly-graded Sand (SP) Gray, Fine	100	7												
			7 9 12	21		Poorly-graded Sand (SP) Gray, Medium	100	8												
			9 12 14	26		Poorly-graded Sand (SP) Gray, Medium	100	9												
			2 3 8	11		Poorly-graded Sand (SP) Gray, Medium	100	10												
			8 14 14	28		Poorly-graded Sand (SP) Gray, Fine	100	11												
220.0	30.0		4 10 13	23		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
2. HOLE NUMBER: 108-BPR-10
LOCATION COORDINATES: N 13,141,991.1 E 2,455,652.4
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
4. NAME OF DRILLER: K. Roberts
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 243.4 10/18/10
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
15. DATE BORING: STARTED 10/18/10 COMPLETED 10/18/10
6. THICKNESS OF OVERBURDEN:
16. ELEVATION TOP OF BORING: 249.4
7. DEPTH DRILLED INTO ROCK:
17. TOTAL CORE RECOVERY FOR BORING: N/A
8. TOTAL DEPTH OF BORING: 30.0
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_r	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	5 4 6	10		Clayey Sand (SC) Gray & Brown, stiff, Oxidized, Organic Matter	100	1												
		☒	2 2 4	6		Clayey Sand (SC) Gray & Brown, medium, Oxidized	100	2			31									
243.9	5.5																			
		☒	2 4 6	10		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	3			10									
241.4	8.0																			
		☒	2 8 9	17		Poorly-graded Sand (SP) Gray, Fine	100	4	0	99	1	0.155								
		☒	4 9 9	18		Poorly-graded Sand (SP) Gray, Fine, Organic Matter	100	5												
		☒	4 8 8	16		Poorly-graded Sand (SP) Gray, Fine, Organic Matter	100	6												
		☒	3 3 4	7		Poorly-graded Sand (SP) Gray, Fine, Organic Matter	100	7												
		☒	5 8 10	18		Poorly-graded Sand (SP) Gray, Fine, Organic Matter	100	8												
		☒	9 15 16	31		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	6 9 12	21		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	12 17 24	41		Poorly-graded Sand (SP) Gray, Medium	100	11												
		☒	22 26 28	54		Poorly-graded Sand (SP) Gray, Medium	100	12												
219.4	30.0																			

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 109-BPR-10
LOCATION COORDINATES: N 13,141,539.1 E 2,455,472.4
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 243.0 10/19/10
15. DATE BORING: STARTED 10/19/10 COMPLETED 10/19/10
16. ELEVATION TOP OF BORING: 249.0
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	5 6 6	12		Fat Clay (CH) Gray, stiff, Oxidized, Organic Matter	100	1							24.2					
		☒	3 3 5	8		Fat Clay (CH) Gray, medium, Oxidized	100	2					87	56	37.7					
243.5	5.5																			
		☒	8 12 12	24		Poorly-graded Sand (SP) Gray, Fine	100	3	0	97	3	0.133								
		☒	3 9 12	21		Poorly-graded Sand (SP) Gray, Fine	100	4												
		☒	4 11 13	24		Poorly-graded Sand (SP) Gray, Fine	100	5												
		☒	3 8 10	18		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	3 3 3	6		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	2 1 4	5		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	8 18 18	36		Poorly-graded Sand (SP) Gray, Medium	100	9												
		☒	8 13 15	28		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	21 22 17	39		Poorly-graded Sand (SP) Gray, Fine	100	11												
219.0	30.0	☒	6 15 12	27		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION	Mississippi Valley Division (MVD)
INSTALLATION	Memphis District (CEMVM)
SHEET	1 OF 1 SHEETS
1. PROJECT	Below Piggott - West Bank SFB Seepage Study
9. COORDINATE SYSTEM	HORIZONTAL / VERTICAL
10. SIZE AND TYPE OF BIT	2.25" ID
2. HOLE NUMBER	110-BPR-10
LOCATION COORDINATES	N 13,141,084.5 E 2,455,264.5
11. MANUFACTURER'S DESIGNATION OF DRILL	CME 45
3. DRILLING AGENCY	Tri-State Testing Services, Inc.
12. TOTAL SAMPLES / DISTURBED / UNDISTURBED	12 / 12 / 0
4. NAME OF DRILLER	K. Roberts
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	242.9 10/19/10
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: --- ; BEARING:
15. DATE BORING	STARTED 10/19/10 COMPLETED 10/19/10
6. THICKNESS OF OVERBURDEN	
16. ELEVATION TOP OF BORING	248.9
7. DEPTH DRILLED INTO ROCK	
17. TOTAL CORE RECOVERY FOR BORING	N/A
8. TOTAL DEPTH OF BORING	30.0
18. SIGNATURE AND TITLE OF INSPECTOR	Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
245.9	3.0	☒	4 4 4	8		Fat Clay (CH) Gray & Brown, medium, Oxidized, Organic Matter	100	1							23.5					
243.4	5.5	☒	2 2 3	5		Lean Clay (CL) Gray & Brown, medium	100	2					47	29	32.8					
240.9	8.0	☒	2 6 7	13		Silty Sand (SM) Gray, Fine	100	3			17									
		☒	2 7 6	13		Poorly-graded Sand (SP) Gray, Fine	100	4	0	99	1	0.159								
		☒	4 11 11	22		Poorly-graded Sand (SP) Gray, Fine	100	5												
		☒	4 7 8	15		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	14 19 18	37		Poorly-graded Sand (SP) Gray, Medium	100	7												
		☒	10 10 14	24		Poorly-graded Sand (SP) Gray, Medium	100	8												
		☒	11 8 12	20		Poorly-graded Sand (SP) Gray, Medium	100	9												
		☒	5 7 10	17		Poorly-graded Sand (SP) Gray, Medium	100	10												
		☒	12 16 17	33		Poorly-graded Sand (SP) Gray, Medium	100	11												
218.9	30.0	☒	9 12 16	28		Poorly-graded Sand (SP) Gray, Medium	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)	INSTALLATION: Memphis District (CEMVM)	SHEET 1 OF 1 SHEETS	
1. PROJECT: Below Piggott - West Bank SFB Seepage Study	9. COORDINATE SYSTEM:	HORIZONTAL:	VERTICAL:
	10. SIZE AND TYPE OF BIT: 2.25" ID		
2. HOLE NUMBER: 111-BPR-10	LOCATION COORDINATES: N 13,140,589.1 E 2,454,994.7	11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45	
3. DRILLING AGENCY: Tri-State Testing Services, Inc.		12. TOTAL SAMPLES: 12	DISTURBED: 12 / UNDISTURBED: 0
4. NAME OF DRILLER: K. Roberts		13. TOTAL NUMBER CORE BOXES: 0	
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED	DEG FROM VERTICAL: --- / BEARING:	14. ELEVATION GROUND WATER: 242.5	10/19/10
		15. DATE BORING: STARTED 10/19/10	COMPLETED 10/19/10
6. THICKNESS OF OVERBURDEN		16. ELEVATION TOP OF BORING: 248.5	
7. DEPTH DRILLED INTO ROCK		17. TOTAL CORE RECOVERY FOR BORING: N/A	
8. TOTAL DEPTH OF BORING: 30.0		18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor	

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	4 2 4	6		Fat Clay (CH) Dark Brown, medium	100	1							23.6					
		☒	3 4 3	7		Fat Clay (CH) Gray & Brown, medium, Oxidized, Organic Matter	100	2					58	38	33.8					
243.0	5.5																			
		☒	3 6 5	11		Poorly-graded Sand with Clay (SP-SC) Dark Gray, Fine	100	3			9									
240.5	8.0																			
		☒	2 4 4	8		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	4	0	92	8	0.082								
238.0	10.5																			
		☒	2 5 7	12		Poorly-graded Sand (SP) Gray, Fine	100	5												
		☒	10 8 9	17		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	7 7 9	16		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	9 10 12	22		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	11 15 16	31		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	20 18 23	41		Poorly-graded Sand (SP) Gray, Medium	100	10												
		☒	13 16 18	34		Poorly-graded Sand (SP) Gray, Medium	100	11												
218.5	30.0	☒	10 17 17	34		Poorly-graded Sand (SP) Gray, Medium	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)	INSTALLATION: Memphis District (CEMVM)	SHEET 1 OF 1 SHEETS	
1. PROJECT: Below Piggott - West Bank SFB Seepage Study	9. COORDINATE SYSTEM	HORIZONTAL	VERTICAL
	10. SIZE AND TYPE OF BIT: 2.25" ID		
2. HOLE NUMBER: 112-BPR-10	LOCATION COORDINATES: N 13,140,097.1 E 2,454,777.9	11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45	
3. DRILLING AGENCY: Tri-State Testing Services, Inc.	12. TOTAL SAMPLES: 12	DISTURBED: 12	UNDISTURBED: 0
4. NAME OF DRILLER: K. Roberts	13. TOTAL NUMBER CORE BOXES: 0		
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED	DEG FROM VERTICAL: ---	BEARING	14. ELEVATION GROUND WATER: 242.4 10/20/10
15. DATE BORING	STARTED: 10/20/10	COMPLETED: 10/20/10	
6. THICKNESS OF OVERBURDEN	16. ELEVATION TOP OF BORING: 248.4		
7. DEPTH DRILLED INTO ROCK	17. TOTAL CORE RECOVERY FOR BORING: N/A		
8. TOTAL DEPTH OF BORING: 30.0	18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor		

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
			6 5 6	11		Fat Clay (CH) Gray, stiff, Oxidized, Organic Matter	100	1							26.6					
245.4	3.0																			
			2 3 4	7		Lean Clay (CL) Gray, medium	100	2					45	25	35.4					
242.9	5.5																			
			5 7 6	13		Poorly-graded Sand (SP) Gray, Fine, Organic Matter	100	3	1	97	2	0.101								
			2 5 10	15		Poorly-graded Sand (SP) Gray, Fine	100	4												
			6 10 10	20		Poorly-graded Sand (SP) Gray, Fine	100	5												
			2 4 8	12		Poorly-graded Sand (SP) Gray, Fine	100	6												
			6 5 8	13		Poorly-graded Sand (SP) Gray, Fine	100	7												
			3 6 10	16		Poorly-graded Sand (SP) Gray, Medium	100	8												
			8 17 21	38		Poorly-graded Sand (SP) Gray, Fine	100	9												
			25 27 28	55		Poorly-graded Sand (SP) Gray, Medium	100	10												
			7 8 9	17		Poorly-graded Sand (SP) Gray, Medium	100	11												
218.4	30.0		4 7 10	17		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 5 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 113-BPT-10
LOCATION COORDINATES: N 13,180,323.5 E 2,489,648.2
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: G. Baker
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 200.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 4.5" Wing Bit
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 75
12. TOTAL SAMPLES: 33 DISTURBED: 33 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 255.7 12/22/10
15. DATE BORING: STARTED 12/16/10 COMPLETED 12/21/10
16. ELEVATION TOP OF BORING: 264.7
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
261.7	3.0	☒	2 3 4	7		Silty Sand (SM) Brown, Fine	100	1			28				12.7					
259.2	5.5	☒	3 3 5	8		Poorly-graded Sand (SP) Brown, Fine	100	2	8	88	4	0.150								
256.7	8.0	☒	2 2 6	8		Poorly-graded Sand with Silt (SP-SM) Brown, Fine	100	3	0	92	8	0.087								
		☒	3 4 6	10		Poorly-graded Sand (SP) Brown, Fine	100	4	1	98	1	0.168								
		☒	3 5 6	11		Poorly-graded Sand (SP) Brown, Fine	100	5												
		☒	6 7 11	18		Poorly-graded Sand (SP) Gray & Brown, Medium	100	6	0	98	2	0.208								
		☒	6 6 7	13		Poorly-graded Sand (SP) Gray, Fine	100	7	1	97	2	0.163								
		☒	3 5 7	12		Poorly-graded Sand (SP) Gray, Medium	100	8	0	98	1	0.202								
		☒	7 11 13	24		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	4 6 7	13		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	10	6	92	1	0.167								
		☒	4 8 12	20		Poorly-graded Sand (SP) Gray, Fine	100	11	0	98	2	0.172								
		☒	14 7 12	19		Poorly-graded Sand (SP) Gray, Medium	100	12	3	95	2	0.181								
		☒	4 8 9	17		Poorly-graded Sand (SP) Gray, Medium	100	13	2	96	2	0.202								
		☒	14 8 11	19		Poorly-graded Sand (SP) Gray, Medium	100	14	3	94	2	0.219								

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,180,323.5 E 2,489,648.2

ELEVATION TOP OF BORING: 264.7

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	1 5 8	13		Poorly-graded Sand (SP) Gray, Fine	100	15	0	99	1	0.163								
		X	6 9 9	18		Poorly-graded Sand (SP) Gray, Fine	100	16												
		X	2 6 9	15		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	17	1	98	2	0.161								
		X	4 6 9	15		Poorly-graded Sand (SP) Gray, Fine	100	18	2	96	2	0.156								
		X	4 6 6	12		Poorly-graded Sand (SP) Gray, Fine	100	19	0	99	1	0.157								
		X	3 8 10	18		Poorly-graded Sand (SP) Gray, Fine	100	20												

35.0 37.5 40.0 42.5 45.0 47.5 50.0 52.5 55.0 57.5 60.0 62.5 65.0 67.5 70.0 72.5 75.0 77.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 3 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,180,323.5 E 2,489,648.2

ELEVATION TOP OF BORING: 264.7

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	8 11 13	24		Poorly-graded Sand (SP) Gray, Medium	100	21	5	93	2	0.302								
		X	1 7 9	16		Poorly-graded Sand (SP) Gray, Medium	100	22	3	96	1	0.329								
		X	7 15 21	36		Poorly-graded Sand (SP) Gray, Medium	100	23	1	96	3	0.232								
		X	7 12 11	23		Poorly-graded Sand (SP) Gray, Fine	100	24												
		X	10 24 24	48		Poorly-graded Sand (SP) Gray	100	25												

77.5 80.0 82.5 85.0 87.5 90.0 92.5 95.0 97.5 100.0 102.5 105.0 107.5 110.0 112.5 115.0 117.5 120.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 4 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM | HORIZONTAL | VERTICAL

LOCATION COORDINATES: N 13,180,323.5 E 2,489,648.2

ELEVATION TOP OF BORING: 264.7

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	8 12 34	46		Poorly-graded Sand (SP) Gray, Medium	100	26	6	90	4	0.191								
		X	21 50	50 /		Poorly-graded Sand (SP) Gray, Medium	100	27	7	88	5	0.159								
		X	9 14 18	32		Poorly-graded Sand (SP) Yellow, Medium	100	28												
		X	8 16 17	33		Poorly-graded Sand (SP) Gray, Medium	100	29	15	82	3	0.191								

120.0 122.5 125.0 127.5 130.0 132.5 135.0 137.5 140.0 142.5 145.0 147.5 150.0 152.5 155.0 157.5 160.0 162.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 5 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,180,323.5 E 2,489,648.2

ELEVATION TOP OF BORING: 264.7

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	15 13 12	25		Poorly-graded Sand (SP) Gray	100	30												
		X	10 14 19	33		Poorly-graded Sand (SP) Gray	100	31	48	49	2	0.442								
		X	23 41 50	91		Poorly-graded Sand (SP) White, Fine	100	32												
64.7	200.0	X	17 33 47	80		Poorly-graded Sand (SP) White, Fine	100	33												

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)	INSTALLATION: Memphis District (CEMVM)	SHEET 1 OF 1 SHEETS	
1. PROJECT: Below Piggott - West Bank SFB Seepage Study	9. COORDINATE SYSTEM: HORIZONTAL / VERTICAL		
	10. SIZE AND TYPE OF BIT: 3.25" ID		
2. HOLE NUMBER: 114-BPL-11 — LOCATION COORDINATES: N 13,179,875.7 E 2,489,425.8	11. MANUFACTURER'S DESIGNATION OF DRILL: CME 850		
3. DRILLING AGENCY: Tri-State Testing Services, Inc.	12. TOTAL SAMPLES: 12 — DISTURBED: 12 — UNDISTURBED: 0		
4. NAME OF DRILLER: J. Crawford	13. TOTAL NUMBER CORE BOXES: 0		
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED — DEG FROM VERTICAL: --- — BEARING:	14. ELEVATION GROUND WATER: 254.6 8/2/11		
	15. DATE BORING — STARTED: 8/2/11 — COMPLETED: 8/2/11		
6. THICKNESS OF OVERBURDEN	16. ELEVATION TOP OF BORING: 265.6		
7. DEPTH DRILLED INTO ROCK	17. TOTAL CORE RECOVERY FOR BORING: N/A		
8. TOTAL DEPTH OF BORING: 30.0	18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor		

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
262.6	3.0	☒	3 3 3	6		Silty Sand (SM) Brown, Fine	100	1	0	73	27									
260.1	5.5	☒	1 2 3	5		Poorly-graded Sand with Silt (SP-SM) Brown, Fine	100	2	0	91	9	0.081								
257.6	8.0	☒	2 3 3	6		Poorly-graded Sand (SP) Brown, Fine	100	3	0	96	4	0.101								
255.1	10.5	☒	2 3 4	7		Poorly-graded Sand with Silt (SP-SM) Brown, Fine	100	4	0	91	9	0.078								
		☒	3 3 2	5		Poorly-graded Sand (SP) Brown, Fine	100	5	0	99	1	0.177								
		☒	3 5 6	11		Poorly-graded Sand (SP) Brown, Fine	100	6												
		☒	4 5 5	10		Poorly-graded Sand (SP) Brown, Fine	100	7												
		☒	4 5 7	12		Poorly-graded Sand (SP) Brown, Fine	100	8												
		☒	5 6 7	13		Poorly-graded Sand (SP) Brown, Fine	100	9												
		☒	4 7 7	14		Poorly-graded Sand (SP) Brown, Fine	100	10												
		☒	5 6 7	13		Poorly-graded Sand (SP) Brown, Fine	100	11												
235.6	30.0	☒	18 25 25	50		Poorly-graded Sand (SP) Brown, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 3.25" ID
2. HOLE NUMBER: 115-BPL-11
LOCATION COORDINATES: N 13,179,427.4 E 2,489,203.5
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 850
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
4. NAME OF DRILLER: J. Crawford
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 250.9 8/1/11
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
15. DATE BORING: STARTED 8/1/11 COMPLETED 8/1/11
6. THICKNESS OF OVERBURDEN:
16. ELEVATION TOP OF BORING: 264.4
7. DEPTH DRILLED INTO ROCK:
17. TOTAL CORE RECOVERY FOR BORING: N/A
8. TOTAL DEPTH OF BORING: 30.0
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	2 3 3	6		Silty Sand (SM) Brown, Fine	100	1												
		☒	2 3 2	5		Silty Sand (SM) Brown, Fine	100	2			30									
256.4	8.0	☒	3 3 2	5		Silty Sand (SM) Brown, Fine	100	3	0	74	26									
		☒	4 4 4	8		Poorly-graded Sand (SP) Brown, Medium	100	4	1	98	2	0.177								
		☒	4 5 5	10		Poorly-graded Sand (SP) Brown, Fine	100	5	2	93	4	0.171								
		☒	3 2 1	3		Poorly-graded Sand (SP) Brown, Medium	100	6	1	98	1	0.183								
		☒	3 3 4	7		Poorly-graded Sand (SP) Brown, Fine	100	7	0	99	1	0.177								
		☒	5 7 8	15		Poorly-graded Sand (SP) Brown, Fine	100	8												
		☒	5 8 12	20		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	9												
		☒	5 10 17	27		Poorly-graded Sand (SP) Brown, Fine	100	10												
		☒	7 11 14	25		Poorly-graded Sand (SP) Gray, Fine	100	11												
234.4	30.0	☒	7 10 10	20		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 5 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 116-BPT-10
LOCATION COORDINATES: N 13,178,978.9 E 2,488,982.1
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: G. Baker
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 190.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 4.5" Wing Bit
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 75
12. TOTAL SAMPLES: 32 DISTURBED: 32 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 254.9 12/21/10
15. DATE BORING: STARTED 12/21/10 COMPLETED 12/23/10
16. ELEVATION TOP OF BORING: 262.9
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	3 2 3	5		Lean Clay (CL) Gray & Brown, medium	100	1					33	16	24.5					
		☒	2 3 4	7		Lean Clay (CL) Gray & Brown, medium	100	2			36				22.6					
257.4	5.5																			
		☒	1 5 6	11		Poorly-graded Sand with Clay (SP-SC) Gray, Fine	100	3	2	93	5	0.103								
254.9	8.0																			
		☒	3 5 7	12		Poorly-graded Sand (SP) Gray, Fine	100	4	0	99	1	0.194								
		☒	3 6 4	10		Poorly-graded Sand (SP) Gray, Fine	100	5	1	98	1	0.193								
		☒	2 2 4	6		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	1 2 2	4		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	3 5 6	11		Poorly-graded Sand (SP) Gray, Medium	100	8	1	98	1	0.207								
		☒	2 6 12	18		Poorly-graded Sand (SP) Gray, Medium	100	9	1	97	2	0.196								
		☒	4 7 12	19		Poorly-graded Sand (SP) Gray, Medium	100	10	0	98	2	0.309								
		☒	4 8 10	18		Poorly-graded Sand (SP) Gray, Fine	100	11												
		☒	7 9 12	21		Poorly-graded Sand (SP) Gray, Fine	100	12	2	96	3	0.157								
		☒	6 13 19	32		Poorly-graded Sand (SP) Gray, Fine	100	13	0	98	2	0.166								
		☒	9 17 18	35		Poorly-graded Sand (SP) Gray, Fine	100	14	0	98	2	0.189								

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM | HORIZONTAL | VERTICAL

LOCATION COORDINATES: N 13,178,978.9 E 2,488,982.1

ELEVATION TOP OF BORING: 262.9

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	4 8 9	17		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	15												
		X	5 10 15	25		Poorly-graded Sand (SP) Gray, Medium	100	16	1	97	2	0.358								
		X	3 7 9	16		Poorly-graded Sand (SP) Gray, Medium	100	17	9	90	1	0.436								
		X	3 8 10	18		Poorly-graded Sand (SP) Gray, Medium	100	18	2	96	2	0.314								
		X	4 5 6	11		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	19												
		X	7 10 11	21		Poorly-graded Sand (SP) Gray, Fine	100	20	4	94	2	0.181								

35.0 37.5 40.0 42.5 45.0 47.5 50.0 52.5 55.0 57.5 60.0 62.5 65.0 67.5 70.0 72.5 75.0 77.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 3 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,178,978.9 E 2,488,982.1

ELEVATION TOP OF BORING: 262.9

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	5 7 12	19		Poorly-graded Sand (SP) Gray, Medium	100	21	0	99	1	0.313								
		X	4 7 10	17		Poorly-graded Sand (SP) Gray, Medium	100	22	0	99	1	0.277								
		X	4 6 9	15		Poorly-graded Sand (SP) Gray, Medium	100	23												
		X	4 4 8	12		Poorly-graded Sand (SP) Gray, Medium	100	24	7	92	1	0.306								
		X	15 44 52	96		Poorly-graded Sand (SP) Gray, Fine	100	25												

77.5 80.0 82.5 85.0 87.5 90.0 92.5 95.0 97.5 100.0 102.5 105.0 107.5 110.0 112.5 115.0 117.5 120.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 4 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,178,978.9 E 2,488,982.1

ELEVATION TOP OF BORING: 262.9

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	16 12 11	23		Poorly-graded Sand (SP) Gray, Medium	100	26	28	68	3	0.175								
		X	46 39 20	59		Poorly-graded Sand (SP) Gray	100	27	33	62	5	0.154								
		X	15 15 21	36		Poorly-graded Sand (SP) Gray	100	28	42	54	4	0.180								
107.9	155.0																			
		X	5 8 12	20		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	29	0	93	7	0.100								

120.0 122.5 125.0 127.5 130.0 132.5 135.0 137.5 140.0 142.5 145.0 147.5 150.0 152.5 155.0 157.5 160.0 162.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 5 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,178,978.9 E 2,488,982.1

ELEVATION TOP OF BORING: 262.9

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
87.9	175.0	X	10 9 14	23		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	30	0	94	6	0.096								
77.9	185.0	X	13 20 47	67		Poorly-graded Sand with Clay (SP-SC) Light Gray, Fine	100	31	0	94	6	0.103								
72.9	190.0	X	12 12 16	28		Lean Clay (CL) Gray, very stiff	100	32												

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 117-BPL-10
LOCATION COORDINATES: N 13,178,530.3 E 2,488,761.1
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: M. Woolfolk
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 3.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 55
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 254.0 10/19/10
15. DATE BORING: STARTED 10/19/10 COMPLETED 10/19/10
16. ELEVATION TOP OF BORING: 263.0
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
260.0	3.0	☒	11 10 8	18		Silty Sand (SM) Brown, Fine	100	1			23									
		☒	10 8 8	16		Poorly-graded Sand with Silt (SP-SM) Brown, Fine	100	2			7									
255.0	8.0	☒	5 6 6	12		Poorly-graded Sand with Silt (SP-SM) Brown, Fine	100	3	0	94	6	0.098								
		☒	3 2 2	4		Poorly-graded Sand (SP) Brown, Fine	100	4												
		☒	4 4 6	10		Poorly-graded Sand (SP) Brown, Medium	100	5												
		☒	5 4 4	8		Poorly-graded Sand (SP) Brown, Medium	100	6												
		☒	6 7 6	13		Poorly-graded Sand (SP) Brown, Medium	100	7												
		☒	5 6 8	14		Poorly-graded Sand (SP) Brown, Medium	100	8												
		☒	6 7 7	14		Poorly-graded Sand (SP) Brown, Medium	100	9												
		☒	5 7 9	16		Poorly-graded Sand (SP) Brown, Fine	100	10												
		☒	6 6 8	14		Poorly-graded Sand (SP) Brown, Fine	100	11												
233.0	30.0	☒	7 7 9	16		Poorly-graded Sand (SP) Brown, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 118-BPL-10
LOCATION COORDINATES: N 13,178,089.1 E 2,488,539.9
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: M. Woolfolk
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 3.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 55
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 253.5 10/18/10
15. DATE BORING: STARTED 10/18/10 COMPLETED 10/18/10
16. ELEVATION TOP OF BORING: 265.5
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	11 20 13	33		Silty Sand (SM) Brown, Rootlets	100	1			22									
		☒	5 7 7	14		Silty Sand (SM) Brown, Fine	100	2	0	78	22									
		☒	11 10 8	18		Silty Sand (SM) Brown, Rootlets	100	3	0	78	21									
257.5	8.0																			
		☒	4 5 5	10		Poorly-graded Sand (SP) Brown, Medium	100	4	0	99	1	0.243								
		☒	4 5 9	14		Poorly-graded Sand (SP) Brown, Medium	100	5	2	97	1	0.190								
		☒	5 6 8	14		Poorly-graded Sand (SP) Brown, Fine	100	6	0	98	2	0.187								
		☒	3 5 10	15		Poorly-graded Sand (SP) Brown, Medium	100	7												
		☒	4 6 8	14		Poorly-graded Sand (SP) Brown, Fine	100	8												
		☒	9 11 13	24		Poorly-graded Sand (SP) Brown, Fine	100	9												
		☒	8 9 12	21		Poorly-graded Sand (SP) Brown, Fine	100	10												
		☒	8 8 12	20		Poorly-graded Sand (SP) Brown, Fine	100	11												
235.5	30.0	☒	7 9 11	20		Poorly-graded Sand (SP) Brown, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 5 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 119-BPT-11
LOCATION COORDINATES: N 13,177,686.7 E 2,488,260.2
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: G. Baker
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED
DEG FROM VERTICAL: ---
BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 180.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 4.5" Wing Bit
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 75
12. TOTAL SAMPLES: 31 DISTURBED: 31 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 255.4 1/4/11
15. DATE BORING: STARTED 1/4/11 COMPLETED 1/5/11
16. ELEVATION TOP OF BORING: 264.4
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	5 4 3	7		Silty Sand (SM) Brown, Fine	100	1												
		☒	4 5 6	11		Silty Sand (SM) Brown, Fine	100	2			23									
258.9	5.5																			
		☒	1 2 2	4		Poorly-graded Sand (SP) Brown, Fine	100	3	3	95	2	0.163								
		☒	1 1 1	2		Poorly-graded Sand (SP) Brown, Fine	100	4	2	97	1	0.179								
		☒	2 2 3	5		Poorly-graded Sand (SP) Brown, Fine	100	5	2	97	1	0.162								
		☒	2 4 3	7		Poorly-graded Sand (SP) Brown, Fine	100	6												
		☒	6 7 7	14		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	3 6 7	13		Poorly-graded Sand (SP) Gray, Fine	100	8	1	98	2	0.173								
		☒	4 3 2	5		Poorly-graded Sand (SP) Gray, Medium	100	9	3	96	1	0.207								
		☒	3 5 6	11		Poorly-graded Sand (SP) Gray, Fine	100	10	2	97	1	0.173								
		☒	2 3 6	9		Poorly-graded Sand (SP) Gray, Fine	100	11												
		☒	3 5 11	16		Poorly-graded Sand (SP) Gray, Fine	100	12												
		☒	4 6 5	11		Poorly-graded Sand (SP) Gray, Fine	100	13	0	99	1	0.310								
		☒	2 4 6	10		Poorly-graded Sand (SP) Gray, Fine	100	14	0	99	0	0.310								

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,177,686.7 E 2,488,260.2

ELEVATION TOP OF BORING: 264.4

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	4 6 7	13		Poorly-graded Sand (SP) Gray, Fine	100	15	15	84	1	0.330								
		X	5 13 16	29		Poorly-graded Sand (SP) Brown, Medium	100	16	0	98	2	0.307								
		X	6 15 19	34		Poorly-graded Sand (SP) Brown, Fine	100	17												
		X	4 14 20	34		Poorly-graded Sand (SP) Gray, Medium	100	18	0	98	2	0.223								
		X	3 6 10	16		Poorly-graded Sand (SP) Gray, Medium	100	19	1	97	1	0.277								
		X	8 9 15	24		Poorly-graded Sand (SP) Gray, Medium	100	20	6	92	2	0.243								

35.0 37.5 40.0 42.5 45.0 47.5 50.0 52.5 55.0 57.5 60.0 62.5 65.0 67.5 70.0 72.5 75.0 77.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 3 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,177,686.7 E 2,488,260.2

ELEVATION TOP OF BORING: 264.4

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	10 23 25	48		Poorly-graded Sand (SP) Brown & Gray, Fine	100	21												
		X	6 7 9	16		Poorly-graded Sand (SP) Gray, Medium	100	22												
		X	7 8 5	13		Poorly-graded Sand (SP) Gray, Medium	100	23	4	95	1	0.337								
		X	9 8 5	13		Poorly-graded Sand (SP) Gray, Medium	100	24	43	54	3	0.254								
		X	3 5 2	7		Poorly-graded Sand (SP) Gray, Medium	100	25	44	55	2	0.179								

77.5 80.0 82.5 85.0 87.5 90.0 92.5 95.0 97.5 100.0 102.5 105.0 107.5 110.0 112.5 115.0 117.5 120.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 4 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,177,686.7 E 2,488,260.2

ELEVATION TOP OF BORING: 264.4

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	9 15 17	32		Poorly-graded Sand (SP) Gray, Medium	100	26	16	80	4	0.177								
		X	7 15 19	34		Poorly-graded Sand (SP) Brown	100	27	49	49	3	0.304								
119.4	145.0																			
		X	15 23 15	38		Poorly-graded Sand with Silt (SP-SM) Brown, Medium	100	28	27	67	5	0.149								
		X	13 15 16	31		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	29	14	80	7	0.108								

120.0 122.5 125.0 127.5 130.0 132.5 135.0 137.5 140.0 142.5 145.0 147.5 150.0 152.5 155.0 157.5 160.0 162.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)		SHEET 5 OF 5 SHEETS
PROJECT: Below Piggott - West Bank SFB Seepage Study	COORDINATE SYSTEM: HORIZONTAL: VERTICAL:	
LOCATION COORDINATES: N 13,177,686.7 E 2,488,260.2	ELEVATION TOP OF BORING: 264.4	

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
89.4	175.0	X	13 15 50	65		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	30	1	93	6	0.111								
84.4	180.0	X	11 21 27	48		Poorly-graded Sand (SP) White, Fine	100	31	0	96	4	0.153								

162.5
165.0
167.5
170.0
172.5
175.0
177.5
180.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 120-BPL-10
LOCATION COORDINATES: N 13,177,257.8 E 2,488,005.8
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 257.7 9/6/10
15. DATE BORING: STARTED 9/6/10 COMPLETED 9/6/10
16. ELEVATION TOP OF BORING: 263.7
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	9 9 15	24		Silty Sand (SM) Tan, Fine	100	1												
		☒	6 9 12	21		Silty Sand (SM) Tan, Oxidized, Fine	100	2												
258.2	5.5																			
		☒	3 5 9	14		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	3			9									
255.7	8.0																			
		☒	3 7 10	17		Poorly-graded Sand (SP) Brown, Fine	100	4	0	99	1	0.176								
		☒	9 12 15	27		Poorly-graded Sand (SP) Brown, Fine	100	5	3	96	1	0.167								
		☒	3 10 13	23		Poorly-graded Sand (SP) Brown, Fine	100	6	0	99	1	0.178								
		☒	7 9 9	18		Poorly-graded Sand (SP) Dark Gray, Fine, Lignite Fragments	100	7	3	95	2	0.131								
		☒	6 9 9	18		Poorly-graded Sand (SP) Gray, Fine	100	8	0	98	2	0.155								
		☒	2 6 8	14		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	1 2 8	10		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	3 9 9	18		Poorly-graded Sand (SP) Gray, Fine	100	11												
		☒	17 12 12	24		Poorly-graded Sand (SP) Green, Medium	100	12												
233.7	30.0																			

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 121-BPL-10
LOCATION COORDINATES: N 13,176,842.1 E 2,487,692.8
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED
DEG FROM VERTICAL: ---
BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 256.2 9/6/10
15. DATE BORING: STARTED 9/6/10 COMPLETED 9/6/10
16. ELEVATION TOP OF BORING: 262.2
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	5 5 5	10		Silty Sand (SM) Red & Brown, Fine	100	1												
		☒	4 4 4	8		Silty Sand (SM) Red & Brown, Fine	100	2			13									
256.7	5.5																			
		☒	4 4 7	11		Poorly-graded Sand (SP) Brown, Fine	100	3	1	98	1	0.168								
		☒	3 5 7	12		Poorly-graded Sand (SP) Brown, Fine	100	4	2	96	2	0.114								
		☒	5 7 7	14		Poorly-graded Sand (SP) Brown, Fine	100	5	1	98	1	0.177								
		☒	4 6 8	14		Poorly-graded Sand (SP) Gray, Fine	100	6	0	98	2	0.142								
		☒	3 5 9	14		Poorly-graded Sand (SP) Brown, Fine	100	7	0	98	2	0.125								
		☒	4 9 13	22		Poorly-graded Sand (SP) Brown, Fine	100	8												
		☒	4 6 8	14		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	6 10 9	19		Poorly-graded Sand (SP) Gray, Medium	100	10												
		☒	9 8 10	18		Poorly-graded Sand (SP) Gray, Fine	100	11												
232.2	30.0	☒	10 13 18	31		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 5 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 122-BPT-11
LOCATION COORDINATES: N 13,176,447.4 E 2,487,420.2
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: G. Baker
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 170.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 4.5" Wing Bit
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 75
12. TOTAL SAMPLES: 30 DISTURBED: 30 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 257.7 1/6/11
15. DATE BORING: STARTED 1/6/11 COMPLETED 1/7/11
16. ELEVATION TOP OF BORING: 263.7
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
260.7	3.0	☒	3 6 6	12		Silt (ML) Brown, stiff, Fine	100	1							15.1					
258.2	5.5	☒	2 3 3	6		Lean Clay (CL) Brown, medium, Lignite Fragments	100	2					22	8	18.0					
255.7	8.0	☒	2 3 4	7		Clayey Sand (SC) Brown, medium	100	3			16				19.7					
		☒	2 3 3	6		Poorly-graded Sand (SP) Gray, Fine	100	4	0	96	4	0.110								
		☒	4 4 6	10		Poorly-graded Sand (SP) Gray, Fine	100	5	2	96	1	0.171								
		☒	5 9 10	19		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	6	0	98	2	0.179								
		☒	4 8 10	18		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	4 6 8	14		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	4 11 9	20		Poorly-graded Sand (SP) Dark Gray, Fine	100	9	0	98	2	0.150								
		☒	5 9 10	19		Poorly-graded Sand (SP) Dark Gray, Fine, Lignite Fragments	100	10	0	98	2	0.135								
		☒	7 16 12	28		Poorly-graded Sand (SP) Gray, Fine	100	11	0	97	3	0.150								
		☒	6 10 12	22		Poorly-graded Sand (SP) Gray, Fine	100	12												
		☒	6 7 6	13		Poorly-graded Sand (SP) Gray, Fine	100	13												
		☒	7 19 17	36		Poorly-graded Sand (SP) Gray, Medium	100	14	1	97	2	0.242								

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,176,447.4 E 2,487,420.2

ELEVATION TOP OF BORING: 263.7

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	7 21 19	40		Poorly-graded Sand (SP) Gray, Medium	100	15	1	96	3	0.229								
		X	7 15 15	30		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	16	0	98	2	0.164								
		X	6 11 15	26		Poorly-graded Sand (SP) Gray, Fine	100	17												
		X	3 4 8	12		Poorly-graded Sand (SP) Gray, Fine	100	18	0	99	1	0.153								
		X	5 10 12	22		Poorly-graded Sand (SP) Gray, Medium	100	19	3	95	2	0.197								
		X	5 9 10	19		Poorly-graded Sand (SP) Gray, Medium	100	20	4	94	2	0.194								

35.0 37.5 40.0 42.5 45.0 47.5 50.0 52.5 55.0 57.5 60.0 62.5 65.0 67.5 70.0 72.5 75.0 77.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 3 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,176,447.4 E 2,487,420.2

ELEVATION TOP OF BORING: 263.7

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	7 14 16	30		Poorly-graded Sand (SP) Gray, Medium	100	21	5	93	2	0.285								
		X	5 9 20	29		Poorly-graded Sand (SP) Gray, Medium, Lignite Fragments	100	22	11	87	2	0.337								
		X	7 5 14	19		Poorly-graded Sand (SP) Brown, Medium	100	23	13	85	2	0.331								
		X	3 13 23	36		Poorly-graded Sand (SP) Tan, Fine	100	24	1	95	5	0.111								
		X	11 11 7	18		Poorly-graded Sand (SP) Light Gray, Medium	100	25	14	83	2	0.234								

77.5 80.0 82.5 85.0 87.5 90.0 92.5 95.0 97.5 100.0 102.5 105.0 107.5 110.0 112.5 115.0 117.5 120.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 4 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,176,447.4 E 2,487,420.2

ELEVATION TOP OF BORING: 263.7

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
138.7	125.0																			
		X	17 21 23	44		Poorly-graded Sand with Silt (SP-SM) Dark Gray, Medium	100	26	14	80	6	0.108								
128.7	135.0																			
		X	6 7 6	13		Poorly-graded Sand (SP) Gray	100	27	49	50	2	0.341								
		X	16 31 33	64		Poorly-graded Sand (SP) Brown	100	28	46	50	5	0.174								
108.7	155.0																			
		X	12 17 9	26		Poorly-graded Sand with Silt (SP-SM) Dark Brown, Fine	100	29	8	81	11									

120.0 122.5 125.0 127.5 130.0 132.5 135.0 137.5 140.0 142.5 145.0 147.5 150.0 152.5 155.0 157.5 160.0 162.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)		SHEET 5 OF 5 SHEETS
PROJECT: Below Piggott - West Bank SFB Seepage Study	COORDINATE SYSTEM: HORIZONTAL	VERTICAL
LOCATION COORDINATES: N 13,176,447.4 E 2,487,420.2	ELEVATION TOP OF BORING: 263.7	

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
98.7	165.0																			162.5
																				165.0
																				167.5
93.7	170.0	X	22 38 38	76		Poorly-graded Sand (SP) White, Medium	100	30	0	96	4	0.182								170.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 123-BPL-10
LOCATION COORDINATES: N 13,176,024.8 E 2,487,114.0
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 258.4 9/6/10
15. DATE BORING: STARTED 9/6/10 COMPLETED 9/6/10
16. ELEVATION TOP OF BORING: 264.4
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	4 4 6	10		Silty Sand (SM) Brown, Fine	100	1												
		☒	3 2 4	6		Silty Sand (SM) Brown, Oxidized, Fine	100	2			36									
258.9	5.5																			
		☒	3 6 6	12		Poorly-graded Sand (SP) Brown, Fine	100	3	1	98	1	0.162								
		☒	2 4 4	8		Poorly-graded Sand (SP) Brown, Fine	100	4	0	97	3	0.098								
253.9	10.5																			
		☒	3 1 2	3		Poorly-graded Sand with Silt (SP-SM) Brown, Fine	100	5	5	88	7	0.080								
251.4	13.0																			
		☒	6 8 12	20		Poorly-graded Sand (SP) Brown, Fine	100	6	1	96	3	0.121								
		☒	4 7 9	16		Poorly-graded Sand (SP) Gray, Fine	100	7	1	98	1	0.155								
		☒	6 5 6	11		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	7 6 9	15		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	12 10 14	24		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	6 11 13	24		Poorly-graded Sand (SP) Gray, Fine	100	11												
		☒	12 10 14	24		Poorly-graded Sand (SP) Gray, Fine	100	12												
234.4	30.0																			

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 124-BPL-10
LOCATION COORDINATES: N 13,175,640.7 E 2,486,814.4
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 257.0 9/5/10
15. DATE BORING: STARTED 9/5/10 COMPLETED 9/5/10
16. ELEVATION TOP OF BORING: 263.0
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	6 2 4	6		Silty Sand (SM) Gray, Oxidized, Fine	100	1												
		☒	2 4 6	10		Silty Sand (SM) Brown, Oxidized, Fine	100	2												
257.5	5.5																			
		☒	2 4 7	11		Poorly-graded Sand with Silt (SP-SM) Brown, Fine	100	3			6									
255.0	8.0																			
		☒	3 4 6	10		Poorly-graded Sand (SP) Gray, Fine	100	4	0	96	3	0.164								
		☒	4 10 16	26		Poorly-graded Sand (SP) Brown & Gray, Fine	100	5	0	98	2	0.168								
		☒	6 14 18	32		Poorly-graded Sand (SP) Gray, Fine	100	6	0	99	1	0.184								
		☒	6 9 11	20		Poorly-graded Sand (SP) Gray, Fine	100	7	0	95	4	0.103								
245.0	18.0																			
		☒	4 6 8	14		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	8	0	95	5	0.087								
242.5	20.5																			
		☒	6 8 12	20		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	4 7 8	15		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	8 10 13	23		Poorly-graded Sand (SP) Gray, Fine	100	11												
		☒	6 10 12	22		Poorly-graded Sand (SP) Gray, Fine	100	12												
233.0	30.0																			

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)

INSTALLATION: Memphis District (CEMVM)

SHEET 1 OF 5 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study

2. HOLE NUMBER: 125-BPT-11

LOCATION COORDINATES: N 13,175,220.0 E 2,486,524.8

3. DRILLING AGENCY: Tri-State Testing Services, Inc.

4. NAME OF DRILLER: G. Baker

5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:

6. THICKNESS OF OVERBURDEN:

7. DEPTH DRILLED INTO ROCK:

8. TOTAL DEPTH OF BORING: 180.0

9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

10. SIZE AND TYPE OF BIT: 4.5" Wing Bit

11. MANUFACTURER'S DESIGNATION OF DRILL: CME 75

12. TOTAL SAMPLES: 31 DISTURBED: 31 UNDISTURBED: 0

13. TOTAL NUMBER CORE BOXES: 0

14. ELEVATION GROUND WATER: 259.2 1/10/11

15. DATE BORING: STARTED 1/10/11 COMPLETED 1/12/11

16. ELEVATION TOP OF BORING: 265.2

17. TOTAL CORE RECOVERY FOR BORING: N/A

18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
			1 1 3	4		Silt (ML) Brown, soft	100	1							15.4					
262.2	3.0																			
			1 2 3	5		Silty Sand (SM) Brown, Fine	100	2			26									
259.7	5.5																			
			2 3 4	7		Poorly-graded Sand (SP) Brown, Fine	100	3	0	96	4	0.147								
			3 4 6	10		Poorly-graded Sand (SP) Brown, Fine	100	4	0	98	2	0.163								
			4 8 9	17		Poorly-graded Sand (SP) Brown, Fine	100	5	0	95	4	0.143								
			4 6 8	14		Poorly-graded Sand (SP) Brown, Fine	100	6	2	96	3	0.166								
			3 7 5	12		Poorly-graded Sand (SP) Brown, Fine	100	7	5	93	2	0.163								
247.2	18.0																			
			1 1 2	3		Silty Sand (SM) Dark Gray, Fine, Lignite Fragments	100	8	3	83	14									
244.7	20.5																			
			1 3 4	7		Poorly-graded Sand with Silt (SP-SM) Dark Gray, Fine	100	9	0	92	8	0.079								
242.2	23.0																			
			1 3 5	8		Poorly-graded Sand (SP) Dark Gray, Fine	100	10												
			1 1 3	4		Poorly-graded Sand (SP) Dark Gray, Fine, Lignite Fragments	100	11												
			1 1 1	2		Poorly-graded Sand (SP) Dark Gray, Fine, Lignite Fragments	100	12	0	98	2	0.097								
			3 5 6	11		Poorly-graded Sand (SP) Dark Gray, Fine, Lignite Fragments	100	13	0	98	2	0.152								
			1 3 4	7		Poorly-graded Sand (SP) Gray & Brown, Medium	100	14	1	98	1	0.167								

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,175,220.0 E 2,486,524.8

ELEVATION TOP OF BORING: 265.2

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	3 3 4	7		Poorly-graded Sand (SP) Gray & Brown, Fine	100	15												
		X	7 11 15	26		Poorly-graded Sand (SP) Brown, Fine	100	16												
		X	7 12 13	25		Poorly-graded Sand (SP) Gray & Brown, Fine	100	17	0	98	2	0.171								
		X	4 5 6	11		Poorly-graded Sand (SP) Gray & Brown, Medium	100	18	5	92	3	0.167								
		X	5 6 7	13		Poorly-graded Sand (SP) Gray & Brown, Medium	100	19	1	98	2	0.176								
		X	9 11 13	24		Poorly-graded Sand (SP) Gray & Brown, Fine	100	20												

35.0 37.5 40.0 42.5 45.0 47.5 50.0 52.5 55.0 57.5 60.0 62.5 65.0 67.5 70.0 72.5 75.0 77.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 3 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM | HORIZONTAL | VERTICAL

LOCATION COORDINATES: N 13,175,220.0 E 2,486,524.8

ELEVATION TOP OF BORING: 265.2

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	4 5 7	12		Poorly-graded Sand (SP) Gray & Brown, Fine	100	21												
		X	4 4 8	12		Poorly-graded Sand (SP) Gray & Brown, Medium	100	22	3	96	1	0.419								
		X	4 7 11	18		Poorly-graded Sand (SP) Gray & Brown, Medium	100	23	5	94	1	0.370								
160.2	105.0																			
		X	20 27 30	57		Poorly-graded Sand with Silt (SP-SM) Brown, Medium	100	24	17	78	5	0.156								
150.2	115.0																			
		X	17 21 24	45		Poorly-graded Sand (SP) Brown, Fine	100	25	0	95	5	0.133								

77.5 80.0 82.5 85.0 87.5 90.0 92.5 95.0 97.5 100.0 102.5 105.0 107.5 110.0 112.5 115.0 117.5 120.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 4 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,175,220.0 E 2,486,524.8

ELEVATION TOP OF BORING: 265.2

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	7 11 15	26		Poorly-graded Sand (SP) Brown, Fine	100	26	1	97	2	0.246								
130.2	135.0																			
		X	7 7 9	16		Poorly-graded Gravel (GP) Gray	100	27	57	41	1	0.333								
120.2	145.0																			
		X	8 9 11	20		Silty Sand (SM) Gray, Fine	100	28	0	87	13									
110.2	155.0																			
		X	11 15 18	33		Poorly-graded Sand (SP) Brown	100	29	42	54	4	0.189								

120.0 122.5 125.0 127.5 130.0 132.5 135.0 137.5 140.0 142.5 145.0 147.5 150.0 152.5 155.0 157.5 160.0 162.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 5 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,175,220.0 E 2,486,524.8

ELEVATION TOP OF BORING: 265.2

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
100.2	165.0																			
		X	15 18 27	45		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	30	6	88	5	0.131								
90.2	175.0																			
		X	8 12 14	26		Fat Clay (CH) Gray, very stiff, Sand Strata or Lenses	100	31												
85.2	180.0																			

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
2. HOLE NUMBER: 126-BPL-10
LOCATION COORDINATES: N 13,174,819.8 E 2,486,223.4
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
4. NAME OF DRILLER: K. Roberts
13. TOTAL NUMBER CORE BOXES: 0
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
14. ELEVATION GROUND WATER:
15. DATE BORING: STARTED 9/5/10 COMPLETED 9/5/10
6. THICKNESS OF OVERBURDEN:
16. ELEVATION TOP OF BORING: 265.0
7. DEPTH DRILLED INTO ROCK:
17. TOTAL CORE RECOVERY FOR BORING: N/A
8. TOTAL DEPTH OF BORING: 30.0
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_F	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	4 7 9	16		Silty Sand (SM) Brown, Fine	100	1												
		☒	3 3 4	7		Silty Sand (SM) Gray, Oxidized, Fine	100	2			47									
259.5	5.5																			
		☒	2 4 4	8		Poorly-graded Sand (SP) Red & Brown, Fine	100	3	1	97	2	0.163								
257.0	8.0																			
		☒	2 3 4	7		Silty Sand (SM) Gray, Oxidized, Fine	100	4	0	84	16									
254.5	10.5																			
		☒	7 14 14	28		Poorly-graded Sand (SP) Brown, Fine	100	5	9	88	3	0.111								
		☒	7 6 9	15		Poorly-graded Sand (SP) Brown, Fine	100	6	2	97	1	0.167								
		☒	8 13 13	26		Poorly-graded Sand (SP) Gray & Brown, Medium	100	7	4	95	1	0.202								
		☒	7 7 6	13		Poorly-graded Sand (SP) Brown, Fine	100	8												
		☒	8 14 13	27		Poorly-graded Sand (SP) Brown, Fine	100	9												
		☒	9 14 14	28		Poorly-graded Sand (SP) Brown, Medium	100	10												
		☒	7 12 15	27		Poorly-graded Sand (SP) Gray, Fine	100	11												
		☒	24 17 17	34		Poorly-graded Sand (SP) Gray, Fine	100	12												
235.0	30.0																			

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 127-BPL-10
LOCATION COORDINATES: N 13,174,380.2 E 2,485,939.0
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED
DEG FROM VERTICAL: ---
BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 257.6 9/5/10
15. DATE BORING: STARTED 9/5/10 COMPLETED 9/5/10
16. ELEVATION TOP OF BORING: 264.6
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	5 4 6	10		Silty Sand (SM) Red & Brown, Fine	100	1												
		☒	3 4 4	8		Silty Sand (SM) Red & Brown, Fine	100	2			25									
259.1	5.5																			
		☒	4 4 4	8		Poorly-graded Sand (SP) Tan, Fine	100	3	1	97	2	0.151								
		☒	3 4 5	9		Poorly-graded Sand (SP) Brown, Fine	100	4	0	98	2	0.147								
		☒	7 8 8	16		Poorly-graded Sand (SP) Brown, Fine	100	5	0	99	1	0.171								
		☒	4 5 6	11		Poorly-graded Sand (SP) Brown, Fine	100	6	0	99	1	0.168								
		☒	9 11 16	27		Poorly-graded Sand (SP) Brown, Medium	100	7	1	98	1	0.184								
		☒	11 16 16	32		Poorly-graded Sand (SP) Brown, Fine	100	8												
		☒	4 6 8	14		Poorly-graded Sand (SP) Brown, Fine	100	9												
		☒	6 7 8	15		Poorly-graded Sand (SP) Brown, Fine	100	10												
		☒	3 6 7	13		Poorly-graded Sand (SP) Gray & Brown, Fine, Lignite Fragments	100	11												
234.6	30.0	☒	8 10 10	20		Poorly-graded Sand (SP) Gray & Brown, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 5 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 128-BPT-11
LOCATION COORDINATES: N 13,173,912.4 E 2,485,778.6
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: G. Baker
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED
DEG FROM VERTICAL: ---
BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 190.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 4.5" Wing Bit
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 75
12. TOTAL SAMPLES: 32 DISTURBED: 32 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 258.3 1/13/11
15. DATE BORING: STARTED 1/13/11 COMPLETED 1/18/11
16. ELEVATION TOP OF BORING: 264.8
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	3 4 4	8		Silty Sand (SM) Brown, Fine, Rootlets	100	1			17									
261.8	3.0																			
		☒	1 2 3	5		Poorly-graded Sand (SP) Brown, Fine	100	2	0	96	4	0.097								
		☒	1 2 3	5		Poorly-graded Sand (SP) Brown, Fine	100	3	0	98	2	0.152								
256.8	8.0																			
		☒	2 1 2	3		Poorly-graded Sand with Silt (SP-SM) Brown, Fine	100	4	0	95	5	0.085								
254.3	10.5																			
		☒	1 4 6	10		Poorly-graded Sand (SP) Brown, Fine	100	5	0	98	2	0.139								
		☒	2 3 4	7		Poorly-graded Sand (SP) Brown, Fine	100	6												
		☒	3 5 7	12		Poorly-graded Sand (SP) Brown, Fine	100	7												
		☒	2 4 8	12		Poorly-graded Sand (SP) Brown, Fine	100	8	0	98	2	0.150								
		☒	3 6 7	13		Poorly-graded Sand (SP) Brown, Medium	100	9	3	96	1	0.256								
		☒	3 6 10	16		Poorly-graded Sand (SP) Dark Brown, Fine, Lignite Fragments	100	10	0	98	2	0.151								
		☒	5 8 8	16		Poorly-graded Sand (SP) Dark Gray, Fine, Lignite Fragments	100	11	0	96	4	0.097								
		☒	6 6 7	13		Poorly-graded Sand (SP) Gray, Fine	100	12	2	97	1	0.185								
		☒	4 8 11	19		Poorly-graded Sand (SP) Brown & Gray, Fine	100	13												
		☒	6 7 9	16		Poorly-graded Sand (SP) Gray, Fine	100	14	0	99	1	0.165								

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,173,912.4 E 2,485,778.6

ELEVATION TOP OF BORING: 264.8

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	6 10 11	21		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	15	0	98	2	0.162								
		X	4 5 7	12		Poorly-graded Sand (SP) Gray, Fine	100	16												
		X	4 8 10	18		Poorly-graded Sand (SP) Gray, Fine	100	17												
		X	11 8 9	17		Poorly-graded Sand (SP) Gray, Fine	100	18	1	97	2	0.158								
		X	5 6 9	15		Poorly-graded Sand (SP) Gray, Medium	100	19	2	96	2	0.198								
		X	11 15 17	32		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	20												

35.0 37.5 40.0 42.5 45.0 47.5 50.0 52.5 55.0 57.5 60.0 62.5 65.0 67.5 70.0 72.5 75.0 77.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 3 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM | HORIZONTAL | VERTICAL

LOCATION COORDINATES: N 13,173,912.4 E 2,485,778.6

ELEVATION TOP OF BORING: 264.8

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	9 11 9	20		Poorly-graded Sand (SP) Gray, Medium	100	21												
		X	4 9 13	22		Poorly-graded Sand (SP) Gray, Medium	100	22	0	99	1	0.359								
		X	5 9 20	29		Poorly-graded Sand (SP) Gray, Medium	100	23	0	98	2	0.319								
		X	5 7 19	26		Poorly-graded Sand (SP) Gray, Medium, Clay Strata or Lenses	100	24												
149.8	115.0																			
		X	1 6 9	15		Poorly-graded Sand with Clay (SP-SC) Gray, Fine	100	25	4	91	5	0.117								

77.5 80.0 82.5 85.0 87.5 90.0 92.5 95.0 97.5 100.0 102.5 105.0 107.5 110.0 112.5 115.0 117.5 120.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 4 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,173,912.4 E 2,485,778.6

ELEVATION TOP OF BORING: 264.8

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
139.8	125.0																			
		X	11 14 15	29		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	26	0	90	10	0.076								
		X	12 14 18	32		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	27	0	95	5	0.125								
119.8	145.0																			
		X	4 12 18	30		Poorly-graded Sand (SP) Gray, Fine	100	28	0	98	2	0.170								
		X	4 6 16	22		Poorly-graded Sand (SP) Gray, Medium	100	29	2	96	2	0.272								

120.0 122.5 125.0 127.5 130.0 132.5 135.0 137.5 140.0 142.5 145.0 147.5 150.0 152.5 155.0 157.5 160.0 162.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 5 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,173,912.4 E 2,485,778.6

ELEVATION TOP OF BORING: 264.8

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
89.8	175.0	X	16 20 20	40		Poorly-graded Sand (SP) Tan, Fine	100	30	0	97	3	0.185								
79.8	185.0	X	11 22 35	57		Poorly-graded Gravel (GP) Brown	100	31	64	36	1	0.646								
74.8	190.0	X	15 24 38	62		Fat Clay (CH) Gray, hard, Sand Strata or Lenses	100	32												

162.5 165.0 167.5 170.0 172.5 175.0 177.5 180.0 182.5 185.0 187.5 190.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)	INSTALLATION: Memphis District (CEMVM)	SHEET 1 OF 1 SHEETS	
1. PROJECT: Below Piggott - West Bank SFB Seepage Study	9. COORDINATE SYSTEM	HORIZONTAL	VERTICAL
	10. SIZE AND TYPE OF BIT: 2.25" ID		
2. HOLE NUMBER: 129-BPL-10 — LOCATION COORDINATES: N 13,173,466.0 E 2,485,615.8	11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45		
3. DRILLING AGENCY: Tri-State Testing Services, Inc.	12. TOTAL SAMPLES: 12	DISTURBED: 12	UNDISTURBED: 0
4. NAME OF DRILLER: K. Roberts	13. TOTAL NUMBER CORE BOXES: 0		
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED — DEG FROM VERTICAL: --- — BEARING:	14. ELEVATION GROUND WATER: 256.1 9/5/10		
	15. DATE BORING: STARTED 9/5/10 — COMPLETED 9/5/10		
6. THICKNESS OF OVERBURDEN	16. ELEVATION TOP OF BORING: 262.1		
7. DEPTH DRILLED INTO ROCK	17. TOTAL CORE RECOVERY FOR BORING: N/A		
8. TOTAL DEPTH OF BORING: 30.0	18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor		

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	7 7 7	14		Silty Sand (SM) Tan, Fine	100	1												
		☒	4 4 4	8		Silty Sand (SM) Brown, Oxidized, Fine	100	2			17									
256.6	5.5																			
		☒	3 8 9	17		Poorly-graded Sand (SP) Tan, Fine	100	3	0	99	1	0.180								
		☒	4 4 6	10		Poorly-graded Sand (SP) Gray, Fine	100	4	2	96	2	0.159								
		☒	4 6 6	12		Poorly-graded Sand (SP) Gray, Fine	100	5	0	98	2	0.154								
		☒	4 6 7	13		Poorly-graded Sand (SP) Gray, Fine	100	6	1	97	2	0.162								
		☒	9 6 9	15		Poorly-graded Sand (SP) Gray, Fine	100	7	1	98	1	0.165								
		☒	3 5 5	10		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	13 12 13	25		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	9												
		☒	7 7 10	17		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	15 20 26	46		Poorly-graded Sand (SP) Gray, Fine	100	11												
232.1	30.0	☒	4 10 15	25		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
2. HOLE NUMBER: 130-BPL-10
LOCATION COORDINATES: N 13,172,985.5 E 2,485,444.6
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
4. NAME OF DRILLER: K. Roberts
13. TOTAL NUMBER CORE BOXES: 0
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
14. ELEVATION GROUND WATER: 255.3 9/5/10
15. DATE BORING: STARTED 9/5/10 COMPLETED 9/5/10
6. THICKNESS OF OVERBURDEN:
16. ELEVATION TOP OF BORING: 260.8
7. DEPTH DRILLED INTO ROCK:
17. TOTAL CORE RECOVERY FOR BORING: N/A
8. TOTAL DEPTH OF BORING: 30.0
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
257.8	3.0	☒	6 6 7	13		Fat Clay (CH) Gray, stiff, Oxidized	100	1							20.6					
255.3 ▼	5.5	☒	2 3 3	6		Lean Clay (CL) Gray, medium	100	2					49	25	25.0					
252.8	8.0	☒	2 7 9	16		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	3			5									
		☒	4 4 9	13		Poorly-graded Sand (SP) Gray, Fine	100	4	0	97	3	0.143								
247.8	13.0	☒	6 12 12	24		Poorly-graded Sand (SP) Gray, Fine	100	5	2	96	2	0.153								
245.3	15.5	☒	6 9 8	17		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	6	0	93	6	0.086								
		☒	6 12 12	24		Poorly-graded Sand (SP) Gray, Fine	100	7	4	94	1	0.167								
		☒	8 13 18	31		Poorly-graded Sand (SP) Gray, Medium	100	8	1	98	1	0.215								
		☒	10 16 18	34		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	9 15 17	32		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	11 18 21	39		Poorly-graded Sand (SP) Gray, Fine	100	11												
230.8	30.0	☒	8 15 18	33		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 5 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 131-BPT-11
LOCATION COORDINATES: N 13,172,509.4 E 2,485,280.2
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: G. Baker
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 180.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 4.5" Wing Bit
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 75
12. TOTAL SAMPLES: 31 DISTURBED: 31 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 254.2 1/19/11
15. DATE BORING: STARTED 1/19/11 COMPLETED 1/20/11
16. ELEVATION TOP OF BORING: 260.2
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
257.2	3.0	☒	2 3 4	7		Fat Clay (CH) Brown & Gray, medium, Oxidized, Rootlets	100	1					52	34	28.2					
254.7	5.5	☒	2 4 5	9		Silty Sand (SM) Brown & Gray, Fine	100	2			45				24.7					
		☒	3 5 6	11		Poorly-graded Sand (SP) Dark Gray, Fine, Lignite Fragments	100	3	0	98	2	0.154								
		☒	3 5 6	11		Poorly-graded Sand (SP) Gray, Fine	100	4	0	98	2	0.171								
		☒	3 4 6	10		Poorly-graded Sand (SP) Gray, Fine	100	5	0	98	2	0.163								
		☒	4 7 9	16		Poorly-graded Sand (SP) Gray, Fine	100	6	0	97	3	0.136								
		☒	3 5 7	12		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	3 7 8	15		Poorly-graded Sand (SP) Gray, Fine	100	8	0	98	1	0.194								
		☒	7 12 16	28		Poorly-graded Sand (SP) Gray, Fine	100	9	0	97	3	0.176								
		☒	5 7 13	20		Poorly-graded Sand (SP) Gray, Fine	100	10	0	98	2	0.169								
		☒	7 7 10	17		Poorly-graded Sand (SP) Gray, Medium	100	11	0	97	2	0.237								
		☒	5 7 13	20		Poorly-graded Sand (SP) Gray, Fine	100	12	0	98	2	0.173								
		☒	6 6 9	15		Poorly-graded Sand (SP) Gray, Fine	100	13												
		☒	4 7 10	17		Poorly-graded Sand (SP) Gray, Fine	100	14												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,172,509.4 E 2,485,280.2

ELEVATION TOP OF BORING: 260.2

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	5 9 11	20		Poorly-graded Sand (SP) Gray, Fine	100	15	0	97	3	0.152								
		X	4 7 12	19		Poorly-graded Sand (SP) Gray, Medium	100	16	1	98	2	0.217								
212.2	48.0																			
		X	5 9 11	20		Poorly-graded Sand with Silt (SP-SM) Dark Gray, Fine	100	17	0	94	6	0.082								
		X	5 9 10	19		Poorly-graded Sand with Silt (SP-SM) Dark Gray, Fine	100	18	0	93	7	0.080								
202.2	58.0																			
		X	5 7 9	16		Poorly-graded Sand (SP) Gray, Fine	100	19												
		X	5 8 12	20		Poorly-graded Sand (SP) Gray, Medium	100	20												

35.0 37.5 40.0 42.5 45.0 47.5 50.0 52.5 55.0 57.5 60.0 62.5 65.0 67.5 70.0 72.5 75.0 77.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 3 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,172,509.4 E 2,485,280.2

ELEVATION TOP OF BORING: 260.2

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	4 7 12	19		Poorly-graded Sand (SP) Gray, Medium	100	21												
		X	7 9 12	21		Poorly-graded Sand (SP) Gray, Medium	100	22	1	97	2	0.220								
		X	7 10 16	26		Poorly-graded Sand (SP) Gray, Fine	100	23	5	92	3	0.165								
		X	10 15 13	28		Poorly-graded Sand (SP) Gray, Fine	100	24	9	88	3	0.157								
		X	8 23 23	46		Poorly-graded Sand (SP) Light Gray, Fine	100	25	4	93	3	0.160								

77.5 80.0 82.5 85.0 87.5 90.0 92.5 95.0 97.5 100.0 102.5 105.0 107.5 110.0 112.5 115.0 117.5 120.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 4 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM | HORIZONTAL | VERTICAL

LOCATION COORDINATES: N 13,172,509.4 E 2,485,280.2

ELEVATION TOP OF BORING: 260.2

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	6 10 15	25		Poorly-graded Sand (SP) Gray, Fine	100	26	1	96	2	0.170								
		X	10 11 15	26		Poorly-graded Sand (SP) Gray, Medium	100	27	20	77	3	0.232								
		X	10 26 50	76		Poorly-graded Sand (SP) Gray, Medium	100	28	4	90	6	0.153								
		X	9 19 25	44		Poorly-graded Sand (SP) Gray & Brown, Fine	100	29	13	81	6	0.132								

120.0 122.5 125.0 127.5 130.0 132.5 135.0 137.5 140.0 142.5 145.0 147.5 150.0 152.5 155.0 157.5 160.0 162.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 5 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,172,509.4 E 2,485,280.2

ELEVATION TOP OF BORING: 260.2

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
85.2	175.0	X	25 25 25	50		Poorly-graded Sand (SP) Brown	100	30	42	53	4	0.189								
80.2	180.0	X	9 9 11	20		Fat Clay (CH) Gray, medium, Sand Strata or Lenses	100	31												

162.5
165.0
167.5
170.0
172.5
175.0
177.5
180.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
2. HOLE NUMBER: 132-BPL-10
LOCATION COORDINATES: N 13,172,042.1 E 2,485,119.2
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
4. NAME OF DRILLER: K. Roberts
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 253.7 9/4/10
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
15. DATE BORING: STARTED 9/4/10 COMPLETED 9/4/10
6. THICKNESS OF OVERBURDEN:
16. ELEVATION TOP OF BORING: 259.7
7. DEPTH DRILLED INTO ROCK:
17. TOTAL CORE RECOVERY FOR BORING: N/A
8. TOTAL DEPTH OF BORING: 30.0
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
256.7	3.0	☒	5 4 3	7		Lean Clay (CL) Gray, medium, Oxidized	100	1					30	18	20.7					
		☒	2 2 7	9		Silty Sand (SM) Gray & Brown, Fine	100	2			15				15.6					
251.7	8.0	☒	3 3 4	7		Silty Sand (SM) Gray, Oxidized, Fine	100	3	1	87	13									
		☒	3 3 6	9		Poorly-graded Sand (SP) Gray, Fine	100	4	0	97	3	0.101								
		☒	2 2 2	4		Poorly-graded Sand (SP) Gray, Fine	100	5	1	99	1	0.176								
		☒	2 4 3	7		Poorly-graded Sand (SP) Gray, Fine	100	6	0	99	1	0.135								
		☒	4 6 7	13		Poorly-graded Sand (SP) Gray, Medium	100	7	0	99	0	0.208								
		☒	3 4 7	11		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	9 6 8	14		Poorly-graded Sand (SP) Gray, Medium	100	9												
		☒	5 8 14	22		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	9 12 20	32		Poorly-graded Sand (SP) Gray, Fine	100	11												
229.7	30.0	☒	11 16 19	35		Poorly-graded Sand (SP) Gray, Medium	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)	INSTALLATION: Memphis District (CEMVM)	SHEET 1 OF 1 SHEETS	
1. PROJECT: Below Piggott - West Bank SFB Seepage Study	9. COORDINATE SYSTEM:	HORIZONTAL:	VERTICAL:
	10. SIZE AND TYPE OF BIT: 2.25" ID		
2. HOLE NUMBER: 133-BPL-10	LOCATION COORDINATES: N 13,171,531.9 E 2,484,999.8	11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45	
3. DRILLING AGENCY: Tri-State Testing Services, Inc.		12. TOTAL SAMPLES: 12	DISTURBED: 12 / UNDISTURBED: 0
4. NAME OF DRILLER: K. Roberts		13. TOTAL NUMBER CORE BOXES: 0	
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED	DEG FROM VERTICAL: --- / BEARING:	14. ELEVATION GROUND WATER: 254.8	9/4/10
		15. DATE BORING: STARTED 9/4/10	COMPLETED 9/4/10
6. THICKNESS OF OVERBURDEN		16. ELEVATION TOP OF BORING: 260.8	
7. DEPTH DRILLED INTO ROCK		17. TOTAL CORE RECOVERY FOR BORING: N/A	
8. TOTAL DEPTH OF BORING: 30.0		18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor	

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
257.8	3.0	☒	8 8 9	17		Silty Sand (SM) Brown, Oxidized, Fine	100	1												
255.3	5.5	☒	4 5 5	10		Silty Clay (CL-ML) Gray, medium	100	2					26	6	15.7					
252.8	8.0	☒	2 5 7	12		Poorly-graded Sand with Silt (SP-SM) Brown, Fine	100	3			7									
		☒	3 5 5	10		Poorly-graded Sand (SP) Brown, Fine	100	4	0	99	1	0.187								
		☒	4 5 7	12		Poorly-graded Sand (SP) Brown, Fine	100	5	1	97	1	0.164								
		☒	9 8 8	16		Poorly-graded Sand (SP) Brown, Medium	100	6	1	98	1	0.259								
		☒	6 14 12	26		Poorly-graded Sand (SP) Gray, Medium	100	7	5	95	0	0.420								
		☒	4 8 13	21		Poorly-graded Sand (SP) Brown, Medium	100	8	3	97	0	0.330								
		☒	4 10 10	20		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	2 2 4	6		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	12 15 17	32		Poorly-graded Sand (SP) Gray, Fine	100	11												
230.8	30.0	☒	12 12 19	31		Poorly-graded Sand (SP) Gray, Medium	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 5 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 134-BPT-11
LOCATION COORDINATES: N 13,171,027.6 E 2,485,019.4
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: C. Herron
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 180.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 4.5" Wing Bit
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 55
12. TOTAL SAMPLES: 31 DISTURBED: 31 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 248.1 1/11/11
15. DATE BORING: STARTED 1/11/11 COMPLETED 1/14/11
16. ELEVATION TOP OF BORING: 262.1
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	3 4 4	8		Silty Sand (SM)	100	1			14									
259.1	3.0																			
		☒	3 4 4	8		Poorly-graded Sand with Silt (SP-SM)	100	2	0	89	11									
		☒	3 4 5	9		Poorly-graded Sand with Silt (SP-SM)	100	3	0	91	9	0.077								
254.1	8.0																			
		☒	4 4 5	9		Poorly-graded Sand (SP)	100	4	0	97	3	0.155								
251.6	10.5																			
		☒	3 4 5	9		Poorly-graded Sand with Silt (SP-SM)	100	5	0	91	9	0.076								
249.1	13.0																			
	▼	☒	6 7 11	18		Poorly-graded Sand (SP)	100	6	0	97	2	0.178								
		☒	6 8 11	19		Poorly-graded Sand (SP)	100	7												
		☒	7 8 10	18		Poorly-graded Sand (SP)	100	8												
		☒	8 9 11	20		Poorly-graded Sand (SP)	100	9	3	94	3	0.114								
		☒	6 7 9	16		Poorly-graded Sand (SP)	100	10	1	94	4	0.155								
		☒	7 7 10	17		Poorly-graded Sand (SP)	100	11	6	93	2	0.179								
		☒	6 8 9	17		Poorly-graded Sand (SP)	100	12	0	96	4	0.125								
		☒	8 7 10	17		Poorly-graded Sand (SP)	100	13												
		☒	9 10 14	24		Poorly-graded Sand (SP)	100	14												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,171,027.6 E 2,485,019.4

ELEVATION TOP OF BORING: 262.1

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	8 9 13	22		Poorly-graded Sand (SP)	100	15	5	94	2	0.216								
		X	9 9 11	20		Poorly-graded Sand (SP)	100	16	17	81	2	0.250								
214.1	48.0																			
		X	8 11 13	24		Poorly-graded Sand with Silt (SP-SM)	100	17	2	92	5	0.146								
209.1	53.0																			
		X	9 12 15	27		Poorly-graded Sand (SP)	100	18	8	90	2	0.212								
		X	10 10 11	21		Poorly-graded Sand (SP)	100	19												
		X	9 8 11	19		Poorly-graded Sand (SP)	100	20												

35.0 37.5 40.0 42.5 45.0 47.5 50.0 52.5 55.0 57.5 60.0 62.5 65.0 67.5 70.0 72.5 75.0 77.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 3 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,171,027.6 E 2,485,019.4

ELEVATION TOP OF BORING: 262.1

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	9 11 11	22		Poorly-graded Sand (SP)	100	21	8	91	1	0.225								
		X	10 11 14	25		Poorly-graded Sand (SP)	100	22	22	76	2	0.242								
		X	12 13 14	27		Poorly-graded Sand (SP)	100	23	6	90	4	0.163								
		X	11 12 12	24		Poorly-graded Sand (SP)	100	24	28	71	1	0.304								
		X	5 7 11	18		Poorly-graded Sand (SP)	100	25	3	93	4	0.153								

77.5 80.0 82.5 85.0 87.5 90.0 92.5 95.0 97.5 100.0 102.5 105.0 107.5 110.0 112.5 115.0 117.5 120.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 4 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,171,027.6 E 2,485,019.4

ELEVATION TOP OF BORING: 262.1

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	7 7 10	17		Poorly-graded Sand (SP)	100	26	16	82	2	0.189								
		X	8 11 11	22		Poorly-graded Sand (SP)	100	27												
		X	7 9 14	23		Poorly-graded Sand (SP)	100	28	1	98	1	0.171								
		X	50 48 53	101		Poorly-graded Sand (SP)	100	29	43	55	3	0.209								

120.0 122.5 125.0 127.5 130.0 132.5 135.0 137.5 140.0 142.5 145.0 147.5 150.0 152.5 155.0 157.5 160.0 162.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 5 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM | HORIZONTAL | VERTICAL

LOCATION COORDINATES: N 13,171,027.6 E 2,485,019.4

ELEVATION TOP OF BORING: 262.1

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
87.1	175.0	X	13 12 18	30		Poorly-graded Sand (SP)	100	30	24	75	1	0.209								
82.1	180.0	X	9 12 14	26		Fat Clay (CH)	100	31												

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 135-BPL-10
LOCATION COORDINATES: N 13,170,540.2 E 2,485,030.2
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED
DEG FROM VERTICAL: ---
BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 254.8 9/4/10
15. DATE BORING: STARTED 9/4/10 COMPLETED 9/4/10
16. ELEVATION TOP OF BORING: 260.8
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	9 10 9	19		Silty Sand (SM) Brown, Oxidized, Fine	100	1												
		☒	4 6 6	12		Silty Sand (SM) Brown & Gray, Oxidized, Fine	100	2			19									
255.3	5.5																			
		☒	3 3 6	9		Poorly-graded Sand (SP) Gray, Fine	100	3	0	96	4	0.153								
		☒	4 4 6	10		Poorly-graded Sand (SP) Dark Brown, Fine	100	4	0	97	3	0.098								
		☒	7 14 15	29		Poorly-graded Sand (SP) Brown, Fine	100	5	0	98	2	0.175								
		☒	7 10 15	25		Poorly-graded Sand (SP) Brown, Fine	100	6	0	99	1	0.185								
		☒	8 11 7	18		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	7	1	98	2	0.185								
		☒	2 5 7	12		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	7 14 15	29		Poorly-graded Sand (SP) Gray, Medium	100	9												
		☒	12 16 15	31		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	10 17 26	43		Poorly-graded Sand (SP) Gray, Medium	100	11												
230.8	30.0	☒	6 9 12	21		Poorly-graded Sand (SP) Gray, Medium	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)	INSTALLATION: Memphis District (CEMVM)	SHEET 1 OF 1 SHEETS	
1. PROJECT: Below Piggott - West Bank SFB Seepage Study	9. COORDINATE SYSTEM	HORIZONTAL	VERTICAL
	10. SIZE AND TYPE OF BIT: 2.25" ID		
2. HOLE NUMBER: 136-BPL-10 — LOCATION COORDINATES: N 13,170,053.1 E 2,485,035.8	11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45		
3. DRILLING AGENCY: Tri-State Testing Services, Inc.	12. TOTAL SAMPLES: 12	DISTURBED: 12	UNDISTURBED: 0
4. NAME OF DRILLER: K. Roberts	13. TOTAL NUMBER CORE BOXES: 0		
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED — DEG FROM VERTICAL: --- — BEARING:	14. ELEVATION GROUND WATER: 254.7 9/4/10		
	15. DATE BORING	STARTED: 9/4/10	COMPLETED: 9/4/10
6. THICKNESS OF OVERBURDEN	16. ELEVATION TOP OF BORING: 260.7		
7. DEPTH DRILLED INTO ROCK	17. TOTAL CORE RECOVERY FOR BORING: N/A		
8. TOTAL DEPTH OF BORING: 30.0	18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor		

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	8 12 11	23		Silty Sand (SM) Tan, Fine	100	1												
		☒	2 1 2	3		Silty Sand (SM) Brown & Gray, Oxidized, Fine	100	2			16									
255.2	5.5																			
		☒	3 3 6	9		Poorly-graded Sand (SP) Gray, Fine	100	3	0	98	2	0.159								
		☒	4 5 8	13		Poorly-graded Sand (SP) Brown & Gray, Medium	100	4	0	98	2	0.169								
		☒	4 8 6	14		Poorly-graded Sand (SP) Brown, Medium	100	5	1	98	0	0.230								
		☒	4 6 7	13		Poorly-graded Sand (SP) Brown & Gray, Fine	100	6	2	98	1	0.165								
		☒	4 8 11	19		Poorly-graded Sand (SP) Gray, Medium	100	7	2	97	0	0.211								
		☒	7 10 10	20		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	6 9 15	24		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	8 8 15	23		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	9 11 17	28		Poorly-graded Sand (SP) Gray, Fine	100	11												
230.7	30.0	☒	9 7 10	17		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)

INSTALLATION: Memphis District (CEMVM)

SHEET 1 OF 5 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study

9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

10. SIZE AND TYPE OF BIT: 4.5" Wing Bit

2. HOLE NUMBER: 137-BPT-11

LOCATION COORDINATES: N 13,169,561.8 E 2,485,051.7

11. MANUFACTURER'S DESIGNATION OF DRILL: CME 75

3. DRILLING AGENCY: Tri-State Testing Services, Inc.

12. TOTAL SAMPLES: 32 DISTURBED: 32 UNDISTURBED: 0

4. NAME OF DRILLER: G. Baker

13. TOTAL NUMBER CORE BOXES: 0

5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:

14. ELEVATION GROUND WATER: 252.7 8/11/11

15. DATE BORING: STARTED 8/11/11 COMPLETED 8/16/11

6. THICKNESS OF OVERBURDEN:

16. ELEVATION TOP OF BORING: 264.7

7. DEPTH DRILLED INTO ROCK:

17. TOTAL CORE RECOVERY FOR BORING: N/A

8. TOTAL DEPTH OF BORING: 190.0

18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
261.7	3.0	☒	3 5 8	13		Silty Sand (SM) Brown, Fine, Rootlets	100	1			19				3.8					
259.2	5.5	☒	3 3 5	8		Poorly-graded Sand with Silt (SP-SM) Brown, Fine	100	2	2	89	9	0.080								
		☒	3 4 4	8		Poorly-graded Sand (SP) Brown, Fine	100	3	0	99	1	0.171								
254.2	10.5	☒	3 3 4	7		Poorly-graded Sand (SP) Brown, Fine	100	4	0	99	1	0.164								
251.7	13.0	☒	1 1 1	2		Poorly-graded Sand with Silt (SP-SM) Brown, Fine	100	5	0	94	6	0.083								
		☒	3 5 9	14		Poorly-graded Sand (SP) Brown, Fine	100	6	0	99	1	0.175								
		☒	3 5 6	11		Poorly-graded Sand (SP) Brown, Fine	100	7												
		☒	2 3 5	8		Poorly-graded Sand (SP) Brown, Fine, Organic Matter	100	8	0	96	4	0.102								
		☒	4 7 8	15		Poorly-graded Sand (SP) Brown, Fine	100	9	0	99	1	0.171								
		☒	3 6 9	15		Poorly-graded Sand (SP) Brown, Fine	100	10												
		☒	7 13 16	29		Poorly-graded Sand (SP) Brown, Medium	100	11	3	95	2	0.203								
		☒	6 11 12	23		Poorly-graded Sand (SP) Gray, Medium	100	12	1	97	2	0.187								
		☒	6 9 10	19		Poorly-graded Sand (SP) Brown, Medium	100	13	2	96	1	0.195								
		☒	4 7 10	17		Poorly-graded Sand (SP) Brown, Medium	100	14	2	97	1	0.250								

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,169,561.8 E 2,485,051.7

ELEVATION TOP OF BORING: 264.7

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	4 8 9	17		Poorly-graded Sand (SP) Gray, Fine	100	15												
		X	3 5 7	12		Poorly-graded Sand (SP) Gray, Medium	100	16	23	76	1	0.302								
		X	2 4 5	9		Poorly-graded Sand (SP) Gray, Medium	100	17	7	92	1	0.316								
		X	3 5 8	13		Poorly-graded Sand (SP) Brown, Medium, Organic Matter	100	18	1	98	1	0.257								
		X	4 5 5	10		Poorly-graded Sand (SP) Gray, Fine	100	19												
		X	4 9 10	19		Poorly-graded Sand (SP) Gray, Medium	100	20	1	98	1	0.320								

35.0 37.5 40.0 42.5 45.0 47.5 50.0 52.5 55.0 57.5 60.0 62.5 65.0 67.5 70.0 72.5 75.0 77.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 3 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,169,561.8 E 2,485,051.7

ELEVATION TOP OF BORING: 264.7

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	10 12 15	27		Poorly-graded Sand (SP) Gray, Medium	100	21	3	96	2	0.302								
		X	9 14 15	29		Poorly-graded Sand (SP) Gray, Medium	100	22	4	94	2	0.182								
		X	8 13 17	30		Poorly-graded Sand (SP) Gray, Medium	100	23												
		X	19 21 23	44		Poorly-graded Sand (SP) Brown, Fine	100	24	0	98	2	0.156								
		X	9 26 43	69		Poorly-graded Sand (SP) Gray, Fine	100	25	0	96	4	0.157								

77.5 80.0 82.5 85.0 87.5 90.0 92.5 95.0 97.5 100.0 102.5 105.0 107.5 110.0 112.5 115.0 117.5 120.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 4 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,169,561.8 E 2,485,051.7

ELEVATION TOP OF BORING: 264.7

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	12 18 20	38		Poorly-graded Sand (SP) Gray, Fine	100	26												
		X	8 15 25	40		Poorly-graded Sand (SP) Gray, Fine	100	27	1	96	3	0.166								
119.7	145.0																			
		X	37 45 53	98		Poorly-graded Sand with Silt (SP-SM) Gray, Medium	100	28	23	72	5	0.163								
109.7	155.0																			
		X	13 12 15	27		Poorly-graded Sand (SP) Brown	100	29												

120.0 122.5 125.0 127.5 130.0 132.5 135.0 137.5 140.0 142.5 145.0 147.5 150.0 152.5 155.0 157.5 160.0 162.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 5 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,169,561.8 E 2,485,051.7

ELEVATION TOP OF BORING: 264.7

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
99.7	165.0																			
		X	22 118	118 /		Poorly-graded Gravel (GP) Brown	100	30	56	42	2	0.324								
89.7	175.0																			
		X	13 24 30	54		Poorly-graded Sand (SP) Brown	100	31												
79.7	185.0																			
			4 7 10	17		Fat Clay (CH) Gray, very stiff	100	32												
74.7	190.0																			

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)	INSTALLATION: Memphis District (CEMVM)	SHEET 1 OF 1 SHEETS	
1. PROJECT: Below Piggott - West Bank SFB Seepage Study	9. COORDINATE SYSTEM:	HORIZONTAL:	VERTICAL:
	10. SIZE AND TYPE OF BIT: 3.25" ID		
2. HOLE NUMBER: 138-BPL-11	LOCATION COORDINATES: N 13,169,302.1 E 2,484,668.2	11. MANUFACTURER'S DESIGNATION OF DRILL: CME 850	
3. DRILLING AGENCY: Tri-State Testing Services, Inc.		12. TOTAL SAMPLES: 12	DISTURBED: 12 / UNDISTURBED: 0
4. NAME OF DRILLER: J. Crawford		13. TOTAL NUMBER CORE BOXES: 0	
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED	DEG FROM VERTICAL: --- / BEARING:	14. ELEVATION GROUND WATER: 251.5	8/2/11
		15. DATE BORING: STARTED 8/2/11	COMPLETED 8/2/11
6. THICKNESS OF OVERBURDEN		16. ELEVATION TOP OF BORING: 262.5	
7. DEPTH DRILLED INTO ROCK		17. TOTAL CORE RECOVERY FOR BORING: N/A	
8. TOTAL DEPTH OF BORING: 30.0		18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor	

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
259.5	3.0	☒	2 2 3	5		Lean Clay (CL) Gray & Brown, medium, Oxidized	100	1							14.6					
257.0	5.5	☒	3 3 3	6		Clayey Sand (SC) Gray & Brown, Oxidized	100	2			23				11.2					
254.5	8.0	☒	2 3 3	6		Poorly-graded Sand (SP) Brown, Oxidized	100	3	0	98	2	0.171								
		☒	4 4 4	8		Poorly-graded Sand with Silt (SP-SM) Gray & Brown, Oxidized, Fine	100	4	0	90	10									
		☒	4 3 3	6		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	5	0	93	7	0.087								
247.0	15.5	☒	3 3 3	6		Poorly-graded Sand with Silt (SP-SM) Brown, Fine	100	6	3	91	6	0.112								
		☒	3 3 4	7		Poorly-graded Sand (SP) Brown, Fine	100	7	0	99	1	0.172								
		☒	3 4 2	6		Poorly-graded Sand (SP) Brown, Fine	100	8												
		☒	4 5 6	11		Poorly-graded Sand (SP) Brown, Fine	100	9												
		☒	7 7 6	13		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	6 7 7	14		Poorly-graded Sand (SP) Gray, Fine	100	11												
232.5	30.0	☒	7 8 7	15		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)	INSTALLATION: Memphis District (CEMVM)	SHEET 1 OF 1 SHEETS	
1. PROJECT: Below Piggott - West Bank SFB Seepage Study	9. COORDINATE SYSTEM:	HORIZONTAL:	VERTICAL:
	10. SIZE AND TYPE OF BIT: 4.5" Wing Bit		
2. HOLE NUMBER: 139-BPL-11	LOCATION COORDINATES: N 13,168,963.2 E 2,484,305.9	11. MANUFACTURER'S DESIGNATION OF DRILL: CME 55	
3. DRILLING AGENCY: Tri-State Testing Services, Inc.		12. TOTAL SAMPLES: 12	DISTURBED: 12 / UNDISTURBED: 0
4. NAME OF DRILLER: C. Herron		13. TOTAL NUMBER CORE BOXES: 0	
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED	DEG FROM VERTICAL: --- / BEARING:	14. ELEVATION GROUND WATER: 256.3	3/23/11
		15. DATE BORING: STARTED 3/23/11	COMPLETED 3/23/11
6. THICKNESS OF OVERBURDEN		16. ELEVATION TOP OF BORING: 262.3	
7. DEPTH DRILLED INTO ROCK		17. TOTAL CORE RECOVERY FOR BORING: N/A	
8. TOTAL DEPTH OF BORING: 30.0		18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor	

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
259.3	3.0	☒	2 3 4	7		Poorly-graded Sand (SP) Brown, Fine, Rootlets	100	1												
256.8	5.5	☒	2 3 3	6		Silty Sand (SM) Brown & Gray, Fine	100	2			23									
254.3	8.0	☒	3 4 5	9		Poorly-graded Sand (SP) Dark Brown, Medium	100	3	5	94	1	0.177								
251.8	10.5	☒	3 2 3	5		Silty Sand (SM) Brown, Fine	100	4	0	87	13									
249.3	13.0	☒	8 11 13	24		Poorly-graded Sand with Silt (SP-SM) Dark Brown, Fine	100	5	0	94	5	0.109								
		☒	7 10 10	20		Poorly-graded Sand (SP) Brown, Fine	100	6	0	97	3	0.178								
		☒	7 8 10	18		Poorly-graded Sand (SP) Dark Gray, Medium	100	7	0	97	2	0.170								
		☒	3 7 7	14		Poorly-graded Sand (SP) Dark Gray, Fine	100	8												
		☒	6 6 7	13		Poorly-graded Sand (SP) Brown, Medium	100	9												
		☒	7 7 11	18		Poorly-graded Sand (SP) Dark Gray, Fine	100	10												
		☒	7 12 17	29		Poorly-graded Sand (SP) Brown, Medium	100	11												
232.3	30.0	☒	8 11 11	22		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION	Mississippi Valley Division (MVD)
INSTALLATION	Memphis District (CEMVM)
SHEET	1 OF 4 SHEETS
1. PROJECT	Below Piggott - West Bank SFB Seepage Study
9. COORDINATE SYSTEM	HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT	4.5" Wing Bit
2. HOLE NUMBER	140-BPT-11
LOCATION COORDINATES	N 13,168,691.7 E 2,483,878.0
11. MANUFACTURER'S DESIGNATION OF DRILL	CME 75
3. DRILLING AGENCY	Tri-State Testing Services, Inc.
12. TOTAL SAMPLES	29
DISTURBED	29
UNDISTURBED	0
4. NAME OF DRILLER	G. Baker
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	254.4 1/25/11
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG FROM VERTICAL	---
BEARING	
15. DATE BORING	STARTED 1/21/11 COMPLETED 1/25/11
6. THICKNESS OF OVERBURDEN	
16. ELEVATION TOP OF BORING	260.9
7. DEPTH DRILLED INTO ROCK	
17. TOTAL CORE RECOVERY FOR BORING	N/A
8. TOTAL DEPTH OF BORING	160.0
18. SIGNATURE AND TITLE OF INSPECTOR	Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
257.9	3.0	☒	1 3 4	7		Poorly-graded Sand with Silt (SP-SM) Dark Brown, Fine	100	1												
255.4	5.5	☒	4 4 4	8		Clayey Sand (SC) Gray & Brown, Fine	100	2			30				27.6					
252.9	8.0	☒	2 4 4	8		Poorly-graded Sand with Silt (SP-SM) Dark Brown, Fine	100	3	0	97	3	0.135								
		☒	2 4 3	7		Poorly-graded Sand (SP) Brown, Fine	100	4	0	99	1	0.164								
		☒	3 3 3	6		Poorly-graded Sand (SP) Brown, Fine	100	5	0	99	1	0.159								
		☒	4 5 8	13		Poorly-graded Sand (SP) Brown, Medium	100	6	0	98	1	0.188								
		☒	4 4 4	8		Poorly-graded Sand (SP) Brown, Fine	100	7	0	99	1	0.193								
		☒	2 2 5	7		Poorly-graded Sand (SP) Brown & Gray, Fine	100	8												
		☒	1 2 6	8		Poorly-graded Sand (SP) Gray, Fine	100	9	2	98	1	0.179								
		☒	5 7 15	22		Poorly-graded Sand (SP) Brown, Fine	100	10	0	99	1	0.174								
		☒	5 7 9	16		Poorly-graded Sand (SP) Brown, Fine	100	11	0	99	1	0.176								
		☒	4 6 9	15		Poorly-graded Sand (SP) Brown, Fine	100	12	1	98	1	0.192								
		☒	4 8 10	18		Poorly-graded Sand (SP) Gray, Medium	100	13	1	98	1	0.203								
		☒	1 3 6	9		Poorly-graded Sand (SP) Gray, Medium	100	14	0	99	1	0.232								

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 4 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,168,691.7 E 2,483,878.0

ELEVATION TOP OF BORING: 260.9

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	8 16 18	34		Poorly-graded Sand (SP) Gray, Medium	100	15	1	97	2	0.201								
		X	4 8 10	18		Poorly-graded Sand (SP) Gray, Medium	100	16	10	89	1	0.338								
		X	2 4 7	11		Poorly-graded Sand (SP) Gray & Brown, Medium	100	17												
		X	4 6 7	13		Poorly-graded Sand (SP) Gray & Brown, Medium	100	18												
		X	3 4 6	10		Poorly-graded Sand (SP) Gray & Brown, Medium	100	19	1	99	1	0.238								
		X	6 10 12	22		Poorly-graded Sand (SP) Gray, Medium	100	20	2	97	1	0.309								

35.0 37.5 40.0 42.5 45.0 47.5 50.0 52.5 55.0 57.5 60.0 62.5 65.0 67.5 70.0 72.5 75.0 77.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 3 OF 4 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,168,691.7 E 2,483,878.0

ELEVATION TOP OF BORING: 260.9

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	5 8 12	20		Poorly-graded Sand (SP) Gray, Medium	100	21	0	99	1	0.306								
		X	8 16 18	34		Poorly-graded Sand (SP) Gray, Medium	100	22	0	98	2	0.183								
		X	13 15 15	30		Poorly-graded Sand (SP) Brown, Fine	100	23												
		X	10 11 13	24		Poorly-graded Sand (SP) Gray, Fine	100	24												
		X	27 38 48	86		Poorly-graded Sand (SP) Light Gray, Fine	100	25	1	95	4	0.159								

77.5 80.0 82.5 85.0 87.5 90.0 92.5 95.0 97.5 100.0 102.5 105.0 107.5 110.0 112.5 115.0 117.5 120.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 4 OF 4 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,168,691.7 E 2,483,878.0

ELEVATION TOP OF BORING: 260.9

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
135.9	125.0																			
		X	12 14 18	32		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	26	0	93	7	0.086								
125.9	135.0																			
		X	15 15 18	33		Poorly-graded Sand (SP) Gray, Fine	100	27	6	91	3	0.159								
		X	28 14 18	32		Poorly-graded Sand (SP) Gray	100	28	39	59	2	0.251								
105.9	155.0																			
		X	10 15 15	30		Silty Sand (SM) Gray, Fine	100	29	4	60	36									
100.9	160.0																			

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)	INSTALLATION: Memphis District (CEMVM)	SHEET 1 OF 1 SHEETS	
1. PROJECT: Below Piggott - West Bank SFB Seepage Study	9. COORDINATE SYSTEM	HORIZONTAL	VERTICAL
	10. SIZE AND TYPE OF BIT: 3.25" ID		
2. HOLE NUMBER: 141-BPL-11 — LOCATION COORDINATES: N 13,168,389.5 E 2,483,483.4	11. MANUFACTURER'S DESIGNATION OF DRILL: CME 75		
3. DRILLING AGENCY: Tri-State Testing Services, Inc.	12. TOTAL SAMPLES: 12	DISTURBED: 12	UNDISTURBED: 0
4. NAME OF DRILLER: G. Baker	13. TOTAL NUMBER CORE BOXES: 0		
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED — DEG FROM VERTICAL: --- — BEARING:	14. ELEVATION GROUND WATER: 251.9 8/2/11		
	15. DATE BORING: STARTED 8/2/11 — COMPLETED 8/2/11		
6. THICKNESS OF OVERBURDEN	16. ELEVATION TOP OF BORING: 260.9		
7. DEPTH DRILLED INTO ROCK	17. TOTAL CORE RECOVERY FOR BORING: N/A		
8. TOTAL DEPTH OF BORING: 30.0	18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor		

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	3 3 4	7		Silty Sand (SM) Brown, Fine	100	1			21									
		☒	2 2 4	6		Silty Sand (SM) Brown, Fine	100	2	0	71	29									
255.4	5.5																			
		☒	3 4 5	9		Poorly-graded Sand with Silt (SP-SM) Brown, Fine	100	3	0	92	8	0.078								
		☒	2 2 4	6		Poorly-graded Sand with Silt (SP-SM) Brown, Fine	100	4	0	94	5	0.122								
250.4	10.5																			
		☒	3 5 6	11		Poorly-graded Sand (SP) Brown, Fine	100	5												
247.9	13.0																			
		☒	1 3 3	6		Silty Sand (SM) Brown, Fine	100	6	0	77	23									
245.4	15.5																			
		☒	3 4 7	11		Poorly-graded Sand (SP) Brown, Fine	100	7												
		☒	3 5 7	12		Poorly-graded Sand (SP) Gray, Fine	100	8	0	98	2	0.118								
		☒	4 6 8	14		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	5 6 9	15		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	7 7 10	17		Poorly-graded Sand (SP) Gray, Fine	100	11												
		☒	8 10 12	22		Poorly-graded Sand (SP) Gray, Fine	100	12												
230.9	30.0																			

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)	INSTALLATION: Memphis District (CEMVM)	SHEET 1 OF 1 SHEETS	
1. PROJECT: Below Piggott - West Bank SFB Seepage Study	9. COORDINATE SYSTEM	HORIZONTAL	VERTICAL
	10. SIZE AND TYPE OF BIT: 3.25" ID		
2. HOLE NUMBER: 142-BPL-11 — LOCATION COORDINATES: N 13,168,083.3 E 2,483,085.9	11. MANUFACTURER'S DESIGNATION OF DRILL: CME 75		
3. DRILLING AGENCY: Tri-State Testing Services, Inc.	12. TOTAL SAMPLES: 12	DISTURBED: 12	UNDISTURBED: 0
4. NAME OF DRILLER: G. Baker	13. TOTAL NUMBER CORE BOXES: 0		
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED — DEG FROM VERTICAL: --- — BEARING:	14. ELEVATION GROUND WATER: 251.4 8/3/11		
	15. DATE BORING	STARTED: 8/3/11	COMPLETED: 8/3/11
6. THICKNESS OF OVERBURDEN	16. ELEVATION TOP OF BORING: 259.9		
7. DEPTH DRILLED INTO ROCK	17. TOTAL CORE RECOVERY FOR BORING: N/A		
8. TOTAL DEPTH OF BORING: 30.0	18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor		

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
256.9	3.0	☒	2 3 3	6		Poorly-graded Sand with Silt (SP-SM) Brown, Fine	100	1												
254.4	5.5	☒	3 4 5	9		Silty Sand (SM) Brown, Fine	100	2			40									
251.9	8.0	☒	3 3 5	8		Silt (ML) Sandy, Brown & Gray, medium	100	3	1	39	60									
249.4	10.5	☒	2 2 3	5		Silty Sand (SM) Brown, Fine	100	4	0	80	20									
		☒	4 5 7	12		Poorly-graded Sand (SP) Brown, Fine	100	5	0	97	3	0.101								
		☒	4 6 9	15		Poorly-graded Sand (SP) Brown, Fine	100	6												
		☒	5 7 10	17		Poorly-graded Sand (SP) Brown, Fine	100	7												
		☒	3 5 9	14		Poorly-graded Sand (SP) Brown, Medium	100	8	2	97	0	0.205								
		☒	6 7 9	16		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	3 4 6	10		Poorly-graded Sand (SP) Gray, Fine	100	10	0	96	4	0.088								
		☒	5 5 7	12		Poorly-graded Sand (SP) Gray, Fine	100	11												
229.9	30.0	☒	3 7 12	19		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 5 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 143-BPT-11
LOCATION COORDINATES: N 13,167,775.6 E 2,482,689.8
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: G. Baker
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 170.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 4.5" Wing Bit
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 75
12. TOTAL SAMPLES: 30 DISTURBED: 30 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 252.6 1/25/11
15. DATE BORING: STARTED 1/25/11 COMPLETED 1/27/11
16. ELEVATION TOP OF BORING: 259.6
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
			3 2 2	4		Clayey Sand (SC) Gray, soft, Oxidized	100	1			48				14.2					
256.6	3.0																			
			4 5 5	10		Silty Sand (SM) Gray, Fine	100	2	0	83	17									
254.1	5.5																			
			2 3 4	7		Poorly-graded Sand (SP) Gray, Fine	100	3	0	97	3	0.093								
			3 3 5	8		Poorly-graded Sand (SP) Gray, Fine	100	4	0	98	2	0.105								
			3 6 6	12		Poorly-graded Sand (SP) Gray, Medium	100	5	1	98	1	0.192								
			5 7 6	13		Poorly-graded Sand (SP) Gray, Fine	100	6	0	98	2	0.101								
			2 4 7	11		Poorly-graded Sand (SP) Gray, Fine	100	7	0	96	4	0.084								
			2 3 3	6		Poorly-graded Sand (SP) Gray, Medium	100	8	2	98	1	0.300								
			4 6 6	12		Poorly-graded Sand (SP) Gray, Medium	100	9	2	97	1	0.209								
			2 4 4	8		Poorly-graded Sand (SP) Gray, Medium	100	10												
			1 2 6	8		Poorly-graded Sand (SP) Gray, Medium	100	11												
			6 10 13	23		Poorly-graded Sand (SP) Gray, Medium	100	12												
			4 8 10	18		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	13	2	96	2	0.158								
			3 7 9	16		Poorly-graded Sand (SP) Gray, Fine	100	14	0	98	1	0.155								

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,167,775.6 E 2,482,689.8

ELEVATION TOP OF BORING: 259.6

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	4 7 9	16		Poorly-graded Sand (SP) Gray, Medium	100	15	2	97	1	0.299								
		X	7 8 9	17		Poorly-graded Sand (SP) Gray, Medium	100	16	0	99	1	0.200								
		X	4 8 9	17		Poorly-graded Sand (SP) Gray, Fine	100	17												
		X	5 5 5	10		Poorly-graded Sand (SP) Gray, Medium	100	18												
		X	3 6 6	12		Poorly-graded Sand (SP) Gray, Fine	100	19	0	99	1	0.174								
		X	4 7 10	17		Poorly-graded Sand (SP) Gray, Medium	100	20	0	99	1	0.336								

35.0 37.5 40.0 42.5 45.0 47.5 50.0 52.5 55.0 57.5 60.0 62.5 65.0 67.5 70.0 72.5 75.0 77.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 3 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,167,775.6 E 2,482,689.8

ELEVATION TOP OF BORING: 259.6

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	4 5 8	13		Poorly-graded Sand (SP) Gray, Fine	100	21	1	98	1	0.171								
		X	3 6 8	14		Poorly-graded Sand (SP) Gray, Medium	100	22	0	99	1	0.247								
		X	8 12 16	28		Poorly-graded Sand (SP) Gray, Fine	100	23												
		X	7 14 19	33		Poorly-graded Sand (SP) Light Gray, Fine	100	24												
		X	16 38 20	58		Poorly-graded Sand (SP) Light Gray, Medium	100	25	21	75	4	0.172								

77.5 80.0 82.5 85.0 87.5 90.0 92.5 95.0 97.5 100.0 102.5 105.0 107.5 110.0 112.5 115.0 117.5 120.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 4 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,167,775.6 E 2,482,689.8

ELEVATION TOP OF BORING: 259.6

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	16 18 27	45		Poorly-graded Sand (SP) Light Brown, Fine	100	26	0	97	3	0.160								
		X	50	50 /		Poorly-graded Sand (SP) Light Brown, Medium	100	27	21	74	5	0.160								
114.6	145.0																			
		X	15 18 17	35		Poorly-graded Gravel (GP) Brown	100	28	59	40	1	0.517								
		X	15 15 20	35		Poorly-graded Gravel (GP) Brown	100	29	59	40	1	0.605								

120.0 122.5 125.0 127.5 130.0 132.5 135.0 137.5 140.0 142.5 145.0 147.5 150.0 152.5 155.0 157.5 160.0 162.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)		SHEET 5 OF 5 SHEETS
PROJECT: Below Piggott - West Bank SFB Seepage Study	COORDINATE SYSTEM: HORIZONTAL: VERTICAL:	
LOCATION COORDINATES: N 13,167,775.6 E 2,482,689.8	ELEVATION TOP OF BORING: 259.6	

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
94.6	165.0																			162.5
																				165.0
																				167.5
89.6	170.0	X	13 13 15	28		Silty Sand (SM) Gray, Fine, Organic Matter	100	30	0	76	24									170.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)	INSTALLATION: Memphis District (CEMVM)	SHEET 1 OF 1 SHEETS	
1. PROJECT: Below Piggott - West Bank SFB Seepage Study	9. COORDINATE SYSTEM:	HORIZONTAL:	VERTICAL:
	10. SIZE AND TYPE OF BIT: 3.25" ID		
2. HOLE NUMBER: 144-BPL-11	LOCATION COORDINATES: N 13,167,469.1 E 2,482,294.4	11. MANUFACTURER'S DESIGNATION OF DRILL: CME 75	
3. DRILLING AGENCY: Tri-State Testing Services, Inc.		12. TOTAL SAMPLES: 12	DISTURBED: 12 / UNDISTURBED: 0
4. NAME OF DRILLER: G. Baker		13. TOTAL NUMBER CORE BOXES: 0	
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED	DEG FROM VERTICAL: --- / BEARING:	14. ELEVATION GROUND WATER: 250.8	8/3/11
		15. DATE BORING: STARTED 8/3/11	COMPLETED 8/3/11
6. THICKNESS OF OVERBURDEN		16. ELEVATION TOP OF BORING: 258.8	
7. DEPTH DRILLED INTO ROCK		17. TOTAL CORE RECOVERY FOR BORING: N/A	
8. TOTAL DEPTH OF BORING: 30.0		18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor	

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	3 3 3	6		Poorly-graded Sand with Silt (SP-SM) Brown & Gray, Fine	100	1												
		☒	1 2 3	5		Poorly-graded Sand with Silt (SP-SM) Brown & Gray, Fine	100	2												
253.3	5.5																			
		☒	3 4 3	7		Poorly-graded Sand with Clay (SP-SC) Brown, Fine	100	3			12									
250.8 ▼	8.0																			
		☒	3 3 3	6		Poorly-graded Sand (SP) Brown, Fine	100	4	0	97	3	0.178								
		☒	3 4 3	7		Poorly-graded Sand (SP) Brown, Fine	100	5	0	97	3	0.159								
		☒	4 6 11	17		Poorly-graded Sand (SP) Gray, Fine	100	6	0	97	3	0.164								
		☒	5 5 9	14		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	1 2 2	4		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	2 2 2	4		Poorly-graded Sand (SP) Gray, Fine	100	9	1	99	0	0.196								
		☒	2 5 8	13		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	3 5 10	15		Poorly-graded Sand (SP) Gray, Fine	100	11	0	99	0	0.177								
		☒	3 7 12	19		Poorly-graded Sand (SP) Gray, Fine	100	12												
228.8	30.0																			

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 145-BPL-11
LOCATION COORDINATES: N 13,167,162.8 E 2,481,903.2
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: G. Baker
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 3.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 75
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 250.5 8/3/11
15. DATE BORING: STARTED 8/3/11 COMPLETED 8/3/11
16. ELEVATION TOP OF BORING: 258.5
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
			2 2 2	4		Lean Clay (CL) Gray, soft	100	1							17.7					
255.5	3.0																			
			1 1 1	2		Silty Sand (SM) Gray	100	2	0	65	35				30.1					
253.0	5.5																			
			3 2 3	5		Clayey Sand (SC) Gray, Fine	100	3			48									
250.5 ▼	8.0																			
			1 1 2	3		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	4	0	94	6	0.089								
248.0	10.5																			
			2 2 2	4		Poorly-graded Sand (SP) Gray, Fine	100	5	0	96	4	0.107								
			3 4 4	8		Poorly-graded Sand (SP) Gray, Fine	100	6												
			4 3 5	8		Poorly-graded Sand (SP) Gray, Fine	100	7	0	99	1	0.159								
			3 7 10	17		Poorly-graded Sand (SP) Gray, Fine	100	8												
			5 6 9	15		Poorly-graded Sand (SP) Gray, Fine	100	9	2	97	1	0.170								
			4 6 11	17		Poorly-graded Sand (SP) Gray, Fine	100	10												
			6 6 10	16		Poorly-graded Sand (SP) Gray, Fine	100	11												
			6 11 13	24		Poorly-graded Sand (SP) Gray, Fine	100	12												
228.5	30.0																			

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 5 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 146-BPT-11
LOCATION COORDINATES: N 13,166,856.3 E 2,481,504.8
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: G. Baker
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 180.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 4.5" Wing Bit
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 75
12. TOTAL SAMPLES: 31 DISTURBED: 31 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 252.8 1/27/11
15. DATE BORING: STARTED 1/27/11 COMPLETED 2/3/11
16. ELEVATION TOP OF BORING: 258.8
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
257.3	1.5	☒	5 4 4	8		Poorly-graded Sand (SP) Brown, Fine	100	1							18.2					
255.8	3.0																			
		☒	3 4 8	12		Clayey Sand (SC) Gray, Fine	100	2			24				16.7					
253.3	5.5																			
		☒	1 1 2	3		Poorly-graded Sand with Silt (SP-SM) Dark Gray, Fine	100	3	0	92	8	0.103								
250.8	8.0																			
		☒	3 4 6	10		Poorly-graded Sand (SP) Gray, Fine	100	4	0	98	2	0.113								
		☒	3 2 5	7		Poorly-graded Sand (SP) Gray, Fine	100	5	0	99	1	0.158								
		☒	3 4 5	9		Poorly-graded Sand (SP) Gray, Fine	100	6	2	98	1	0.175								
		☒	4 4 6	10		Poorly-graded Sand (SP) Gray, Fine	100	7	0	98	1	0.172								
		☒	4 4 6	10		Poorly-graded Sand (SP) Gray, Medium	100	8	1	98	1	0.186								
		☒	6 7 9	16		Poorly-graded Sand (SP) Gray, Fine	100	9	0	99	1	0.183								
		☒	5 7 11	18		Poorly-graded Sand (SP) Gray, Fine	100	10	0	99	1	0.179								
		☒	6 7 9	16		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	11	0	98	2	0.167								
		☒	5 10 11	21		Poorly-graded Sand (SP) Gray, Medium	100	12	2	97	1	0.189								
		☒	7 14 11	25		Poorly-graded Sand (SP) Gray, Medium	100	13	2	96	1	0.233								
		☒	5 10 14	24		Poorly-graded Sand (SP) Gray, Fine	100	14	0	99	1	0.209								

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,166,856.3 E 2,481,504.8

ELEVATION TOP OF BORING: 258.8

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	5 12 14	26		Poorly-graded Sand (SP) Gray, Medium	100	15	0	99	1	0.304								
		X	6 11 14	25		Poorly-graded Sand (SP) Gray, Fine	100	16												
		X	5 7 11	18		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	17												
		X	6 7 8	15		Poorly-graded Sand (SP) Gray, Medium	100	18												
		X	6 7 8	15		Poorly-graded Sand (SP) Gray, Medium	100	19												
		X	6 8 9	17		Poorly-graded Sand (SP) Gray, Fine	100	20	0	99	1	0.218								

35.0 37.5 40.0 42.5 45.0 47.5 50.0 52.5 55.0 57.5 60.0 62.5 65.0 67.5 70.0 72.5 75.0 77.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 3 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,166,856.3 E 2,481,504.8

ELEVATION TOP OF BORING: 258.8

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	13 14 14	28		Poorly-graded Sand (SP) Gray, Fine	100	21	0	99	1	0.203								
		X	13 14 14	28		Poorly-graded Sand (SP) Gray, Fine	100	22	3	96	2	0.189								
		X	17 32 25	57		Poorly-graded Sand (SP) Gray, Fine	100	23	0	97	3	0.163								
		X	17 28 32	60		Poorly-graded Sand (SP) Light Gray, Fine	100	24												
		X	40 44 35	79		Poorly-graded Sand (SP) Light Gray, Fine	100	25												

77.5 80.0 82.5 85.0 87.5 90.0 92.5 95.0 97.5 100.0 102.5 105.0 107.5 110.0 112.5 115.0 117.5 120.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 4 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,166,856.3 E 2,481,504.8

ELEVATION TOP OF BORING: 258.8

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	9 32 32	64		Poorly-graded Sand (SP) Light Gray, Fine	100	26	0	96	4	0.101								
		X	15 40 23	63		Poorly-graded Sand (SP) Brown, Medium	100	27	30	67	3	0.215								
		X	10 15 17	32		Poorly-graded Sand (SP) Brown, Medium	100	28	2	96	2	0.272								
		X	26 26 21	47		Poorly-graded Sand (SP) Brown	100	29	35	61	4	0.178								

120.0 122.5 125.0 127.5 130.0 132.5 135.0 137.5 140.0 142.5 145.0 147.5 150.0 152.5 155.0 157.5 160.0 162.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 5 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,166,856.3 E 2,481,504.8

ELEVATION TOP OF BORING: 258.8

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
83.8	175.0	X	12 11 17	28		Poorly-graded Sand (SP) Brown	100	30	33	66	1	0.401								
78.8	180.0	X	12 18 23	41		Fat Clay (CH) White	100	31												

162.5
165.0
167.5
170.0
172.5
175.0
177.5
180.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 147-BPL-11
LOCATION COORDINATES: N 13,166,552.8 E 2,481,107.2
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: G. Baker
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 3.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 75
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 251.4 8/3/11
15. DATE BORING: STARTED 8/3/11 COMPLETED 8/3/11
16. ELEVATION TOP OF BORING: 259.4
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	3 3 2	5		Lean Clay (CL) Brown, medium	100	1							9.9					
		☒	1 1 2	3		Lean Clay (CL) Brown, soft	100	2					25	10	17.5					
253.9	5.5																			
		☒	2 2 2	4		Clayey Sand (SC) Brown & Gray, Fine	100	3			17				21.0					
		☒	3 1 1	2		Clayey Sand (SC) Gray, Fine	100	4	0	58	42									
248.9	10.5																			
		☒	4 4 5	9		Poorly-graded Sand (SP) Gray, Fine	100	5	1	95	4	0.113								
		☒	5 6 7	13		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	6 7 7	14		Poorly-graded Sand (SP) Gray, Medium	100	7	1	98	1	0.187								
		☒	5 7 10	17		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	4 7 9	16		Poorly-graded Sand (SP) Gray, Medium	100	9	0	99	1	0.219								
		☒	5 9 10	19		Poorly-graded Sand (SP) Brown, Medium	100	10	0	100	0	0.219								
		☒	6 5 8	13		Poorly-graded Sand (SP) Brown, Fine	100	11												
		☒	5 7 12	19		Poorly-graded Sand (SP) Gray, Fine	100	12												
229.4	30.0																			

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 3.25" ID
2. HOLE NUMBER: 148-BPL-11
LOCATION COORDINATES: N 13,166,249.8 E 2,480,711.2
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 850
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
4. NAME OF DRILLER: J. Crawford
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 251.5 8/3/11
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
15. DATE BORING: STARTED 8/3/11 COMPLETED 8/3/11
6. THICKNESS OF OVERBURDEN:
16. ELEVATION TOP OF BORING: 260.0
7. DEPTH DRILLED INTO ROCK:
17. TOTAL CORE RECOVERY FOR BORING: N/A
8. TOTAL DEPTH OF BORING: 30.0
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	3 3 3	6		Silty Sand (SM) Dark Brown, Fine	100	1												
		☒	2 2 3	5		Silty Sand (SM) Brown, Fine	100	2	0	58	42									
254.5	5.5																			
		☒	3 3 3	6		Clayey Sand (SC) Brown, Fine	100	3			48				18.7					
252.0	8.0																			
		☒	1 2 2	4		Silty Sand (SM) Brown, Fine	100	4	0	72	28									
249.5	10.5																			
		☒	1 2 3	5		Poorly-graded Sand (SP) Brown, Fine	100	5	0	99	1	0.163								
247.0	13.0																			
		☒	1 1 2	3		Silty Sand (SM) Brown, Fine	100	6	0	87	13									
244.5	15.5																			
		☒	1 2 3	5		Poorly-graded Sand (SP) Brown, Fine	100	7	1	98	1	0.190								
		☒	11 11 12	23		Poorly-graded Sand (SP) Brown, Fine	100	8												
		☒	14 14 14	28		Poorly-graded Sand (SP) Brown, Fine	100	9												
		☒	6 7 7	14		Poorly-graded Sand (SP) Brown, Fine	100	10												
		☒	5 6 6	12		Poorly-graded Sand (SP) Gray, Fine	100	11												
		☒	6 5 6	11		Poorly-graded Sand (SP) Brown, Fine	100	12												
230.0	30.0																			

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 5 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 4.5" Wing Bit
2. HOLE NUMBER: 149-BPT-11
LOCATION COORDINATES: N 13,165,949.4 E 2,480,312.6
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 75
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
12. TOTAL SAMPLES: 32 DISTURBED: 32 UNDISTURBED: 0
4. NAME OF DRILLER: G. Baker
13. TOTAL NUMBER CORE BOXES: 0
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
14. ELEVATION GROUND WATER: 252.4 2/4/11
15. DATE BORING: STARTED 2/4/11 COMPLETED 2/11/11
6. THICKNESS OF OVERBURDEN:
16. ELEVATION TOP OF BORING: 259.9
7. DEPTH DRILLED INTO ROCK:
17. TOTAL CORE RECOVERY FOR BORING: N/A
8. TOTAL DEPTH OF BORING: 190.0
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
			4 5 6	11		Silty Sand (SM) Brown, Fine	100	1			36									
256.9	3.0																			
			2 4 4	8		Poorly-graded Sand with Silt (SP-SM) Red & Brown, Fine	100	2	1	89	10									
			1 2 1	3		Poorly-graded Sand with Silt (SP-SM) Brown, Fine	100	3	0	91	9	0.077								
251.9	8.0																			
			1 3 6	9		Poorly-graded Sand (SP) Brown, Fine	100	4	0	98	2	0.152								
			5 5 5	10		Poorly-graded Sand (SP) Brown, Fine	100	5	0	99	1	0.165								
			5 7 7	14		Poorly-graded Sand (SP) Brown, Fine	100	6	1	98	1	0.180								
			3 5 7	12		Poorly-graded Sand (SP) Brown, Fine	100	7	1	98	1	0.162								
			4 5 6	11		Poorly-graded Sand (SP) Brown, Fine	100	8												
			3 5 8	13		Poorly-graded Sand (SP) Brown, Fine	100	9	0	99	1	0.173								
			4 5 9	14		Poorly-graded Sand (SP) Brown & Gray, Fine	100	10	0	99	1	0.188								
			4 8 9	17		Poorly-graded Sand (SP) Gray, Fine	100	11	0	97	3	0.102								
			4 8 9	17		Poorly-graded Sand (SP) Gray, Fine	100	12												
			4 7 9	16		Poorly-graded Sand (SP) Gray, Medium	100	13												
			6 8 9	17		Poorly-graded Sand (SP) Gray, Medium	100	14	2	97	1	0.280								

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,165,949.4 E 2,480,312.6

ELEVATION TOP OF BORING: 259.9

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	4 7 10	17		Poorly-graded Sand (SP) Gray, Medium	100	15	0	99	1	0.253								
		X	5 7 8	15		Poorly-graded Sand (SP) Gray, Medium	100	16	4	95	1	0.199								
		X	5 9 10	19		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	17												
		X	10 20 22	42		Poorly-graded Sand (SP) Gray, Fine	100	18												
		X	5 7 10	17		Poorly-graded Sand (SP) Gray, Fine	100	19	2	96	2	0.162								
		X	5 10 12	22		Poorly-graded Sand (SP) Gray, Medium	100	20	3	96	1	0.330								

35.0 37.5 40.0 42.5 45.0 47.5 50.0 52.5 55.0 57.5 60.0 62.5 65.0 67.5 70.0 72.5 75.0 77.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 3 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM | HORIZONTAL | VERTICAL

LOCATION COORDINATES: N 13,165,949.4 E 2,480,312.6

ELEVATION TOP OF BORING: 259.9

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	5 10 14	24		Poorly-graded Sand (SP) Gray, Fine	100	21	0	98	2	0.118								
		X	5 9 16	25		Poorly-graded Sand (SP) Gray, Medium	100	22												
		X	5 11 14	25		Poorly-graded Sand (SP) Gray, Fine	100	23												
		X	7 12 14	26		Poorly-graded Sand (SP) Brown & Gray, Fine	100	24	5	93	2	0.167								
		X	19 33 35	68		Poorly-graded Sand (SP) Brown & Gray, Fine	100	25	0	97	3	0.154								

77.5 80.0 82.5 85.0 87.5 90.0 92.5 95.0 97.5 100.0 102.5 105.0 107.5 110.0 112.5 115.0 117.5 120.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 4 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,165,949.4 E 2,480,312.6

ELEVATION TOP OF BORING: 259.9

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	7 17 17	34		Poorly-graded Sand (SP) Gray, Medium	100	26	18	81	2	0.279								
		X	17 38 50	88		Poorly-graded Sand (SP) Brown	100	27	37	59	4	0.191								
		X	20 17 17	34		Poorly-graded Sand (SP) Gray, Medium	100	28	36	61	3	0.170								
		X	13 28 30	58		Poorly-graded Sand (SP) Brown, Medium	100	29	22	75	4	0.209								

120.0 122.5 125.0 127.5 130.0 132.5 135.0 137.5 140.0 142.5 145.0 147.5 150.0 152.5 155.0 157.5 160.0 162.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 5 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,165,949.4 E 2,480,312.6

ELEVATION TOP OF BORING: 259.9

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
84.9	175.0	X	17 12 14	26		Poorly-graded Sand (SP) Brown	100	30	39	58	3	0.206								
74.9	185.0	X	9 10 10	20		Silty Sand (SM) Brown, Fine	100	31	26	34	40									
69.9	190.0	X	7 9 11	20		Fat Clay (CH) Gray, very stiff, Silt Strata or Lenses, Lignite Fragments	100	32												

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)	INSTALLATION: Memphis District (CEMVM)	SHEET 1 OF 1 SHEETS	
1. PROJECT: Below Piggott - West Bank SFB Seepage Study	9. COORDINATE SYSTEM	HORIZONTAL	VERTICAL
	10. SIZE AND TYPE OF BIT: 3.25" ID		
2. HOLE NUMBER: 150-BPL-11 — LOCATION COORDINATES: N 13,165,662.3 E 2,479,912.1	11. MANUFACTURER'S DESIGNATION OF DRILL: CME 850		
3. DRILLING AGENCY: Tri-State Testing Services, Inc.	12. TOTAL SAMPLES: 12	DISTURBED: 12	UNDISTURBED: 0
4. NAME OF DRILLER: J. Crawford	13. TOTAL NUMBER CORE BOXES: 0		
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED — DEG FROM VERTICAL: --- — BEARING:	14. ELEVATION GROUND WATER: 243.1 8/3/11		
	15. DATE BORING — STARTED: 8/3/11 — COMPLETED: 8/3/11		
6. THICKNESS OF OVERBURDEN	16. ELEVATION TOP OF BORING: 259.1		
7. DEPTH DRILLED INTO ROCK	17. TOTAL CORE RECOVERY FOR BORING: N/A		
8. TOTAL DEPTH OF BORING: 30.0	18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor		

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	2 2 2	4		Silty Sand (SM) Brown, Oxidized, Fine	100	1												
		☒	2 3 3	6		Silty Sand (SM) Brown, Oxidized, Fine	100	2	0	69	31									
253.6	5.5																			
		☒	3 4 4	8		Poorly-graded Sand with Silt (SP-SM) Brown, Fine	100	3	1	88	11									
251.1	8.0																			
		☒	2 3 1	4		Silt (ML) Sandy, Brown, soft	100	4	0	47	53									
248.6	10.5																			
		☒	1 1 1	2		Silty Sand (SM) Gray, Fine	100	5												
		☒	1 1 1	2		Silty Sand (SM) Gray, Fine	100	6	0	75	25									
243.6	15.5																			
		☒	1 2 1	3		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	7	0	92	8	0.078								
241.1	18.0																			
		☒	2 2 1	3		Poorly-graded Sand (SP) Gray, Medium	100	8												
		☒	1 2 1	3		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	2 2 3	5		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	3 4 5	9		Poorly-graded Sand (SP) Gray, Fine, Organic Matter	100	11												
		☒	7 10 11	21		Poorly-graded Sand (SP) Gray, Fine	100	12												
229.1	30.0																			

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 151-BPL-11
LOCATION COORDINATES: N 13,165,399.6 E 2,479,488.8
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: J. Crawford
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 3.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 850
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 248.1 8/3/11
15. DATE BORING: STARTED 8/3/11 COMPLETED 8/3/11
16. ELEVATION TOP OF BORING: 259.1
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
256.1	3.0	☒	2 2 3	5		Silty Sand (SM) Gray, Fine	100	1												
253.6	5.5	☒	2 2 2	4		Clayey Sand (SC) Gray, Oxidized, Fine	100	2			38				14.0					
251.1	8.0	☒	2 3 2	5		Silty Sand (SM) Brown, Oxidized, Fine	100	3	0	79	21									
248.6	10.5	☒	2 4 5	9		Poorly-graded Sand (SP) Brown, Fine	100	4	0	98	2	0.170								
246.1	13.0	☒	2 3 4	7		Silty Sand (SM) Brown, Fine	100	5	0	83	17									
		☒	2 3 3	6		Poorly-graded Sand (SP) Brown, Medium	100	6	0	98	1	0.175								
		☒	2 4 6	10		Poorly-graded Sand (SP) Brown, Fine	100	7	0	98	1	0.163								
		☒	7 7 10	17		Poorly-graded Sand (SP) Brown, Fine	100	8												
		☒	6 9 13	22		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	4 7 7	14		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	3 6 7	13		Poorly-graded Sand (SP) Gray, Fine	100	11												
229.1	30.0	☒	10 12 14	26		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 5 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 4.5" Wing Bit
2. HOLE NUMBER: 152-BPT-11
LOCATION COORDINATES: N 13,165,134.7 E 2,479,063.8
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 75
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
12. TOTAL SAMPLES: 31 DISTURBED: 31 UNDISTURBED: 0
4. NAME OF DRILLER: G. Baker
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 251.6 2/15/11
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
15. DATE BORING: STARTED 2/14/11 COMPLETED 2/17/11
6. THICKNESS OF OVERBURDEN:
16. ELEVATION TOP OF BORING: 258.6
7. DEPTH DRILLED INTO ROCK:
17. TOTAL CORE RECOVERY FOR BORING: N/A
8. TOTAL DEPTH OF BORING: 180.0
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
			2 3 4	7		Lean Clay (CL) Brown & Gray, medium, Oxidized	100	1			39				16.5					
255.6	3.0																			
			3 4 5	9		Poorly-graded Sand with Clay (SP-SC) Brown & Gray, Fine	100	2	0	95	5	0.126								
253.1	5.5																			
			2 3 4	7		Poorly-graded Sand (SP) Brown & Gray, Fine	100	3	0	99	1	0.158								
			2 2 2	4		Poorly-graded Sand (SP) Brown & Gray, Fine	100	4	0	99	1	0.155								
			3 5 5	10		Poorly-graded Sand (SP) Gray, Fine	100	5	0	99	1	0.159								
			1 3 6	9		Poorly-graded Sand (SP) Gray, Fine	100	6	0	99	1	0.162								
			2 3 4	7		Poorly-graded Sand (SP) Gray, Fine	100	7	0	98	2	0.102								
			4 4 5	9		Poorly-graded Sand (SP) Gray, Fine	100	8												
			3 4 5	9		Poorly-graded Sand (SP) Gray, Fine	100	9												
			3 3 5	8		Poorly-graded Sand (SP) Gray, Fine	100	10	0	99	1	0.156								
			3 7 9	16		Poorly-graded Sand (SP) Gray, Fine	100	11	0	99	1	0.170								
			6 9 9	18		Poorly-graded Sand (SP) Gray, Fine	100	12	2	97	1	0.185								
227.1	31.5		6 1 1	2		Poorly-graded Sand (SP) Brown, Medium	100	13												
224.6	34.0		1 1 2	3		Fat Clay (CH) Gray, soft	100	14												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,165,134.7 E 2,479,063.8

ELEVATION TOP OF BORING: 258.6

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	5 7 10	17		Poorly-graded Sand (SP) Gray, Fine	100	15	1	98	1	0.182								
		X	5 8 10	18		Poorly-graded Sand (SP) Gray, Fine	100	16	0	99	1	0.160								
		X	5 8 8	16		Poorly-graded Sand (SP) Gray, Medium	100	17	0	99	1	0.310								
		X	4 8 10	18		Poorly-graded Sand (SP) Gray, Fine	100	18												
		X	4 9 9	18		Poorly-graded Sand (SP) Gray, Medium	100	19												
		X	3 6 6	12		Poorly-graded Sand (SP) Gray, Medium	100	20	0	99	1	0.284								

35.0 37.5 40.0 42.5 45.0 47.5 50.0 52.5 55.0 57.5 60.0 62.5 65.0 67.5 70.0 72.5 75.0 77.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 3 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,165,134.7 E 2,479,063.8

ELEVATION TOP OF BORING: 258.6

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	2 4 7	11		Poorly-graded Sand (SP) Gray & Brown, Medium	100	21	6	94	1	0.338								
		X	8 8 13	21		Poorly-graded Sand (SP) Gray, Medium	100	22	9	90	2	0.185								
		X	3 7 9	16		Poorly-graded Sand (SP) Gray, Medium	100	23	5	94	1	0.224								
		X	13 20 25	45		Poorly-graded Sand (SP) Brown, Fine	100	24	1	97	2	0.190								
		X	8 15 12	27		Poorly-graded Sand (SP) Gray, Medium	100	25												

77.5 80.0 82.5 85.0 87.5 90.0 92.5 95.0 97.5 100.0 102.5 105.0 107.5 110.0 112.5 115.0 117.5 120.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 4 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM | HORIZONTAL | VERTICAL

LOCATION COORDINATES: N 13,165,134.7 E 2,479,063.8

ELEVATION TOP OF BORING: 258.6

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	20 17 27	44		Poorly-graded Sand (SP) Gray	100	26	48	48	4	0.172								
		X	29 22 12	34		Poorly-graded Sand (SP) Brown	100	27	48	48	4	0.238								
		X	10 19 15	34		Poorly-graded Sand (SP) Brown, Fine	100	28	11	86	3	0.193								
		X	17 14 13	27		Poorly-graded Sand (SP) Brown	100	29	48	48	4	0.179								

120.0 122.5 125.0 127.5 130.0 132.5 135.0 137.5 140.0 142.5 145.0 147.5 150.0 152.5 155.0 157.5 160.0 162.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 5 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,165,134.7 E 2,479,063.8

ELEVATION TOP OF BORING: 258.6

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
93.6	165.0																			
		X	12 18 16	34		Poorly-graded Gravel (GP) Brown, Fine	100	30	58	40	2	0.332								
83.6	175.0																			
		X	4 9 10	19		Fat Clay (CH) Gray, very stiff	100	31												
78.6	180.0																			

162.5 165.0 167.5 170.0 172.5 175.0 177.5 180.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 153-BPL-11
LOCATION COORDINATES: N 13,164,873.1 E 2,478,639.0
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: J. Crawford
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 3.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 850
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 247.6 8/3/11
15. DATE BORING: STARTED 8/3/11 COMPLETED 8/3/11
16. ELEVATION TOP OF BORING: 258.6
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	2 3 3	6		Poorly-graded Sand with Silt (SP-SM) Brown, Oxidized, Fine	100	1												
255.6	3.0																			
		☒	2 4 4	8		Silty Sand (SM) Brown, Fine	100	2	0	78	22									
		☒	3 4 5	9		Silty Sand (SM) Brown, Fine	100	3	0	68	32									
		☒	2 3 2	5		Silty Sand (SM) Brown, Fine	100	4	0	72	28									
248.1	10.5																			
		☒	2 2 1	3		Poorly-graded Sand (SP) Brown, Medium	100	5	0	99	1	0.221								
		☒	1 1 1	2		Poorly-graded Sand (SP) Brown, Fine	100	6	0	97	2	0.116								
		☒	2 1 1	2		Poorly-graded Sand (SP) Brown, Fine	100	7												
		☒	2 3 3	6		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	2 2 3	5		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	10 10 9	19		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	7 7 9	16		Poorly-graded Sand (SP) Gray, Fine	100	11												
228.6	30.0	☒	10 11 11	22		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION	Mississippi Valley Division (MVD)
INSTALLATION	Memphis District (CEMVM)
SHEET	1 OF 1 SHEETS
1. PROJECT	Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER	154-BPL-11
LOCATION COORDINATES	N 13,164,602.7 E 2,478,216.4
3. DRILLING AGENCY	Tri-State Testing Services, Inc.
4. NAME OF DRILLER	J. Crawford
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG FROM VERTICAL	---
BEARING	
6. THICKNESS OF OVERBURDEN	
7. DEPTH DRILLED INTO ROCK	
8. TOTAL DEPTH OF BORING	30.0
9. COORDINATE SYSTEM	HORIZONTAL / VERTICAL
10. SIZE AND TYPE OF BIT:	3.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL	CME 850
12. TOTAL SAMPLES	12 (DISTURBED 12 / UNDISTURBED 0)
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	244.6 8/4/11
15. DATE BORING	STARTED 8/4/11 COMPLETED 8/4/11
16. ELEVATION TOP OF BORING	258.1
17. TOTAL CORE RECOVERY FOR BORING	N/A
18. SIGNATURE AND TITLE OF INSPECTOR	Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	2 3 2	5		Lean Clay (CL) Gray, medium, Oxidized	100	1							14.7					
		☒	1 2 3	5		Lean Clay (CL) Gray, medium, Oxidized	100	2					25	11	16.8					
252.6	5.5																			
		☒	2 2 2	4		Clayey Sand (SC) Gray & Brown, Fine	100	3			47				17.4					
250.1	8.0																			
		☒	2 3 4	7		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	4	0	94	6	0.101								
247.6	10.5																			
		☒	3 3 3	6		Poorly-graded Sand (SP) Brown, Fine	100	5	0	96	4	0.138								
		☒	2 2 3	5		Poorly-graded Sand (SP) Gray, Fine	100	6	2	96	2	0.162								
		☒	2 3 4	7		Poorly-graded Sand (SP) Gray, Fine	100	7	0	99	1	0.168								
		☒	1 1 2	3		Poorly-graded Sand (SP) Gray, Fine	100	8	0	100	0	0.163								
		☒	2 1 1	2		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	3 4 5	9		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	4 4 5	9		Poorly-graded Sand (SP) Gray, Fine	100	11												
228.1	30.0	☒	2 4 5	9		Poorly-graded Sand (SP) Brown, Fine	100	12												

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)

INSTALLATION: Memphis District (CEMVM)

SHEET 1 OF 5 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study

9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

10. SIZE AND TYPE OF BIT: 4.5" Wing Bit

2. HOLE NUMBER: 155-BPT-11

LOCATION COORDINATES: N 13,164,342.9 E 2,477,790.0

11. MANUFACTURER'S DESIGNATION OF DRILL: CME 75

3. DRILLING AGENCY: Tri-State Testing Services, Inc.

12. TOTAL SAMPLES: 31 DISTURBED: 31 UNDISTURBED: 0

4. NAME OF DRILLER: G. Baker

13. TOTAL NUMBER CORE BOXES: 0

5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:

14. ELEVATION GROUND WATER: 251.8 2/18/11

15. DATE BORING: STARTED 2/18/11 COMPLETED 2/23/11

6. THICKNESS OF OVERBURDEN:

16. ELEVATION TOP OF BORING: 258.3

7. DEPTH DRILLED INTO ROCK:

17. TOTAL CORE RECOVERY FOR BORING: N/A

8. TOTAL DEPTH OF BORING: 180.0

18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	2 3 4	7		Silt (ML) Brown & Gray, medium, Oxidized	100	1							14.2					
		☒	4 4 4	8		Silt (ML) Sandy, Gray, medium, Fine	100	2			58				20.7					
252.8	5.5																			
		☒	2 3 4	7		Poorly-graded Sand (SP) Brown, Fine	100	3	0	97	3	0.157								
		☒	5 6 6	12		Poorly-graded Sand (SP) Brown, Fine	100	4	0	99	1	0.175								
		☒	3 4 6	10		Poorly-graded Sand (SP) Gray, Fine	100	5	0	97	3	0.098								
		☒	4 5 8	13		Poorly-graded Sand (SP) Gray, Fine	100	6	1	97	2	0.147								
		☒	3 1 1	2		Poorly-graded Sand (SP) Gray, Fine	100	7	1	98	1	0.156								
		☒	1 2 2	4		Poorly-graded Sand (SP) Gray, Fine	100	8	0	99	1	0.175								
		☒	1 3 4	7		Poorly-graded Sand (SP) Gray, Fine	100	9	0	99	1	0.182								
		☒	2 4 5	9		Poorly-graded Sand (SP) Gray, Fine	100	10	0	99	1	0.169								
		☒	3 4 6	10		Poorly-graded Sand (SP) Gray, Fine	100	11												
		☒	2 4 6	10		Poorly-graded Sand (SP) Gray, Fine	100	12												
		☒	3 6 6	12		Poorly-graded Sand (SP) Gray, Medium	100	13	1	98	1	0.188								
		☒	3 6 9	15		Poorly-graded Sand (SP) Gray, Fine	100	14	0	99	1	0.155								

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,164,342.9 E 2,477,790.0

ELEVATION TOP OF BORING: 258.3

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	3 4 6	10		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	15												
		X	5 12 13	25		Poorly-graded Sand (SP) Brown, Fine	100	16												
		X	6 13 13	26		Poorly-graded Sand (SP) Gray, Medium	100	17	2	96	2	0.292								
		X	4 10 10	20		Poorly-graded Sand (SP) Gray, Medium	100	18	2	96	1	0.275								
		X	4 12 12	24		Poorly-graded Sand (SP) Gray, Medium	100	19	2	97	2	0.215								
		X	3 10 12	22		Poorly-graded Sand (SP) Gray, Medium	100	20	3	96	1	0.338								

35.0 37.5 40.0 42.5 45.0 47.5 50.0 52.5 55.0 57.5 60.0 62.5 65.0 67.5 70.0 72.5 75.0 77.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 3 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,164,342.9 E 2,477,790.0

ELEVATION TOP OF BORING: 258.3

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	8 10 21	31		Poorly-graded Sand (SP) Gray, Fine	100	21												
		X	6 9 9	18		Poorly-graded Sand (SP) Gray, Medium	100	22												
		X	4 15 16	31		Poorly-graded Sand (SP) Gray, Medium	100	23	15	83	2	0.252								
		X	4 9 16	25		Poorly-graded Sand (SP) Gray, Medium	100	24	5	93	2	0.251								
		X	5 48 49	97		Poorly-graded Sand (SP) Brown & Gray	100	25	41	55	4	0.169								

77.5 80.0 82.5 85.0 87.5 90.0 92.5 95.0 97.5 100.0 102.5 105.0 107.5 110.0 112.5 115.0 117.5 120.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 4 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,164,342.9 E 2,477,790.0

ELEVATION TOP OF BORING: 258.3

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	15 30 50	80		Poorly-graded Sand (SP) Brown & Gray, Medium	100	26	25	71	4	0.187								
		X	15 6 5	11		Poorly-graded Sand (SP) Brown & Gray	100	27	33	66	2	0.335								
113.3	145.0																			
		X	10 14 20	34		Poorly-graded Sand with Silt (SP-SM) Brown, Fine	100	28	2	91	6	0.118								
103.3	155.0																			
		X	13 35 28	63		Poorly-graded Sand (SP) Brown, Medium	100	29	29	66	4	0.162								

120.0 122.5 125.0 127.5 130.0 132.5 135.0 137.5 140.0 142.5 145.0 147.5 150.0 152.5 155.0 157.5 160.0 162.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 5 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,164,342.9 E 2,477,790.0

ELEVATION TOP OF BORING: 258.3

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
83.3	175.0	X	7 7 8	15		Poorly-graded Sand (SP) Brown, Medium	100	30												
78.3	180.0	X	4 8 8	16		Silt (ML) Gray, very stiff, Fine	100	31												

162.5 165.0 167.5 170.0 172.5 175.0 177.5 180.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)	INSTALLATION: Memphis District (CEMVM)	SHEET 1 OF 1 SHEETS	
1. PROJECT: Below Piggott - West Bank SFB Seepage Study	9. COORDINATE SYSTEM:	HORIZONTAL:	VERTICAL:
	10. SIZE AND TYPE OF BIT: 3.25" ID		
2. HOLE NUMBER: 156-BPL-11	LOCATION COORDINATES: N 13,164,075.4 E 2,477,364.2	11. MANUFACTURER'S DESIGNATION OF DRILL: CME 850	
3. DRILLING AGENCY: Tri-State Testing Services, Inc.		12. TOTAL SAMPLES: 12	DISTURBED: 12 / UNDISTURBED: 0
4. NAME OF DRILLER: J. Crawford		13. TOTAL NUMBER CORE BOXES: 0	
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED	DEG FROM VERTICAL: --- / BEARING:	14. ELEVATION GROUND WATER: 246.3	8/4/11
		15. DATE BORING: STARTED 8/4/11	COMPLETED 8/4/11
6. THICKNESS OF OVERBURDEN		16. ELEVATION TOP OF BORING: 257.3	
7. DEPTH DRILLED INTO ROCK		17. TOTAL CORE RECOVERY FOR BORING: N/A	
8. TOTAL DEPTH OF BORING: 30.0		18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor	

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	1 2 2	4		Lean Clay (CL) Brown & Gray, medium, Oxidized	100	1							12.3					
		☒	1 2 2	4		Lean Clay (CL) Gray, medium, Oxidized	100	2					37	21	27.4					
251.8	5.5	☒	2 3 2	5		Lean Clay (CL) Sandy, Gray, medium, Oxidized	100	3			52				25.1					
249.3	8.0	☒	1 1 1	2		Poorly-graded Sand with Clay (SP-SC) Gray, Fine	100	4	0	88	12									
		☒	2 1 1	2		Poorly-graded Sand with Clay (SP-SC) Gray, Fine	100	5	0	91	9	0.076								
244.3	13.0	☒	1 2 2	4		Poorly-graded Sand (SP) Gray, Fine	100	6	0	97	3	0.092								
241.8	15.5	☒	2 1 3	4		Silty Sand (SM) Gray, Fine	100	7	0	79	21									
239.3	18.0	☒	4 5 6	11		Poorly-graded Sand (SP) Gray, Fine	100	8	0	100	0	0.177								
		☒	5 5 7	12		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	5 6 7	13		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	6 6 6	12		Poorly-graded Sand (SP) Gray, Fine	100	11												
227.3	30.0	☒	12 8 8	16		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 157-BPL-11
LOCATION COORDINATES: N 13,163,786.8 E 2,476,949.7
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: J. Crawford
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 3.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 850
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 248.6 8/4/11
15. DATE BORING: STARTED 8/4/11 COMPLETED 8/4/11
16. ELEVATION TOP OF BORING: 257.1
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	1 3 3	6		Lean Clay (CL) Gray, medium, Oxidized	100	1							15.7					
254.1	3.0																			
		☒	1 2 2	4		Clayey Sand (SC) Gray, Oxidized	100	2			22				12.1					
		☒	2 3 3	6		Clayey Sand (SC) Brown, Fine	100	3	0	85	15									
		☒	2 2 2	4		Clayey Sand (SC) Gray	100	4			26				23.8					
246.6	10.5																			
		☒	2 3 3	6		Poorly-graded Sand (SP) Gray, Fine	100	5	0	96	4	0.151								
		☒	2 2 2	4		Poorly-graded Sand (SP) Gray, Fine	100	6	1	99	0	0.189								
		☒	2 3 3	6		Poorly-graded Sand (SP) Gray, Fine	100	7	0	99	1	0.163								
		☒	2 3 4	7		Poorly-graded Sand (SP) Gray, Fine	100	8	1	99	0	0.176								
		☒	3 3 3	6		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	5 6 6	12		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	7 8 9	17		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	11												
227.1	30.0	☒	8 22 23	45		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)

INSTALLATION: Memphis District (CEMVM)

SHEET 1 OF 5 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study

9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

10. SIZE AND TYPE OF BIT: 4.5" Wing Bit

2. HOLE NUMBER: 158-BPT-11

LOCATION COORDINATES: N 13,163,494.0 E 2,476,546.4

11. MANUFACTURER'S DESIGNATION OF DRILL: CME 55

3. DRILLING AGENCY: Tri-State Testing Services, Inc.

12. TOTAL SAMPLES: 29 DISTURBED: 29 UNDISTURBED: 0

4. NAME OF DRILLER: C. Herron

13. TOTAL NUMBER CORE BOXES: 0

5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:

14. ELEVATION GROUND WATER: 250.4 1/26/11

15. DATE BORING: STARTED 1/26/11 COMPLETED 2/11/11

6. THICKNESS OF OVERBURDEN:

16. ELEVATION TOP OF BORING: 256.4

7. DEPTH DRILLED INTO ROCK:

17. TOTAL CORE RECOVERY FOR BORING: N/A

8. TOTAL DEPTH OF BORING: 180.0

18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
			1 2 1	3		Lean Clay (CL) Brown & Gray, soft	100	1					47	28	23.7					
253.4	3.0																			
			2 2 2	4		Lean Clay (CL) Sandy, Brown & Gray, soft, Oxidized	100	2			60				39.2					
250.9	5.5																			
			6 6 7	13		Poorly-graded Sand (SP) Brown, Fine	100	3	3	95	3	0.157								
			4 5 8	13		Poorly-graded Sand (SP) Gray, Fine	100	4	5	93	2	0.157								
			4 5 5	10		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	5	0	98	2	0.154								
			8 12 14	26		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	6	0	96	4	0.153								
			9 11 11	22		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	7	0	98	2	0.161								
			6 11 12	23		Poorly-graded Sand (SP) Gray, Medium	100	8	0	96	3	0.169								
			8 12 15	27		Poorly-graded Sand (SP) Gray & Brown, Medium	100	9	2	97	1	0.202								
			6 8 9	17		Poorly-graded Sand (SP) Gray, Fine	100	10												
			7 8 7	15		Poorly-graded Sand (SP) Brown & Gray, Fine	100	11	1	97	1	0.211								
			10 10 10	20		Poorly-graded Sand (SP) Brown & Gray, Fine	100	12	0	97	3	0.177								
			9 12 14	26		Poorly-graded Sand (SP) Gray, Medium	100	13	4	93	2	0.233								

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,163,494.0 E 2,476,546.4

ELEVATION TOP OF BORING: 256.4

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	7 9 10	19		Poorly-graded Sand (SP) Gray, Medium	100	14	2	96	2	0.201								
		X	6 9 11	20		Poorly-graded Sand (SP) Gray, Medium	100	15	1	98	1	0.271								
		X	8 9 8	17		Poorly-graded Sand (SP) Gray, Medium	100	16	8	91	1	0.245								
		X	7 7 9	16		Poorly-graded Sand (SP) Gray & Brown, Medium	100	17	0	99	1	0.242								
		X	9 10 9	19		Poorly-graded Sand (SP) Gray & Brown, Fine	100	18	4	95	1	0.210								

35.0
37.5
40.0
42.5
45.0
47.5
50.0
52.5
55.0
57.5
60.0
62.5
65.0
67.5
70.0
72.5
75.0
77.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 3 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,163,494.0 E 2,476,546.4

ELEVATION TOP OF BORING: 256.4

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	11 11 13	24		Poorly-graded Sand (SP) Gray & Brown, Fine	100	19	3	95	1	0.198								
		X	22 30 40	70		Poorly-graded Sand (SP) Gray, Fine	100	20												
		X	14 13 22	35		Poorly-graded Sand (SP) Gray, Fine	100	21	0	99	1	0.153								
		X	8 11 11	22		Poorly-graded Sand (SP) Brown, Fine	100	22	3	95	2	0.181								
		X	7 9 12	21		Poorly-graded Sand (SP) Brown, Fine	100	23	6	92	2	0.184								

77.5 80.0 82.5 85.0 87.5 90.0 92.5 95.0 97.5 100.0 102.5 105.0 107.5 110.0 112.5 115.0 117.5 120.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 4 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,163,494.0 E 2,476,546.4

ELEVATION TOP OF BORING: 256.4

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
131.4	125.0																			
		X	4 8 9	17		Lean Clay (CL) Gray, very stiff	100	24												
121.4	135.0																			
		X	11 14 17	31		Clayey Sand (SC) Gray, Fine	100	25	0	71	29									
111.4	145.0																			
		X	19 22 28	50		Poorly-graded Sand (SP) Gray & Brown, Medium	100	26	26	73	1	0.336								
		X	18 24 31	55		Poorly-graded Sand (SP) Gray & Brown, Medium	100	27	32	67	1	0.256								

120.0 122.5 125.0 127.5 130.0 132.5 135.0 137.5 140.0 142.5 145.0 147.5 150.0 152.5 155.0 157.5 160.0 162.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 5 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,163,494.0 E 2,476,546.4

ELEVATION TOP OF BORING: 256.4

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
81.4	175.0	X	19 22 31	53		Poorly-graded Sand (SP) Gray, Medium	100	28	29	69	1	0.214								
76.4	180.0	X	6 8 12	20		Lean Clay (CL) with Sand, Gray, very stiff	100	29	0	18	82									

162.5
165.0
167.5
170.0
172.5
175.0
177.5
180.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 159-BPL-11
LOCATION COORDINATES: N 13,163,201.0 E 2,476,141.0
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: J. Crawford
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 3.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 850
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 247.7 8/4/11
15. DATE BORING: STARTED 8/4/11 COMPLETED 8/4/11
16. ELEVATION TOP OF BORING: 256.2
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	1 2 2	4		Fat Clay (CH) Gray, soft, Oxidized	100	1							29.1					
		☒	2 2 2	4		Fat Clay (CH) Gray, soft, Oxidized	100	2					60	39	27.5					
250.7	5.5																			
		☒	3 3 3	6		Lean Clay (CL) Dark Gray, medium, Oxidized	100	3					45	24	31.4					
248.2	8.0																			
		☒	2 3 3	6		Poorly-graded Sand (SP) Gray, Fine	100	4	1	98	1	0.167								
		☒	2 3 4	7		Poorly-graded Sand (SP) Gray, Fine	100	5	0	99	1	0.160								
		☒	7 8 10	18		Poorly-graded Sand (SP) Gray, Fine	100	6	1	99	0	0.216								
		☒	9 10 10	20		Poorly-graded Sand (SP) Gray, Fine	100	7	0	99	1	0.209								
		☒	5 9 12	21		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	8	0	98	2	0.110								
		☒	7 9 10	19		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	9												
		☒	5 9 10	19		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	7 8 10	18		Poorly-graded Sand (SP) Gray, Fine	100	11												
226.2	30.0	☒	5 9 12	21		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION	Mississippi Valley Division (MVD)
INSTALLATION	Memphis District (CEMVM)
SHEET	1 OF 1 SHEETS
1. PROJECT	Below Piggott - West Bank SFB Seepage Study
9. COORDINATE SYSTEM	HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT	3.25" ID
2. HOLE NUMBER	160-BPL-11
LOCATION COORDINATES	N 13,162,907.3 E 2,475,736.0
11. MANUFACTURER'S DESIGNATION OF DRILL	CME 75
3. DRILLING AGENCY	Tri-State Testing Services, Inc.
12. TOTAL SAMPLES	12 (DISTURBED 12, UNDISTURBED 0)
4. NAME OF DRILLER	G. Baker
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	247.8 8/4/11
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
15. DATE BORING	STARTED 8/4/11 COMPLETED 8/4/11
6. THICKNESS OF OVERBURDEN	
16. ELEVATION TOP OF BORING	256.3
7. DEPTH DRILLED INTO ROCK	
17. TOTAL CORE RECOVERY FOR BORING	N/A
8. TOTAL DEPTH OF BORING	30.0
18. SIGNATURE AND TITLE OF INSPECTOR	Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
253.3	3.0	☒	2 2 3	5		Fat Clay (CH) Gray, medium, Oxidized	100	1					50	24	14.5					
		☒	2 2 2	4		Poorly-graded Sand (SP) Brown, Fine	100	2			1									
		☒	2 2 3	5		Poorly-graded Sand (SP) Brown, Fine	100	3	0	99	1	0.156								
		☒	2 2 4	6		Poorly-graded Sand (SP) Gray, Fine	100	4												
		☒	3 3 4	7		Poorly-graded Sand (SP) Gray, Medium	100	5	0	98	1	0.181								
		☒	3 5 5	10		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	4 5 6	11		Poorly-graded Sand (SP) Gray, Medium	100	7	5	95	1	0.191								
		☒	2 3 6	9		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	3 5 7	12		Poorly-graded Sand (SP) Gray, Fine	100	9	0	98	2	0.164								
		☒	2 3 4	7		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	3 3 5	8		Poorly-graded Sand (SP) Gray, Fine	100	11												
226.3	30.0	☒	3 4 6	10		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)

INSTALLATION: Memphis District (CEMVM)

SHEET 1 OF 5 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study

9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

10. SIZE AND TYPE OF BIT: 4.5" Wing Bit

2. HOLE NUMBER: 161-BPT-11

LOCATION COORDINATES: N 13,162,616.5 E 2,475,330.3

11. MANUFACTURER'S DESIGNATION OF DRILL: CME 55

3. DRILLING AGENCY: Tri-State Testing Services, Inc.

12. TOTAL SAMPLES: 30 DISTURBED: 30 UNDISTURBED: 0

4. NAME OF DRILLER: C. Herron

13. TOTAL NUMBER CORE BOXES: 0

5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:

14. ELEVATION GROUND WATER: 251.0 2/18/11

15. DATE BORING: STARTED 2/18/11 COMPLETED 2/24/11

6. THICKNESS OF OVERBURDEN:

16. ELEVATION TOP OF BORING: 256.5

7. DEPTH DRILLED INTO ROCK:

17. TOTAL CORE RECOVERY FOR BORING: N/A

8. TOTAL DEPTH OF BORING: 170.0

18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
253.5	3.0	☒	1 1 1	2		Lean Clay (CL) Gray & Brown, soft	100	1							22.4					
251.0 ▼	5.5	☒	1 1 1	2		Clayey Sand (SC) Gray & Brown, Fine	100	2			31				23.4					
248.5	8.0	☒	3 5 6	11		Poorly-graded Sand (SP) Brown, Fine	100	3	0	98	2	0.156								
246.0	10.5	☒	3 3 4	7		Poorly-graded Sand with Silt (SP-SM) Brown, Fine	100	4	0	99	1	0.158								
		☒	2 3 4	7		Poorly-graded Sand (SP) Gray, Fine	100	5	0	98	2	0.153								
		☒	3 2 6	8		Poorly-graded Sand (SP) Gray, Fine	100	6	0	99	1	0.142								
		☒	3 3 5	8		Poorly-graded Sand (SP) Gray, Fine	100	7	0	97	3	0.149								
		☒	4 5 7	12		Poorly-graded Sand (SP) Gray, Medium	100	8	1	96	3	0.154								
		☒	8 9 12	21		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	7 8 11	19		Poorly-graded Sand (SP) Gray, Fine	100	10												
228.5	28.0	☒	9 12 16	28		Poorly-graded Sand (SP) Brown, Medium	100	11	11	86	2	0.238								
226.0	30.5	☒	6 8 12	20		Poorly-graded Sand with Silt (SP-SM) Brown, Medium	100	12	6	89	5	0.158								
		☒	11 14 11	25		Poorly-graded Sand (SP) Dark Gray, Fine	100	13												
		☒	6 8 11	19		Poorly-graded Sand (SP) Gray, Medium	100	14												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,162,616.5 E 2,475,330.3

ELEVATION TOP OF BORING: 256.5

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	7 7 12	19		Poorly-graded Sand (SP) Gray, Medium	100	15	4	94	2	0.192								
		X	4 8 10	18		Poorly-graded Sand (SP) Gray, Medium	100	16	2	97	1	0.312								
		X	12 13 14	27		Poorly-graded Sand (SP) Gray, Medium	100	17	3	96	2	0.263								
		X	7 10 10	20		Poorly-graded Sand (SP) Dark Gray, Medium	100	18	27	72	1	0.261								
		X	5 7 8	15		Poorly-graded Sand (SP) Gray, Medium	100	19												
		X	7 7 7	14		Poorly-graded Sand (SP) Gray, Medium	100	20	5	92	3	0.194								

35.0 37.5 40.0 42.5 45.0 47.5 50.0 52.5 55.0 57.5 60.0 62.5 65.0 67.5 70.0 72.5 75.0 77.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 3 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,162,616.5 E 2,475,330.3

ELEVATION TOP OF BORING: 256.5

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	7 8 11	19		Poorly-graded Sand (SP) Dark Gray, Medium	100	21	4	94	2	0.159								
		X	8 16 26	42		Poorly-graded Sand (SP) Brown, Medium	100	22	2	97	2	0.209								
		X	9 14 23	37		Poorly-graded Sand (SP) Brown, Medium	100	23	6	91	3	0.212								
		X	11 13 18	31		Poorly-graded Sand (SP) Brown, Medium	100	24	5	94	2	0.309								
		X	1 1 2	3		Poorly-graded Sand (SP) Brown, Medium	100	25	25	75	0	0.218								

77.5 80.0 82.5 85.0 87.5 90.0 92.5 95.0 97.5 100.0 102.5 105.0 107.5 110.0 112.5 115.0 117.5 120.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 4 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,162,616.5 E 2,475,330.3

ELEVATION TOP OF BORING: 256.5

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
131.5	125.0																			
		X	18 30 27	57		Poorly-graded Gravel (GP) Brown	100	26	78	22	0	2.470								
121.5	135.0																			
		X	26 32 31	63		Poorly-graded Sand with Silt (SP-SM) Brown, Medium	100	27	22	69	9	0.082								
111.5	145.0																			
		X	15 10 12	22		Poorly-graded Gravel (GP) Brown	100	28	60	39	1	0.365								
		X	13 15 19	34		Poorly-graded Gravel (GP) Brown	100	29	97	3	0	5.005								

120.0 122.5 125.0 127.5 130.0 132.5 135.0 137.5 140.0 142.5 145.0 147.5 150.0 152.5 155.0 157.5 160.0 162.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 5 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,162,616.5 E 2,475,330.3

ELEVATION TOP OF BORING: 256.5

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
91.5	165.0																			
86.5	170.0	X	12 12 13	25		Fat Clay (CH) Dark Gray, very stiff, Slickensides	100	30												

162.5
165.0
167.5
170.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)	INSTALLATION: Memphis District (CEMVM)	SHEET 1 OF 1 SHEETS	
1. PROJECT: Below Piggott - West Bank SFB Seepage Study	9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:		
	10. SIZE AND TYPE OF BIT: 3.25" ID		
2. HOLE NUMBER: 162-BPL-11 — LOCATION COORDINATES: N 13,162,322.2 E 2,474,924.2	11. MANUFACTURER'S DESIGNATION OF DRILL: CME 75		
3. DRILLING AGENCY: Tri-State Testing Services, Inc.	12. TOTAL SAMPLES: 12 — DISTURBED: 12 — UNDISTURBED: 0		
4. NAME OF DRILLER: G. Baker	13. TOTAL NUMBER CORE BOXES: 0		
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED — DEG FROM VERTICAL: --- — BEARING:	14. ELEVATION GROUND WATER: 247.3 8/4/11		
	15. DATE BORING — STARTED: 8/4/11 — COMPLETED: 8/4/11		
6. THICKNESS OF OVERBURDEN	16. ELEVATION TOP OF BORING: 256.3		
7. DEPTH DRILLED INTO ROCK	17. TOTAL CORE RECOVERY FOR BORING: N/A		
8. TOTAL DEPTH OF BORING: 30.0	18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor		

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
253.3	3.0	☒	1 2 2	4		Silt (ML) Gray & Brown, soft, Oxidized	100	1							15.4					
250.8	5.5	☒	2 2 4	6		Silty Clay (CL-ML) Brown, medium, Oxidized	100	2					22	4	16.4					
248.3	8.0	☒	2 3 4	7		Clayey Sand (SC) Brown, Oxidized, Fine	100	3			39				17.6					
		☒	2 2 3	5		Poorly-graded Sand (SP) Brown & Gray, Fine	100	4	0	98	2	0.111								
		☒	2 3 2	5		Poorly-graded Sand (SP) Gray, Fine	100	5	0	98	2	0.150								
		☒	1 2 2	4		Poorly-graded Sand (SP) Gray, Fine	100	6	0	98	2	0.158								
		☒	2 3 4	7		Poorly-graded Sand (SP) Brown & Gray, Fine	100	7												
		☒	2 3 5	8		Poorly-graded Sand (SP) Brown, Fine	100	8	0	99	1	0.159								
		☒	3 3 5	8		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	2 3 5	8		Poorly-graded Sand (SP) Gray, Fine	100	10	0	99	1	0.168								
		☒	3 3 4	7		Poorly-graded Sand (SP) Gray, Medium	100	11												
226.3	30.0	☒	3 4 4	8		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)

INSTALLATION: Memphis District (CEMVM)

SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study

9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

10. SIZE AND TYPE OF BIT: 3.25" ID

2. HOLE NUMBER: 163-BPL-11

LOCATION COORDINATES: N 13,162,006.5 E 2,474,523.2

11. MANUFACTURER'S DESIGNATION OF DRILL: CME 75

3. DRILLING AGENCY: Tri-State Testing Services, Inc.

12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0

4. NAME OF DRILLER: G. Baker

13. TOTAL NUMBER CORE BOXES: 0

14. ELEVATION GROUND WATER: 247.1 8/4/11

5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:

15. DATE BORING: STARTED 8/4/11 COMPLETED 8/4/11

6. THICKNESS OF OVERBURDEN:

16. ELEVATION TOP OF BORING: 256.1

7. DEPTH DRILLED INTO ROCK:

17. TOTAL CORE RECOVERY FOR BORING: N/A

8. TOTAL DEPTH OF BORING: 30.0

18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
253.1	3.0	☒	2 2 3	5		Silt (ML) Gray, medium	100	1					17	2	11.9					
250.6	5.5	☒	1 2 2	4		Clayey Sand (SC) Gray & Brown, Fine	100	2			28				15.0					
248.1	8.0	☒	2 2 2	4		Silty Sand (SM) Gray & Brown, Fine	100	3	0	82	18									
		☒	2 2 4	6		Poorly-graded Sand (SP) Gray, Fine	100	4	0	98	2	0.158								
		☒	2 3 4	7		Poorly-graded Sand (SP) Brown, Fine	100	5												
		☒	2 2 3	5		Poorly-graded Sand (SP) Gray, Fine	100	6	0	99	1	0.162								
		☒	3 4 4	8		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	2 3 5	8		Poorly-graded Sand (SP) Gray, Fine	100	8	0	99	1	0.156								
		☒	3 3 5	8		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	4 10 13	23		Poorly-graded Sand (SP) Gray, Fine	100	10	0	99	1	0.162								
		☒	5 9 11	20		Poorly-graded Sand (SP) Gray, Medium	100	11												
226.1	30.0	☒	5 7 10	17		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)

INSTALLATION: Memphis District (CEMVM)

SHEET 1 OF 4 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study

2. HOLE NUMBER: 164-BPT-11

LOCATION COORDINATES: N 13,161,679.3 E 2,474,147.7

3. DRILLING AGENCY: Tri-State Testing Services, Inc.

4. NAME OF DRILLER: G. Baker

5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:

6. THICKNESS OF OVERBURDEN:

7. DEPTH DRILLED INTO ROCK:

8. TOTAL DEPTH OF BORING: 160.0

9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

10. SIZE AND TYPE OF BIT: 4.5" Wing Bit

11. MANUFACTURER'S DESIGNATION OF DRILL: CME 75

12. TOTAL SAMPLES: 29 DISTURBED: 29 UNDISTURBED: 0

13. TOTAL NUMBER CORE BOXES: 0

14. ELEVATION GROUND WATER: 249.1 8/16/11

15. DATE BORING: STARTED 8/16/11 COMPLETED 8/18/11

16. ELEVATION TOP OF BORING: 256.1

17. TOTAL CORE RECOVERY FOR BORING: N/A

18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
253.1	3.0	☒	5 4 2	6		Silty Sand (SM) Brown, Fine	100	1			27									
250.6	5.5	☒	5 5 6	11		Poorly-graded Sand with Silt (SP-SM) Gray & Brown, Fine	100	2	2	89	9	0.079								
		☒	3 3 4	7		Poorly-graded Sand (SP) Brown, Fine	100	3	0	96	4	0.115								
		☒	3 5 6	11		Poorly-graded Sand (SP) Dark Brown, Fine	100	4	0	97	3	0.120								
243.1	13.0	☒	5 8 10	18		Poorly-graded Sand (SP) Gray, Fine, Organic Matter	100	5	0	97	3	0.113								
240.6	15.5	☒	4 2 1	3		Clayey Sand (SC) Gray, Fine	100	6	2	76	22									
238.1	18.0	☒	3 4 5	9		Poorly-graded Sand with Clay (SP-SC) Gray, Fine	100	7	0	94	6	0.083								
		☒	1 2 3	5		Poorly-graded Sand (SP) Gray, Fine	100	8	0	99	1	0.172								
		☒	2 4 6	10		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	4 5 8	13		Poorly-graded Sand (SP) Gray, Fine	100	10	0	99	1	0.185								
		☒	5 7 11	18		Poorly-graded Sand (SP) Gray, Fine	100	11												
		☒	4 7 9	16		Poorly-graded Sand (SP) Gray, Medium, Organic Matter	100	12	6	92	2	0.189								
		☒	5 8 9	17		Poorly-graded Sand (SP) Gray, Fine, Organic Matter	100	13	11	85	4	0.106								
		☒	4 7 9	16		Poorly-graded Sand (SP) Gray, Fine	100	14	0	98	1	0.157								

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 4 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,161,679.3 E 2,474,147.7

ELEVATION TOP OF BORING: 256.1

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	6 8 9	17		Poorly-graded Sand (SP) Gray, Fine	100	15	2	97	1	0.216								
		X	7 12 16	28		Poorly-graded Sand (SP) Gray, Fine	100	16	0	99	1	0.171								
		X	7 12 14	26		Poorly-graded Sand (SP) Gray, Medium	100	17	0	98	2	0.236								
		X	6 11 14	25		Poorly-graded Sand (SP) Gray, Medium	100	18	0	98	2	0.217								
		X	4 8 11	19		Poorly-graded Sand (SP) Gray, Medium	100	19	1	98	2	0.240								
		X	8 16 23	39		Poorly-graded Sand (SP) Gray, Medium	100	20												

35.0 37.5 40.0 42.5 45.0 47.5 50.0 52.5 55.0 57.5 60.0 62.5 65.0 67.5 70.0 72.5 75.0 77.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 3 OF 4 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,161,679.3 E 2,474,147.7

ELEVATION TOP OF BORING: 256.1

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	7 14 20	34		Poorly-graded Sand (SP) Gray, Medium	100	21	14	84	2	0.261								
		X	5 9 16	25		Poorly-graded Sand (SP) Gray, Fine	100	22												
		X	8 10 11	21		Poorly-graded Sand (SP) Gray, Medium	100	23	12	86	2	0.202								
		X	6 10 16	26		Poorly-graded Sand (SP) Gray, Fine	100	24												
141.1	115.0																			
		X	11 14 15	29		Poorly-graded Gravel (GP) Brown, Fine	100	25	45	52	3	0.262								

77.5 80.0 82.5 85.0 87.5 90.0 92.5 95.0 97.5 100.0 102.5 105.0 107.5 110.0 112.5 115.0 117.5 120.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 4 OF 4 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,161,679.3 E 2,474,147.7

ELEVATION TOP OF BORING: 256.1

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
131.1	125.0																			
		X	6 8 9	17		Poorly-graded Sand (SP) Brown	100	26	47	50	3	0.281								
121.1	135.0																			
		X	10 15 13	28		Poorly-graded Gravel (GP) Brown	100	27	52	45	3	0.234								
111.1	145.0																			
		X	7 10 16	26		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	28	5	89	5	0.136								
101.1	155.0																			
		X	3 6 8	14		Fat Clay (CH) Gray, stiff	100	29												
96.1	160.0																			

120.0 122.5 125.0 127.5 130.0 132.5 135.0 137.5 140.0 142.5 145.0 147.5 150.0 152.5 155.0 157.5 160.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)

INSTALLATION: Memphis District (CEMVM)

SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study

2. HOLE NUMBER: 165-BPL-11

LOCATION COORDINATES: N 13,161,350.4 E 2,473,770.8

3. DRILLING AGENCY: Tri-State Testing Services, Inc.

4. NAME OF DRILLER: G. Baker

5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:

6. THICKNESS OF OVERBURDEN:

7. DEPTH DRILLED INTO ROCK:

8. TOTAL DEPTH OF BORING: 30.0

9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

10. SIZE AND TYPE OF BIT: 3.25" ID

11. MANUFACTURER'S DESIGNATION OF DRILL: CME 75

12. TOTAL SAMPLES: 12; DISTURBED: 12; UNDISTURBED: 0

13. TOTAL NUMBER CORE BOXES: 0

14. ELEVATION GROUND WATER: 245.4 8/4/11

15. DATE BORING: STARTED 8/4/11; COMPLETED 8/4/11

16. ELEVATION TOP OF BORING: 253.9

17. TOTAL CORE RECOVERY FOR BORING: N/A

18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	3 3 4	7		Silty Sand (SM) Brown, Fine	100	1	0	79	21									
		☒	2 2 2	4		Silty Sand (SM) Brown, Fine	100	2	0	74	26									
		☒	1 2 2	4		Silty Sand (SM) Gray, Fine	100	3	0	69	31									
245.9	8.0																			
		☒	2 3 3	6		Poorly-graded Sand with Silt (SP-SM) Brown, Fine	100	4	0	91	9	0.082								
243.4	10.5																			
		☒	3 4 4	8		Poorly-graded Sand (SP) Brown, Fine	100	5	0	97	3	0.162								
		☒	3 2 3	5		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	3 4 4	8		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	4 5 5	10		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	4 5 6	11		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	4 4 7	11		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	5 6 7	13		Poorly-graded Sand (SP) Gray, Fine	100	11												
		☒	5 7 10	17		Poorly-graded Sand (SP) Gray, Fine	100	12												
223.9	30.0																			

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)	INSTALLATION: Memphis District (CEMVM)	SHEET 1 OF 1 SHEETS	
1. PROJECT: Below Piggott - West Bank SFB Seepage Study	9. COORDINATE SYSTEM	HORIZONTAL	VERTICAL
	10. SIZE AND TYPE OF BIT: 3.25" ID		
2. HOLE NUMBER: 166-BPL-11 — LOCATION COORDINATES: N 13,161,022.0 E 2,473,393.9	11. MANUFACTURER'S DESIGNATION OF DRILL: CME 75		
3. DRILLING AGENCY: Tri-State Testing Services, Inc.	12. TOTAL SAMPLES: 12	DISTURBED: 12	UNDISTURBED: 0
4. NAME OF DRILLER: G. Baker	13. TOTAL NUMBER CORE BOXES: 0		
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED — DEG FROM VERTICAL: --- — BEARING:	14. ELEVATION GROUND WATER: 247.4 8/4/11		
	15. DATE BORING	STARTED: 8/4/11	COMPLETED: 8/4/11
6. THICKNESS OF OVERBURDEN	16. ELEVATION TOP OF BORING: 256.4		
7. DEPTH DRILLED INTO ROCK	17. TOTAL CORE RECOVERY FOR BORING: N/A		
8. TOTAL DEPTH OF BORING: 30.0	18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor		

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	1 2 3	5		Lean Clay (CL) Gray, medium	100	1							13.2					
		☒	2 2 3	5		Lean Clay (CL) Gray & Brown, medium	100	2					26	11	16.1					
250.9	5.5																			
		☒	2 2 3	5		Clayey Sand (SC) Brown & Gray, Fine	100	3			38				24.4					
248.4	8.0																			
	▼	☒	2 2 3	5		Poorly-graded Sand with Clay (SP-SC) Brown & Gray, Fine	100	4	0	93	7	0.098								
245.9	10.5																			
		☒	2 3 4	7		Poorly-graded Sand (SP) Gray, Fine	100	5	0	97	3	0.154								
		☒	2 3 4	7		Poorly-graded Sand (SP) Gray, Fine	100	6	0	95	5	0.126								
		☒	3 3 4	7		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	3 5 6	11		Poorly-graded Sand (SP) Gray, Fine	100	8	1	98	1	0.160								
		☒	3 6 8	14		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	3 4 4	8		Poorly-graded Sand (SP) Gray, Medium	100	10	1	98	1	0.208								
		☒	4 4 5	9		Poorly-graded Sand (SP) Gray, Fine	100	11												
		☒	4 5 7	12		Poorly-graded Sand (SP) Gray, Fine	100	12												
226.4	30.0																			

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)

INSTALLATION: Memphis District (CEMVM)

SHEET 1 OF 4 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study

2. HOLE NUMBER: 167-BPT-11

LOCATION COORDINATES: N 13,160,690.0 E 2,473,016.7

3. DRILLING AGENCY: Tri-State Testing Services, Inc.

4. NAME OF DRILLER: G. Baker

5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:

6. THICKNESS OF OVERBURDEN:

7. DEPTH DRILLED INTO ROCK:

8. TOTAL DEPTH OF BORING: 160.0

9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

10. SIZE AND TYPE OF BIT: 4.5" Wing Bit

11. MANUFACTURER'S DESIGNATION OF DRILL: CME 75

12. TOTAL SAMPLES: 29; DISTURBED: 29; UNDISTURBED: 0

13. TOTAL NUMBER CORE BOXES: 0

14. ELEVATION GROUND WATER: 249.3 8/18/11

15. DATE BORING: STARTED 8/18/11; COMPLETED 8/19/11

16. ELEVATION TOP OF BORING: 257.3

17. TOTAL CORE RECOVERY FOR BORING: N/A

18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	6 6 5	11		Silty Sand (SM) Brown, Fine	100	1	1	63	36									
		☒	4 5 4	9		Silty Sand (SM) Brown, Fine	100	2	2	60	37									
		☒	3 4 5	9		Silty Sand (SM) Brown, Fine	100	3	0	87	13									
249.3	8.0																			
		☒	4 6 10	16		Poorly-graded Sand with Silt (SP-SM) Brown, Fine	100	4	0	95	5	0.105								
246.8	10.5																			
		☒	3 7 8	15		Poorly-graded Sand (SP) Brown, Fine	100	5	0	99	1	0.169								
		☒	4 6 8	14		Poorly-graded Sand (SP) Gray, Fine	100	6	0	98	2	0.163								
		☒	7 11 13	24		Poorly-graded Sand (SP) Gray, Fine	100	7	0	98	2	0.174								
		☒	5 6 3	9		Poorly-graded Sand (SP) Gray, Fine	100	8	1	98	1	0.240								
236.8	20.5																			
		☒	5 7 9	16		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	9	0	91	9	0.076								
234.3	23.0																			
		☒	3 3 5	8		Poorly-graded Sand (SP) Gray, Fine	100	10	0	99	1	0.206								
		☒	4 9 15	24		Poorly-graded Sand (SP) Gray, Fine	100	11	0	98	2	0.183								
		☒	5 9 12	21		Poorly-graded Sand (SP) Gray, Fine	100	12												
		☒	5 8 9	17		Poorly-graded Sand (SP) Gray, Medium	100	13	11	87	2	0.225								
		☒	6 7 9	16		Poorly-graded Sand (SP) Gray, Medium	100	14	1	97	2	0.212								

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 4 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,160,690.0 E 2,473,016.7

ELEVATION TOP OF BORING: 257.3

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	6 8 8	16		Poorly-graded Sand (SP) Gray, Fine	100	15	0	97	3	0.096								
		X	4 5 6	11		Poorly-graded Sand (SP) Gray, Fine	100	16	0	97	3	0.096								
		X	5 8 9	17		Poorly-graded Sand (SP) Gray, Medium	100	17	0	98	1	0.224								
		X	6 8 11	19		Poorly-graded Sand (SP) Gray, Medium	100	18												
		X	7 12 16	28		Poorly-graded Sand (SP) Gray, Medium	100	19	0	98	2	0.200								
		X	6 8 12	20		Poorly-graded Sand (SP) Gray, Medium	100	20												

35.0 37.5 40.0 42.5 45.0 47.5 50.0 52.5 55.0 57.5 60.0 62.5 65.0 67.5 70.0 72.5 75.0 77.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 3 OF 4 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM | HORIZONTAL | VERTICAL

LOCATION COORDINATES: N 13,160,690.0 E 2,473,016.7

ELEVATION TOP OF BORING: 257.3

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	10 15 22	37		Poorly-graded Sand (SP) Gray, Fine	100	21	0	98	2	0.151								
		X	6 10 12	22		Poorly-graded Sand (SP) Gray, Medium	100	22												
		X	7 15 17	32		Poorly-graded Sand (SP) Gray, Fine	100	23	0	98	2	0.168								
		X	14 16 17	33		Poorly-graded Sand (SP) Gray, Fine	100	24												
		X	4 10 11	21		Poorly-graded Sand (SP) Gray, Fine	100	25	0	98	2	0.230								

77.5 80.0 82.5 85.0 87.5 90.0 92.5 95.0 97.5 100.0 102.5 105.0 107.5 110.0 112.5 115.0 117.5 120.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 4 OF 4 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,160,690.0 E 2,473,016.7

ELEVATION TOP OF BORING: 257.3

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
122.3	135.0	X	16 25 14	39		Poorly-graded Sand (SP) Gray, Fine	100	26												
112.3	145.0	X	15 12 15	27		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	27	16	78	6	0.132								
102.3	155.0	X	14 23 24	47		Poorly-graded Sand (SP) Gray, Fine	100	28	31	65	4	0.171								
97.3	160.0	X	13 8 7	15		Fat Clay (CH) Gray, stiff	100	29												

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 3.25" ID
2. HOLE NUMBER: 168-BPL-11
LOCATION COORDINATES: N 13,160,365.0 E 2,472,638.8
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 75
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
4. NAME OF DRILLER: G. Baker
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 246.8 8/4/11
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
15. DATE BORING: STARTED 8/4/11 COMPLETED 8/4/11
6. THICKNESS OF OVERBURDEN:
16. ELEVATION TOP OF BORING: 255.8
7. DEPTH DRILLED INTO ROCK:
17. TOTAL CORE RECOVERY FOR BORING: N/A
8. TOTAL DEPTH OF BORING: 30.0
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	4 5 6	11		Silty Sand (SM) Brown, Fine	100	1	0	67	33									
		☒	3 4 4	8		Silty Sand (SM) Brown, Fine	100	2	0	82	18									
250.3	5.5																			
		☒	4 3 4	7		Poorly-graded Sand with Silt (SP-SM) Brown, Fine	100	3	0	92	8	0.085								
247.8	8.0																			
		☒	2 3 3	6		Poorly-graded Sand (SP) Gray, Fine	100	4	0	98	1	0.163								
		☒	3 4 5	9		Poorly-graded Sand (SP) Brown, Fine	100	5	0	99	1	0.161								
		☒	4 4 4	8		Poorly-graded Sand (SP) Brown, Fine	100	6												
		☒	3 5 4	9		Poorly-graded Sand (SP) Brown, Fine	100	7												
		☒	3 3 4	7		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	4 4 4	8		Poorly-graded Sand (SP) Brown, Fine	100	9												
		☒	4 8 9	17		Poorly-graded Sand (SP) Brown, Fine	100	10												
		☒	5 7 10	17		Poorly-graded Sand (SP) Gray, Fine	100	11												
225.8	30.0	☒	6 6 9	15		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)	INSTALLATION: Memphis District (CEMVM)	SHEET 1 OF 1 SHEETS	
1. PROJECT: Below Piggott - West Bank SFB Seepage Study	9. COORDINATE SYSTEM	HORIZONTAL	VERTICAL
	10. SIZE AND TYPE OF BIT: 3.25" ID		
2. HOLE NUMBER: 169-BPL-11 — LOCATION COORDINATES: N 13,160,055.4 E 2,472,254.8	11. MANUFACTURER'S DESIGNATION OF DRILL: CME 75		
3. DRILLING AGENCY: Tri-State Testing Services, Inc.	12. TOTAL SAMPLES: 12	DISTURBED: 12	UNDISTURBED: 0
4. NAME OF DRILLER: G. Baker	13. TOTAL NUMBER CORE BOXES: 0		
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED — DEG FROM VERTICAL: --- — BEARING:	14. ELEVATION GROUND WATER: 246.2 8/5/11		
	15. DATE BORING: STARTED 8/5/11 — COMPLETED 8/5/11		
6. THICKNESS OF OVERBURDEN	16. ELEVATION TOP OF BORING: 255.2		
7. DEPTH DRILLED INTO ROCK	17. TOTAL CORE RECOVERY FOR BORING: N/A		
8. TOTAL DEPTH OF BORING: 30.0	18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor		

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
252.2	3.0	☒	1 2 2	4		Poorly-graded Sand with Silt (SP-SM) Brown & Gray, Fine	100	1												
		☒	1 1 2	3		Clayey Sand (SC) Gray, Fine	100	2			28				17.4					
247.2	8.0	☒	1 2 2	4		Clayey Sand (SC) Gray, Fine	100	3	0	83	17									
244.7	10.5	☒	2 5 6	11		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	4	0	92	8	0.084								
		☒	3 5 6	11		Poorly-graded Sand (SP) Gray, Fine	100	5	0	98	1	0.155								
		☒	3 5 7	12		Poorly-graded Sand (SP) Gray, Fine	100	6	0	97	3	0.124								
		☒	4 4 5	9		Poorly-graded Sand (SP) Brown, Medium	100	7	0	99	1	0.243								
		☒	3 5 7	12		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	4 5 7	12		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	4 4 5	9		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	5 5 6	11		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	11												
225.2	30.0	☒	4 4 5	9		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 5 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 170-BPT-11
LOCATION COORDINATES: N 13,159,741.0 E 2,471,865.4
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: G. Baker
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 180.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 4.5" Wing Bit
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 75
12. TOTAL SAMPLES: 31 DISTURBED: 31 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 247.5 2/23/11
15. DATE BORING: STARTED 2/23/11 COMPLETED 2/25/11
16. ELEVATION TOP OF BORING: 254.0
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
251.0	3.0	☒	3 3 3	6		Lean Clay (CL) Brown & Gray, medium, Oxidized, Rootlets	100	1							22.9					
248.5	5.5	☒	1 1 2	3		Fat Clay (CH) Brown & Gray, soft, Oxidized	100	2					52	36	30.0					
246.0	8.0	☒	2 4 6	10		Silty Sand (SM) Dark Gray, Fine	100	3	1	87	13									
		☒	4 6 6	12		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	4	0	98	2	0.167								
		☒	3 7 9	16		Poorly-graded Sand (SP) Gray, Fine	100	5	0	98	2	0.185								
		☒	3 4 5	9		Poorly-graded Sand (SP) Gray, Fine	100	6	0	98	2	0.153								
		☒	4 4 8	12		Poorly-graded Sand (SP) Gray, Fine	100	7	0	98	2	0.111								
		☒	3 5 6	11		Poorly-graded Sand (SP) Gray, Fine	100	8	0	98	2	0.115								
		☒	5 6 6	12		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	4 5 7	12		Poorly-graded Sand (SP) Gray, Medium	100	10												
		☒	5 7 9	16		Poorly-graded Sand (SP) Gray, Fine	100	11	0	98	1	0.213								
		☒	3 6 8	14		Poorly-graded Sand (SP) Gray, Fine	100	12	0	99	1	0.184								
		☒	3 7 7	14		Poorly-graded Sand (SP) Gray, Fine	100	13	0	98	2	0.161								
		☒	4 10 14	24		Poorly-graded Sand (SP) Gray, Fine	100	14	0	97	2	0.160								

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,159,741.0 E 2,471,865.4

ELEVATION TOP OF BORING: 254.0

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	3 5 7	12		Poorly-graded Sand (SP) Gray, Medium	100	15	0	98	1	0.201								
		X	5 11 11	22		Poorly-graded Sand (SP) Gray, Medium	100	16	1	97	2	0.282								
		X	5 10 10	20		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	17	1	97	2	0.166								
		X	6 10 12	22		Poorly-graded Sand (SP) Gray & Brown, Medium	100	18	2	96	2	0.229								
		X	8 9 10	19		Poorly-graded Sand (SP) Gray & Brown, Medium	100	19	4	94	2	0.228								
		X	8 8 9	17		Poorly-graded Sand (SP) Brown, Medium	100	20	1	98	2	0.258								

35.0 37.5 40.0 42.5 45.0 47.5 50.0 52.5 55.0 57.5 60.0 62.5 65.0 67.5 70.0 72.5 75.0 77.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 3 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,159,741.0 E 2,471,865.4

ELEVATION TOP OF BORING: 254.0

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	6 11 15	26		Poorly-graded Sand (SP) Brown, Medium	100	21												
		X	3 8 11	19		Poorly-graded Sand (SP) Gray, Fine	100	22												
		X	9 19 27	46		Poorly-graded Sand (SP) Gray, Fine	100	23	0	96	4	0.152								
149.0	105.0																			
		X	21 50	50 /		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	24	0	91	9	0.078								
139.0	115.0																			
		X	10 7 6	13		Poorly-graded Sand (SP) Brown, Fine	100	25	23	74	3	0.172								

77.5 80.0 82.5 85.0 87.5 90.0 92.5 95.0 97.5 100.0 102.5 105.0 107.5 110.0 112.5 115.0 117.5 120.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 4 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,159,741.0 E 2,471,865.4

ELEVATION TOP OF BORING: 254.0

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
129.0	125.0																			
		X	22 22 20	42		Poorly-graded Sand with Silt (SP-SM) Brown, Medium	100	26	35	58	8	0.090								
119.0	135.0																			
		X	12 20 19	39		Poorly-graded Sand (SP) Brown, Medium	100	27	36	60	4	0.182								
		X	9 9 10	19		Poorly-graded Sand (SP) Brown	100	28	47	51	3	0.200								
99.0	155.0																			
94.5	159.5	X	2 2 14	16		Fat Clay (CH) Dark Gray, soft Poorly-graded Sand (SP) Brown	100	29	40	55	5	0.154								

120.0 122.5 125.0 127.5 130.0 132.5 135.0 137.5 140.0 142.5 145.0 147.5 150.0 152.5 155.0 157.5 160.0 162.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 5 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,159,741.0 E 2,471,865.4

ELEVATION TOP OF BORING: 254.0

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
89.0	165.0																			
		X	9 25 50	75		Poorly-graded Sand with Silt (SP-SM) Light Gray, Fine	100	30	0	93	6	0.085								
79.0	175.0																			
		X	7 9 11	20		Fat Clay (CH) Gray, stiff, Sand Strata or Lenses	100	31												
74.0	180.0																			

162.5 165.0 167.5 170.0 172.5 175.0 177.5 180.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 3.25" ID
2. HOLE NUMBER: 171-BPL-11
LOCATION COORDINATES: N 13,159,461.2 E 2,471,465.4
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 75
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
4. NAME OF DRILLER: G. Baker
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 246.1 8/5/11
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
15. DATE BORING: STARTED 8/5/11 COMPLETED 8/5/11
6. THICKNESS OF OVERBURDEN:
16. ELEVATION TOP OF BORING: 254.6
7. DEPTH DRILLED INTO ROCK:
17. TOTAL CORE RECOVERY FOR BORING: N/A
8. TOTAL DEPTH OF BORING: 30.0
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	1 2 2	4		Lean Clay (CL) Gray, medium	100	1							14.0					
		☒	1 1 2	3		Lean Clay (CL) Brown, soft	100	2					39	22	24.3					
249.1	5.5																			
		☒	2 2 2	4		Clayey Sand (SC) Gray & Brown, Fine	100	3			50				24.8					
246.6	8.0																			
		☒	4 5 7	12		Poorly-graded Sand (SP) Gray, Fine	100	4	0	98	2	0.186								
		☒	4 6 6	12		Poorly-graded Sand (SP) Gray, Fine	100	5	0	98	2	0.169								
		☒	3 4 5	9		Poorly-graded Sand (SP) Gray, Fine	100	6	1	98	1	0.187								
		☒	4 4 6	10		Poorly-graded Sand (SP) Gray, Fine	100	7	0	98	2	0.170								
		☒	5 6 7	13		Poorly-graded Sand (SP) Gray, Fine	100	8	1	98	1	0.154								
		☒	5 8 9	17		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	4 6 6	12		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	10												
		☒	5 5 5	10		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	11												
224.6	30.0	☒	6 7 6	13		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 3.25" ID
2. HOLE NUMBER: 172-BPL-11
LOCATION COORDINATES: N 13,159,198.8 E 2,471,039.0
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 75
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
4. NAME OF DRILLER: G. Baker
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 245.1 8/5/11
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
15. DATE BORING: STARTED 8/5/11 COMPLETED 8/5/11
6. THICKNESS OF OVERBURDEN:
16. ELEVATION TOP OF BORING: 254.6
7. DEPTH DRILLED INTO ROCK:
17. TOTAL CORE RECOVERY FOR BORING: N/A
8. TOTAL DEPTH OF BORING: 30.0
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	1 2 2	4		Lean Clay (CL) Gray, soft, Oxidized	100	1							17.7					
		☒	2 2 2	4		Lean Clay (CL) Gray, soft, Oxidized	100	2					48	30	17.9					
		☒	2 1 2	3		Lean Clay (CL) Brown, soft, Oxidized	100	3			63				23.8					
246.6	8.0																			
		☒	2 4 5	9		Poorly-graded Sand (SP) Gray, Medium	100	4	6	93	1	0.193								
		☒	4 4 4	8		Poorly-graded Sand (SP) Gray, Fine	100	5	0	99	1	0.173								
		☒	3 5 7	12		Poorly-graded Sand (SP) Gray, Fine	100	6	0	98	2	0.151								
		☒	4 4 7	11		Poorly-graded Sand (SP) Gray, Fine	100	7	0	99	1	0.158								
		☒	3 4 5	9		Poorly-graded Sand (SP) Gray, Fine	100	8	0	96	3	0.139								
		☒	4 5 6	11		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	2 4 5	9		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	3 5 6	11		Poorly-graded Sand (SP) Gray, Fine	100	11												
224.6	30.0	☒	4 5 5	10		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 5 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 173-BPT-11
LOCATION COORDINATES: N 13,158,934.8 E 2,470,614.4
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: G. Baker
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 170.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 4.5" Wing Bit
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 75
12. TOTAL SAMPLES: 30 DISTURBED: 30 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 247.5 3/1/11
15. DATE BORING: STARTED 2/28/11 COMPLETED 3/2/11
16. ELEVATION TOP OF BORING: 254.5
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	1 2 2	4		Lean Clay (CL) Brown & Gray, soft, Rootlets	100	1					41	24	25.6					
		☒	1 2 2	4		Lean Clay (CL) Brown & Gray, soft, Oxidized	100	2					39	23	28.1					
249.0	5.5																			
		☒	1 2 2	4		Poorly-graded Sand (SP) Dark Gray, Fine, Lignite Fragments	100	3	0	98	1	0.153								
		☒	4 5 6	11		Poorly-graded Sand (SP) Gray, Fine	100	4	0	98	2	0.103								
		☒	5 10 12	22		Poorly-graded Sand (SP) Gray, Fine	100	5	0	98	2	0.199								
		☒	5 10 11	21		Poorly-graded Sand (SP) Gray, Fine	100	6	0	98	2	0.171								
		☒	4 5 6	11		Poorly-graded Sand (SP) Gray, Fine	100	7	0	96	4	0.083								
		☒	4 5 5	10		Poorly-graded Sand (SP) Gray, Fine	100	8	0	99	1	0.127								
		☒	4 5 5	10		Poorly-graded Sand (SP) Gray, Medium	100	9	0	99	1	0.197								
		☒	3 6 7	13		Poorly-graded Sand (SP) Gray, Medium	100	10	2	96	2	0.152								
		☒	5 6 7	13		Poorly-graded Sand (SP) Gray, Medium	100	11												
		☒	5 8 8	16		Poorly-graded Sand (SP) Gray, Medium	100	12												
		☒	5 7 8	15		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	13	2	96	2	0.165								
		☒	3 4 8	12		Poorly-graded Sand (SP) Gray, Fine	100	14	0	99	1	0.163								

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,158,934.8 E 2,470,614.4

ELEVATION TOP OF BORING: 254.5

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	5 10 13	23		Poorly-graded Sand (SP) Gray, Fine	100	15	0	97	3	0.154								
		X	6 9 14	23		Poorly-graded Sand (SP) Gray, Medium	100	16	2	96	2	0.281								
		X	6 9 9	18		Poorly-graded Sand (SP) Gray, Medium	100	17												
		X	5 6 6	12		Poorly-graded Sand (SP) Gray, Medium	100	18												
		X	6 9 12	21		Poorly-graded Sand (SP) Gray, Medium	100	19	5	94	2	0.301								
		X	4 8 9	17		Poorly-graded Sand (SP) Gray, Medium	100	20	2	97	1	0.215								

35.0 37.5 40.0 42.5 45.0 47.5 50.0 52.5 55.0 57.5 60.0 62.5 65.0 67.5 70.0 72.5 75.0 77.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 3 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,158,934.8 E 2,470,614.4

ELEVATION TOP OF BORING: 254.5

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	5 9 12	21		Poorly-graded Sand (SP) Gray, Medium	100	21	8	89	3	0.204								
		X	5 10 13	23		Poorly-graded Sand (SP) Gray, Fine	100	22	0	98	2	0.169								
		X	5 10 12	22		Poorly-graded Sand (SP) Gray, Fine	100	23	0	98	2	0.159								
		X	5 9 12	21		Poorly-graded Sand (SP) Gray, Fine	100	24												
		X	7 9 11	20		Poorly-graded Sand (SP) Gray, Fine	100	25	0	99	1	0.165								

77.5 80.0 82.5 85.0 87.5 90.0 92.5 95.0 97.5 100.0 102.5 105.0 107.5 110.0 112.5 115.0 117.5 120.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 4 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,158,934.8 E 2,470,614.4

ELEVATION TOP OF BORING: 254.5

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	7 9 10	19		Poorly-graded Sand (SP) Gray & Brown, Medium	100	26	19	79	2	0.227								
		X	6 18 26	44		Poorly-graded Sand (SP) Brown, Fine	100	27	3	93	4	0.156								
		X	13 10 15	25		Poorly-graded Sand (SP) Gray, Medium	100	28	36	61	3	0.181								
99.5	155.0																			
		X	4 7 12	19		Poorly-graded Gravel (GP) Brown	100	29	58	41	1	0.510								

120.0 122.5 125.0 127.5 130.0 132.5 135.0 137.5 140.0 142.5 145.0 147.5 150.0 152.5 155.0 157.5 160.0 162.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)		SHEET 5 OF 5 SHEETS
PROJECT: Below Piggott - West Bank SFB Seepage Study	COORDINATE SYSTEM: HORIZONTAL: VERTICAL:	
LOCATION COORDINATES: N 13,158,934.8 E 2,470,614.4	ELEVATION TOP OF BORING: 254.5	

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
89.5	165.0																			162.5
																				165.0
																				167.5
84.5	170.0	X	4 9 11	20		Lean Clay (CL) Sandy, Gray, very stiff	100	30	0	33	67									170.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)	INSTALLATION: Memphis District (CEMVM)	SHEET 1 OF 1 SHEETS
1. PROJECT: Below Piggott - West Bank SFB Seepage Study	9. COORDINATE SYSTEM:	HORIZONTAL:	VERTICAL:
	10. SIZE AND TYPE OF BIT: 3.25" ID		
2. HOLE NUMBER: 174-BPL-11	LOCATION COORDINATES: N 13,158,671.3 E 2,470,189.8	11. MANUFACTURER'S DESIGNATION OF DRILL: CME 75	
3. DRILLING AGENCY: Tri-State Testing Services, Inc.		12. TOTAL SAMPLES: 12	DISTURBED: 12	UNDISTURBED: 0
4. NAME OF DRILLER: G. Baker		13. TOTAL NUMBER CORE BOXES: 0	
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED	DEG FROM VERTICAL: ---	BEARING:	14. ELEVATION GROUND WATER: 245.4 8/8/11	
		15. DATE BORING	STARTED: 8/8/11	COMPLETED: 8/8/11
6. THICKNESS OF OVERBURDEN		16. ELEVATION TOP OF BORING: 254.4	
7. DEPTH DRILLED INTO ROCK		17. TOTAL CORE RECOVERY FOR BORING: N/A	
8. TOTAL DEPTH OF BORING: 30.0		18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor	

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	2 2 2	4		Lean Clay (CL) Dark Brown, soft, Oxidized, Rootlets	100	1							15.7					
		☒	2 2 2	4		Lean Clay (CL) Dark Brown, soft	100	2					49	32	24.4					
248.9	5.5																			
		☒	1 1 2	3		Lean Clay (CL) Sandy, Gray, Fine	100	3			70				30.1					
246.4	8.0																			
	▼	☒	2 4 5	9		Clayey Sand (SC) Gray, Fine	100	4	0	83	17									
243.9	10.5																			
		☒	3 4 5	9		Poorly-graded Sand (SP) Gray, Fine	100	5	0	99	1	0.162								
		☒	4 5 7	12		Poorly-graded Sand (SP) Gray, Fine	100	6	0	98	2	0.145								
		☒	4 6 8	14		Poorly-graded Sand (SP) Gray, Fine	100	7	0	98	2	0.161								
		☒	3 5 8	13		Poorly-graded Sand (SP) Gray, Fine	100	8	1	99	1	0.184								
		☒	5 7 8	15		Poorly-graded Sand (SP) Gray, Fine, Organic Matter	100	9												
		☒	4 6 8	14		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	4 5 6	11		Poorly-graded Sand (SP) Gray, Medium	100	11												
224.4	30.0	☒	3 6 9	15		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 3.25" ID
2. HOLE NUMBER: 175-BPL-11
LOCATION COORDINATES: N 13,158,406.5 E 2,469,766.2
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 75
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
4. NAME OF DRILLER: G. Baker
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 245.0 8/8/11
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
15. DATE BORING: STARTED 8/8/11 COMPLETED 8/8/11
6. THICKNESS OF OVERBURDEN:
16. ELEVATION TOP OF BORING: 254.0
7. DEPTH DRILLED INTO ROCK:
17. TOTAL CORE RECOVERY FOR BORING: N/A
8. TOTAL DEPTH OF BORING: 30.0
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	1 1 2	3		Fat Clay (CH) Gray, soft, Oxidized	100	1							29.7					
		☒	1 1 2	3		Fat Clay (CH) Gray, soft, Organic Matter	100	2					73	51	34.8					
248.5	5.5																			
		☒	1 2 2	4		Lean Clay (CL) Sandy, Gray, soft, Oxidized, Fine	100	3			65				29.2					
246.0	8.0																			
		☒	1 1 1	2		Fat Clay (CH) Gray, very soft, Fine	100	4			66				33.8					
243.5	10.5																			
		☒	1 1 2	3		Clayey Sand (SC) Gray, Fine	100	5	0	72	28									
241.0	13.0																			
		☒	1 1 1	2		Lean Clay (CL) Sandy, Gray, soft	100	6	0	46	54									
238.5	15.5																			
		☒	2 2 3	5		Poorly-graded Sand (SP) Dark Gray, Medium	100	7	12	88	1	0.347								
		☒	4 6 6	12		Poorly-graded Sand (SP) Gray, Fine	100	8	0	99	1	0.160								
233.5	20.5																			
		☒	5 9 11	20		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	9	0	94	6	0.099								
231.0	23.0																			
		☒	4 5 7	12		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	4 5 6	11		Poorly-graded Sand (SP) Gray, Fine	100	11												
		☒	5 6 7	13		Poorly-graded Sand (SP) Gray, Fine	100	12												
224.0	30.0																			

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 5 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 176-BPT-11
LOCATION COORDINATES: N 13,158,143.3 E 2,469,340.6
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: G. Baker
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 170.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 4.5" Wing Bit
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 75
12. TOTAL SAMPLES: 30 DISTURBED: 30 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 248.2 3/2/11
15. DATE BORING: STARTED 3/2/11 COMPLETED 3/4/11
16. ELEVATION TOP OF BORING: 254.2
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	1 1 1	2		Fat Clay (CH) Brown & Gray, soft, Oxidized, Rootlets	100	1							25.6					
		☒	1 1 1	2		Fat Clay (CH) Brown & Gray, soft, Oxidized, Rootlets	100	2					51	31	28.1					
		☒	1 1 1	2		Fat Clay (CH) Gray, soft, Oxidized	100	3					58	39	40.3					
246.2	8.0																			
		☒	1 1 1	2		Poorly-graded Sand (SP) Gray, Fine	100	4	0	99	1	0.086								
		☒	4 7 8	15		Poorly-graded Sand (SP) Gray, Fine	100	5	1	97	2	0.175								
		☒	4 8 9	17		Poorly-graded Sand (SP) Gray, Fine	100	6	0	98	2	0.157								
		☒	2 3 6	9		Poorly-graded Sand (SP) Gray, Fine	100	7	0	97	3	0.153								
		☒	2 4 5	9		Poorly-graded Sand (SP) Gray, Fine	100	8	0	97	3	0.127								
		☒	2 5 5	10		Poorly-graded Sand (SP) Gray, Fine	100	9	1	97	2	0.122								
		☒	5 6 8	14		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	4 5 7	12		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	11												
		☒	2 4 5	9		Poorly-graded Sand (SP) Gray, Fine	100	12												
		☒	4 7 8	15		Poorly-graded Sand (SP) Gray, Medium	100	13	2	97	1	0.343								
		☒	3 5 7	12		Poorly-graded Sand (SP) Gray, Medium	100	14	1	98	1	0.326								

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,158,143.3 E 2,469,340.6

ELEVATION TOP OF BORING: 254.2

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	3 5 8	13		Poorly-graded Sand (SP) Gray, Fine	100	15	0	98	1	0.229								
		X	4 9 9	18		Poorly-graded Sand (SP) Gray, Medium	100	16	0	98	1	0.231								
		X	5 10 16	26		Poorly-graded Sand (SP) Gray, Medium	100	17	1	97	2	0.190								
		X	5 9 11	20		Poorly-graded Sand (SP) Gray, Medium	100	18	3	95	1	0.332								
		X	5 7 11	18		Poorly-graded Sand (SP) Gray, Medium	100	19												
		X	5 10 15	25		Poorly-graded Sand (SP) Gray, Medium	100	20	4	94	1	0.269								

35.0 37.5 40.0 42.5 45.0 47.5 50.0 52.5 55.0 57.5 60.0 62.5 65.0 67.5 70.0 72.5 75.0 77.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 3 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,158,143.3 E 2,469,340.6

ELEVATION TOP OF BORING: 254.2

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	11 25 30	55		Poorly-graded Sand (SP) Gray, Fine	100	21	0	96	4	0.095								
		X	3 6 10	16		Poorly-graded Sand (SP) Gray, Fine	100	22	0	99	1	0.206								
		X	3 7 9	16		Poorly-graded Sand (SP) Brown, Medium	100	23	7	91	2	0.242								
		X	9 10 19	29		Poorly-graded Sand (SP) Gray, Fine	100	24	0	97	3	0.160								
		X	9 11 18	29		Poorly-graded Sand (SP) Gray, Fine	100	25	0	97	2	0.163								

77.5 80.0 82.5 85.0 87.5 90.0 92.5 95.0 97.5 100.0 102.5 105.0 107.5 110.0 112.5 115.0 117.5 120.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 4 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,158,143.3 E 2,469,340.6

ELEVATION TOP OF BORING: 254.2

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	18 18 23	41		Poorly-graded Sand (SP) Gray, Fine	100	26	0	97	3	0.145								
		X	6 11 21	32		Poorly-graded Sand (SP) Brown	100	27	49	49	2	0.288								
		X	3 15 23	38		Poorly-graded Sand (SP) Brown	100	28	42	55	4	0.198								
		X	22 25 27	52		Poorly-graded Sand (SP) Brown	100	29	39	57	4	0.215								

120.0 122.5 125.0 127.5 130.0 132.5 135.0 137.5 140.0 142.5 145.0 147.5 150.0 152.5 155.0 157.5 160.0 162.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)		SHEET 5 OF 5 SHEETS
PROJECT: Below Piggott - West Bank SFB Seepage Study	COORDINATE SYSTEM: HORIZONTAL	VERTICAL
LOCATION COORDINATES: N 13,158,143.3 E 2,469,340.6	ELEVATION TOP OF BORING: 254.2	

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
89.2	165.0																			
84.2	170.0	X	4 8 10	18		Lean Clay (CL) Brown & Gray, very stiff	100	30	0	12	88									

162.5
165.0
167.5
170.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 177-BPL-11
LOCATION COORDINATES: N 13,157,828.0 E 2,468,927.6
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: J. Crawford
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 3.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 850
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 242.8 8/5/11
15. DATE BORING: STARTED 8/5/11 COMPLETED 8/5/11
16. ELEVATION TOP OF BORING: 253.8
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
250.8	3.0	☒	2 2 3	5		Fat Clay (CH) Gray, medium, Oxidized	100	1							17.9					
248.3	5.5	☒	2 4 4	8		Lean Clay (CL) Gray, medium, Oxidized	100	2					35	21	22.2					
245.8	8.0	☒	2 2 3	5		Lean Clay (CL) Sandy, Gray, medium, Oxidized	100	3			51				22.6					
243.3	10.5	☒	2 1 1	2		Clayey Sand (SC) Gray	100	4	0	55	45									
		☒	2 2 2	4		Poorly-graded Sand (SP) Gray, Fine	100	5	0	99	1	0.158								
		☒	3 3 3	6		Poorly-graded Sand (SP) Gray, Fine	100	6	1	98	1	0.159								
		☒	2 3 3	6		Poorly-graded Sand (SP) Gray, Fine	100	7	0	99	1	0.199								
		☒	4 4 5	9		Poorly-graded Sand (SP) Gray, Fine	100	8	2	97	1	0.216								
		☒	4 5 5	10		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	4 4 6	10		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	5 4 5	9		Poorly-graded Sand (SP) Gray, Fine	100	11												
223.8	30.0	☒	5 5 5	10		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 3.25" ID
2. HOLE NUMBER: 178-BPL-11
LOCATION COORDINATES: N 13,157,474.1 E 2,468,572.3
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 850
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
4. NAME OF DRILLER: J. Crawford
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 240.4 8/5/11
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
15. DATE BORING: STARTED 8/5/11 COMPLETED 8/5/11
6. THICKNESS OF OVERBURDEN:
16. ELEVATION TOP OF BORING: 253.9
7. DEPTH DRILLED INTO ROCK:
17. TOTAL CORE RECOVERY FOR BORING: N/A
8. TOTAL DEPTH OF BORING: 30.0
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_r	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	3 2 2	4		Lean Clay (CL) Gray, soft, Oxidized	100	1							16.7					
250.9	3.0																			
		☒	1 2 2	4		Clayey Sand (SC) Gray, Oxidized, Fine	100	2			49				22.1					
		☒	2 4 4	8		Clayey Sand (SC) Gray, Oxidized	100	3	0	69	31									
245.9	8.0																			
		☒	3 1 1	2		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	4	0	89	11									
		☒	1 1 2	3		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	5	0	95	5	0.088								
		☒	4 5 5	10		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	6	1	92	7	0.084								
238.4	15.5																			
		☒	5 7 8	15		Poorly-graded Sand (SP) Gray, Fine	100	7	1	97	2	0.155								
		☒	7 7 9	16		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	8 9 11	20		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	8 10 11	21		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	8 8 10	18		Poorly-graded Sand (SP) Gray, Fine	100	11												
223.9	30.0	☒	9 9 11	20		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)

INSTALLATION: Memphis District (CEMVM)

SHEET 1 OF 5 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study

2. HOLE NUMBER: 179-BPT-11

LOCATION COORDINATES: N 13,157,117.8 E 2,468,219.7

3. DRILLING AGENCY: Tri-State Testing Services, Inc.

4. NAME OF DRILLER: G. Baker

5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:

6. THICKNESS OF OVERBURDEN:

7. DEPTH DRILLED INTO ROCK:

8. TOTAL DEPTH OF BORING: 190.0

9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

10. SIZE AND TYPE OF BIT: 4.5" Wing Bit

11. MANUFACTURER'S DESIGNATION OF DRILL: CME 75

12. TOTAL SAMPLES: 32 DISTURBED: 32 UNDISTURBED: 0

13. TOTAL NUMBER CORE BOXES: 0

14. ELEVATION GROUND WATER: 245.8 3/8/11

15. DATE BORING: STARTED 3/7/11 COMPLETED 3/9/11

16. ELEVATION TOP OF BORING: 253.3

17. TOTAL CORE RECOVERY FOR BORING: N/A

18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
250.3	3.0	☒	1 1 1	2		Lean Clay (CL) Gray, soft, Oxidized, Rootlets	100	1							32.4					
247.8	5.5	☒	1 1 1	2		Fat Clay (CH) Gray, soft, Oxidized	100	2					89	52	47.9					
245.3 ▼	8.0	☒	1 1 1	2		Lean Clay (CL) Dark Gray, soft, Rootlets	100	3							53.2					
		☒	3 4 4	8		Poorly-graded Sand (SP) Gray, Fine	100	4	1	98	2	0.167								
		☒	4 7 7	14		Poorly-graded Sand (SP) Gray, Fine	100	5	1	98	2	0.179								
		☒	3 5 7	12		Poorly-graded Sand (SP) Gray, Medium	100	6	0	98	1	0.206								
		☒	3 4 5	9		Poorly-graded Sand (SP) Gray, Fine	100	7	0	98	2	0.110								
		☒	4 5 5	10		Poorly-graded Sand (SP) Gray, Fine	100	8	1	97	2	0.173								
		☒	3 5 7	12		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	2 4 5	9		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	3 8 9	17		Poorly-graded Sand (SP) Gray, Fine	100	11	0	98	2	0.172								
		☒	3 7 9	16		Poorly-graded Sand (SP) Gray, Fine	100	12	0	99	1	0.176								
		☒	5 9 13	22		Poorly-graded Sand (SP) Gray, Fine	100	13	0	98	2	0.162								
		☒	3 6 6	12		Poorly-graded Sand (SP) Gray, Fine	100	14	0	98	2	0.168								

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,157,117.8 E 2,468,219.7

ELEVATION TOP OF BORING: 253.3

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	3 5 5	10		Poorly-graded Sand (SP) Gray & Brown, Fine	100	15	0	98	2	0.167								
		X	3 5 9	14		Poorly-graded Sand (SP) Brown, Medium	100	16												
		X	5 7 9	16		Poorly-graded Sand (SP) Gray, Fine	100	17												
		X	4 9 9	18		Poorly-graded Sand (SP) Gray, Medium	100	18	1	97	1	0.276								
		X	4 5 8	13		Poorly-graded Sand (SP) Gray, Medium	100	19	2	97	1	0.238								
		X	4 5 9	14		Poorly-graded Sand (SP) Gray, Medium	100	20	1	97	2	0.183								
178.3	75.0																			

35.0 37.5 40.0 42.5 45.0 47.5 50.0 52.5 55.0 57.5 60.0 62.5 65.0 67.5 70.0 72.5 75.0 77.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 3 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,157,117.8 E 2,468,219.7

ELEVATION TOP OF BORING: 253.3

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	7 10 14	24		Poorly-graded Sand with Silt (SP-SM) Gray, Medium	100	21	8	83	8	0.106								
168.3	85.0																			
		X	4 14 15	29		Poorly-graded Sand (SP) Brown, Fine	100	22	3	94	3	0.162								
		X	4 7 12	19		Poorly-graded Sand (SP) Brown & Gray, Fine	100	23	0	98	2	0.162								
		X	5 7 11	18		Poorly-graded Sand (SP) Gray, Fine	100	24												
		X	9 11 13	24		Poorly-graded Sand (SP) Gray, Fine	100	25												

77.5 80.0 82.5 85.0 87.5 90.0 92.5 95.0 97.5 100.0 102.5 105.0 107.5 110.0 112.5 115.0 117.5 120.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 4 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,157,117.8 E 2,468,219.7

ELEVATION TOP OF BORING: 253.3

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	4 7 9	16		Poorly-graded Sand (SP) Gray, Fine	100	26	0	98	2	0.153								
118.3	135.0																			
		X	11 19 21	40		Poorly-graded Sand with Silt (SP-SM) Brown, Fine	100	27	8	85	7	0.130								
		X	19 50	50 /		Poorly-graded Sand with Silt (SP-SM) Brown, Fine	100	28	18	75	7	0.101								
98.3	155.0																			
		X	10 15 17	32		Poorly-graded Sand (SP) Gray	100	29	35	64	1	0.315								

120.0 122.5 125.0 127.5 130.0 132.5 135.0 137.5 140.0 142.5 145.0 147.5 150.0 152.5 155.0 157.5 160.0 162.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 5 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,157,117.8 E 2,468,219.7

ELEVATION TOP OF BORING: 253.3

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	25 50	50/		Poorly-graded Sand (SP) Brown	100	30	42	53	5	0.176								
		X	11 19 27	46		Poorly-graded Sand (SP) Brown	100	31	47	49	4	0.222								
68.3	185.0																			
		X	5 7 10	17		Lean Clay (CL) Gray, stiff	100	32												
63.3	190.0																			

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

162.5 165.0 167.5 170.0 172.5 175.0 177.5 180.0 182.5 185.0 187.5 190.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION	Mississippi Valley Division (MVD)
INSTALLATION	Memphis District (CEMVM)
SHEET	1 OF 1 SHEETS
1. PROJECT	Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER	180-BPL-11
LOCATION COORDINATES	N 13,156,766.3 E 2,467,869.4
3. DRILLING AGENCY	Tri-State Testing Services, Inc.
4. NAME OF DRILLER	J. Crawford
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG FROM VERTICAL	---
BEARING	
6. THICKNESS OF OVERBURDEN	
7. DEPTH DRILLED INTO ROCK	
8. TOTAL DEPTH OF BORING	30.0
9. COORDINATE SYSTEM	HORIZONTAL / VERTICAL
10. SIZE AND TYPE OF BIT:	3.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL	CME 850
12. TOTAL SAMPLES	12 (DISTURBED 12 / UNDISTURBED 0)
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	242.6 8/8/11
15. DATE BORING	STARTED 8/8/11 / COMPLETED 8/8/11
16. ELEVATION TOP OF BORING	253.6
17. TOTAL CORE RECOVERY FOR BORING	N/A
18. SIGNATURE AND TITLE OF INSPECTOR	Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_r	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
250.6	3.0	☒	2 2 3	5		Lean Clay (CL) Brown & Gray, medium, Oxidized, Rootlets	100	1							24.1					
248.1	5.5	☒	1 1 2	3		Fat Clay (CH) Brown & Gray, soft, Oxidized	100	2					69	47	31.1					
		☒	2 1 1	2		Lean Clay (CL) Gray, very soft, Oxidized	100	3							48.2					
243.1	10.5	☒	1 1 1	2		Lean Clay (CL) Brown, very soft	100	4			75				44.6					
240.6	13.0	☒	7 8 9	17		Poorly-graded Sand (SP) Gray, Fine	100	5	0	96	4	0.152								
		☒	5 5 7	12		Poorly-graded Sand with Silt (SP-SM) Light Gray, Fine	100	6	0	84	16									
235.6	18.0	☒	3 6 9	15		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	7	0	95	5	0.084								
		☒	7 8 9	17		Poorly-graded Sand (SP) Gray, Fine	100	8	0	99	1	0.164								
		☒	4 9 11	20		Poorly-graded Sand (SP) Gray, Fine	100	9	1	97	2	0.162								
		☒	9 10 11	21		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	11 12 16	28		Poorly-graded Sand (SP) Gray, Fine	100	11												
223.6	30.0	☒	11 15 16	31		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)	INSTALLATION: Memphis District (CEMVM)	SHEET 1 OF 1 SHEETS	
1. PROJECT: Below Piggott - West Bank SFB Seepage Study	9. COORDINATE SYSTEM:	HORIZONTAL:	VERTICAL:
	10. SIZE AND TYPE OF BIT: 3.25" ID		
2. HOLE NUMBER: 181-BPL-11	LOCATION COORDINATES: N 13,156,411.7 E 2,467,515.8	11. MANUFACTURER'S DESIGNATION OF DRILL: CME 850	
3. DRILLING AGENCY: Tri-State Testing Services, Inc.		12. TOTAL SAMPLES: 12	DISTURBED: 12 / UNDISTURBED: 0
4. NAME OF DRILLER: J. Crawford		13. TOTAL NUMBER CORE BOXES: 0	
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED	DEG FROM VERTICAL: --- / BEARING:	14. ELEVATION GROUND WATER: 247.4	8/8/11
		15. DATE BORING: STARTED 8/8/11	COMPLETED 8/8/11
6. THICKNESS OF OVERBURDEN		16. ELEVATION TOP OF BORING: 253.4	
7. DEPTH DRILLED INTO ROCK		17. TOTAL CORE RECOVERY FOR BORING: N/A	
8. TOTAL DEPTH OF BORING: 30.0		18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor	

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
250.4	3.0	☒	2 2 2	4		Silty Sand (SM) Brown, Fine	100	1												
247.9	5.5	☒	1 1 2	3		Clayey Sand (SC) Brown & Gray, Fine	100	2			27									
245.4	8.0	☒	1 1 1	2		Poorly-graded Sand with Clay (SP-SC) Brown, Fine	100	3	0	92	8	0.079								
		☒	1 1 1	2		Poorly-graded Sand (SP) Brown, Fine	100	4	0	97	3	0.115								
		☒	1 1 1	2		Poorly-graded Sand (SP) Brown, Fine	100	5	0	100	0	0.168								
		☒	1 2 2	4		Poorly-graded Sand (SP) Brown, Fine	100	6	0	99	1	0.117								
		☒	3 2 3	5		Poorly-graded Sand (SP) Brown, Fine	100	7	0	98	2	0.105								
		☒	3 3 3	6		Poorly-graded Sand (SP) Gray, Fine, Organic Matter	100	8												
		☒	4 7 7	14		Poorly-graded Sand (SP) Gray, Fine, Organic Matter	100	9												
		☒	6 5 5	10		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	4 4 5	9		Poorly-graded Sand (SP) Gray, Fine	100	11												
223.4	30.0	☒	5 5 5	10		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG	DIVISION: Mississippi Valley Division (MVD)	INSTALLATION: Memphis District (CEMVM)	SHEET 1 OF 5 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study	9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
	10. SIZE AND TYPE OF BIT: 4.5" Wing Bit
2. HOLE NUMBER: 182-BPT-11 — LOCATION COORDINATES: N 13,156,057.5 E 2,467,161.8	11. MANUFACTURER'S DESIGNATION OF DRILL: CME 75
3. DRILLING AGENCY: Tri-State Testing Services, Inc.	12. TOTAL SAMPLES: 32 — DISTURBED: 32 — UNDISTURBED: 0
4. NAME OF DRILLER: G. Baker	13. TOTAL NUMBER CORE BOXES: 0
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED — DEG FROM VERTICAL: --- — BEARING:	14. ELEVATION GROUND WATER: 246.5 3/10/11
	15. DATE BORING — STARTED: 3/10/11 — COMPLETED: 3/15/11
6. THICKNESS OF OVERBURDEN	16. ELEVATION TOP OF BORING: 253.5
7. DEPTH DRILLED INTO ROCK	17. TOTAL CORE RECOVERY FOR BORING: N/A
8. TOTAL DEPTH OF BORING: 190.0	18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	1 2 2	4		Lean Clay (CL) Gray & Brown, medium, Oxidized, Rootlets	100	1							27.2					
250.5	3.0																			
		☒	1 1 2	3		Fat Clay (CH) Gray & Brown, soft, Oxidized	100	2			79									
248.0	5.5														35.6					
		☒	2 2 2	4		Poorly-graded Sand (SP) Gray, Fine	100	3	0	99	1	0.174								
		☒	3 5 5	10		Poorly-graded Sand (SP) Gray, Fine	100	4	3	96	2	0.162								
		☒	3 6 8	14		Poorly-graded Sand (SP) Gray, Fine	100	5	0	98	1	0.164								
		☒	2 4 5	9		Poorly-graded Sand (SP) Gray, Fine	100	6	1	98	2	0.178								
		☒	3 4 5	9		Poorly-graded Sand (SP) Gray, Fine	100	7	0	98	2	0.169								
		☒	3 6 7	13		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	2 2 3	5		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	9												
		☒	2 3 3	6		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	10	1	99	1	0.172								
228.0	25.5																			
225.5	28.0	☒	6 10 15	25		Poorly-graded Sand (SP) Gray, Fine	100	11	1	94	5	0.154								
		☒	3 4 7	11		Poorly-graded Sand (SP) Gray, Fine	100	12	1	99	1	0.188								
		☒	3 7 11	18		Poorly-graded Sand (SP) Brown & Gray, Fine, Lignite Fragments	100	13	0	98	2	0.178								
		☒	3 5 6	11		Poorly-graded Sand (SP) Gray, Fine	100	14	0	99	1	0.169								

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,156,057.5 E 2,467,161.8

ELEVATION TOP OF BORING: 253.5

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	6 10 16	26		Poorly-graded Sand (SP) Gray, Fine	100	15												
		X	6 9 14	23		Poorly-graded Sand (SP) Gray, Fine	100	16												
		X	6 9 12	21		Poorly-graded Sand (SP) Gray, Medium	100	17	0	99	1	0.212								
		X	6 10 10	20		Poorly-graded Sand (SP) Gray & Brown, Medium	100	18	0	99	1	0.198								
		X	10 10 19	29		Poorly-graded Sand (SP) Brown, Medium	100	19	4	94	2	0.264								
		X	6 10 14	24		Poorly-graded Sand (SP) Gray, Medium	100	20	3	95	2	0.222								

35.0 37.5 40.0 42.5 45.0 47.5 50.0 52.5 55.0 57.5 60.0 62.5 65.0 67.5 70.0 72.5 75.0 77.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 3 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,156,057.5 E 2,467,161.8

ELEVATION TOP OF BORING: 253.5

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	1 3 3	6		Poorly-graded Sand (SP) Gray, Fine	100	21	14	83	3	0.094								
		X	8 10 10	20		Poorly-graded Sand (SP) Brown, Fine	100	22												
		X	7 12 13	25		Poorly-graded Sand (SP) Gray, Fine	100	23												
		X	9 9 18	27		Poorly-graded Sand (SP) Gray, Fine	100	24												
		X	1 2 13	15		Poorly-graded Sand (SP) Brown & Gray, Fine	100	25	0	98	2	0.138								

77.5 80.0 82.5 85.0 87.5 90.0 92.5 95.0 97.5 100.0 102.5 105.0 107.5 110.0 112.5 115.0 117.5 120.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 4 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,156,057.5 E 2,467,161.8

ELEVATION TOP OF BORING: 253.5

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	4 8 13	21		Poorly-graded Sand (SP) Gray, Fine	100	26	25	74	2	0.156								
		X	12 12 14	26		Poorly-graded Sand (SP) Brown, Medium	100	27	25	73	3	0.220								
		X	20 20 19	39		Poorly-graded Sand (SP) Brown	100	28	33	64	2	0.239								
98.5	155.0																			
		X	28 42 50	92		Poorly-graded Sand with Silt (SP-SM) Brown, Medium	100	29	22	72	6	0.139								

120.0 122.5 125.0 127.5 130.0 132.5 135.0 137.5 140.0 142.5 145.0 147.5 150.0 152.5 155.0 157.5 160.0 162.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 5 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,156,057.5 E 2,467,161.8

ELEVATION TOP OF BORING: 253.5

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
88.5	165.0																			
		X	16 16 16	32		Poorly-graded Sand (SP) Brown	100	30	31	65	4	0.205								
78.5	175.0																			
		X	16 28 40	68		Poorly-graded Sand with Silt (SP-SM) Brown	100	31	33	62	5	0.181								
68.5	185.0																			
		X	22 44 50	94		Poorly-graded Sand (SP) Light Gray, Fine	100	32												
63.5	190.0																			

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 183-BPL-11
LOCATION COORDINATES: N 13,155,705.1 E 2,466,807.0
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: J. Crawford
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 3.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 850
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 241.5 8/9/11
15. DATE BORING STARTED: 8/9/11 COMPLETED: 8/9/11
16. ELEVATION TOP OF BORING: 252.5
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
249.5	3.0	☒	1 1 1	2		Lean Clay (CL) Gray, very soft, Oxidized, Fine, Rootlets	100	1							19.7					
247.0	5.5	☒	2 1 1	2		Fat Clay (CH) Brown & Gray, very soft, Oxidized, Organic Matter	100	2					52	34	28.2					
244.5	8.0	☒	2 2 3	5		Lean Clay (CL) Brown & Gray, medium, Oxidized, Organic Matter	100	3					49	33	27.8					
242.0	10.5	☒	1 1 2	3		Lean Clay (CL) Sandy, Brown, soft	100	4			65				26.3					
239.5	13.0	☒	2 3 4	7		Clayey Sand (SC) Gray, Fine	100	5	0	87	13									
		☒	4 7 8	15		Poorly-graded Sand (SP) Gray, Fine	100	6	0	99	1	0.170								
		☒	5 7 9	16		Poorly-graded Sand (SP) Gray, Fine	100	7	0	97	3	0.154								
		☒	5 4 6	10		Poorly-graded Sand (SP) Gray, Fine	100	8	0	98	2	0.112								
		☒	4 4 8	12		Poorly-graded Sand (SP) Gray, Fine	100	9	0	98	2	0.121								
		☒	5 4 7	11		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	5 5 8	13		Poorly-graded Sand (SP) Gray, Fine	100	11												
222.5	30.0	☒	4 5 8	13		Poorly-graded Sand (SP) Gray, Medium	100	12												

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 184-BPL-11
LOCATION COORDINATES: N 13,155,363.7 E 2,466,442.3
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: J. Crawford
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 3.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 850
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 242.2 8/9/11
15. DATE BORING: STARTED 8/9/11 COMPLETED 8/9/11
16. ELEVATION TOP OF BORING: 253.2
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	1 2 2	4		Silt (ML) Brown, soft, Oxidized, Rootlets	100	1			55				17.3					
250.2	3.0																			
		☒	2 3 3	6		Silty Sand (SM) Brown, Fine	100	2	0	64	36									
		☒	2 3 4	7		Silty Sand (SM) Brown, Fine	100	3	0	74	26									
245.2	8.0																			
		☒	2 4 4	8		Clayey Sand (SC) Brown, Fine	100	4	0	65	35									
242.7	10.5																			
		☒	3 4 3	7		Poorly-graded Sand (SP) Brown & Gray, Fine	100	5	0	99	1	0.171								
		☒	4 4 5	9		Poorly-graded Sand (SP) Gray, Fine	100	6	0	99	1	0.170								
		☒	4 6 7	13		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	5 6 9	15		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	5 7 9	16		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	6 7 9	16		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	6 9 11	20		Poorly-graded Sand (SP) Gray, Fine	100	11												
		☒	7 9 10	19		Poorly-graded Sand (SP) Gray, Fine	100	12												
223.2	30.0																			

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 4 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 4.5" Wing Bit
2. HOLE NUMBER: 185-BPT-11
LOCATION COORDINATES: N 13,155,019.4 E 2,466,077.5
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 55
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
12. TOTAL SAMPLES: 29 DISTURBED: 29 UNDISTURBED: 0
4. NAME OF DRILLER: C. Herron
13. TOTAL NUMBER CORE BOXES: 0
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
14. ELEVATION GROUND WATER: 247.1 3/2/11
15. DATE BORING: STARTED 3/2/11 COMPLETED 3/2/11
6. THICKNESS OF OVERBURDEN:
16. ELEVATION TOP OF BORING: 253.1
7. DEPTH DRILLED INTO ROCK:
17. TOTAL CORE RECOVERY FOR BORING: N/A
8. TOTAL DEPTH OF BORING: 160.0
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	4 4 5	9		Lean Clay (CL) Gray & Brown, stiff, Oxidized	100	1							20.4					
		☒	3 5 6	11		Lean Clay (CL) Gray & Brown, stiff, Oxidized	100	2			43				19.7					
247.6	5.5																			
		☒	3 4 4	8		Poorly-graded Sand with Silt (SP-SM) Brown & Gray, Fine	100	3	0	94	6	0.083								
245.1	8.0																			
		☒	4 4 6	10		Poorly-graded Sand (SP) Gray, Fine	100	4	0	98	2	0.157								
		☒	5 5 6	11		Poorly-graded Sand (SP) Gray & Brown, Fine	100	5	0	99	1	0.166								
		☒	3 5 5	10		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	6	0	99	1	0.158								
		☒	3 3 4	7		Poorly-graded Sand (SP) Gray & Brown, Medium	100	7	1	98	1	0.186								
		☒	3 3 3	6		Poorly-graded Sand (SP) Brown, Fine	100	8												
		☒	3 5 4	9		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	6 9 14	23		Poorly-graded Sand (SP) Brown, Medium	100	10	0	98	2	0.244								
		☒	6 9 9	18		Poorly-graded Sand (SP) Gray, Medium	100	11	0	98	2	0.159								
		☒	5 13 13	26		Poorly-graded Sand (SP) Brown, Fine	100	12	0	96	4	0.133								
		☒	7 9 14	23		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	13	2	96	2	0.107								
		☒	6 10 12	22		Poorly-graded Sand (SP) Brown & Gray, Fine	100	14	0	97	3	0.154								

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 4 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,155,019.4 E 2,466,077.5

ELEVATION TOP OF BORING: 253.1

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	9 13 16	29		Poorly-graded Sand (SP) Brown & Gray, Medium	100	15												
		X	6 9 12	21		Poorly-graded Sand (SP) Gray, Medium	100	16												
		X	7 7 14	21		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	17	0	98	2	0.160								
		X	6 13 14	27		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	18	7	91	2	0.175								
		X	9 11 11	22		Poorly-graded Sand (SP) Brown, Medium	100	19	11	87	2	0.260								
		X	7 11 13	24		Poorly-graded Sand (SP) Brown, Medium	100	20	2	95	3	0.211								

35.0 37.5 40.0 42.5 45.0 47.5 50.0 52.5 55.0 57.5 60.0 62.5 65.0 67.5 70.0 72.5 75.0 77.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 3 OF 4 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,155,019.4 E 2,466,077.5

ELEVATION TOP OF BORING: 253.1

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	10 13 13	26		Poorly-graded Sand (SP) Gray & Brown, Medium	100	21	7	89	4	0.170								
		X	9 11 12	23		Poorly-graded Sand (SP) Brown, Medium	100	22	7	90	3	0.176								
		X	9 13 14	27		Poorly-graded Sand (SP) Brown, Medium	100	23	1	99	0	0.243								
		X	7 11 11	22		Poorly-graded Sand (SP) Brown, Fine	100	24												
138.1	115.0																			
		X	6 13 13	26		Poorly-graded Sand with Silt (SP-SM) Brown, Medium	100	25	14	81	5	0.171								

77.5 80.0 82.5 85.0 87.5 90.0 92.5 95.0 97.5 100.0 102.5 105.0 107.5 110.0 112.5 115.0 117.5 120.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 4 OF 4 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM | HORIZONTAL | VERTICAL

LOCATION COORDINATES: N 13,155,019.4 E 2,466,077.5

ELEVATION TOP OF BORING: 253.1

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
128.1	125.0																			
		X	7 11 12	23		Poorly-graded Sand (SP) Brown, Medium	100	26	8	90	2	0.272								
		X	8 9 13	22		Poorly-graded Sand (SP) Gray & Brown, Fine	100	27	5	90	4	0.159								
		X	11 17 21	38		Poorly-graded Sand (SP) Brown, Medium	100	28	28	69	3	0.173								
93.1	160.0	X	7 14 13	27		Poorly-graded Sand (SP) Brown, Medium	100	29	6	90	4	0.185								

120.0 122.5 125.0 127.5 130.0 132.5 135.0 137.5 140.0 142.5 145.0 147.5 150.0 152.5 155.0 157.5 160.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)	INSTALLATION: Memphis District (CEMVM)	SHEET 1 OF 1 SHEETS	
1. PROJECT: Below Piggott - West Bank SFB Seepage Study	9. COORDINATE SYSTEM:	HORIZONTAL:	VERTICAL:
	10. SIZE AND TYPE OF BIT: 3.25" ID		
2. HOLE NUMBER: 186-BPL-11	LOCATION COORDINATES: N 13,154,675.9 E 2,465,715.6	11. MANUFACTURER'S DESIGNATION OF DRILL: CME 850	
3. DRILLING AGENCY: Tri-State Testing Services, Inc.		12. TOTAL SAMPLES: 12	DISTURBED: 12 / UNDISTURBED: 0
4. NAME OF DRILLER: J. Crawford		13. TOTAL NUMBER CORE BOXES: 0	
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED	DEG FROM VERTICAL: --- / BEARING:	14. ELEVATION GROUND WATER: 241.4	8/10/11
		15. DATE BORING: STARTED 8/10/11	COMPLETED 8/10/11
6. THICKNESS OF OVERBURDEN		16. ELEVATION TOP OF BORING: 252.4	
7. DEPTH DRILLED INTO ROCK		17. TOTAL CORE RECOVERY FOR BORING: N/A	
8. TOTAL DEPTH OF BORING: 30.0		18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor	

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	2 2 2	4		Lean Clay (CL) Brown, soft, Organic Matter, Rootlets	100	1							14.9					
		☒	3 2 2	4		Lean Clay (CL) Brown, soft, Oxidized, Organic Matter	100	2							23.8					
246.9	5.5																			
		☒	1 1 2	3		Fat Clay (CH) Gray, soft	100	3					55	39	26.9					
244.4	8.0																			
		☒	2 2 3	5		Clayey Sand (SC) Gray, medium	100	4			31				25.3					
241.9	10.5																			
		☒	3 4 5	9		Poorly-graded Sand (SP) Gray, Fine	100	5	0	98	2	0.129								
		☒	5 6 6	12		Poorly-graded Sand (SP) Gray, Fine	100	6	1	96	3	0.106								
		☒	4 7 10	17		Poorly-graded Sand (SP) Gray, Fine	100	7	0	96	4	0.105								
		☒	5 4 4	8		Poorly-graded Sand (SP) Gray, Fine	100	8	0	99	1	0.157								
		☒	4 5 7	12		Poorly-graded Sand (SP) Gray, Fine	100	9	1	97	2	0.159								
		☒	8 9 11	20		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	5 10 11	21		Poorly-graded Sand (SP) Gray, Fine	100	11												
222.4	30.0	☒	10 11 10	21		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)	INSTALLATION: Memphis District (CEMVM)	SHEET 1 OF 1 SHEETS	
1. PROJECT: Below Piggott - West Bank SFB Seepage Study	9. COORDINATE SYSTEM:	HORIZONTAL:	VERTICAL:
	10. SIZE AND TYPE OF BIT: 3.25" ID		
2. HOLE NUMBER: 187-BPL-11	LOCATION COORDINATES: N 13,154,281.4 E 2,465,385.1	11. MANUFACTURER'S DESIGNATION OF DRILL: CME 850	
3. DRILLING AGENCY: Tri-State Testing Services, Inc.		12. TOTAL SAMPLES: 12	DISTURBED: 12 / UNDISTURBED: 0
4. NAME OF DRILLER: J. Crawford		13. TOTAL NUMBER CORE BOXES: 0	
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED	DEG FROM VERTICAL: --- / BEARING:	14. ELEVATION GROUND WATER: 244.0	8/10/11
		15. DATE BORING: STARTED 8/10/11	COMPLETED 8/10/11
6. THICKNESS OF OVERBURDEN		16. ELEVATION TOP OF BORING: 252.5	
7. DEPTH DRILLED INTO ROCK		17. TOTAL CORE RECOVERY FOR BORING: N/A	
8. TOTAL DEPTH OF BORING: 30.0		18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor	

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
			1 1 2	3		Lean Clay (CL) Gray, soft, Oxidized, Organic Matter	100	1							18.3					
249.5	3.0																			
			2 1 1	2		Fat Clay (CH) Gray, very soft, Oxidized, Rootlets	100	2					53	35	26.4					
247.0	5.5																			
			2 1 1	2		Clayey Sand (SC) Gray, very soft	100	3			55				36.1					
244.5	8.0																			
			2 2 2	4		Poorly-graded Sand (SP) Gray, Fine	100	4	0	99	1	0.173								
			3 3 4	7		Poorly-graded Sand (SP) Gray, Fine	100	5	0	99	1	0.155								
			2 3 3	6		Poorly-graded Sand (SP) Gray, Fine	100	6	0	99	1	0.160								
			1 2 4	6		Poorly-graded Sand (SP) Gray, Fine	100	7	0	98	2	0.160								
			2 3 5	8		Poorly-graded Sand (SP) Gray, Fine	100	8	0	99	0	0.190								
			2 4 5	9		Poorly-graded Sand (SP) Gray, Fine	100	9												
			7 8 8	16		Poorly-graded Sand (SP) Gray, Fine	100	10												
			5 7 8	15		Poorly-graded Sand (SP) Gray, Fine	100	11												
222.5	30.0		7 10 11	21		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 5 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 4.5" Wing Bit
2. HOLE NUMBER: 188-BPT-11
LOCATION COORDINATES: N 13,153,869.7 E 2,465,097.9
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 75
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
12. TOTAL SAMPLES: 31 DISTURBED: 31 UNDISTURBED: 0
4. NAME OF DRILLER: G. Baker
13. TOTAL NUMBER CORE BOXES: 0
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
14. ELEVATION GROUND WATER: 245.2 3/16/11
15. DATE BORING: STARTED 3/16/11 COMPLETED 3/17/11
6. THICKNESS OF OVERBURDEN:
16. ELEVATION TOP OF BORING: 253.2
7. DEPTH DRILLED INTO ROCK:
17. TOTAL CORE RECOVERY FOR BORING: N/A
8. TOTAL DEPTH OF BORING: 180.0
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
			1 1 1	2		Lean Clay (CL) Gray & Brown, soft, Oxidized, Rootlets	100	1							24.1					
250.2	3.0																			
			1 2 2	4		Clayey Sand (SC) Gray & Brown	100	2			48									
247.7	5.5														24.9					
			1 1 1	2		Poorly-graded Sand (SP) Gray, Fine	100	3	0	98	2	0.152								
			3 4 6	10		Poorly-graded Sand (SP) Brown & Gray, Medium, Lignite Fragments	100	4	1	98	1	0.197								
			1 2 2	4		Poorly-graded Sand (SP) Gray, Fine	100	5	0	99	1	0.161								
			3 4 6	10		Poorly-graded Sand (SP) Gray, Fine	100	6	0	97	3	0.113								
			4 5 6	11		Poorly-graded Sand (SP) Gray, Fine	100	7	0	98	2	0.166								
			2 4 4	8		Poorly-graded Sand (SP) Gray, Fine	100	8												
			4 5 6	11		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	9												
			3 4 7	11		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	10	1	95	4	0.118								
			1 2 2	4		Poorly-graded Sand (SP) Gray, Fine	100	11	0	96	4	0.097								
			3 4 7	11		Poorly-graded Sand (SP) Gray, Fine	100	12	0	98	2	0.169								
			3 6 9	15		Poorly-graded Sand (SP) Brown & Gray, Fine, Lignite Fragments	100	13	3	96	2	0.163								
			3 6 10	16		Poorly-graded Sand (SP) Brown, Fine	100	14	0	98	2	0.184								

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,153,869.7 E 2,465,097.9

ELEVATION TOP OF BORING: 253.2

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	3 9 6	15		Poorly-graded Sand (SP) Dark Gray, Fine, Lignite Fragments	100	15	1	97	2	0.166								
		X	3 6 7	13		Poorly-graded Sand (SP) Gray, Medium	100	16	0	99	1	0.221								
		X	6 9 12	21		Poorly-graded Sand (SP) Gray, Medium	100	17	0	98	2	0.191								
		X	5 5 10	15		Poorly-graded Sand (SP) Gray, Fine	100	18												
		X	7 14 16	30		Poorly-graded Sand (SP) Gray & Brown, Fine	100	19	0	98	2	0.177								
		X	6 10 11	21		Poorly-graded Sand (SP) Gray & Brown, Medium	100	20	1	97	2	0.191								

35.0 37.5 40.0 42.5 45.0 47.5 50.0 52.5 55.0 57.5 60.0 62.5 65.0 67.5 70.0 72.5 75.0 77.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 3 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,153,869.7 E 2,465,097.9

ELEVATION TOP OF BORING: 253.2

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	12 28 33	61		Poorly-graded Sand (SP) Brown, Medium	100	21	0	96	4	0.172								
164.2	89.0	X	4 2 2	4		Poorly-graded Sand (SP) Brown, Medium	100	22												
158.2	95.0																			
		X	12 22 33	55		Poorly-graded Sand (SP) Tan, Fine	100	23												
		X	5 8 9	17		Poorly-graded Sand (SP) Brown & Gray, Fine	100	24	4	94	2	0.181								
		X	9 9 8	17		Poorly-graded Sand (SP) Brown, Medium	100	25	20	79	2	0.250								

77.5 80.0 82.5 85.0 87.5 90.0 92.5 95.0 97.5 100.0 102.5 105.0 107.5 110.0 112.5 115.0 117.5 120.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 4 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,153,869.7 E 2,465,097.9

ELEVATION TOP OF BORING: 253.2

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	14 14 24	38		Poorly-graded Sand (SP) Brown, Medium	100	26	14	82	4	0.208								
		X	9 18 24	42		Poorly-graded Sand (SP) Brown, Fine	100	27	12	84	4	0.162								
		X	18 24 32	56		Poorly-graded Sand (SP) Brown	100	28	37	61	2	0.266								
		X	18 22 22	44		Poorly-graded Sand (SP) Brown, Medium	100	29	26	71	3	0.193								

120.0
122.5
125.0
127.5
130.0
132.5
135.0
137.5
140.0
142.5
145.0
147.5
150.0
152.5
155.0
157.5
160.0
162.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 5 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM | HORIZONTAL | VERTICAL

LOCATION COORDINATES: N 13,153,869.7 E 2,465,097.9

ELEVATION TOP OF BORING: 253.2

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
88.2	165.0																			
		X	7 12 32	44		Silty Sand (SM) Light Gray, Fine	100	30												
78.2	175.0																			
		X	12 26 40	66		Poorly-graded Sand (SP) Light Gray, Fine	100	31												
73.2	180.0																			

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 3.25" ID
2. HOLE NUMBER: 189-BPL-10
LOCATION COORDINATES: N 13,153,460.7 E 2,464,811.0
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 55
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
4. NAME OF DRILLER: M. Woolfolk
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 244.9 12/2/10
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
15. DATE BORING: STARTED 12/2/10 COMPLETED 12/2/10
6. THICKNESS OF OVERBURDEN:
16. ELEVATION TOP OF BORING: 253.4
7. DEPTH DRILLED INTO ROCK:
17. TOTAL CORE RECOVERY FOR BORING: N/A
8. TOTAL DEPTH OF BORING: 30.0
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
			3 4 4	8		Lean Clay (CL) Gray & Brown, medium, Oxidized, Organic Matter	100	1							17.2					
250.4	3.0																			
			5 7 8	15		Silty Sand (SM) Gray, Fine	100	2					NP	NP	12.4					
			4 5 5	10		Silty Sand (SM) Gray, Fine	100	3			29				26.6					
245.4	8.0																			
			3 5 8	13		Poorly-graded Sand (SP) Gray, Fine	100	4	1	98	1	0.161								
			4 3 4	7		Poorly-graded Sand (SP) Gray, Fine	100	5	3	96	1	0.127								
			5 5 4	9		Poorly-graded Sand (SP) Gray, Fine	100	6	0	99	1	0.125								
			6 7 5	12		Poorly-graded Sand (SP) Gray, Fine	100	7	0	97	3	0.110								
			6 6 4	10		Poorly-graded Sand (SP) Gray, Fine	100	8	0	98	2	0.113								
			5 5 5	10		Poorly-graded Sand (SP) Gray, Fine	100	9												
			7 4 5	9		Poorly-graded Sand (SP) Gray, Fine	100	10												
			7 7 6	13		Poorly-graded Sand (SP) Gray, Fine	100	11												
223.4	30.0		5 7 8	15		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 190-BPL-10
LOCATION COORDINATES: N 13,153,026.1 E 2,464,534.0
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: M. Woolfolk
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 3.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 55
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 249.5 12/2/10
15. DATE BORING: STARTED 12/2/10 COMPLETED 12/2/10
16. ELEVATION TOP OF BORING: 254.5
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
251.5	3.0	☒	4 3 4	7		Lean Clay (CL) Brown, medium	100	1							15.8					
249.0 ▼	5.5	☒	3 3 2	5		Poorly-graded Sand (SP) Gray, Fine	100	2	0	98	2	0.143								
246.5	8.0	☒	4 4 5	9		Poorly-graded Sand with Clay (SP-SC) Gray & Brown, stiff, Oxidized	100	3			10				26.5					
		☒	5 4 6	10		Poorly-graded Sand (SP) Gray, Fine	100	4	3	97	0	0.171								
		☒	5 5 6	11		Poorly-graded Sand (SP) Gray, Fine	100	5	0	99	0	0.170								
		☒	6 5 4	9		Poorly-graded Sand (SP) Gray, Fine	100	6	5	94	1	0.166								
		☒	5 6 5	11		Poorly-graded Sand (SP) Gray, Fine	100	7	0	100	0	0.164								
		☒	6 5 4	9		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	5 6 5	11		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	6 6 7	13		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	8 5 4	9		Poorly-graded Sand (SP) Gray, Fine	100	11												
224.5	30.0	☒	6 6 4	10		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 5 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 191-BPT-11
LOCATION COORDINATES: N 13,152,638.2 E 2,464,241.6
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: G. Baker
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 170.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 4.5" Wing Bit
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 75
12. TOTAL SAMPLES: 30 DISTURBED: 30 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 247.2 3/22/11
15. DATE BORING: STARTED 3/22/11 COMPLETED 3/24/11
16. ELEVATION TOP OF BORING: 253.2
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
250.2	3.0	☒	1 2 3	5		Lean Clay (CL)	100	1							27.6					
247.7	5.5	☒	1 2 2	4		Clayey Sand (SC)	100	2			48				29.3					
		☒	1 1 1	2		Poorly-graded Sand (SP)	100	3	1	97	2	0.150								
		☒	2 2 4	6		Poorly-graded Sand (SP)	100	4	0	98	2	0.157								
		☒	2 3 5	8		Poorly-graded Sand (SP)	100	5	0	99	1	0.165								
		☒	2 3 6	9		Poorly-graded Sand (SP)	100	6	0	97	3	0.153								
		☒	2 3 3	6		Poorly-graded Sand (SP)	100	7	0	99	1	0.155								
		☒	3 4 7	11		Poorly-graded Sand (SP)	100	8	1	98	1	0.214								
		☒	3 6 6	12		Poorly-graded Sand (SP)	100	9												
		☒	6 7 10	17		Poorly-graded Sand (SP)	100	10												
		☒	6 8 8	16		Poorly-graded Sand (SP)	100	11	0	98	1	0.176								
		☒	2 3 6	9		Poorly-graded Sand (SP)	100	12	0	99	1	0.195								
		☒	2 8 12	20		Poorly-graded Sand (SP)	100	13	2	96	2	0.184								
		☒	2 3 8	11		Poorly-graded Sand (SP)	100	14	0	99	1	0.219								

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,152,638.2 E 2,464,241.6

ELEVATION TOP OF BORING: 253.2

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	4 4 8	12		Poorly-graded Sand (SP)	100	15	1	98	1	0.283								
		X	8 14 24	38		Poorly-graded Sand (SP)	100	16												
		X	12 22 24	46		Poorly-graded Sand (SP)	100	17												
		X	4 8 10	18		Poorly-graded Sand (SP)	100	18	3	96	1	0.310								
		X	4 8 11	19		Poorly-graded Sand (SP)	100	19	11	88	1	0.230								
		X	3 7 12	19		Poorly-graded Sand (SP)	100	20	0	99	1	0.171								

35.0 37.5 40.0 42.5 45.0 47.5 50.0 52.5 55.0 57.5 60.0 62.5 65.0 67.5 70.0 72.5 75.0 77.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 3 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,152,638.2 E 2,464,241.6

ELEVATION TOP OF BORING: 253.2

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	4 7 9	16		Poorly-graded Sand (SP)	100	21	2	97	2	0.183								
		X	5 12 20	32		Poorly-graded Sand (SP)	100	22	9	89	2	0.237								
		X	4 7 10	17		Poorly-graded Sand (SP)	100	23	2	97	1	0.252								
		X	4 9 11	20		Poorly-graded Sand (SP)	100	24												
		X	16 22 24	46		Poorly-graded Sand (SP)	100	25	9	88	3	0.205								

77.5 80.0 82.5 85.0 87.5 90.0 92.5 95.0 97.5 100.0 102.5 105.0 107.5 110.0 112.5 115.0 117.5 120.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 4 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,152,638.2 E 2,464,241.6

ELEVATION TOP OF BORING: 253.2

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
			17 20 23	43		Poorly-graded Sand (SP)	100	26	16	80	4	0.200								
			8 14 9	23		Poorly-graded Sand (SP)	100	27	19	79	2	0.309								
108.2	145.0																			
			30 40 42	82		Poorly-graded Sand with Silt (SP-SM)	100	28	43	52	5	0.164								
98.2	155.0																			
			30 50	50 /		Poorly-graded Gravel (GP)	100	29	51	46	4	0.211								

120.0
122.5
125.0
127.5
130.0
132.5
135.0
137.5
140.0
142.5
145.0
147.5
150.0
152.5
155.0
157.5
160.0
162.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)		SHEET 5 OF 5 SHEETS
PROJECT: Below Piggott - West Bank SFB Seepage Study	COORDINATE SYSTEM: HORIZONTAL: VERTICAL:	
LOCATION COORDINATES: N 13,152,638.2 E 2,464,241.6	ELEVATION TOP OF BORING: 253.2	

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
88.2	165.0																			
83.2	170.0	X	7 8 11	19		Fat Clay (CH)	100	30												

162.5
165.0
167.5
170.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)	INSTALLATION: Memphis District (CEMVM)	SHEET 1 OF 1 SHEETS
1. PROJECT: Below Piggott - West Bank SFB Seepage Study	9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:	
	10. SIZE AND TYPE OF BIT: 3.25" ID	
2. HOLE NUMBER: 192-BPL-10 — LOCATION COORDINATES: N 13,152,318.3 E 2,463,875.8	11. MANUFACTURER'S DESIGNATION OF DRILL: CME 55	
3. DRILLING AGENCY: Tri-State Testing Services, Inc.	12. TOTAL SAMPLES: 12 — DISTURBED: 12 — UNDISTURBED: 0	
4. NAME OF DRILLER: M. Woolfolk	13. TOTAL NUMBER CORE BOXES: 0	
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED — DEG FROM VERTICAL: --- — BEARING:	14. ELEVATION GROUND WATER: 245.4 12/2/10	
	15. DATE BORING — STARTED: 12/2/10 — COMPLETED: 12/2/10	
6. THICKNESS OF OVERBURDEN	16. ELEVATION TOP OF BORING: 252.9	
7. DEPTH DRILLED INTO ROCK	17. TOTAL CORE RECOVERY FOR BORING: N/A	
8. TOTAL DEPTH OF BORING: 30.0	18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor	

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	5 4 4	8		Fat Clay (CH) Gray, medium, Oxidized	100	1							24.1					
		☒	4 3 3	6		Fat Clay (CH) Gray, medium	100	2					46	27	26.7					
247.4	5.5																			
		☒	2 3 3	6		Lean Clay (CL) Gray, medium	100	3			21				31.5					
244.9	8.0																			
		☒	2 4 5	9		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	4	0	94	6	0.083								
242.4	10.5																			
		☒	3 4 3	7		Poorly-graded Sand (SP) Gray, Fine	100	5	0	98	2	0.119								
		☒	5 6 4	10		Poorly-graded Sand (SP) Gray, Fine	100	6	1	97	3	0.126								
		☒	6 6 4	10		Poorly-graded Sand (SP) Gray, Fine	100	7	0	98	2	0.144								
		☒	5 7 6	13		Poorly-graded Sand (SP) Gray, Fine	100	8	1	99	1	0.157								
		☒	5 5 7	12		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	4 7 7	14		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	8 6 5	11		Poorly-graded Sand (SP) Gray, Fine	100	11												
222.9	30.0	☒	6 6 7	13		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 193-BPL-10
LOCATION COORDINATES: N 13,152,151.2 E 2,463,454.3
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: M. Woolfolk
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 3.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 55
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 247.2 12/1/10
15. DATE BORING: STARTED 12/1/10 COMPLETED 12/1/10
16. ELEVATION TOP OF BORING: 254.2
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
			4 5 9	14		Lean Clay (CL) Brown, stiff	100	1							16.8					
251.2	3.0																			
			4 5 4	9		Silty Sand (SM) Light Brown	100	2			21									
248.7	5.5																			
			4 5 5	10		Poorly-graded Sand (SP) Brown, Fine	100	3	8	90	2	0.164								
			5 11 10	21		Poorly-graded Sand (SP) Brown, Fine	100	4	0	96	4	0.093								
			3 5 8	13		Poorly-graded Sand (SP) Gray, Fine	100	5	0	98	2	0.104								
			4 4 4	8		Poorly-graded Sand (SP) Gray, Fine	100	6	0	98	2	0.109								
			5 6 4	10		Poorly-graded Sand (SP) Gray, Fine	100	7	1	97	3	0.110								
			4 7 5	12		Poorly-graded Sand (SP) Gray, Fine	100	8												
			5 6 6	12		Poorly-graded Sand (SP) Gray, Fine	100	9												
			5 7 4	11		Poorly-graded Sand (SP) Gray, Fine	100	10												
			6 6 4	10		Poorly-graded Sand (SP) Gray, Fine	100	11												
224.2	30.0		4 7 4	11		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)

INSTALLATION: Memphis District (CEMVM)

SHEET 1 OF 5 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study

9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

10. SIZE AND TYPE OF BIT: 4.5" Wing Bit

2. HOLE NUMBER: 194-BPT-11

LOCATION COORDINATES: N 13,151,977.9 E 2,462,970.9

11. MANUFACTURER'S DESIGNATION OF DRILL: CME 75

3. DRILLING AGENCY: Tri-State Testing Services, Inc.

12. TOTAL SAMPLES: 30 DISTURBED: 30 UNDISTURBED: 0

4. NAME OF DRILLER: G. Baker

13. TOTAL NUMBER CORE BOXES: 0

5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:

14. ELEVATION GROUND WATER: 246.7 3/29/11

15. DATE BORING: STARTED 3/29/11 COMPLETED 3/31/11

6. THICKNESS OF OVERBURDEN:

16. ELEVATION TOP OF BORING: 253.7

7. DEPTH DRILLED INTO ROCK:

17. TOTAL CORE RECOVERY FOR BORING: N/A

8. TOTAL DEPTH OF BORING: 170.0

18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
250.7	3.0	☒	2 3 3	6		Silty Sand (SM) Brown, Oxidized, Fine, Rootlets	100	1			37									
		☒	2 3 2	5		Lean Clay (CL) Brown, medium, Fine, Rootlets	100	2							24.0					
245.7	8.0	☒	1 1 1	2		Lean Clay (CL) Gray, soft	100	3					38	22						
		☒	1 3 3	6		Poorly-graded Sand (SP) Gray, Fine	100	4	0	97	3	0.109			39.1					
		☒	1 2 5	7		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	5	1	98	1	0.164								
		☒	4 5 5	10		Poorly-graded Sand (SP) Brown & Gray, Fine	100	6	0	98	2	0.160								
		☒	4 5 6	11		Poorly-graded Sand (SP) Brown & Gray, Fine	100	7	0	99	1	0.181								
		☒	4 4 4	8		Poorly-graded Sand (SP) Gray, Fine	100	8	1	98	1	0.155								
		☒	2 3 4	7		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	4 4 5	9		Poorly-graded Sand (SP) Gray, Fine	100	10												
225.7	28.0	☒	2 3 3	6		Poorly-graded Sand (SP) Gray, Fine	100	11	0	97	3	0.084								
		☒	2 2 2	4		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	12	0	95	5	0.084								
220.7	33.0	☒	3 4 5	9		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	13	3	90	7	0.079								
		☒	5 9 12	21		Poorly-graded Sand (SP) Gray, Medium	100	14	4	94	2	0.198								

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,151,977.9 E 2,462,970.9

ELEVATION TOP OF BORING: 253.7

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	5 7 11	18		Poorly-graded Sand (SP) Gray, Medium	100	15	5	94	1	0.248								
		X	3 7 8	15		Poorly-graded Sand (SP) Gray, Fine	100	16												
		X	6 9 12	21		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	17												
		X	3 6 12	18		Poorly-graded Sand (SP) Gray, Fine	100	18	6	92	2	0.143								
		X	6 9 15	24		Poorly-graded Sand (SP) Gray, Medium	100	19	7	91	2	0.194								
		X	5 10 16	26		Poorly-graded Sand (SP) Gray, Medium	100	20	2	96	2	0.196								

35.0 37.5 40.0 42.5 45.0 47.5 50.0 52.5 55.0 57.5 60.0 62.5 65.0 67.5 70.0 72.5 75.0 77.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 3 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,151,977.9 E 2,462,970.9

ELEVATION TOP OF BORING: 253.7

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
			6 11 16	27		Poorly-graded Sand (SP) Gray, Fine	100	21	0	98	2	0.168								
			5 15 23	38		Poorly-graded Sand (SP) Gray, Fine	100	22	0	97	3	0.156								
			6 8 10	18		Poorly-graded Sand (SP) Gray, Medium	100	23	6	93	2	0.215								
			10 12 23	35		Poorly-graded Sand (SP) Gray, Fine	100	24												
			12 23 24	47		Poorly-graded Sand (SP) Tan, Fine	100	25	2	95	4	0.179								

77.5 80.0 82.5 85.0 87.5 90.0 92.5 95.0 97.5 100.0 102.5 105.0 107.5 110.0 112.5 115.0 117.5 120.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 4 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,151,977.9 E 2,462,970.9

ELEVATION TOP OF BORING: 253.7

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	6 10 17	27		Poorly-graded Sand (SP) Tan, Fine	100	26	7	90	3	0.188								
		X	17 9 7	16		Poorly-graded Sand (SP) Brown, Medium	100	27	24	73	3	0.256								
		X	8 11 18	29		Poorly-graded Sand (SP) Brown, Medium	100	28	19	77	4	0.196								
		X	50	50 /		Poorly-graded Sand (SP) Brown, Medium	100	29	36	60	4	0.197								

120.0 122.5 125.0 127.5 130.0 132.5 135.0 137.5 140.0 142.5 145.0 147.5 150.0 152.5 155.0 157.5 160.0 162.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)		SHEET 5 OF 5 SHEETS
PROJECT: Below Piggott - West Bank SFB Seepage Study	COORDINATE SYSTEM: HORIZONTAL: VERTICAL	
LOCATION COORDINATES: N 13,151,977.9 E 2,462,970.9	ELEVATION TOP OF BORING: 253.7	

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
88.7	165.0																			
83.7	170.0		30 49 48	97		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	30	1	93	7	0.079								

162.5
165.0
167.5
170.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)

INSTALLATION: Memphis District (CEMVM)

SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study

2. HOLE NUMBER: 195-BPL-10

LOCATION COORDINATES: N 13,151,795.8 E 2,462,516.4

3. DRILLING AGENCY: Tri-State Testing Services, Inc.

4. NAME OF DRILLER: M. Woolfolk

5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:

6. THICKNESS OF OVERBURDEN:

7. DEPTH DRILLED INTO ROCK:

8. TOTAL DEPTH OF BORING: 30.0

9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

10. SIZE AND TYPE OF BIT: 3.25" ID

11. MANUFACTURER'S DESIGNATION OF DRILL: CME 55

12. TOTAL SAMPLES: 12; DISTURBED: 12; UNDISTURBED: 0

13. TOTAL NUMBER CORE BOXES: 0

14. ELEVATION GROUND WATER: 244.4 12/1/10

15. DATE BORING: STARTED 12/1/10; COMPLETED 12/1/10

16. ELEVATION TOP OF BORING: 252.4

17. TOTAL CORE RECOVERY FOR BORING: N/A

18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	7 4 4	8		Fat Clay (CH) Brown & Gray, medium	100	1							26.2					
		☒	4 4 4	8		Fat Clay (CH) Gray & Brown, medium	100	2					59	41	28.2					
246.9	5.5																			
		☒	4 5 5	10		Lean Clay (CL) Gray & Brown, stiff	100	3			43				37.8					
244.4 ▼	8.0																			
		☒	3 3 5	8		Poorly-graded Sand (SP) Gray, Fine, Rootlets	100	4	0	99	1	0.159								
		☒	4 5 4	9		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	5	2	97	1	0.126								
		☒	5 6 7	13		Poorly-graded Sand (SP) Gray, Fine	100	6	0	99	1	0.116								
		☒	5 5 6	11		Poorly-graded Sand (SP) Gray, Fine	100	7	0	99	1	0.153								
		☒	6 6 4	10		Poorly-graded Sand (SP) Gray, Fine	100	8	0	99	1	0.157								
		☒	7 4 5	9		Poorly-graded Sand (SP) Gray	100	9												
		☒	6 6 5	11		Poorly-graded Sand (SP) Gray	100	10												
		☒	4 4 5	9		Poorly-graded Sand (SP) Gray	100	11												
222.4	30.0	☒	6 7 6	13		Poorly-graded Sand (SP) Gray	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)	INSTALLATION: Memphis District (CEMVM)	SHEET 1 OF 1 SHEETS	
1. PROJECT: Below Piggott - West Bank SFB Seepage Study	9. COORDINATE SYSTEM:	HORIZONTAL:	VERTICAL:
	10. SIZE AND TYPE OF BIT: 3.25" ID		
2. HOLE NUMBER: 196-BPL-10	LOCATION COORDINATES: N 13,151,605.9 E 2,462,030.2	11. MANUFACTURER'S DESIGNATION OF DRILL: CME 55	
3. DRILLING AGENCY: Tri-State Testing Services, Inc.		12. TOTAL SAMPLES: 12	DISTURBED: 12 / UNDISTURBED: 0
4. NAME OF DRILLER: M. Woolfolk		13. TOTAL NUMBER CORE BOXES: 0	
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED	DEG FROM VERTICAL: --- / BEARING:	14. ELEVATION GROUND WATER: 245.0	12/1/10
		15. DATE BORING: STARTED 12/1/10	COMPLETED 12/1/10
6. THICKNESS OF OVERBURDEN:		16. ELEVATION TOP OF BORING: 252.5	
7. DEPTH DRILLED INTO ROCK:		17. TOTAL CORE RECOVERY FOR BORING: N/A	
8. TOTAL DEPTH OF BORING: 30.0		18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor	

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
			4 4 4	8		Lean Clay (CL) Gray & Brown, medium	100	1							17.5					
249.5	3.0																			
			3 3 5	8		Clayey Sand (SC) Brown	100	2	0	67	33									
			9 7 6	13		Clayey Sand (SC) Brown & Gray	100	3			33				25.5					
244.5	8.0																			
			6 5 3	8		Poorly-graded Sand (SP) Gray, Fine	100	4	0	97	3	0.113								
			4 5 4	9		Poorly-graded Sand (SP) Gray, Fine	100	5	0	98	2	0.152								
			3 3 3	6		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	6	0	99	1	0.165								
			4 3 5	8		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	7	0	99	1	0.169								
			5 6 6	12		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	8												
			4 5 7	12		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	9												
			3 3 5	8		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	10												
			6 5 3	8		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	11												
224.5	28.0																			
			6 5 4	9		Silty Sand (SM) Gray, Lignite Fragments	100	12												
222.5	30.0																			

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)	INSTALLATION: Memphis District (CEMVM)	SHEET 1 OF 5 SHEETS	
1. PROJECT: Below Piggott - West Bank SFB Seepage Study	9. COORDINATE SYSTEM	HORIZONTAL	VERTICAL
	10. SIZE AND TYPE OF BIT: 4.5" Wing Bit		
2. HOLE NUMBER: 197-BPT-11 — LOCATION COORDINATES: N 13,151,441.0 E 2,461,573.8	11. MANUFACTURER'S DESIGNATION OF DRILL: CME 75		
3. DRILLING AGENCY: Tri-State Testing Services, Inc.	12. TOTAL SAMPLES: 31	DISTURBED: 31	UNDISTURBED: 0
4. NAME OF DRILLER: G. Baker	13. TOTAL NUMBER CORE BOXES: 0		
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED — DEG FROM VERTICAL: --- — BEARING:	14. ELEVATION GROUND WATER: 250.5 4/1/11		
	15. DATE BORING	STARTED: 4/1/11	COMPLETED: 4/20/11
6. THICKNESS OF OVERBURDEN	16. ELEVATION TOP OF BORING: 254.0		
7. DEPTH DRILLED INTO ROCK	17. TOTAL CORE RECOVERY FOR BORING: N/A		
8. TOTAL DEPTH OF BORING: 180.0	18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor		

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	1 3 3	6		Silty Sand (SM) Brown, Fine	100	1												
		☒	1 2 3	5		Silty Sand (SM) Brown, Oxidized, Fine	100	2	0	70	30									
		☒	1 3 3	6		Silty Sand (SM) Brown, Fine	100	3	0	85	15									
246.0	8.0																			
		☒	1 1 1	2		Poorly-graded Sand with Silt (SP-SM) Brown, Fine	100	4	0	88	12									
243.5	10.5																			
		☒	2 3 1	4		Silty Sand (SM) Gray & Brown, Fine	100	5			14									
241.0	13.0																			
		☒	1 2 3	5		Poorly-graded Sand (SP) Brown, Medium	100	6	1	99	1	0.210								
		☒	2 3 1	4		Poorly-graded Sand (SP) Brown, Fine	100	7	0	99	1	0.201								
		☒	1 3 5	8		Poorly-graded Sand (SP) Gray, Fine	100	8	1	98	1	0.157								
		☒	4 8 10	18		Poorly-graded Sand (SP) Gray, Fine	100	9	3	97	0	0.185								
		☒	5 10 13	23		Poorly-graded Sand (SP) Gray, Fine	100	10	0	98	2	0.165								
228.5	25.5																			
		☒	5 10 12	22		Poorly-graded Sand with Silt (SP-SM) Gray, Fine, Lignite Fragments	100	11	1	93	6	0.091								
226.0	28.0																			
		☒	4 5 7	12		Poorly-graded Sand (SP) Gray, Fine	100	12	0	98	2	0.138								
		☒	4 7 8	15		Poorly-graded Sand (SP) Gray, Fine	100	13												
		☒	2 2 7	9		Poorly-graded Sand (SP) Gray, Fine	100	14												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,151,441.0 E 2,461,573.8

ELEVATION TOP OF BORING: 254.0

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	5 9 10	19		Poorly-graded Sand (SP) Gray, Fine	100	15	0	98	2	0.166								
		X	7 10 10	20		Poorly-graded Sand (SP) Gray, Fine	100	16	0	99	1	0.160								
		X	5 7 9	16		Poorly-graded Sand (SP) Gray, Fine	100	17												
		X	7 9 12	21		Poorly-graded Sand (SP) Gray, Medium, Lignite Fragments	100	18	7	91	2	0.216								
		X	7 9 13	22		Poorly-graded Sand (SP) Gray, Medium	100	19	0	98	1	0.253								
		X	8 15 15	30		Poorly-graded Sand (SP) Gray, Fine	100	20	0	96	4	0.095								

35.0 37.5 40.0 42.5 45.0 47.5 50.0 52.5 55.0 57.5 60.0 62.5 65.0 67.5 70.0 72.5 75.0 77.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 3 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM | HORIZONTAL | VERTICAL

LOCATION COORDINATES: N 13,151,441.0 E 2,461,573.8

ELEVATION TOP OF BORING: 254.0

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	6 18 22	40		Poorly-graded Sand (SP) Gray, Medium	100	21	0	97	3	0.182								
		X	6 15 25	40		Poorly-graded Sand (SP) Brown	100	22	66	33	2	0.323								
		X	3 15 20	35		Poorly-graded Sand (SP) Gray, Fine	100	23												
149.0	105.0																			
145.0	109.0	X	7 11 13	24		Fat Clay (CH) Gray, medium	100	24												
		X	8 12 14	26		Poorly-graded Sand (SP) Brown, Medium	100	25	30	67	3	0.181								

77.5 80.0 82.5 85.0 87.5 90.0 92.5 95.0 97.5 100.0 102.5 105.0 107.5 110.0 112.5 115.0 117.5 120.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 4 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,151,441.0 E 2,461,573.8

ELEVATION TOP OF BORING: 254.0

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	7 11 21	32		Poorly-graded Sand (SP) Brown	100	26	48	49	3	0.266								
		X	50	50 /		Poorly-graded Sand (SP) Brown	100	27	39	57	4	0.294								
		X	11 15 26	41		Poorly-graded Sand (SP) Brown, Medium	100	28	23	74	4	0.190								
		X	35 50	50 /		Poorly-graded Sand (SP) Brown	100	29	45	51	3	0.248								

120.0
122.5
125.0
127.5
130.0
132.5
135.0
137.5
140.0
142.5
145.0
147.5
150.0
152.5
155.0
157.5
160.0
162.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)		SHEET 5 OF 5 SHEETS
PROJECT: Below Piggott - West Bank SFB Seepage Study	COORDINATE SYSTEM: HORIZONTAL: VERTICAL:	
LOCATION COORDINATES: N 13,151,441.0 E 2,461,573.8	ELEVATION TOP OF BORING: 254.0	

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
89.0	165.0																			
		X	8 9 9	18		Lean Clay (CL) Gray, very stiff	100	30												
74.0	180.0	X	4 5 5	10		Lean Clay (CL) Gray, stiff	100	31												

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION	Mississippi Valley Division (MVD)
INSTALLATION	Memphis District (CEMVM)
SHEET	1 OF 1 SHEETS
1. PROJECT	Below Piggott - West Bank SFB Seepage Study
9. COORDINATE SYSTEM	HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT	3.25" ID
2. HOLE NUMBER	198-BPL-10
LOCATION COORDINATES	N 13,151,258.8 E 2,461,124.5
11. MANUFACTURER'S DESIGNATION OF DRILL	CME 55
3. DRILLING AGENCY	Tri-State Testing Services, Inc.
12. TOTAL SAMPLES	12 (DISTURBED 12, UNDISTURBED 0)
4. NAME OF DRILLER	M. Woolfolk
13. TOTAL NUMBER CORE BOXES	0
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
14. ELEVATION GROUND WATER	246.0 11/30/10
15. DATE BORING	STARTED 11/30/10 COMPLETED 11/30/10
6. THICKNESS OF OVERBURDEN	
16. ELEVATION TOP OF BORING	254.0
7. DEPTH DRILLED INTO ROCK	
17. TOTAL CORE RECOVERY FOR BORING	N/A
8. TOTAL DEPTH OF BORING	30.0
18. SIGNATURE AND TITLE OF INSPECTOR	Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
251.0	3.0	☒	5 5 4	9		Lean Clay (CL) Brown & Gray, stiff	100	1							18.8					
248.5	5.5	☒	4 4 6	10		Poorly-graded Sand (SP) Gray & Brown, Fine	100	2	0	78	22									
246.0 ▼	8.0	☒	5 5 5	10		Lean Clay (CL) Brown & Gray, stiff	100	3			31				21.7					
243.5	10.5	☒	4 5 9	14		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	4	0	94	6	0.091								
		☒	6 6 4	10		Poorly-graded Sand (SP) Gray, Fine	100	5	1	96	3	0.172								
		☒	5 4 6	10		Poorly-graded Sand (SP) Gray, Fine	100	6	0	99	1	0.184								
		☒	4 4 5	9		Poorly-graded Sand (SP) Gray, Fine	100	7	0	99	1	0.171								
		☒	3 5 7	12		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	8												
		☒	4 4 4	8		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	6 5 5	10		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	10												
226.0	28.0	☒	7 2 8	10		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	11												
224.0	30.0	☒	6 8 6	14		Poorly-graded Sand with Clay (SP-SC) Gray, Fine, Lignite Fragments	100	12												

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)

INSTALLATION: Memphis District (CEMVM)

SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study

9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

10. SIZE AND TYPE OF BIT: 3.25" ID

2. HOLE NUMBER: 199-BPL-10

LOCATION COORDINATES: N 13,151,076.8 E 2,460,644.9

11. MANUFACTURER'S DESIGNATION OF DRILL: CME 55

3. DRILLING AGENCY: Tri-State Testing Services, Inc.

12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0

4. NAME OF DRILLER: M. Woolfolk

13. TOTAL NUMBER CORE BOXES: 0

5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:

14. ELEVATION GROUND WATER: 245.3 11/30/10

15. DATE BORING: STARTED 11/30/10 COMPLETED 11/30/10

6. THICKNESS OF OVERBURDEN:

16. ELEVATION TOP OF BORING: 253.3

7. DEPTH DRILLED INTO ROCK:

17. TOTAL CORE RECOVERY FOR BORING: N/A

8. TOTAL DEPTH OF BORING: 30.0

18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
250.3	3.0	☒	7 9 10	19		Lean Clay (CL) Brown & Gray, medium, Rootlets	100	1							15.2					
		☒	6 7 8	15		Clayey Sand (SC) Gray & Brown	100	2	0	38	62									
245.3 ▼	8.0	☒	8 9 9	18		Clayey Sand (SC) Gray & Brown, Fine	100	3			44				19.3					
		☒	3 3 4	7		Poorly-graded Sand (SP) Gray & Brown, Fine	100	4	3	93	4	0.096								
		☒	4 4 5	9		Poorly-graded Sand (SP) Gray, Fine	100	5	3	95	1	0.159								
		☒	7 9 9	18		Poorly-graded Sand (SP) Gray, Fine	100	6	0	96	4	0.160								
		☒	11 10 12	22		Poorly-graded Sand (SP) Brown & Gray, Fine	100	7	2	95	3	0.139								
		☒	7 8 7	15		Poorly-graded Sand (SP) Brown & Gray	100	8												
		☒	6 9 8	17		Poorly-graded Sand (SP) Brown & Gray	100	9												
		☒	5 7 9	16		Poorly-graded Sand (SP) Brown & Gray	100	10												
		☒	6 6 8	14		Poorly-graded Sand (SP) Brown & Gray	100	11												
223.3	30.0	☒	8 8 7	15		Poorly-graded Sand (SP) Brown & Gray	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 5 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 200-BPT-11
LOCATION COORDINATES: N 13,150,899.8 E 2,460,172.2
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: G. Baker
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 170.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 4.5" Wing Bit
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 75
12. TOTAL SAMPLES: 30 DISTURBED: 30 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 246.5 4/21/11
15. DATE BORING: STARTED 4/21/11 COMPLETED 4/22/11
16. ELEVATION TOP OF BORING: 251.0
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	1 1 2	3		Lean Clay (CL) Gray, soft, Rootlets	100	1							29.3					
		☒	1 1 2	3		Lean Clay (CL) Gray, soft, Rootlets	100	2			40				35.8					
245.5	5.5																			
		☒	1 2 2	4		Poorly-graded Sand with Clay (SP-SC) Gray, Fine	100	3	3	91	5	0.098								
243.0	8.0																			
		☒	2 2 4	6		Poorly-graded Sand (SP) Gray, Fine	100	4	1	97	2	0.161								
		☒	2 4 6	10		Poorly-graded Sand (SP) Gray, Fine	100	5	0	99	1	0.196								
		☒	2 3 4	7		Poorly-graded Sand (SP) Gray, Medium, Organic Matter	100	6	1	98	1	0.238								
		☒	3 3 4	7		Poorly-graded Sand (SP) Gray, Fine	100	7	0	98	2	0.170								
		☒	1 2 4	6		Poorly-graded Sand (SP) Gray, Medium	100	8	0	98	1	0.226								
		☒	3 4 7	11		Poorly-graded Sand (SP) Gray, Fine	100	9	0	98	2	0.170								
		☒	3 6 8	14		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	3 8 8	16		Poorly-graded Sand (SP) Gray, Fine	100	11	0	98	2	0.175								
		☒	3 4 7	11		Poorly-graded Sand (SP) Gray, Fine	100	12	0	98	2	0.148								
		☒	3 6 8	14		Poorly-graded Sand (SP) Gray, Medium	100	13	2	96	2	0.179								
		☒	6 10 13	23		Poorly-graded Sand (SP) Gray, Medium	100	14	1	96	3	0.188								

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,150,899.8 E 2,460,172.2

ELEVATION TOP OF BORING: 251.0

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	4 8 9	17		Poorly-graded Sand (SP) Gray, Medium	100	15	2	96	2	0.208								
		X	4 7 9	16		Poorly-graded Sand (SP) Gray, Fine	100	16	0	98	2	0.185								
		X	5 6 11	17		Poorly-graded Sand (SP) Gray, Medium	100	17	0	98	2	0.283								
		X	6 12 18	30		Poorly-graded Sand (SP) Gray, Medium	100	18												
		X	8 12 17	29		Poorly-graded Sand (SP) Gray, Medium	100	19	0	98	2	0.286								
		X	4 10 11	21		Poorly-graded Sand (SP) Gray, Medium, Lignite Fragments	100	20	4	94	2	0.197								

35.0 37.5 40.0 42.5 45.0 47.5 50.0 52.5 55.0 57.5 60.0 62.5 65.0 67.5 70.0 72.5 75.0 77.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 3 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,150,899.8 E 2,460,172.2

ELEVATION TOP OF BORING: 251.0

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	4 6 14	20		Poorly-graded Sand (SP) Gray, Fine	100	21												
		X	4 8 11	19		Poorly-graded Sand (SP) Gray, Medium	100	22	45	52	3	0.272								
		X	7 16 25	41		Poorly-graded Sand (SP) Gray, Fine, Clay Strata or Lenses	100	23	11	84	4	0.153								
146.0	105.0																			
		X	24 40 50	90		Poorly-graded Sand with Silt (SP-SM) Brown, Medium	100	24	24	70	5	0.156								
136.0	115.0																			
		X	6 28 32	60		Poorly-graded Sand (SP) Brown, Medium	100	25	17	79	4	0.167								

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 4 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,150,899.8 E 2,460,172.2

ELEVATION TOP OF BORING: 251.0

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
126.0	125.0																			
		X	29 50	50 /		Poorly-graded Sand with Silt (SP-SM) Brown, Fine	100	26	8	86	6	0.153								
116.0	135.0																			
		X	11 7 9	16		Poorly-graded Sand (SP) Brown, Medium	100	27	24	73	2	0.230								
		X	28 20 28	48		Poorly-graded Sand (SP) Brown	100	28	48	48	4	0.231								
96.0	155.0																			
		X	7 10 12	22		Fat Clay (CH) Dark Gray, Slickensides	100	29													

120.0 122.5 125.0 127.5 130.0 132.5 135.0 137.5 140.0 142.5 145.0 147.5 150.0 152.5 155.0 157.5 160.0 162.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)		SHEET 5 OF 5 SHEETS
PROJECT: Below Piggott - West Bank SFB Seepage Study	COORDINATE SYSTEM: HORIZONTAL: VERTICAL:	
LOCATION COORDINATES: N 13,150,899.8 E 2,460,172.2	ELEVATION TOP OF BORING: 251.0	

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
81.0	170.0	X	9 9 10	19		Fat Clay (CH) Dark Gray, Slickensides	100	30												

162.5
165.0
167.5
170.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)	INSTALLATION: Memphis District (CEMVM)	SHEET 1 OF 1 SHEETS	
1. PROJECT: Below Piggott - West Bank SFB Seepage Study	9. COORDINATE SYSTEM	HORIZONTAL	VERTICAL
	10. SIZE AND TYPE OF BIT: 3.25" ID		
2. HOLE NUMBER: 201-BPL-10 — LOCATION COORDINATES: N 13,150,587.1 E 2,459,750.2	11. MANUFACTURER'S DESIGNATION OF DRILL: CME 55		
3. DRILLING AGENCY: Tri-State Testing Services, Inc.	12. TOTAL SAMPLES: 12	DISTURBED: 12	UNDISTURBED: 0
4. NAME OF DRILLER: M. Woolfolk	13. TOTAL NUMBER CORE BOXES: 0		
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED — DEG FROM VERTICAL: --- — BEARING:	14. ELEVATION GROUND WATER: 242.9	11/30/10	
	15. DATE BORING	STARTED: 11/30/10	COMPLETED: 11/30/10
6. THICKNESS OF OVERBURDEN	16. ELEVATION TOP OF BORING: 251.4		
7. DEPTH DRILLED INTO ROCK	17. TOTAL CORE RECOVERY FOR BORING: N/A		
8. TOTAL DEPTH OF BORING: 30.0	18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor		

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	4 6 4	10		Lean Clay (CL) Brown & Gray, stiff	100	1							12.5					
		☒	8 9 7	16		Lean Clay (CL) Brown & Gray, medium	100	2					39	22	11.9					
245.9	5.5																			
		☒	6 6 7	13		Clayey Sand (SC) Gray & Brown, Fine	100	3			41				20.9					
243.4	8.0																			
		☒	4 6 5	11		Poorly-graded Sand (SP) Gray, Fine	100	4	0	99	1	0.175								
		☒	4 3 4	7		Poorly-graded Sand (SP) Gray, Fine	100	5	1	98	1	0.156								
		☒	5 4 6	10		Poorly-graded Sand (SP) Gray, Fine	100	6	0	99	1	0.158								
		☒	6 5 8	13		Poorly-graded Sand (SP) Gray, Fine	100	7	0	99	1	0.149								
		☒	5 6 7	13		Poorly-graded Sand (SP) Gray, Fine	100	8	0	99	1	0.151								
		☒	4 4 6	10		Poorly-graded Sand (SP) Gray	100	9												
		☒	6 8 7	15		Poorly-graded Sand (SP) Gray	100	10												
		☒	2 2 6	8		Poorly-graded Sand (SP) Gray	100	11												
221.4	30.0	☒	5 8 6	14		Poorly-graded Sand (SP) Gray	100	12												

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)	INSTALLATION: Memphis District (CEMVM)	SHEET 1 OF 1 SHEETS	
1. PROJECT: Below Piggott - West Bank SFB Seepage Study	9. COORDINATE SYSTEM	HORIZONTAL	VERTICAL
	10. SIZE AND TYPE OF BIT: 3.25" ID		
2. HOLE NUMBER: 202-BPL-10	LOCATION COORDINATES: N 13,150,147.5 E 2,459,488.3	11. MANUFACTURER'S DESIGNATION OF DRILL: CME 55	
3. DRILLING AGENCY: Tri-State Testing Services, Inc.	12. TOTAL SAMPLES: 12	DISTURBED: 12	UNDISTURBED: 0
4. NAME OF DRILLER: M. Woolfolk	13. TOTAL NUMBER CORE BOXES: 0		
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED	DEG FROM VERTICAL: ---	BEARING	14. ELEVATION GROUND WATER: 242.0 11/24/10
15. DATE BORING	STARTED: 11/24/10	COMPLETED: 11/24/10	
6. THICKNESS OF OVERBURDEN	16. ELEVATION TOP OF BORING: 251.0		
7. DEPTH DRILLED INTO ROCK	17. TOTAL CORE RECOVERY FOR BORING: N/A		
8. TOTAL DEPTH OF BORING: 30.0	18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor		

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	6 7 8	15		Fat Clay (CH) Brown & Gray, stiff	100	1							16.1					
		☒	5 5 7	12		Fat Clay (CH) Brown & Gray, stiff, Organic Matter	100	2					57	37	23.2					
245.5	5.5																			
		☒	3 5 5	10		Lean Clay (CL) Brown & Gray, stiff, Organic Matter	100	3							25.4					
243.0	8.0																			
		☒	4 6 7	13		Poorly-graded Sand (SP) Gray, Fine	100	4	0	98	2	0.149								
		☒	3 5 7	12		Poorly-graded Sand (SP) Gray, Fine	100	5	1	98	1	0.162								
		☒	4 6 13	19		Poorly-graded Sand (SP) Gray, Fine	100	6	1	99	0	0.232								
		☒	4 5 10	15		Poorly-graded Sand (SP) Gray, Fine	100	7	1	99	0	0.234								
		☒	11 15 17	32		Poorly-graded Sand (SP) Gray, Fine	100	8	1	95	4	0.096								
		☒	9 12 14	26		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	6 12 12	24		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	8 10 12	22		Poorly-graded Sand (SP) Gray, Fine	100	11												
221.0	30.0	☒	10 12 14	26		Poorly-graded Sand (SP) Gray, Fine	100	12												

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 5 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 203-BPT-11
LOCATION COORDINATES: N 13,149,712.6 E 2,459,235.1
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: J. Crawford
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 170.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 4.5" Wing Bit
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 850
12. TOTAL SAMPLES: 30 DISTURBED: 30 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 241.2 8/11/11
15. DATE BORING: STARTED 8/11/11 COMPLETED 8/16/11
16. ELEVATION TOP OF BORING: 249.7
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	2 3 3	6		Lean Clay (CL) Dark Brown, medium, Rootlets	100	1							12.3					
		☒	2 3 2	5		Lean Clay (CL) Dark Brown, medium, Oxidized, Rootlets, Organic Matter	100	2							19.2					
		☒	2 3 1	4		Lean Clay (CL) Gray, soft	100	3					43	22	29.3					
241.7	8.0																			
		☒	1 1 1	2		Poorly-graded Sand with Clay (SP-SC) Gray, Fine	100	4	0	91	9	0.081								
239.2	10.5																			
		☒	3 3 4	7		Poorly-graded Sand (SP) Gray, Fine	100	5	0	97	3	0.132								
		☒	3 4 4	8		Poorly-graded Sand (SP) Gray, Fine	100	6	0	97	3	0.148								
		☒	6 5 7	12		Poorly-graded Sand (SP) Gray, Fine	100	7	0	99	1	0.167								
		☒	5 8 8	16		Poorly-graded Sand (SP) Gray, Fine	100	8	1	97	2	0.160								
		☒	5 5 2	7		Poorly-graded Sand (SP) Gray, Fine	100	9	6	93	1	0.176								
		☒	5 6 6	12		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	7 11 12	23		Poorly-graded Sand (SP) Gray, Medium	100	11	9	89	2	0.185								
		☒	5 12 16	28		Poorly-graded Sand (SP) Gray, Fine	100	12	0	97	3	0.171								
		☒	7 7 9	16		Poorly-graded Sand (SP) Gray, Fine	100	13	9	90	1	0.167								
		☒	10 11 14	25		Poorly-graded Sand (SP) Gray, Fine	100	14	8	90	3	0.163								

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,149,712.6 E 2,459,235.1

ELEVATION TOP OF BORING: 249.7

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	9 9 9	18		Poorly-graded Sand (SP) Gray, Fine	100	15												
		X	8 8 10	18		Poorly-graded Sand (SP) Gray, Fine	100	16	0	98	2	0.161								
		X	11 12 14	26		Poorly-graded Sand (SP) Gray, Fine	100	17	0	98	2	0.155								
		X	12 12 14	26		Poorly-graded Sand (SP) Gray, Fine	100	18	0	97	3	0.157								
		X	6 7 9	16		Poorly-graded Sand (SP) Gray, Fine	100	19												
		X	9 11 10	21		Poorly-graded Sand (SP) Gray, Fine	100	20	0	96	4	0.133								

35.0 37.5 40.0 42.5 45.0 47.5 50.0 52.5 55.0 57.5 60.0 62.5 65.0 67.5 70.0 72.5 75.0 77.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 3 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM | HORIZONTAL | VERTICAL

LOCATION COORDINATES: N 13,149,712.6 E 2,459,235.1

ELEVATION TOP OF BORING: 249.7

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	16 24 24	48		Poorly-graded Sand (SP) Gray, Medium	100	21	4	95	1	0.177								
		X	10 11 14	25		Poorly-graded Sand (SP) Gray, Medium	100	22	1	97	2	0.165								
		X	24 50	50 /		Poorly-graded Sand (SP) Brown	100	23												
		X	26 35 37	72		Poorly-graded Sand (SP) Gray, Medium	100	24	11	87	2	0.190								
134.7	115.0																			
		X	15 10 12	22		Poorly-graded Gravel (GP) Brown	100	25	55	43	2	0.375								

77.5 80.0 82.5 85.0 87.5 90.0 92.5 95.0 97.5 100.0 102.5 105.0 107.5 110.0 112.5 115.0 117.5 120.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 4 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,149,712.6 E 2,459,235.1

ELEVATION TOP OF BORING: 249.7

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	20 31 32	63		Poorly-graded Gravel (GP) Brown	100	26	93	7	0	5.468								
		X	25 30 35	65		Poorly-graded Gravel (GP) Brown	100	27	94	6	0	5.326								
		X	20 21 24	45		Poorly-graded Gravel (GP) Brown	100	28	54	46	0	1.398								
94.7	155.0																			
		X	9 9 12	21		Poorly-graded Sand (SP) Brown	100	29	46	53	0	2.032								

120.0 122.5 125.0 127.5 130.0 132.5 135.0 137.5 140.0 142.5 145.0 147.5 150.0 152.5 155.0 157.5 160.0 162.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)		SHEET 5 OF 5 SHEETS
PROJECT: Below Piggott - West Bank SFB Seepage Study	COORDINATE SYSTEM: HORIZONTAL: VERTICAL	
LOCATION COORDINATES: N 13,149,712.6 E 2,459,235.1	ELEVATION TOP OF BORING: 249.7	

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
84.7	165.0																			
79.7	170.0	X	7 7 10	17		Fat Clay (CH) Gray, very stiff, Slickensides	100	30												

162.5
165.0
167.5
170.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)	INSTALLATION: Memphis District (CEMVM)	SHEET 1 OF 1 SHEETS	
1. PROJECT: Below Piggott - West Bank SFB Seepage Study	9. COORDINATE SYSTEM	HORIZONTAL	VERTICAL
	10. SIZE AND TYPE OF BIT: 3.25" ID		
2. HOLE NUMBER: 204-BPL-10 — LOCATION COORDINATES: N 13,149,253.7 E 2,459,043.0	11. MANUFACTURER'S DESIGNATION OF DRILL: CME 55		
3. DRILLING AGENCY: Tri-State Testing Services, Inc.	12. TOTAL SAMPLES: 12	DISTURBED: 12	UNDISTURBED: 0
4. NAME OF DRILLER: M. Woolfolk	13. TOTAL NUMBER CORE BOXES: 0		
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED — DEG FROM VERTICAL: --- — BEARING:	14. ELEVATION GROUND WATER: 242.5 11/23/10		
	15. DATE BORING — STARTED: 11/23/10 — COMPLETED: 11/23/10		
6. THICKNESS OF OVERBURDEN	16. ELEVATION TOP OF BORING: 251.5		
7. DEPTH DRILLED INTO ROCK	17. TOTAL CORE RECOVERY FOR BORING: N/A		
8. TOTAL DEPTH OF BORING: 30.0	18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor		

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_r	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	6 6 6	12		Lean Clay (CL) Gray & Brown, medium	100	1							9.1					
248.5	3.0																			
		☒	4 6 6	12		Fat Clay (CH) Gray & Brown, stiff, Organic Matter	100	2							19.0					
		☒	4 6 7	13		Fat Clay (CH) Gray & Brown, medium, Organic Matter	100	3					52	33	28.6					
243.5	8.0																			
		☒	2 3 4	7		Poorly-graded Sand (SP) Gray, Medium	100	4	0	99	1	0.219								
		☒	4 6 7	13		Poorly-graded Sand (SP) Gray, Fine	100	5	0	99	1	0.199								
		☒	10 21 22	43		Poorly-graded Sand (SP) Brown & Gray, Fine	100	6	11	88	1	0.186								
		☒	8 14 17	31		Poorly-graded Sand (SP) Gray, Fine	100	7	0	96	3	0.166								
		☒	9 10 14	24		Poorly-graded Sand (SP) Gray, Medium	100	8	1	98	1	0.197								
		☒	10 13 15	28		Poorly-graded Sand (SP) Gray	100	9												
		☒	5 9 11	20		Poorly-graded Sand (SP) Gray	100	10												
		☒	7 7 11	18		Poorly-graded Sand (SP) Gray	100	11												
221.5	30.0	☒	8 10 12	22		Poorly-graded Sand (SP) Gray, Lignite Fragments	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)	INSTALLATION: Memphis District (CEMVM)	SHEET 1 OF 1 SHEETS	
1. PROJECT: Below Piggott - West Bank SFB Seepage Study	9. COORDINATE SYSTEM	HORIZONTAL	VERTICAL
	10. SIZE AND TYPE OF BIT: 3.25" ID		
2. HOLE NUMBER: 205-BPL-10 — LOCATION COORDINATES: N 13,148,794.0 E 2,458,811.2	11. MANUFACTURER'S DESIGNATION OF DRILL: CME 55		
3. DRILLING AGENCY: Tri-State Testing Services, Inc.	12. TOTAL SAMPLES: 12	DISTURBED: 12	UNDISTURBED: 0
4. NAME OF DRILLER: M. Woolfolk	13. TOTAL NUMBER CORE BOXES: 0		
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED — DEG FROM VERTICAL: --- — BEARING:	14. ELEVATION GROUND WATER: 242.5	11/23/10	
	15. DATE BORING	STARTED: 11/23/10	COMPLETED: 11/23/10
6. THICKNESS OF OVERBURDEN	16. ELEVATION TOP OF BORING: 251.5		
7. DEPTH DRILLED INTO ROCK	17. TOTAL CORE RECOVERY FOR BORING: N/A		
8. TOTAL DEPTH OF BORING: 30.0	18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor		

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
248.5	3.0	☒	7 8 10	18		Lean Clay (CL) Gray & Brown, very stiff	100	1							17.1					
		☒	4 4 7	11		Fat Clay (CH) Gray & Brown, stiff	100	2					61	38	27.9					
243.5	8.0	☒	4 5 5	10		Fat Clay (CH) Gray & Brown, stiff	100	3							34.6					
		☒	2 4 3	7		Poorly-graded Sand (SP) Gray, Fine	100	4	4	93	3	0.124								
		☒	3 5 7	12		Poorly-graded Sand (SP) Gray, Fine	100	5	0	98	1	0.159								
		☒	5 7 9	16		Poorly-graded Sand (SP) Gray, Fine	100	6	1	98	1	0.166								
		☒	15 28 30	58		Poorly-graded Sand (SP) Gray, Fine	100	7	8	89	3	0.157								
		☒	12 17 21	38		Poorly-graded Sand (SP) Gray, Fine	100	8	0	99	1	0.165								
		☒	7 12 16	28		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	9 13 15	28		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	11 12 16	28		Poorly-graded Sand (SP) Gray, Fine	100	11												
221.5	30.0	☒	10 11 14	25		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 4 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 206-BPT-11
LOCATION COORDINATES: N 13,148,377.0 E 2,458,557.4
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: J. Crawford
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 160.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 4.5" Wing Bit
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 850
12. TOTAL SAMPLES: 29 DISTURBED: 29 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 240.2 8/17/11
15. DATE BORING: STARTED 8/17/11 COMPLETED 8/19/11
16. ELEVATION TOP OF BORING: 248.7
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_r	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	1 1 1	2		Lean Clay (CL) Gray, very soft, Rootlets, Organic Matter	100	1							30.1					
		☒	2 2 2	4		Lean Clay (CL) Brown & Gray, soft, Oxidized, Organic Matter	100	2			73				13.5					
243.2	5.5																			
		☒	1 1 1	2		Poorly-graded Sand (SP) Gray, Fine	100	3	0	96	4	0.152								
		☒	1 1 1	2		Poorly-graded Sand (SP) Gray, Fine	100	4	0	96	4	0.136								
238.2	10.5																			
		☒	1 1 1	2		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	5	0	95	5	0.095								
235.7	13.0																			
		☒	1 1 3	4		Poorly-graded Sand (SP) Gray, Fine	100	6	0	98	2	0.124								
		☒	8 9 9	18		Poorly-graded Sand (SP) Gray, Fine	100	7	2	96	2	0.194								
		☒	7 11 11	22		Poorly-graded Sand (SP) Gray, Fine	100	8												
		☒	8 11 11	22		Poorly-graded Sand (SP) Gray, Medium	100	9	1	96	3	0.175								
225.7	23.0																			
		☒	14 11 12	23		Poorly-graded Sand with Silt (SP-SM) Gray, Medium	100	10	1	94	5	0.161								
		☒	5 6 5	11		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	11	0	92	8	0.078								
220.7	28.0																			
		☒	4 4 8	12		Poorly-graded Sand (SP) Gray, Fine	100	12												
		☒	5 7 10	17		Poorly-graded Sand (SP) Gray, Medium	100	13	1	98	1	0.195								
		☒	5 8 9	17		Poorly-graded Sand (SP) Gray, Medium	100	14	0	97	2	0.181								

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 4 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,148,377.0 E 2,458,557.4

ELEVATION TOP OF BORING: 248.7

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	6 6 7	13		Poorly-graded Sand (SP) Gray, Fine	100	15												
		X	5 7 9	16		Poorly-graded Sand (SP) Gray, Fine	100	16	8	91	2	0.184								
		X	7 9 11	20		Poorly-graded Sand (SP) Gray, Medium	100	17	2	96	1	0.223								
		X	8 10 10	20		Poorly-graded Sand (SP) Gray, Medium	100	18	6	92	2	0.207								
		X	9 11 11	22		Poorly-graded Sand (SP) Gray, Medium	100	19												
		X	8 9 11	20		Poorly-graded Sand (SP) Gray, Medium	100	20	1	96	3	0.160								

35.0 37.5 40.0 42.5 45.0 47.5 50.0 52.5 55.0 57.5 60.0 62.5 65.0 67.5 70.0 72.5 75.0 77.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 3 OF 4 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,148,377.0 E 2,458,557.4

ELEVATION TOP OF BORING: 248.7

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	8 11 12	23		Poorly-graded Sand (SP) Gray, Medium	100	21	0	98	2	0.242								
		X	7 14 14	28		Poorly-graded Sand (SP) Gray, Fine	100	22	3	95	2	0.193								
		X	9 12 13	25		Poorly-graded Sand (SP) Gray, Medium	100	23	30	67	4	0.165								
143.7	105.0																			
		X	12 14 15	29		Poorly-graded Sand (SP) Gray, Fine	100	24	64	34	1	0.439								
133.7	115.0																			
		X	15 15 12	27		Clayey Sand (SC) Gray, Medium	100	25	39	38	23									

77.5 80.0 82.5 85.0 87.5 90.0 92.5 95.0 97.5 100.0 102.5 105.0 107.5 110.0 112.5 115.0 117.5 120.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 4 OF 4 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM | HORIZONTAL | VERTICAL

LOCATION COORDINATES: N 13,148,377.0 E 2,458,557.4

ELEVATION TOP OF BORING: 248.7

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	5 24 26	50		Poorly-graded Sand (SP) Gray, Medium	100	26	32	64	4	0.181								
113.7	135.0																			
		X	5 27 45	72		Poorly-graded Sand with Clay (SP-SC) Brown	100	27	43	51	6	0.149								
		X	16 15 35	50		Poorly-graded Sand with Clay (SP-SC) Brown, Medium	100	28	31	62	7	0.112								
93.7	155.0																			
		X	11 14 15	29		Fat Clay (CH) Gray, hard	100	29												
88.7	160.0																			

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 3.25" ID
2. HOLE NUMBER: 207-BPL-10
LOCATION COORDINATES: N 13,147,930.2 E 2,458,332.3
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 55
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
4. NAME OF DRILLER: M. Woolfolk
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 240.1 11/22/10
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
15. DATE BORING: STARTED 11/22/10 COMPLETED 11/22/10
6. THICKNESS OF OVERBURDEN:
16. ELEVATION TOP OF BORING: 249.1
7. DEPTH DRILLED INTO ROCK:
17. TOTAL CORE RECOVERY FOR BORING: N/A
8. TOTAL DEPTH OF BORING: 30.0
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
246.1	3.0	☒	5 6 7	13		Fat Clay (CH) Gray & Brown, stiff, Rootlets	100	1							17.0					
243.6	5.5	☒	5 5 6	11		Lean Clay (CL) Gray & Brown, stiff	100	2					39	23	15.5					
241.1	8.0	☒	4 5 5	10		Clayey Sand (SC) Gray & Brown, Fine	100	3			27				22.5					
238.6	10.5	☒	2 1 1	2		Silty Sand (SM) Gray, Fine	100	4			30				32.0					
		☒	5 10 5	15		Poorly-graded Sand (SP) Dark Gray, Fine	100	5	0	99	1	0.162								
		☒	7 8 11	19		Poorly-graded Sand (SP) Gray, Fine	100	6	0	98	2	0.162								
		☒	7 11 21	32		Poorly-graded Sand (SP) Dark Gray, Fine	100	7	2	96	2	0.166								
		☒	10 12 13	25		Poorly-graded Sand (SP) Dark Gray, Medium	100	8	2	96	1	0.198								
		☒	11 15 17	32		Poorly-graded Sand (SP) Gray, Medium	100	9	1	98	2	0.196								
		☒	11 13 13	26		Poorly-graded Sand (SP) Gray, Medium	100	10												
		☒	11 15 17	32		Poorly-graded Sand (SP) Gray, Medium	100	11												
219.1	30.0	☒	10 12 15	27		Poorly-graded Sand (SP) Gray, Medium	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 3.25" ID
2. HOLE NUMBER: 208-BPL-10
LOCATION COORDINATES: N 13,147,457.1 E 2,458,140.8
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 55
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
4. NAME OF DRILLER: M. Woolfolk
13. TOTAL NUMBER CORE BOXES: 0
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
14. ELEVATION GROUND WATER: 240.8 11/19/10
15. DATE BORING: STARTED 11/19/10 COMPLETED 11/19/10
6. THICKNESS OF OVERBURDEN:
16. ELEVATION TOP OF BORING: 251.8
7. DEPTH DRILLED INTO ROCK:
17. TOTAL CORE RECOVERY FOR BORING: N/A
8. TOTAL DEPTH OF BORING: 30.0
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	6 11 10	21		Lean Clay (CL) Brown & Gray, very stiff	100	1							13.6					
		☒	5 4 5	9		Lean Clay (CL) Brown & Gray, stiff	100	2					45	29						
246.3	5.5														18.5					
		☒	1 2 3	5		Fat Clay (CH) Brown & Gray, medium	100	3												
243.8	8.0														24.1					
		☒	1 1 1	2		Silty Clay (CL-ML) Gray, very soft	100	4			55									
241.3	10.5														31.2					
		☒	5 5 8	13		Poorly-graded Sand (SP) Gray, Fine	100	5	1	98	1	0.170								
		☒	4 6 8	14		Poorly-graded Sand (SP) Gray, Fine	100	6	0	99	1	0.171								
		☒	8 15 15	30		Poorly-graded Sand (SP) Gray, Medium	100	7	1	97	1	0.294								
		☒	5 3 5	8		Poorly-graded Sand (SP) Gray, Fine	100	8		94	2	0.199								
		☒	9 9 10	19		Poorly-graded Sand (SP) Gray, Fine	100	9	1	98	1	0.163								
		☒	7 8 9	17		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	3 4 10	14		Poorly-graded Sand (SP) Gray, Fine	100	11												
221.8	30.0	☒	7 9 11	20		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 4 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 209-BPT-11
LOCATION COORDINATES: N 13,147,037.7 E 2,457,881.7
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: J. Kinas
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 160.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 4.5" Wing Bit
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 850
12. TOTAL SAMPLES: 29 DISTURBED: 29 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 241.5 8/22/11
15. DATE BORING: STARTED 8/22/11 COMPLETED 8/23/11
16. ELEVATION TOP OF BORING: 249.5
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
246.5	3.0	☒	2 3 3	6		Lean Clay (CL) Brown & Gray, soft	100	1							20.4					
244.0	5.5	☒	2 3 4	7		Fat Clay (CH) Gray, medium	100	2					56	32	28.6					
239.0	10.5	☒	3 3 5	8		Lean Clay (CL) Gray, medium, Organic Matter	100	3							26.5					
		☒	3 4 5	9		Lean Clay (CL) Gray, stiff	100	4							28.1					
234.0	15.5	☒	1 1 1	2		Silty Sand (SM) Gray, Fine	100	5							42.0					
		☒	2 2 3	5		Silty Sand (SM) Gray, Fine	100	6			46				41.0					
229.0	20.5	☒	1 2 2	4		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	7	0	88	12									
		☒	2 2 2	4		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	8	0	93	7	0.102								
		☒	7 5 5	10		Poorly-graded Sand (SP) Gray, Fine	100	9	0	98	2	0.183								
		☒	5 5 4	9		Poorly-graded Sand (SP) Gray, Fine	100	10	0	97	3	0.171								
		☒	3 5 4	9		Poorly-graded Sand (SP) Gray, Fine	100	11	0	98	2	0.157								
		☒	4 5 5	10		Poorly-graded Sand (SP) Gray, Fine	100	12	0	97	3	0.155								
		☒	7 12 15	27		Poorly-graded Sand (SP) Gray, Fine	100	13	0	97	3	0.156								
		☒	8 11 13	24		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	14	4	93	3	0.100								

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 4 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,147,037.7 E 2,457,881.7

ELEVATION TOP OF BORING: 249.5

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
211.5	38.0																			
		X	7 8 8	16		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	15	0	94	6	0.086								
206.5	43.0																			
		X	9 11 13	24		Poorly-graded Sand (SP) Gray, Fine	100	16	2	94	4	0.148								
		X	7 9 13	22		Poorly-graded Sand (SP) Gray, Fine	100	17	3	96	1	0.170								
		X	6 8 12	20		Poorly-graded Sand (SP) Gray, Fine	100	18	0	97	3	0.157								
		X	5 9 14	23		Poorly-graded Sand (SP) Gray, Fine	100	19	0	97	3	0.169								
		X	6 7 11	18		Poorly-graded Sand (SP) Gray, Fine	100	20	0	100	0	0.215								

35.0 37.5 40.0 42.5 45.0 47.5 50.0 52.5 55.0 57.5 60.0 62.5 65.0 67.5 70.0 72.5 75.0 77.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 3 OF 4 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,147,037.7 E 2,457,881.7

ELEVATION TOP OF BORING: 249.5

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	12 14 21	35		Poorly-graded Sand (SP) Gray, Fine	100	21	0	96	4	0.162								
		X	10 14 20	34		Poorly-graded Sand (SP) Gray, Fine	100	22	1	97	3	0.171								
		X	9 12 22	34		Poorly-graded Sand (SP) Gray, Medium	100	23	5	92	3	0.244								
		X	9 11 18	29		Poorly-graded Sand (SP) Gray, Medium	100	24	3	93	4	0.173								
134.5	115.0																			
		X	7 12 16	28		Poorly-graded Sand with Silt (SP-SM) Gray, Medium	100	25	33	62	5	0.166								

77.5 80.0 82.5 85.0 87.5 90.0 92.5 95.0 97.5 100.0 102.5 105.0 107.5 110.0 112.5 115.0 117.5 120.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 4 OF 4 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,147,037.7 E 2,457,881.7

ELEVATION TOP OF BORING: 249.5

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_t	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
124.5	125.0																			
		X	16 32 29	61		Poorly-graded Gravel (GP) Gray	100	26	69	30	0	0.729								
		X	18 23 29	52		Poorly-graded Gravel (GP) Gray	100	27	69	31	0	0.592								
		X	16 15 27	42		Poorly-graded Gravel (GP) Gray	100	28	68	31	0	0.600								
94.5	155.0																			
		X	10 14 17	31		Fat Clay (CH) Gray, hard	100	29												
89.5	160.0																			

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 3.25" ID
2. HOLE NUMBER: 210-BPL-10
LOCATION COORDINATES: N 13,146,590.6 E 2,457,657.3
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 55
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
4. NAME OF DRILLER: M. Woolfolk
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 240.1 11/19/10
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
15. DATE BORING: STARTED 11/19/10 COMPLETED 11/19/10
6. THICKNESS OF OVERBURDEN:
16. ELEVATION TOP OF BORING: 249.1
7. DEPTH DRILLED INTO ROCK:
17. TOTAL CORE RECOVERY FOR BORING: N/A
8. TOTAL DEPTH OF BORING: 30.0
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	6 4 6	10		Lean Clay (CL) Brown & Gray, stiff	100	1							15.4					
		☒	3 3 3	6		Lean Clay (CL) Brown & Gray, medium, Lignite Fragments	100	2					31	12	23.1					
241.1	8.0	☒	3 4 4	8		Lean Clay (CL) Brown & Gray, medium	100	3							23.8					
238.6	10.5	☒	6 9 10	19		Silty Sand (SM) Gray, Fine	100	4			31				25.3					
		☒	5 7 8	15		Poorly-graded Sand (SP) Gray, Fine	100	5	0	98	2	0.186								
		☒	2 3 4	7		Poorly-graded Sand (SP) Gray, Fine	100	6	0	99	1	0.183								
		☒	4 4 6	10		Poorly-graded Sand (SP) Gray, Fine	100	7	3	96	1	0.203								
		☒	10 13 14	27		Poorly-graded Sand (SP) Gray, Fine	100	8	0	99	1	0.183								
		☒	7 9 12	21		Poorly-graded Sand (SP) Gray, Fine	100	9	2	95	3	0.168								
		☒	10 12 15	27		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	10												
		☒	11 12 14	26		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	11												
219.1	30.0	☒	10 15 17	32		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)	INSTALLATION: Memphis District (CEMVM)	SHEET 1 OF 1 SHEETS	
1. PROJECT: Below Piggott - West Bank SFB Seepage Study	9. COORDINATE SYSTEM:	HORIZONTAL:	VERTICAL:
	10. SIZE AND TYPE OF BIT: 3.25" ID		
2. HOLE NUMBER: 211-BPL-10	LOCATION COORDINATES: N 13,146,130.5 E 2,457,460.5	11. MANUFACTURER'S DESIGNATION OF DRILL: CME 55	
3. DRILLING AGENCY: Tri-State Testing Services, Inc.		12. TOTAL SAMPLES: 12	DISTURBED: 12 / UNDISTURBED: 0
4. NAME OF DRILLER: M. Woolfolk		13. TOTAL NUMBER CORE BOXES: 0	
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED	DEG FROM VERTICAL: --- / BEARING:	14. ELEVATION GROUND WATER: 241.0	11/18/10
		15. DATE BORING: STARTED 11/18/10	COMPLETED 11/18/10
6. THICKNESS OF OVERBURDEN		16. ELEVATION TOP OF BORING: 250.0	
7. DEPTH DRILLED INTO ROCK		17. TOTAL CORE RECOVERY FOR BORING: N/A	
8. TOTAL DEPTH OF BORING: 30.0		18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor	

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	5 6 6	12		Lean Clay (CL) Brown & Gray, stiff	100	1							19.6					
		☒	3 4 5	9		Lean Clay (CL) Brown & Gray, stiff	100	2					37	21						
244.5	5.5														23.2					
		☒	2 3 4	7		Clayey Sand (SC) Gray	100	3			45									
		☒	1 1 5	6		Clayey Sand (SC) Gray, Fine	100	4	0	59	41				25.4					
239.5	10.5																			
		☒	4 5 8	13		Poorly-graded Sand (SP) Gray, Fine	100	5	1	98	2	0.165								
		☒	5 6 6	12		Poorly-graded Sand (SP) Gray, Fine	100	6	0	99	1	0.169								
		☒	4 7 11	18		Poorly-graded Sand (SP) Gray, Medium	100	7	4	94	2	0.171								
		☒	3 6 8	14		Poorly-graded Sand (SP) Gray, Fine	100	8	0	99	1	0.167								
		☒	5 13 12	25		Poorly-graded Sand (SP) Gray	100	9												
		☒	7 11 13	24		Poorly-graded Sand (SP) Gray	100	10												
		☒	5 12 18	30		Poorly-graded Sand (SP) Gray	100	11												
220.0	30.0	☒	8 11 13	24		Poorly-graded Sand (SP) Gray	100	12												

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG	DIVISION: Mississippi Valley Division (MVD)	INSTALLATION: Memphis District (CEMVM)	SHEET 1 OF 5 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study	9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
	10. SIZE AND TYPE OF BIT: 4.5" Wing Bit
2. HOLE NUMBER: 212-BPT-11 — LOCATION COORDINATES: N 13,145,697.3 E 2,457,206.7	11. MANUFACTURER'S DESIGNATION OF DRILL: CME 850
3. DRILLING AGENCY: Tri-State Testing Services, Inc.	12. TOTAL SAMPLES: 31 — DISTURBED: 31 — UNDISTURBED: 0
4. NAME OF DRILLER: J. Kinas	13. TOTAL NUMBER CORE BOXES: 0
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED — DEG FROM VERTICAL: --- — BEARING:	14. ELEVATION GROUND WATER: 239.5 8/24/11
	15. DATE BORING — STARTED: 8/24/11 — COMPLETED: 8/26/11
6. THICKNESS OF OVERBURDEN	16. ELEVATION TOP OF BORING: 248.5
7. DEPTH DRILLED INTO ROCK	17. TOTAL CORE RECOVERY FOR BORING: N/A
8. TOTAL DEPTH OF BORING: 180.0	18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
245.5	3.0	☒	1 2 2	4		Lean Clay (CL) Brown & Gray, soft	100	1							30.3					
243.0	5.5	☒	1 3 2	5		Fat Clay (CH) Brown, medium	100	2					63	38	14.6					
240.5	8.0	☒	1 1 1	2		Clayey Sand (SC) Brown & Gray, Fine	100	3			30				35.2					
		☒	1 2 2	4		Silty Sand (SM) Gray, Fine	100	4	0	86	14									
235.5	13.0	☒	3 5 9	14		Silty Sand (SM) Gray, Fine	100	5	0	87	13									
233.0	15.5	☒	4 6 7	13		Poorly-graded Sand (SP) Gray, Fine	100	6	0	97	3	0.151								
230.5	18.0	☒	3 5 6	11		Silty Sand (SM) Gray, Fine	100	7	0	85	15									
		☒	3 5 6	11		Poorly-graded Sand (SP) Gray, Fine	100	8	0	98	2	0.180								
		☒	3 7 7	14		Poorly-graded Sand (SP) Gray, Fine	100	9	0	98	2	0.163								
223.0	25.5	☒	4 6 8	14		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	10	0	97	3	0.155								
220.5	28.0	☒	3 5 7	12		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	11	0	95	5	0.150								
		☒	6 18 13	31		Poorly-graded Sand (SP) Gray, Fine	100	12	0	99	1	0.162								
215.5	33.0	☒	6 7 11	18		Poorly-graded Sand (SP) Gray, Fine	100	13	0	98	2	0.156								
		☒	5 9 10	19		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	14	0	94	6	0.117								

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,145,697.3 E 2,457,206.7

ELEVATION TOP OF BORING: 248.5

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
210.5	38.0																			
		X	9 13 17	30		Poorly-graded Sand (SP) Gray, Medium	100	15	0	99	1	0.289								
		X	8 10 13	23		Poorly-graded Sand (SP) Gray, Medium	100	16	0	96	4	0.174								
		X	8 14 13	27		Poorly-graded Sand (SP) Gray, Fine	100	17	0	99	1	0.188								
		X	8 12 14	26		Poorly-graded Sand (SP) Gray, Medium	100	18	0	98	2	0.201								
		X	10 11 13	24		Poorly-graded Sand (SP) Gray, Medium	100	19	0	97	3	0.176								
		X	4 9 11	20		Poorly-graded Sand (SP) Gray, Medium	100	20												

35.0 37.5 40.0 42.5 45.0 47.5 50.0 52.5 55.0 57.5 60.0 62.5 65.0 67.5 70.0 72.5 75.0 77.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 3 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,145,697.3 E 2,457,206.7

ELEVATION TOP OF BORING: 248.5

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
			6 9 14	23		Poorly-graded Sand (SP) Gray, Fine	100	21	0	99	1	0.166								
			5 10 13	23		Poorly-graded Sand (SP) Gray, Medium	100	22												
			7 10 13	23		Poorly-graded Sand (SP) Gray, Medium	100	23	0	99	1	0.324								
			7 11 14	25		Poorly-graded Sand (SP) Gray, Fine	100	24	0	96	4	0.105								
			9 10 16	26		Poorly-graded Sand (SP) Gray, Fine	100	25												

77.5 80.0 82.5 85.0 87.5 90.0 92.5 95.0 97.5 100.0 102.5 105.0 107.5 110.0 112.5 115.0 117.5 120.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 4 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,145,697.3 E 2,457,206.7

ELEVATION TOP OF BORING: 248.5

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
123.5	125.0																			
		X	9 12 14	26		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	26	0	94	6	0.086								
113.5	135.0																			
		X	17 27 28	55		Poorly-graded Sand (SP) Gray, Fine	100	27												
		X	15 21 25	46		Poorly-graded Sand (SP) Gray, Fine	100	28	19	78	3	0.156								
		X	13 14 6	20		Poorly-graded Sand (SP) Gray, Medium	100	29	15	82	2	0.303								

120.0 122.5 125.0 127.5 130.0 132.5 135.0 137.5 140.0 142.5 145.0 147.5 150.0 152.5 155.0 157.5 160.0 162.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 5 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,145,697.3 E 2,457,206.7

ELEVATION TOP OF BORING: 248.5

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
83.5	165.0																			
		X	27 55 55	110		Poorly-graded Gravel (GP) Brown	100	30												
73.5	175.0																			
		X	15 24 28	52		Poorly-graded Sand (SP) Light Gray	100	31												
68.5	180.0																			

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)	INSTALLATION: Memphis District (CEMVM)	SHEET 1 OF 1 SHEETS	
1. PROJECT: Below Piggott - West Bank SFB Seepage Study	9. COORDINATE SYSTEM:	HORIZONTAL:	VERTICAL:
	10. SIZE AND TYPE OF BIT: 3.25" ID		
2. HOLE NUMBER: 213-BPL-10	LOCATION COORDINATES: N 13,145,251.1 E 2,456,981.9	11. MANUFACTURER'S DESIGNATION OF DRILL: CME 55	
3. DRILLING AGENCY: Tri-State Testing Services, Inc.		12. TOTAL SAMPLES: 12	DISTURBED: 12 / UNDISTURBED: 0
4. NAME OF DRILLER: M. Woolfolk		13. TOTAL NUMBER CORE BOXES: 0	
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED	DEG FROM VERTICAL: --- / BEARING:	14. ELEVATION GROUND WATER: 237.6	11/18/10
		15. DATE BORING: STARTED 11/18/10	COMPLETED 11/18/10
6. THICKNESS OF OVERBURDEN		16. ELEVATION TOP OF BORING: 246.6	
7. DEPTH DRILLED INTO ROCK		17. TOTAL CORE RECOVERY FOR BORING: N/A	
8. TOTAL DEPTH OF BORING: 30.0		18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor	

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	9 12 5	17		Lean Clay (CL) Brown & Gray, very stiff	100	1							11.6					
		☒	5 4 5	9		Lean Clay (CL) Brown & Gray, stiff	100	2							18.0					
		☒	3 5 4	9		Lean Clay (CL) Brown & Gray, stiff	100	3					32	17						
238.6	8.0														20.0					
	▼	☒	3 1 1	2		Clayey Sand (SC) Brown, very soft	100	4			27									
236.1	10.5														28.2					
		☒	2 3 2	5		Poorly-graded Sand (SP) Gray, Fine	100	5	0	98	1	0.168								
		☒	5 11 13	24		Poorly-graded Sand (SP) Gray, Medium	100	6	1	97	2	0.236								
		☒	4 8 10	18		Poorly-graded Sand (SP) Gray, Medium	100	7	2	97	1	0.243								
		☒	5 4 5	9		Poorly-graded Sand (SP) Gray, Fine	100	8	2	98	1	0.188								
		☒	4 4 6	10		Poorly-graded Sand (SP) Gray, Medium	100	9	2	97	1	0.254								
		☒	5 11 17	28		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	5 8 10	18		Poorly-graded Sand (SP) Gray, Fine	100	11												
216.6	30.0	☒	3 4 7	11		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 214-BPL-11
LOCATION COORDINATES: N 13,144,798.2 E 2,456,764.3
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: G. Baker
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 3.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 75
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 240.2 8/9/11
15. DATE BORING: STARTED 8/9/11 COMPLETED 8/9/11
16. ELEVATION TOP OF BORING: 249.7
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	2 2 2	4		Lean Clay (CL) Gray, soft, Oxidized, Rootlets	100	1							14.5					
		☒	2 2 1	3		Lean Clay (CL) Brown, soft, Rootlets	100	2							14.7					
244.2	5.5																			
		☒	1 2 3	5		Lean Clay (CL) Sandy, Gray, medium	100	3			50				19.0					
241.7	8.0																			
		☒	2 3 3	6		Clayey Sand (SC) Brown, Fine	100	4	0	76	24									
239.2	10.5																			
		☒	3 5 7	12		Poorly-graded Sand (SP) Brown, Fine	100	5	1	97	3	0.138								
236.7	13.0																			
		☒	2 4 4	8		Clayey Sand (SC) Brown, Fine	100	6	0	79	21									
234.2	15.5																			
		☒	3 6 8	14		Poorly-graded Sand (SP) Gray, Fine, Organic Matter	100	7	0	98	2	0.146								
		☒	2 3 4	7		Poorly-graded Sand (SP) Gray, Fine	100	8	1	98	1	0.172								
		☒	3 4 7	11		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	9												
		☒	4 5 7	12		Poorly-graded Sand (SP) Gray, Medium	100	10												
		☒	4 5 7	12		Poorly-graded Sand (SP) Gray, Medium	100	11												
		☒	4 6 9	15		Poorly-graded Sand (SP) Gray, Fine	100	12												
219.7	30.0																			

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)

INSTALLATION: Memphis District (CEMVM)

SHEET 1 OF 5 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study

2. HOLE NUMBER: 215-BPT-11

LOCATION COORDINATES: N 13,144,345.0 E 2,456,551.5

3. DRILLING AGENCY: Tri-State Testing Services, Inc.

4. NAME OF DRILLER: G. Baker

5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:

6. THICKNESS OF OVERBURDEN:

7. DEPTH DRILLED INTO ROCK:

8. TOTAL DEPTH OF BORING: 180.0

9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

10. SIZE AND TYPE OF BIT: 4.5" Wing Bit

11. MANUFACTURER'S DESIGNATION OF DRILL: CME 75

12. TOTAL SAMPLES: 31 DISTURBED: 31 UNDISTURBED: 0

13. TOTAL NUMBER CORE BOXES: 0

14. ELEVATION GROUND WATER: 239.9 8/22/11

15. DATE BORING: STARTED 8/22/11 COMPLETED 8/24/11

16. ELEVATION TOP OF BORING: 249.9

17. TOTAL CORE RECOVERY FOR BORING: N/A

18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
246.9	3.0	☒	6 4 3	7		Poorly-graded Sand with Silt (SP-SM) Brown	100	1							10.5					
244.4	5.5	☒	5 4 5	9		Lean Clay (CL) Brown & Gray, stiff	100	2			33				21.7					
241.9	8.0	☒	2 2 1	3		Poorly-graded Sand with Silt (SP-SM) Brown, Fine	100	3	0	93	7	0.093								
		☒	5 4 5	9		Poorly-graded Sand (SP) Gray, Fine	100	4	0	98	2	0.144								
		☒	1 2 1	3		Poorly-graded Sand (SP) Gray, Fine	100	5	0	99	1	0.154								
		☒	5 6 7	13		Poorly-graded Sand (SP) Gray, Fine	100	6	0	99	1	0.174								
		☒	3 5 8	13		Poorly-graded Sand (SP) Gray, Fine	100	7	0	99	1	0.216								
229.4	20.5	☒	3 6 9	15		Poorly-graded Sand (SP) Gray, Fine	100	8	0	99	1	0.198								
226.9	23.0	☒	4 6 6	12		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	9	0	92	8	0.078								
		☒	8 10 11	21		Poorly-graded Sand (SP) Gray, Medium	100	10	2	97	1	0.208								
		☒	8 12 12	24		Poorly-graded Sand (SP) Gray, Fine	100	11	0	98	2	0.186								
		☒	5 11 11	22		Poorly-graded Sand (SP) Gray, Fine	100	12	0	99	1	0.163								
		☒	5 11 14	25		Poorly-graded Sand (SP) Gray, Fine, Organic Matter	100	13	0	99	1	0.163								
		☒	5 7 10	17		Poorly-graded Sand (SP) Gray, Medium	100	14	0	99	1	0.237								

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,144,345.0 E 2,456,551.5

ELEVATION TOP OF BORING: 249.9

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	5 7 9	16		Poorly-graded Sand (SP) Gray, Medium, Organic Matter	100	15	0	99	1	0.182								
		X	5 11 12	23		Poorly-graded Sand (SP) Gray, Fine	100	16	2	97	1	0.164								
		X	8 12 12	24		Poorly-graded Sand (SP) Gray, Medium	100	17	3	95	1	0.233								
		X	8 12 17	29		Poorly-graded Sand (SP) Gray, Fine	100	18												
		X	5 10 15	25		Poorly-graded Sand (SP) Gray, Fine	100	19	11	88	2	0.160								
		X	9 21 17	38		Poorly-graded Sand (SP) Gray, Fine	100	20												

35.0 37.5 40.0 42.5 45.0 47.5 50.0 52.5 55.0 57.5 60.0 62.5 65.0 67.5 70.0 72.5 75.0 77.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 3 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,144,345.0 E 2,456,551.5

ELEVATION TOP OF BORING: 249.9

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	9 12 13	25		Poorly-graded Sand (SP) Gray, Fine	100	21	6	92	1	0.168								
		X	8 11 13	24		Poorly-graded Sand (SP) Gray, Medium	100	22												
		X	8 10 14	24		Poorly-graded Sand (SP) Gray, Medium	100	23	44	55	1	0.363								
		X	8 9 14	23		Poorly-graded Sand (SP) Gray, Medium	100	24												
		X	8 12 14	26		Poorly-graded Sand (SP) Gray, Fine	100	25	15	84	1	0.265								

77.5 80.0 82.5 85.0 87.5 90.0 92.5 95.0 97.5 100.0 102.5 105.0 107.5 110.0 112.5 115.0 117.5 120.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 4 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM | HORIZONTAL | VERTICAL

LOCATION COORDINATES: N 13,144,345.0 E 2,456,551.5

ELEVATION TOP OF BORING: 249.9

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
124.9	125.0																			
		X	8 9 10	19		Poorly-graded Gravel (GP) Gray	100	26												
		X	9 19 29	48		Poorly-graded Gravel (GP) Gray, Fine	100	27	51	48	1	0.322								
104.9	145.0																			
		X	26 46 37	83		Poorly-graded Sand (SP) Gray	100	28												
		X	18 20 12	32		Poorly-graded Sand (SP) Brown & Gray, Medium	100	29	22	77	2	0.272								

120.0 122.5 125.0 127.5 130.0 132.5 135.0 137.5 140.0 142.5 145.0 147.5 150.0 152.5 155.0 157.5 160.0 162.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 5 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM | HORIZONTAL | VERTICAL

LOCATION COORDINATES: N 13,144,345.0 E 2,456,551.5

ELEVATION TOP OF BORING: 249.9

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
74.9	175.0	X	22 16 11	27		Poorly-graded Sand (SP) Brown & Gray	100	30	39	58	3	0.291								
69.9	180.0	X	28 45 50	95		Clayey Sand (SC) Light Gray, Clay Strata or Lenses	100	31												

162.5 165.0 167.5 170.0 172.5 175.0 177.5 180.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 216-BPL-11
LOCATION COORDINATES: N 13,143,891.3 E 2,456,341.7
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: G. Baker
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 3.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 75
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 238.4 8/9/11
15. DATE BORING: STARTED 8/9/11 COMPLETED 8/9/11
16. ELEVATION TOP OF BORING: 250.4
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	2 2 3	5		Silt (ML) Brown, medium, Oxidized, Rootlets	100	1							13.2					
		☒	2 2 2	4		Silt (ML) Brown, soft, Oxidized	100	2							17.0					
244.9	5.5																			
		☒	2 2 3	5		Silt (ML) Sandy, Brown, medium, Oxidized	100	3			58				26.4					
242.4	8.0																			
		☒	1 2 3	5		Silty Sand (SM) Brown	100	4	0	76	24									
239.9	10.5																			
		☒	2 2 4	6		Poorly-graded Sand (SP) Brown, Fine	100	5	0	97	3	0.130								
		☒	3 4 6	10		Poorly-graded Sand (SP) Gray, Fine	100	6	1	96	3	0.096								
		☒	3 5 6	11		Poorly-graded Sand (SP) Gray, Fine	100	7	0	98	2	0.149								
		☒	2 5 8	13		Poorly-graded Sand (SP) Gray, Fine	100	8	0	98	2	0.113								
		☒	3 4 7	11		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	4 5 6	11		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	3 5 9	14		Poorly-graded Sand (SP) Gray, Fine, Organic Matter	100	11												
220.4	30.0	☒	3 4 8	12		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 3.25" ID
2. HOLE NUMBER: 217-BPL-11
LOCATION COORDINATES: N 13,143,437.6 E 2,456,131.7
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 75
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
4. NAME OF DRILLER: G. Baker
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 239.9 8/9/11
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
15. DATE BORING: STARTED 8/9/11 COMPLETED 8/9/11
6. THICKNESS OF OVERBURDEN:
16. ELEVATION TOP OF BORING: 249.9
7. DEPTH DRILLED INTO ROCK:
17. TOTAL CORE RECOVERY FOR BORING: N/A
8. TOTAL DEPTH OF BORING: 30.0
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	2 2 2	4		Lean Clay (CL) Gray, soft, Rootlets	100	1							14.2					
		☒	1 2 2	4		Lean Clay (CL) Gray, soft, Oxidized	100	2							22.0					
244.4	5.5																			
		☒	1 2 2	4		Lean Clay (CL) Sandy, Gray, soft, Oxidized, Organic Matter	100	3			51				22.5					
241.9	8.0																			
		☒	2 3 5	8		Poorly-graded Sand (SP) Brown, Medium	100	4	1	99	1	0.215								
		☒	2 3 4	7		Poorly-graded Sand (SP) Brown, Medium	100	5	0	98	1	0.195								
		☒	4 4 7	11		Poorly-graded Sand (SP) Gray, Fine	100	6	0	99	1	0.181								
		☒	4 5 7	12		Poorly-graded Sand (SP) Gray, Fine	100	7	0	99	1	0.184								
		☒	3 5 7	12		Poorly-graded Sand (SP) Gray, Fine	100	8	0	99	1	0.159								
		☒	4 4 7	11		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	3 4 7	11		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	4 4 8	12		Poorly-graded Sand (SP) Gray, Fine	100	11												
219.9	30.0	☒	4 5 7	12		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 5 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 218-BPT-11
LOCATION COORDINATES: N 13,142,984.3 E 2,455,921.1
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: G. Baker
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 180.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 4.5" Wing Bit
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 75
12. TOTAL SAMPLES: 31 DISTURBED: 31 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 239.3 8/24/11
15. DATE BORING: STARTED 8/24/11 COMPLETED 8/26/11
16. ELEVATION TOP OF BORING: 249.3
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	4 3 2	5		Lean Clay (CL) Brown & Gray, medium	100	1							13.0					
		☒	3 2 1	3		Lean Clay (CL) Brown, soft	100	2					27	13	22.4					
243.8	5.5																			
		☒	3 5 4	9		Clayey Sand (SC) Gray, Fine	100	3			13				24.1					
241.3	8.0																			
		☒	6 7 8	15		Poorly-graded Sand (SP) Gray, Fine, Organic Matter	100	4	0	96	4	0.096								
		☒	7 8 11	19		Poorly-graded Sand (SP) Gray, Fine, Organic Matter	100	5	0	96	4	0.114								
		☒	6 7 8	15		Poorly-graded Sand (SP) Gray, Fine	100	6	0	99	1	0.163								
		☒	2 4 5	9		Poorly-graded Sand (SP) Gray, Fine, Organic Matter	100	7	0	98	2	0.142								
		☒	4 8 10	18		Poorly-graded Sand (SP) Gray, Medium, Organic Matter	100	8	0	99	1	0.205								
		☒	5 9 12	21		Poorly-graded Sand (SP) Gray, Fine, Organic Matter	100	9	0	99	1	0.173								
		☒	5 8 12	20		Poorly-graded Sand (SP) Gray, Fine, Organic Matter	100	10	0	99	1	0.167								
		☒	9 12 16	28		Poorly-graded Sand (SP) Gray, Medium	100	11	0	98	2	0.235								
		☒	5 7 10	17		Poorly-graded Sand (SP) Gray, Fine	100	12	0	99	1	0.191								
		☒	7 9 9	18		Poorly-graded Sand (SP) Gray, Medium, Organic Matter	100	13	2	97	1	0.166								
		☒	5 6 11	17		Poorly-graded Sand (SP) Gray, Medium	100	14	0	99	1	0.216								

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,142,984.3 E 2,455,921.1

ELEVATION TOP OF BORING: 249.3

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	5 6 8	14		Poorly-graded Sand (SP) Gray, Fine	100	15	9	89	2	0.163								
		X	4 7 7	14		Poorly-graded Sand (SP) Gray, Medium	100	16	5	94	1	0.318								
		X	7 10 12	22		Poorly-graded Sand (SP) Gray, Medium	100	17	5	94	1	0.308								
		X	7 7 7	14		Poorly-graded Sand (SP) Gray, Medium	100	18	12	86	1	0.229								
		X	5 9 11	20		Poorly-graded Sand (SP) Gray, Medium	100	19	9	90	1	0.275								
		X	8 9 9	18		Poorly-graded Sand (SP) Gray, Medium	100	20												

35.0 37.5 40.0 42.5 45.0 47.5 50.0 52.5 55.0 57.5 60.0 62.5 65.0 67.5 70.0 72.5 75.0 77.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 3 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,142,984.3 E 2,455,921.1

ELEVATION TOP OF BORING: 249.3

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	6 7 8	15		Poorly-graded Sand (SP) Gray, Medium	100	21	11	88	1	0.293								
		X	5 9 15	24		Poorly-graded Sand (SP) Gray, Medium	100	22												
		X	9 12 17	29		Poorly-graded Sand (SP) Gray, Medium	100	23	12	87	1	0.235								
		X	14 20 25	45		Poorly-graded Sand (SP) Brown & Gray, Medium	100	24												
		X	20 20 20	40		Poorly-graded Sand (SP) Brown & Gray, Medium	100	25	18	78	3	0.195								

77.5 80.0 82.5 85.0 87.5 90.0 92.5 95.0 97.5 100.0 102.5 105.0 107.5 110.0 112.5 115.0 117.5 120.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 4 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,142,984.3 E 2,455,921.1

ELEVATION TOP OF BORING: 249.3

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	14 12 8	20		Poorly-graded Sand (SP) Brown & Gray, Medium	100	26												
		X	8 10 14	24		Poorly-graded Sand (SP) Brown & Gray, Medium	100	27	27	72	2	0.256								
		X	15 50	50 /		Poorly-graded Sand (SP) Brown & Gray, Medium	100	28												
94.3	155.0																			
		X	12 16 14	30		Poorly-graded Gravel (GP) Brown	100	29	56	42	2	0.447								

120.0 122.5 125.0 127.5 130.0 132.5 135.0 137.5 140.0 142.5 145.0 147.5 150.0 152.5 155.0 157.5 160.0 162.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 5 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM | HORIZONTAL | VERTICAL

LOCATION COORDINATES: N 13,142,984.3 E 2,455,921.1

ELEVATION TOP OF BORING: 249.3

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
84.3	165.0																			
		X	11 11 15	26		Poorly-graded Sand (SP) Brown & Gray	100	30	38	59	3	0.284								
69.3	180.0	X	39 50	50 /		Poorly-graded Sand (SP) Light Gray	100	31												

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 219-BPL-11
LOCATION COORDINATES: N 13,142,530.6 E 2,455,710.2
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: G. Baker
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 3.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 75
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 240.1 8/9/11
15. DATE BORING: STARTED 8/9/11 COMPLETED 8/9/11
16. ELEVATION TOP OF BORING: 249.6
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
246.6	3.0	☒	2 2 3	5		Fat Clay (CH) Gray, medium, Oxidized, Organic Matter	100	1							18.9					
244.1	5.5	☒	2 2 2	4		Silt (ML) Gray, soft	100	2					25	2	21.9					
		☒	2 2 3	5		Clayey Sand (SC) Gray, Oxidized, Fine, Organic Matter	100	3			44				21.5					
239.1	10.5	☒	1 1 2	3		Clayey Sand (SC) Gray, Fine	100	4	0	80	20									
		☒	2 3 4	7		Poorly-graded Sand (SP) Gray, Fine, Organic Matter	100	5	0	98	2	0.102								
		☒	4 5 7	12		Poorly-graded Sand (SP) Gray, Fine	100	6	0	99	1	0.182								
		☒	5 6 9	15		Poorly-graded Sand (SP) Gray, Fine	100	7	0	99	1	0.182								
		☒	5 7 8	15		Poorly-graded Sand (SP) Gray, Fine	100	8	1	98	1	0.179								
		☒	6 8 7	15		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	8 11 15	26		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	5 8 9	17		Poorly-graded Sand (SP) Gray, Fine	100	11												
219.6	30.0	☒	5 7 7	14		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)

INSTALLATION: Memphis District (CEMVM)

SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study

2. HOLE NUMBER: 220-BPL-11

LOCATION COORDINATES: N 13,142,076.7 E 2,455,500.4

3. DRILLING AGENCY: Tri-State Testing Services, Inc.

4. NAME OF DRILLER: G. Baker

5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:

6. THICKNESS OF OVERBURDEN:

7. DEPTH DRILLED INTO ROCK:

8. TOTAL DEPTH OF BORING: 30.0

9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

10. SIZE AND TYPE OF BIT: 3.25" ID

11. MANUFACTURER'S DESIGNATION OF DRILL: CME 75

12. TOTAL SAMPLES: 12; DISTURBED: 12; UNDISTURBED: 0

13. TOTAL NUMBER CORE BOXES: 0

14. ELEVATION GROUND WATER: 238.4 8/9/11

15. DATE BORING: STARTED 8/9/11; COMPLETED 8/9/11

16. ELEVATION TOP OF BORING: 249.4

17. TOTAL CORE RECOVERY FOR BORING: N/A

18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
246.4	3.0	☒	3 4 4	8		Fat Clay (CH) Gray, medium, Oxidized, Organic Matter	100	1							16.5					
243.9	5.5	☒	2 2 2	4		Lean Clay (CL) Sandy, Gray, soft	100	2			51				17.9					
241.4	8.0	☒	2 2 3	5		Fat Clay (CH) Gray, medium, Oxidized	100	3					68	43	26.4					
		☒	1 1 2	3		Clayey Sand (SC) Gray, Fine	100	4	0	60	40									
236.4	13.0	☒	2 3 3	6		Clayey Sand (SC) Gray, Fine	100	5	0	76	24									
		☒	3 4 4	8		Poorly-graded Sand (SP) Gray, Fine	100	6	0	98	1	0.186								
		☒	3 4 5	9		Poorly-graded Sand (SP) Gray, Fine	100	7	0	97	3	0.156								
		☒	5 7 11	18		Poorly-graded Sand (SP) Gray, Fine	100	8	0	100	0	0.162								
		☒	4 5 8	13		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	4 4 6	10		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	3 4 5	9		Poorly-graded Sand (SP) Gray, Fine	100	11												
219.4	30.0	☒	3 6 10	16		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 5 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 4.5" Wing Bit
2. HOLE NUMBER: 221-BPT-11
LOCATION COORDINATES: N 13,141,622.4 E 2,455,290.6
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 75
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
12. TOTAL SAMPLES: 31 DISTURBED: 31 UNDISTURBED: 0
4. NAME OF DRILLER: G. Baker
13. TOTAL NUMBER CORE BOXES: 0
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED
DEG FROM VERTICAL: ---
BEARING:
14. ELEVATION GROUND WATER: 239.1 8/29/11
15. DATE BORING: STARTED 8/29/11 COMPLETED 8/30/11
6. THICKNESS OF OVERBURDEN:
16. ELEVATION TOP OF BORING: 249.1
7. DEPTH DRILLED INTO ROCK:
17. TOTAL CORE RECOVERY FOR BORING: N/A
8. TOTAL DEPTH OF BORING: 180.0
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_r	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	5 6 6	12		Lean Clay (CL) Brown, stiff	100	1							13.5					
		☒	4 3 3	6		Lean Clay (CL) Brown, medium	100	2					48	29	19.3					
243.6	5.5																			
		☒	1 1 1	2		Silty Sand (SM) Gray, Fine	100	3			44				37.0					
241.1	8.0																			
		☒	2 4 6	10		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	4	0	90	10									
238.6	10.5																			
		☒	5 7 8	15		Poorly-graded Sand (SP) Gray, Fine	100	5	0	96	4	0.151								
		☒	7 14 14	28		Poorly-graded Sand (SP) Gray, Medium	100	6	0	99	1	0.182								
		☒	7 12 13	25		Poorly-graded Sand (SP) Gray, Fine	100	7	0	97	3	0.166								
		☒	4 8 8	16		Poorly-graded Sand (SP) Gray, Fine	100	8	0	99	1	0.181								
		☒	8 9 10	19		Poorly-graded Sand (SP) Gray, Medium	100	9	0	99	1	0.211								
		☒	4 10 16	26		Poorly-graded Sand (SP) Gray, Medium	100	10	0	98	2	0.201								
		☒	4 8 8	16		Poorly-graded Sand (SP) Gray, Medium	100	11	0	99	1	0.209								
		☒	4 8 9	17		Poorly-graded Sand (SP) Gray, Fine	100	12	0	96	4	0.109								
218.6	30.5																			
		☒	7 7 8	15		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	13	0	89	11									
216.1	33.0																			
		☒	5 10 11	21		Poorly-graded Sand (SP) Gray, Fine	100	14	4	95	1	0.177								

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,141,622.4 E 2,455,290.6

ELEVATION TOP OF BORING: 249.1

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	6 7 8	15		Poorly-graded Sand (SP) Gray, Medium	100	15	3	97	1	0.183								
		X	5 6 7	13		Poorly-graded Sand (SP) Gray, Medium	100	16	6	92	2	0.193								
		X	5 6 7	13		Poorly-graded Sand (SP) Gray, Medium	100	17	6	93	1	0.169								
		X	5 7 12	19		Poorly-graded Sand (SP) Gray, Medium	100	18	0	99	1	0.289								
		X	7 8 13	21		Poorly-graded Sand (SP) Gray, Medium	100	19	2	97	1	0.294								
		X	10 20 21	41		Poorly-graded Sand (SP) Gray, Fine	100	20												

35.0 37.5 40.0 42.5 45.0 47.5 50.0 52.5 55.0 57.5 60.0 62.5 65.0 67.5 70.0 72.5 75.0 77.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 3 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,141,622.4 E 2,455,290.6

ELEVATION TOP OF BORING: 249.1

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	7 12 15	27		Poorly-graded Sand (SP) Gray, Fine	100	21	2	97	2	0.193								
		X	10 15 22	37		Poorly-graded Sand (SP) Gray, Fine	100	22												
		X	10 12 15	27		Poorly-graded Sand (SP) Gray, Fine	100	23	11	88	1	0.166								
		X	6 13 26	39		Poorly-graded Sand (SP) Brown & Gray, Medium	100	24												
		X	5 8 15	23		Poorly-graded Sand (SP) Brown & Gray, Medium	100	25	23	76	1	0.208								

77.5 80.0 82.5 85.0 87.5 90.0 92.5 95.0 97.5 100.0 102.5 105.0 107.5 110.0 112.5 115.0 117.5 120.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 4 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,141,622.4 E 2,455,290.6

ELEVATION TOP OF BORING: 249.1

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	7 8 13	21		Poorly-graded Sand (SP) Brown & Gray, Medium	100	26												
		X	11 8 9	17		Poorly-graded Sand (SP) Brown & Gray, Medium	100	27	26	73	1	0.307								
104.1	145.0																			
		X	20 22 20	42		Poorly-graded Gravel (GP) Brown & Gray, Fine	100	28												
		X	31 47 17	64		Poorly-graded Sand (SP) Brown & Gray	100	29	53	46	1	0.423								

120.0
122.5
125.0
127.5
130.0
132.5
135.0
137.5
140.0
142.5
145.0
147.5
150.0
152.5
155.0
157.5
160.0
162.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)		SHEET 5 OF 5 SHEETS
PROJECT: Below Piggott - West Bank SFB Seepage Study	COORDINATE SYSTEM: HORIZONTAL: VERTICAL:	
LOCATION COORDINATES: N 13,141,622.4 E 2,455,290.6	ELEVATION TOP OF BORING: 249.1	

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
84.1	165.0																			
		X	10 12 16	28		Poorly-graded Sand (SP) Brown & Gray, Medium	100	30	20	76	4	0.185								
74.1	175.0																			
		X	18 28 35	63		Clayey Sand (SC) Light Gray, Fine	100	31												
69.1	180.0																			

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 222-BPL-11
LOCATION COORDINATES: N 13,141,167.7 E 2,455,082.6
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: G. Baker
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 3.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 75
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 238.5 8/10/11
15. DATE BORING: STARTED 8/10/11 COMPLETED 8/10/11
16. ELEVATION TOP OF BORING: 248.5
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
245.5	3.0	☒	2 4 5	9		Fat Clay (CH) Brown, stiff, Oxidized, Rootlets	100	1							22.8					
243.0	5.5	☒	2 2 3	5		Lean Clay (CL) Gray, medium, Fine	100	2							21.3					
240.5	8.0	☒	2 1 2	3		Clayey Sand (SC) Brown, Fine	100	3			50				16.9					
		☒	1 2 2	4		Poorly-graded Sand (SP) Gray, Fine	100	4	0	96	4	0.151								
		☒	2 2 3	5		Poorly-graded Sand (SP) Gray, Fine	100	5	0	97	3	0.153								
		☒	1 2 3	5		Poorly-graded Sand (SP) Gray, Fine	100	6	0	97	3	0.153								
		☒	2 2 4	6		Poorly-graded Sand (SP) Gray, Fine	100	7	0	99	1	0.157								
		☒	3 4 5	9		Poorly-graded Sand (SP) Gray, Fine	100	8	0	99	1	0.174								
		☒	3 6 7	13		Poorly-graded Sand (SP) Gray, Fine	100	9												
		☒	6 8 11	19		Poorly-graded Sand (SP) Gray, Fine	100	10												
		☒	4 4 5	9		Poorly-graded Sand (SP) Gray, Fine	100	11												
218.5	30.0	☒	4 5 8	13		Poorly-graded Sand (SP) Gray, Fine	100	12												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 1 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 223-BPL-11
LOCATION COORDINATES: N 13,140,713.4 E 2,454,874.4
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: G. Baker
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 30.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 3.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 75
12. TOTAL SAMPLES: 12 DISTURBED: 12 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 238.3 8/10/11
15. DATE BORING: STARTED 8/10/11 COMPLETED 8/10/11
16. ELEVATION TOP OF BORING: 248.3
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
			3 3 4	7		Lean Clay (CL) Brown, medium	100	1							13.5					
245.3	3.0																			
			2 2 3	5		Fat Clay (CH) Brown, medium, Oxidized, Organic Matter	100	2							19.6					
			2 2 2	4		Fat Clay (CH) Gray, soft, Oxidized, Organic Matter	100	3					56	37	20.9					
240.3	8.0																			
			1 2 2	4		Clayey Sand (SC) Gray, Fine	100	4			24				23.8					
237.8	10.5																			
			2 2 3	5		Poorly-graded Sand (SP) Gray, Fine	100	5	0	99	1	0.172								
			4 5 5	10		Poorly-graded Sand (SP) Gray, Fine	100	6	1	98	1	0.172								
			4 6 7	13		Poorly-graded Sand (SP) Gray, Fine	100	7	0	99	1	0.171								
			5 7 8	15		Poorly-graded Sand (SP) Gray, Fine	100	8	0	99	1	0.168								
			5 6 9	15		Poorly-graded Sand (SP) Gray, Fine	100	9	0	98	2	0.181								
			3 3 7	10		Poorly-graded Sand (SP) Gray, Fine	100	10												
			3 4 6	10		Poorly-graded Sand (SP) Gray, Fine	100	11												
			4 7 10	17		Poorly-graded Sand (SP) Gray, Fine	100	12												
218.3	30.0																			

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)

INSTALLATION: Memphis District (CEMVM)

SHEET 1 OF 5 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study

9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

10. SIZE AND TYPE OF BIT: 4.5" Wing Bit

2. HOLE NUMBER: 224-BPT-11

LOCATION COORDINATES: N 13,140,258.9 E 2,454,665.8

11. MANUFACTURER'S DESIGNATION OF DRILL: CME 850

3. DRILLING AGENCY: Tri-State Testing Services, Inc.

12. TOTAL SAMPLES: 30 DISTURBED: 30 UNDISTURBED: 0

4. NAME OF DRILLER: J. Kinas

13. TOTAL NUMBER CORE BOXES: 0

5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:

14. ELEVATION GROUND WATER: 238.7 8/29/11

15. DATE BORING: STARTED 8/29/11 COMPLETED 8/30/11

6. THICKNESS OF OVERBURDEN:

16. ELEVATION TOP OF BORING: 248.7

7. DEPTH DRILLED INTO ROCK:

17. TOTAL CORE RECOVERY FOR BORING: N/A

8. TOTAL DEPTH OF BORING: 170.0

18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	2 4 5	9		Fat Clay (CH) Brown, stiff	100	1							17.5					
		☒	2 3 3	6		Fat Clay (CH) Brown & Gray, medium	100	2					77	46	25.0					
243.2	5.5																			
		☒	3 6 5	11		Lean Clay (CL) Brown & Gray, stiff	100	3							25.6					
		☒	4 4 6	10		Lean Clay (CL) Brown & Gray, stiff	100	4			71				35.3					
238.2 ▼	10.5																			
		☒	5 6 7	13		Poorly-graded Sand (SP) Gray, Fine	100	5	0	96	4	0.118								
		☒	5 6 6	12		Poorly-graded Sand (SP) Gray, Fine	100	6	0	97	3	0.158								
		☒	5 7 8	15		Poorly-graded Sand (SP) Gray, Fine	100	7	0	98	2	0.192								
		☒	4 5 7	12		Poorly-graded Sand (SP) Gray, Medium	100	8	0	98	2	0.181								
		☒	5 7 8	15		Poorly-graded Sand (SP) Gray, Medium	100	9	5	93	2	0.177								
		☒	5 5 8	13		Poorly-graded Sand (SP) Gray, Medium	100	10	0	97	3	0.163								
		☒	4 7 9	16		Poorly-graded Sand (SP) Gray, Fine	100	11	0	98	2	0.166								
		☒	5 8 10	18		Poorly-graded Sand (SP) Gray, Fine	100	12	0	96	4	0.151								
		☒	4 5 8	13		Poorly-graded Sand (SP) Gray, Medium	100	13	0	98	2	0.167								
		☒	5 6 8	14		Poorly-graded Sand (SP) Gray, Medium	100	14	2	95	2	0.154								

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,140,258.9 E 2,454,665.8

ELEVATION TOP OF BORING: 248.7

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	6 7 10	17		Poorly-graded Sand (SP) Gray, Medium	100	15	0	99	1	0.177								
		X	6 6 7	13		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	16	0	96	4	0.116								
		X	6 6 9	15		Poorly-graded Sand (SP) Gray, Fine	100	17	6	92	3	0.154								
		X	4 9 13	22		Poorly-graded Sand (SP) Gray, Medium	100	18	5	93	2	0.311								
		X	6 8 11	19		Poorly-graded Sand (SP) Gray, Medium	100	19	7	90	2	0.258								
183.7	65.0																			
		X	8 13 18	31		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	20	0	95	5	0.147								
173.7	75.0																			

35.0 37.5 40.0 42.5 45.0 47.5 50.0 52.5 55.0 57.5 60.0 62.5 65.0 67.5 70.0 72.5 75.0 77.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 3 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,140,258.9 E 2,454,665.8

ELEVATION TOP OF BORING: 248.7

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	8 11 15	26		Poorly-graded Sand (SP) Gray, Fine	100	21	2	95	3	0.157								
		X	9 14 15	29		Poorly-graded Sand (SP) Gray, Fine	100	22	0	97	3	0.160								
		X	8 11 15	26		Poorly-graded Sand (SP) Gray, Fine	100	23	0	98	2	0.173								
		X	31 31 14	45		Poorly-graded Sand (SP) Gray, Fine	100	24												
		X	27 32 18	50		Poorly-graded Sand (SP) Gray, Medium	100	25	37	62	1	0.136								

77.5 80.0 82.5 85.0 87.5 90.0 92.5 95.0 97.5 100.0 102.5 105.0 107.5 110.0 112.5 115.0 117.5 120.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 4 OF 5 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,140,258.9 E 2,454,665.8

ELEVATION TOP OF BORING: 248.7

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	4 9 12	21		Poorly-graded Sand (SP) Gray, Medium	100	26												
113.7	135.0																			
		X	6 10 14	24		Poorly-graded Sand with Clay (SP-SC) Gray, Fine	100	27	0	94	6	0.084								
103.7	145.0																			
		X	7 12 14	26		Poorly-graded Sand (SP) Gray	100	28												
93.7	155.0																			
		X	27 36 50	86		Poorly-graded Sand with Silt (SP-SM) Gray	100	29	35	60	5	0.152								

120.0 122.5 125.0 127.5 130.0 132.5 135.0 137.5 140.0 142.5 145.0 147.5 150.0 152.5 155.0 157.5 160.0 162.5

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)		SHEET 5 OF 5 SHEETS
PROJECT: Below Piggott - West Bank SFB Seepage Study	COORDINATE SYSTEM: HORIZONTAL: VERTICAL	
LOCATION COORDINATES: N 13,140,258.9 E 2,454,665.8	ELEVATION TOP OF BORING: 248.7	

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
83.7	165.0																			
78.7	170.0	X	9 14 17	31		Fat Clay (CH) Gray, very stiff	100	30												

162.5
165.0
167.5
170.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)

INSTALLATION: Memphis District (CEMVM)

SHEET 1 OF 2 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study

2. HOLE NUMBER: 225-BPC-10

LOCATION COORDINATES: N 13,180,279.0 E 2,489,737.9

3. DRILLING AGENCY: Tri-State Testing Services, Inc.

4. NAME OF DRILLER: M. Woolfolk

5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:

6. THICKNESS OF OVERBURDEN:

7. DEPTH DRILLED INTO ROCK:

8. TOTAL DEPTH OF BORING: 45.0

9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

10. SIZE AND TYPE OF BIT: 3.25" ID

11. MANUFACTURER'S DESIGNATION OF DRILL: CME 55

12. TOTAL SAMPLES: 10; DISTURBED: 10; UNDISTURBED: 0

13. TOTAL NUMBER CORE BOXES: 0

14. ELEVATION GROUND WATER: 254.7 10/14/10

15. DATE BORING: STARTED 10/14/10; COMPLETED 10/14/10

16. ELEVATION TOP OF BORING: 277.7

17. TOTAL CORE RECOVERY FOR BORING: N/A

18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
			24 21 18	39		Silty Sand (SM) Light Brown, Fine	100	1			20									
274.7	3.0																			
			8 10 8	18		Clayey Sand (SC) Gray, Fine	100	2												
			3 2 2	4		Clayey Sand (SC) Gray, Fine	100	3			22									
			1 2 3	5		Clayey Sand (SC) Gray, Fine	100	4												
			6 8 9	17		Clayey Sand (SC) Gray, Fine	100	5												
			6 10 12	22		Clayey Sand (SC) Gray, Fine	100	6												
251.7	26.0																			
			4 6 6	12		Poorly-graded Sand (SP) Gray, Fine	100	7												
			2 2 2	4		Poorly-graded Sand (SP) Gray, Medium	100	8												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 2 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM | HORIZONTAL | VERTICAL

LOCATION COORDINATES: N 13,180,279.0 E 2,489,737.9

ELEVATION TOP OF BORING: 277.7

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	6 8 8	16		Poorly-graded Sand (SP) Gray, Medium	100	9												
232.7	45.0	X	7 8 9	17		Poorly-graded Sand (SP) Gray, Medium	100	10												

35.0
37.5
40.0
42.5
45.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)

INSTALLATION: Memphis District (CEMVM)

SHEET 1 OF 2 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study

2. HOLE NUMBER: 226-BPC-10

LOCATION COORDINATES: N 13,178,934.8 E 2,489,071.6

3. DRILLING AGENCY: Tri-State Testing Services, Inc.

4. NAME OF DRILLER: M. Woolfolk

5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:

6. THICKNESS OF OVERBURDEN:

7. DEPTH DRILLED INTO ROCK:

8. TOTAL DEPTH OF BORING: 45.0

9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

10. SIZE AND TYPE OF BIT: 3.25" ID

11. MANUFACTURER'S DESIGNATION OF DRILL: CME 55

12. TOTAL SAMPLES: 10; DISTURBED: 10; UNDISTURBED: 0

13. TOTAL NUMBER CORE BOXES: 0

14. ELEVATION GROUND WATER: 254.1 10/15/10

15. DATE BORING: STARTED 10/15/10; COMPLETED 10/15/10

16. ELEVATION TOP OF BORING: 277.1

17. TOTAL CORE RECOVERY FOR BORING: N/A

18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
274.1	3.0	☒	23 22 22	44		Silty Sand (SM) Light Brown, Fine	100	1												
271.1	6.0	☒	10 8 7	15		Lean Clay (CL) Gray, stiff	100	2					34	19	14.6					
		☒	2 3 2	5		Clayey Sand (SC) Gray, Fine	100	3			48									
261.1	16.0	☒	2 2 2	4		Clayey Sand (SC) Gray, Fine	100	4												
256.1	21.0	☒	4 5 6	11		Silty Sand (SM) Gray	100	5												
		☒	5 8 10	18		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	6 6 7	13		Poorly-graded Sand (SP) Gray, Medium	100	7												
		☒	7 7 9	16		Poorly-graded Sand (SP) Gray, Medium	100	8												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 2 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,178,934.8 E 2,489,071.6

ELEVATION TOP OF BORING: 277.1

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	8 9 11	20		Poorly-graded Sand (SP) Gray, Medium	100	9												
232.1	45.0	X	8 8 10	18		Poorly-graded Sand (SP) Gray, Medium	100	10												

35.0
37.5
40.0
42.5
45.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)

INSTALLATION: Memphis District (CEMVM)

SHEET 1 OF 2 SHEETS

1. PROJECT	Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER	227-BPC-10
LOCATION COORDINATES	N 13,177,628.9 E 2,488,341.7
3. DRILLING AGENCY	Tri-State Testing Services, Inc.
4. NAME OF DRILLER	M. Woolfolk
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG FROM VERTICAL	---
BEARING	
6. THICKNESS OF OVERBURDEN	
7. DEPTH DRILLED INTO ROCK	
8. TOTAL DEPTH OF BORING	45.0
9. COORDINATE SYSTEM	HORIZONTAL / VERTICAL
10. SIZE AND TYPE OF BIT:	3.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL	CME 55
12. TOTAL SAMPLES	10 (DISTURBED 10 / UNDISTURBED 0)
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	253.1 10/15/10
15. DATE BORING	STARTED 10/15/10 COMPLETED 10/15/10
16. ELEVATION TOP OF BORING	277.1
17. TOTAL CORE RECOVERY FOR BORING	N/A
18. SIGNATURE AND TITLE OF INSPECTOR	Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_r	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	21 13 10	23		Silty Sand (SM) Brown, Fine	100	1												
		☒	7 7 5	12		Silty Sand (SM) Brown, Fine	100	2												
271.1	6.0																			
		☒	2 2 2	4		Clayey Sand (SC) Brown, Fine	100	3												
		☒	2 1 2	3		Clayey Sand (SC) Gray, Fine	100	4			19									
261.1	16.0																			
		☒	4 6 6	12		Silty Sand (SM) Brown, Fine	100	5												
256.1	21.0																			
		☒	4 3 7	10		Poorly-graded Sand (SP) Brown, Fine	100	6												
		☒	2 2 3	5		Poorly-graded Sand (SP) Brown, Fine	100	7												
		☒	8 12 14	26		Poorly-graded Sand (SP) Brown, Medium	100	8												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 2 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM | HORIZONTAL | VERTICAL

LOCATION COORDINATES: N 13,177,628.9 E 2,488,341.7

ELEVATION TOP OF BORING: 277.1

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	7 9 12	21		Poorly-graded Sand (SP) Brown, Medium	100	9												
232.1	45.0	X	8 8 13	21		Poorly-graded Sand (SP) Brown, Medium	100	10												

35.0
37.5
40.0
42.5
45.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)

INSTALLATION: Memphis District (CEMVM)

SHEET 1 OF 2 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study

9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

10. SIZE AND TYPE OF BIT: 2.25" ID

2. HOLE NUMBER: 228-BPC-10

LOCATION COORDINATES: N 13,176,412.8 E 2,487,465.4

11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45

3. DRILLING AGENCY: Tri-State Testing Services, Inc.

12. TOTAL SAMPLES: 10 DISTURBED: 10 UNDISTURBED: 0

4. NAME OF DRILLER: K. Roberts

13. TOTAL NUMBER CORE BOXES: 0

5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:

14. ELEVATION GROUND WATER: 259.6 9/6/10

15. DATE BORING: STARTED 9/6/10 COMPLETED 9/6/10

6. THICKNESS OF OVERBURDEN:

16. ELEVATION TOP OF BORING: 276.6

7. DEPTH DRILLED INTO ROCK:

17. TOTAL CORE RECOVERY FOR BORING: N/A

8. TOTAL DEPTH OF BORING: 45.0

18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	5 5 5	10		Silty Sand (SM) Red & Brown, Fine	100	1												
		☒	2 2 2	4		Silty Sand (SM) Red & Brown, Fine	100	2												
		☒	2 1 2	3		Silty Sand (SM) Red & Brown, Fine	100	3												
265.6	11.0																			
		☒	1 2 1	3		Silty Clay (CL-ML) Gray, soft, Fine	100	4					21	4	16.3					
260.6	16.0																			
		☒	4 7 12	19		Silty Sand (SM) Gray, Fine	100	5												
255.6	21.0																			
		☒	5 9 13	22		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	6			11									
250.6	26.0																			
		☒	11 13 19	32		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	11 13 14	27		Poorly-graded Sand (SP) Gray, Fine	100	8												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 2 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,176,412.8 E 2,487,465.4

ELEVATION TOP OF BORING: 276.6

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	3 3 8	11		Poorly-graded Sand (SP) Gray, Fine	100	9												
231.6	45.0	X	11 17 22	39		Poorly-graded Sand (SP) Gray, Fine	100	10												

35.0
37.5
40.0
42.5
45.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 2 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 229-BPC-10
LOCATION COORDINATES: N 13,175,195.0 E 2,486,563.6
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 45.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 10 DISTURBED: 10 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 259.2 9/7/10
15. DATE BORING: STARTED 9/7/10 COMPLETED 9/7/10
16. ELEVATION TOP OF BORING: 276.2
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	10 9 9	18		Silty Sand (SM) Red & Brown, Fine	100	1												
		☒	5 6 8	14		Silty Sand (SM) Gray, Oxidized, Fine	100	2												
		☒	2 2 2	4		Silty Sand (SM) Gray, Fine	100	3			33									
		☒	2 2 3	5		Silty Sand (SM) Brown & Gray, Fine	100	4												
		☒	5 10 8	18		Silty Sand (SM) Brown, Fine	100	5												
		☒	5 12 7	19		Silty Sand (SM) Brown & Gray, Fine	100	6												
250.2	26.0																			
		☒	7 5 7	12		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	6 7 10	17		Poorly-graded Sand (SP) Dark Gray, Fine	100	8												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 2 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM | HORIZONTAL | VERTICAL

LOCATION COORDINATES: N 13,175,195.0 E 2,486,563.6

ELEVATION TOP OF BORING: 276.2

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	5 8 14	22		Poorly-graded Sand (SP) Dark Gray, Fine	100	9												
231.2	45.0	X	12 21 21	42		Poorly-graded Sand (SP) Gray, Fine	100	10												

35.0
37.5
40.0
42.5
45.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)

INSTALLATION: Memphis District (CEMVM)

SHEET 1 OF 2 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study

9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

10. SIZE AND TYPE OF BIT: 2.25" ID

2. HOLE NUMBER: 230-BPC-10

LOCATION COORDINATES: N 13,173,895.4 E 2,485,831.2

11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45

3. DRILLING AGENCY: Tri-State Testing Services, Inc.

12. TOTAL SAMPLES: 10 DISTURBED: 10 UNDISTURBED: 0

4. NAME OF DRILLER: K. Roberts

13. TOTAL NUMBER CORE BOXES: 0

5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:

14. ELEVATION GROUND WATER: 252.3 9/7/10

15. DATE BORING: STARTED 9/7/10 COMPLETED 9/7/10

6. THICKNESS OF OVERBURDEN:

16. ELEVATION TOP OF BORING: 275.3

7. DEPTH DRILLED INTO ROCK:

17. TOTAL CORE RECOVERY FOR BORING: N/A

8. TOTAL DEPTH OF BORING: 45.0

18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	11 9 8	17		Silty Sand (SM) Tan & Brown, Fine	100	1												
		☒	3 3 3	6		Silty Sand (SM) Red & Brown, Fine	100	2												
		☒	3 3 2	5		Silty Sand (SM) Red & Brown, Fine	100	3												
		☒	2 3 3	6		Silty Sand (SM) Brown, Fine	100	4			18									
259.3	16.0																			
		☒	5 6 8	14		Poorly-graded Sand (SP) Brown, Fine	100	5												
		☒	13 10 12	22		Poorly-graded Sand (SP) Gray & Brown, Fine	100	6												
		☒	10 12 13	25		Poorly-graded Sand (SP) Brown, Fine	100	7												
		☒	12 14 20	34		Poorly-graded Sand (SP) Brown, Fine	100	8												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 2 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM | HORIZONTAL | VERTICAL

LOCATION COORDINATES: N 13,173,895.4 E 2,485,831.2

ELEVATION TOP OF BORING: 275.3

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	5 11 17	28		Poorly-graded Sand (SP) Gray, Fine	100	9												
230.3	45.0	X	9 15 22	37		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	10												

35.0
37.5
40.0
42.5
45.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 2 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 231-BPC-10
LOCATION COORDINATES: N 13,172,482.7 E 2,485,346.6
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 45.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 10 DISTURBED: 10 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 255.4 9/7/10
15. DATE BORING: STARTED 9/7/10 COMPLETED 9/7/10
16. ELEVATION TOP OF BORING: 273.9
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
270.9	3.0	☒	5 4 4	8		Silty Sand (SM) Brown & Gray, Oxidized, Fine	100	1												
267.9	6.0	☒	4 4 5	9		Clayey Sand (SC) Gray, Oxidized, Fine	100	2			41				13.6					
		☒	1 3 3	6		Lean Clay (CL) Gray, medium, Oxidized	100	3					33	17	19.9					
		☒	0 1 3	4		Lean Clay (CL) Gray, soft, Oxidized	100	4							34.4					
252.9	21.0	☒	0 2 1	3		Lean Clay (CL) Gray, soft, Oxidized	100	5							38.9					
		☒	10 12 8	20		Poorly-graded Sand (SP) Brown & Gray, Fine	100	6												
		☒	3 5 10	15		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	12 16 21	37		Poorly-graded Sand (SP) Gray, Fine	100	8												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 2 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM | HORIZONTAL | VERTICAL

LOCATION COORDINATES: N 13,172,482.7 E 2,485,346.6

ELEVATION TOP OF BORING: 273.9

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	10 19 18	37		Poorly-graded Sand (SP) Gray, Fine	100	9												
228.9	45.0	X	7 19 30	49		Poorly-graded Sand (SP) Gray, Fine	100	10												

35.0
37.5
40.0
42.5
45.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 2 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 232-BPC-10
LOCATION COORDINATES: N 13,171,030.1 E 2,485,080.4
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: K. Roberts
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 45.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 2.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
12. TOTAL SAMPLES: 10 DISTURBED: 10 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 255.8 9/13/10
15. DATE BORING: STARTED 9/13/10 COMPLETED 9/13/10
16. ELEVATION TOP OF BORING: 273.3
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	9 7 8	15		Silty Sand (SM) Brown, Oxidized, Fine	100	1												
		☒	4 4 4	8		Silty Sand (SM) Brown & Gray, Oxidized, Fine	100	2												
		☒	3 2 1	3		Silty Sand (SM) Brown & Gray, & Mottled, Oxidized, Fine	100	3												
		☒	3 3 2	5		Silty Sand (SM) Gray, Fine	100	4			40									
257.3	16.0																			
		☒	6 5 4	9		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	5												
252.3	21.0																			
		☒	2 6 8	14		Poorly-graded Sand (SP) Brown, Fine	100	6												
		☒	9 11 11	22		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	7												
		☒	13 12 11	23		Poorly-graded Sand (SP) Gray, Fine	100	8												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 2 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM | HORIZONTAL | VERTICAL

LOCATION COORDINATES: N 13,171,030.1 E 2,485,080.4

ELEVATION TOP OF BORING: 273.3

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	7 13 15	28		Poorly-graded Sand (SP) Gray, Fine	100	9												
228.3	45.0	X	12 14 16	30		Poorly-graded Sand (SP) Gray, Fine	100	10												

35.0
37.5
40.0
42.5
45.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 2 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 233-BPC-11
LOCATION COORDINATES: N 13,169,546.9 E 2,485,105.6
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: G. Baker
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 45.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 3.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 75
12. TOTAL SAMPLES: 10 DISTURBED: 10 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 254.7 8/1/11
15. DATE BORING: STARTED 8/1/11 COMPLETED 8/1/11
16. ELEVATION TOP OF BORING: 272.7
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
269.7	3.0	☒	6 7 7	14		Poorly-graded Sand with Silt (SP-SM) Brown, Fine	100	1												
266.7	6.0	☒	2 2 2	4		Poorly-graded Sand with Clay (SP-SC) Brown, Fine	100	2												
261.7	11.0	☒	7 8 9	17		Poorly-graded Sand (SP) Brown, Fine	100	3												
256.7	16.0	☒	4 5 8	13		Silty Sand (SM) Brown, Fine	100	4			26									
		☒	4 4 3	7		Poorly-graded Sand (SP) Brown, Fine	100	5												
		☒	8 10 16	26		Poorly-graded Sand (SP) Brown, Fine	100	6												
		☒	7 12 18	30		Poorly-graded Sand (SP) Brown, Fine	100	7												
		☒	8 13 15	28		Poorly-graded Sand (SP) Brown, Fine	100	8												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 2 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM | HORIZONTAL | VERTICAL

LOCATION COORDINATES: N 13,169,546.9 E 2,485,105.6

ELEVATION TOP OF BORING: 272.7

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	5 7 10	17		Poorly-graded Sand (SP) Brown, Fine	100	9												
227.7	45.0	X	4 7 9	16		Poorly-graded Sand (SP) Brown, Fine, Lignite Fragments	100	10												

35.0
37.5
40.0
42.5
45.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 2 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 234-BPC-10
LOCATION COORDINATES: N 13,168,608.6 E 2,483,937.5
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: M. Woolfolk
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 45.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 3.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 55
12. TOTAL SAMPLES: 10 DISTURBED: 10 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 254.7 10/19/10
15. DATE BORING: STARTED 10/19/10 COMPLETED 10/19/10
16. ELEVATION TOP OF BORING: 272.7
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_F	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
269.7	3.0	☒	2 5 7	12		Silty Sand (SM) Brown & Gray	100	1												
266.7	6.0	☒	3 4 4	8		Clayey Sand (SC) Brown & Gray	100	2												
261.7	11.0	☒	3 2 2	4		Silty Sand (SM) Brown	100	3												
256.7	16.0	☒	4 4 8	12		Silt (ML) Sandy, Brown & Gray, medium, Fine	100	4			65									
		☒	4 6 8	14		Poorly-graded Sand (SP) Gray, Fine	100	5												
		☒	2 4 6	10		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	4 3 2	5		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	4 6 6	12		Poorly-graded Sand (SP) Gray, Fine	100	8												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 2 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM | HORIZONTAL | VERTICAL

LOCATION COORDINATES: N 13,168,608.6 E 2,483,937.5

ELEVATION TOP OF BORING: 272.7

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	3 5 7	12		Poorly-graded Sand (SP) Gray, Fine	100	9												
227.7	45.0	X	4 5 6	11		Poorly-graded Sand (SP) Gray, Fine	100	10												

35.0
37.5
40.0
42.5
45.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 2 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 235-BPC-10
LOCATION COORDINATES: N 13,167,694.2 E 2,482,752.0
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: M. Woolfolk
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 45.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 3.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 55
12. TOTAL SAMPLES: 10 DISTURBED: 10 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 253.3 10/19/10
15. DATE BORING: STARTED 10/19/10 COMPLETED 10/19/10
16. ELEVATION TOP OF BORING: 271.3
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
268.3	3.0	☒	11 10 9	19		Silty Sand (SM) Brown, Oxidized	100	1												
265.3	6.0	☒	4 5 4	9		Silt (ML) Sandy, Brown, Oxidized	100	2			60									
		☒	3 2 2	4		Silty Sand (SM) Brown, Oxidized, Organic Matter	100	3												
		☒	3 2 2	4		Silty Sand (SM) Gray, Oxidized	100	4												
250.3	21.0	☒	6 3 4	7		Silty Sand (SM) Brown	100	5												
		☒	4 6 4	10		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	6 7 9	16		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	6 5 4	9		Poorly-graded Sand (SP) Gray, Fine	100	8												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 2 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM | HORIZONTAL | VERTICAL

LOCATION COORDINATES: N 13,167,694.2 E 2,482,752.0

ELEVATION TOP OF BORING: 271.3

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	7 6 6	12		Poorly-graded Sand (SP) Gray, Fine, Organic Matter	100	9												
226.3	45.0	X	5 7 5	12		Poorly-graded Sand (SP) Gray, Fine, Organic Matter	100	10												

35.0
37.5
40.0
42.5
45.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)

INSTALLATION: Memphis District (CEMVM)

SHEET 1 OF 2 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study

2. HOLE NUMBER: 236-BPC-10

LOCATION COORDINATES: N 13,166,777.1 E 2,481,564.8

3. DRILLING AGENCY: Tri-State Testing Services, Inc.

4. NAME OF DRILLER: M. Woolfolk

5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:

6. THICKNESS OF OVERBURDEN:

7. DEPTH DRILLED INTO ROCK:

8. TOTAL DEPTH OF BORING: 45.0

9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

10. SIZE AND TYPE OF BIT: 3.25" ID

11. MANUFACTURER'S DESIGNATION OF DRILL: CME 55

12. TOTAL SAMPLES: 10; DISTURBED: 10; UNDISTURBED: 0

13. TOTAL NUMBER CORE BOXES: 0

14. ELEVATION GROUND WATER: 252.9 10/20/10

15. DATE BORING: STARTED 10/20/10; COMPLETED 10/20/10

16. ELEVATION TOP OF BORING: 270.9

17. TOTAL CORE RECOVERY FOR BORING: N/A

18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_r	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	7 6 7	13		Fat Clay (CH) Dark Brown, stiff, Oxidized, Organic Matter	100	1							17.5					
		☒	3 5 4	9		Fat Clay (CH) Dark Brown, stiff, Oxidized, Organic Matter	100	2							18.6					
264.9	6.0																			
		☒	2 2 3	5		Lean Clay (CL) Dark Brown, medium	100	3					45	28	30.4					
		☒	3 4 5	9		Lean Clay (CL) Dark Gray & Brown, stiff	100	4							21.2					
		☒	4 4 5	9		Lean Clay (CL) Brown, stiff, Fine	100	5			72									
249.9	21.0																			
		☒	5 7 11	18		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	5 7 8	15		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	4 6 8	14		Poorly-graded Sand (SP) Gray, Fine	100	8												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 2 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM | HORIZONTAL | VERTICAL

LOCATION COORDINATES: N 13,166,777.1 E 2,481,564.8

ELEVATION TOP OF BORING: 270.9

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	5 7 7	14		Poorly-graded Sand (SP) Gray, Fine	100	9												
225.9	45.0	X	6 5 7	12		Poorly-graded Sand (SP) Gray, Fine	100	10												

35.0
37.5
40.0
42.5
45.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG	DIVISION: Mississippi Valley Division (MVD)	INSTALLATION: Memphis District (CEMVM)	SHEET 1 OF 2 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study	9. COORDINATE SYSTEM: HORIZONTAL / VERTICAL
	10. SIZE AND TYPE OF BIT: 3.25" ID
2. HOLE NUMBER: 237-BPC-10 — LOCATION COORDINATES: N 13,165,868.6 E 2,480,369.0	11. MANUFACTURER'S DESIGNATION OF DRILL: CME 55
3. DRILLING AGENCY: Tri-State Testing Services, Inc.	12. TOTAL SAMPLES: 10 — DISTURBED: 10 — UNDISTURBED: 0
4. NAME OF DRILLER: J. Kinas	13. TOTAL NUMBER CORE BOXES: 0
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED — DEG FROM VERTICAL: --- — BEARING	14. ELEVATION GROUND WATER: 254.0 10/21/10
	15. DATE BORING — STARTED: 10/21/10 — COMPLETED: 10/21/10
6. THICKNESS OF OVERBURDEN	16. ELEVATION TOP OF BORING: 272.0
7. DEPTH DRILLED INTO ROCK	17. TOTAL CORE RECOVERY FOR BORING: N/A
8. TOTAL DEPTH OF BORING: 45.0	18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	14 11 10	21		Silty Sand (SM) Light Brown, Fine	100	1												
		☒	5 2 7	9		Silty Sand (SM) Light Brown, Fine	100	2			45									
		☒	3 4 5	9		Silty Sand (SM) Brown, Fine	100	3												
		☒	3 4 4	8		Silty Sand (SM) Brown, Fine	100	4												
		☒	4 3 4	7		Silty Sand (SM) Brown, Fine	100	5												
251.0	21.0																			
		☒	5 5 7	12		Poorly-graded Sand (SP) Brown, Medium	100	6												
		☒	4 8 8	16		Poorly-graded Sand (SP) Brown, Medium	100	7												
		☒	3 10 9	19		Poorly-graded Sand (SP) Brown, Medium	100	8												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 2 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM | HORIZONTAL | VERTICAL

LOCATION COORDINATES: N 13,165,868.6 E 2,480,369.0

ELEVATION TOP OF BORING: 272.0

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	6 7 7	14		Poorly-graded Sand (SP) Brown, Medium	100	9												
227.0	45.0	X	1 7 8	15		Poorly-graded Sand (SP) Brown, Medium	100	10												

35.0
37.5
40.0
42.5
45.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 2 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 238-BPC-10
LOCATION COORDINATES: N 13,165,050.0 E 2,479,117.0
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: J. Kinas
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 45.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 3.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 55
12. TOTAL SAMPLES: 10 DISTURBED: 10 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 251.1 10/21/10
15. DATE BORING: STARTED 10/21/10 COMPLETED 10/21/10
16. ELEVATION TOP OF BORING: 270.1
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	21 12 15	27		Silty Sand (SM) Brown	100	1												
		☒	7 9 8	17		Silty Sand (SM) Brown	100	2			48									
		☒	3 4 3	7		Silty Sand (SM) Gray	100	3												
		☒	4 5 3	8		Silty Sand (SM) Brown	100	4												
254.1	16.0																			
		☒	5 6 7	13		Poorly-graded Sand (SP) Gray, Fine	100	5												
		☒	6 7 8	15		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	7 7 9	16		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	9 8 8	16		Poorly-graded Sand (SP) Gray, Fine	100	8												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 2 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM | HORIZONTAL | VERTICAL

LOCATION COORDINATES: N 13,165,050.0 E 2,479,117.0

ELEVATION TOP OF BORING: 270.1

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	6 5 8	13		Poorly-graded Sand (SP) Gray, Fine	100	9												
225.1	45.0	X	7 9 7	16		Poorly-graded Sand (SP) Gray, Fine	100	10												

35.0
37.5
40.0
42.5
45.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 2 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 239-BPC-11
LOCATION COORDINATES: N 13,164,257.3 E 2,477,843.1
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: G. Baker
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 45.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 3.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 75
12. TOTAL SAMPLES: 10 DISTURBED: 10 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 252.1 8/2/11
15. DATE BORING: STARTED 8/2/11 COMPLETED 8/2/11
16. ELEVATION TOP OF BORING: 270.1
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	6 5 3	8		Silty Sand (SM) Brown, Fine	100	1												
		☒	1 2 2	4		Silty Sand (SM) Brown, Fine	100	2												
		☒	1 1 2	3		Silty Sand (SM) Brown, Fine	100	3												
		☒	2 2 2	4		Silty Sand (SM) Brown, Fine	100	4			25									
254.1	16.0																			
		☒	1 2 2	4		Poorly-graded Sand (SP) Brown, Fine	100	5												
		☒	2 2 2	4		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	3 6 9	15		Poorly-graded Sand (SP) Brown, Fine	100	7												
		☒	7 11 12	23		Poorly-graded Sand (SP) Brown & Gray, Fine	100	8												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 2 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM | HORIZONTAL | VERTICAL

LOCATION COORDINATES: N 13,164,257.3 E 2,477,843.1

ELEVATION TOP OF BORING: 270.1

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	3 5 7	12		Poorly-graded Sand (SP) Gray, Fine	100	9												
225.1	45.0	X	6 7 10	17		Poorly-graded Sand (SP) Gray, Fine	100	10												

35.0
37.5
40.0
42.5
45.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 2 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 240-BPC-10
LOCATION COORDINATES: N 13,163,408.5 E 2,476,595.9
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: M. Woolfolk
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 45.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 3.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 55
12. TOTAL SAMPLES: 10 DISTURBED: 10 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 250.6 10/26/10
15. DATE BORING: STARTED 10/26/10 COMPLETED 10/26/10
16. ELEVATION TOP OF BORING: 268.6
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	15 12 11	23		Silty Sand (SM) Brown, Fine	100	1												
		☒	7 5 3	8		Silty Sand (SM) Brown, Fine	100	2												
		☒	4 4 3	7		Silty Sand (SM) Brown, Fine	100	3												
		☒	4 4 4	8		Silty Sand (SM) Brown, Fine	100	4												
252.6	16.0																			
		☒	3 5 7	12		Poorly-graded Sand with Silt (SP-SM) Gray & Brown, Fine	100	5			9									
247.6	21.0																			
		☒	4 5 4	9		Poorly-graded Sand (SP) Brown, Fine	100	6												
		☒	3 5 6	11		Poorly-graded Sand (SP) Brown, Fine	100	7												
		☒	4 7 9	16		Poorly-graded Sand (SP) Brown, Fine	100	8												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 2 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM | HORIZONTAL | VERTICAL

LOCATION COORDINATES: N 13,163,408.5 E 2,476,595.9

ELEVATION TOP OF BORING: 268.6

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	6 6 7	13		Poorly-graded Sand (SP) Brown, Fine	100	9												
223.6	45.0	X	4 5 6	11		Poorly-graded Sand (SP) Brown, Fine	100	10												

35.0
37.5
40.0
42.5
45.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 2 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 241-BPC-10
LOCATION COORDINATES: N 13,162,546.0 E 2,475,398.2
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: M. Woolfolk
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 45.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 3.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 55
12. TOTAL SAMPLES: 10 DISTURBED: 10 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 250.7 10/26/10
15. DATE BORING: STARTED 10/26/10 COMPLETED 10/26/10
16. ELEVATION TOP OF BORING: 269.7
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	13 9 10	19		Silty Sand (SM) Brown, Fine	100	1												
		☒	6 6 5	11		Silty Sand (SM) Brown, Fine	100	2												
		☒	3 4 5	9		Silty Sand (SM) Brown, Fine	100	3												
		☒	3 4 4	8		Silty Sand (SM) Gray & Brown, Fine	100	4												
253.7	16.0																			
		☒	4 6 4	10		Clayey Sand (SC) Gray, Fine	100	5			13									
248.7	21.0																			
		☒	5 3 6	9		Poorly-graded Sand (SP) Brown, Fine	100	6												
		☒	6 7 6	13		Poorly-graded Sand (SP) Brown, Medium	100	7												
		☒	5 2 8	10		Poorly-graded Sand (SP) Brown, Fine	100	8												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 2 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,162,546.0 E 2,475,398.2

ELEVATION TOP OF BORING: 269.7

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	6 7 7	14		Poorly-graded Sand (SP) Brown, Fine	100	9												
224.7	45.0	X	7 6 5	11		Poorly-graded Sand (SP) Brown, Fine	100	10												

35.0
37.5
40.0
42.5
45.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 2 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 242-BPC-10
LOCATION COORDINATES: N 13,161,603.4 E 2,474,213.5
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: M. Woolfolk
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 45.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 3.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 55
12. TOTAL SAMPLES: 10 DISTURBED: 10 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 251.4 10/27/10
15. DATE BORING: STARTED 10/27/10 COMPLETED 10/27/10
16. ELEVATION TOP OF BORING: 269.4
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	11 13 9	22		Lean Clay (CL) Gray & Brown, very stiff, Oxidized, Organic Matter	100	1							12.8					
		☒	6 5 4	9		Lean Clay (CL) Gray & Brown, stiff, Oxidized, Fine	100	2					34	19	14.8					
															16.8					
		☒	3 4 4	8		Lean Clay (CL) Gray & Brown, medium, Oxidized, Organic Matter	100	3							15.2					
253.4	16.0	☒	3 3 4	7		Lean Clay (CL) Gray & Brown, medium, Oxidized	100	4					26	12						
		▼																		
248.4	21.0	☒	6 8 7	15		Poorly-graded Sand (SP) Gray, Fine	100	5			5									
		☒	3 4 3	7		Silty Sand (SM) Gray, Fine	100	6												
243.4	26.0																			
		☒	4 3 4	7		Poorly-graded Sand (SP) Gray, Fine, Organic Matter	100	7												
		☒	4 5 5	10		Poorly-graded Sand (SP) Gray, Fine	100	8												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 2 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM | HORIZONTAL | VERTICAL

LOCATION COORDINATES: N 13,161,603.4 E 2,474,213.5

ELEVATION TOP OF BORING: 269.4

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	3 4 6	10		Poorly-graded Sand (SP) Gray, Fine, Organic Matter	100	9												
224.4	45.0	X	4 4 5	9		Poorly-graded Sand (SP) Gray, Fine	100	10												

35.0
37.5
40.0
42.5
45.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 2 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 243-BPC-10
LOCATION COORDINATES: N 13,160,607.4 E 2,473,073.1
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: M. Woolfolk
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 45.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 3.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 55
12. TOTAL SAMPLES: 10 DISTURBED: 10 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 249.8 11/4/10
15. DATE BORING: STARTED 11/4/10 COMPLETED 11/4/10
16. ELEVATION TOP OF BORING: 268.8
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	11 11 13	24		Silty Sand (SM) Brown, Oxidized, Fine	100	1												
		☒	4 4 4	8		Silty Sand (SM) Brown, Fine	100	2												
		☒	2 3 3	6		Silty Sand (SM) Brown, Fine	100	3												
		☒	4 2 3	5		Silty Sand (SM) Gray, Fine	100	4												
252.8	16.0																			
		☒	4 4 4	8		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	5			8									
247.8	21.0																			
		☒	4 5 6	11		Poorly-graded Sand (SP) Brown, Fine	100	6												
		☒	6 7 8	15		Poorly-graded Sand (SP) Brown, Fine	100	7												
		☒	8 8 6	14		Poorly-graded Sand (SP) Brown, Fine	100	8												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 2 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM | HORIZONTAL | VERTICAL

LOCATION COORDINATES: N 13,160,607.4 E 2,473,073.1

ELEVATION TOP OF BORING: 268.8

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	7 8 9	17		Poorly-graded Sand (SP) Brown, Fine	100	9												
223.8	45.0	X	9 7 7	14		Poorly-graded Sand (SP) Brown, Fine	100	10												

35.0
37.5
40.0
42.5
45.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 2 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 244-BPC-10
LOCATION COORDINATES: N 13,159,675.1 E 2,471,938.6
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: M. Woolfolk
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 45.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 3.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 55
12. TOTAL SAMPLES: 10 DISTURBED: 10 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 242.7 11/4/10
15. DATE BORING: STARTED 11/4/10 COMPLETED 11/4/10
16. ELEVATION TOP OF BORING: 265.7
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_c	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
262.7	3.0	☒	13 15 18	33		Silty Sand (SM) Brown, Fine	100	1												
259.7	6.0	☒	4 4 6	10		Lean Clay (CL) Gray & Brown, stiff	100	2					31	13	21.5					
254.7	11.0	☒	2 1 2	3		Silty Sand (SM) Brown	100	3												
249.7	16.0	☒	4 5 7	12		Lean Clay (CL) Sandy, Gray, stiff	100	4			51									
		☒	11 8 12	20		Poorly-graded Sand (SP) Gray, Fine	100	5												
		☒	7 8 9	17		Poorly-graded Sand (SP) Brown, Medium	100	6												
		☒	7 8 7	15		Poorly-graded Sand (SP) Gray, Medium	100	7												
		☒	8 10 9	19		Poorly-graded Sand (SP) Gray, Medium	100	8												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)		SHEET 2 OF 2 SHEETS
PROJECT: Below Piggott - West Bank SFB Seepage Study	COORDINATE SYSTEM: HORIZONTAL: VERTICAL	
LOCATION COORDINATES: N 13,159,675.1 E 2,471,938.6	ELEVATION TOP OF BORING: 265.7	

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	4 9 7	16		Poorly-graded Sand (SP) Gray, Medium	100	9												
220.7	45.0	X	8 9 10	19		Poorly-graded Sand (SP) Gray, Fine	100	10												

35.0
37.5
40.0
42.5
45.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)

INSTALLATION: Memphis District (CEMVM)

SHEET 1 OF 2 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study

2. HOLE NUMBER: 245-BPC-10

LOCATION COORDINATES: N 13,158,841.1 E 2,470,651.3

3. DRILLING AGENCY: Tri-State Testing Services, Inc.

4. NAME OF DRILLER: M. Woolfolk

5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:

6. THICKNESS OF OVERBURDEN:

7. DEPTH DRILLED INTO ROCK:

8. TOTAL DEPTH OF BORING: 45.0

9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

10. SIZE AND TYPE OF BIT: 3.25" ID

11. MANUFACTURER'S DESIGNATION OF DRILL: CME 55

12. TOTAL SAMPLES: 10; DISTURBED: 10; UNDISTURBED: 0

13. TOTAL NUMBER CORE BOXES: 0

14. ELEVATION GROUND WATER: 247.0 11/4/10

15. DATE BORING: STARTED 11/4/10; COMPLETED 11/4/10

16. ELEVATION TOP OF BORING: 267.0

17. TOTAL CORE RECOVERY FOR BORING: N/A

18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
264.0	3.0	☒	10 12 14	26		Poorly-graded Sand (SP) Brown, Fine	100	1												
261.0	6.0	☒	6 7 7	14		Silt (ML) Gray & Brown, stiff, Fine	100	2							16.3					
		☒	7 3 4	7		Clayey Sand (SC) Gray & Brown, medium, Fine	100	3			36		35	15	25.9 19.6					
251.0	16.0	☒	4 3 4	7		Clayey Sand (SC) Gray & Brown, medium, Fine	100	4												
246.0	21.0	☒	6 7 7	14		Poorly-graded Sand (SP) Brown, Medium	100	5												
241.0	26.0	☒	7 7 11	18		Lean Clay (CL) Brown, very stiff, Fine	100	6							24.7					
		☒	7 8 7	15		Poorly-graded Sand (SP) Brown, Medium	100	7												
		☒	6 9 11	20		Poorly-graded Sand (SP) Brown, Medium	100	8												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 2 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,158,841.1 E 2,470,651.3

ELEVATION TOP OF BORING: 267.0

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	10 8 9	17		Poorly-graded Sand (SP) Brown, Medium	100	9												
222.0	45.0	X	8 7 8	15		Poorly-graded Sand (SP) Brown, Fine	100	10												

35.0
37.5
40.0
42.5
45.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

Boring Designation 246-BPC-10

DRILLING LOG	DIVISION	INSTALLATION	SHEET / OF
	Mississippi Valley Division (MVD)	Memphis District (CEMVM)	1 OF 2 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study		9. COORDINATE SYSTEM	HORIZONTAL / VERTICAL
		10. SIZE AND TYPE OF BIT: 3.25" ID	
2. HOLE NUMBER: 246-BPC-10	LOCATION COORDINATES: N 13,158,054.6 E 2,469,385.3	11. MANUFACTURER'S DESIGNATION OF DRILL: CME 55	
3. DRILLING AGENCY: Tri-State Testing Services, Inc.		12. TOTAL SAMPLES: 10	DISTURBED: 10 / UNDISTURBED: 0
4. NAME OF DRILLER: M. Woolfolk		13. TOTAL NUMBER CORE BOXES: 0	
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED	DEG FROM VERTICAL: --- / BEARING	14. ELEVATION GROUND WATER: 248.7	11/5/10
		15. DATE BORING	STARTED: 11/5/10 / COMPLETED: 11/5/10
6. THICKNESS OF OVERBURDEN		16. ELEVATION TOP OF BORING: 266.7	
7. DEPTH DRILLED INTO ROCK		17. TOTAL CORE RECOVERY FOR BORING: N/A	
8. TOTAL DEPTH OF BORING: 45.0		18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor	

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_c	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
263.7	3.0	☒	11 12 10	22		Poorly-graded Sand (SP) Brown, Fine	100	1												
260.7	6.0	☒	5 5 4	9		Fat Clay (CH) Gray & Brown, stiff, Oxidized, Organic Matter	100	2							18.6					
		☒	4 6 7	13		Lean Clay (CL) Gray & Brown, stiff	100	3					42	26	20.5					
250.7	16.0	☒	4 5 6	11		Lean Clay (CL) Gray & Brown, stiff	100	4					41	25	19.8					
		☒	6 9 7	16		Poorly-graded Sand (SP) Gray, Fine	100	5												
		☒	4 4 6	10		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	6 7 9	16		Poorly-graded Sand (SP) Gray, Medium	100	7												
		☒	5 5 6	11		Poorly-graded Sand (SP) Gray, Fine	100	8												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 2 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM | HORIZONTAL | VERTICAL

LOCATION COORDINATES: N 13,158,054.6 E 2,469,385.3

ELEVATION TOP OF BORING: 266.7

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	6 4 5	9		Poorly-graded Sand (SP) Gray, Fine	100	9												
221.7	45.0	X	5 7 5	12		Poorly-graded Sand (SP) Gray, Fine	100	10												

35.0
37.5
40.0
42.5
45.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 2 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 247-BPC-10
LOCATION COORDINATES: N 13,157,059.3 E 2,468,298.2
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: M. Woolfolk
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 45.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 3.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 55
12. TOTAL SAMPLES: 10 DISTURBED: 10 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 246.4 11/5/10
15. DATE BORING: STARTED 11/5/10 COMPLETED 11/5/10
16. ELEVATION TOP OF BORING: 264.4
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
261.4	3.0	☒	10 15 13	28		Silty Sand (SM) Brown	100	1												
258.4	6.0	☒	4 4 6	10		Clayey Sand (SC) Brown	100	2												
		☒	6 4 5	9		Lean Clay (CL) Gray, stiff	100	3							22.6					
248.4	16.0	☒	4 5 7	12		Lean Clay (CL) Gray, stiff	100	4					34	19	18.0					
243.4	21.0	☒	7 7 8	15		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	5			5									
238.4	26.0	☒	3 4 5	9		Clayey Sand (SC) Gray, Fine	100	6												
		☒	8 7 7	14		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	4 4 6	10		Poorly-graded Sand (SP) Gray, Fine	100	8												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 2 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM | HORIZONTAL | VERTICAL

LOCATION COORDINATES: N 13,157,059.3 E 2,468,298.2

ELEVATION TOP OF BORING: 264.4

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	5 5 6	11		Poorly-graded Sand (SP) Gray, Fine	100	9												
219.4	45.0	X	6 4 7	11		Poorly-graded Sand (SP) Gray, Fine	100	10												

35.0
37.5
40.0
42.5
45.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 2 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 248-BPC-10
LOCATION COORDINATES: N 13,155,989.8 E 2,467,239.0
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: M. Woolfolk
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 45.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 3.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 55
12. TOTAL SAMPLES: 10 DISTURBED: 10 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 245.9 11/8/10
15. DATE BORING: STARTED 11/8/10 COMPLETED 11/8/10
16. ELEVATION TOP OF BORING: 264.9
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
261.9	3.0	☒	8 7 6	13		Silty Sand (SM) Brown	100	1												
258.9	6.0	☒	4 5 4	9		Fat Clay (CH) Gray, stiff, Oxidized	100	2							26.3					
253.9	11.0	☒	2 2 2	4		Lean Clay (CL) Gray, soft	100	3					44	27	30.5					
248.9	16.0	☒	4 3 2	5		Fat Clay (CH) Gray, medium	100	4							31.2					
243.9	21.0	☒	8 6 4	10		Silty Sand (SM) Dark Gray, Fine	100	5			12									
		☒	3 3 4	7		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	4 4 3	7		Poorly-graded Sand (SP) Gray, Medium	100	7												
		☒	3 5 4	9		Poorly-graded Sand (SP) Gray, Medium	100	8												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 2 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM | HORIZONTAL | VERTICAL

LOCATION COORDINATES: N 13,155,989.8 E 2,467,239.0

ELEVATION TOP OF BORING: 264.9

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	4 3 4	7		Poorly-graded Sand (SP) Gray, Fine	100	9												
219.9	45.0	X	3 4 5	9		Poorly-graded Sand (SP) Gray, Fine	100	10												

35.0
37.5
40.0
42.5
45.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 2 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 249-BPC-10
LOCATION COORDINATES: N 13,154,944.8 E 2,466,143.0
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: M. Woolfolk
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 45.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 3.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 55
12. TOTAL SAMPLES: 10 DISTURBED: 10 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 244.3 11/9/10
15. DATE BORING: STARTED 11/9/10 COMPLETED 11/9/10
16. ELEVATION TOP OF BORING: 265.3
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
262.3	3.0	☒	8 12 8	20		Lean Clay (CL) Dark Brown, very stiff, Oxidized, Fine	100	1												
259.3	6.0	☒	4 4 3	7		Silty Sand (SM) Brown, Fine	100	2												
254.3	11.0	☒	4 3 3	6		Clayey Sand (SC) Gray & Brown, Fine	100	3			40				38.5					
249.3	16.0	☒	4 4 4	8		Lean Clay (CL) Gray, medium	100	4					47	29	30.2					
		☒	5 4 6	10		Poorly-graded Sand (SP) Gray, Fine	100	5												
		☒	6 7 8	15		Poorly-graded Sand (SP) Gray, Medium	100	6												
		☒	6 6 7	13		Poorly-graded Sand (SP) Gray, Medium	100	7												
		☒	8 9 9	18		Poorly-graded Sand (SP) Gray, Medium	100	8												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 2 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM | HORIZONTAL | VERTICAL

LOCATION COORDINATES: N 13,154,944.8 E 2,466,143.0

ELEVATION TOP OF BORING: 265.3

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	7 6 8	14		Poorly-graded Sand (SP) Gray, Medium	100	9												
220.3	45.0	X	7 7 8	15		Poorly-graded Sand (SP) Gray, Medium	100	10												

35.0
37.5
40.0
42.5
45.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 2 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 250-BPC-10
LOCATION COORDINATES: N 13,153,837.4 E 2,465,172.9
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: M. Woolfolk
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 45.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 3.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 55
12. TOTAL SAMPLES: 10 DISTURBED: 10 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 247.0 11/9/10
15. DATE BORING STARTED: 11/9/10 COMPLETED: 11/9/10
16. ELEVATION TOP OF BORING: 265.0
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
262.0	3.0	☒	18 15 12	27		Silty Sand (SM) Brown, Fine	100	1												
259.0	6.0	☒	4 3 4	7		Clayey Sand (SC) Gray, medium, Oxidized	100	2			24				12.6					
		☒	10 9 10	19		Silty Sand (SM) Tan & Red, Oxidized, Fine	100	3												
		☒	7 7 7	14		Silty Sand (SM) Tan, Oxidized, Fine	100	4												
244.0	21.0	☒	4 5 5	10		Silty Sand (SM) Dark Gray, Fine	100	5												
		☒	6 7 8	15		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	5 8 6	14		Poorly-graded Sand (SP) Brown & Gray, Fine	100	7												
		☒	6 9 7	16		Poorly-graded Sand (SP) Gray, Fine	100	8												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 2 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM | HORIZONTAL | VERTICAL

LOCATION COORDINATES: N 13,153,837.4 E 2,465,172.9

ELEVATION TOP OF BORING: 265.0

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	6 7 8	15		Poorly-graded Sand (SP) Gray, Fine	100	9												
220.0	45.0	X	7 8 8	16		Poorly-graded Sand (SP) Gray, Fine	100	10												

35.0
37.5
40.0
42.5
45.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)

INSTALLATION: Memphis District (CEMVM)

SHEET 1 OF 2 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study

2. HOLE NUMBER: 251-BPC-10

LOCATION COORDINATES: N 13,152,575.5 E 2,464,291.3

3. DRILLING AGENCY: Tri-State Testing Services, Inc.

4. NAME OF DRILLER: M. Woolfolk

5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:

6. THICKNESS OF OVERBURDEN:

7. DEPTH DRILLED INTO ROCK:

8. TOTAL DEPTH OF BORING: 45.0

9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

10. SIZE AND TYPE OF BIT: 3.25" ID

11. MANUFACTURER'S DESIGNATION OF DRILL: CME 55

12. TOTAL SAMPLES: 10; DISTURBED: 10; UNDISTURBED: 0

13. TOTAL NUMBER CORE BOXES: 0

14. ELEVATION GROUND WATER: 245.2 11/9/10

15. DATE BORING: STARTED 11/9/10; COMPLETED 11/9/10

16. ELEVATION TOP OF BORING: 264.2

17. TOTAL CORE RECOVERY FOR BORING: N/A

18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
261.2	3.0	☒	9 2 5	7		Silty Sand (SM) Brown, Fine	100	1												
		☒	3 3 4	7		Clayey Sand (SC) Brown, Fine	100	2												
253.2	11.0	☒	2 2 2	4		Clayey Sand (SC) Gray & Brown, Fine	100	3			27									
		☒	4 3 4	7		Lean Clay (CL) Gray & Brown, medium	100	4					43	27	22.3					
248.2	16.0																			
		☒	5 5 3	8		Poorly-graded Sand (SP) Gray, Fine	100	5												
		☒	6 6 9	15		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	6 11 10	21		Poorly-graded Sand (SP) Gray, Medium	100	7												
		☒	7 8 8	16		Poorly-graded Sand (SP) Gray, Medium	100	8												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 2 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM | HORIZONTAL | VERTICAL

LOCATION COORDINATES: N 13,152,575.5 E 2,464,291.3

ELEVATION TOP OF BORING: 264.2

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	6 9 7	16		Poorly-graded Sand (SP) Gray, Medium	100	9												
219.2	45.0	X	8 8 6	14		Poorly-graded Sand (SP) Gray, Medium	100	10												

35.0
37.5
40.0
42.5
45.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 2 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 252-BPC-10
LOCATION COORDINATES: N 13,151,913.5 E 2,462,985.2
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: M. Woolfolk
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 45.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 3.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 55
12. TOTAL SAMPLES: 10 DISTURBED: 10 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 244.2 11/10/10
15. DATE BORING: STARTED 11/10/10 COMPLETED 11/10/10
16. ELEVATION TOP OF BORING: 263.2
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
260.2	3.0	☒	9 7 5	12		Silty Sand (SM) Brown, Fine	100	1												
257.2	6.0	☒	4 4 3	7		Lean Clay (CL) Brown & Gray, medium, Oxidized, Fine	100	2					33	18	20.1					
252.2	11.0	☒	3 3 4	7		Silt (ML) Brown, medium	100	3							24.2					
247.2	16.0	☒	4 4 5	9		Lean Clay (CL) Sandy, Brown, medium	100	4			53				17.3					
		☒	6 7 8	15		Poorly-graded Sand (SP) Dark Gray, Fine	100	5												
		☒	5 5 5	10		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	6												
		☒	4 6 5	11		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	4 6 7	13		Poorly-graded Sand (SP) Gray, Fine	100	8												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 2 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,151,913.5 E 2,462,985.2

ELEVATION TOP OF BORING: 263.2

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	7 5 6	11		Poorly-graded Sand (SP) Gray, Fine	100	9												
218.2	45.0	X	8 4 6	10		Poorly-graded Sand (SP) Gray, Fine	100	10												

35.0
37.5
40.0
42.5
45.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 2 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 253-BPC-10
LOCATION COORDINATES: N 13,151,366.0 E 2,461,565.3
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: M. Woolfolk
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 45.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 3.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 55
12. TOTAL SAMPLES: 10 DISTURBED: 10 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 246.3 11/10/10
15. DATE BORING: STARTED 11/10/10 COMPLETED 11/10/10
16. ELEVATION TOP OF BORING: 264.8
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_r	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
261.8	3.0	☒	9 13 12	25		Silty Sand (SM) Brown & Gray, Oxidized, Fine	100	1												
258.8	6.0	☒	4 3 4	7		Silt (ML) Light Brown, medium	100	2							8.4					
253.8	11.0	☒	3 4 4	8		Silt (ML) Sandy, Brown & Gray, medium, Fine	100	3			62				20.5					
248.8	16.0	☒	4 5 5	10		Fat Clay (CH) Gray, stiff, Oxidized	100	4					57	35	25.9					
243.8	21.0	☒	6 7 6	13		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	5												
		☒	5 7 12	19		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	6 8 10	18		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	9 7 9	16		Poorly-graded Sand (SP) Gray, Fine	100	8												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 2 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM | HORIZONTAL | VERTICAL

LOCATION COORDINATES: N 13,151,366.0 E 2,461,565.3

ELEVATION TOP OF BORING: 264.8

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	8 9 9	18		Poorly-graded Sand (SP) Gray, Fine	100	9												
219.8	45.0	X	6 7 8	15		Poorly-graded Sand (SP) Gray, Fine	100	10												

35.0
37.5
40.0
42.5
45.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)

INSTALLATION: Memphis District (CEMVM)

SHEET 1 OF 2 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study

9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

10. SIZE AND TYPE OF BIT: 3.25" ID

2. HOLE NUMBER: 254-BPC-10

LOCATION COORDINATES: N 13,150,838.2 E 2,460,183.2

11. MANUFACTURER'S DESIGNATION OF DRILL: CME 55

3. DRILLING AGENCY: Tri-State Testing Services, Inc.

12. TOTAL SAMPLES: 10 DISTURBED: 10 UNDISTURBED: 0

4. NAME OF DRILLER: M. Woolfolk

13. TOTAL NUMBER CORE BOXES: 0

5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:

14. ELEVATION GROUND WATER: 243.6 11/11/10

15. DATE BORING: STARTED 11/11/10 COMPLETED 11/11/10

6. THICKNESS OF OVERBURDEN:

16. ELEVATION TOP OF BORING: 261.6

7. DEPTH DRILLED INTO ROCK:

17. TOTAL CORE RECOVERY FOR BORING: N/A

8. TOTAL DEPTH OF BORING: 45.0

18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
258.6	3.0	☒	9 10 13	23		Silty Sand (SM) Brown, Fine	100	1												
255.6	6.0	☒	2 3 3	6		Lean Clay (CL) Brown, medium, Oxidized, Fine	100	2							17.9					
		☒	3 3 3	6		Silty Sand (SM) Brown, Fine	100	3												
		☒	2 2 2	4		Silty Sand (SM) Gray, Fine	100	4			47				16.7					
240.6	21.0	☒	2 2 2	4		Silty Sand (SM) Brown, Fine	100	5												
		☒	4 3 6	9		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	5 4 5	9		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	4 4 6	10		Poorly-graded Sand (SP) Gray, Fine	100	8												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 2 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM | HORIZONTAL | VERTICAL

LOCATION COORDINATES: N 13,150,838.2 E 2,460,183.2

ELEVATION TOP OF BORING: 261.6

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	6 7 4	11		Poorly-graded Sand (SP) Gray, Fine	100	9												
216.6	45.0	X	6 6 5	11		Poorly-graded Sand (SP) Gray, Fine	100	10												

35.0
37.5
40.0
42.5
45.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 2 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 255-BPC-10
LOCATION COORDINATES: N 13,149,672.1 E 2,459,320.8
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: M. Woolfolk
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 45.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 3.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 55
12. TOTAL SAMPLES: 10 DISTURBED: 10 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 244.4 11/11/10
15. DATE BORING: STARTED 11/11/10 COMPLETED 11/11/10
16. ELEVATION TOP OF BORING: 262.4
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_r	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
259.4	3.0	☒	8 7 9	16		Fat Clay (CH) Brown & Gray, very stiff, Oxidized	100	1					50	31	20.4					
256.4	6.0	☒	3 5 5	10		Silt (ML) Sandy, Brown, stiff, Oxidized	100	2			50				19.6					
		☒	2 3 3	6		Lean Clay (CL) Brown, medium, Oxidized	100	3							25.2					
246.4	16.0	☒	4 5 6	11		Lean Clay (CL) Gray, stiff	100	4					49	33	21.1					
		☒	6 4 7	11		Poorly-graded Sand (SP) Gray, Fine	100	5												
		☒	4 4 5	9		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	6 6 7	13		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	5 6 8	14		Poorly-graded Sand (SP) Gray, Fine	100	8												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 2 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM | HORIZONTAL | VERTICAL

LOCATION COORDINATES: N 13,149,672.1 E 2,459,320.8

ELEVATION TOP OF BORING: 262.4

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	5 5 7	12		Poorly-graded Sand (SP) Gray, Fine	100	9												
217.4	45.0	X	4 8 6	14		Poorly-graded Sand (SP) Gray, Fine	100	10												

35.0
37.5
40.0
42.5
45.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)

INSTALLATION: Memphis District (CEMVM)

SHEET 1 OF 2 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study

9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

10. SIZE AND TYPE OF BIT: 3.25" ID

2. HOLE NUMBER: 256-BPC-10

LOCATION COORDINATES: N 13,148,329.1 E 2,458,645.8

11. MANUFACTURER'S DESIGNATION OF DRILL: CME 55

3. DRILLING AGENCY: Tri-State Testing Services, Inc.

12. TOTAL SAMPLES: 10 DISTURBED: 10 UNDISTURBED: 0

4. NAME OF DRILLER: M. Woolfolk

13. TOTAL NUMBER CORE BOXES: 0

14. ELEVATION GROUND WATER: 242.7 11/11/10

5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:

15. DATE BORING: STARTED 11/11/10 COMPLETED 11/11/10

6. THICKNESS OF OVERBURDEN:

16. ELEVATION TOP OF BORING: 261.7

7. DEPTH DRILLED INTO ROCK:

17. TOTAL CORE RECOVERY FOR BORING: N/A

8. TOTAL DEPTH OF BORING: 45.0

18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	5 7 8	15		Fat Clay (CH) Gray, stiff, Oxidized	100	1							28.2					
		☒	4 4 5	9		Fat Clay (CH) Gray, stiff, Oxidized	100	2					56	38	26.9					
		☒	4 5 5	10		Fat Clay (CH) Gray, stiff, Oxidized	100	3							33.2					
		☒	3 5 4	9		Fat Clay (CH) Gray, stiff, Oxidized	100	4					56	40	25.3					
245.7	16.0																			
		☒	4 4 6	10		Clayey Sand (SC) Gray, Fine	100	5			17				29.1					
240.7	21.0																			
		☒	5 8 8	16		Poorly-graded Sand (SP) Gray, Fine	100	6												
		☒	4 7 9	16		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	7 5 7	12		Poorly-graded Sand (SP) Gray, Fine	100	8												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 2 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM | HORIZONTAL | VERTICAL

LOCATION COORDINATES: N 13,148,329.1 E 2,458,645.8

ELEVATION TOP OF BORING: 261.7

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	6 8 5	13		Poorly-graded Sand (SP) Gray, Fine	100	9												
216.7	45.0	X	6 6 7	13		Poorly-graded Sand (SP) Gray, Fine	100	10												

35.0
37.5
40.0
42.5
45.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 2 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 257-BPC-10
LOCATION COORDINATES: N 13,146,992.7 E 2,457,971.0
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: M. Woolfolk
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 45.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 3.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 55
12. TOTAL SAMPLES: 10 DISTURBED: 10 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 244.0 11/12/10
15. DATE BORING: STARTED 11/12/10 COMPLETED 11/12/10
16. ELEVATION TOP OF BORING: 262.0
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_r	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	5 11 13	24		Lean Clay (CL) Brown, very stiff, Oxidized	100	1							19.0					
		☒	5 8 7	15		Lean Clay (CL) Brown & Gray, stiff, Oxidized	100	2							21.1					
		☒	2 2 3	5		Lean Clay (CL) Gray & Brown, medium, Oxidized, Fine	100	3			72				22.7					
251.0	11.0																			
		☒	2 3 5	8		Silty Sand (SM) Gray, Fine	100	4												
		☒	3 3 3	6		Silty Sand (SM) Gray, Fine	100	5												
241.0	21.0																			
		☒	5 6 7	13		Poorly-graded Sand (SP) Gray, Fine, Clay Strata or Lenses	100	6												
		☒	6 6 7	13		Poorly-graded Sand (SP) Gray, Fine	100	7												
		☒	5 6 8	14		Poorly-graded Sand (SP) Gray, Fine	100	8												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 2 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM | HORIZONTAL | VERTICAL

LOCATION COORDINATES: N 13,146,992.7 E 2,457,971.0

ELEVATION TOP OF BORING: 262.0

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
221.0	41.0	X	5 5 9	14		Poorly-graded Sand (SP) Gray, Fine	100	9												
217.0	45.0	X	7 5 9	14		Poorly-graded Sand with Silt (SP-SM) Gray, Fine	100	10												

35.0
37.5
40.0
42.5
45.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)

INSTALLATION: Memphis District (CEMVM)

SHEET 1 OF 2 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study

2. HOLE NUMBER: 258-BPC-10

LOCATION COORDINATES: N 13,145,653.1 E 2,457,295.6

3. DRILLING AGENCY: Tri-State Testing Services, Inc.

4. NAME OF DRILLER: M. Woolfolk

5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:

6. THICKNESS OF OVERBURDEN:

7. DEPTH DRILLED INTO ROCK:

8. TOTAL DEPTH OF BORING: 45.0

9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

10. SIZE AND TYPE OF BIT: 3.25" ID

11. MANUFACTURER'S DESIGNATION OF DRILL: CME 55

12. TOTAL SAMPLES: 10; DISTURBED: 10; UNDISTURBED: 0

13. TOTAL NUMBER CORE BOXES: 0

14. ELEVATION GROUND WATER: 243.4 11/12/10

15. DATE BORING: STARTED 11/12/10; COMPLETED 11/12/10

16. ELEVATION TOP OF BORING: 261.4

17. TOTAL CORE RECOVERY FOR BORING: N/A

18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_r	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	6 10 12	22		Fat Clay (CH) Gray, very stiff, Oxidized	100	1							21.6					
		☒	5 8 8	16		Fat Clay (CH) Gray, very stiff, Oxidized	100	2							15.3					
		☒	2 2 2	4		Fat Clay (CH) Sandy, Brown & Gray, medium, Oxidized	100	3			56				26.6					
250.4	11.0																			
		☒	3 2 3	5		Lean Clay (CL) Gray, medium	100	4					39	23	23.6					
245.4	16.0																			
		☒	4 6 7	13		Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments	100	5												
		☒	4 6 8	14		Poorly-graded Sand (SP) Gray, Fine, Organic Matter	100	6												
		☒	5 6 6	12		Poorly-graded Sand (SP) Gray, Fine, Organic Matter	100	7												
		☒	6 6 7	13		Poorly-graded Sand (SP) Gray, Fine	100	8												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 2 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM | HORIZONTAL | VERTICAL

LOCATION COORDINATES: N 13,145,653.1 E 2,457,295.6

ELEVATION TOP OF BORING: 261.4

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	4 4 6	10		Poorly-graded Sand (SP) Gray, Fine	100	9												
216.4	45.0	X	7 6 8	14		Poorly-graded Sand (SP) Gray, Fine	100	10												

35.0
37.5
40.0
42.5
45.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 2 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 3.25" ID
2. HOLE NUMBER: 259-BPC-10
LOCATION COORDINATES: N 13,144,303.2 E 2,456,642.2
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 55
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
12. TOTAL SAMPLES: 10 DISTURBED: 10 UNDISTURBED: 0
4. NAME OF DRILLER: M. Woolfolk
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 239.1 11/17/10
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
15. DATE BORING: STARTED 11/17/10 COMPLETED 11/17/10
6. THICKNESS OF OVERBURDEN:
16. ELEVATION TOP OF BORING: 262.6
7. DEPTH DRILLED INTO ROCK:
17. TOTAL CORE RECOVERY FOR BORING: N/A
8. TOTAL DEPTH OF BORING: 45.0
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_r	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		☒	7 6 7	13		Lean Clay (CL) Brown, stiff	100	1							11.8					
		☒	3 3 3	6		Lean Clay (CL) Brown, medium	100	2							17.1					
251.6	11.0	☒	2 4 5	9		Lean Clay (CL) Brown & Gray, stiff	100	3							19.9					
246.6	16.0	☒	2 3 5	8		Fat Clay (CH) Brown & Gray, medium	100	4					66	40	29.5					
241.6	21.0	☒	1 2 4	6		Lean Clay (CL) Sandy, Gray, medium	100	5			67				31.9					
		☒	7 11 12	23		Poorly-graded Sand (SP) Brown & Gray	100	6												
		☒	4 4 5	9		Poorly-graded Sand (SP) Gray	100	7												
		☒	4 5 6	11		Poorly-graded Sand (SP) Gray	100	8												

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 2 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM | HORIZONTAL | VERTICAL

LOCATION COORDINATES: N 13,144,303.2 E 2,456,642.2

ELEVATION TOP OF BORING: 262.6

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	5 5 6	11		Poorly-graded Sand (SP) Gray	100	9												
217.6	45.0	X	4 6 6	12		Poorly-graded Sand (SP) Gray	100	10												

35.0
37.5
40.0
42.5
45.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)

INSTALLATION: Memphis District (CEMVM)

SHEET 1 OF 2 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study

2. HOLE NUMBER: 260-BPC-10

LOCATION COORDINATES: N 13,142,942.1 E 2,456,011.6

3. DRILLING AGENCY: Tri-State Testing Services, Inc.

4. NAME OF DRILLER: M. Woolfolk

5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:

6. THICKNESS OF OVERBURDEN:

7. DEPTH DRILLED INTO ROCK:

8. TOTAL DEPTH OF BORING: 45.0

9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

10. SIZE AND TYPE OF BIT: 3.25" ID

11. MANUFACTURER'S DESIGNATION OF DRILL: CME 55

12. TOTAL SAMPLES: 10; DISTURBED: 10; UNDISTURBED: 0

13. TOTAL NUMBER CORE BOXES: 0

14. ELEVATION GROUND WATER: 239.6 11/17/10

15. DATE BORING: STARTED 11/17/10; COMPLETED 11/17/10

16. ELEVATION TOP OF BORING: 262.6

17. TOTAL CORE RECOVERY FOR BORING: N/A

18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_r	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
259.6	3.0	☒	6 7 8	15		Fat Clay (CH) Gray & Brown, medium	100	1							20.8					
256.6	6.0	☒	1 2 3	5		Lean Clay (CL) Gray, medium	100	2							27.8					
251.6	11.0	☒	2 2 2	4		Fat Clay (CH) Brown & Gray, soft	100	3					63	41	35.5					
246.6	16.0	☒	2 2 3	5		Lean Clay (CL) Brown & Gray, medium	100	4							23.1					
		☒	4 7 8	15		Poorly-graded Sand (SP) Gray	100	5												
		☒	4 6 8	14		Poorly-graded Sand (SP) Gray	100	6												
		☒	4 7 8	15		Poorly-graded Sand (SP) Gray	100	7												
		☒	5 6 7	13		Poorly-graded Sand (SP) Gray	100	8												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 2 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM | HORIZONTAL | VERTICAL

LOCATION COORDINATES: N 13,142,942.1 E 2,456,011.6

ELEVATION TOP OF BORING: 262.6

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	3 5 6	11		Poorly-graded Sand (SP) Gray	100	9												
217.6	45.0	X	4 5 7	12		Poorly-graded Sand (SP) Gray	100	10												

35.0
37.5
40.0
42.5
45.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)
INSTALLATION: Memphis District (CEMVM)
SHEET 1 OF 2 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study
2. HOLE NUMBER: 261-BPC-10
LOCATION COORDINATES: N 13,141,580.8 E 2,455,381.6
3. DRILLING AGENCY: Tri-State Testing Services, Inc.
4. NAME OF DRILLER: M. Woolfolk
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:
6. THICKNESS OF OVERBURDEN:
7. DEPTH DRILLED INTO ROCK:
8. TOTAL DEPTH OF BORING: 45.0
9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:
10. SIZE AND TYPE OF BIT: 3.25" ID
11. MANUFACTURER'S DESIGNATION OF DRILL: CME 55
12. TOTAL SAMPLES: 10 DISTURBED: 10 UNDISTURBED: 0
13. TOTAL NUMBER CORE BOXES: 0
14. ELEVATION GROUND WATER: 237.1 11/17/10
15. DATE BORING: STARTED 11/17/10 COMPLETED 11/17/10
16. ELEVATION TOP OF BORING: 260.6
17. TOTAL CORE RECOVERY FOR BORING: N/A
18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_r	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
			3 4 4	8		Fat Clay (CH) Gray & Brown, medium	100	1							34.9					
256.6	4.0		4 4 3	7		Fat Clay (CH) Brown, medium	100	2												
254.6	6.0																			
			1 2 3	5		Fat Clay (CH) Brown, medium	100	3							26.5					
249.6	11.0																			
			2 3 4	7		Lean Clay (CL) Brown, medium	100	4					38	21	20.5					
244.6	16.0																			
			6 7 11	18		Poorly-graded Sand (SP) Gray	100	5												
239.6	21.0																			
236.6	24.0		5 6 8	14		Lean Clay (CL) Brown & Gray, stiff	100	6												
			3 7 9	16		Poorly-graded Sand (SP) Brown & Gray	100	7												
			4 6 7	13		Poorly-graded Sand (SP) Gray	100	8												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 2 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

LOCATION COORDINATES: N 13,141,580.8 E 2,455,381.6

ELEVATION TOP OF BORING: 260.6

ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	5 5 7	12		Poorly-graded Sand (SP) Brown & Gray	100	9												
215.6	45.0	X	6 8 7	15		Poorly-graded Sand (SP) Gray, Lignite Fragments	100	10												

35.0
37.5
40.0
42.5
45.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG

DIVISION: Mississippi Valley Division (MVD)

INSTALLATION: Memphis District (CEMVM)

SHEET 1 OF 2 SHEETS

1. PROJECT: Below Piggott - West Bank SFB Seepage Study

2. HOLE NUMBER: 262-BPC-10

LOCATION COORDINATES: N 13,140,217.1 E 2,454,756.8

3. DRILLING AGENCY: Tri-State Testing Services, Inc.

4. NAME OF DRILLER: M. Woolfolk

5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED; DEG FROM VERTICAL: ---; BEARING:

6. THICKNESS OF OVERBURDEN:

7. DEPTH DRILLED INTO ROCK:

8. TOTAL DEPTH OF BORING: 45.0

9. COORDINATE SYSTEM: HORIZONTAL: VERTICAL:

10. SIZE AND TYPE OF BIT: 3.25" ID

11. MANUFACTURER'S DESIGNATION OF DRILL: CME 55

12. TOTAL SAMPLES: 10; DISTURBED: 10; UNDISTURBED: 0

13. TOTAL NUMBER CORE BOXES: 0

14. ELEVATION GROUND WATER: 237.9 11/18/10

15. DATE BORING: STARTED 11/18/10; COMPLETED 11/18/10

16. ELEVATION TOP OF BORING: 261.9

17. TOTAL CORE RECOVERY FOR BORING: N/A

18. SIGNATURE AND TITLE OF INSPECTOR: Lab Supervisor

ELEV	DEPTH	SAMPLE	Blows/0.5 ft	N_r	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
258.9	3.0	☒	7 8 8	16		Fat Clay (CH) Brown & Gray, very stiff	100	1							24.6					
255.9	6.0	☒	2 3 2	5		Lean Clay (CL) Brown, medium	100	2							17.3					
250.9	11.0	☒	2 3 4	7		Fat Clay (CH) Gray & Brown, medium	100	3							30.2					
245.9	16.0	☒	2 3 4	7		Lean Clay (CL) Gray & Brown, medium	100	4					43	23	27.7					
240.9	21.0	☒	3 5 8	13		Clayey Sand (SC) Gray	100	5			15									
237.9 ▼	24.0	☒	4 7 10	17		Fat Clay (CH) Gray, very stiff	100	6												
		☒	5 10 15	25		Poorly-graded Sand (SP) Brown & Gray	100	7												
		☒	4 8 12	20		Poorly-graded Sand (SP) Gray	100	8												

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

DRILLING LOG (Cont Sheet)

INSTALLATION: Memphis District (CEMVM)

SHEET 2 OF 2 SHEETS

PROJECT: Below Piggott - West Bank SFB Seepage Study

COORDINATE SYSTEM | HORIZONTAL | VERTICAL

LOCATION COORDINATES: N 13,140,217.1 E 2,454,756.8

ELEVATION TOP OF BORING: 261.9

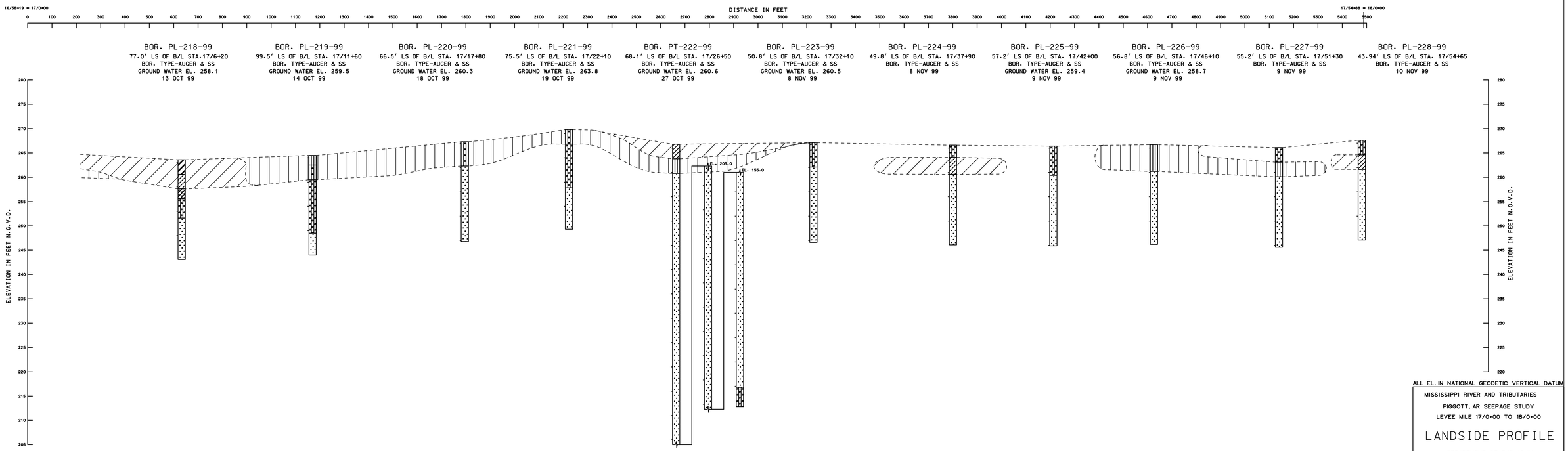
ELEV	DEPTH	SAMPLE	Blows/ 0.5 ft	N_f	LEGEND	LAB CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	Laboratory: % Gravel	% Sand	% Fines	D10	LL	PI	MC	DUW (pcf)	PPR (tsf)	Torvane (tsf)	C (psf)	REMARKS
		X	7 8 10	18		Poorly-graded Sand (SP) Brown & Gray	100	9												
216.9	45.0	X	9 10 11	21		Poorly-graded Sand (SP) Brown & Gray	100	10												

35.0
37.5
40.0
42.5
45.0

Note: The SPT N-value is a field value and uncorrected. Autohammer correction values should be verified by the drilling contractor before use.

ACE 1836-A (DRILLING LOG) - MVM RANDY E-9-536_USACE_BELOW PIGGOTT_FINAL.GPJ GINT TEMPLATE.GDT 4/17/19

Appendix C



ALL EL. IN NATIONAL GEODETIC VERTICAL DATUM

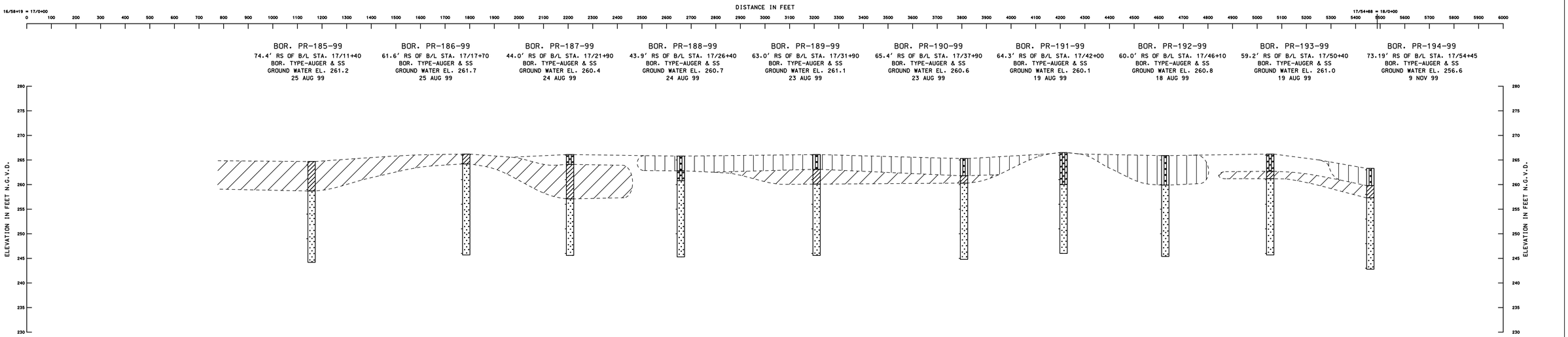
MISSISSIPPI RIVER AND TRIBUTARIES

PIGGOTT, AR SEEPAGE STUDY

LEVEE MILE 17/0+00 TO 18/0+00

LANDSIDE PROFILE

DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
GEOTECHNICAL DESIGN SECTION



ALL EL. IN NATIONAL GEODETIC VERTICAL DATUM

MISSISSIPPI RIVER AND TRIBUTARIES

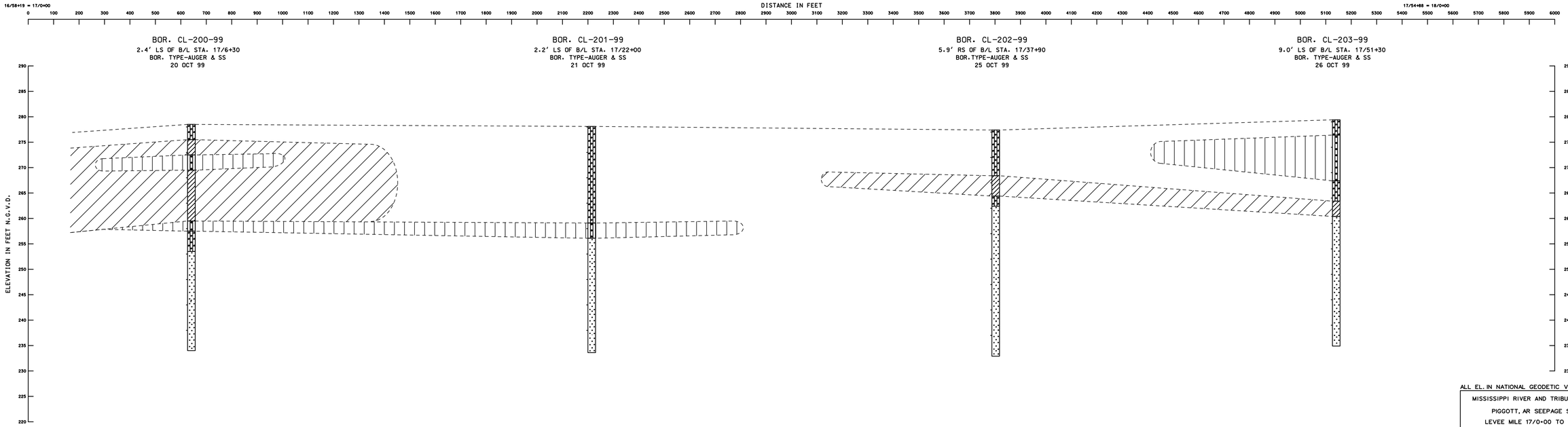
PIGGOTT, AR SEEPAGE STUDY

LEVEE MILE 17/0+00 TO 18/0+00

RIVERSIDE PROFILE

DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
GEOTECHNICAL DESIGN SECTION

PLATE 25



ALL EL. IN NATIONAL GEODETIC VERTICAL DATUM

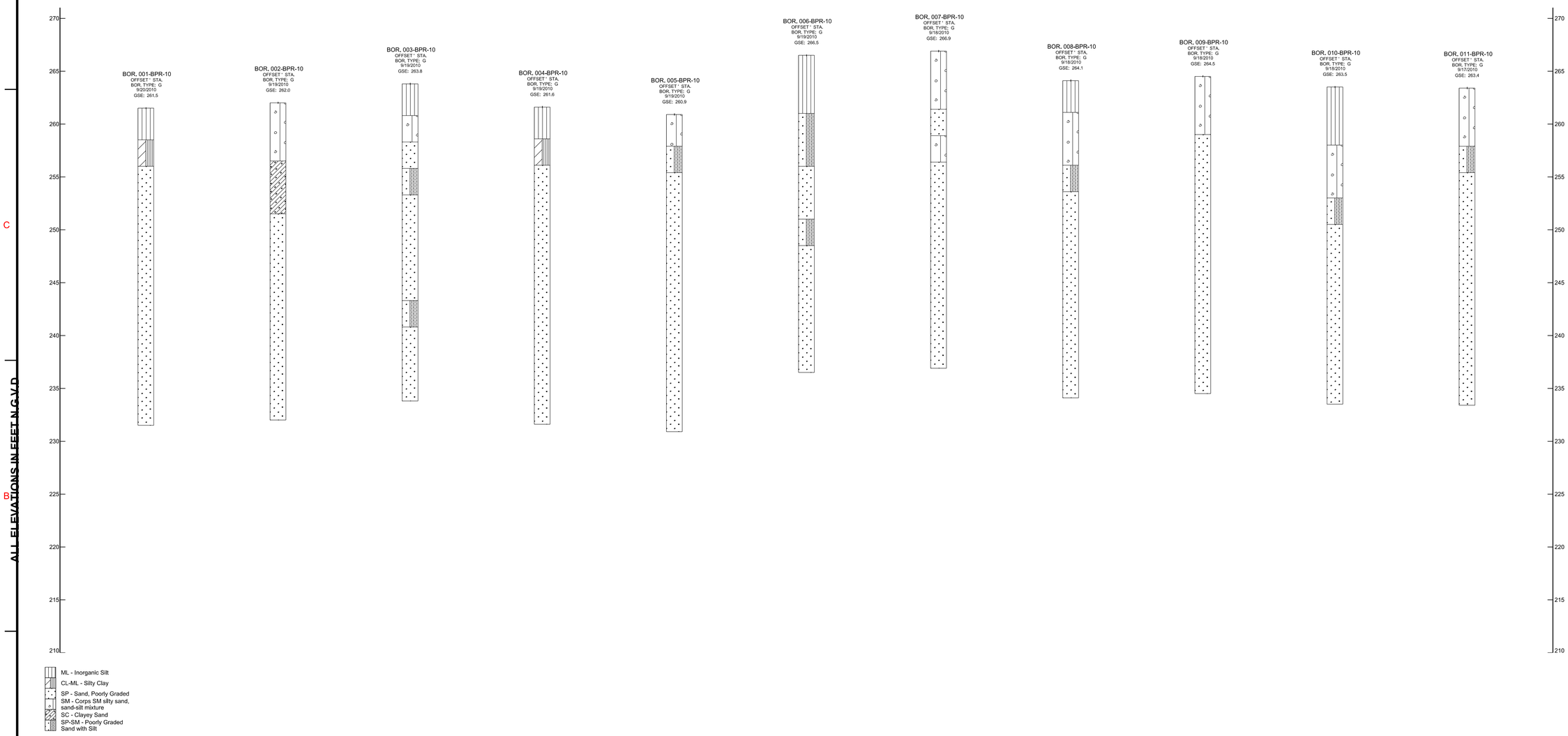
MISSISSIPPI RIVER AND TRIBUTARIES

PIGGOTT, AR SEEPAGE STUDY

LEVEE MILE 17/0+00 TO 18/0+00

CENTERLINE PROFILE

DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
GEOTECHNICAL DESIGN SECTION



US Army Corps of Engineers®

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

DESIGNED BY:
DWN BY:
CKD BY:
SUBMITTED BY:
PLOT SCALE: 1" = 10'
PLOT DATE: 06/23/2017
SIZE: ANSI D
FILE NAME: BP_Riverside18.dgn
DATE: 06/23/2017
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

River Side
Levee Mile 18

Sheet ID
BP-001

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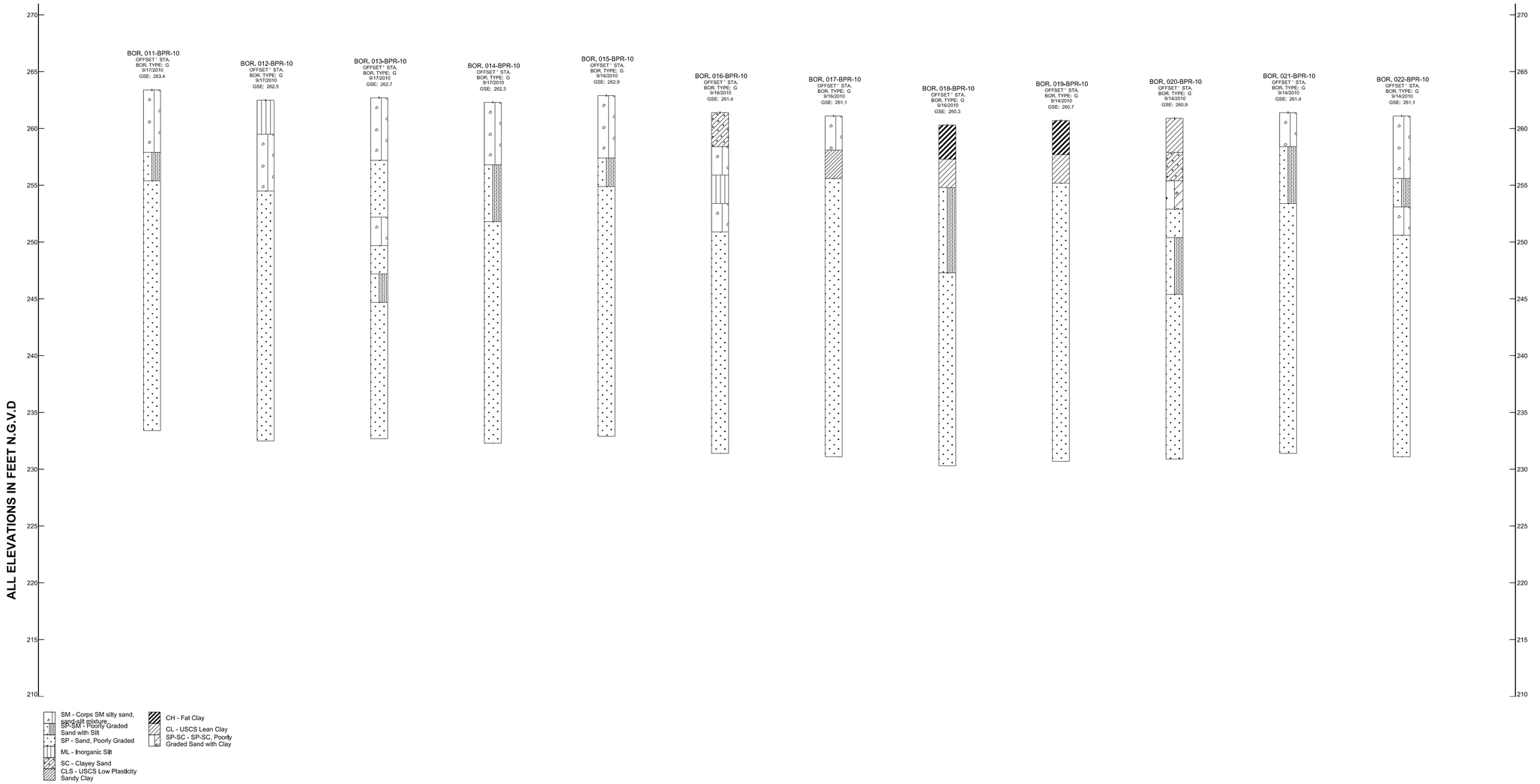

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DATE: 06/23/2017
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MEMPHIS, TENNESSEE

Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

River Side
Levee Mile 19

Sheet ID
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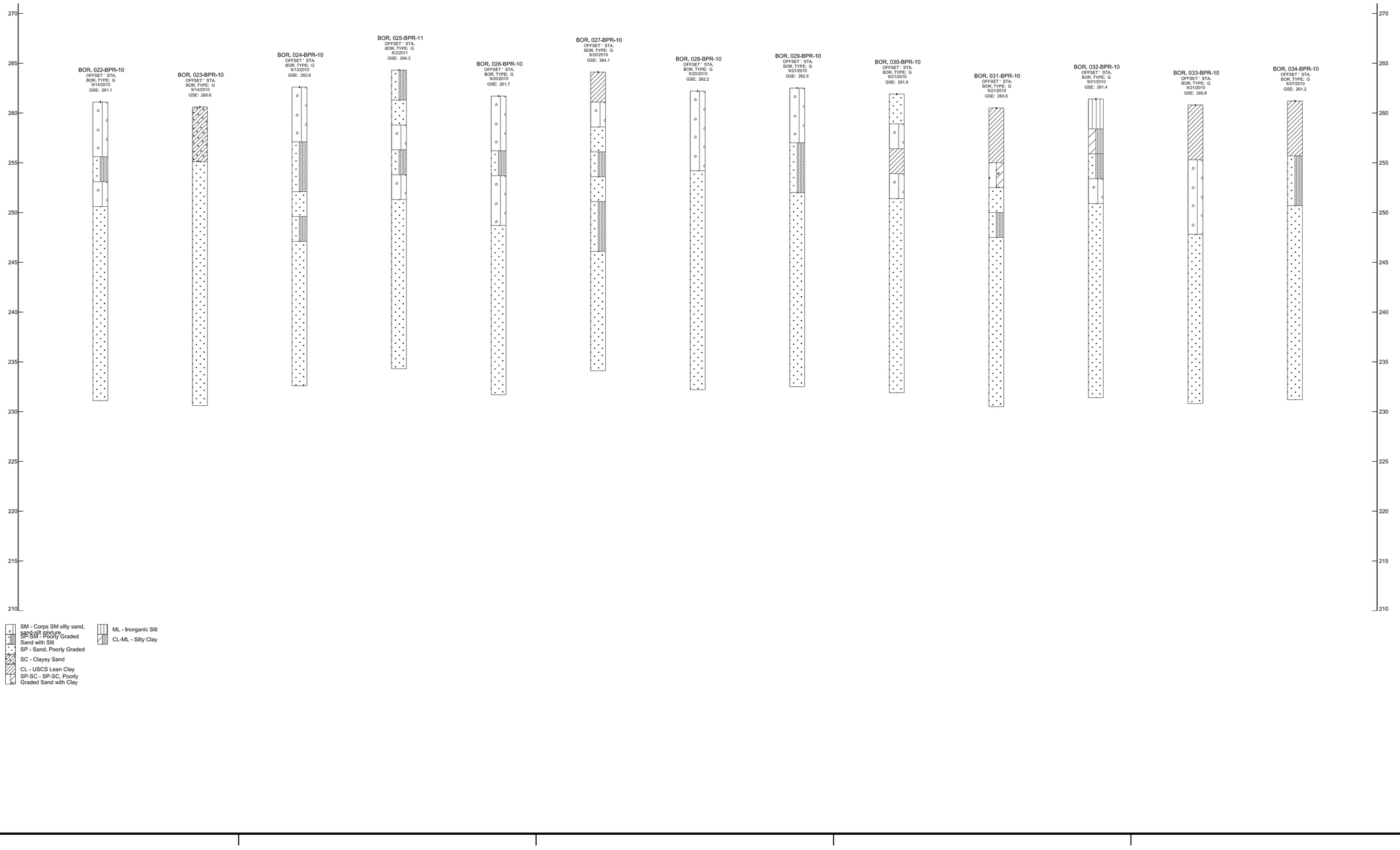

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CONTRACT NO.:
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FILE NUMBER:
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MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

Below Pitgpot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

River Side
Levee Mile 20

Sheet ID
BP-003

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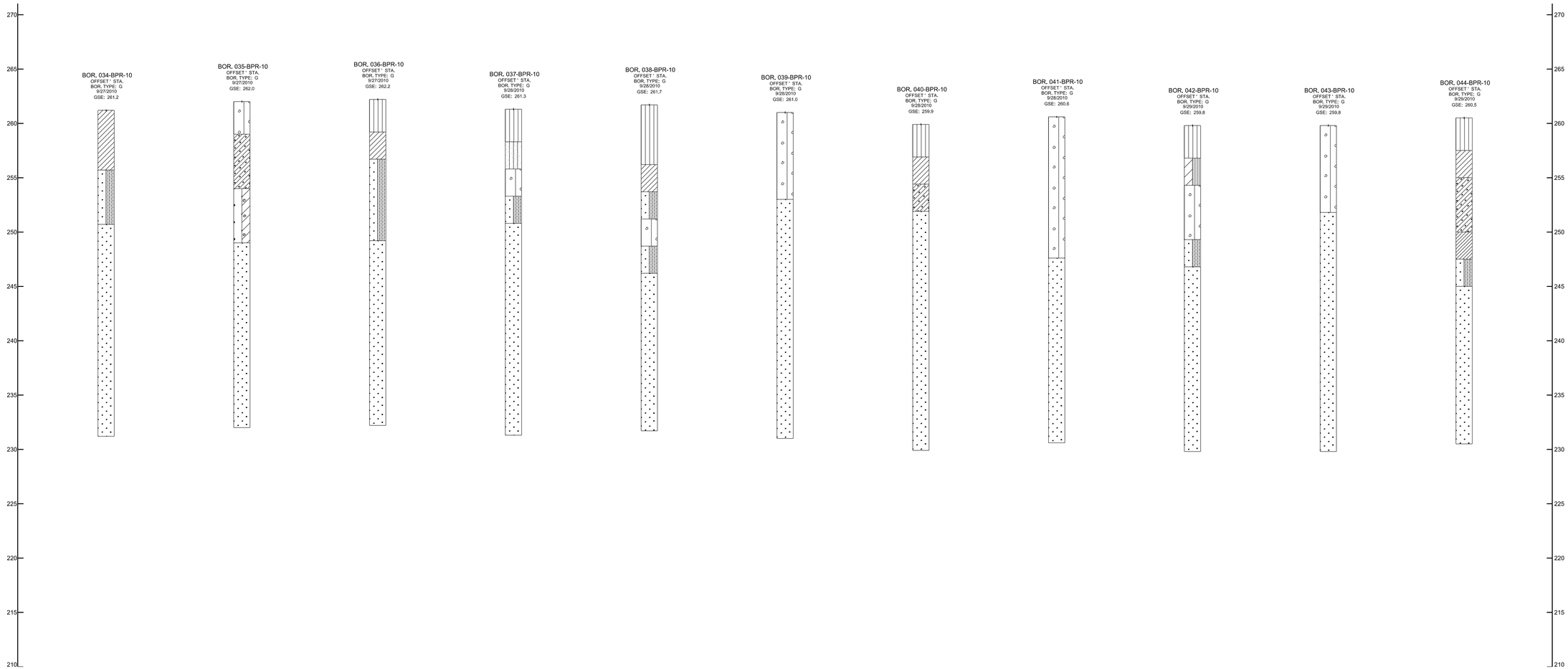

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MEMPHIS DISTRICT
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PLOT DATE: AS NOTED
SIZE: ANSI D
DATE: 06/23/2017
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Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

River Side
Levee Mile 21

Sheet ID
BP-004

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CONTRACT NO.:
PLOT SCALE: AS SHOWN
PLOT DATE: 09/22/2017
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St. Francis Drainage District of Clay and Greene Counties

River Side
Levee Mile 22

Sheet ID
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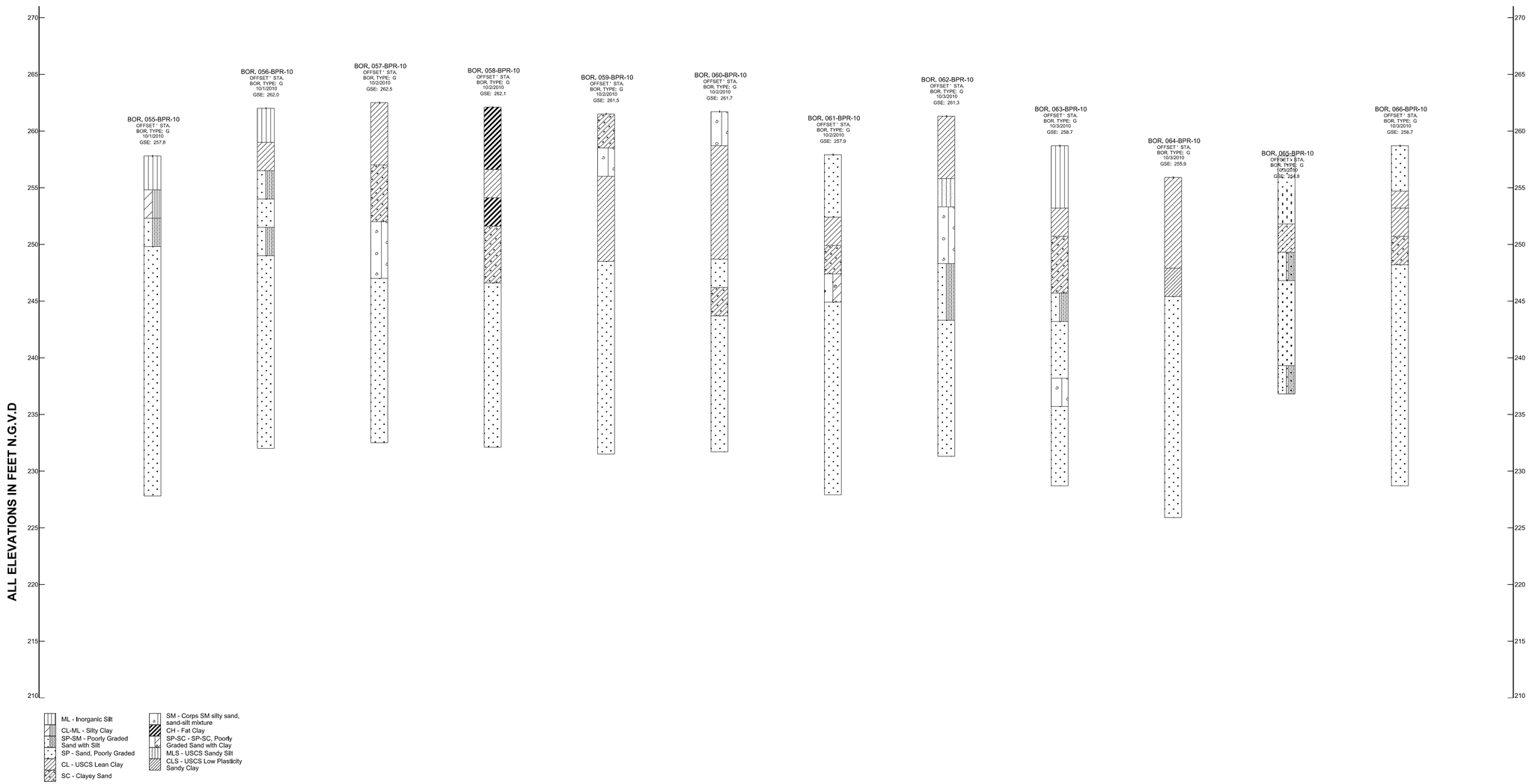

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PLOT DATE: 06/23/2017
SIZE: ANSI D
FILE NAME: BP_Riverside23.dgn
DATE: 06/23/2017
SOLICITATION NO.:
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St. Francis Drainage District of Clay and Greene Counties

River Side
Levee Mile 23

Sheet ID
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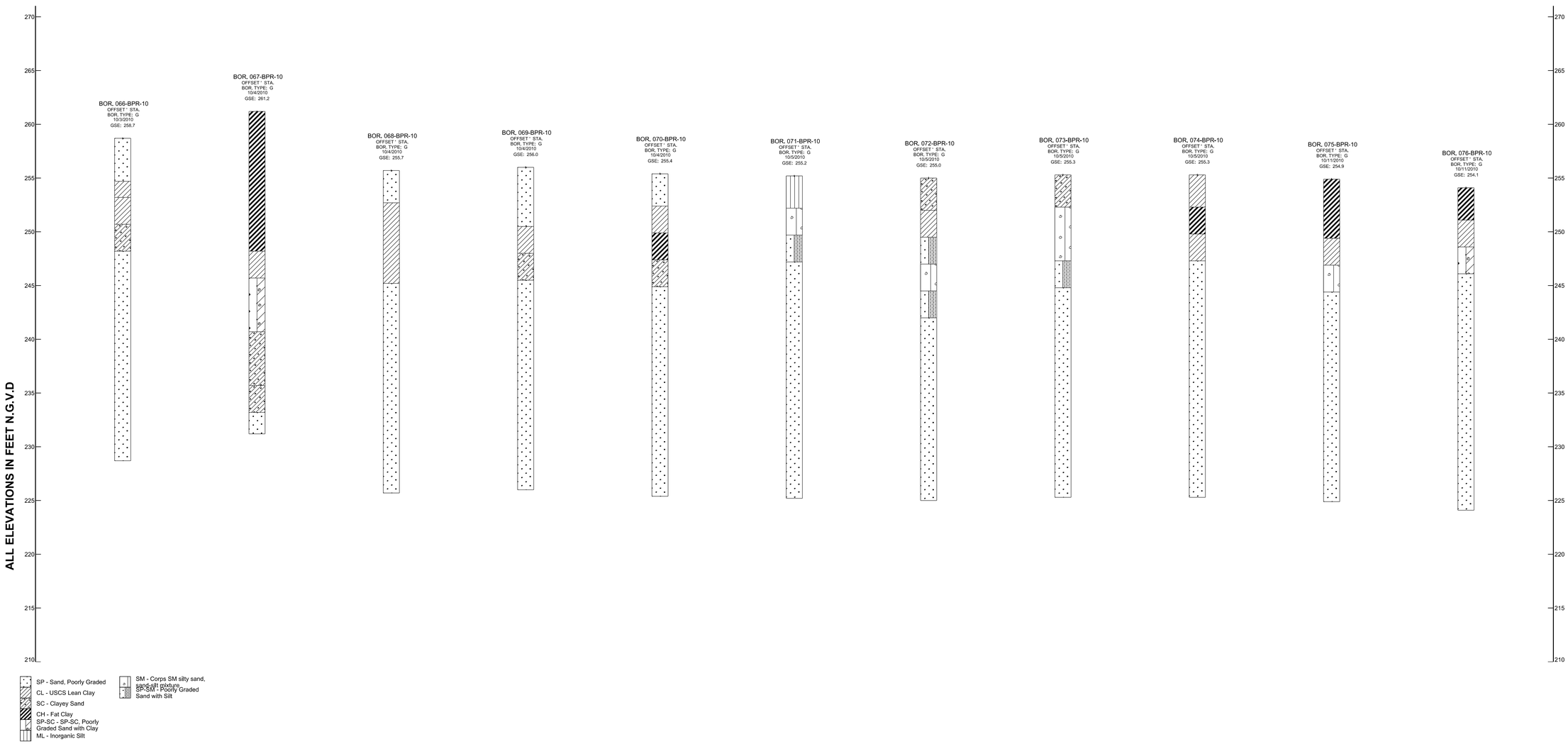

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PLOT SCALE: 1" = 10'
PLOT DATE: 06/23/2017
FILE NAME: BP_Riverside24.dgn
SIZE: ANSI D
DATE: 06/23/2017
SOLICITATION NO.:
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St. Francis Drainage District of Clay and Greene Counties

River Side
Levee Mile 24

Sheet ID
BP-007

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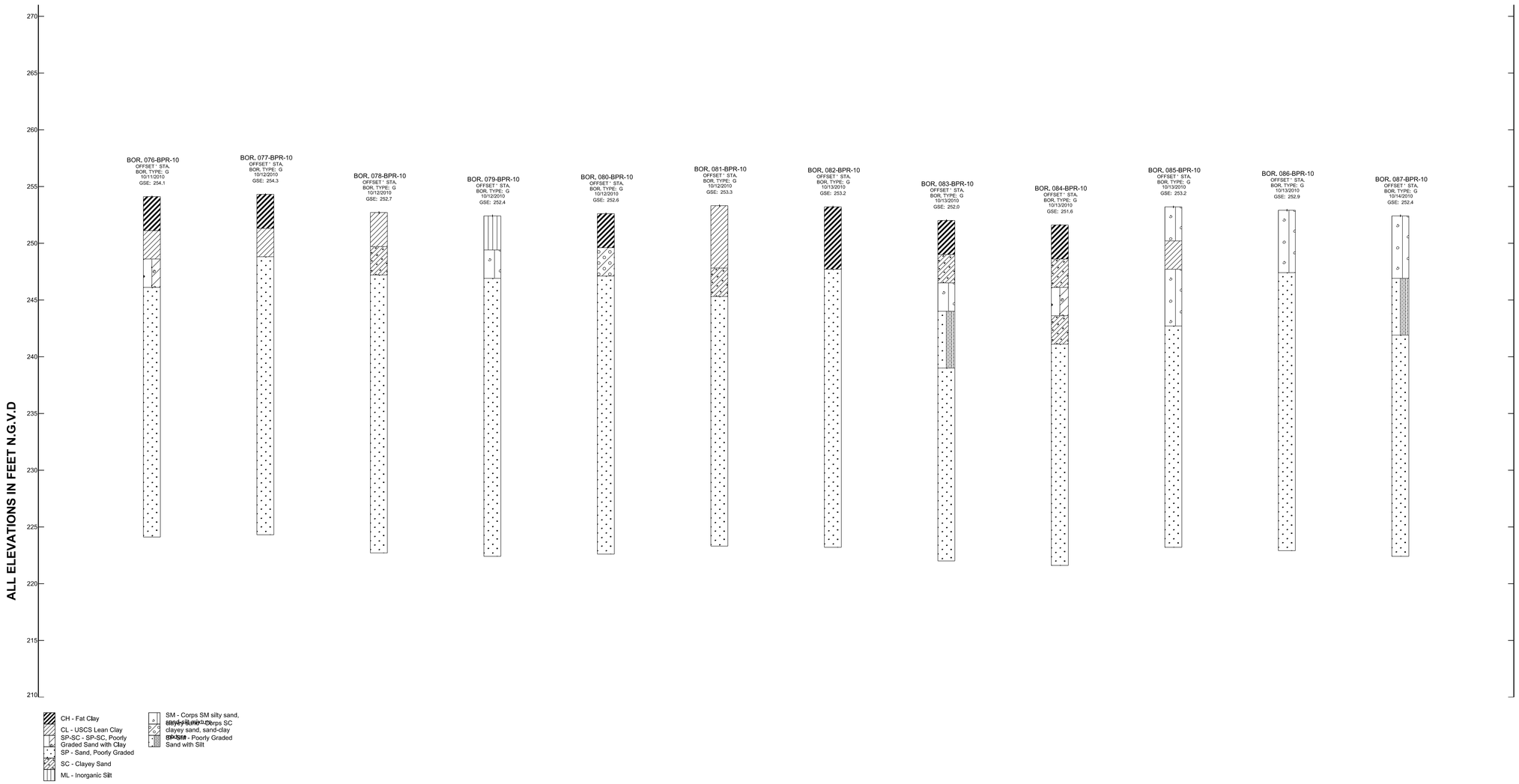

ACE MVM FENCE WITITLE 11 X 17-SEEPAGE E-5-036_USACE_BELOW PIGGOTT(FINAL) - COPY.GPJ GINT TEMPLATE.GDT 6/23/17

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MEMPHIS, TENNESSEE

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CKD BY:
SUBMITTED BY:
PLOT SCALE: 1" = 10'
PLOT DATE: 06/23/2017
FILE NAME: BP_Riverside25.dgn
DATE: 06/23/2017
SOLICITATION NO.:
CONTRACT NO.:
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St. Francis Drainage District of Clay and Greene Counties

River Side
Levee Mile 25

Sheet ID
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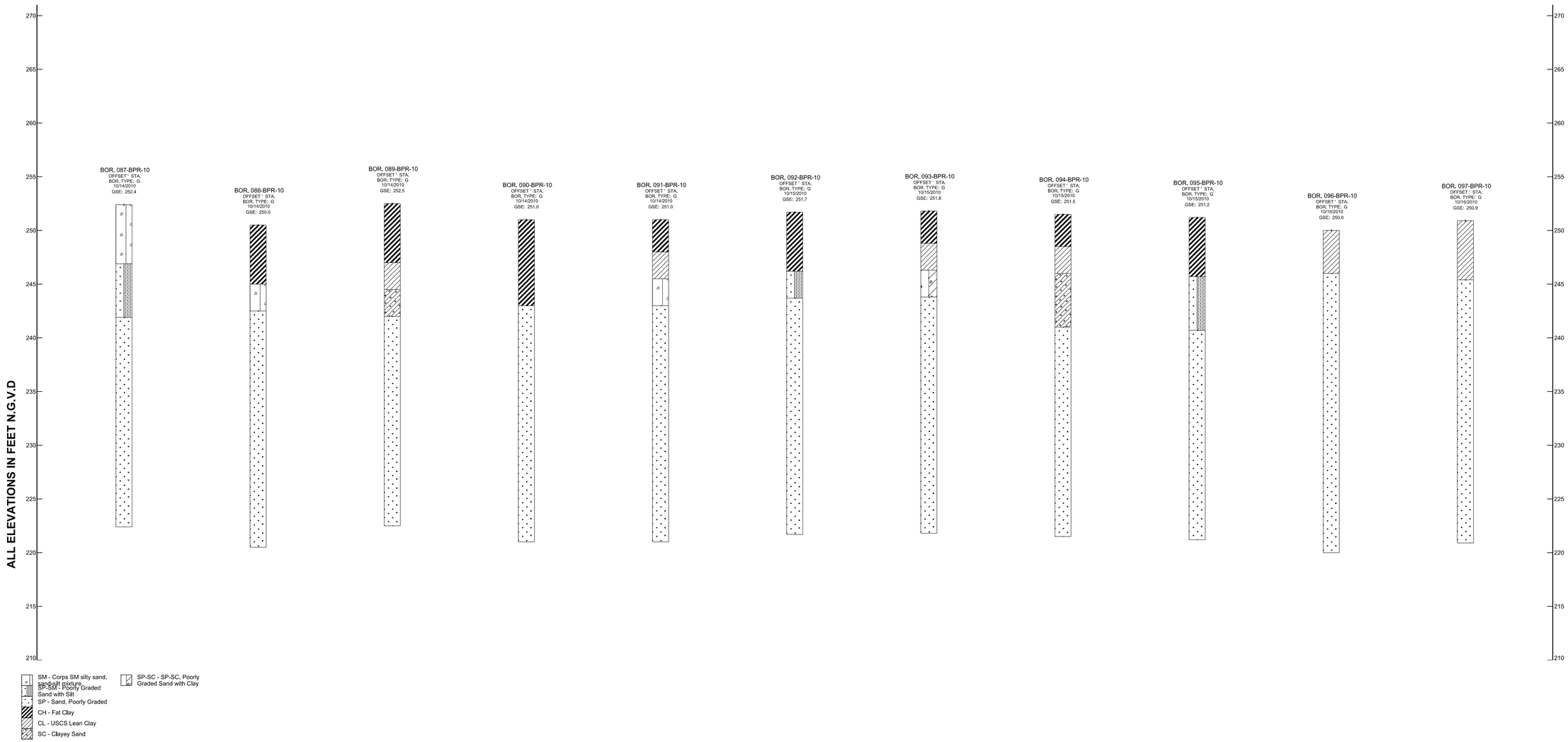

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U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

DESIGNED BY:
DWN BY:
CKD BY:
SUBMITTED BY:
PLOT SCALE: 1" = 10'
PLOT DATE: 06/23/2017
FILE NAME: BP_RiverSide26.dgn
DATE: 06/23/2017
SOLICITATION NO.:
CONTRACT NO.:
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St. Francis Drainage District of Clay and Greene Counties

River Side
Levee Mile 26

Sheet ID
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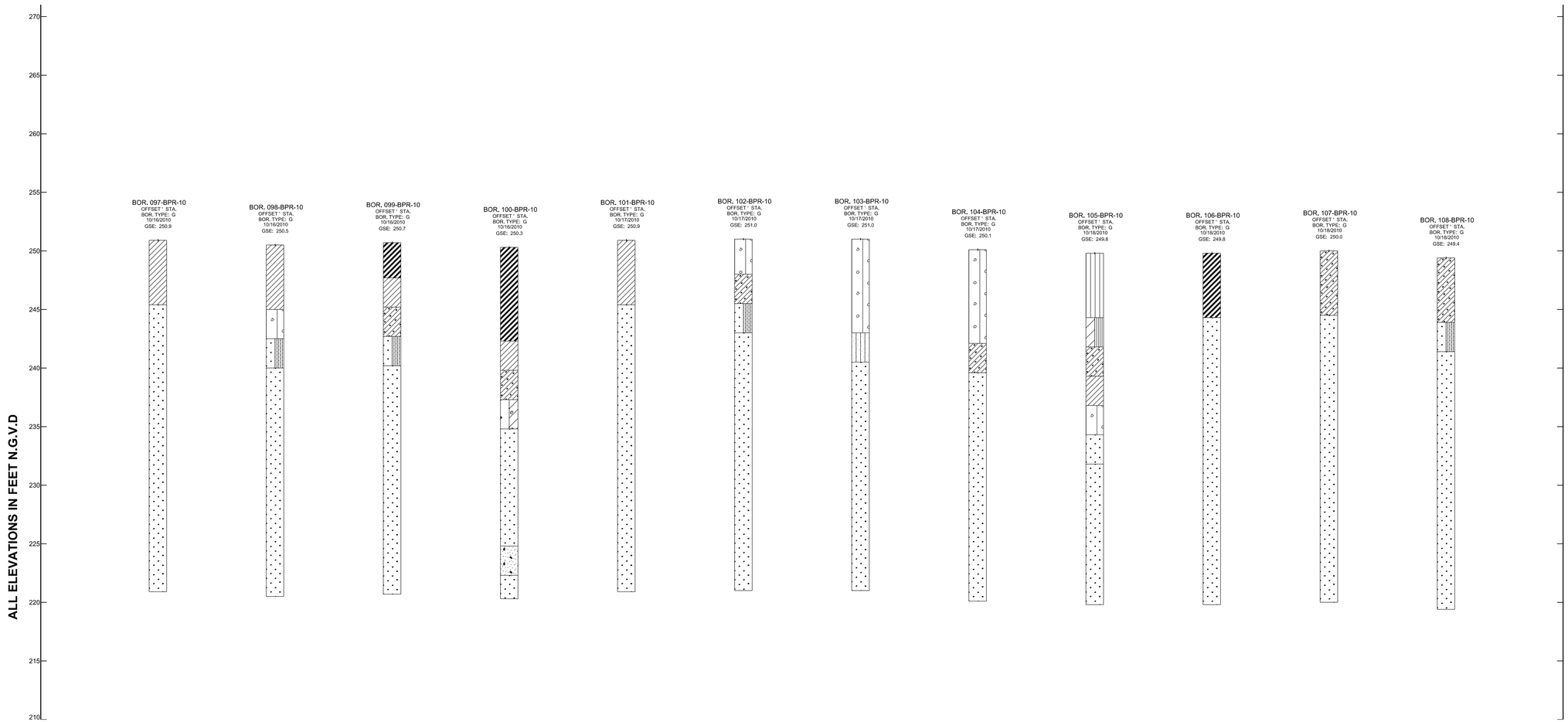

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MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

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CKD BY:
SUBMITTED BY:
DATE: 09/22/2017
SOLICITATION NO.:
CONTRACT NO.:
PLOT SCALE: As noted
PLOT DATE: 9/27/2017
FILE NAME: BP- Riverside27.dgn
FILE NUMBER:
SIZE: ANSI D

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St. Francis Drainage District of Clay and Greene Counties

River Side
Levee Mile 27

Sheet ID
BP-010

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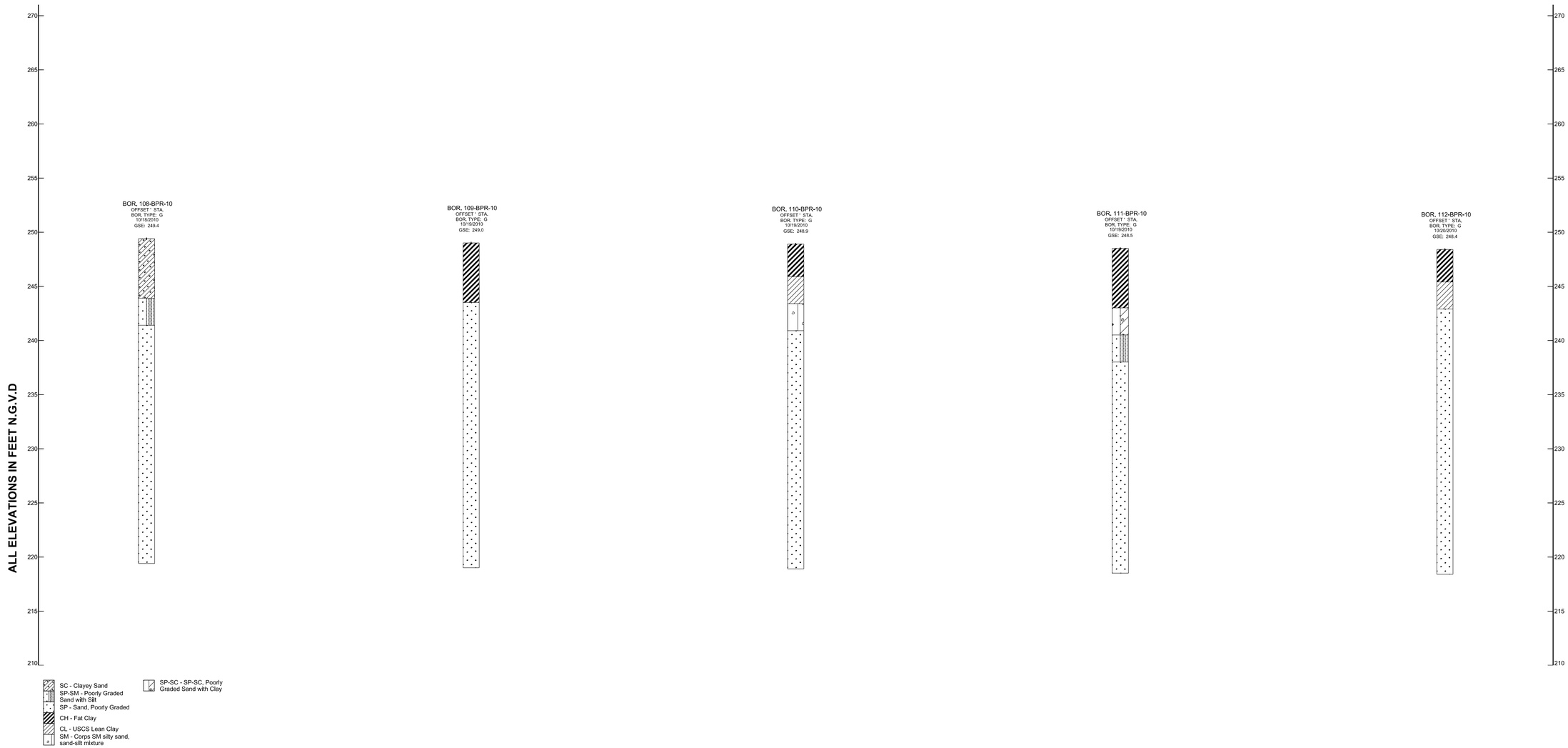

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MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

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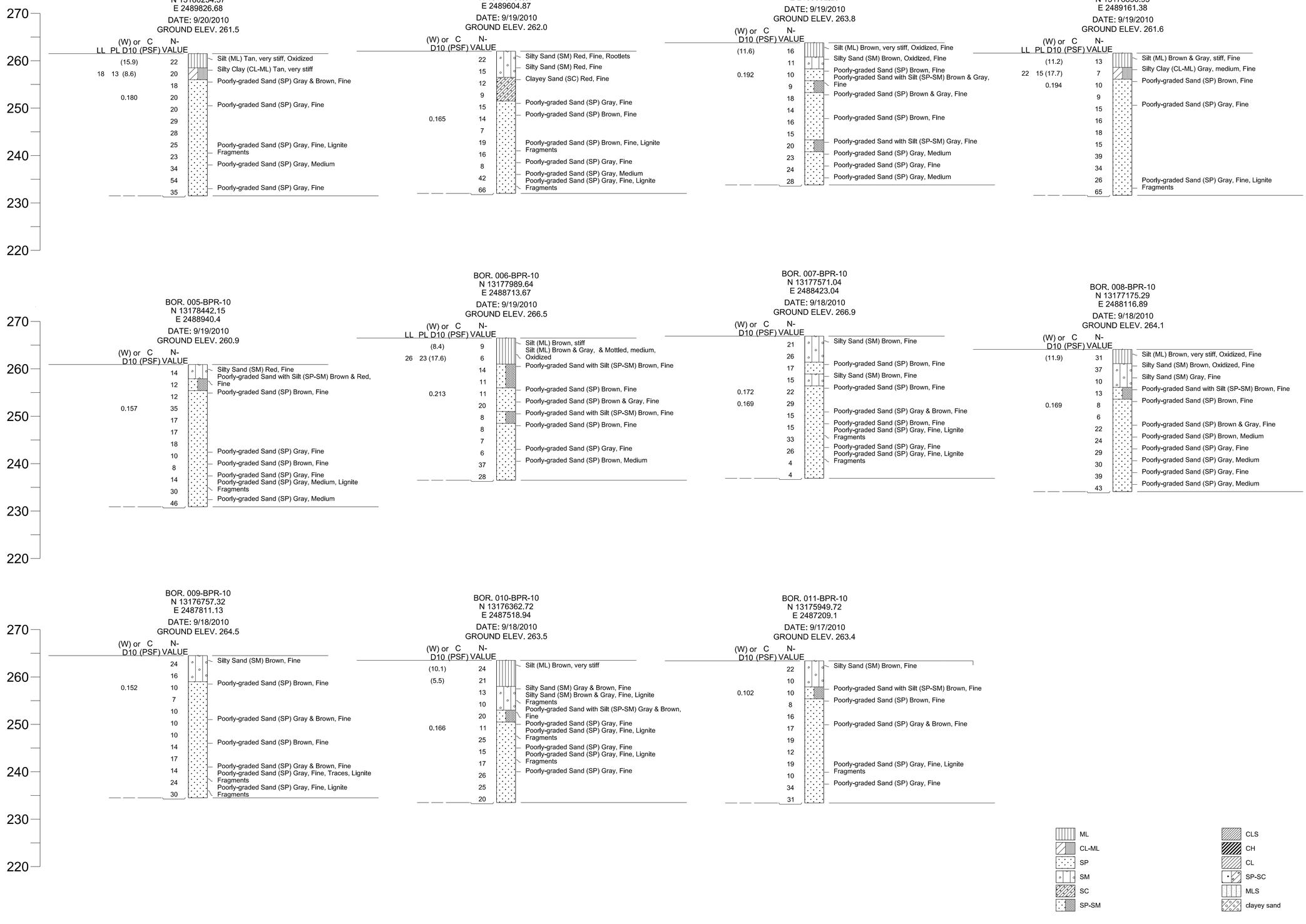
DWN BY:
CKD BY:
SUBMITTED BY:
PLOT SCALE: 1" = 10'
PLOT DATE: 06/23/2017
SIZE: ANSI D
FILE NAME: BP_RiverSide28.dgn
DATE: 06/23/2017
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

River Side
Levee Mile 28

Sheet ID
BP-011

auto_time


BOR. 001-BPR-10
N 13180234.37
E 2489826.68
DATE: 9/20/2010
GROUND ELEV. 261.5
(W) or C N-
LL PL D10 (PSF) VALUE
(15.9) 22 Silt (ML) Tan, very stiff, Oxidized
18 13 (8.6) 20 Silty Clay (CL-ML) Tan, very stiff
18 Poorly-graded Sand (SP) Gray & Brown, Fine
0.180 20
20 Poorly-graded Sand (SP) Gray, Fine
29
28
25 Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments
23
34 Poorly-graded Sand (SP) Gray, Medium
54
35 Poorly-graded Sand (SP) Gray, Fine
BOR. 002-BPR-10
N 13179786.57
E 2489604.87
DATE: 9/19/2010
GROUND ELEV. 262.0
(W) or C N-
D10 (PSF) VALUE
22 Silty Sand (SM) Red, Fine, Rootlets
15 Silty Sand (SM) Red, Fine
12 Clayey Sand (SC) Red, Fine
9
15 Poorly-graded Sand (SP) Gray, Fine
0.165 14 Poorly-graded Sand (SP) Brown, Fine
7
19 Poorly-graded Sand (SP) Brown, Fine, Lignite Fragments
16
8 Poorly-graded Sand (SP) Gray, Fine
42 Poorly-graded Sand (SP) Gray, Medium
66 Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments
BOR. 003-BPR-10
N 13179338.97
E 2489382.29
DATE: 9/19/2010
GROUND ELEV. 263.8
(W) or C N-
D10 (PSF) VALUE
(11.6) 16 Silt (ML) Brown, very stiff, Oxidized, Fine
11 Silty Sand (SM) Brown, Oxidized, Fine
0.192 10 Poorly-graded Sand (SP) Brown, Fine
9 Poorly-graded Sand with Silt (SP-SM) Brown & Gray, Fine
18 Poorly-graded Sand (SP) Brown & Gray, Fine
14
16 Poorly-graded Sand (SP) Brown, Fine
15
20 Poorly-graded Sand with Silt (SP-SM) Gray, Fine
23 Poorly-graded Sand (SP) Gray, Medium
24 Poorly-graded Sand (SP) Gray, Fine
28 Poorly-graded Sand (SP) Gray, Medium
BOR. 004-BPR-10
N 13178890.93
E 2489161.38
DATE: 9/19/2010
GROUND ELEV. 261.6
(W) or C N-
LL PL D10 (PSF) VALUE
(11.2) 13 Silt (ML) Brown & Gray, stiff, Fine
22 15 (17.7) 7 Silty Clay (CL-ML) Gray, medium, Fine
0.194 10 Poorly-graded Sand (SP) Brown, Fine
9
15 Poorly-graded Sand (SP) Gray, Fine
16
18
15
39
34
26 Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments
65
BOR. 005-BPR-10
N 13178442.15
E 2488940.4
DATE: 9/19/2010
GROUND ELEV. 260.9
(W) or C N-
D10 (PSF) VALUE
14 Silty Sand (SM) Red, Fine
12 Poorly-graded Sand with Silt (SP-SM) Brown & Red, Fine
12 Poorly-graded Sand (SP) Brown, Fine
0.157 35
17
17
18
10 Poorly-graded Sand (SP) Gray, Fine
8 Poorly-graded Sand (SP) Brown, Fine
14 Poorly-graded Sand (SP) Gray, Fine
30 Poorly-graded Sand (SP) Gray, Medium, Lignite Fragments
46 Poorly-graded Sand (SP) Gray, Medium
BOR. 006-BPR-10
N 13177989.64
E 2488713.67
DATE: 9/19/2010
GROUND ELEV. 266.5
(W) or C N-
LL PL D10 (PSF) VALUE
(8.4) 9 Silt (ML) Brown, stiff
6 Silt (ML) Brown & Gray, & Mottled, medium, Oxidized
26 23 (17.6) 14 Poorly-graded Sand with Silt (SP-SM) Brown, Fine
11
0.213 11 Poorly-graded Sand (SP) Brown, Fine
20 Poorly-graded Sand (SP) Brown & Gray, Fine
8 Poorly-graded Sand with Silt (SP-SM) Brown, Fine
8 Poorly-graded Sand (SP) Brown, Fine
7
6 Poorly-graded Sand (SP) Gray, Fine
37 Poorly-graded Sand (SP) Brown, Medium
28
BOR. 007-BPR-10
N 13177571.04
E 2488423.04
DATE: 9/18/2010
GROUND ELEV. 266.9
(W) or C N-
D10 (PSF) VALUE
21 Silty Sand (SM) Brown, Fine
26
17 Poorly-graded Sand (SP) Brown, Fine
15 Silty Sand (SM) Brown, Fine
0.172 22 Poorly-graded Sand (SP) Brown, Fine
0.169 29
15 Poorly-graded Sand (SP) Gray & Brown, Fine
15 Poorly-graded Sand (SP) Brown, Fine
33 Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments
26 Poorly-graded Sand (SP) Gray, Fine
Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments
4
4
BOR. 008-BPR-10
N 13177175.29
E 2488116.89
DATE: 9/18/2010
GROUND ELEV. 264.1
(W) or C N-
D10 (PSF) VALUE
(11.9) 31 Silt (ML) Brown, very stiff, Oxidized, Fine
37 Silty Sand (SM) Brown, Oxidized, Fine
10 Silty Sand (SM) Gray, Fine
13 Poorly-graded Sand with Silt (SP-SM) Brown, Fine
0.169 8 Poorly-graded Sand (SP) Brown, Fine
6
22 Poorly-graded Sand (SP) Brown & Gray, Fine
24 Poorly-graded Sand (SP) Brown, Medium
29 Poorly-graded Sand (SP) Gray, Fine
30 Poorly-graded Sand (SP) Gray, Medium
39 Poorly-graded Sand (SP) Gray, Fine
43 Poorly-graded Sand (SP) Gray, Medium
BOR. 009-BPR-10
N 13176757.32
E 2487811.13
DATE: 9/18/2010
GROUND ELEV. 264.5
(W) or C N-
D10 (PSF) VALUE
24 Silty Sand (SM) Brown, Fine
16
0.152 10 Poorly-graded Sand (SP) Brown, Fine
7
10
10 Poorly-graded Sand (SP) Gray & Brown, Fine
10
14 Poorly-graded Sand (SP) Brown, Fine
17
14 Poorly-graded Sand (SP) Gray & Brown, Fine
24 Poorly-graded Sand (SP) Gray, Fine, Traces, Lignite Fragments
30 Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments
BOR. 010-BPR-10
N 13176362.72
E 2487518.94
DATE: 9/18/2010
GROUND ELEV. 263.5
(W) or C N-
D10 (PSF) VALUE
(10.1) 24 Silt (ML) Brown, very stiff
(5.5) 21
13 Silty Sand (SM) Gray & Brown, Fine
10 Silty Sand (SM) Brown & Gray, Fine, Lignite Fragments
20 Poorly-graded Sand with Silt (SP-SM) Gray & Brown, Fine
0.166 11 Poorly-graded Sand (SP) Gray, Fine
25 Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments
15
17 Poorly-graded Sand (SP) Gray, Fine
26 Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments
25
20 Poorly-graded Sand (SP) Gray, Fine
BOR. 011-BPR-10
N 13175949.72
E 2487209.1
DATE: 9/17/2010
GROUND ELEV. 263.4
(W) or C N-
D10 (PSF) VALUE
22 Silty Sand (SM) Brown, Fine
10
0.102 10 Poorly-graded Sand with Silt (SP-SM) Brown, Fine
8 Poorly-graded Sand (SP) Brown, Fine
16
17 Poorly-graded Sand (SP) Gray & Brown, Fine
19
12
19 Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments
10
34 Poorly-graded Sand (SP) Gray, Fine
31
ML
CL-ML
SP
SM
SC
SP-SM
CLS
CH
CL
SP-SC
MLS
clayey sand
US Army Corps of Engineers
DESIGNED BY:
DWN BY:
CKD BY:
SUBMITTED BY:
DATE: 09/22/2017
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:
PLOT SCALE: 1:1
PLOT DATE: 09/27/2017
SIZE: ANSI D
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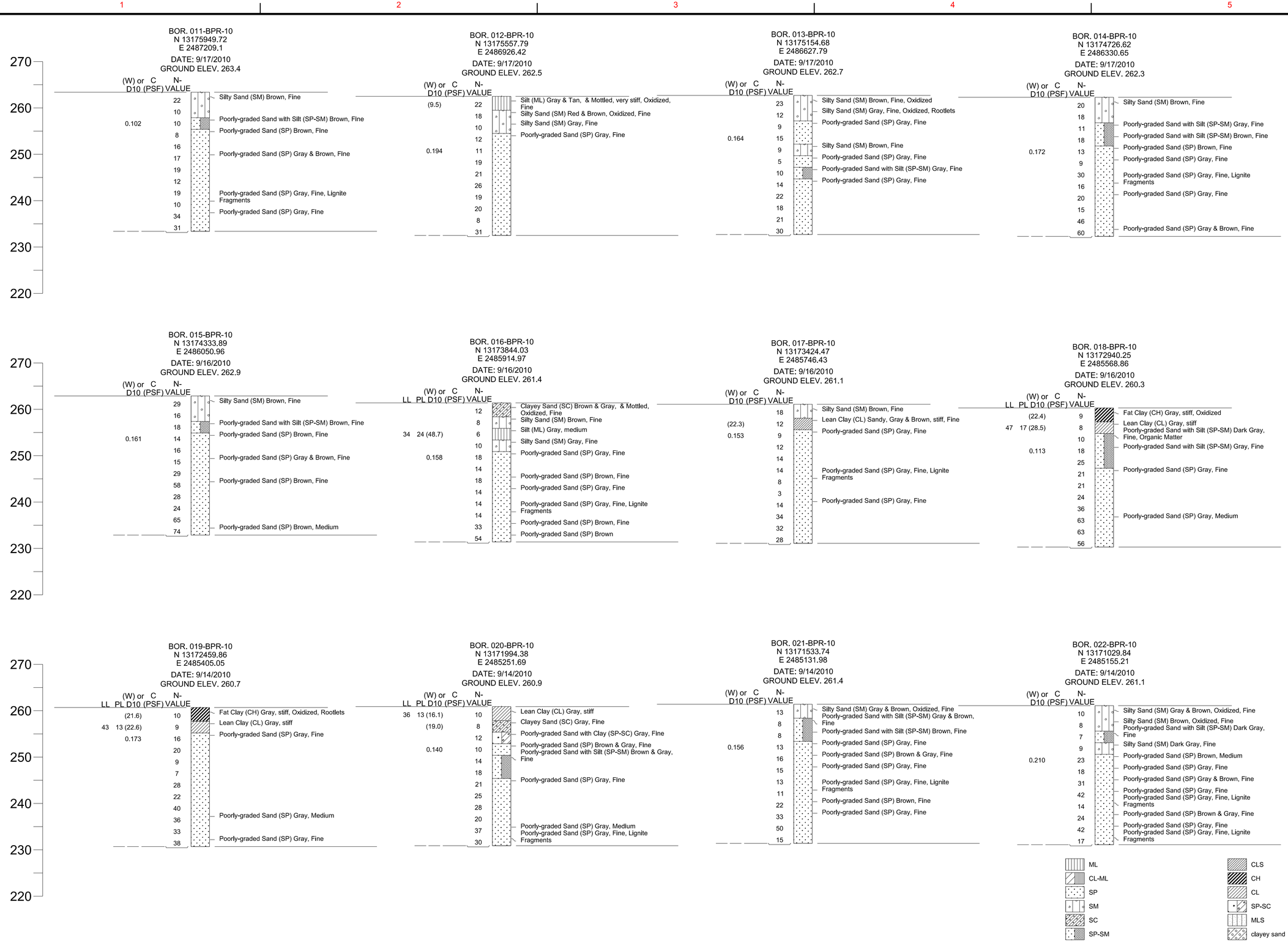
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE
Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties
River Side Fences
Levee Mile 18
Sheet ID
BP-012
MARK
DESCRIPTION
DATE
APPR.


BOR. 011-BPR-10
N 13175949.72
E 2487209.1
DATE: 9/17/2010
GROUND ELEV. 263.4
(W) or D10 (PSF) C N-VALUE
0.102
22 Silty Sand (SM) Brown, Fine
10
10 Poorly-graded Sand with Silt (SP-SM) Brown, Fine
8 Poorly-graded Sand (SP) Brown, Fine
16
17 Poorly-graded Sand (SP) Gray & Brown, Fine
19
12
19 Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments
10
34 Poorly-graded Sand (SP) Gray, Fine
31
BOR. 012-BPR-10
N 13175557.79
E 2486926.42
DATE: 9/17/2010
GROUND ELEV. 262.5
(W) or D10 (PSF) C N-VALUE
(9.5)
22 Silt (ML) Gray & Tan, & Mottled, very stiff, Oxidized, Fine
18 Silty Sand (SM) Red & Brown, Oxidized, Fine
10 Silty Sand (SM) Gray, Fine
0.194
12 Poorly-graded Sand (SP) Gray, Fine
11
19
21
26
19
20
8
31
BOR. 013-BPR-10
N 13175154.68
E 2486627.79
DATE: 9/17/2010
GROUND ELEV. 262.7
(W) or D10 (PSF) C N-VALUE
23 Silty Sand (SM) Brown, Fine, Oxidized
12 Silty Sand (SM) Gray, Fine, Oxidized, Rootlets
9 Poorly-graded Sand (SP) Gray, Fine
0.164
15
9 Silty Sand (SM) Brown, Fine
5 Poorly-graded Sand (SP) Gray, Fine
10 Poorly-graded Sand with Silt (SP-SM) Gray, Fine
14 Poorly-graded Sand (SP) Gray, Fine
22
18
21
30
BOR. 014-BPR-10
N 13174726.62
E 2486330.65
DATE: 9/17/2010
GROUND ELEV. 262.3
(W) or D10 (PSF) C N-VALUE
20 Silty Sand (SM) Brown, Fine
18
11 Poorly-graded Sand with Silt (SP-SM) Gray, Fine
18 Poorly-graded Sand with Silt (SP-SM) Brown, Fine
0.172
13 Poorly-graded Sand (SP) Brown, Fine
9 Poorly-graded Sand (SP) Gray, Fine
30 Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments
16
20 Poorly-graded Sand (SP) Gray, Fine
15
46
60 Poorly-graded Sand (SP) Gray & Brown, Fine
BOR. 015-BPR-10
N 13174333.89
E 2486050.96
DATE: 9/16/2010
GROUND ELEV. 262.9
(W) or D10 (PSF) C N-VALUE
29 Silty Sand (SM) Brown, Fine
16
18 Poorly-graded Sand with Silt (SP-SM) Brown, Fine
0.161
14 Poorly-graded Sand (SP) Brown, Fine
16
15 Poorly-graded Sand (SP) Gray & Brown, Fine
29
58 Poorly-graded Sand (SP) Brown, Fine
28
24
65
74 Poorly-graded Sand (SP) Brown, Medium
BOR. 016-BPR-10
N 13173844.03
E 2485914.97
DATE: 9/16/2010
GROUND ELEV. 261.4
(W) or LL PL D10 (PSF) C N-VALUE
12 Clayey Sand (SC) Brown & Gray, & Mottled, Oxidized, Fine
8 Silty Sand (SM) Brown, Fine
34 24 (48.7)
6 Silt (ML) Gray, medium
10 Silty Sand (SM) Gray, Fine
0.158
18 Poorly-graded Sand (SP) Gray, Fine
14
18 Poorly-graded Sand (SP) Brown, Fine
14 Poorly-graded Sand (SP) Gray, Fine
14 Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments
14
33 Poorly-graded Sand (SP) Brown, Fine
54 Poorly-graded Sand (SP) Brown
BOR. 017-BPR-10
N 13173424.47
E 2485746.43
DATE: 9/16/2010
GROUND ELEV. 261.1
(W) or D10 (PSF) C N-VALUE
18 Silty Sand (SM) Brown, Fine
(22.3)
12 Lean Clay (CL) Sandy, Gray & Brown, stiff, Fine
0.153
9 Poorly-graded Sand (SP) Gray, Fine
12
14
14 Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments
8
3
14 Poorly-graded Sand (SP) Gray, Fine
34
32
28
BOR. 018-BPR-10
N 13172940.25
E 2485568.86
DATE: 9/16/2010
GROUND ELEV. 260.3
(W) or LL PL D10 (PSF) C N-VALUE
(22.4)
9 Fat Clay (CH) Gray, stiff, Oxidized
47 17 (28.5)
8 Lean Clay (CL) Gray, stiff
Poorly-graded Sand with Silt (SP-SM) Dark Gray, Fine, Organic Matter
10 Poorly-graded Sand with Silt (SP-SM) Gray, Fine
0.113
18
25 Poorly-graded Sand (SP) Gray, Fine
21
21
24
36
63 Poorly-graded Sand (SP) Gray, Medium
63
56
BOR. 019-BPR-10
N 13172459.86
E 2485405.05
DATE: 9/14/2010
GROUND ELEV. 260.7
(W) or LL PL D10 (PSF) C N-VALUE
(21.6)
10 Fat Clay (CH) Gray, stiff, Oxidized, Rootlets
43 13 (22.6)
9 Lean Clay (CL) Gray, stiff
0.173
16 Poorly-graded Sand (SP) Gray, Fine
20
9
7
28
22
40 Poorly-graded Sand (SP) Gray, Medium
36
33
38 Poorly-graded Sand (SP) Gray, Fine
BOR. 020-BPR-10
N 13171994.38
E 2485251.69
DATE: 9/14/2010
GROUND ELEV. 260.9
(W) or LL PL D10 (PSF) C N-VALUE
36 13 (16.1)
10 Lean Clay (CL) Gray, stiff
(19.0)
8 Clayey Sand (SC) Gray, Fine
12 Poorly-graded Sand with Clay (SP-SC) Gray, Fine
0.140
10 Poorly-graded Sand (SP) Brown & Gray, Fine
14 Poorly-graded Sand with Silt (SP-SM) Brown & Gray, Fine
18 Poorly-graded Sand (SP) Gray, Fine
21
25
28
20
37 Poorly-graded Sand (SP) Gray, Medlum
Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments
30
BOR. 021-BPR-10
N 13171533.74
E 2485131.98
DATE: 9/14/2010
GROUND ELEV. 261.4
(W) or D10 (PSF) C N-VALUE
13 Silty Sand (SM) Gray & Brown, Oxidized, Fine
8 Poorly-graded Sand with Silt (SP-SM) Gray & Brown, Fine
8 Poorly-graded Sand with Silt (SP-SM) Brown, Fine
0.156
13 Poorly-graded Sand (SP) Gray, Fine
16 Poorly-graded Sand (SP) Brown & Gray, Fine
15 Poorly-graded Sand (SP) Gray, Fine
13 Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments
11
22 Poorly-graded Sand (SP) Brown, Fine
33 Poorly-graded Sand (SP) Gray, Fine
50
15
BOR. 022-BPR-10
N 13171029.84
E 2485155.21
DATE: 9/14/2010
GROUND ELEV. 261.1
(W) or D10 (PSF) C N-VALUE
10 Silty Sand (SM) Gray & Brown, Oxidized, Fine
8 Silty Sand (SM) Brown, Oxidized, Fine
Poorly-graded Sand with Silt (SP-SM) Dark Gray, Fine
7
9 Silty Sand (SM) Dark Gray, Fine
Poorly-graded Sand (SP) Brown, Medium
0.210
23 Poorly-graded Sand (SP) Gray, Fine
18
31 Poorly-graded Sand (SP) Gray & Brown, Fine
42 Poorly-graded Sand (SP) Gray, Fine
Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments
14
24 Poorly-graded Sand (SP) Brown & Gray, Fine
42 Poorly-graded Sand (SP) Gray, Fine
Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments
17
ML
CL-ML
SP
SM
SC
SP-SM
CLS
CH
CL
SP-SC
MLS
clayey sand
US Army Corps of Engineers
APPR.
DATE
DESCRIPTION
MARK
DESIGNED BY:
DWN BY:
CKD BY:
SUBMITTED BY:
DATE: 06/22/2017
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:
PLOT SCALE: 1:1
PLOT DATE: 6/22/2017
SIZE: ANSI D
FILE NAME: BP-14Fences.cgn
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE
Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties
River Side Fences
Levee Mile 19
Sheet ID
BP-013
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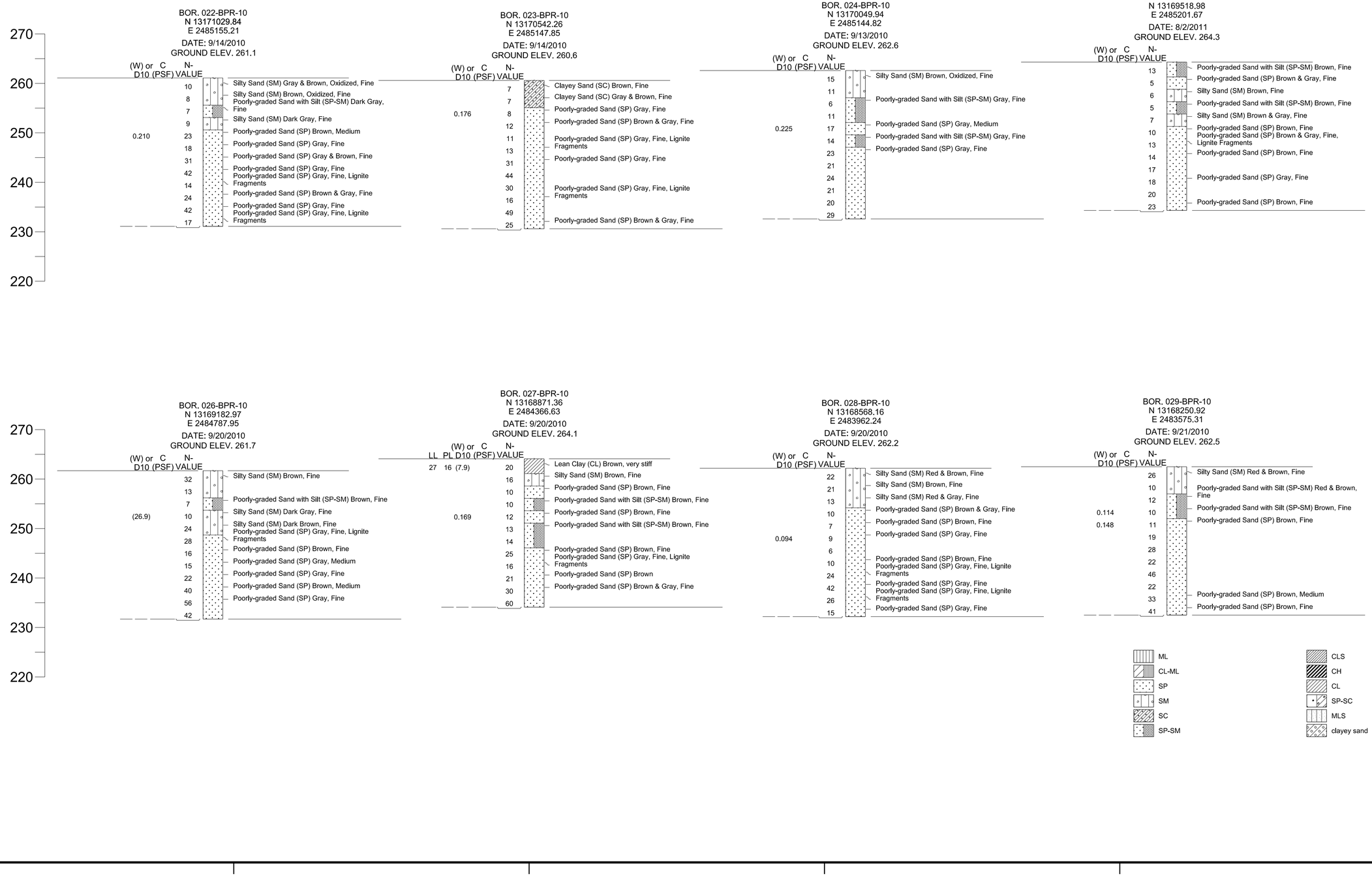

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MARK	APPR.	DATE	DESCRIPTION

DESIGNED BY:
DWN BY:
CKD BY:
SUBMITTED BY:
DATE: 06/23/2017
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:
PLOT SCALE: AS PLOTTED
PLOT DATE: AS PLOTTED
FILE NAME: BP-Fences.dgn
SIZE: ANSI D

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

River Side Fences
Levee Mile 20 (1)

Sheet ID
BP-014

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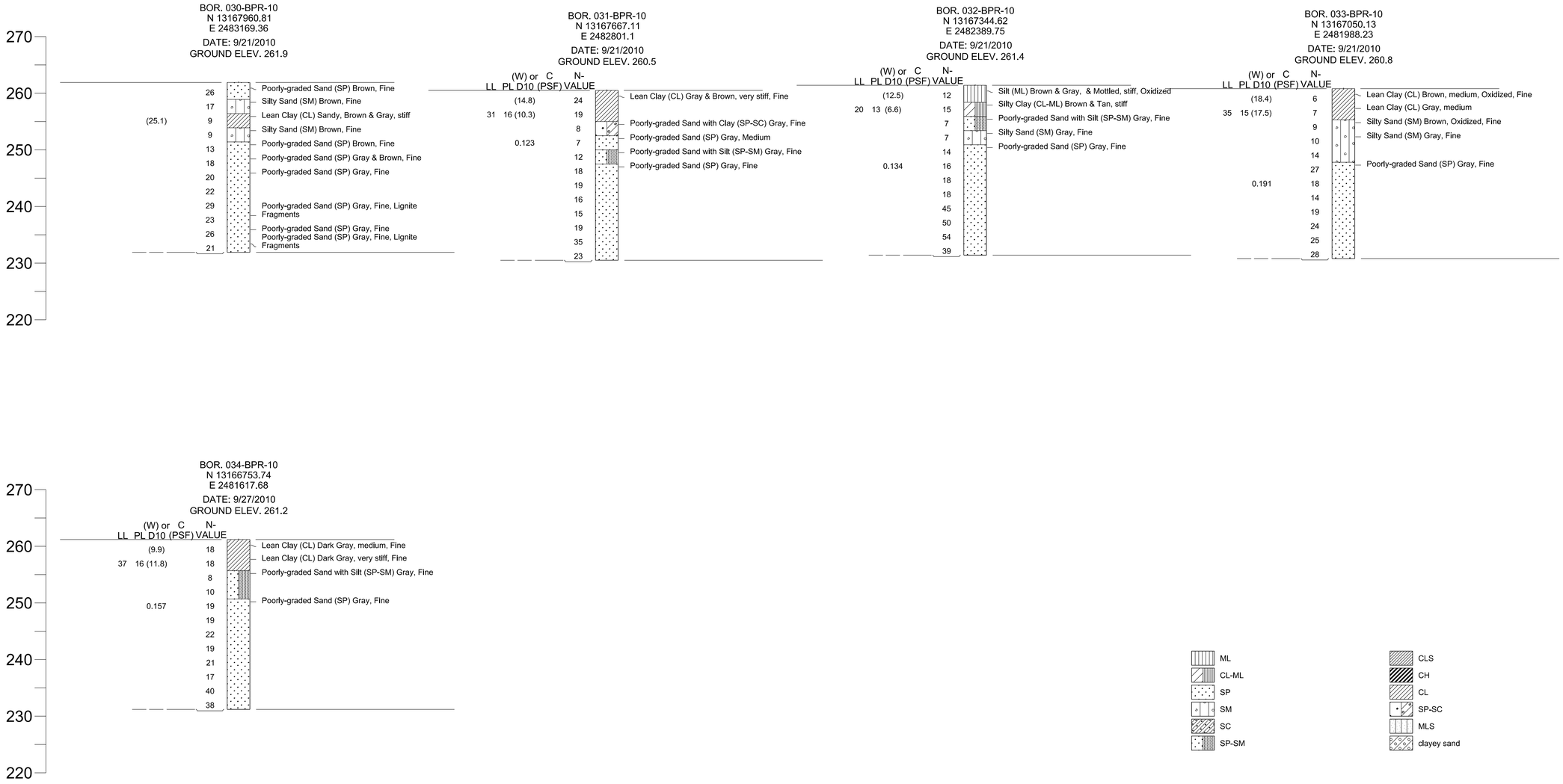

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE	APPR.
MARK	DESCRIPTION	DATE	APPR.

DESIGNED BY:
DWN BY:
CKD BY:
SUBMITTED BY:
DATE: 06/23/2017
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:
PLOT SCALE: AS SHOWN
PLOT DATE: AS SHOWN
SIZE: ANSI D
FILE NAME: BP-Fences.dgn

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

River Side Fences
Levee Mile 20 (2)

Sheet ID
BP-015

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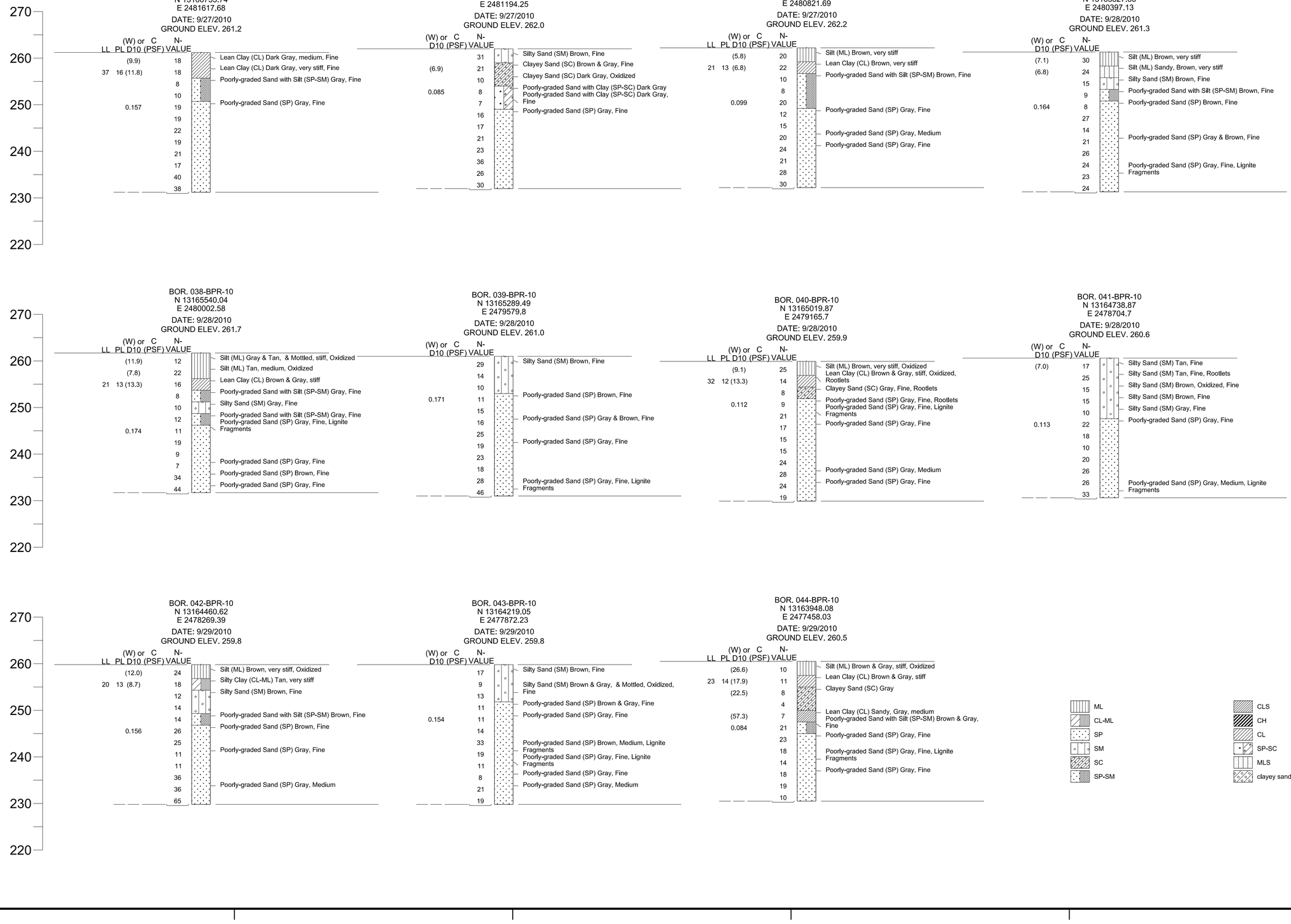
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N 13166753.74
E 2481617.68
DATE: 9/27/2010
GROUND ELEV. 261.2
(W) or C N-
LL PL D10 (PSF) VALUE
(9.9) 18 Lean Clay (CL) Dark Gray, medium, Fine
37 16 (11.8) 18 Lean Clay (CL) Dark Gray, very stiff, Fine
8
10 Poorly-graded Sand with Silt (SP-SM) Gray, Fine
0.157 19 Poorly-graded Sand (SP) Gray, Fine
19
22
19
21
17
40
38
BOR. 035-BPR-10
N 13166435.95
E 2481194.25
DATE: 9/27/2010
GROUND ELEV. 262.0
(W) or C N-
D10 (PSF) VALUE
31 Silty Sand (SM) Brown, Fine
(6.9) 21 Clayey Sand (SC) Brown & Gray, Fine
10 Clayey Sand (SC) Dark Gray, Oxidized
0.085 8 Poorly-graded Sand with Clay (SP-SC) Dark Gray
7 Poorly-graded Sand with Clay (SP-SC) Dark Gray, Fine
16 Poorly-graded Sand (SP) Gray, Fine
17
21
23
36
26
30
BOR. 036-BPR-10
N 13166146.57
E 2480821.69
DATE: 9/27/2010
GROUND ELEV. 262.2
(W) or C N-
LL PL D10 (PSF) VALUE
(5.8) 20 Silt (ML) Brown, very stiff
21 13 (6.8) 22 Lean Clay (CL) Brown, very stiff
10 Poorly-graded Sand with Silt (SP-SM) Brown, Fine
8
0.099 20 Poorly-graded Sand (SP) Gray, Fine
12
15 Poorly-graded Sand (SP) Gray, Medium
20 Poorly-graded Sand (SP) Gray, Fine
24
21
28
30
BOR. 037-BPR-10
N 13165827.86
E 2480397.13
DATE: 9/28/2010
GROUND ELEV. 261.3
(W) or C N-
D10 (PSF) VALUE
(7.1) 30 Silt (ML) Brown, very stiff
(6.8) 24 Silt (ML) Sandy, Brown, very stiff
15 Silty Sand (SM) Brown, Fine
9 Poorly-graded Sand with Silt (SP-SM) Brown, Fine
0.164 8 Poorly-graded Sand (SP) Brown, Fine
27
14 Poorly-graded Sand (SP) Gray & Brown, Fine
21
26
24 Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments
23
24
BOR. 038-BPR-10
N 13165540.04
E 2480002.58
DATE: 9/28/2010
GROUND ELEV. 261.7
(W) or C N-
LL PL D10 (PSF) VALUE
(11.9) 12 Silt (ML) Gray & Tan, & Mottled, stiff, Oxidized
(7.8) 22 Silt (ML) Tan, medium, Oxidized
21 13 (13.3) 16 Lean Clay (CL) Brown & Gray, stiff
8 Poorly-graded Sand with Silt (SP-SM) Gray, Fine
10 Silty Sand (SM) Gray, Fine
12 Poorly-graded Sand with Silt (SP-SM) Gray, Fine
Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments
0.174 11
19
9 Poorly-graded Sand (SP) Gray, Fine
7 Poorly-graded Sand (SP) Brown, Fine
34 Poorly-graded Sand (SP) Gray, Fine
44
BOR. 039-BPR-10
N 13165289.49
E 2479579.8
DATE: 9/28/2010
GROUND ELEV. 261.0
(W) or C N-
D10 (PSF) VALUE
29 Silty Sand (SM) Brown, Fine
14
10 Poorly-graded Sand (SP) Brown, Fine
0.171 11
15
16 Poorly-graded Sand (SP) Gray & Brown, Fine
25
19 Poorly-graded Sand (SP) Gray, Fine
23
18
28 Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments
46
BOR. 040-BPR-10
N 13165019.87
E 2479165.7
DATE: 9/28/2010
GROUND ELEV. 259.9
(W) or C N-
LL PL D10 (PSF) VALUE
(9.1) 25 Silt (ML) Brown, very stiff, Oxidized
14 Lean Clay (CL) Brown & Gray, stiff, Oxidized, Rootlets
32 12 (13.3) 8 Clayey Sand (SC) Gray, Fine, Rootlets
Poorly-graded Sand (SP) Gray, Fine, Rootlets
0.112 9 Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments
21
17 Poorly-graded Sand (SP) Gray, Fine
15
15
24
28 Poorly-graded Sand (SP) Gray, Medium
24 Poorly-graded Sand (SP) Gray, Fine
19
BOR. 041-BPR-10
N 13164738.87
E 2478704.7
DATE: 9/28/2010
GROUND ELEV. 260.6
(W) or C N-
D10 (PSF) VALUE
(7.0) 17 Silty Sand (SM) Tan, Fine
25 Silty Sand (SM) Tan, Fine, Rootlets
15 Silty Sand (SM) Brown, Oxidized, Fine
15 Silty Sand (SM) Brown, Fine
10 Silty Sand (SM) Gray, Fine
0.113 22 Poorly-graded Sand (SP) Gray, Fine
18
10
20
26
26 Poorly-graded Sand (SP) Gray, Medium, Lignite Fragments
33
BOR. 042-BPR-10
N 13164460.62
E 2478269.39
DATE: 9/29/2010
GROUND ELEV. 259.8
(W) or C N-
LL PL D10 (PSF) VALUE
(12.0) 24 Silt (ML) Brown, very stiff, Oxidized
20 13 (8.7) 18 Silty Clay (CL-ML) Tan, very stiff
12 Silty Sand (SM) Brown, Fine
14
14 Poorly-graded Sand with Silt (SP-SM) Brown, Fine
0.156 26 Poorly-graded Sand (SP) Brown, Fine
25
11 Poorly-graded Sand (SP) Gray, Fine
11
36
36 Poorly-graded Sand (SP) Gray, Medium
65
BOR. 043-BPR-10
N 13164219.05
E 2477872.23
DATE: 9/29/2010
GROUND ELEV. 259.8
(W) or C N-
D10 (PSF) VALUE
17 Silty Sand (SM) Brown, Fine
9
13 Silty Sand (SM) Brown & Gray, & Mottled, Oxidized, Fine
11 Poorly-graded Sand (SP) Brown & Gray, Fine
0.154 11 Poorly-graded Sand (SP) Gray, Fine
14
33 Poorly-graded Sand (SP) Brown, Medium, Lignite Fragments
19
11 Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments
8 Poorly-graded Sand (SP) Gray, Fine
21 Poorly-graded Sand (SP) Gray, Medium
19
BOR. 044-BPR-10
N 13163948.08
E 2477458.03
DATE: 9/29/2010
GROUND ELEV. 260.5
(W) or C N-
LL PL D10 (PSF) VALUE
(26.6) 10 Silt (ML) Brown & Gray, stiff, Oxidized
23 14 (17.9) 11 Lean Clay (CL) Brown & Gray, stiff
(22.5) 8 Clayey Sand (SC) Gray
4
(57.3) 7 Lean Clay (CL) Sandy, Gray, medium
0.084 21 Poorly-graded Sand with Silt (SP-SM) Brown & Gray, Fine
23 Poorly-graded Sand (SP) Gray, Fine
18 Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments
14
18 Poorly-graded Sand (SP) Gray, Fine
19
10
ML
CL-ML
SP
SM
SC
SP-SM
CLS
CH
CL
SP-SC
MLS
clayey sand
US Army Corps of Engineers
APPR.
DATE
DESCRIPTION
MARK
APPR.
DATE
DESCRIPTION
MARK
DESIGNED BY:
DWN BY:
CKD BY:
SUBMITTED BY:
DATE: 09/22/2017
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:
PLOT SCALE: 1:1
PLOT DATE: 9/27/2017
FILE NAME: BP-06-Fences.dgn
SIZE: ANSI D
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE
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St. Francis Drainage District of Clay and Greene Counties
River Side Fences
Levees Mile 21
Sheet ID
BP-016
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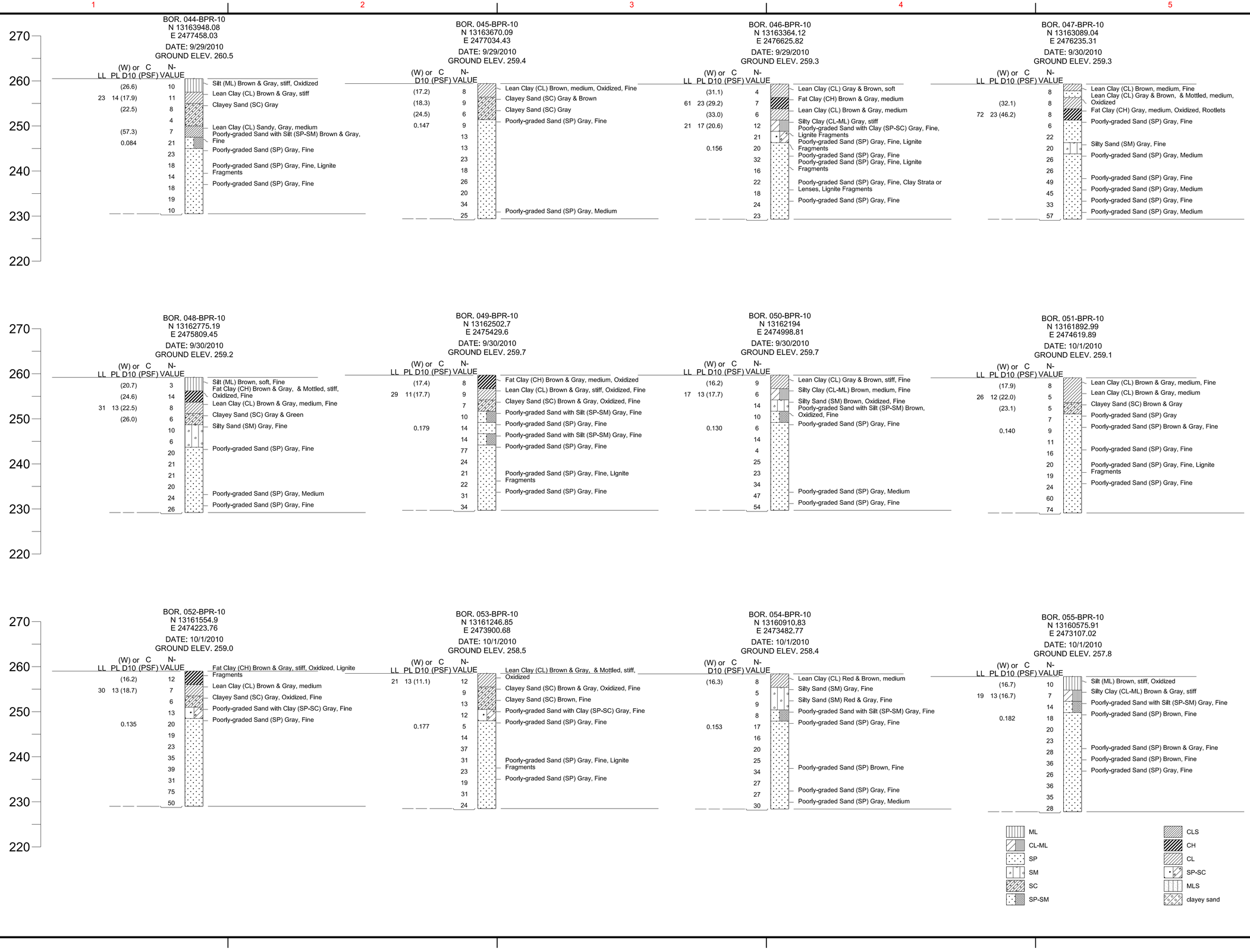
BOR. 044-BPR-10
N 13163948.08
E 2477458.03
DATE: 9/29/2010
GROUND ELEV. 260.5
(W) or C N-
LL PL D10 (PSF) VALUE
(26.6) 10 Silt (ML) Brown & Gray, stiff, Oxidized
23 14 (17.9) 11 Lean Clay (CL) Brown & Gray, stiff
(22.5) 8 Clayey Sand (SC) Gray
4
(57.3) 7 Lean Clay (CL) Sandy, Gray, medium
0.084 21 Poorly-graded Sand with Silt (SP-SM) Brown & Gray, Fine
23 Poorly-graded Sand (SP) Gray, Fine
18
14 Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments
18 Poorly-graded Sand (SP) Gray, Fine
19
10
BOR. 045-BPR-10
N 13163670.09
E 2477034.43
DATE: 9/29/2010
GROUND ELEV. 259.4
(W) or C N-
LL PL D10 (PSF) VALUE
(17.2) 8 Lean Clay (CL) Brown, medium, Oxidized, Fine
(18.3) 9 Clayey Sand (SC) Gray & Brown
(24.5) 6 Clayey Sand (SC) Gray
0.147 9 Poorly-graded Sand (SP) Gray, Fine
13
13
23
18
26
20
34
25 Poorly-graded Sand (SP) Gray, Medium
BOR. 046-BPR-10
N 13163364.12
E 2476625.82
DATE: 9/29/2010
GROUND ELEV. 259.3
(W) or C N-
LL PL D10 (PSF) VALUE
(31.1) 4 Lean Clay (CL) Gray & Brown, soft
61 23 (29.2) 7 Fat Clay (CH) Brown & Gray, medium
(33.0) 6 Lean Clay (CL) Brown & Gray, medium
21 17 (20.6) 12 Silty Clay (CL-ML) Gray, stiff
21 Poorly-graded Sand with Clay (SP-SC) Gray, Fine, Lignite Fragments
0.156 20 Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments
32 Poorly-graded Sand (SP) Gray, Fine
16 Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments
22 Poorly-graded Sand (SP) Gray, Fine, Clay Strata or Lenses, Lignite Fragments
18
24 Poorly-graded Sand (SP) Gray, Fine
23
BOR. 047-BPR-10
N 13163089.04
E 2476235.31
DATE: 9/30/2010
GROUND ELEV. 259.3
(W) or C N-
LL PL D10 (PSF) VALUE
8 Lean Clay (CL) Brown, medium, Fine
Lean Clay (CL) Gray & Brown, & Mottled, medium, Oxidized
(32.1) 8
72 23 (46.2) 8 Fat Clay (CH) Gray, medium, Oxidized, Rootlets
6 Poorly-graded Sand (SP) Gray, Fine
22
20 Silty Sand (SM) Gray, Fine
26 Poorly-graded Sand (SP) Gray, Medium
26
49 Poorly-graded Sand (SP) Gray, Fine
45 Poorly-graded Sand (SP) Gray, Medium
33 Poorly-graded Sand (SP) Gray, Fine
57 Poorly-graded Sand (SP) Gray, Medium
BOR. 048-BPR-10
N 13162775.19
E 2475809.45
DATE: 9/30/2010
GROUND ELEV. 259.2
(W) or C N-
LL PL D10 (PSF) VALUE
(20.7) 3 Silt (ML) Brown, soft, Fine
(24.6) 14 Fat Clay (CH) Brown & Gray, & Mottled, stiff, Oxidized, Fine
31 13 (22.5) 8 Lean Clay (CL) Brown & Gray, medium, Fine
(26.0) 6 Clayey Sand (SC) Gray & Green
10 Silty Sand (SM) Gray, Fine
6
20 Poorly-graded Sand (SP) Gray, Fine
21
21
20 Poorly-graded Sand (SP) Gray, Medium
24
26 Poorly-graded Sand (SP) Gray, Fine
BOR. 049-BPR-10
N 13162502.7
E 2475429.6
DATE: 9/30/2010
GROUND ELEV. 259.7
(W) or C N-
LL PL D10 (PSF) VALUE
(17.4) 8 Fat Clay (CH) Brown & Gray, medium, Oxidized
29 11 (17.7) 9 Lean Clay (CL) Brown & Gray, stiff, Oxidized, Fine
7 Clayey Sand (SC) Brown & Gray, Oxidized, Fine
10 Poorly-graded Sand with Silt (SP-SM) Gray, Fine
0.179 14 Poorly-graded Sand (SP) Gray, Fine
14 Poorly-graded Sand with Silt (SP-SM) Gray, Fine
77 Poorly-graded Sand (SP) Gray, Fine
24
21 Poorly-graded Sand (SP) Gray, Fine, LIgnite Fragments
22
31 Poorly-graded Sand (SP) Gray, Fine
34
BOR. 050-BPR-10
N 13162194
E 2474998.81
DATE: 9/30/2010
GROUND ELEV. 259.7
(W) or C N-
LL PL D10 (PSF) VALUE
(16.2) 9 Lean Clay (CL) Gray & Brown, stiff, Fine
17 13 (17.7) 6 Silty Clay (CL-ML) Brown, medium, Fine
14 Silty Sand (SM) Brown, Oxidized, Fine
10 Poorly-graded Sand with Silt (SP-SM) Brown, Oxidized, Fine
0.130 6 Poorly-graded Sand (SP) Gray, Fine
14
4
25
23
34 Poorly-graded Sand (SP) Gray, Medium
47
54 Poorly-graded Sand (SP) Gray, Fine
BOR. 051-BPR-10
N 13161892.99
E 2474619.89
DATE: 10/1/2010
GROUND ELEV. 259.1
(W) or C N-
LL PL D10 (PSF) VALUE
(17.9) 8 Lean Clay (CL) Brown & Gray, medium, Fine
26 12 (22.0) 5 Lean Clay (CL) Brown & Gray, medium
(23.1) 5 Clayey Sand (SC) Brown & Gray
7 Poorly-graded Sand (SP) Gray
0.140 9 Poorly-graded Sand (SP) Brown & Gray, Fine
11
16 Poorly-graded Sand (SP) Gray, Fine
20
19 Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments
24 Poorly-graded Sand (SP) Gray, Fine
60
74
BOR. 052-BPR-10
N 13161554.9
E 2474223.76
DATE: 10/1/2010
GROUND ELEV. 259.0
(W) or C N-
LL PL D10 (PSF) VALUE
(16.2) 12 Fat Clay (CH) Brown & Gray, stiff, Oxidized, Lignite Fragments
30 13 (18.7) 7 Lean Clay (CL) Brown & Gray, medium
6 Clayey Sand (SC) Gray, Oxidized, Fine
13 Poorly-graded Sand with Clay (SP-SC) Gray, Fine
0.135 20 Poorly-graded Sand (SP) Gray, Fine
19
23
35
39
31
75
50
BOR. 053-BPR-10
N 13161246.85
E 2473900.68
DATE: 10/1/2010
GROUND ELEV. 258.5
(W) or C N-
LL PL D10 (PSF) VALUE
12 Lean Clay (CL) Brown & Gray, & Mottled, stiff, Oxidized
21 13 (11.1) 12
9 Clayey Sand (SC) Brown & Gray, Oxidized, Fine
13 Clayey Sand (SC) Brown, Fine
12 Poorly-graded Sand with Clay (SP-SC) Gray, Fine
0.177 5 Poorly-graded Sand (SP) Gray, Fine
14
37
31 Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments
23
19 Poorly-graded Sand (SP) Gray, Fine
31
24
BOR. 054-BPR-10
N 13160910.83
E 2473482.77
DATE: 10/1/2010
GROUND ELEV. 258.4
(W) or C N-
D10 (PSF) VALUE
(16.3) 8 Lean Clay (CL) Red & Brown, medium
5 Silty Sand (SM) Gray, Fine
9 Silty Sand (SM) Red & Gray, Fine
8 Poorly-graded Sand with Silt (SP-SM) Gray, Fine
0.153 17 Poorly-graded Sand (SP) Gray, Fine
16
20
25 Poorly-graded Sand (SP) Brown, Fine
34
27
27 Poorly-graded Sand (SP) Gray, Fine
30 Poorly-graded Sand (SP) Gray, Medium
BOR. 055-BPR-10
N 13160575.91
E 2473107.02
DATE: 10/1/2010
GROUND ELEV. 257.8
(W) or C N-
LL PL D10 (PSF) VALUE
(16.7) 10 Silt (ML) Brown, stiff, Oxidized
19 13 (16.7) 7 Silty Clay (CL-ML) Brown & Gray, stiff
14 Poorly-graded Sand with Silt (SP-SM) Gray, Fine
0.182 18 Poorly-graded Sand (SP) Brown, Fine
20
23
28 Poorly-graded Sand (SP) Brown & Gray, Fine
36 Poorly-graded Sand (SP) Brown, Fine
26 Poorly-graded Sand (SP) Gray, Fine
36
35
28
270
260
250
240
230
220
1
2
3
4
5
A
B
C
D
ML
CL-ML
SP
SM
SC
SP-SM
CLS
CH
CL
SP-SC
MLS
clayey sand
US Army Corps of Engineers
APPR.
DATE
DESCRIPTION
MARK
APPR.
DATE
DESCRIPTION
MARK
DESIGNED BY:
DWN BY:
CKD BY:
SUBMITTED BY:
DATE: 06/22/2017
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:
PLOT DATE: 6/22/2017
PLOT SCALE: 1:1 = 10'
SIZE: ANSI D
FILE NAME: BP-RFences.dgn
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE
Below Pigpot Seepage Study
St. Francis Drainage District of Clay and Greene Counties
River Side Fences
Levee Mile 22
Sheet ID
BP-017
auto_time

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE	APPR.
MARK	DESCRIPTION	DATE	APPR.

DESIGNED BY:
DWN BY:
CKD BY:
SUBMITTED BY:
DATE: 06/22/2017
PLOT SCALE: 1=1'-0"
PLOT DATE: 6/27/2017
SIZE: ANSI D
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:
FILE NAME: BP-Fences.dgn

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

Below Pitgoit Seepage Study
St. Francis Drainage District of Clay and Greene Counties

River Side Fences
Levee Mile 23

Sheet ID
BP-018

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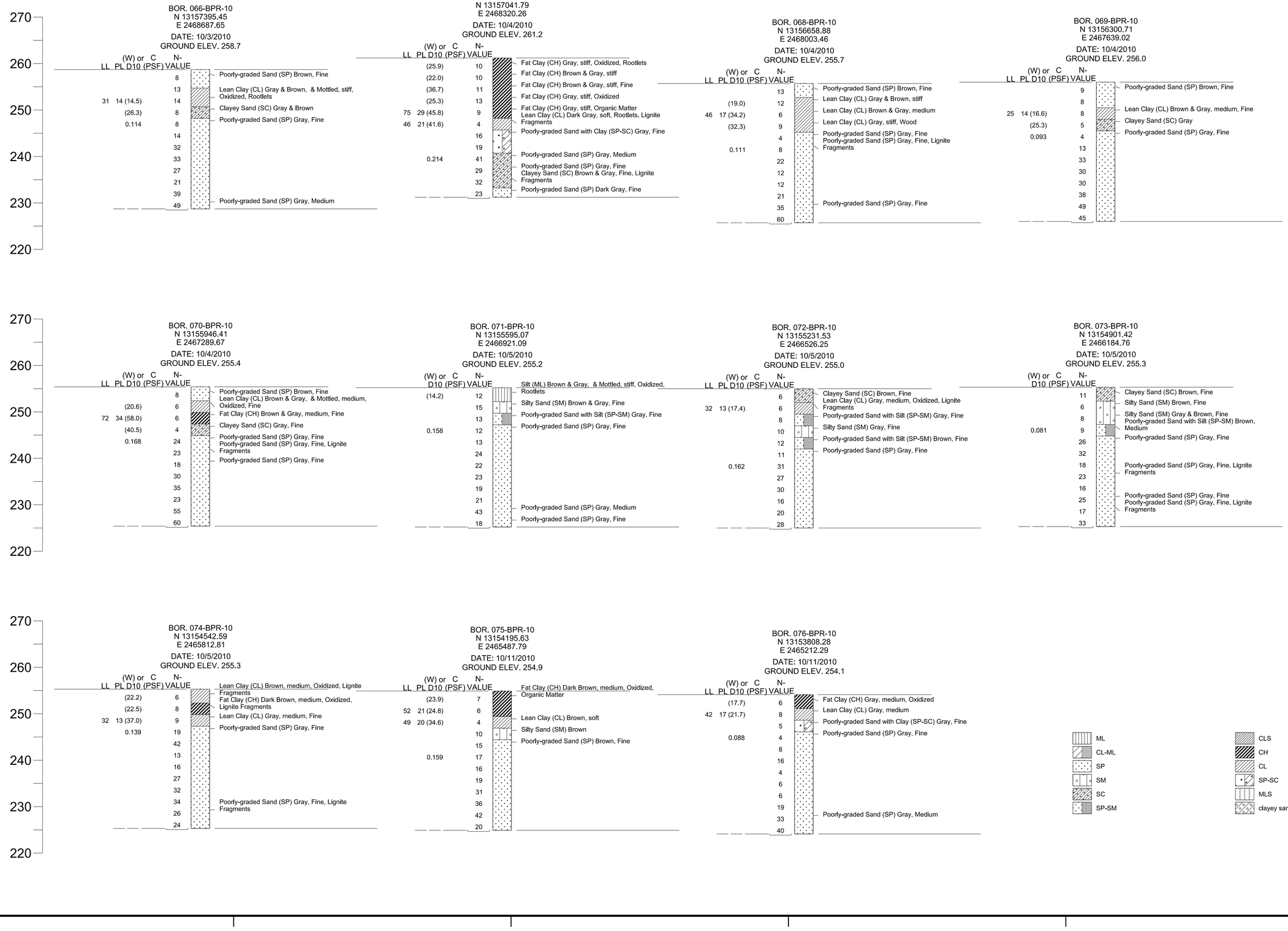
BOR. 066-BPR-10
N 13157395.45
E 2468687.65
DATE: 10/3/2010
GROUND ELEV. 258.7
(W) or C N-
LL PL D10 (PSF) VALUE
8 Poorly-graded Sand (SP) Brown, Fine
13 Lean Clay (CL) Gray & Brown, & Mottled, stiff, Oxidized, Rootlets
31 14 (14.5) 14
(26.3) 8 Clayey Sand (SC) Gray & Brown
0.114 8 Poorly-graded Sand (SP) Gray, Fine
14
32
33
27
21
39
49 Poorly-graded Sand (SP) Gray, Medium
BOR. 067-BPR-10
N 13157041.79
E 2468320.26
DATE: 10/4/2010
GROUND ELEV. 261.2
(W) or C N-
LL PL D10 (PSF) VALUE
(25.9) 10 Fat Clay (CH) Gray, stiff, Oxidized, Rootlets
(22.0) 10 Fat Clay (CH) Brown & Gray, stiff
(36.7) 11 Fat Clay (CH) Brown & Gray, stiff, Fine
(25.3) 13 Fat Clay (CH) Gray, stiff, Oxidized
75 29 (45.8) 9 Fat Clay (CH) Gray, stiff, Organic Matter
46 21 (41.6) 4 Lean Clay (CL) Dark Gray, soft, Rootlets, Lignite Fragments
16 Poorly-graded Sand with Clay (SP-SC) Gray, Fine
19
0.214 41 Poorly-graded Sand (SP) Gray, Medium
29 Poorly-graded Sand (SP) Gray, Fine
32 Clayey Sand (SC) Brown & Gray, Fine, Lignite Fragments
23 Poorly-graded Sand (SP) Dark Gray, Fine
BOR. 068-BPR-10
N 13156658.88
E 2468003.46
DATE: 10/4/2010
GROUND ELEV. 255.7
(W) or C N-
LL PL D10 (PSF) VALUE
13 Poorly-graded Sand (SP) Brown, Fine
(19.0) 12 Lean Clay (CL) Gray & Brown, stiff
46 17 (34.2) 6 Lean Clay (CL) Brown & Gray, medium
(32.3) 9 Lean Clay (CL) Gray, stiff, Wood
4 Poorly-graded Sand (SP) Gray, Fine
0.111 8 Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments
22
12
12
21
35 Poorly-graded Sand (SP) Gray, Fine
60
BOR. 069-BPR-10
N 13156300.71
E 2467639.02
DATE: 10/4/2010
GROUND ELEV. 256.0
(W) or C N-
LL PL D10 (PSF) VALUE
9 Poorly-graded Sand (SP) Brown, Fine
8
25 14 (16.6) 8 Lean Clay (CL) Brown & Gray, medium, Fine
(25.3) 5 Clayey Sand (SC) Gray
0.093 4 Poorly-graded Sand (SP) Gray, Fine
13
33
30
30
38
49
45
BOR. 070-BPR-10
N 13155946.41
E 2467289.67
DATE: 10/4/2010
GROUND ELEV. 255.4
(W) or C N-
LL PL D10 (PSF) VALUE
8 Poorly-graded Sand (SP) Brown, Fine
6 Lean Clay (CL) Brown & Gray, & Mottled, medium, Oxidized, Fine
(20.6)
72 34 (58.0) 6 Fat Clay (CH) Brown & Gray, medium, Fine
(40.5) 4 Clayey Sand (SC) Gray, Fine
0.168 24 Poorly-graded Sand (SP) Gray, Fine
23 Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments
18 Poorly-graded Sand (SP) Gray, Fine
30
35
23
55
60
BOR. 071-BPR-10
N 13155595.07
E 2466921.09
DATE: 10/5/2010
GROUND ELEV. 255.2
(W) or C N-
D10 (PSF) VALUE
(14.2) 12 Silt (ML) Brown & Gray, & Mottled, stiff, Oxidized, Rootlets
15 Silty Sand (SM) Brown & Gray, Fine
13 Poorly-graded Sand with Silt (SP-SM) Gray, Fine
0.158 12 Poorly-graded Sand (SP) Gray, Fine
13
24
22
23
19
21 Poorly-graded Sand (SP) Gray, Medium
43 Poorly-graded Sand (SP) Gray, Fine
18
BOR. 072-BPR-10
N 13155231.53
E 2466526.25
DATE: 10/5/2010
GROUND ELEV. 255.0
(W) or C N-
LL PL D10 (PSF) VALUE
6 Clayey Sand (SC) Brown, Fine
6 Lean Clay (CL) Gray, medium, Oxidized, Lignite Fragments
32 13 (17.4) 8 Poorly-graded Sand with Silt (SP-SM) Gray, Fine
10 Silty Sand (SM) Gray, Fine
12 Poorly-graded Sand with Silt (SP-SM) Brown, Fine
11 Poorly-graded Sand (SP) Gray, Fine
0.162 31
27
30
16
20
28
BOR. 073-BPR-10
N 13154901.42
E 2466184.76
DATE: 10/5/2010
GROUND ELEV. 255.3
(W) or C N-
D10 (PSF) VALUE
11 Clayey Sand (SC) Brown, Fine
6 Silty Sand (SM) Brown, Fine
8 Silty Sand (SM) Gray & Brown, Fine
Poorly-graded Sand with Silt (SP-SM) Brown, Medium
0.081 9
26 Poorly-graded Sand (SP) Gray, Fine
32
18 Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments
23
16
25 Poorly-graded Sand (SP) Gray, Fine
Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments
17
33
BOR. 074-BPR-10
N 13154542.59
E 2465812.81
DATE: 10/5/2010
GROUND ELEV. 255.3
(W) or C N-
LL PL D10 (PSF) VALUE
(22.2) 6 Lean Clay (CL) Brown, medium, Oxidized, Lignite Fragments
(22.5) 8 Fat Clay (CH) Dark Brown, medium, Oxidized, Lignite Fragments
32 13 (37.0) 9 Lean Clay (CL) Gray, medium, Fine
0.139 19 Poorly-graded Sand (SP) Gray, Fine
42
13
16
27
32
34 Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments
26
24
BOR. 075-BPR-10
N 13154195.63
E 2465487.79
DATE: 10/11/2010
GROUND ELEV. 254.9
(W) or C N-
LL PL D10 (PSF) VALUE
(23.9) 7 Fat Clay (CH) Dark Brown, medium, Oxidized, Organic Matter
52 21 (24.8) 6
49 20 (34.6) 4 Lean Clay (CL) Brown, soft
10 Silty Sand (SM) Brown
15 Poorly-graded Sand (SP) Brown, Fine
0.159 17
16
19
31
36
42
20
BOR. 076-BPR-10
N 13153808.28
E 2465212.29
DATE: 10/11/2010
GROUND ELEV. 254.1
(W) or C N-
LL PL D10 (PSF) VALUE
(17.7) 6 Fat Clay (CH) Gray, medium, Oxidized
42 17 (21.7) 8 Lean Clay (CL) Gray, medium
5 Poorly-graded Sand with Clay (SP-SC) Gray, Fine
0.088 4 Poorly-graded Sand (SP) Gray, Fine
8
16
4
6
6
19
33 Poorly-graded Sand (SP) Gray, Medium
40
ML
CL-ML
SP
SM
SC
SP-SM
CLS
CH
CL
SP-SC
MLS
clayey sand
270
260
250
240
230
220
D
C
B
A
1
2
3
4
5
US Army Corps of Engineers
DESIGNED BY:
DWN BY:
CKD BY:
SUBMITTED BY:
DATE: 08/22/2017
PLOT SCALE: AS SHOWN
PLOT DATE: 08/22/2017
SIZE: ANSI D
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:
FILE NAME: BP-Fences.dgn
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE
Below Pitgoit Seepage Study
St. Francis Drainage District of Clay and Greene Counties
River Side Fences
Levee Mile 24
Sheet ID
BP-019
outo_time

BOR. 076-BPR-10
N 13153808.28
E 2465212.29

DATE: 10/11/2010
GROUND ELEV. 254.1

LL	PL	(W) or D10 (PSF)	C VALUE	N- VALUE	
		(17.7)		6	Fat Clay (CH) Gray, medium, Oxidized
42	17	(21.7)		8	Lean Clay (CL) Gray, medium
				5	Poorly-graded Sand with Clay (SP-SC) Gray, Fine
		0.088		4	Poorly-graded Sand (SP) Gray, Fine
				8	
				16	
				4	
				6	
				6	
				19	
				33	Poorly-graded Sand (SP) Gray, Medium
				40	

BOR. 077-BPR-10
N 13153377.77
E 2464910.55

DATE: 10/12/2010
GROUND ELEV. 254.3

LL	PL	(W) or D10 (PSF)	C VALUE	N- VALUE	
		(25.9)		11	Fat Clay (CH) Gray & Brown, stiff, Oxidized, Organic Matter
45	15	(24.7)		7	Lean Clay (CL) Gray & Brown, medium
		0.162		6	Poorly-graded Sand (SP) Gray, Fine
				14	
				17	
				2	
				18	
				22	Poorly-graded Sand (SP) Gray, Medium
				23	Poorly-graded Sand (SP) Brown, Medium
				31	Poorly-graded Sand (SP) Gray, Medium
				32	
				42	

BOR. 078-BPR-10
N 13152976.58
E 2464642.96

DATE: 10/12/2010
GROUND ELEV. 252.7

(W) or D10 (PSF)	C VALUE	N- VALUE	
(18.3)		10	Silty Clay (CL-ML) Gray, stiff, Oxidized, Organic Matter
(24.8)		4	Clayey Sand (SC) Red & Brown
0.138		4	Poorly-graded Sand (SP) Gray, Fine
		15	
		16	
		17	
		27	
		14	
		27	
		21	
		22	
		24	

BOR. 079-BPR-10
N 13152537.5
E 2464339.56

DATE: 10/12/2010
GROUND ELEV. 252.4

(W) or D10 (PSF)	C VALUE	N- VALUE	
(14.8)		10	Silt (ML) Gray, stiff, Oxidized, Fine
(14.5)		10	Silty Sand (SM) Gray & Brown, Fine
0.159		8	Poorly-graded Sand (SP) Gray, Fine, Organic Matter
		10	Poorly-graded Sand (SP) Gray, Fine
		16	
		15	
		23	
		24	
		27	
		25	
		29	
		37	

BOR. 080-BPR-10
N 13152212.56
E 2463939.74

DATE: 10/12/2010
GROUND ELEV. 252.6

(W) or D10 (PSF)	C VALUE	N- VALUE	
(23.1)		6	Fat Clay (CH) Dark Brown, medium, Oxidized, Organic Matter
(30.6)		3	Clayey Sand (SC) Gray
0.158		6	Poorly-graded Sand (SP) Gray, Fine
		21	
		25	
		26	
		23	
		20	
		30	
		19	
		24	
		27	

BOR. 081-BPR-10
N 13152023.52
E 2463458.35

DATE: 10/12/2010
GROUND ELEV. 253.3

LL	PL	(W) or D10 (PSF)	C VALUE	N- VALUE	
		(22.2)		7	Lean Clay (CL) Gray, medium, Oxidized, Rootlets
39	17	(23.3)		9	Lean Clay (CL) Gray, stiff, Oxidized, Rootlets, Organic Matter
				20	Clayey Sand (SC) Gray
		0.152		19	Poorly-graded Sand (SP) Gray, Fine
				16	
				19	
				25	
				25	
				26	
				31	
				33	
				26	

BOR. 082-BPR-10
N 13151863.11
E 2463010.26

DATE: 10/13/2010
GROUND ELEV. 253.2

LL	PL	(W) or D10 (PSF)	C VALUE	N- VALUE	
		(23.1)		11	Fat Clay (CH) Gray, stiff, Oxidized
71	23	(27.9)		10	Fat Clay (CH) Gray, stiff, Oxidized, Organic Matter
				14	Poorly-graded Sand (SP) Brown, Fine
		0.174		15	
				18	
				16	
				10	
				18	
				31	
				46	
				18	Poorly-graded Sand (SP) Gray, Fine, Organic Matter
				22	

BOR. 083-BPR-10
N 13151683.86
E 2462566.53

DATE: 10/13/2010
GROUND ELEV. 252.0

LL	PL	(W) or D10 (PSF)	C VALUE	N- VALUE	
51	21	(23.8)		8	Fat Clay (CH) Dark Brown, medium, Oxidized, Organic Matter
				5	Clayey Sand (SC) Gray
				11	Silty Sand (SM) Gray, Fine
				11	Poorly-graded Sand with Silt (SP-SM) Gray, Fine
		0.083		13	
				17	Poorly-graded Sand (SP) Gray, Fine
				20	
				19	
				25	
				19	
				24	
				22	

BOR. 084-BPR-10
N 13151509.98
E 2462088.03

DATE: 10/13/2010
GROUND ELEV. 251.6

(W) or D10 (PSF)	C VALUE	N- VALUE	
(51.8)		5	Fat Clay (CH) Brown, medium, Oxidized, Organic Matter
		6	Clayey Sand (SC) Gray, Fine, Organic Matter, Clay Strata or Lenses
0.101		4	Poorly-graded Sand with Clay (SP-SC) Gray, Fine
		5	Clayey Sand (SC) Gray
0.154		22	Poorly-graded Sand (SP) Gray, Fine
		28	
		23	
		19	
		40	
		70	
		46	
		24	

BOR. 085-BPR-10
N 13151309.87
E 2461594.68

DATE: 10/13/2010
GROUND ELEV. 253.2

LL	PL	(W) or D10 (PSF)	C VALUE	N- VALUE	
				18	Silty Sand (SM) Brown & Gray, Oxidized
29	16	(14.6)		16	Lean Clay (CL) Gray, very stiff
				6	Silty Sand (SM) Brown
				5	Silty Sand (SM) Gray
		0.230		20	Poorly-graded Sand (SP) Gray, Medium
				24	
				32	Poorly-graded Sand (SP) Gray, Fine
				27	
				25	
				45	Poorly-graded Sand (SP) Gray, Medium
				43	
				47	Poorly-graded Sand (SP) Gray, Fine

BOR. 086-BPR-10
N 13151150.23
E 2461175.5

DATE: 10/13/2010
GROUND ELEV. 252.9

(W) or D10 (PSF)	C VALUE	N- VALUE	
		9	Silty Sand (SM) Gray, Oxidized
		8	
		7	Poorly-graded Sand (SP) Brown, Fine
		10	
		7	
0.160		10	Poorly-graded Sand (SP) Gray, Fine
		15	Poorly-graded Sand (SP) Gray, Medium
		23	
		44	
		40	
		40	
		20	

BOR. 087-BPR-10
N 13150975.96
E 2460712.16

DATE: 10/14/2010
GROUND ELEV. 252.4

(W) or D10 (PSF)	C VALUE	N- VALUE	
		10	Silty Sand (SM) Brown & Gray, Oxidized, Fine
		11	Silty Sand (SM) Gray, Oxidized, Fine
		8	Poorly-graded Sand with Silt (SP-SM) Brown, Fine
		23	
		26	Poorly-graded Sand (SP) Brown, Fine
0.167		32	Poorly-graded Sand (SP) Dark Gray, Fine
		15	
		24	
		25	Poorly-graded Sand (SP) Gray, Fine
		22	Poorly-graded Sand (SP) Gray, Medium
		23	
		64	

ML
CL-ML
SP
SM
SC
SP-SM
CLS
CH
CL
SP-SC
MLS
clayey sand

US Army Corps of Engineers®

MARK	APPR.	DATE	DESCRIPTION

DESIGNED BY:
DWN BY:
CKD BY:
SUBMITTED BY:
DATE: 09/23/2017
SOLICITATION NO.:
CONTRACT NO.:
PLOT SCALE: AS SHOWN
PLOT DATE: 09/27/2017
FILE NAME: BP-Fences.dgn
FILE NUMBER:
SIZE: ANSI D

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

Below Pigpot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

River Side Fences
Levee Mile 25

Sheet ID
BP-020

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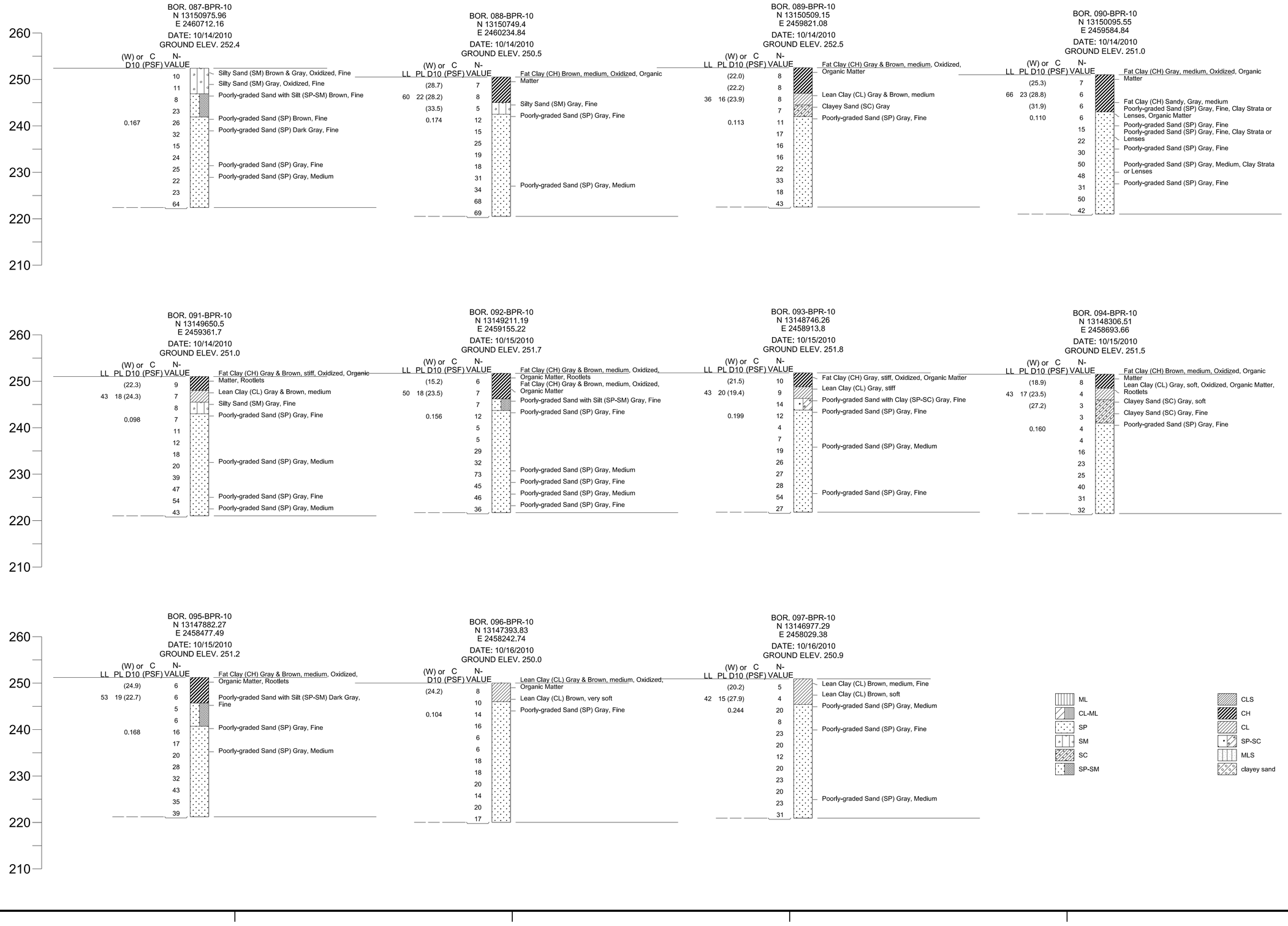

US Army Corps of Engineers®

MARK	DATE	APPR.	DESCRIPTION

MARK	DATE	APPR.	DESCRIPTION

DESIGNED BY:
DWN BY:
CKD BY:
SUBMITTED BY:
PLOT SCALE: 1:10
PLOT DATE: AUTO FIT
SIZE: ANSI D
DATE: 06/23/2017
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:
FILE NAME: BP-Fences.dgn

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

River Side Fences
Levee Mile 26

Sheet ID
BP-021

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260 / 250 / 240 / 230 / 220 / 210

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BOR. 097-BPR-10
N 13146977.29
E 2458029.38
DATE: 10/16/2010
GROUND ELEV. 250.9

(W) or LL	C PL	D10 (PSF)	N-VALUE	
		(20.2)	5	Lean Clay (CL) Brown, medium, Fine
42	15	(27.9)	4	Lean Clay (CL) Brown, soft
		0.244	20	Poorly-graded Sand (SP) Gray, Medium
			8	
			23	Poorly-graded Sand (SP) Gray, Fine
			20	
			12	
			20	
			23	
			20	Poorly-graded Sand (SP) Gray, Medium
			23	
			31	

BOR. 098-BPR-10
N 13146495.09
E 2457783.73
DATE: 10/16/2010
GROUND ELEV. 250.5

(W) or LL	C PL	D10 (PSF)	N-VALUE	
		(24.6)	8	Lean Clay (CL) Gray & Brown, medium, Organic Matter
26	2	(23.0)	6	Lean Clay (CL) Gray, medium, Oxidized
			7	Silty Sand (SM) Gray
			3	Poorly-graded Sand with Silt (SP-SM) Gray, Fine
		0.221	18	Poorly-graded Sand (SP) Gray, Fine
			20	
			26	
			31	Poorly-graded Sand (SP) Gray, Medium
			48	
			38	
			46	Poorly-graded Sand (SP) Gray, Fine
			40	

BOR. 099-BPR-10
N 13146074.35
E 2457577.41
DATE: 10/16/2010
GROUND ELEV. 250.7

(W) or LL	C PL	D10 (PSF)	N-VALUE	
		(23.0)	8	Fat Clay (CH) Gray, medium, Oxidized, Organic Matter
42	15	(22.9)	7	Lean Clay (CL) Gray, medium, Oxidized, Organic Matter
			2	Clayey Sand (SC) Gray, very soft, Oxidized
		0.101	4	Poorly-graded Sand with Silt (SP-SM) Gray, Fine
			15	Poorly-graded Sand (SP) Gray, Fine
			18	
			16	
			14	
			26	
			27	Poorly-graded Sand (SP) Gray, Medium
			60	
			35	

BOR. 100-BPR-10
N 13145647.26
E 2457361.5
DATE: 10/16/2010
GROUND ELEV. 250.3

(W) or LL	C PL	D10 (PSF)	N-VALUE	
		(21.8)	8	Fat Clay (CH) Gray, medium, Oxidized, Organic Matter
50	17	(25.4)	6	
		(52.6)	4	Fat Clay (CH) Gray, soft, Oxidized, Organic Matter
37	16	(24.3)	2	Lean Clay (CL) Gray, very soft
			13	Clayey Sand (SC) Gray, stiff
			8	Poorly-graded Sand with Clay (SP-SC) Gray, Fine
		0.203	20	Poorly-graded Sand (SP) Brown, Medium
			32	Poorly-graded Sand (SP) Brown, Fine
			28	
			41	
			48	Poorly-graded Gravel (GP)
			46	Poorly-graded Sand (SP) Brown, Fine

C

260 / 250 / 240 / 230 / 220 / 210

BOR. 101-BPR-10
N 13145163.54
E 2457124.71
DATE: 10/17/2010
GROUND ELEV. 250.9

(W) or LL	C PL	D10 (PSF)	N-VALUE	
		(20.3)	10	Lean Clay (CL) Gray, stiff, Oxidized
42	16	(16.8)	10	Lean Clay (CL) Brown, stiff
		0.181	10	Poorly-graded Sand (SP) Gray, Fine, Organic Matter
			14	Poorly-graded Sand (SP) Gray, Fine
			22	
			17	
			22	
			41	
			18	
			20	
			37	
			33	

BOR. 102-BPR-10
N 13144711.4
E 2456902.63
DATE: 10/17/2010
GROUND ELEV. 251.0

(W) or LL	C PL	D10 (PSF)	N-VALUE	
			16	Silty Sand (SM) Gray, Oxidized, Organic Matter
		(14.8)	10	Clayey Sand (SC) Brown, stiff, Fine
			9	Poorly-graded Sand with Silt (SP-SM) Red, Fine
		0.154	9	Poorly-graded Sand (SP) Red, Fine
			23	Poorly-graded Sand (SP) Gray, Fine
			23	
			15	
			19	
			22	Poorly-graded Sand (SP) Gray, Fine, Organic Matter
			15	
			22	
			27	

BOR. 103-BPR-10
N 13144280.61
E 2456690.72
DATE: 10/17/2010
GROUND ELEV. 251.0

(W) or LL	C PL	D10 (PSF)	N-VALUE	
			10	Silty Sand (SM) Brown, Fine
			10	
		(30.2)	4	
		(39.9)	3	Silt (ML) Sandy, Brown, soft
		0.095	24	Poorly-graded Sand (SP) Gray, Fine
			18	Poorly-graded Sand (SP) Gray, Fine, Clay Strata or Lenses
			24	Poorly-graded Sand (SP) Gray, Fine
			26	
			18	Poorly-graded Sand (SP) Gray, Medium
			17	
			59	
			31	

BOR. 104-BPR-10
N 13143800.13
E 2456488.1
DATE: 10/17/2010
GROUND ELEV. 250.1

(W) or LL	C PL	D10 (PSF)	N-VALUE	
			16	Silty Sand (SM) Light Brown, Fine
			15	Silty Sand (SM) Gray, Oxidized, Fine
			9	Silty Sand (SM) Gray, Fine
			8	Clayey Sand (SC) Gray
		(23.0)	33	Poorly-graded Sand (SP) Gray, Fine
		0.164	22	
			13	Poorly-graded Sand (SP) Gray, Fine, Organic Matter
			16	Poorly-graded Sand (SP) Gray, Fine
			19	
			38	Poorly-graded Sand (SP) Gray, Medium
			30	
			17	Poorly-graded Sand (SP) Gray, Fine

B

260 / 250 / 240 / 230 / 220 / 210

BOR. 105-BPR-10
N 13143353.3
E 2456313.08
DATE: 10/18/2010
GROUND ELEV. 249.8

(W) or LL	C PL	D10 (PSF)	N-VALUE	
		(10.0)	12	Silt (ML) Gray, Oxidized, Fine, Organic Matter
		(19.7)	10	
22	16	(29.8)	8	Silty Clay (CL-ML) Gray, medium
			3	Clayey Sand (SC) Gray, Fine
34	18	(35.1)	8	Lean Clay (CL) Gray, medium
			11	Silty Sand (SM) Gray, Fine
		0.151	24	Poorly-graded Sand (SP) Gray, Fine
			24	
			24	
			19	
			25	Poorly-graded Sand (SP) Gray, Medium
			51	

BOR. 106-BPR-10
N 13142899.92
E 2456102.2
DATE: 10/18/2010
GROUND ELEV. 249.8

(W) or LL	C PL	D10 (PSF)	N-VALUE	
		(17.2)	14	Fat Clay (CH) Gray, stIff, Oxidized, Organic Matter
50	17	(23.3)	9	
		0.109	8	Poorly-graded Sand (SP) Gray, Fine
			8	
			13	
			16	
			16	
			21	
			34	
			30	
			35	
			37	

BOR. 107-BPR-10
N 13142449.24
E 2455865.93
DATE: 10/18/2010
GROUND ELEV. 250.0

(W) or LL	C PL	D10 (PSF)	N-VALUE	
			11	Clayey Sand (SC) Brown
			12	Clayey Sand (SC) Gray
			15	Poorly-graded Sand (SP) Brown, Fine
		0.151	8	Poorly-graded Sand (SP) Gray, Fine, Organic Matter
			22	Poorly-graded Sand (SP) Gray, Fine
			17	
			29	
			21	Poorly-graded Sand (SP) Gray, Medium
			26	
			11	
			28	Poorly-graded Sand (SP) Gray, Fine
			23	

BOR. 108-BPR-10
N 13141991.14
E 2455652.36
DATE: 10/18/2010
GROUND ELEV. 249.4

(W) or LL	C PL	D10 (PSF)	N-VALUE	
			10	Clayey Sand (SC) Gray & Brown, stiff, Oxidized, Organic Matter
			6	Clayey Sand (SC) Gray & Brown, medium, Oxidized
			10	Poorly-graded Sand with Silt (SP-SM) Gray, Fine
			17	Poorly-graded Sand (SP) Gray, Fine
		0.155	18	Poorly-graded Sand (SP) Gray, Fine, Organic Matter
			16	
			7	
			18	
			31	Poorly-graded Sand (SP) Gray, Fine
			21	
			41	Poorly-graded Sand (SP) Gray, Medium
			54	

A

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APPR.	DATE	DESCRIPTION
APPR.	DATE	DESCRIPTION
MARK		

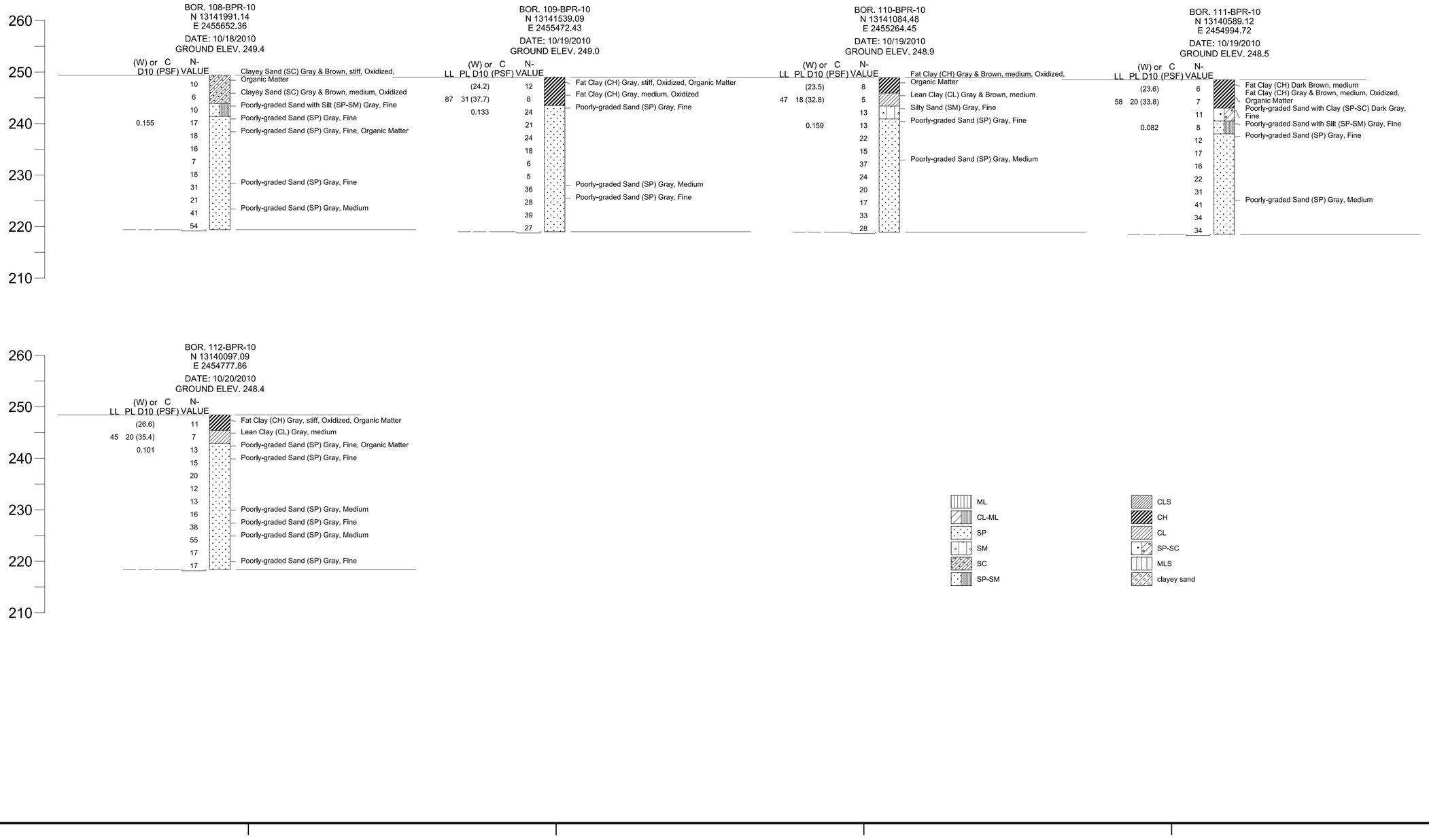
DESIGNED BY:
DWN BY:
CKD BY:
SUBMITTED BY:
DATE: 09/22/2017
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:
PLOT SCALE: 1'=10'
PLOT DATE: 9/27/2017
FILE NAME: BP-Reaches.dgn
SIZE: ANSI D

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

Below Pitgoit Seepage Study
St. Francis Drainage District of Clay and Greene Counties

River Side Fences
Levee Mile 27

Sheet ID
BP-022



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DESIGNED BY:
DWN BY:
CKD BY:
SUBMITTED BY:
DATE: 06/23/2017
SOLICITATION NO.:
CONTRACT NO.:
PLOT SCALE: 1=10
PLOT DATE: AS PLOTTED
FILE NUMBER:
SIZE: ANSI D
FILE NAME: BP-Fences.dgn

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

River Side Fences
Levee Mile 28

Sheet ID
BP-023

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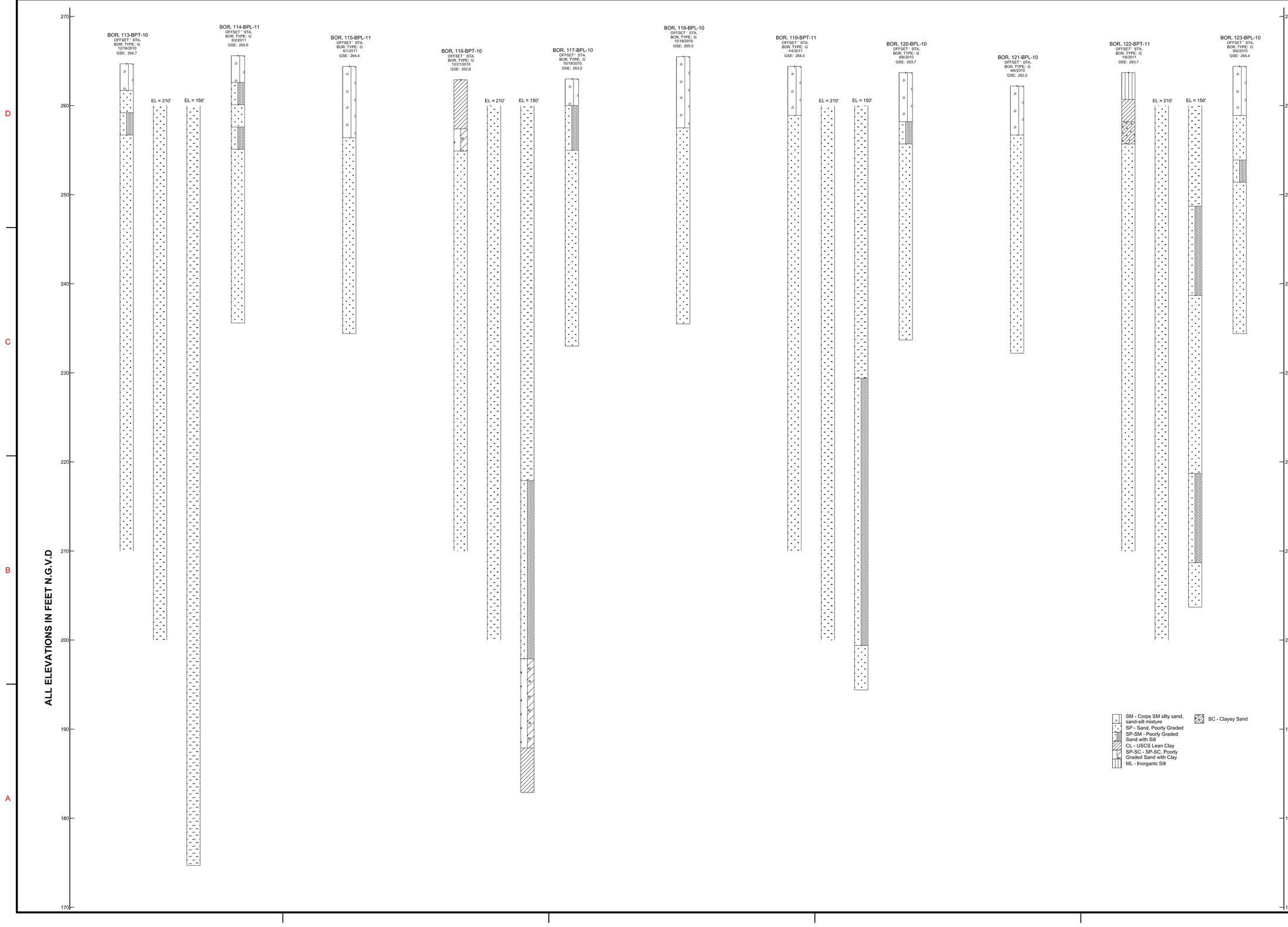

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PLOT SCALE: 1" = 10'
PLOT DATE: 06/23/2017
FILE NAME: BP_Landside18.dgn
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DATE: 06/23/2017
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

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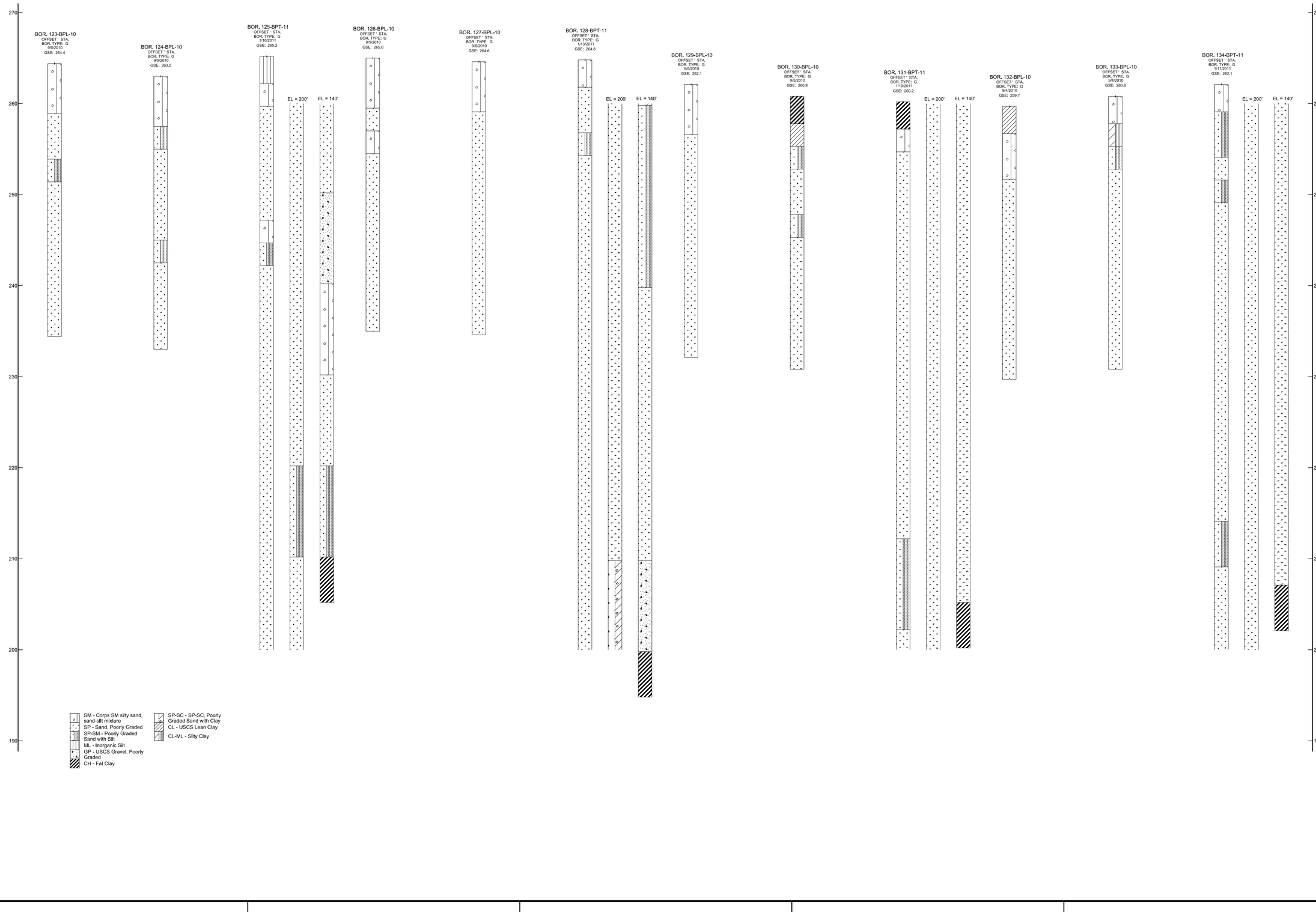
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

Land Side
Levee Mile 18

Sheet ID
BP-024

auto_time



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MARK	DESCRIPTION	DATE	APPR.

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CKD BY:
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PLOT SCALE: 1:1.0
PLOT DATE: 8/22/2017
SIZE: ANSI D
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SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:
FILE NAME: BP_Landside19.dgn

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MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

Land Side
Levee Mile 19

Sheet ID
BP-025

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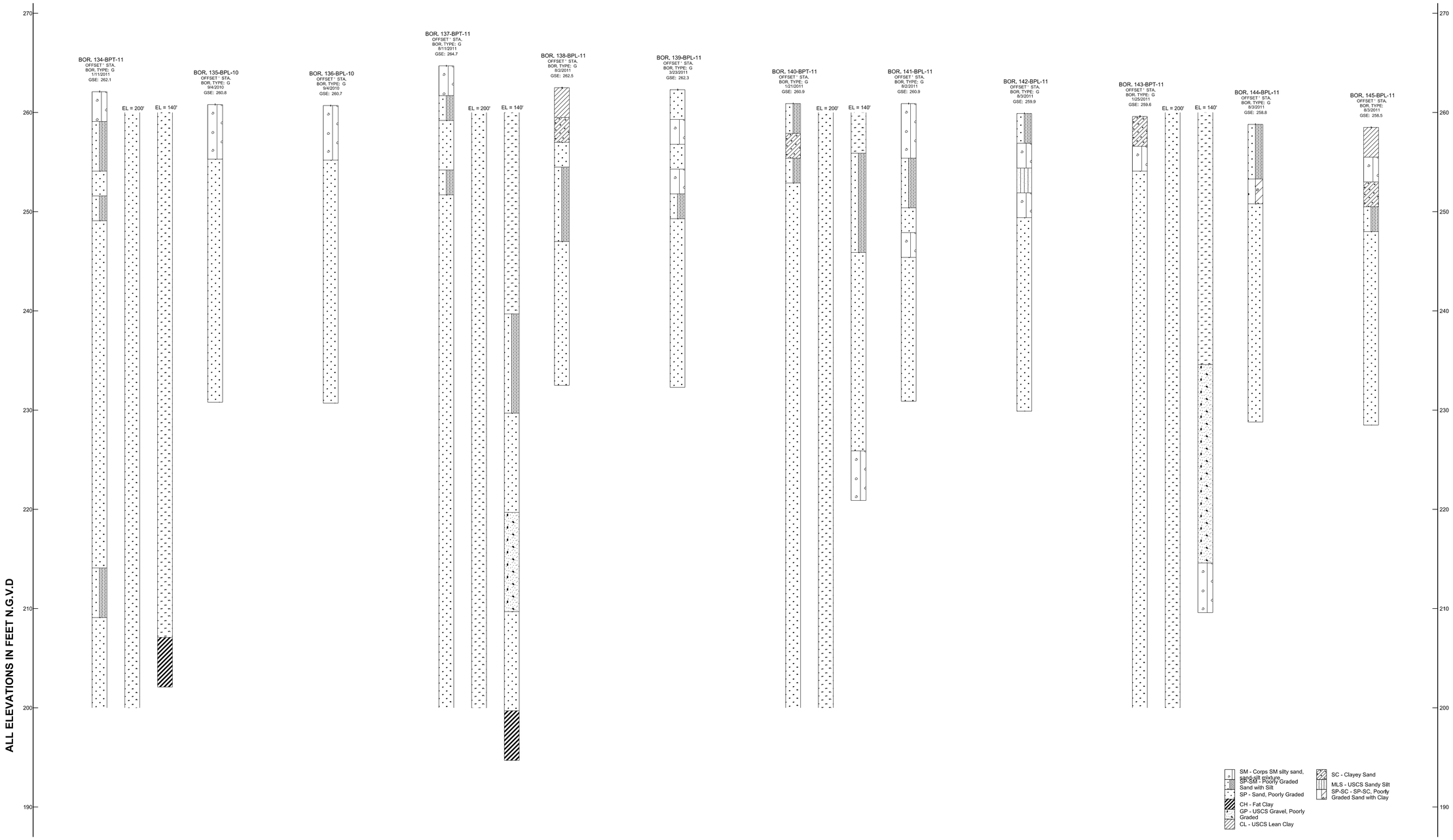

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U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

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SUBMITTED BY:
PLOT SCALE: 1" = 10'
PLOT DATE: 06/23/2017
SIZE: ANSI D
FILE NAME: BP_Landside20.dgn
DATE: 06/23/2017
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

Land Side
Levee Mile 20

Sheet ID
BP-026

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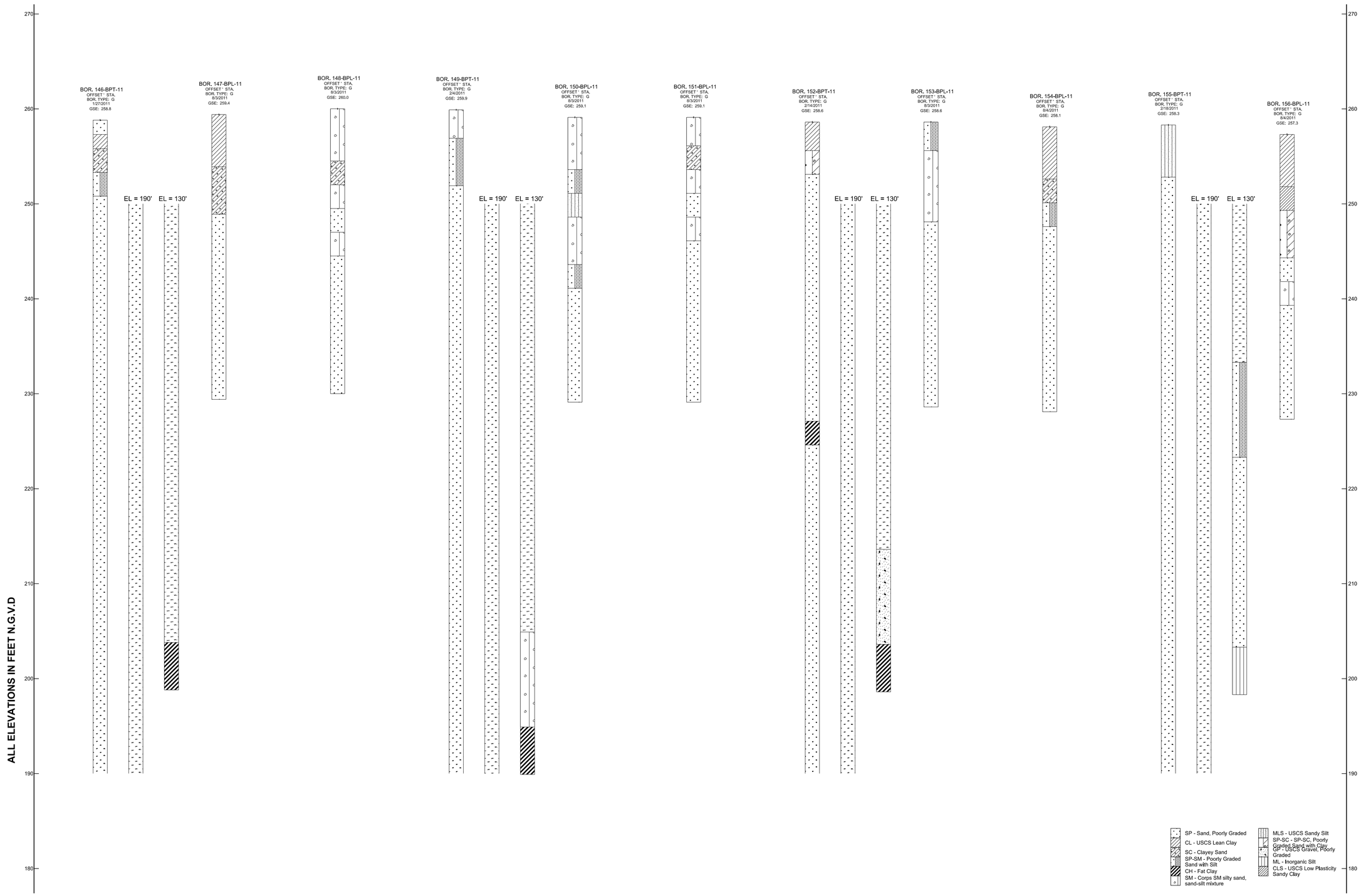

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MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

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SUBMITTED BY:
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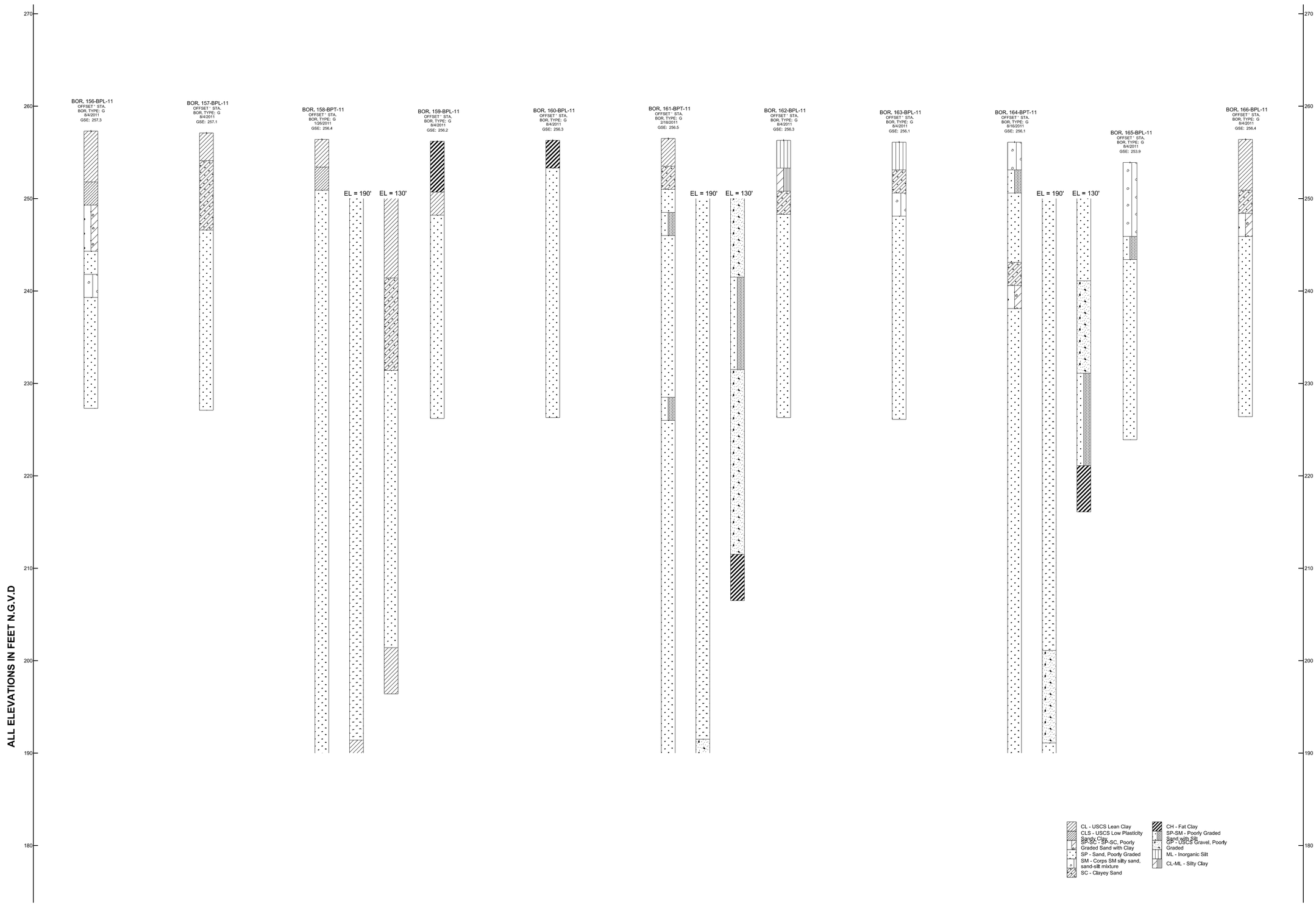
PLOT DATE: 06/23/2017
SIZE: ANSI D
FILE NAME: BP_Landside21.dgn
DATE: 06/23/2017
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

Land Side
Levee Mile 21

Sheet ID
BP-027

auto_time



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MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

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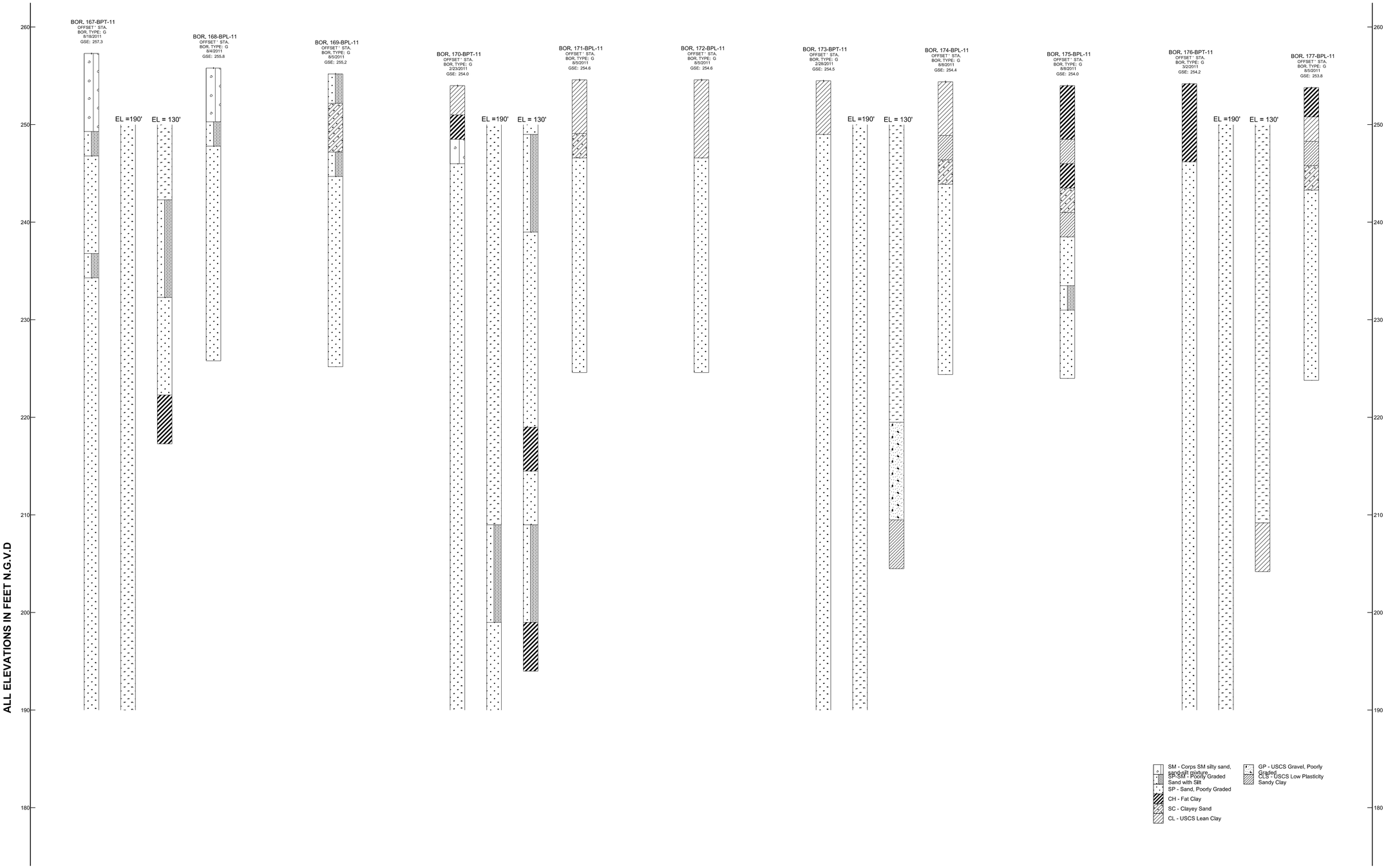
SUBMITTED BY:
PLOT SCALE: 1" = 10'
PLOT DATE: 06/23/2017
SIZE: ANSI D
FILE NAME: BP_Landside22.dgn
DATE: 06/23/2017
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

Land Side
Levee Mile 22

Sheet ID
BP-028

auto_time



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MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

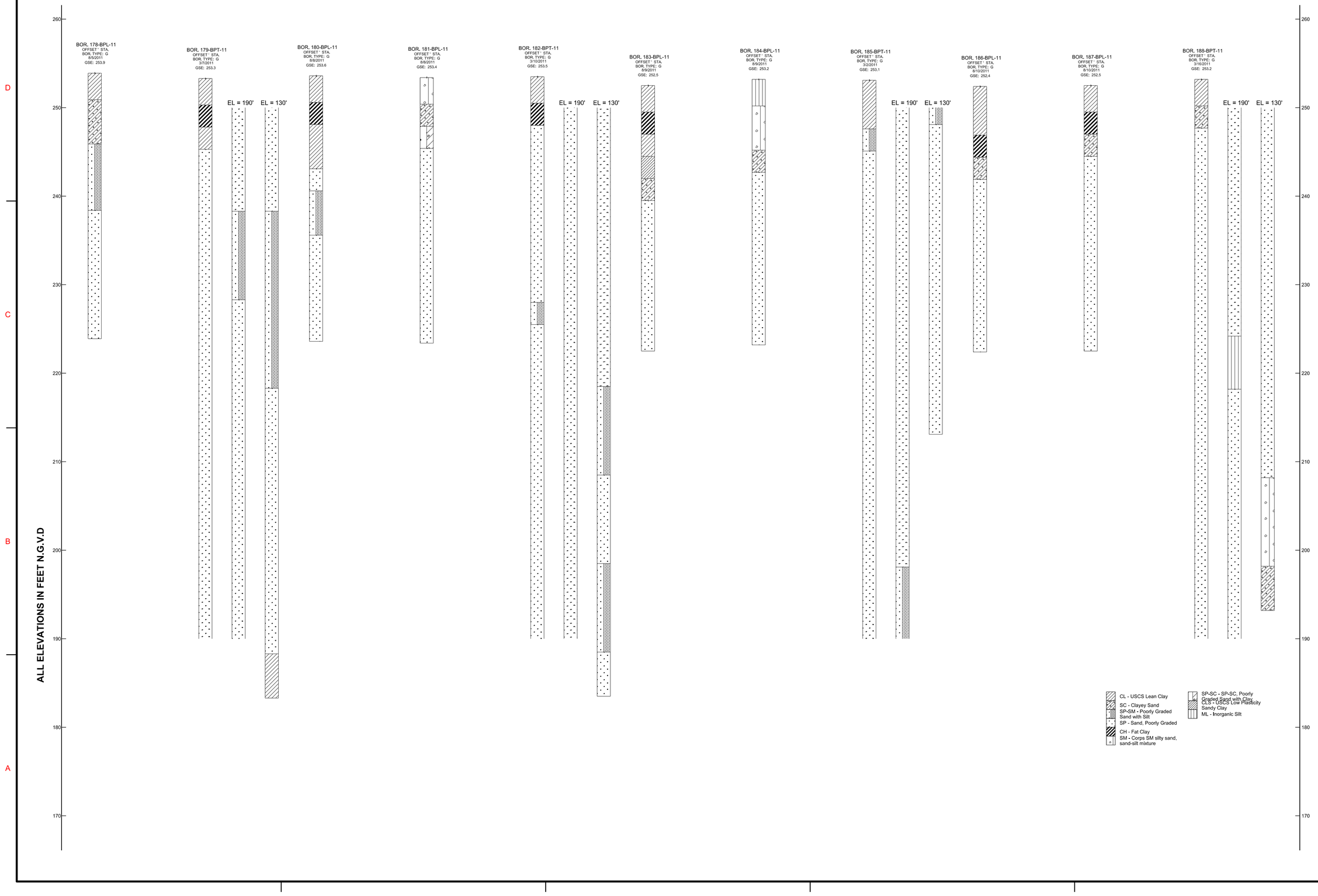
DESIGNED BY:
DWN BY:
CKD BY:
SUBMITTED BY:
PLOT SCALE: 1" = 10'
PLOT DATE: 06/23/2017
FILE NAME: BP_Landside23.dgn
SIZE: ANSI D
DATE: 06/23/2017
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

Land Side
Levee Mile 23

Sheet ID
BP-029

auto_time



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MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

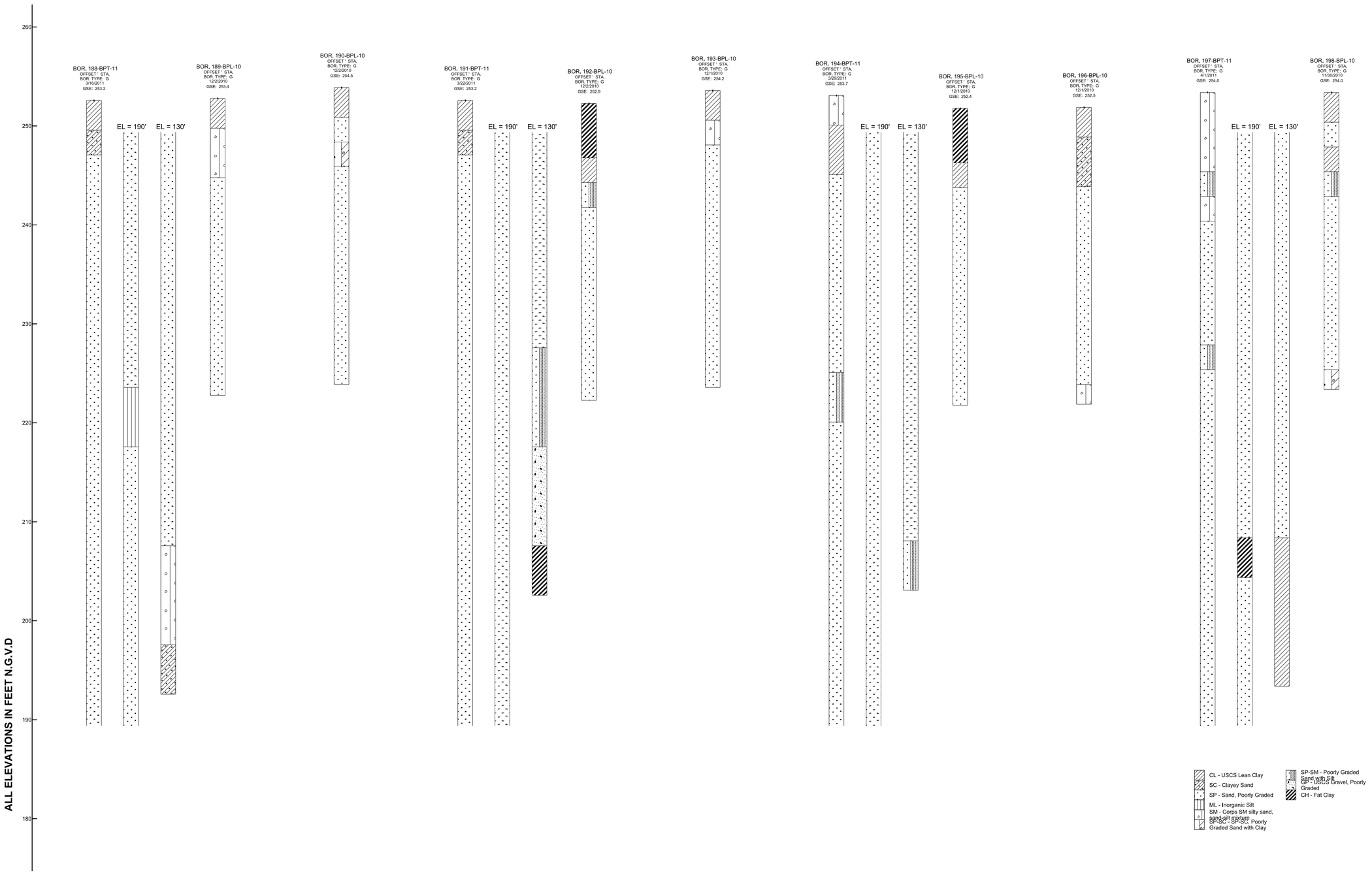
DESIGNED BY:
DWN BY:
CKD BY:
SUBMITTED BY:
PLOT SCALE: 1" = 10'
PLOT DATE: 06/23/2017
SIZE: ANSI D
FILE NAME: BP_Landside24.dgn
DATE: 06/23/2017
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

Land Side
Levee Mile 24

Sheet ID
BP-030

auto_time



1 2 3 4 5

D C B A

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MARK	DESCRIPTION	DATE	APPR.

DESIGNED BY:
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CKD BY:
SUBMITTED BY:
DATE: 06/23/2017
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:
PLOT SCALE: As Noted
PLOT DATE: As Noted
SIZE: ANSI D
FILE NAME: BP_Landside25.dgn

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MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

Land Side
Levee Mile 25

Sheet ID
BP-031

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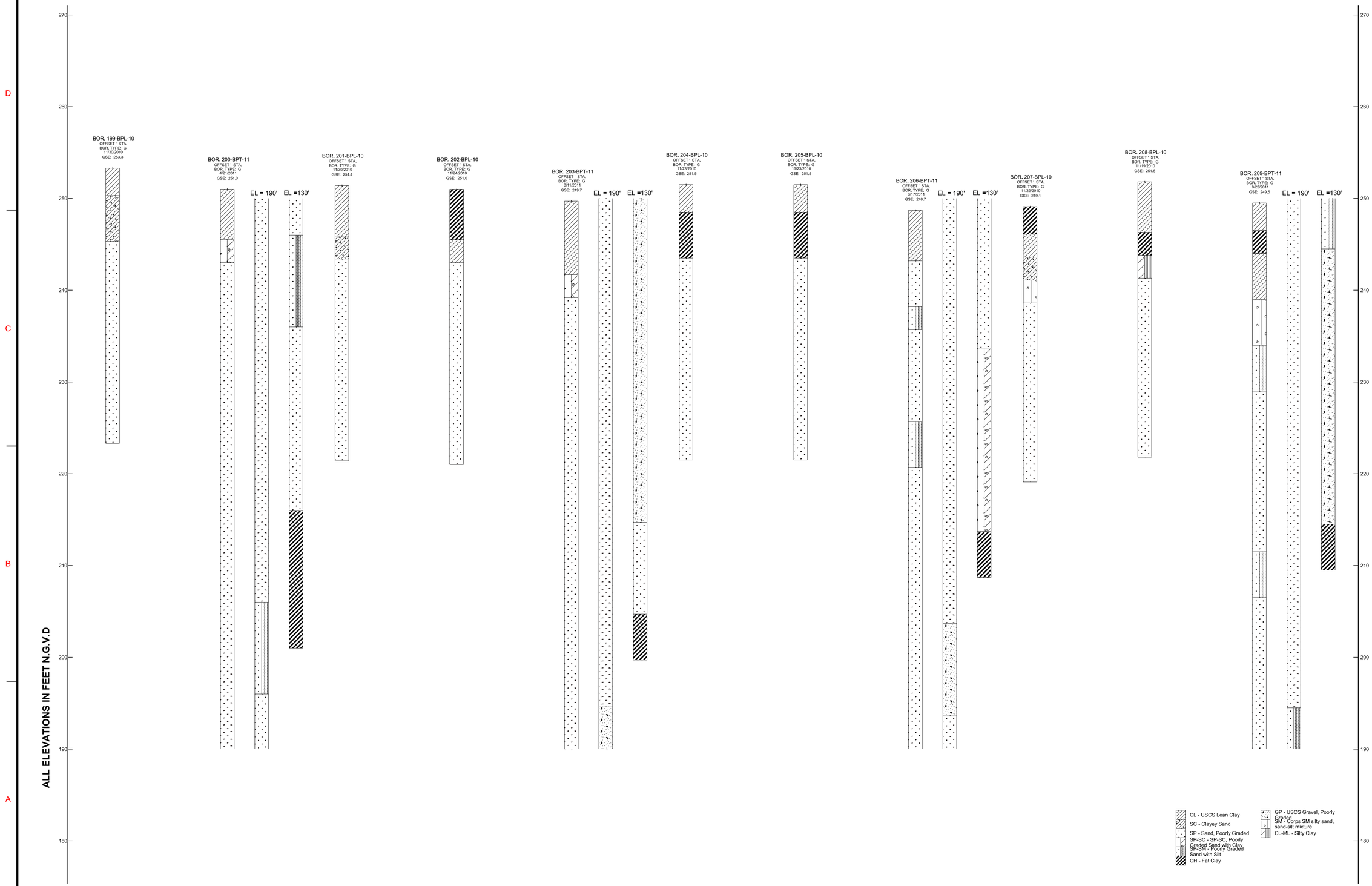

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MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

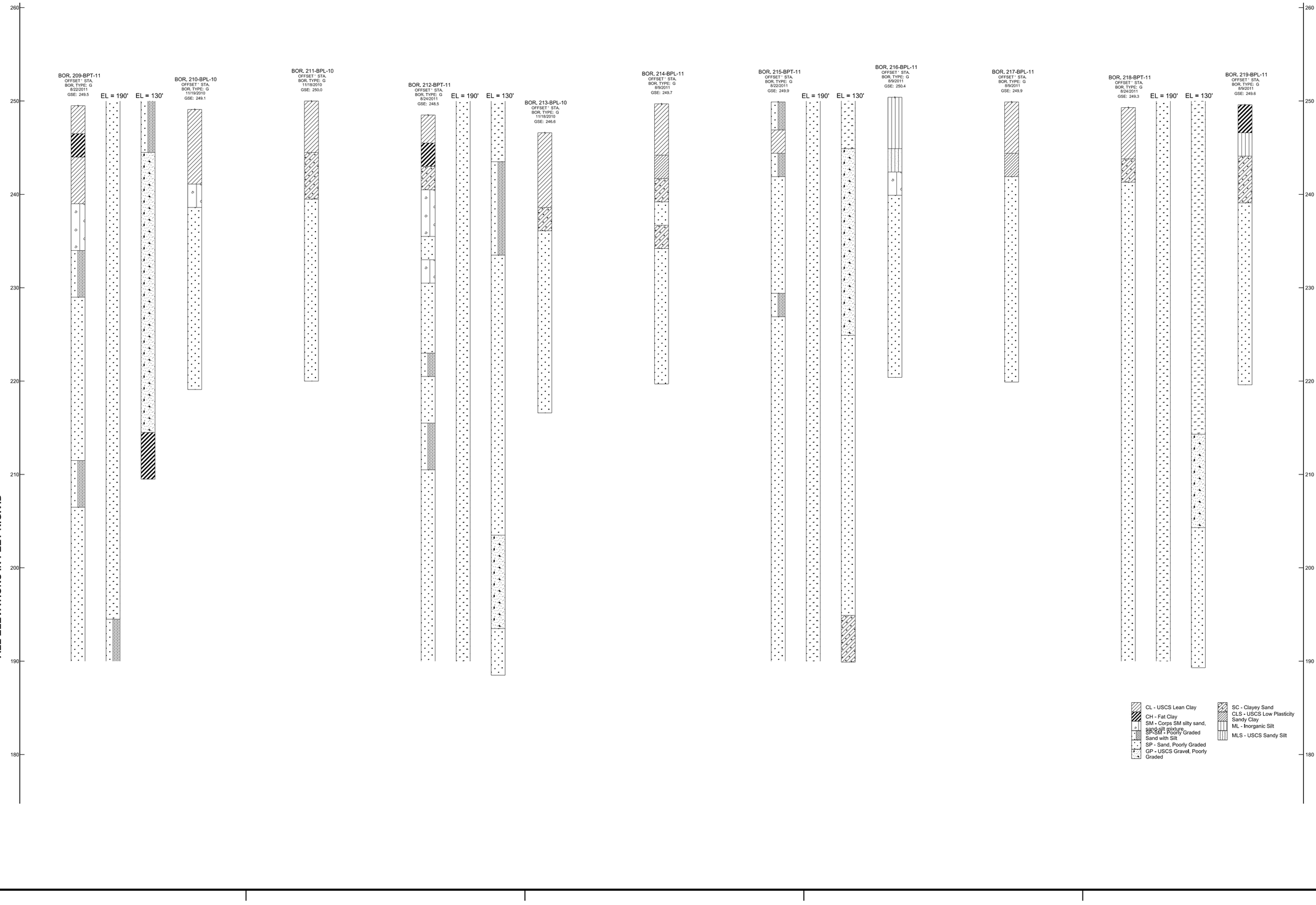
DESIGNED BY:
DWN BY:
CKD BY:
SUBMITTED BY:
PLOT SCALE: 1" = 10'
PLOT DATE: 06/23/2017
SIZE: ANSI D
FILE NAME: BP_Landside26.dgn
DATE: 06/23/2017
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

Land Side
Levee Mile 26

Sheet ID
BP-032

auto_time



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MARK	DESCRIPTION	DATE	APPR.
MARK	DESCRIPTION	DATE	APPR.

DESIGNED BY:
DWN BY:
CKD BY:
SUBMITTED BY:
DATE: 06/22/2017
SOLICITATION NO.:
CONTRACT NO.:
PLOT SCALE: AS PLOTTED
PLOT DATE: AS PLOTTED
FILE NUMBER:
SIZE: ANSI D
FILE NAME: BP_Landside27.dgn

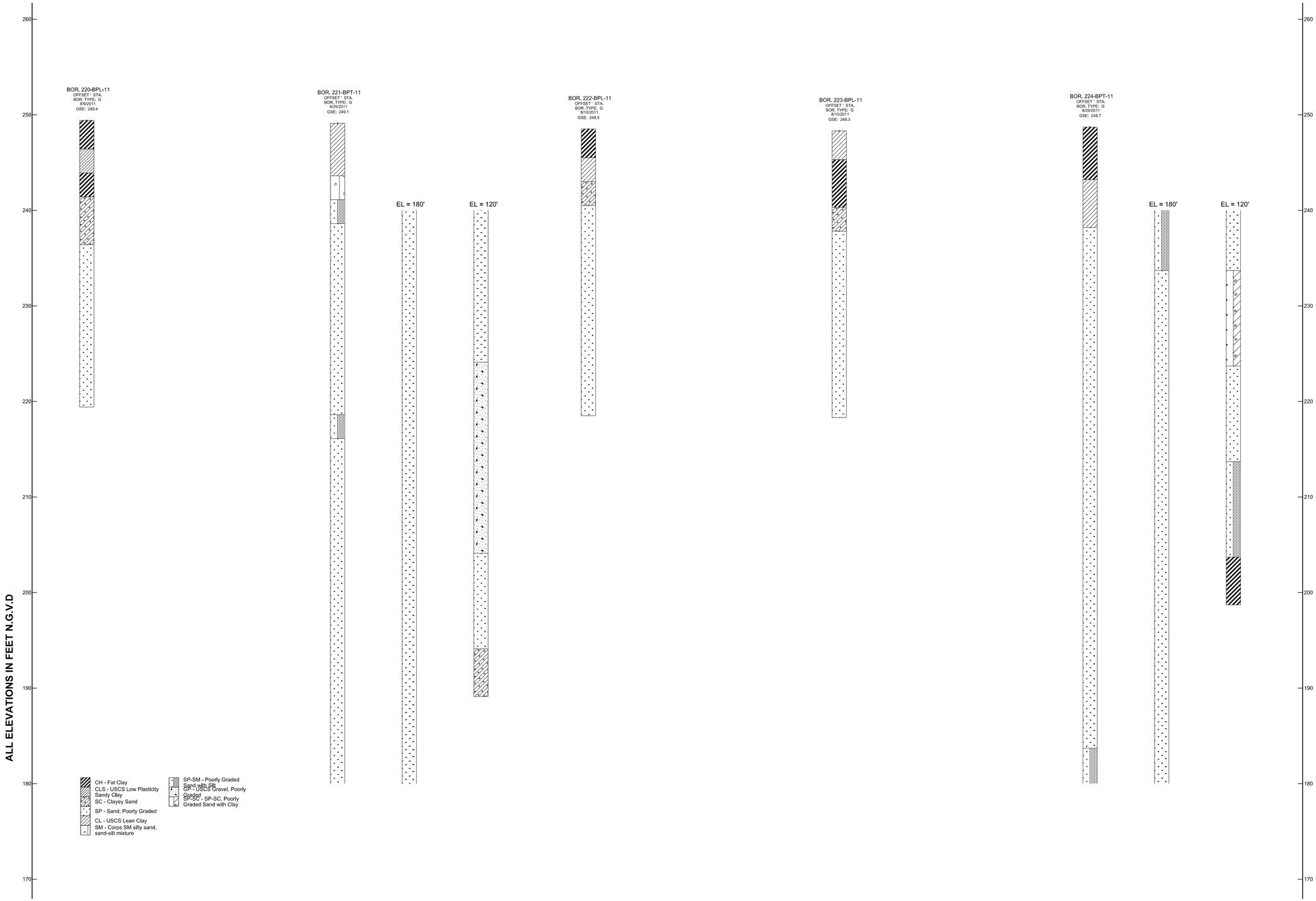
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

Land Side
Levee Mile 27

Sheet ID
BP-033

auto_time



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MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

DESIGNED BY:
DWN BY:
CKD BY:
SUBMITTED BY:
DATE: 06/23/2017
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:
PLOT SCALE: 1=10'
PLOT DATE: 8/29/2017
SIZE: ANSI D
FILE NAME: BP_Landside28.dgn

Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

Land Side
Levee Mile 28

Sheet ID
BP-034

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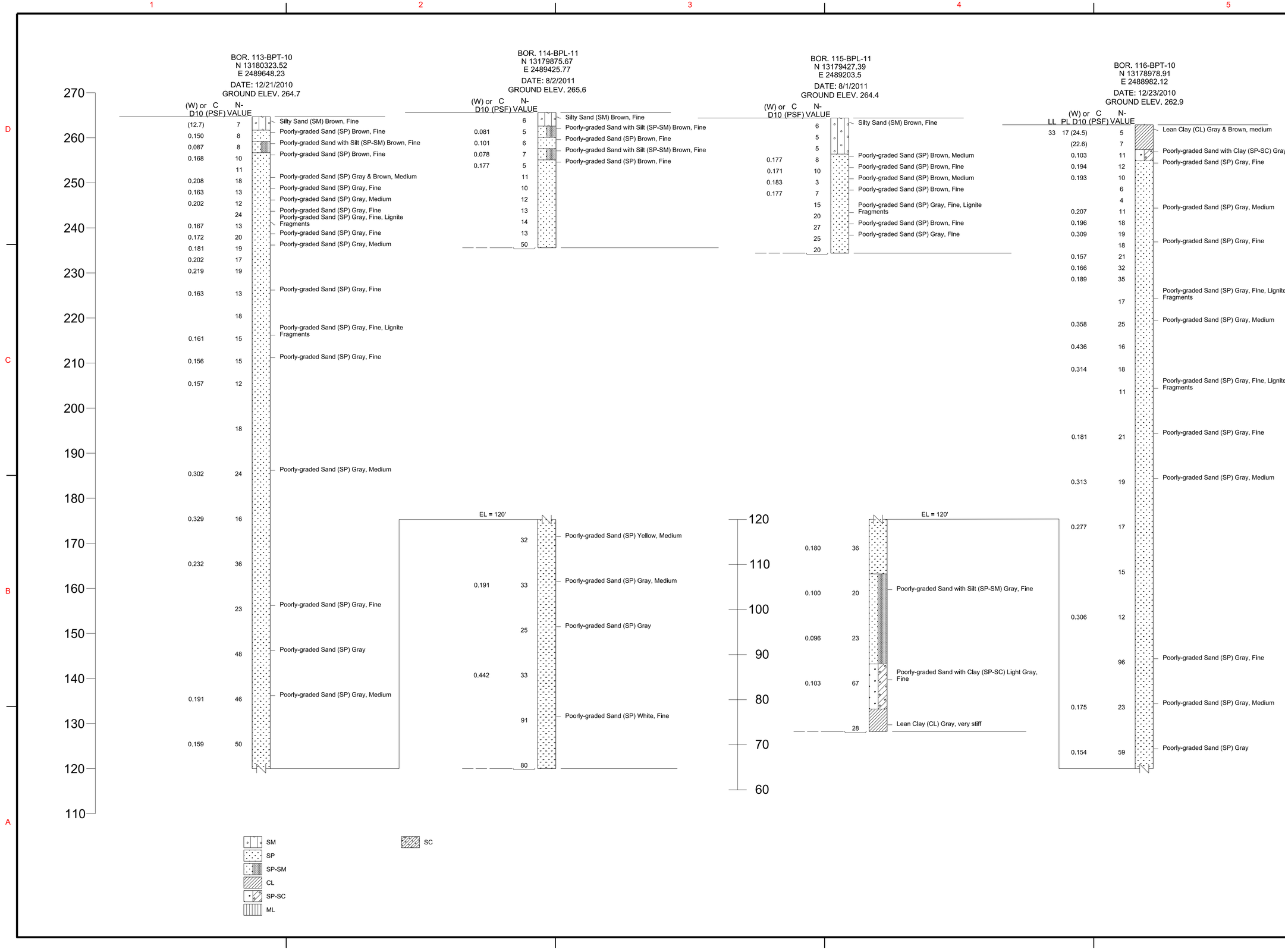
BOR. 113-BPT-10
N 13180323.52
E 2489648.23
DATE: 12/21/2010
GROUND ELEV. 264.7
(W) or D10 (PSF)
C
N-VALUE
(12.7) 7 Silty Sand (SM) Brown, Fine
0.150 8 Poorly-graded Sand (SP) Brown, Fine
0.087 8 Poorly-graded Sand with Silt (SP-SM) Brown, Fine
0.168 10 Poorly-graded Sand (SP) Brown, Fine
11
0.208 18 Poorly-graded Sand (SP) Gray & Brown, Medium
0.163 13 Poorly-graded Sand (SP) Gray, Fine
0.202 12 Poorly-graded Sand (SP) Gray, Medium
24 Poorly-graded Sand (SP) Gray, Fine
0.167 13 Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments
0.172 20 Poorly-graded Sand (SP) Gray, Fine
0.181 19 Poorly-graded Sand (SP) Gray, Medium
0.202 17
0.219 19
0.163 13 Poorly-graded Sand (SP) Gray, Fine
18
0.161 15 Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments
0.156 15 Poorly-graded Sand (SP) Gray, Fine
0.157 12
18
0.302 24 Poorly-graded Sand (SP) Gray, Medium
0.329 16
0.232 36
23 Poorly-graded Sand (SP) Gray, Fine
48 Poorly-graded Sand (SP) Gray
0.191 46 Poorly-graded Sand (SP) Gray, Medium
0.159 50
BOR. 114-BPL-11
N 13179875.67
E 2489425.77
DATE: 8/2/2011
GROUND ELEV. 265.6
(W) or D10 (PSF)
C
N-VALUE
6 Silty Sand (SM) Brown, Fine
0.081 5 Poorly-graded Sand with Silt (SP-SM) Brown, Fine
0.101 6 Poorly-graded Sand (SP) Brown, Fine
0.078 7 Poorly-graded Sand with Silt (SP-SM) Brown, Fine
0.177 5 Poorly-graded Sand (SP) Brown, Fine
11
10
12
13
14
13
50
EL = 120'
32 Poorly-graded Sand (SP) Yellow, Medium
0.191 33 Poorly-graded Sand (SP) Gray, Medium
25 Poorly-graded Sand (SP) Gray
0.442 33
91 Poorly-graded Sand (SP) White, Fine
80
BOR. 115-BPL-11
N 13179427.39
E 2489203.5
DATE: 8/1/2011
GROUND ELEV. 264.4
(W) or D10 (PSF)
C
N-VALUE
6 Silty Sand (SM) Brown, Fine
5
5
0.177 8 Poorly-graded Sand (SP) Brown, Medium
0.171 10 Poorly-graded Sand (SP) Brown, Fine
0.183 3 Poorly-graded Sand (SP) Brown, Medium
0.177 7 Poorly-graded Sand (SP) Brown, Fine
15 Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments
20 Poorly-graded Sand (SP) Brown, Fine
27 Poorly-graded Sand (SP) Gray, Fine
25
20
EL = 120'
0.180 36
0.100 20 Poorly-graded Sand with Silt (SP-SM) Gray, Fine
0.096 23
0.103 67 Poorly-graded Sand with Clay (SP-SC) Light Gray, Fine
28 Lean Clay (CL) Gray, very stiff
BOR. 116-BPT-10
N 13178978.91
E 2488982.12
DATE: 12/23/2010
GROUND ELEV. 262.9
LL PL (W) or D10 (PSF)
C
N-VALUE
33 17 (24.5) 5 Lean Clay (CL) Gray & Brown, medium
(22.6) 7
0.103 11 Poorly-graded Sand with Clay (SP-SC) Gray, Fine
0.194 12 Poorly-graded Sand (SP) Gray, Fine
0.193 10
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4
0.207 11 Poorly-graded Sand (SP) Gray, Medium
0.196 18
0.309 19 Poorly-graded Sand (SP) Gray, Fine
18
0.157 21
0.166 32
0.189 35
17 Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments
0.358 25 Poorly-graded Sand (SP) Gray, Medium
0.436 16
0.314 18
11 Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments
0.181 21 Poorly-graded Sand (SP) Gray, Fine
0.313 19 Poorly-graded Sand (SP) Gray, Medium
15
0.306 12
96 Poorly-graded Sand (SP) Gray, Fine
0.175 23 Poorly-graded Sand (SP) Gray, Medium
0.154 59 Poorly-graded Sand (SP) Gray
270
260
250
240
230
220
210
200
190
180
170
160
150
140
130
120
110
120
110
100
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70
60
SM
SP
SP-SM
CL
SP-SC
ML
SC
1
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DWN BY:
SUBMITTED BY:
DATE: 08/23/2017
CKD BY:
SOLICITATION NO.:
CONTRACT NO.:
PLOT SCALE: AS SHOWN
PLOT DATE: 8/23/2017
SIZE: ANSI D
FILE NAME: BP_L Fences18.dgn
FILE NUMBER:
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE
Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties
Land Side Fences
Levee Mile 18 (1)
Sheet ID
BP-035
auto_lime

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

DESIGNED BY: | DWN BY: | CKD BY: | SUBMITTED BY: | PLOT SCALE: 1" = 10' | PLOT DATE: 06/23/2017 | SIZE: ANSI D | FILE NAME: BP_LFences18.dgn

DATE: 06/23/2017 | SOLICITATION NO.: | CONTRACT NO.: | FILE NUMBER:

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

Land Side Fences
Levee Mile 18 (2)

Sheet ID
BP-036

auto_time

BOR. 121-BPL-10
N 13176842.05
E 2487692.79
DATE: 9/6/2010
GROUND ELEV. 262.2

(W) or D10 (PSF)	C	N-VALUE	
		10	Silty Sand (SM) Red & Brown, Fine
		8	
0.168		11	Poorly-graded Sand (SP) Brown, Fine
0.114		12	
0.177		14	
0.142		14	Poorly-graded Sand (SP) Gray, Fine
0.125		14	Poorly-graded Sand (SP) Brown, Fine
		22	
		14	Poorly-graded Sand (SP) Gray, Fine
		19	Poorly-graded Sand (SP) Gray, Medium
		18	Poorly-graded Sand (SP) Gray, Fine
		31	

BOR. 122-BPT-11
N 13176447.42
E 2487420.16
DATE: 1/7/2011
GROUND ELEV. 263.7

(W) or D10 (PSF)	C	LL	PL	N-VALUE	
			(15.1)	12	Silt (ML) Brown, stiff, Fine
		22	14 (18.0)	6	Lean Clay (CL) Brown, medium, Lignite Fragments
			(19.7)	7	Clayey Sand (SC) Brown, medium
0.110				6	Poorly-graded Sand (SP) Gray, Fine
0.171				10	Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments
0.179				19	
				18	Poorly-graded Sand (SP) Gray, Fine
				14	
0.150				20	Poorly-graded Sand (SP) Dark Gray, Fine
0.135				19	Poorly-graded Sand (SP) Dark Gray, Fine, Lignite Fragments
0.150				28	Poorly-graded Sand (SP) Gray, Fine
				22	
				13	
0.242				36	Poorly-graded Sand (SP) Gray, Medium
0.229				40	
0.164				30	Poorly-graded Sand (SP) Gray, Fine, Lignite Fragments
				26	Poorly-graded Sand (SP) Gray, Fine
0.153				12	
0.197				22	Poorly-graded Sand (SP) Gray, Medium
0.194				19	
0.285				30	
0.337				29	Poorly-graded Sand (SP) Gray, Medium, Lignite Fragments
0.331				19	Poorly-graded Sand (SP) Brown, Medium
0.111				36	Poorly-graded Sand (SP) Tan, Fine

BOR. 123-BPL-10
N 13176024.8
E 2487114.02
DATE: 9/6/2010
GROUND ELEV. 264.4

(W) or D10 (PSF)	C	N-VALUE	
		10	Silty Sand (SM) Brown, Fine
		6	Silty Sand (SM) Brown, Oxidized, Fine
0.162		12	Poorly-graded Sand (SP) Brown, Fine
0.098		8	
0.080		3	Poorly-graded Sand with Silt (SP-SM) Brown, Fine
0.121		20	Poorly-graded Sand (SP) Brown, Fine
0.155		16	Poorly-graded Sand (SP) Gray, Fine
		11	
		15	
		24	
		24	
		24	

EL = 150'

0.234	18	Poorly-graded Sand (SP) Light Gray, Medium
0.108	44	Poorly-graded Sand with Silt (SP-SM) Dark Gray, Medium
0.341	13	Poorly-graded Sand (SP) Gray
0.174	64	Poorly-graded Sand (SP) Brown
	26	Poorly-graded Sand with Silt (SP-SM) Dark Brown, Fine
0.182	76	Poorly-graded Sand (SP) White, Medium

270 260 250 240 230 220 210 200 190 180 170 160 150 140

150 140 130 120 110 100 90 80

SM
SP
SP-SM
CL
SP-SC
ML
SC

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MARK	DESCRIPTION	DATE	APPR.
MARK	DESCRIPTION	DATE	APPR.

DESIGNED BY:
DWN BY:
CKD BY:
SUBMITTED BY:
DATE: 06/23/2017
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:
PLOT SCALE: AS NOTED
PLOT DATE: AS NOTED
SIZE: ANSI D
FILE NAME: BP_1 Fences18.dgn

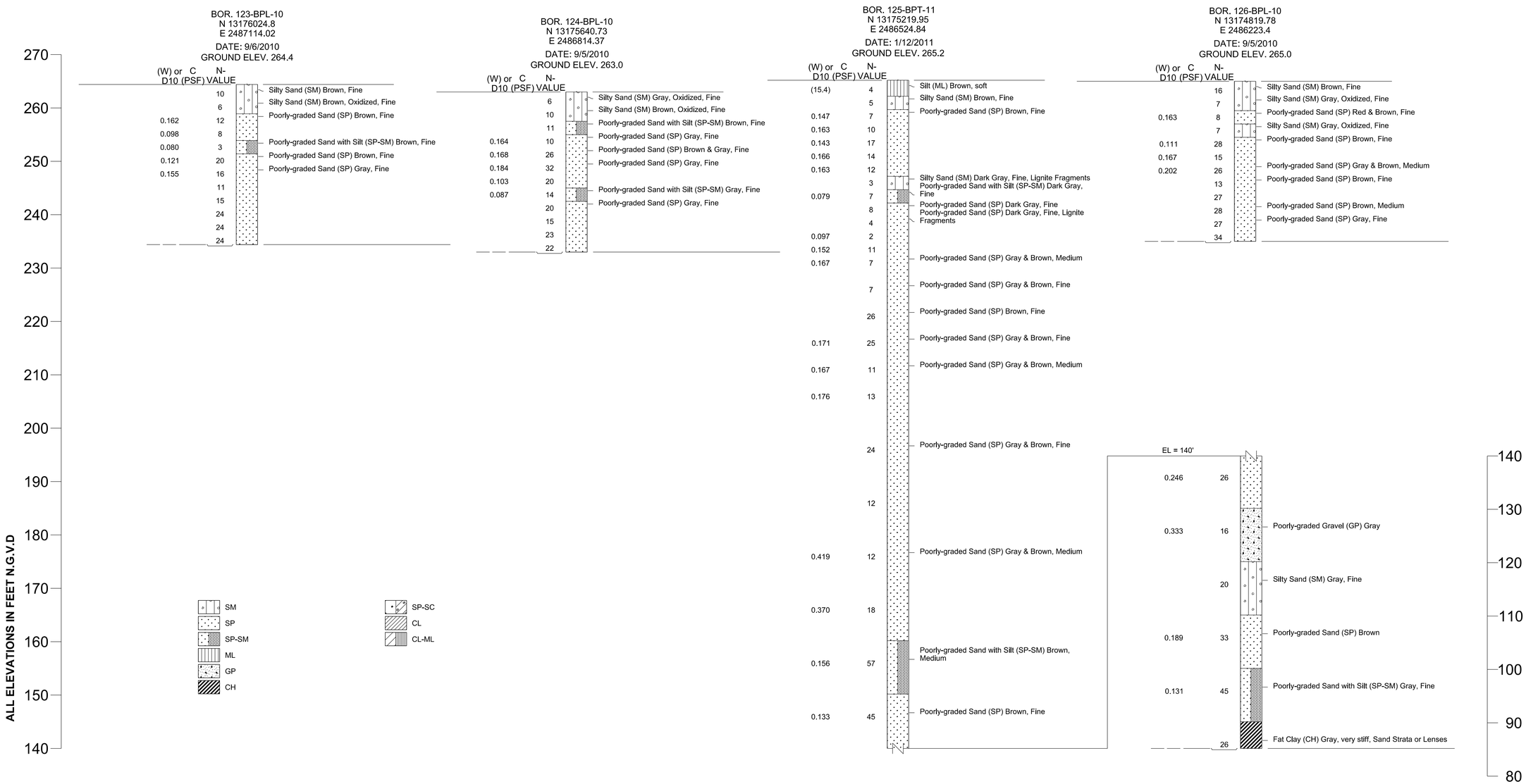
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

Land Side Fences
Levee Mile 18 (3)

Sheet ID
BP-037

auto_time



US Army Corps of Engineers

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

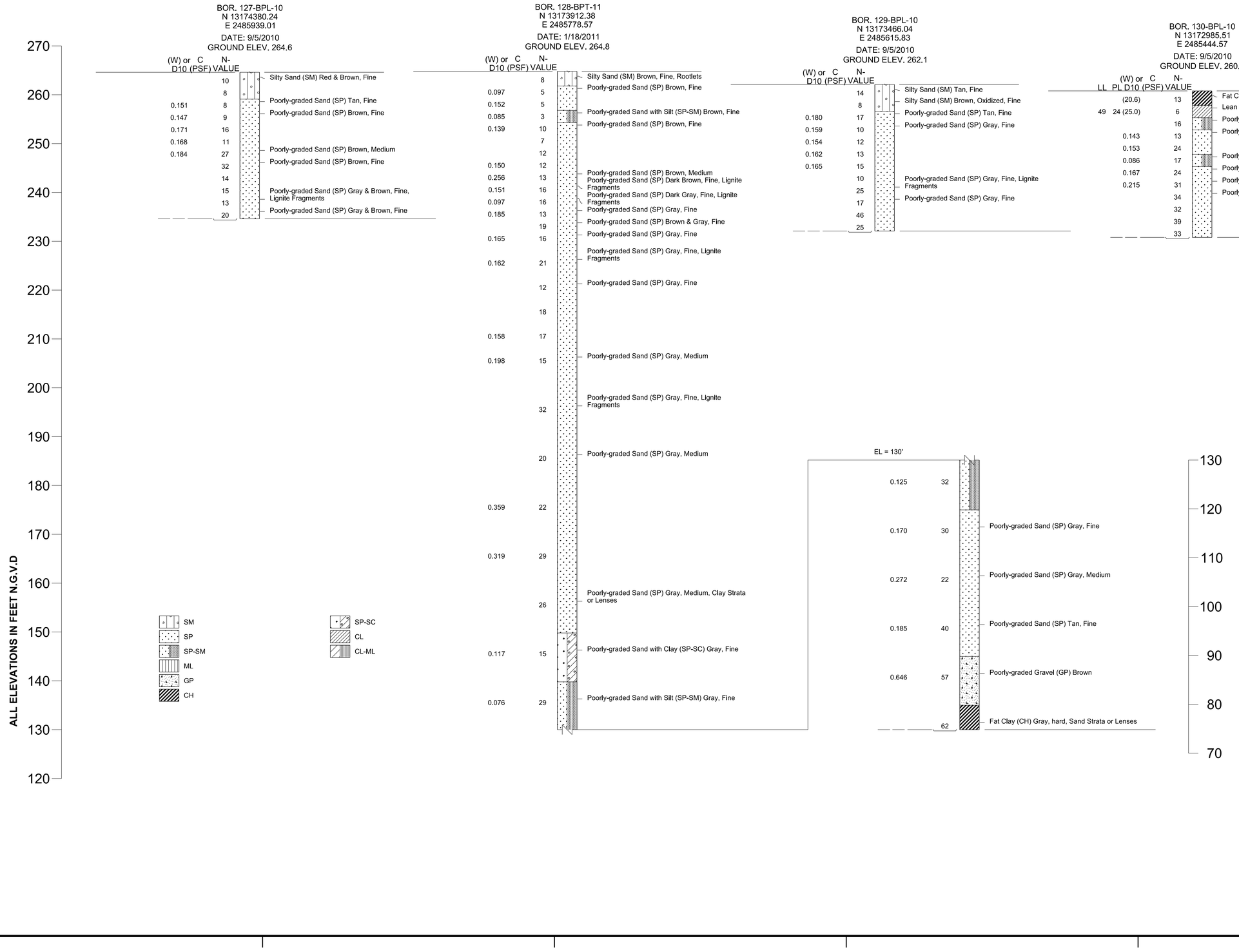
DESIGNED BY: | DATE: 06/23/2017
DWN BY: | CKD BY: | SOLICITATION NO.:
SUBMITTED BY: | CONTRACT NO.:
PLOT SCALE: 1" = 10' | PLOT DATE: 06/23/2017 | FILE NUMBER:
SIZE: ANSI D | FILE NAME: BP_I_Fences19.dgn

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

Land Side Fences
Levee Mile 19 (1)

Sheet ID
BP-038



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DESIGNED BY:
DWN BY:
CKD BY:
SUBMITTED BY:
DATE: 06/22/2017
SOLICITATION NO.:
CONTRACT NO.:
PLOT SCALE: AS SHOWN
PLOT DATE: AS SHOWN
FILE NAME: BP- LF Fences19.dgn
FILE NUMBER:
SIZE: ANSI D

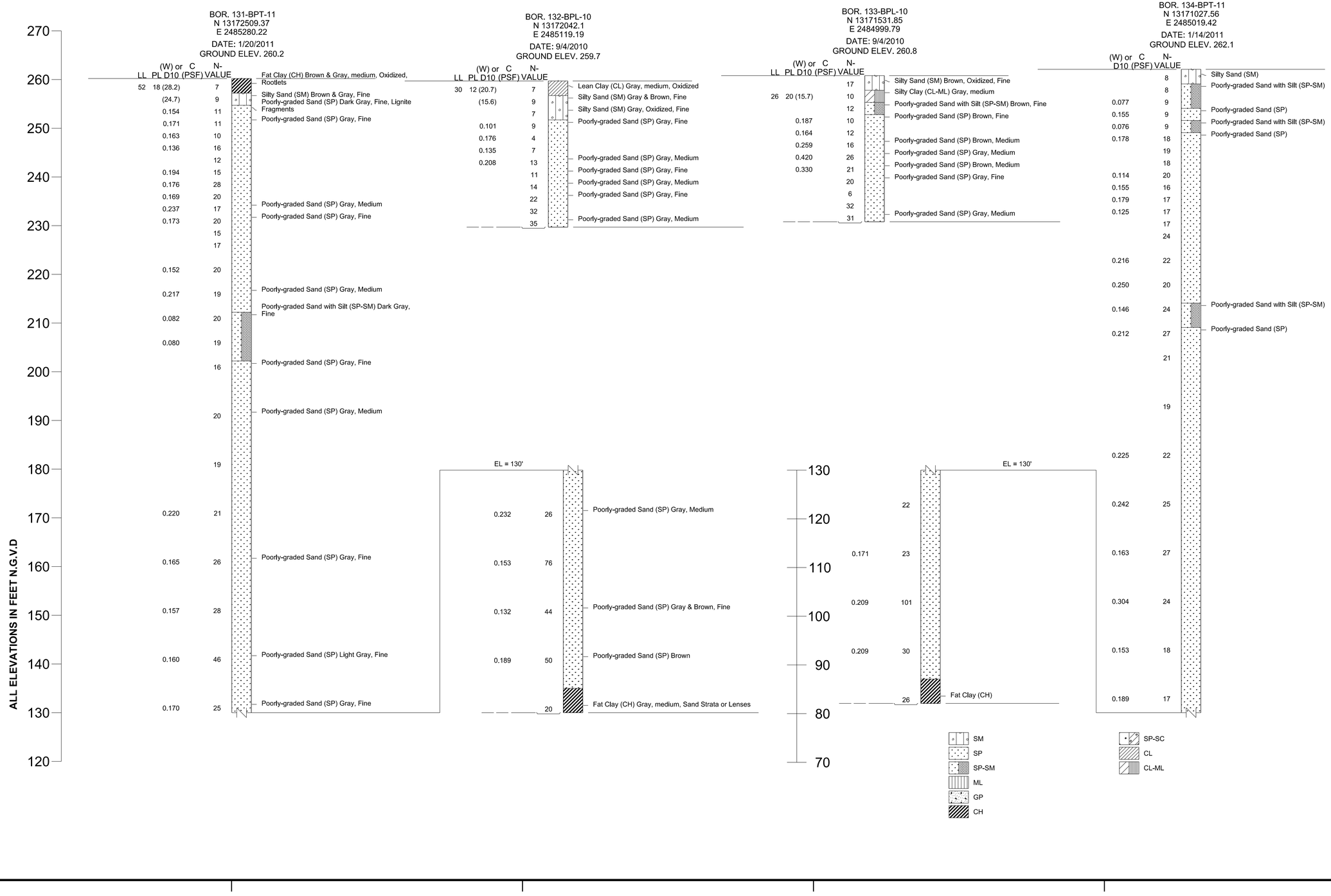
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

Land Side Fences
Levee Mile 19 (2)

Sheet ID
BP-039

auto_time



US Army Corps of Engineers

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U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

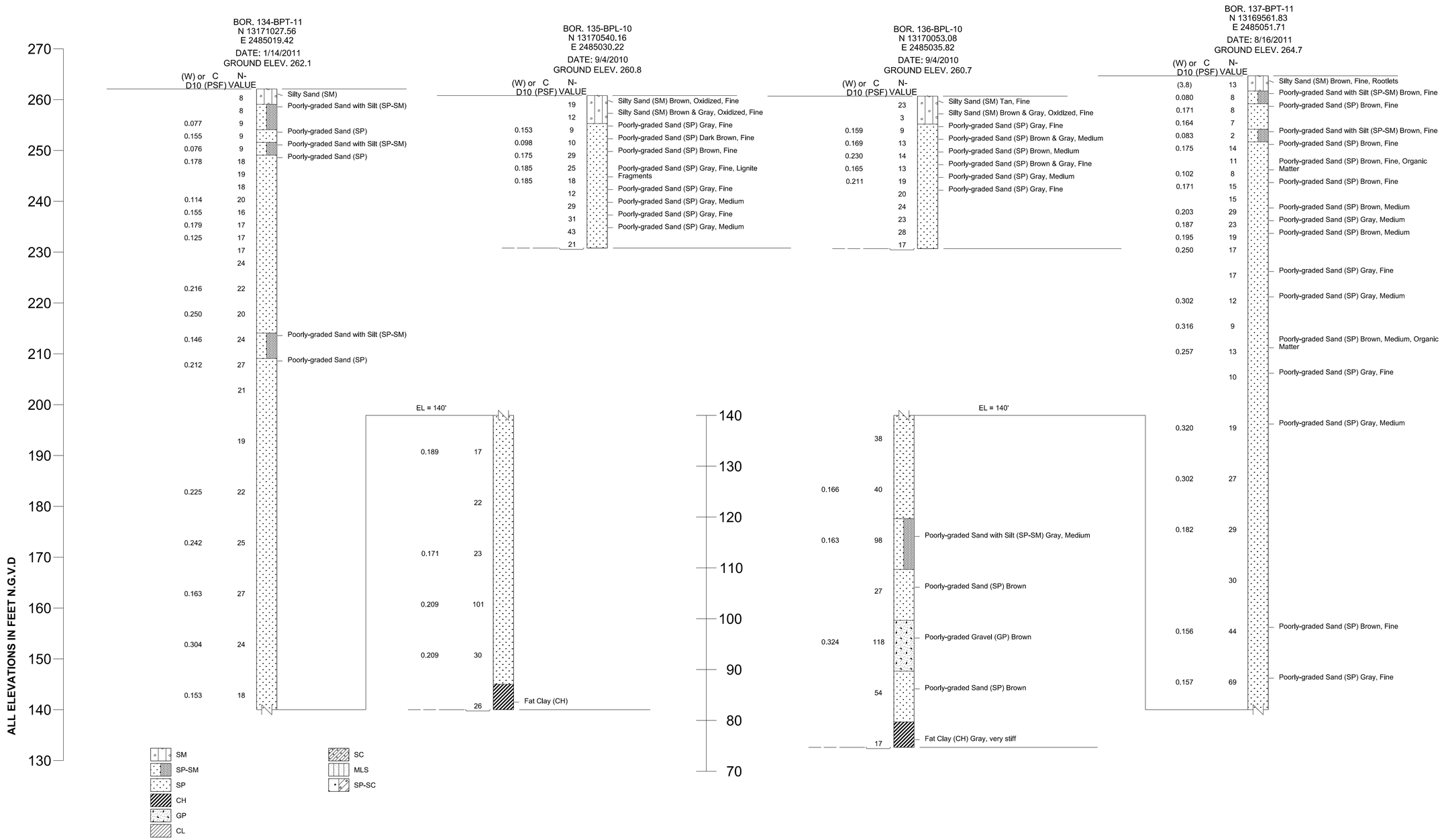
DESIGNED BY: | DATE: 06/23/2017
DWN BY: | CKD BY: | SOLICITATION NO.:
SUBMITTED BY: | CONTRACT NO.:
PLOT SCALE: 1" = 10' | PLOT DATE: 06/23/2017 | FILE NUMBER:
SIZE: ANSI D | FILE NAME: BP_I_Fences19.dgn

Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

Land Side Fences
Levee Mile 19 (3)

Sheet ID
BP-040

auto_time



US Army Corps of Engineers

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MARK	DESCRIPTION	DATE	APPR.

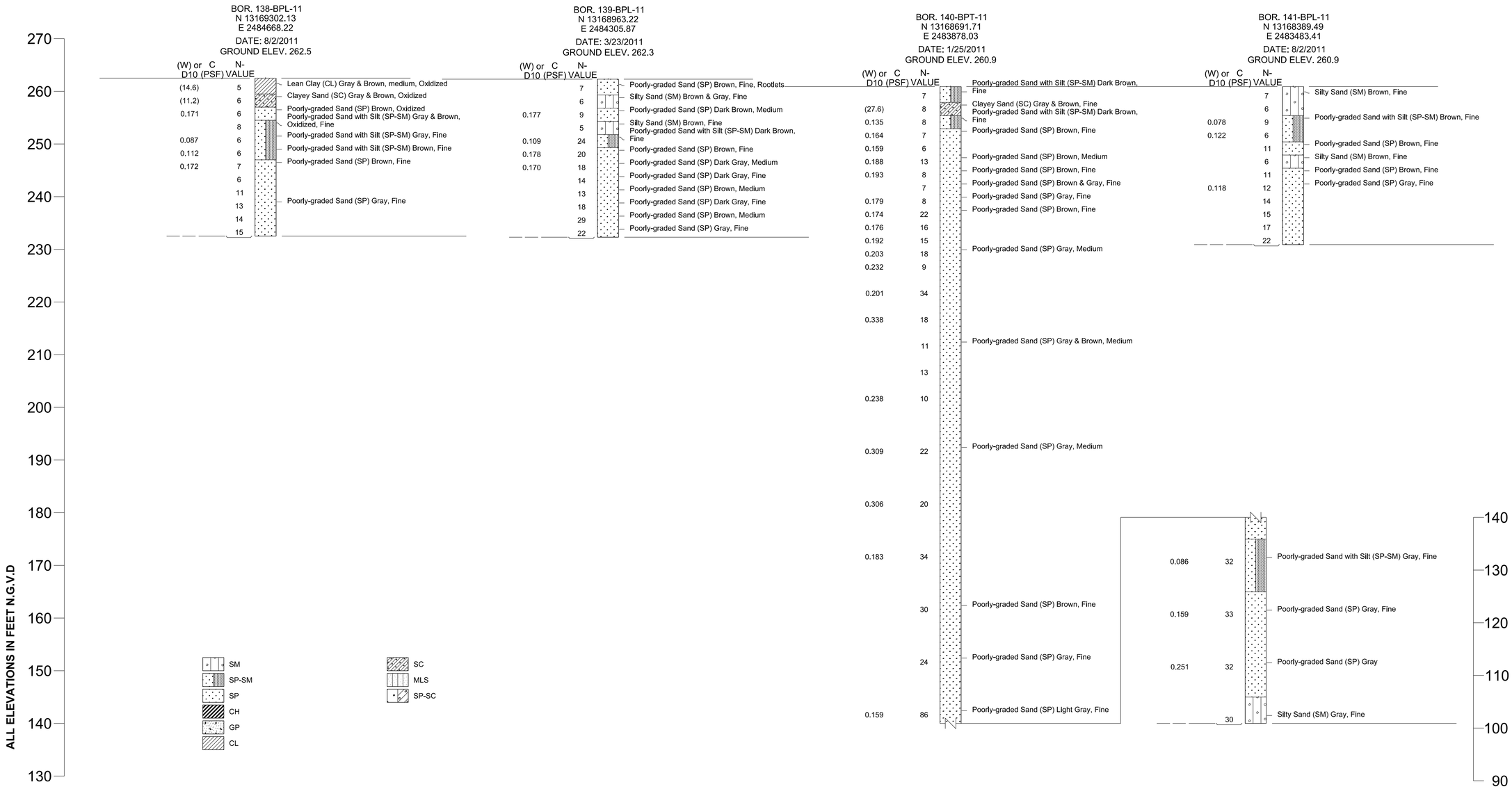
DESIGNED BY: | DATE: 08/23/2017
DWN BY: | CKD BY: | SOLICITATION NO.:
SUBMITTED BY: | CONTRACT NO.:
PLOT SCALE: 1" = 10' | PLOT DATE: 08/23/2017 | FILE NUMBER:
SIZE: ANSI D | FILE NAME: BP_LFences20.dgn

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

Land Side Fences
Levee Mile 20 (1)

Sheet ID
BP-041



US Army Corps of Engineers

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U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

DESIGNED BY: | DATE: 06/23/2017
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SUBMITTED BY: | CONTRACT NO.:
PLOT SCALE: 1" = 10' | PLOT DATE: 06/23/2017 | FILE NUMBER:
SIZE: ANSI D | FILE NAME: BP_LFences20.dgn

Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

Land Side Fences
Levee Mile 20 (2)

Sheet ID
BP-042

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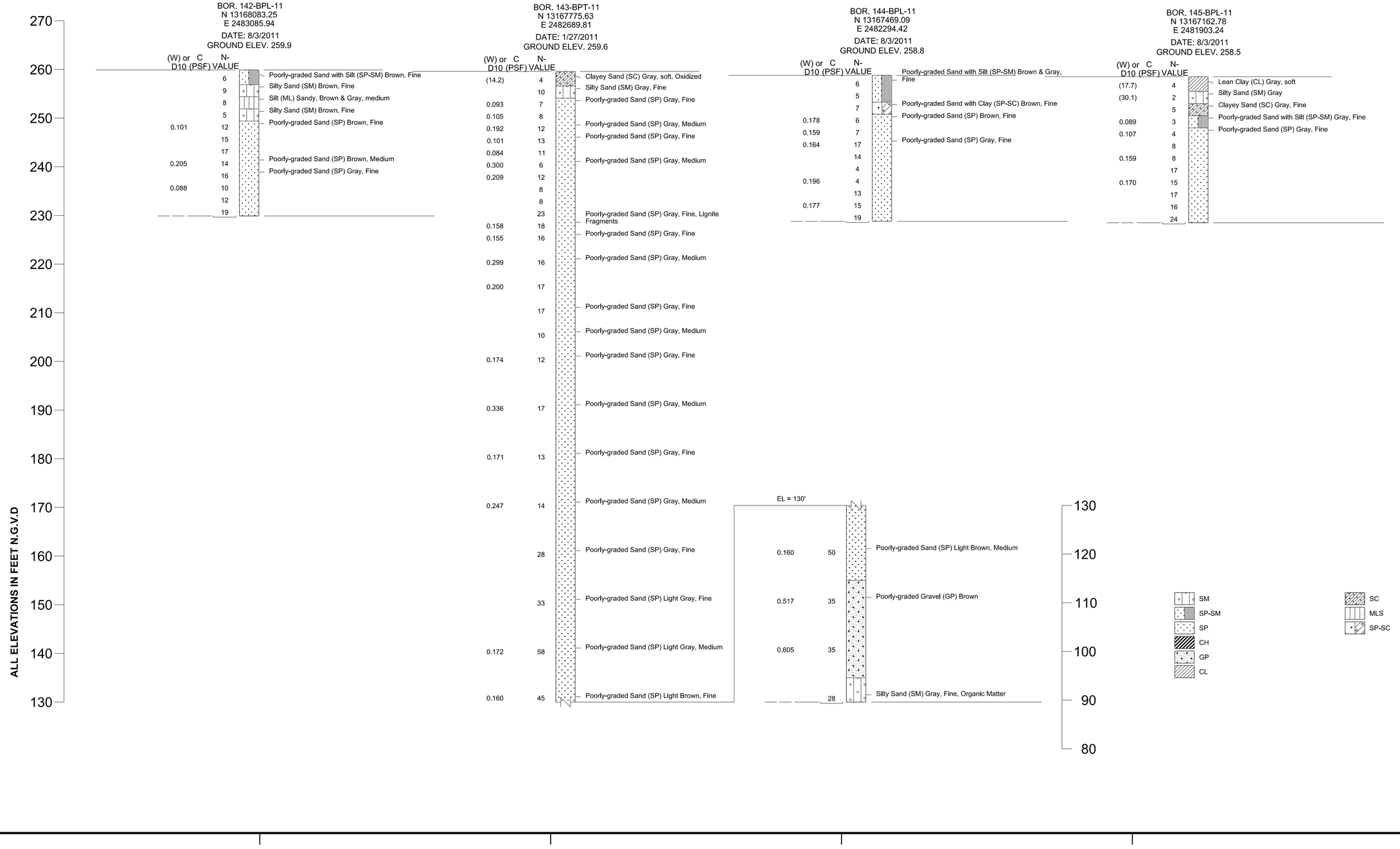

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MARK	DESCRIPTION	DATE	APPR.

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SUBMITTED BY:
CKD BY:
DATE: 08/23/2017
SOLICITATION NO.:
CONTRACT NO.:
PLOT SCALE: 1:1
PLOT DATE: 8/23/2017
SIZE: ANSI D
FILE NUMBER:
FILE NAME: BP_L Fences20.dgn

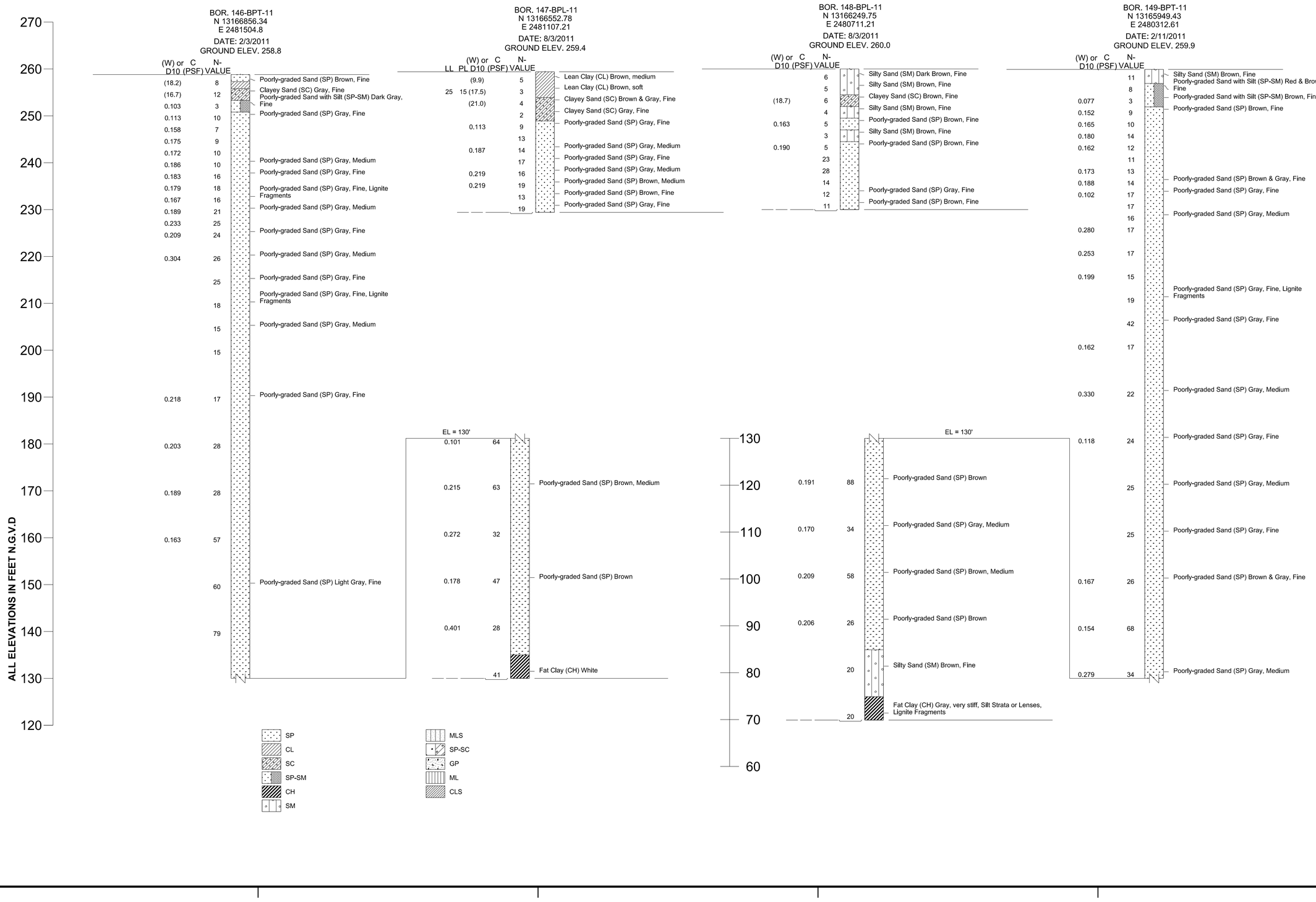
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

Land Side Fences
Levee Mile 20 (3)

Sheet ID
BP-043

auto_lime



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DESIGNED BY:
DWN BY:
CKD BY:
SUBMITTED BY:
DATE: 06/22/2017
SOLICITATION NO.:
CONTRACT NO.:
PLOT SCALE: 1" = 10'
PLOT DATE: 6/22/2017
FILE NAME: BP- LF Fences21.dgn
FILE NUMBER:
SIZE: ANSI D

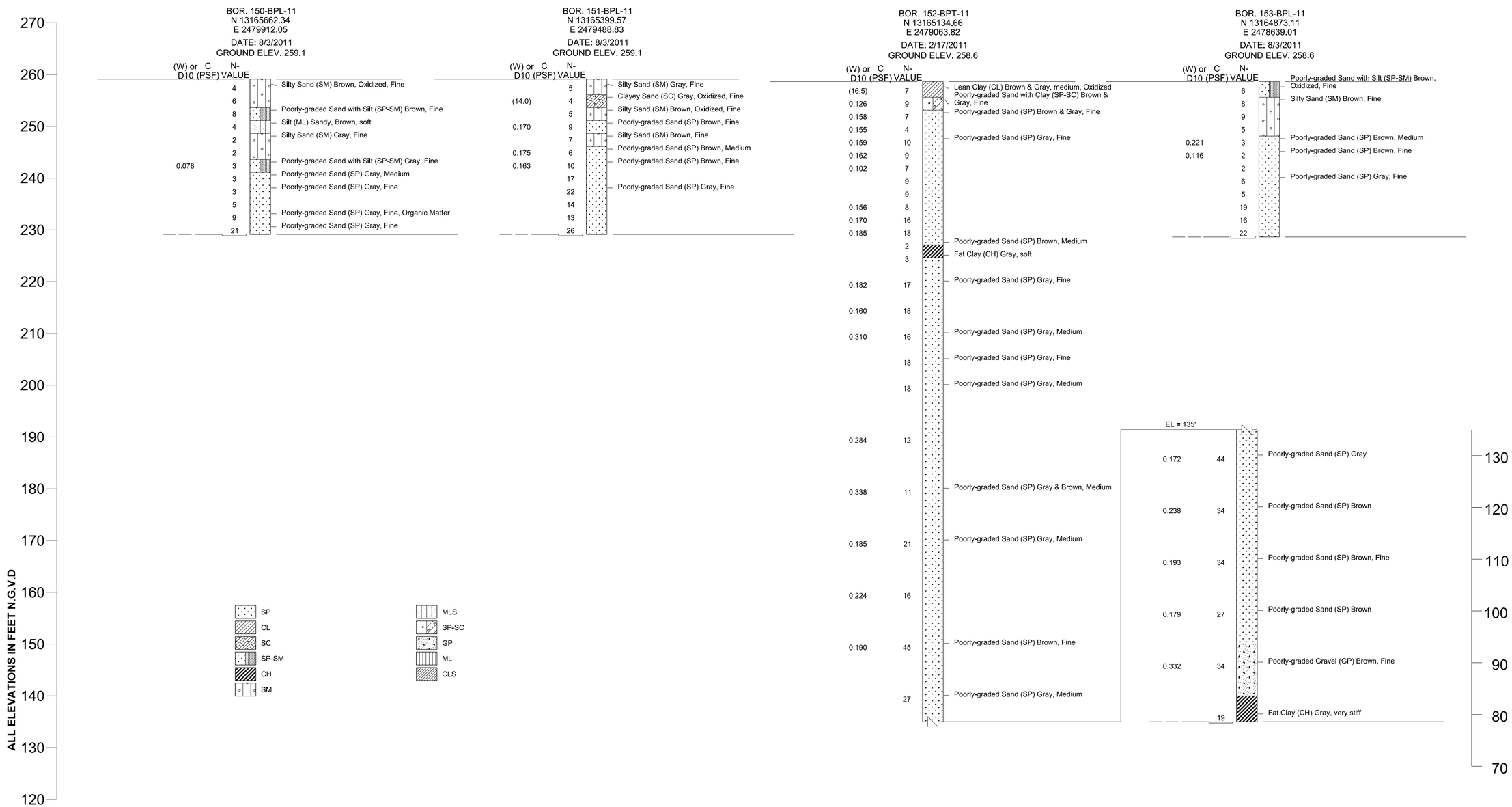
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

Land Side Fences
Levee Mile 21 (1)

Sheet ID
BP-044

auto_time



US Army Corps of Engineers

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MARK	DESCRIPTION	DATE	APPR.

DESIGNED BY: | DATE: 06/23/2017
DWN BY: | CKD BY: | SOLICITATION NO.:
SUBMITTED BY: | CONTRACT NO.:
PLOT SCALE: 1" = 10' | PLOT DATE: 06/23/2017 | FILE NUMBER:
SIZE: ANSI D | FILE NAME: BP_Fences21.dgn

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

Land Side Fences
Levee Mile 21 (2)

Sheet ID
BP-045

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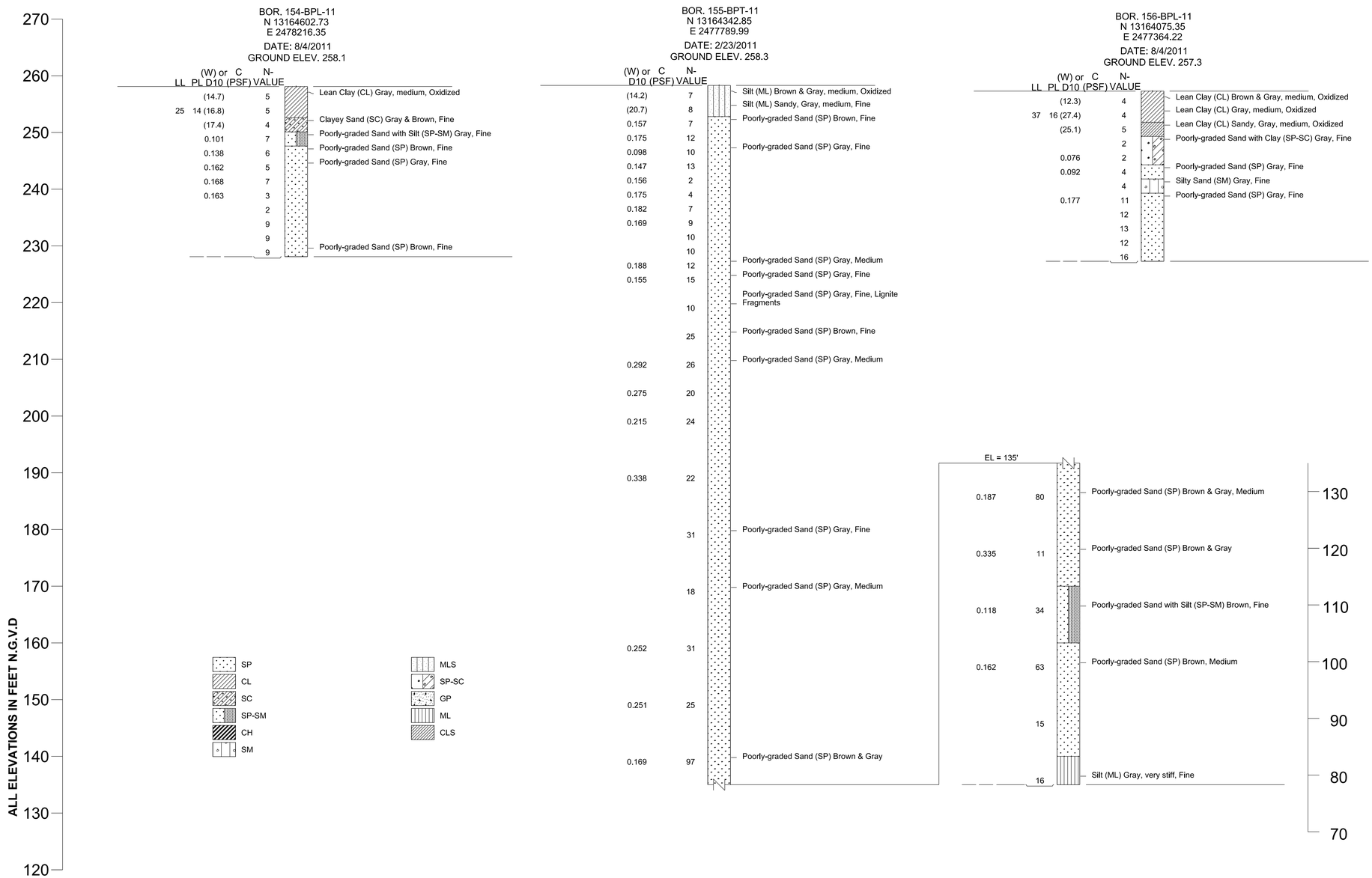

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U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

DESIGNED BY: | DATE: 06/23/2017
DWN BY: | CKD BY: | SOLICITATION NO.:
SUBMITTED BY: | CONTRACT NO.:
PLOT SCALE: 1" = 10' | PLOT DATE: 06/23/2017 | FILE NUMBER:
SIZE: ANSI D | FILE NAME: BP_I_Fences21.dgn

Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

Land Side Fences
Levee Mile 21 (3)

Sheet ID
BP-046

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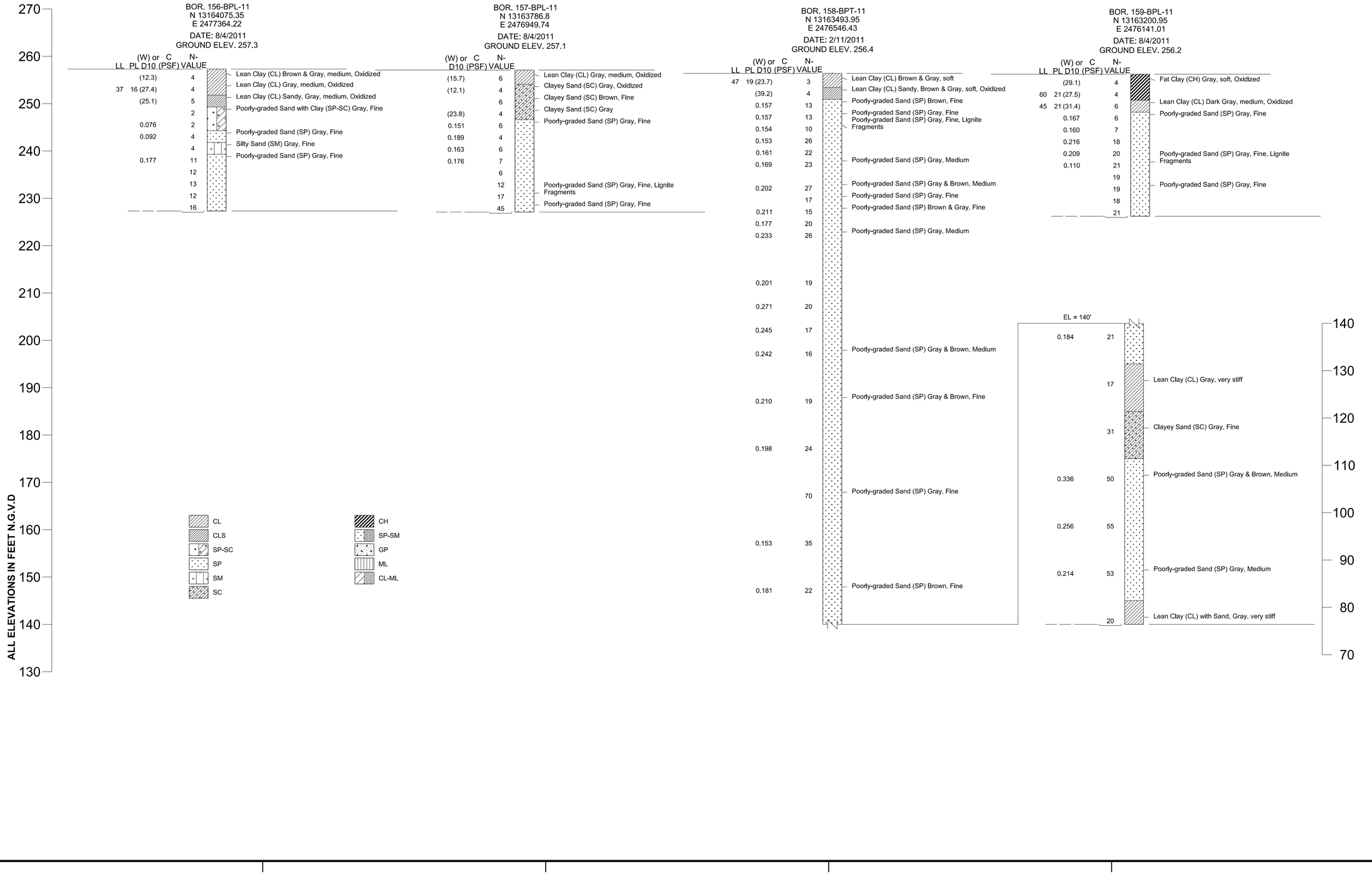

US Army Corps of Engineers®

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MARK	DESCRIPTION	DATE	APPR.

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CKD BY:
SUBMITTED BY:
DATE: 06/23/2017
SOLICITATION NO.:
CONTRACT NO.:
PLOT SCALE: 1=1
PLOT DATE: 6/23/2017
FILE NAME: BP_1 Fences22.dgn
SIZE: ANSI D
FILE NUMBER:

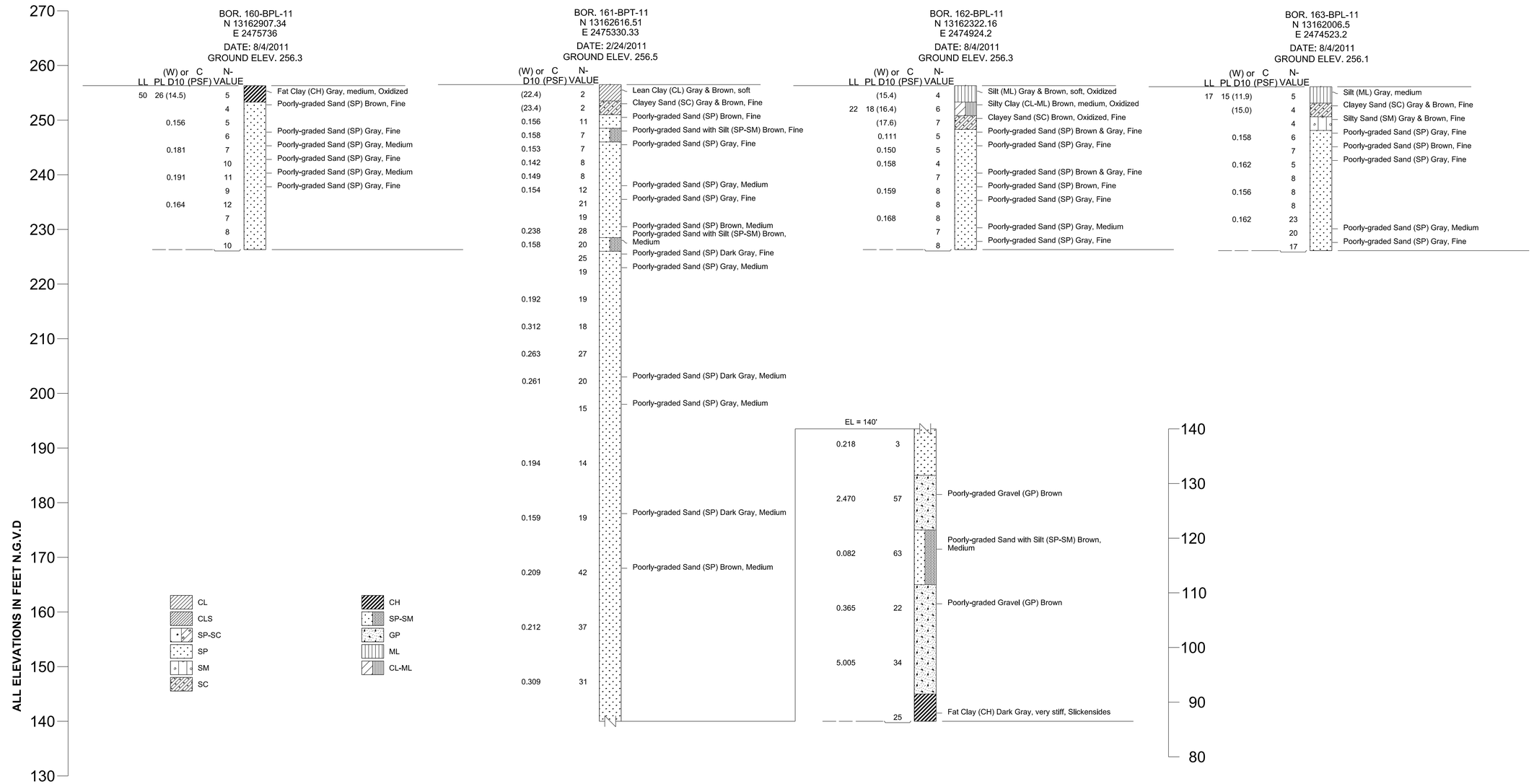
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

Land Side Fences
Levee Mile 22 (1)

Sheet ID
BP-047

auto_time



US Army Corps of Engineers

MARK	DESCRIPTION	DATE	APPR.

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U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

DESIGNED BY: | DATE: 06/23/2017
DWN BY: | CKD BY: | SOLICITATION NO.:
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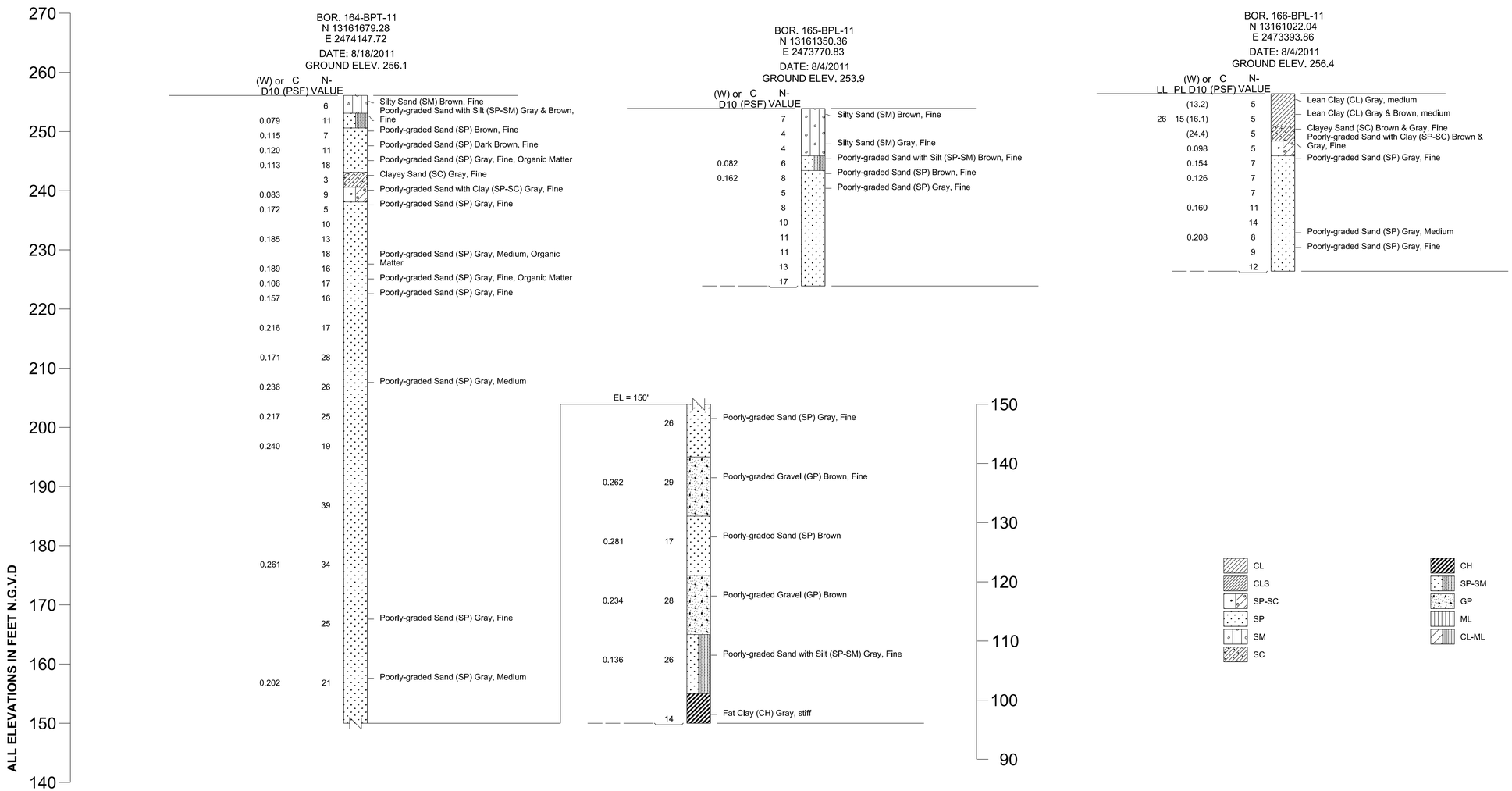
PLOT SCALE: 1" = 10' | PLOT DATE: 06/23/2017 | FILE NUMBER:
SIZE: ANSI D | FILE NAME: BP_I_Fences22.dgn

Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

Land Side Fences
Levee Mile 22 (2)

Sheet ID
BP-048



US Army Corps of Engineers®

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MARK	DESCRIPTION	DATE	APPR.

DESIGNED BY:
DWN BY:
CKD BY:
SUBMITTED BY:
DATE: 06/23/2017
SOLICITATION NO.:
CONTRACT NO.:
PLOT SCALE: 1=10'
PLOT DATE: 8/27/2017
FILE NAME: BP_1 Fences22.dgn
FILE NUMBER:
SIZE: ANSI D

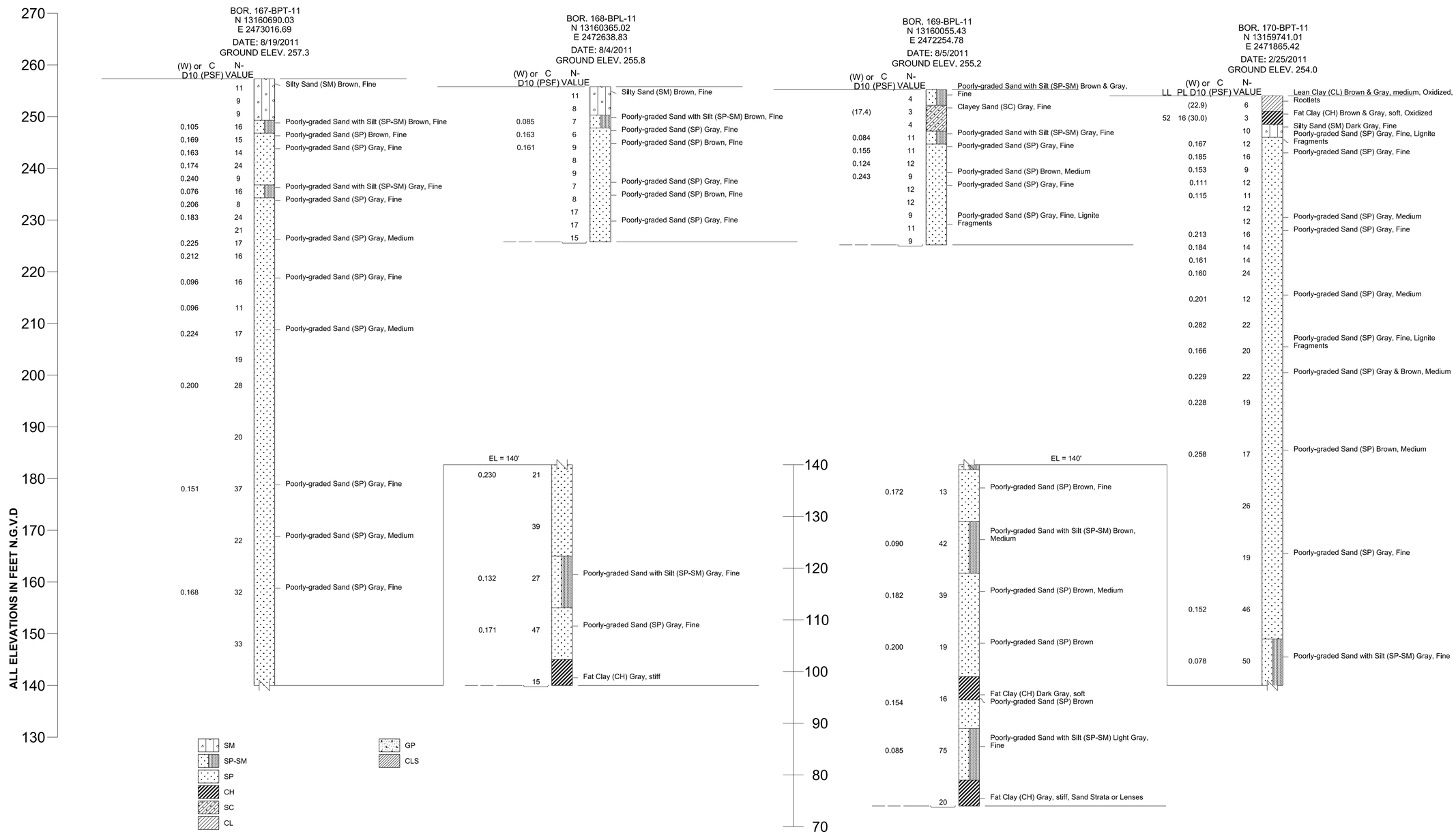
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

Land Side Fences
Levee Mile 22 (3)

Sheet ID
BP-049

auto_time



US Army Corps of Engineers

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SUBMITTED BY: | CONTRACT NO.:
PLOT SCALE: 1" = 10' | PLOT DATE: 06/23/2017 | FILE NUMBER:
SIZE: ANSI D | FILE NAME: BP_LFences23.dgn

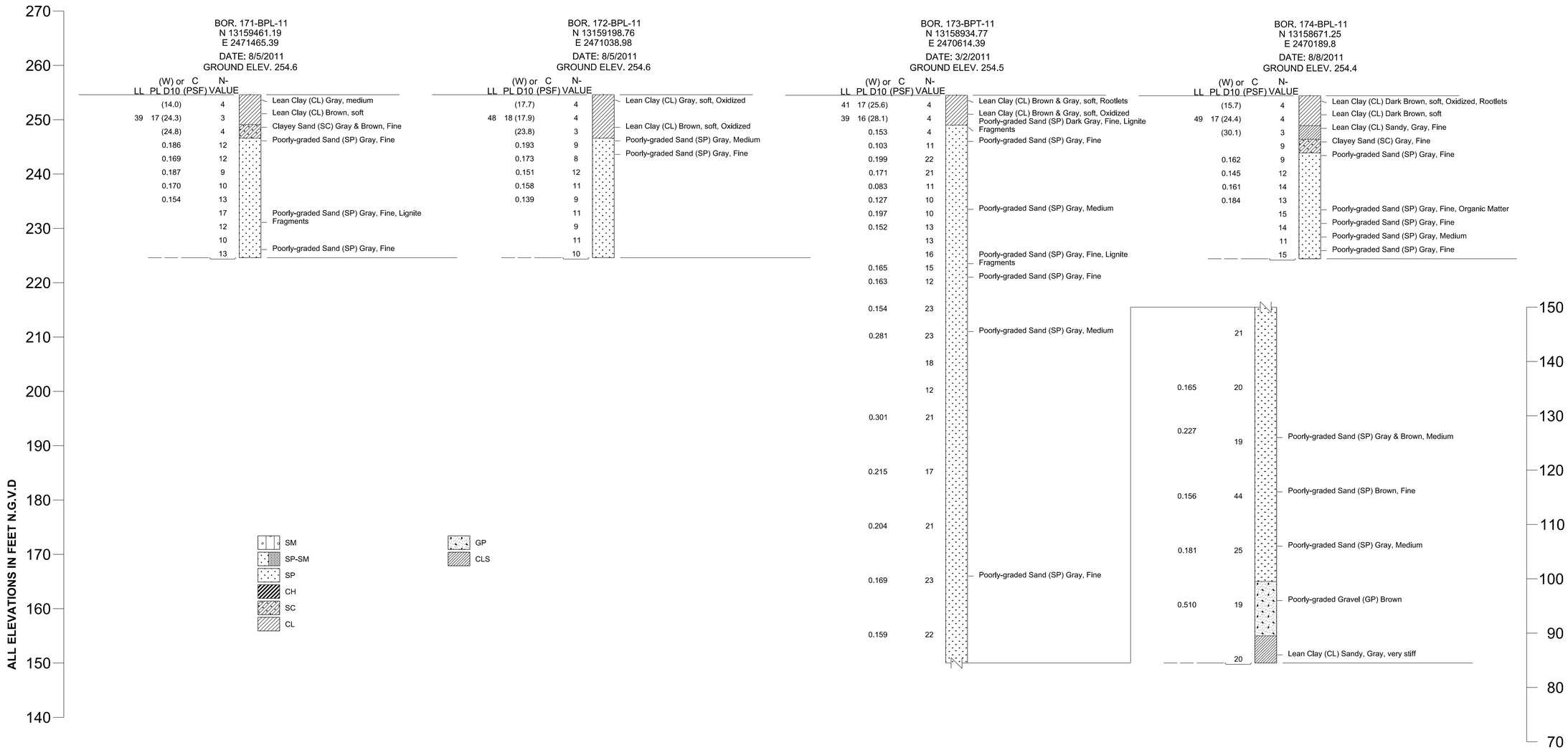
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

Land Side Fences
Levee Mile 23 (1)

Sheet ID
BP-050

auto_time



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DWN BY: | CKD BY: | SOLICITATION NO.:
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SIZE: ANSI D | FILE NAME: BP_LFences23.dgn

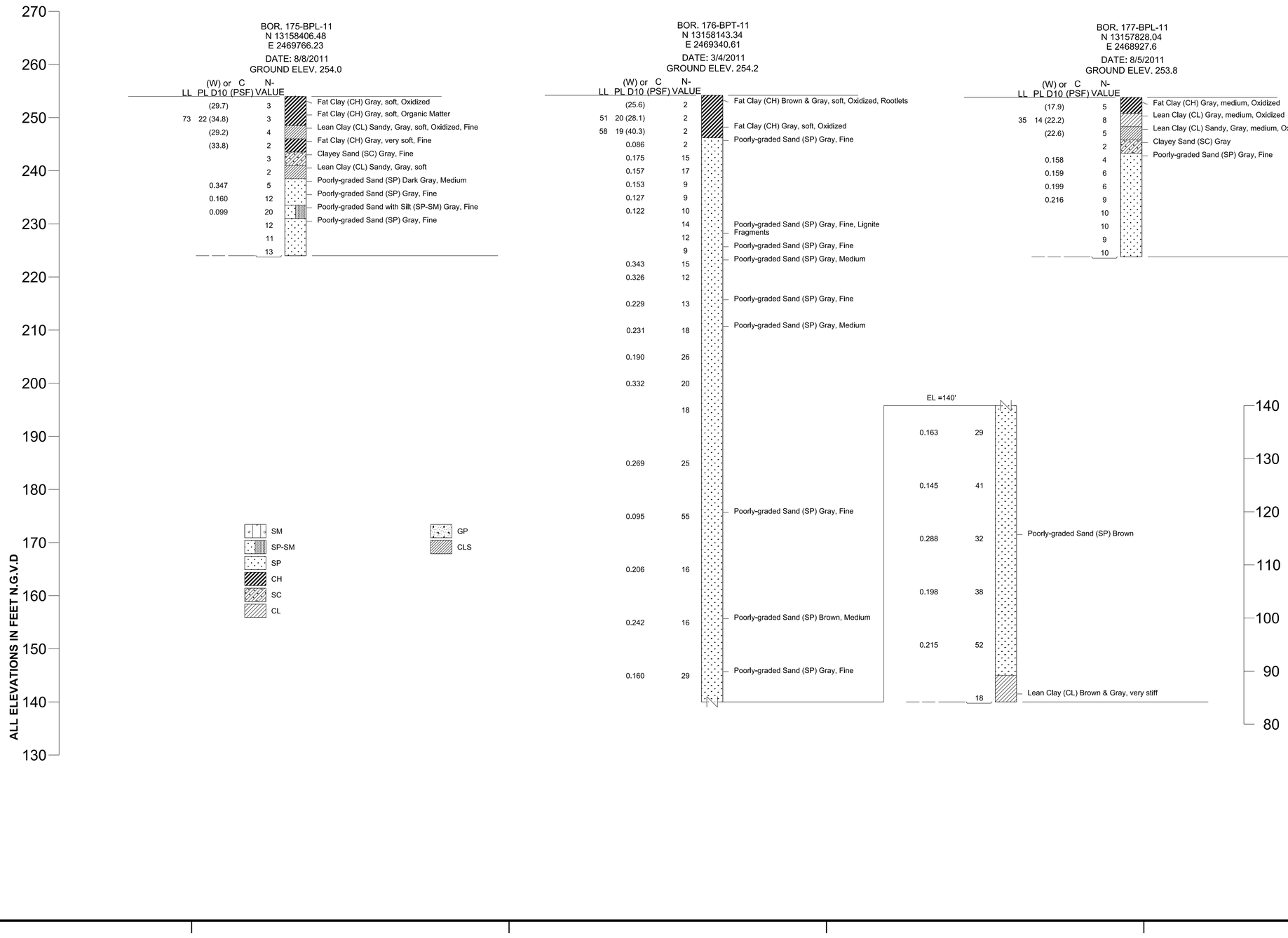
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

Land Side Fences
Levee Mile 23 (2)

Sheet ID
BP-051

auto_time



US Army Corps of Engineers®

MARK	DESCRIPTION	DATE	APPR.
MARK	DESCRIPTION	DATE	APPR.

DESIGNED BY:
DWN BY:
SUBMITTED BY:
CKD BY:
DATE: 08/23/2017
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:
PLOT SCALE: 1=1
PLOT DATE: 8/23/2017
SIZE: ANSI D
FILE NAME: BP_Fences23.dgn

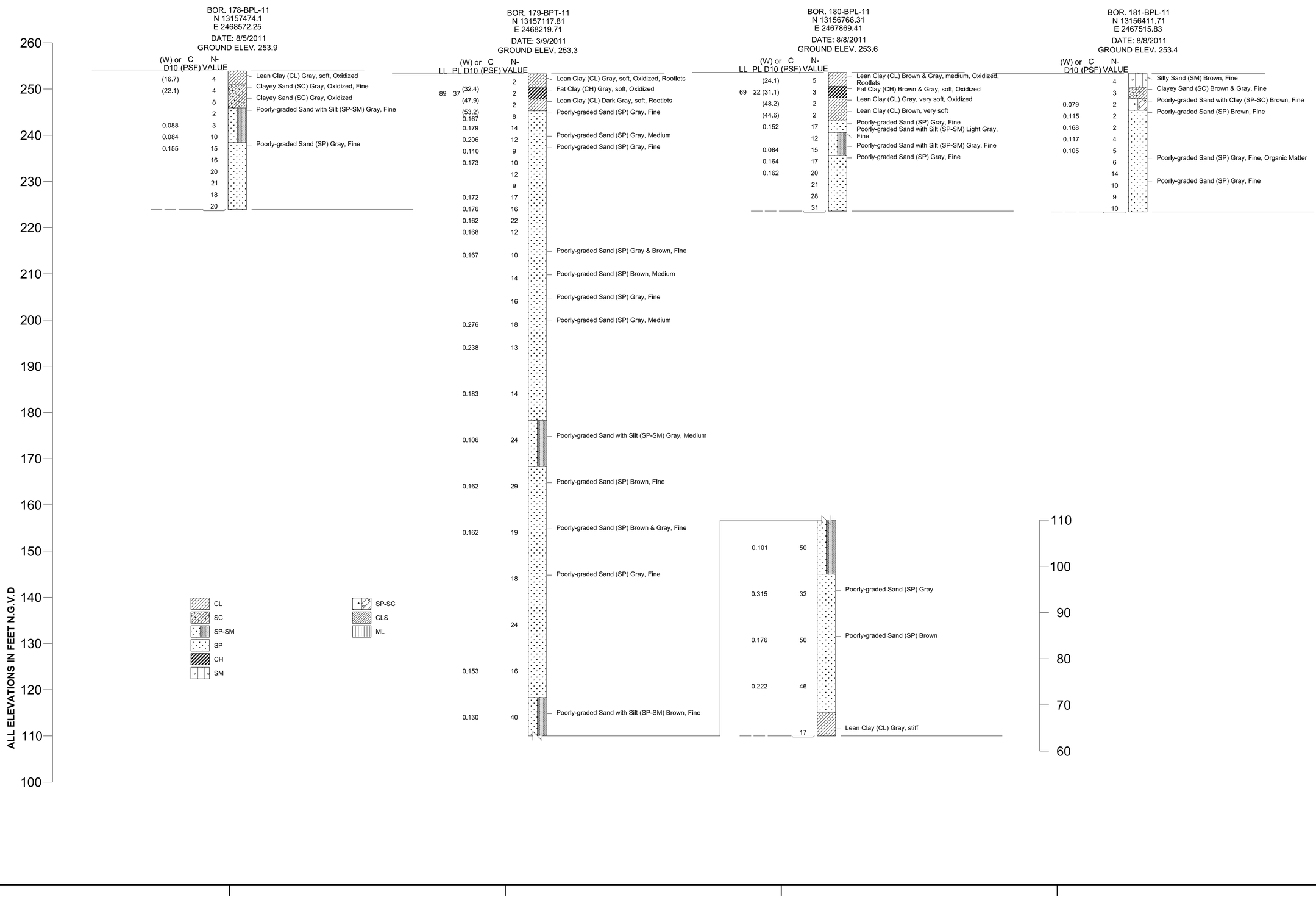
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

Land Side Fences
Levee Mile 23 (3)

Sheet ID
BP-052

auto_lime



US Army Corps of Engineers®

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DWN BY:
CKD BY:
SUBMITTED BY:
DATE: 06/23/2017
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:
PLOT SCALE: 1=10'
PLOT DATE: AUTO
SIZE: ANSI D
FILE NAME: BP_1 Fences24.dgn

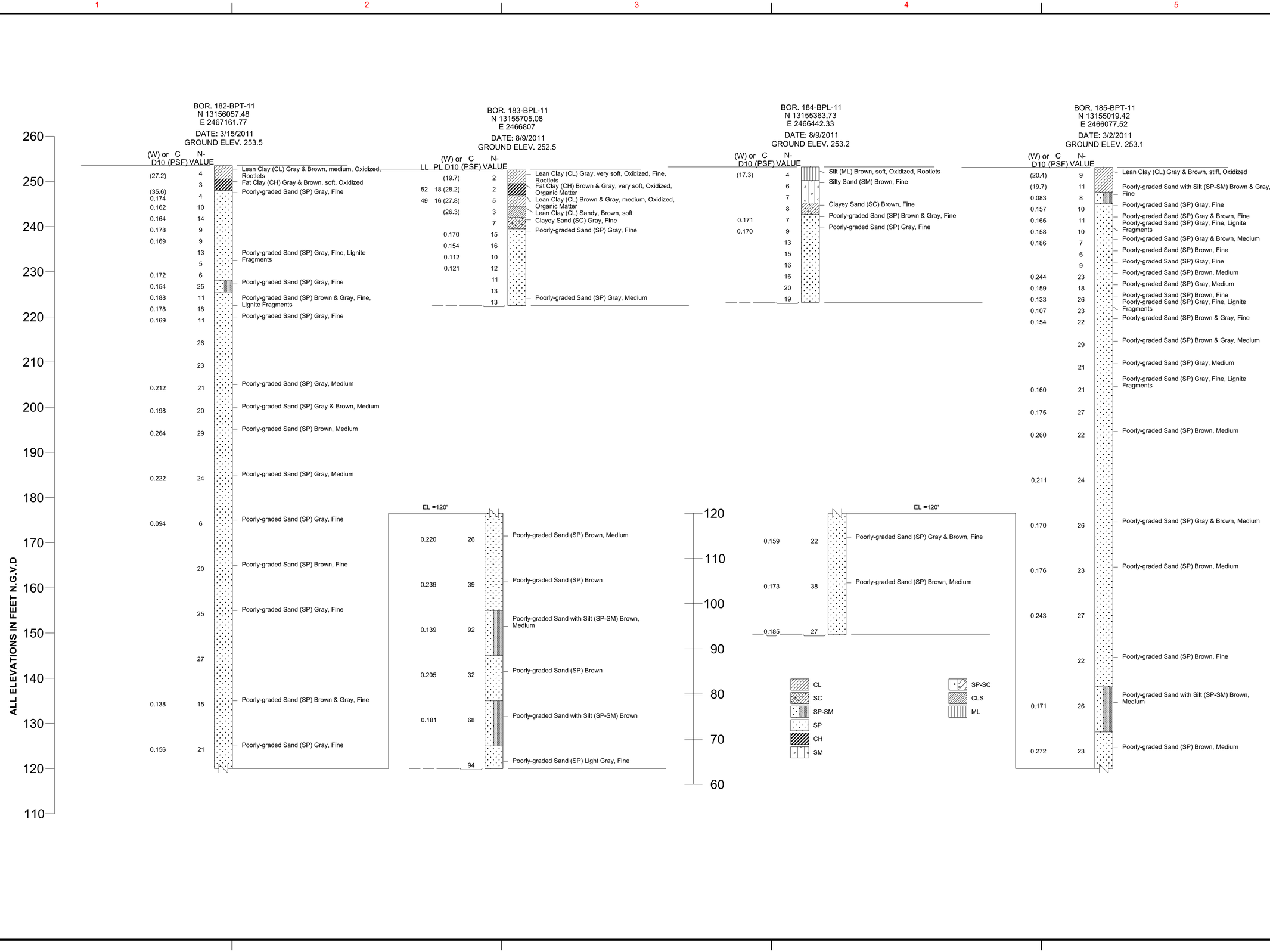
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

Land Side Fences
Levee Mile 24 (1)

Sheet ID
BP-053

auto_time



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MARK	DESCRIPTION	DATE	APPR.

DESIGNED BY:
DWN BY:
CKD BY:
SUBMITTED BY:
DATE: 09/22/2017
SOLICITATION NO.:
CONTRACT NO.:
PLOT SCALE: 1:1
PLOT DATE: 9/27/2017
FILE NAME: BP_LFences24.dgn
SIZE: ANSI D
FILE NUMBER:

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

Below Pitgoit Seepage Study
St. Francis Drainage District of Clay and Greene Counties

Land Side Fences
Levee Mile 24 (2)

Sheet ID
BP-054

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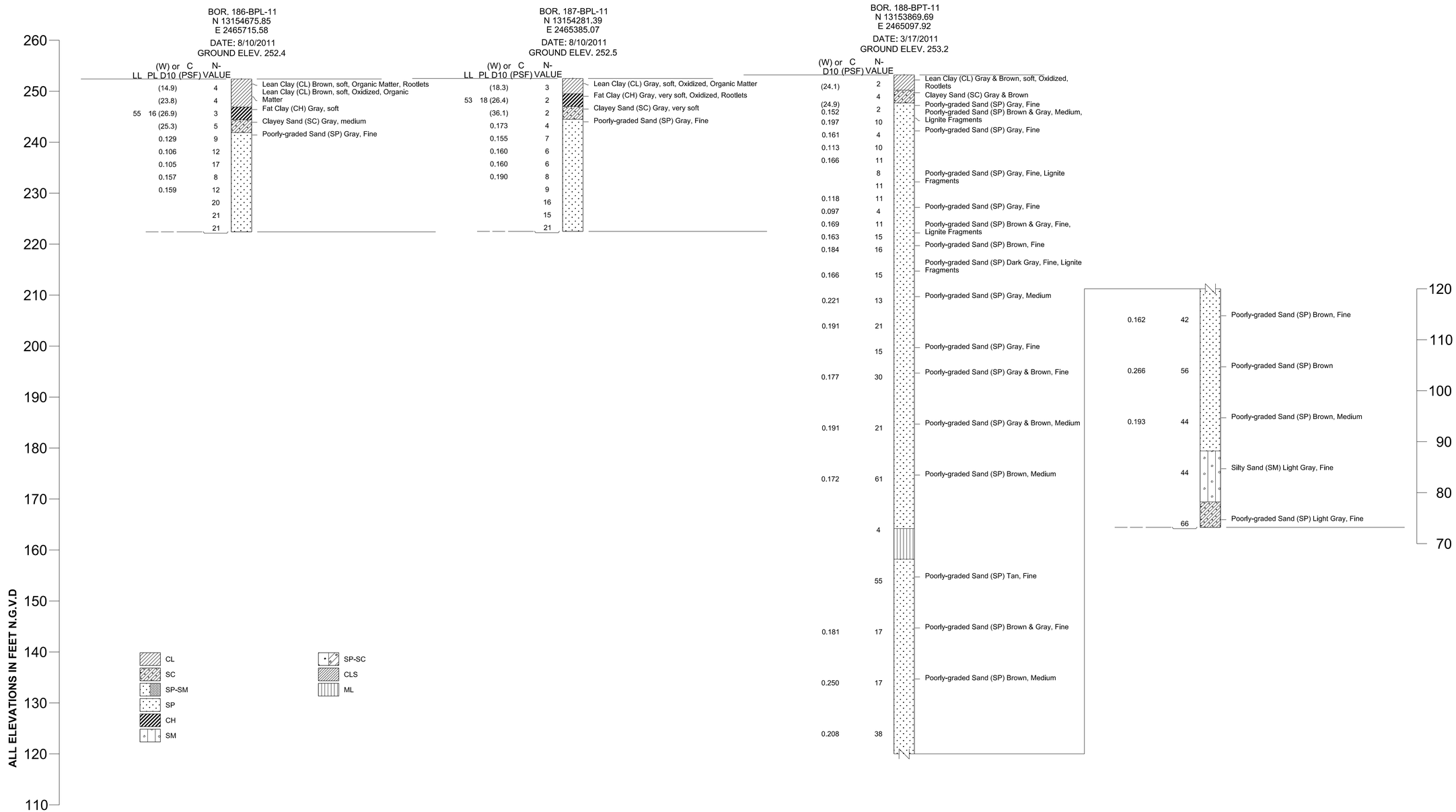


US Army Corps of Engineers

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

DESIGNED BY: | DATE: 06/23/2017
DWN BY: | CKD BY: | SOLICITATION NO.:
SUBMITTED BY: | CONTRACT NO.:
PLOT SCALE: 1" = 10' | PLOT DATE: 06/23/2017 | FILE NUMBER:
SIZE: ANSI D | FILE NAME: BP_I_Fences24.dgn

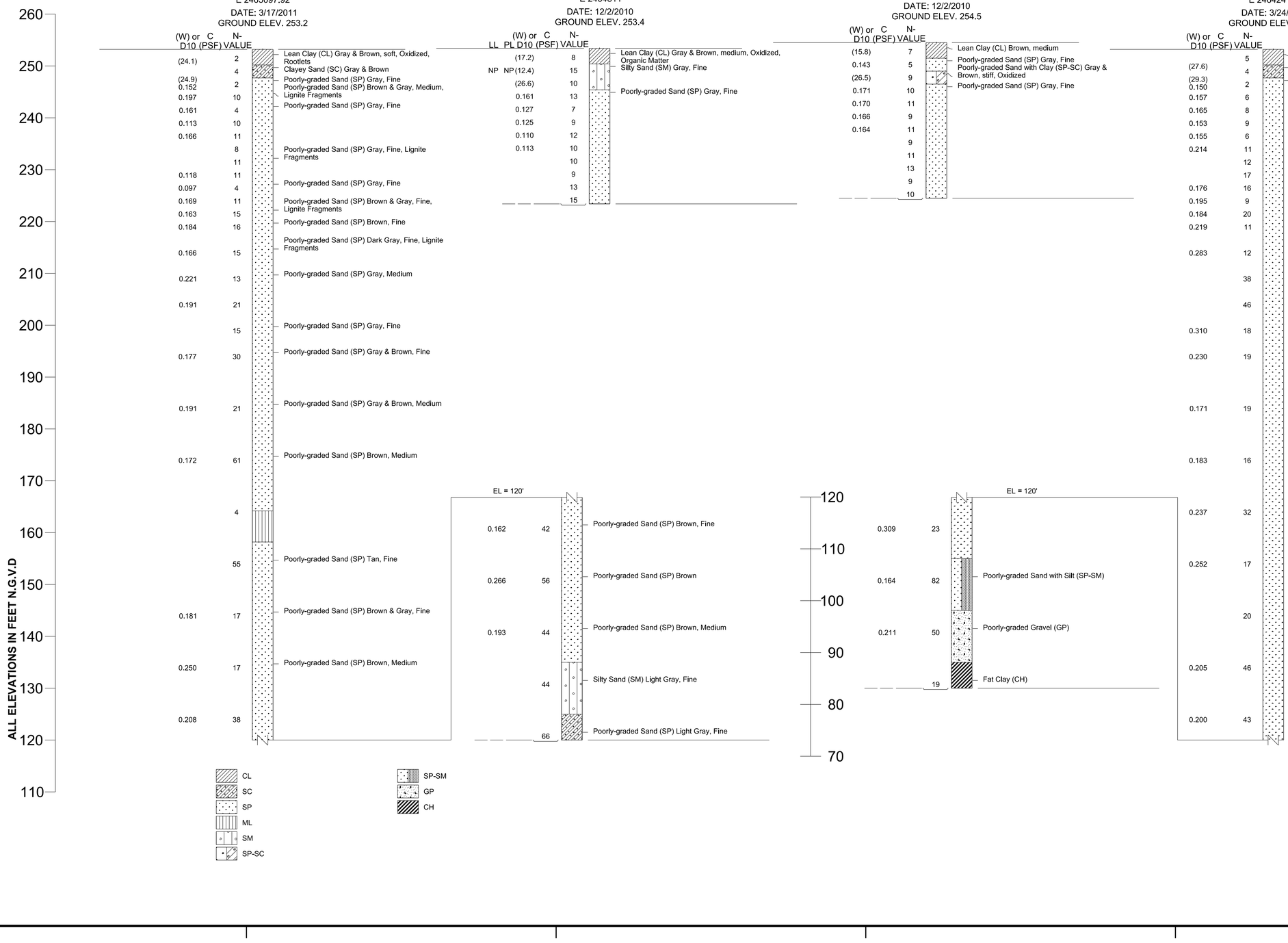
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

Land Side Fences
Levee Mile 24 (3)

Sheet ID
BP-055

auto_time



US Army Corps of Engineers®

DESCRIPTION	DATE	APPR.	MARK
DESCRIPTION	DATE	APPR.	MARK

DESIGNED BY:
DWN BY:
CKD BY:
SUBMITTED BY:
DATE: 06/23/2017
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:
PLOT SCALE: 1=10'
PLOT DATE: 6/27/2017
SIZE: ANSI D
FILE NAME: BP_1 Fences25.dgn

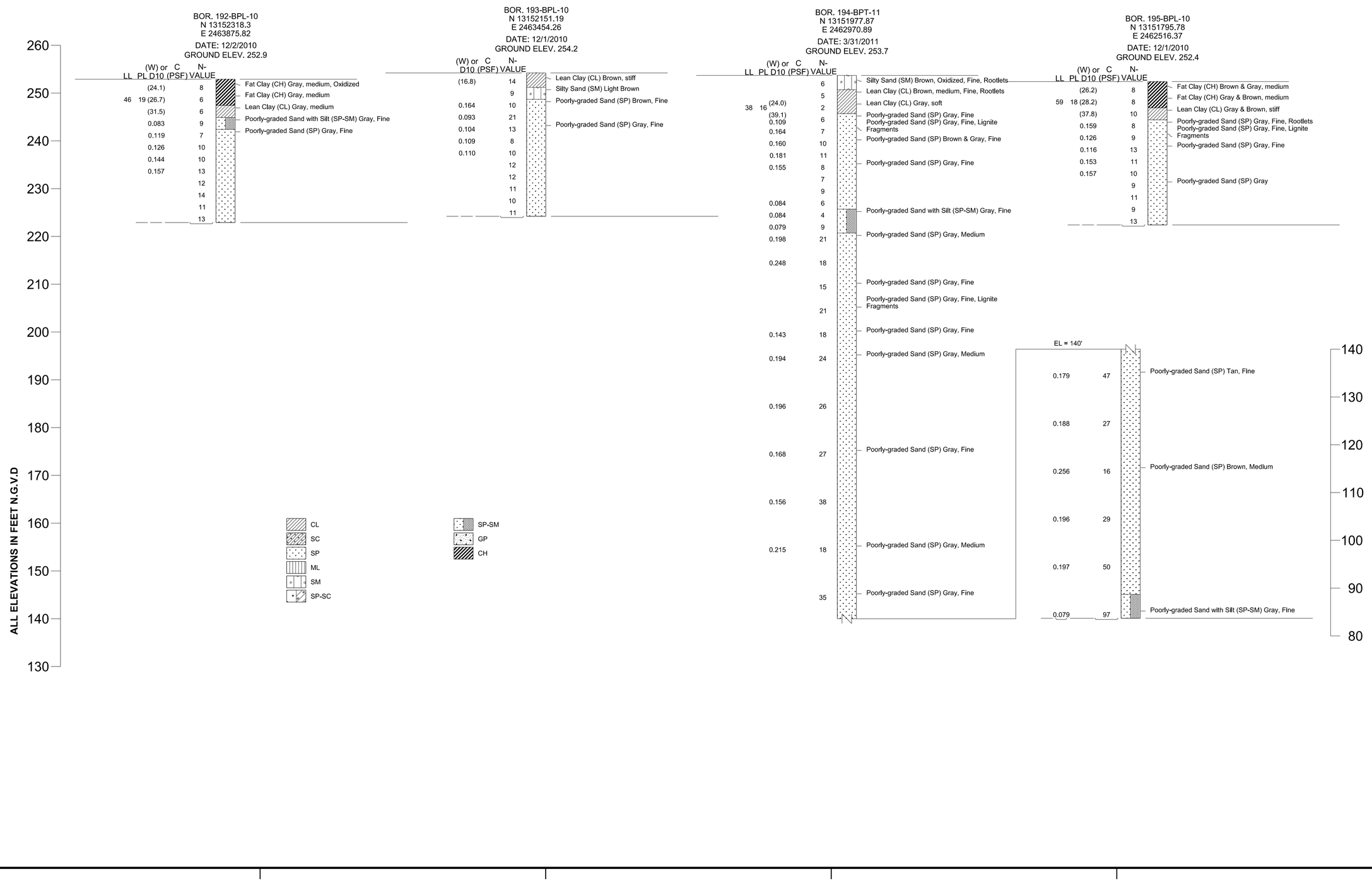
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

Land Side Fences
Levee Mile 25 (1)

Sheet ID
BP-056

auto_time



US Army Corps of Engineers®

MARK	DESCRIPTION	DATE	APPR.
MARK	DESCRIPTION	DATE	APPR.

DESIGNED BY:
DWN BY:
CKD BY:
SUBMITTED BY:
DATE: 08/23/2017
SOLICITATION NO.:
CONTRACT NO.:
PLOT SCALE: As Noted
PLOT DATE: As Noted
SIZE: ANSI D
FILE NUMBER:
FILE NAME: BP_1 Fences25.dgn

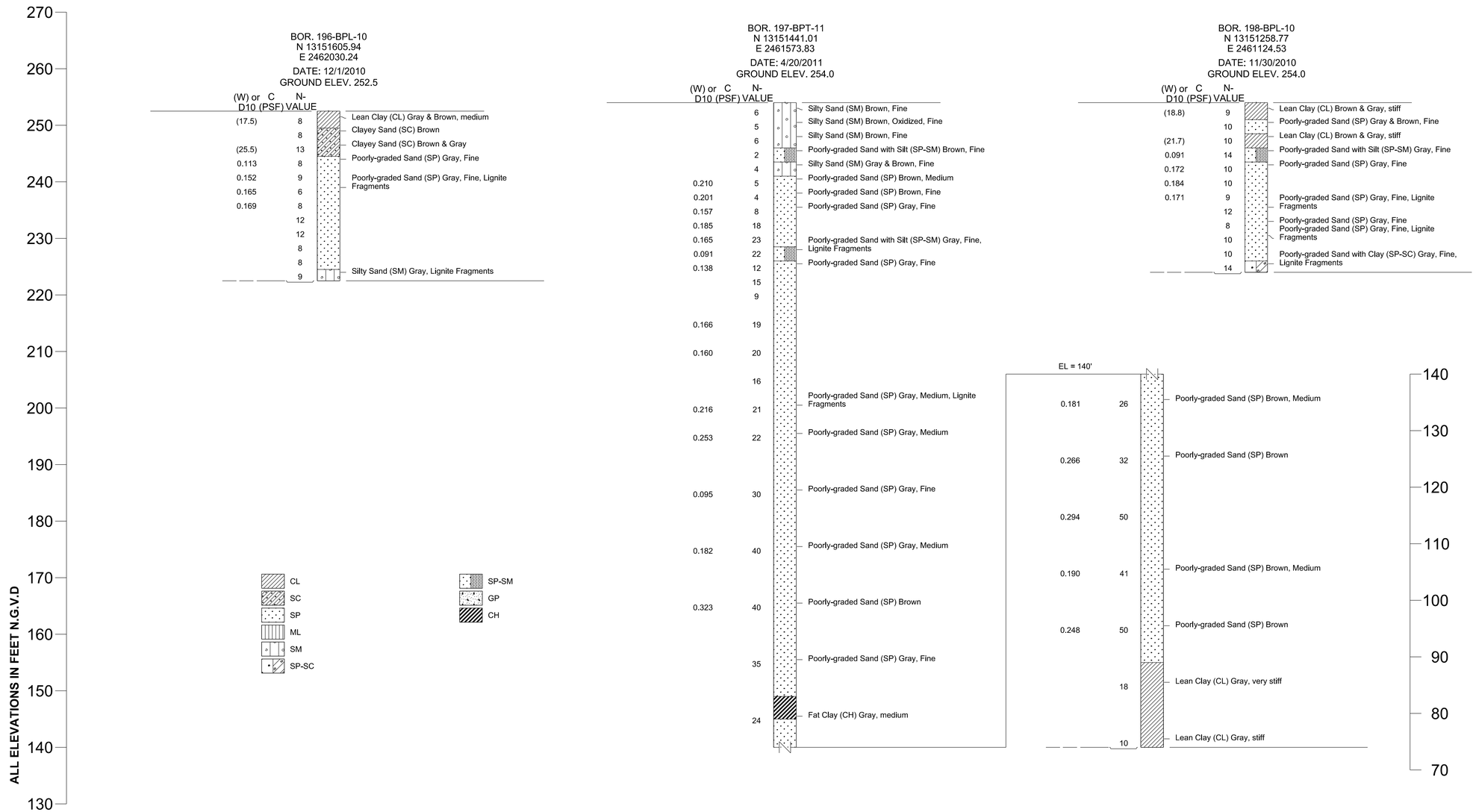
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

Land Side Fences
Levee Mile 25 (2)

Sheet ID
BP-057

auto_time



US Army Corps of Engineers

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MARK	DESCRIPTION	DATE	APPR.

DESIGNED BY: | DATE: 06/23/2017
DWN BY: | CKD BY: | SOLICITATION NO.:
SUBMITTED BY: | CONTRACT NO.:
PLOT SCALE: 1" = 10' | PLOT DATE: 06/23/2017 | FILE NUMBER:
SIZE: ANSI D | FILE NAME: BP_LFences25.dgn

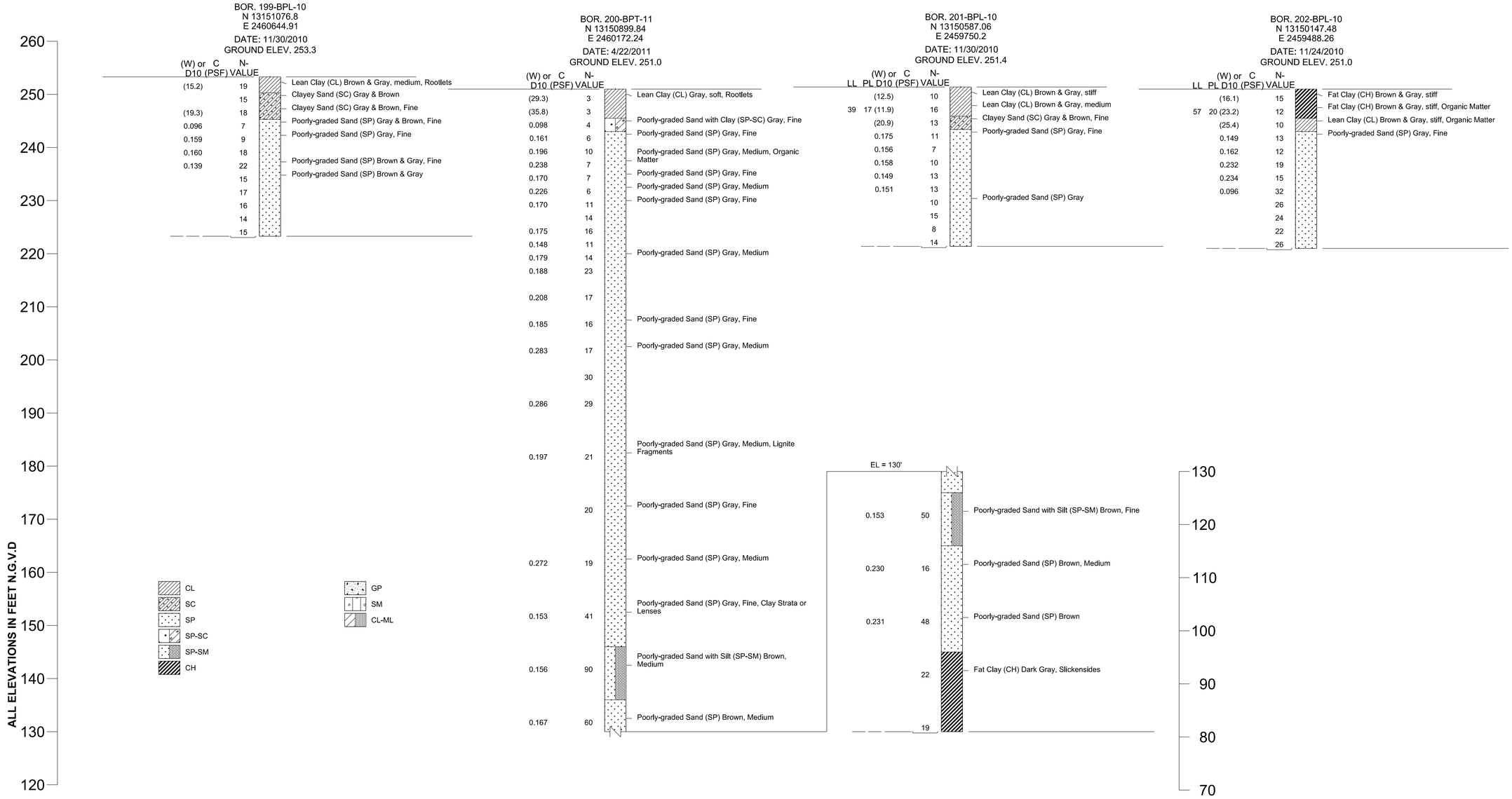
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

Land Side Fences
Levee Mile 25 (3)

Sheet ID
BP-058

auto_time



US Army Corps of Engineers

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MARK	DESCRIPTION	DATE	APPR.

DESIGNED BY: | DATE: 06/23/2017
DWN BY: | CKD BY: | SOLICITATION NO.:
SUBMITTED BY: | CONTRACT NO.:
PLOT SCALE: 1" = 10' | PLOT DATE: 06/23/2017 | FILE NUMBER:
SIZE: ANSI D | FILE NAME: BP_I_Fences26.dgn

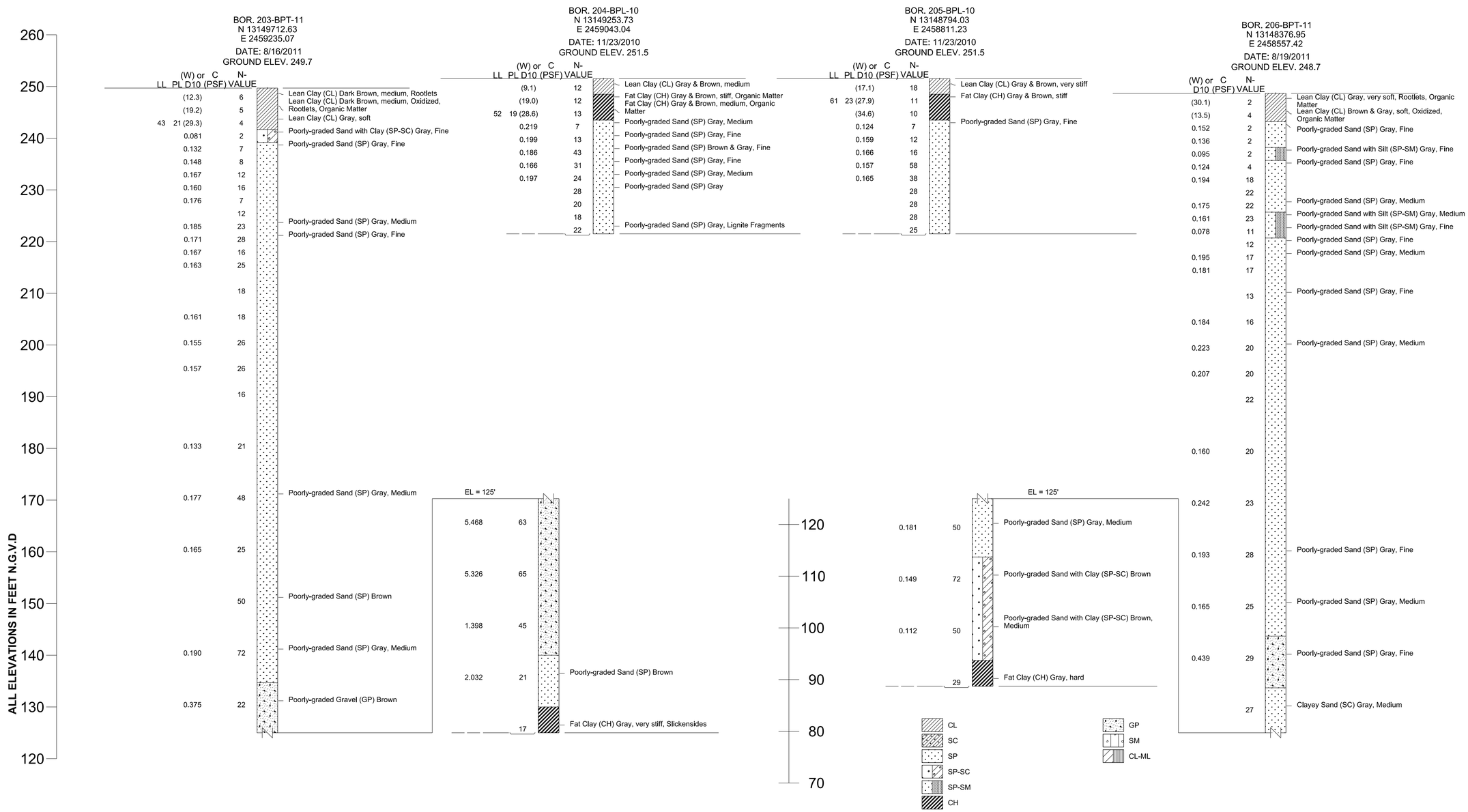
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

Land Side Fences
Levee Mile 26 (1)

Sheet ID
BP-059

auto_time



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MARK	DESCRIPTION	DATE	APPR.

DESIGNED BY: | DATE: 06/23/2017
DWN BY: | CKD BY: | SOLICITATION NO.:
SUBMITTED BY: | CONTRACT NO.:
PLOT SCALE: 1" = 10' | PLOT DATE: 06/23/2017 | FILE NUMBER:
SIZE: ANSI D | FILE NAME: BP_LFences26.dgn

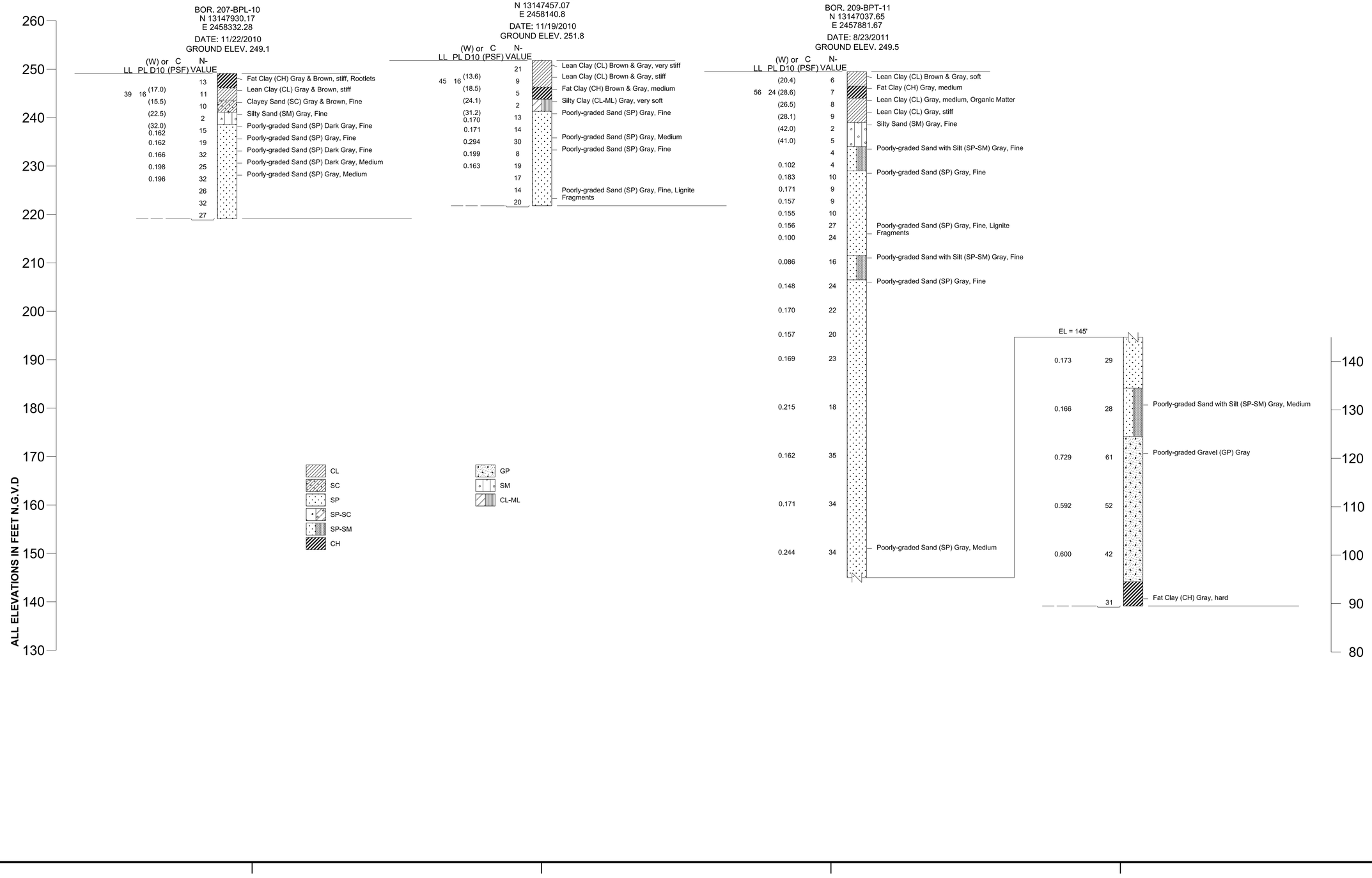
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

Land Side Fences
Levee Mile 26 (2)

Sheet ID
BP-060

auto_time



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MARK	DESCRIPTION	DATE	APPR.

DESIGNED BY:
DWN BY:
CKD BY:
SUBMITTED BY:
DATE: 08/23/2017
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:
PLOT SCALE: 1:1
PLOT DATE: 8/23/2017
SIZE: ANSI D
FILE NAME: BP_1 Fences26.dgn

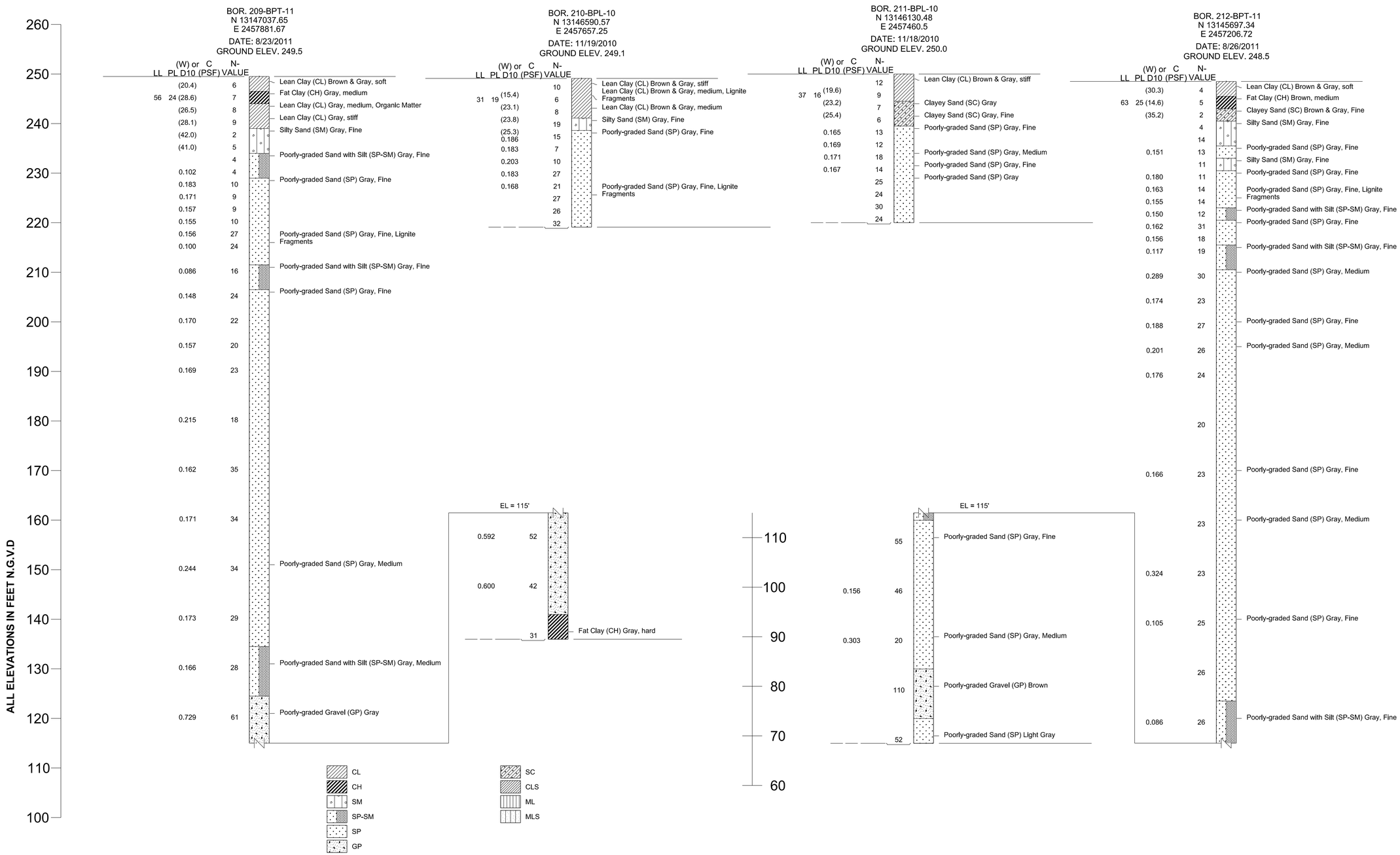
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

Land Side Fences
Levee Mile 26 (3)

Sheet ID
BP-061

auto_time



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MARK	DESCRIPTION	DATE	APPR.

DESIGNED BY: | DATE: 08/23/2017
DWN BY: | CKD BY: | SOLICITATION NO.:
SUBMITTED BY: | CONTRACT NO.:
PLOT SCALE: 1" = 10' | PLOT DATE: 08/23/2017 | FILE NUMBER:
SIZE: ANSI D | FILE NAME: BP_LFences27.dgn

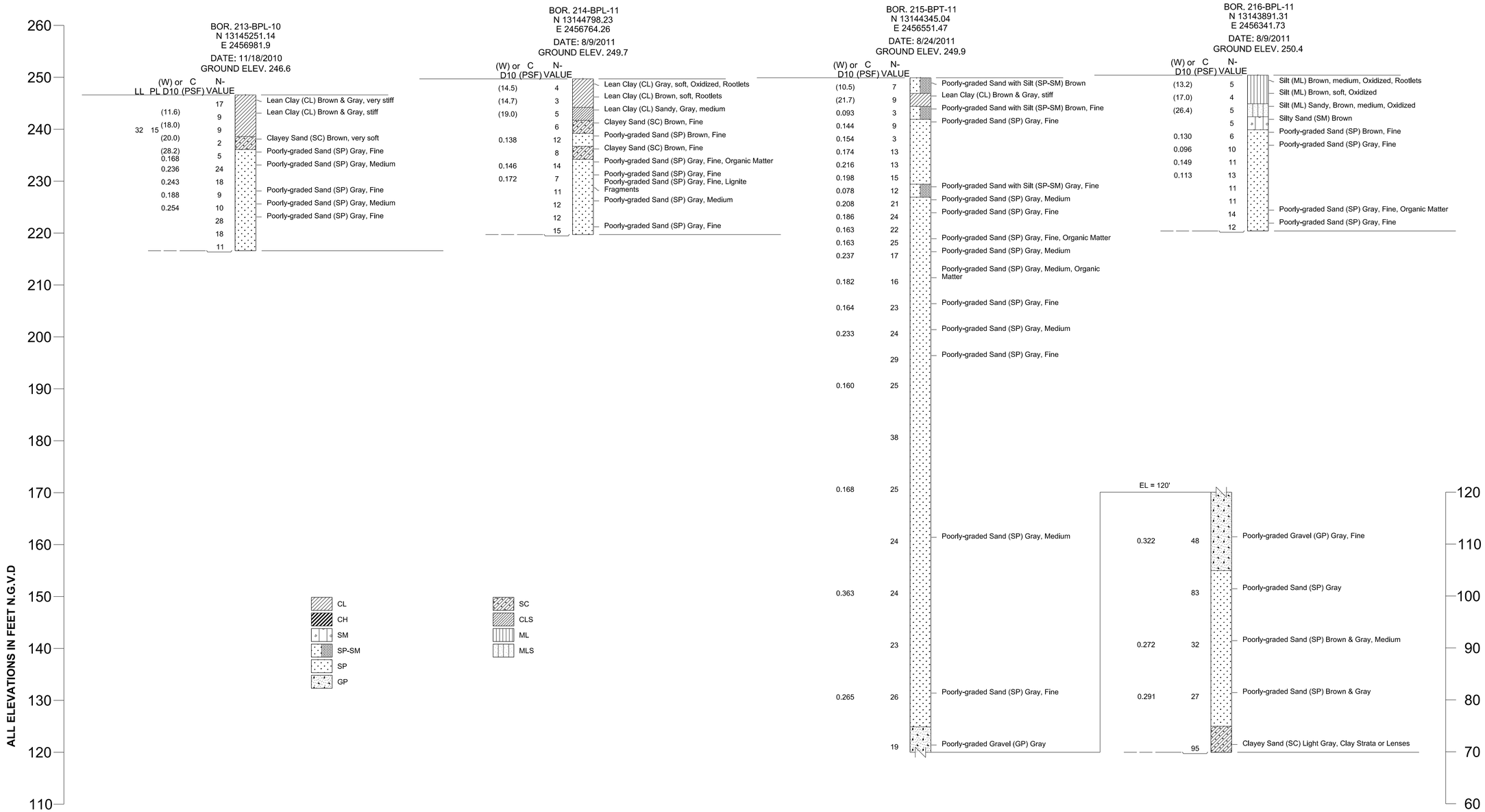
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

Land Side Fences
Levee Mile 27 (1)

Sheet ID
BP-062

auto_time



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U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

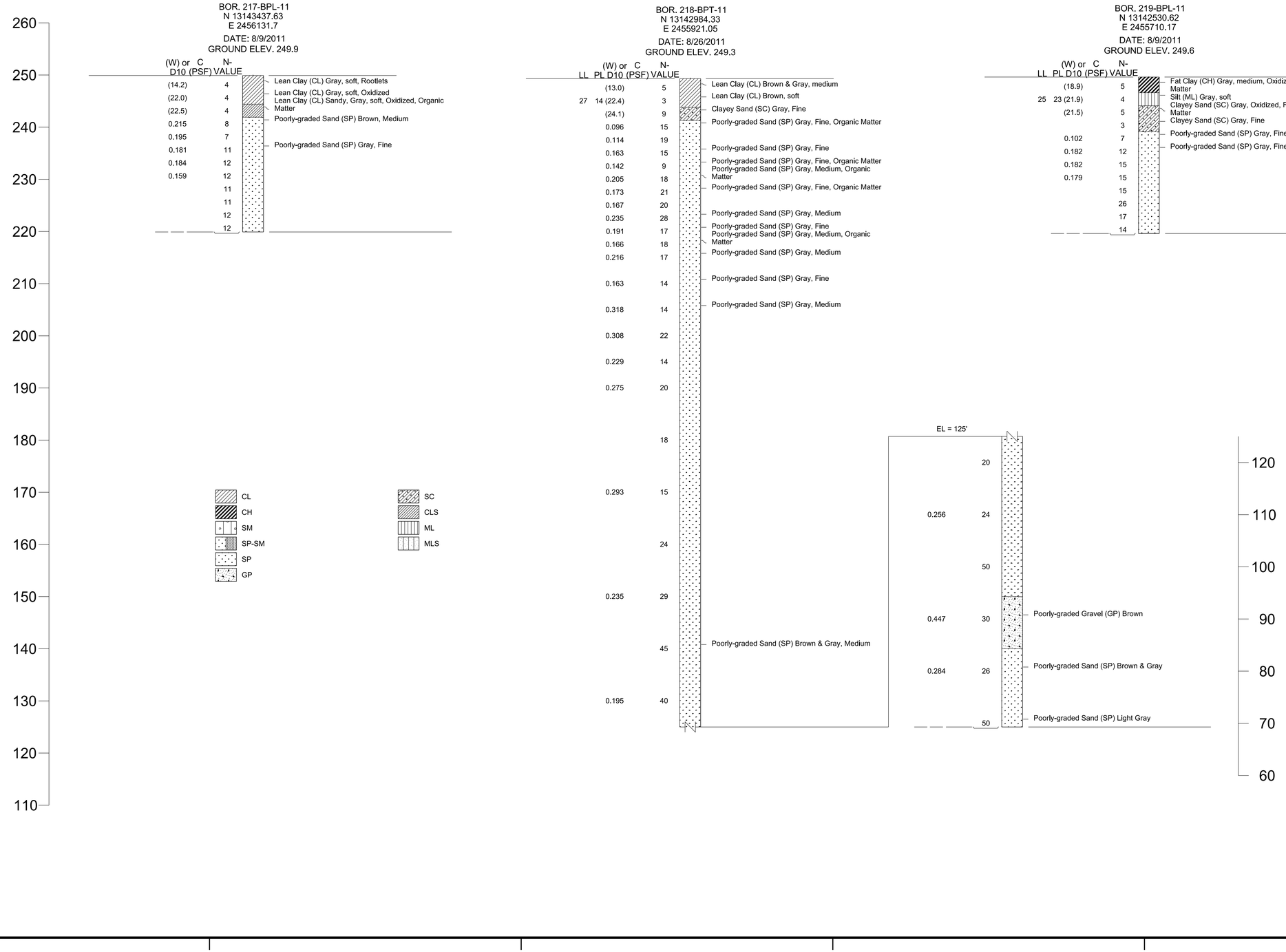
DESIGNED BY: | DATE: 06/23/2017
DWN BY: | CKD BY: | SOLICITATION NO.:
SUBMITTED BY: | CONTRACT NO.:
PLOT SCALE: 1" = 10' | PLOT DATE: 06/23/2017 | FILE NUMBER:
SIZE: ANSI D | FILE NAME: BP_I_Fences27.dgn

Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

Land Side Fences
Levee Mile 27 (2)

Sheet ID
BP-063

auto_time



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MARK	DATE	APPR.	DESCRIPTION

DESIGNED BY:
DWN BY:
SUBMITTED BY:
CKD BY:
DATE: 08/23/2017
SOLICITATION NO.:
CONTRACT NO.:
PLOT SCALE: 1=1
PLOT DATE: 8/23/2017
SIZE: ANSI D
FILE NUMBER:
FILE NAME: BP_Fences27.dgn

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

Land Side Fences
Levee Mile 27 (3)

Sheet ID
BP-064

auto_time

D C B A

260 250 240 230 220 210 200 190 180 170 160 150 140 130 120 110 100

BOR. 220-BPL-11
N 13142076.69
E 2455500.35
DATE: 8/9/2011
GROUND ELEV. 249.4

(W) or LL	C PL	D10 (PSF)	N-VALUE	
			8	Fat Clay (CH) Gray, medium, Oxidized, Organic Matter
(16.5)			4	Lean Clay (CL) Sandy, Gray, soft
(17.9)			5	Fat Clay (CH) Gray, medium, Oxidized
68	25	(26.4)	3	Clayey Sand (SC) Gray, Fine
			6	
		0.186	8	Poorly-graded Sand (SP) Gray, Fine
		0.156	9	
		0.162	18	
			13	
			10	
			9	
			16	

BOR. 221-BPT-11
N 13141622.43
E 2455290.64
DATE: 8/30/2011
GROUND ELEV. 249.1

(W) or LL	C PL	D10 (PSF)	N-VALUE	
		(13.5)	12	Lean Clay (CL) Brown, stiff
			6	Lean Clay (CL) Brown, medium
48	19	(19.3)	2	Silty Sand (SM) Gray, Fine
		(37.0)	10	Poorly-graded Sand with Silt (SP-SM) Gray, Fine
		0.151	15	Poorly-graded Sand (SP) Gray, Fine
		0.182	28	Poorly-graded Sand (SP) Gray, Medium
		0.166	25	Poorly-graded Sand (SP) Gray, Fine
		0.181	16	
		0.211	19	Poorly-graded Sand (SP) Gray, Medium
		0.201	26	
		0.209	16	
		0.109	17	Poorly-graded Sand (SP) Gray, Fine
			15	Poorly-graded Sand with Silt (SP-SM) Gray, Fine
		0.177	21	Poorly-graded Sand (SP) Gray, Fine
		0.183	15	Poorly-graded Sand (SP) Gray, Medium
		0.193	13	
		0.169	13	
		0.289	19	
		0.294	21	
			41	Poorly-graded Sand (SP) Gray, Fine
		0.193	27	
			37	
		0.166	27	
			39	Poorly-graded Sand (SP) Brown & Gray, Medium
		0.208	23	
			21	

BOR. 222-BPL-11
N 13141167.74
E 2455082.6
DATE: 8/10/2011
GROUND ELEV. 248.5

(W) or LL	C PL	D10 (PSF)	N-VALUE	
		(22.8)	9	Fat Clay (CH) Brown, stiff, Oxidized, Rootlets
		(21.3)	5	Lean Clay (CL) Gray, medium, Fine
		(16.9)	3	Clayey Sand (SC) Brown, Fine
		0.151	4	Poorly-graded Sand (SP) Gray, Fine
		0.153	5	
		0.153	5	
		0.157	6	
		0.174	9	
			13	
			19	
			9	
			13	
				EL = 115'
		0.307	17	
			42	Poorly-graded Gravel (GP) Brown & Gray, Fine
		0.423	64	Poorly-graded Sand (SP) Brown & Gray
		0.185	28	Poorly-graded Sand (SP) Brown & Gray, Medium
			63	Clayey Sand (SC) Light Gray, Fine

110 100 90 80 70 60

CH
CLS
SC
SP
CL
SM

SP-SM
GP
SP-SC

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MARK	DESCRIPTION	DATE	APPR.

DESIGNED BY:
DWN BY:
CKD BY:
SUBMITTED BY:
DATE: 08/23/2017
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:
PLOT SCALE: 1=1
PLOT DATE: 8/23/2017
SIZE: ANSI D
FILE NAME:

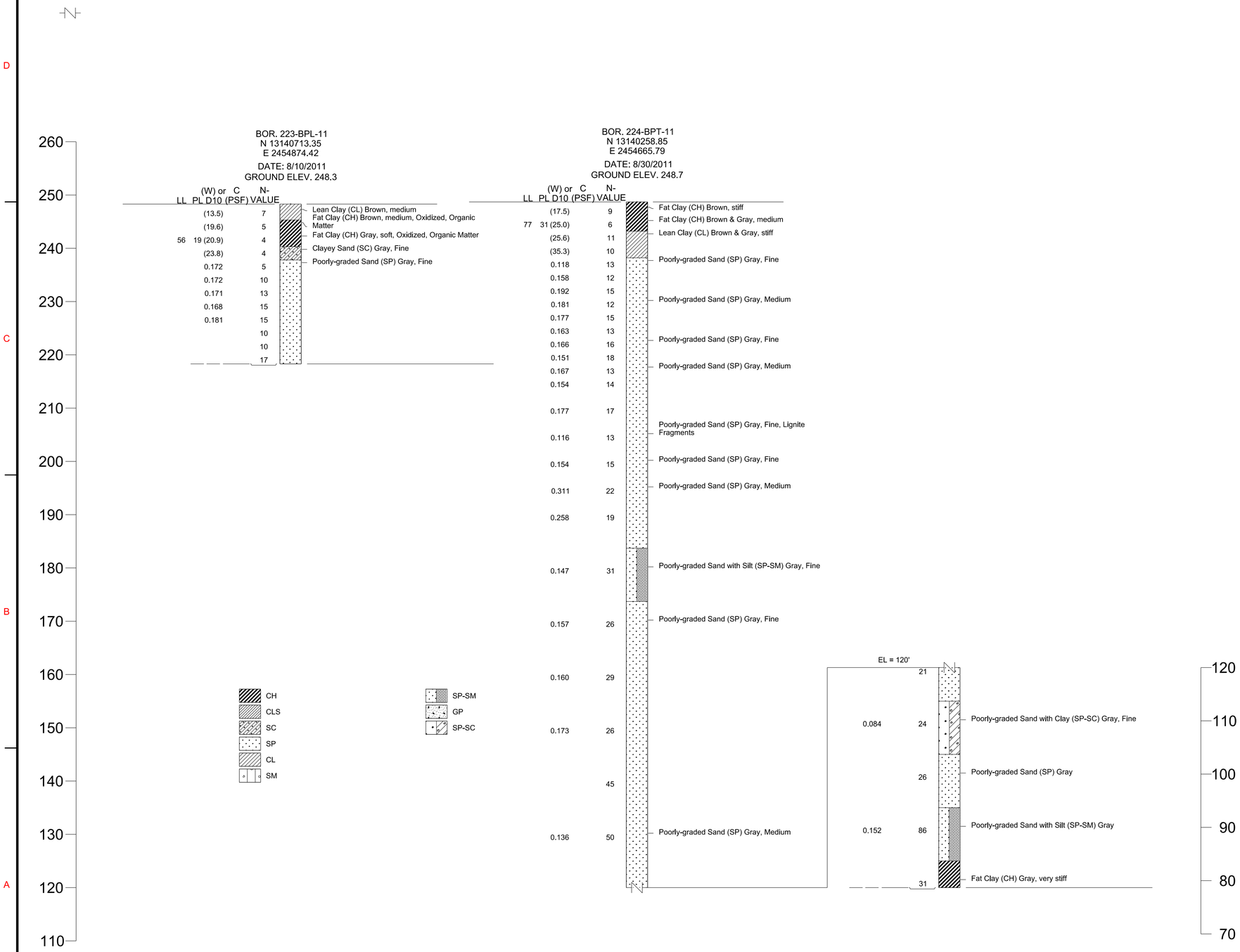
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

Land Side Fences
Levee Mile 28 (1)

Sheet ID
BP-065

auto_time



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MARK	DESCRIPTION	DATE	APPR.

DESIGNED BY: | DATE: 06/23/2017
DWN BY: | CKD BY: | SOLICITATION NO.:
SUBMITTED BY: | CONTRACT NO.:
PLOT SCALE: 1" = 10' | PLOT DATE: 06/23/2017 | FILE NUMBER:
SIZE: ANSI D | FILE NAME:

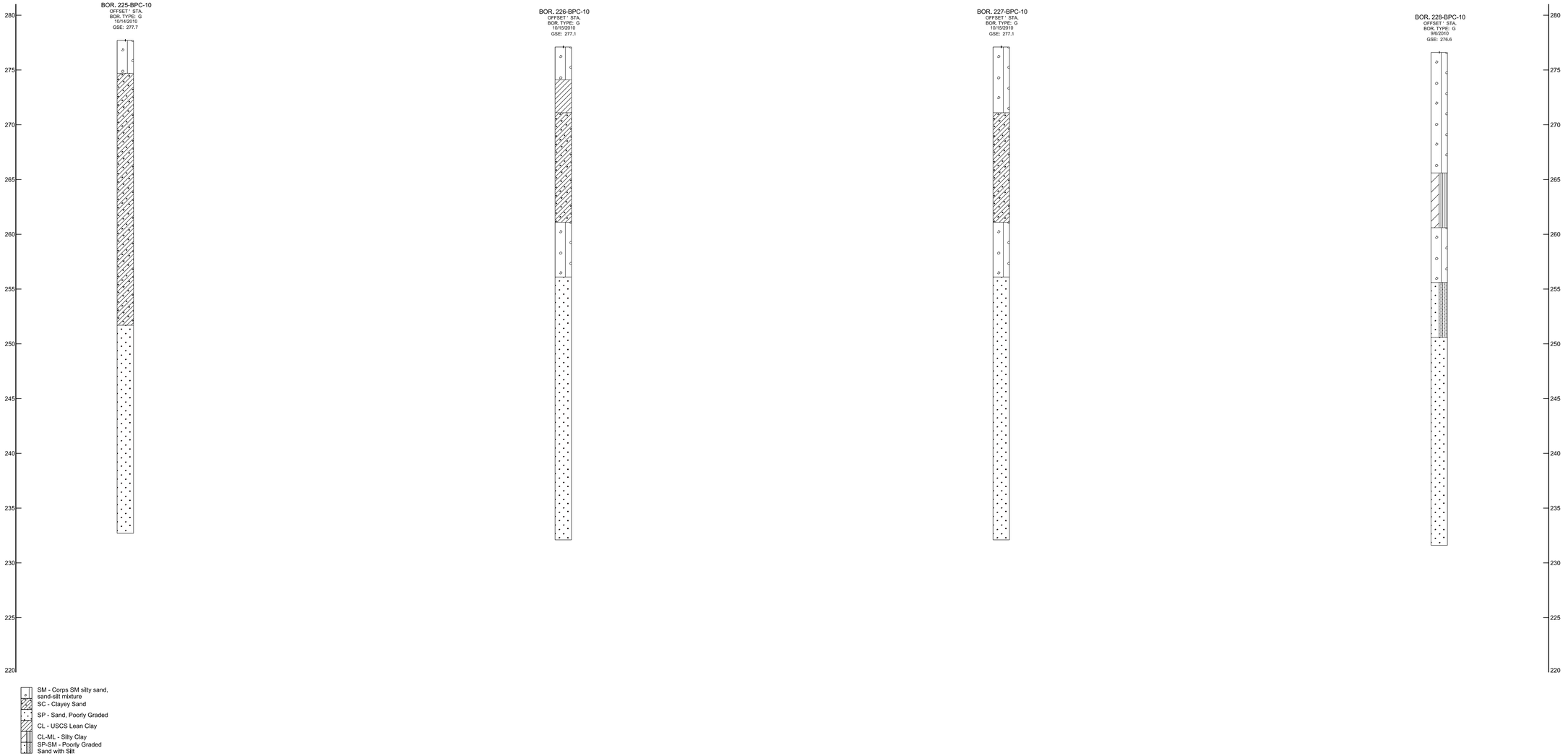
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

Land Side Fences
Levee Mile 28 (2)

Sheet ID
BP-066

auto_time



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MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

DESIGNED BY:
DWN BY:
SUBMITTED BY:

DATE: 08/23/2017
CKD BY:
PLOT DATE: 8/23/2017
PLOT SCALE: As Plotted
SIZE: ANSI D

SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:
FILE NAME: BP_CenterLine18.dgn

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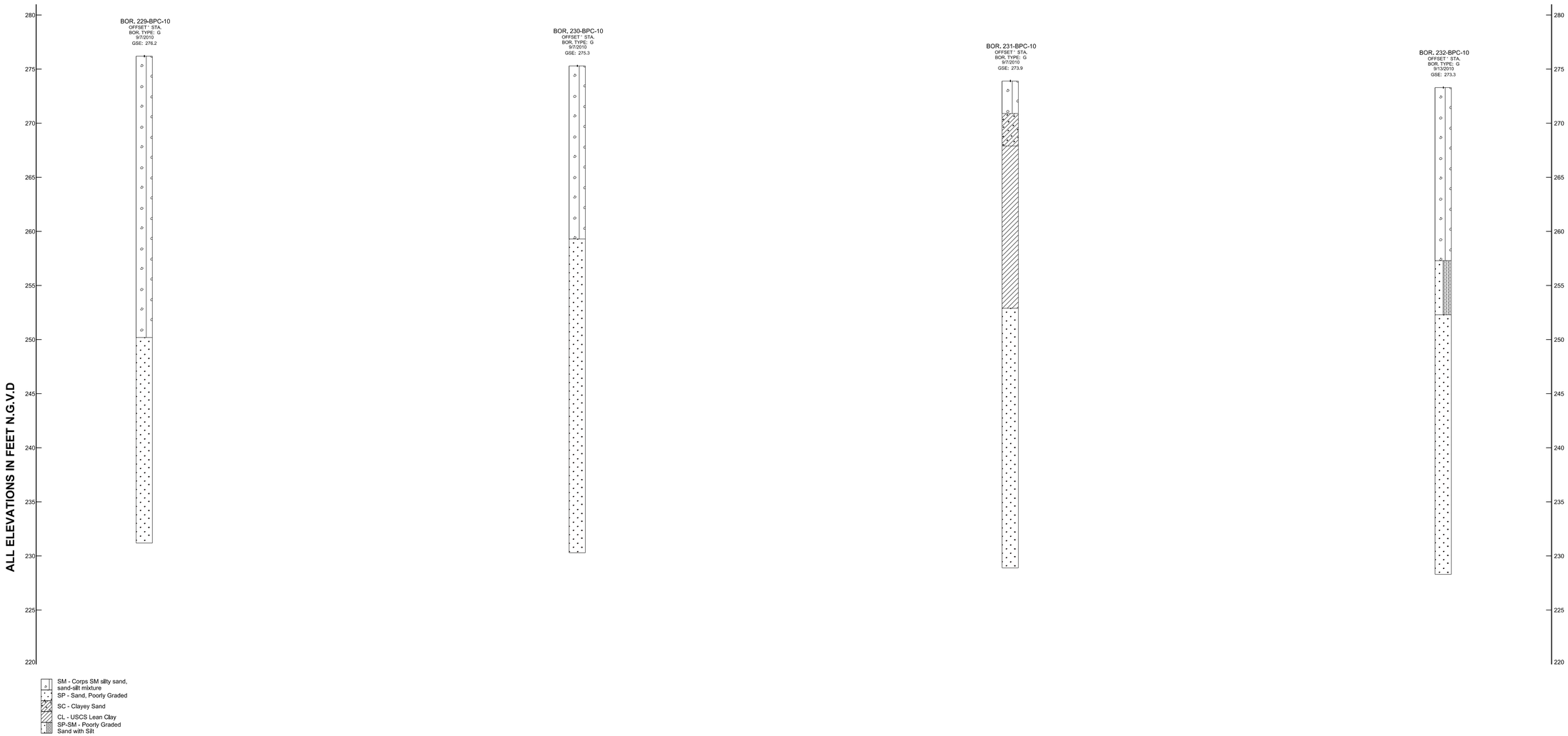
St. Francis Drainage District of Clay and Greene Counties

Center Line
Levee Mile 18

Sheet ID
BP-067

auto_time



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U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

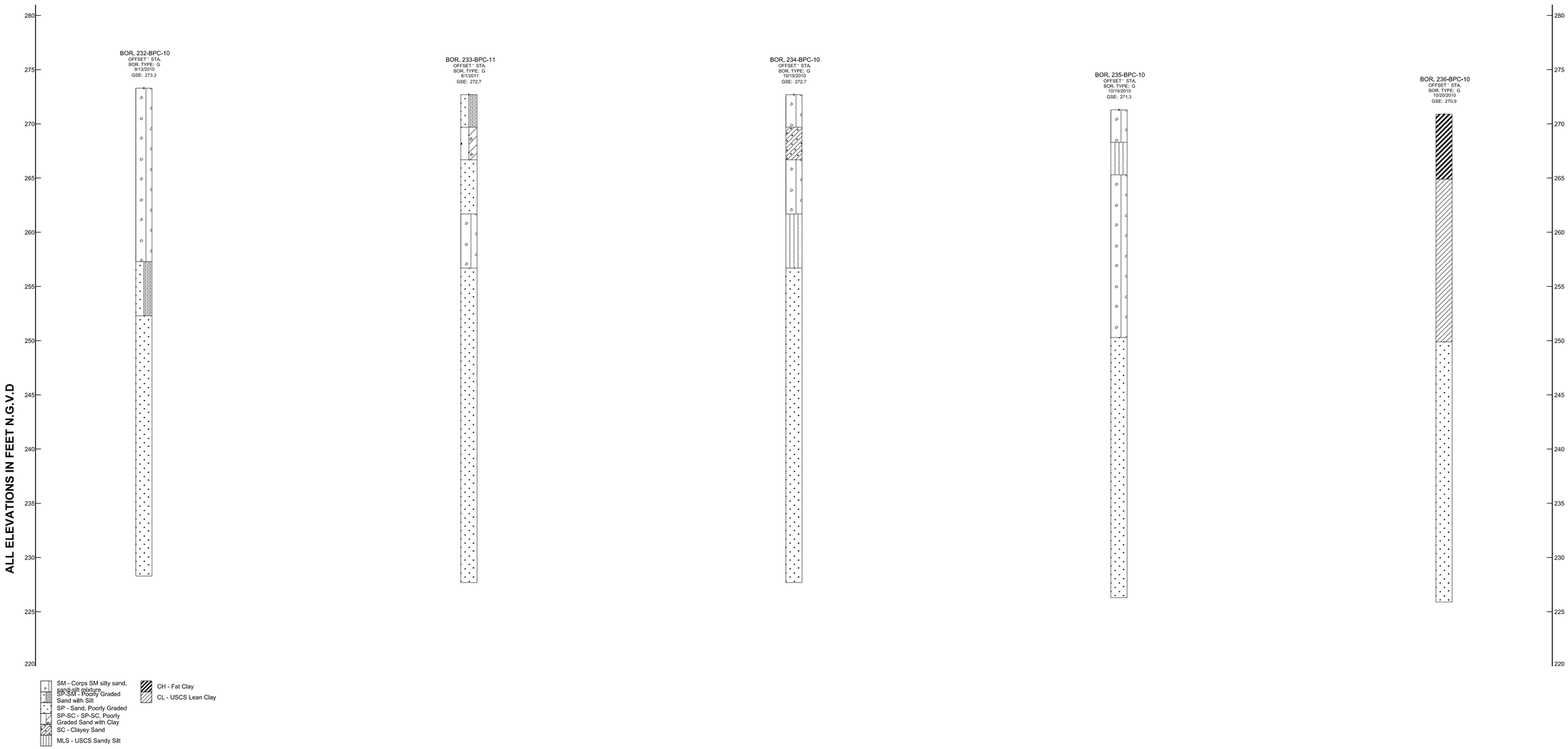
DESIGNED BY:
DWN BY:
CKD BY:
SUBMITTED BY:
PLOT SCALE: 1" = 10'
PLOT DATE: 06/23/2017
SIZE: ANSI D
FILE NAME: BP_Centerline19.dgn
DATE: 06/23/2017
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

Center Line
Levee Mile 19

Sheet ID
BP-068

auto_time



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MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

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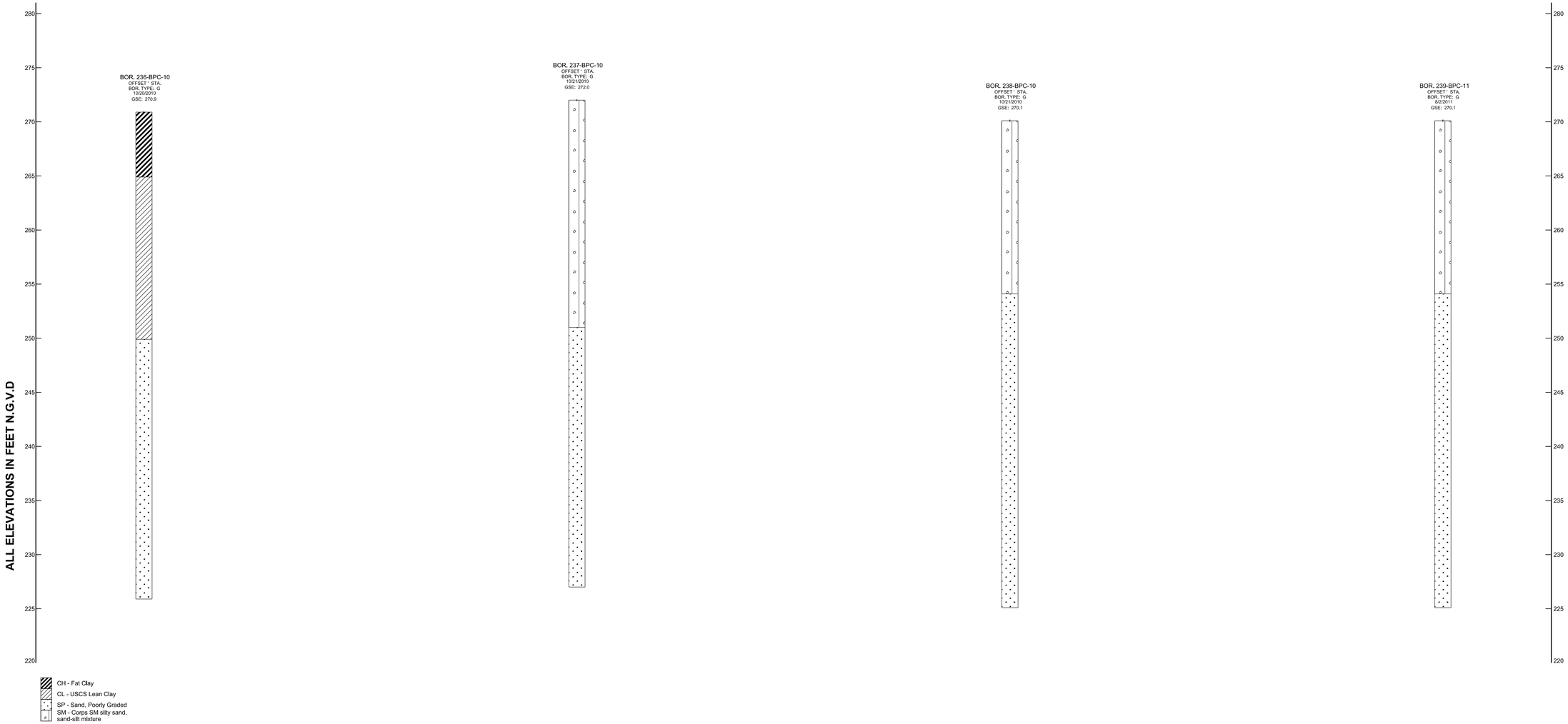
PLOT DATE: 06/23/2017
SIZE: ANSI D
FILE NAME: BP_Centerline20.dgn
DATE: 06/23/2017
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

Center Line
Levee Mile 20

Sheet ID
BP-069

auto_time



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U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

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SUBMITTED BY:
PLOT SCALE: 1" = 10'
PLOT DATE: 06/23/2017
SIZE: ANSI D
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DATE: 06/23/2017
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

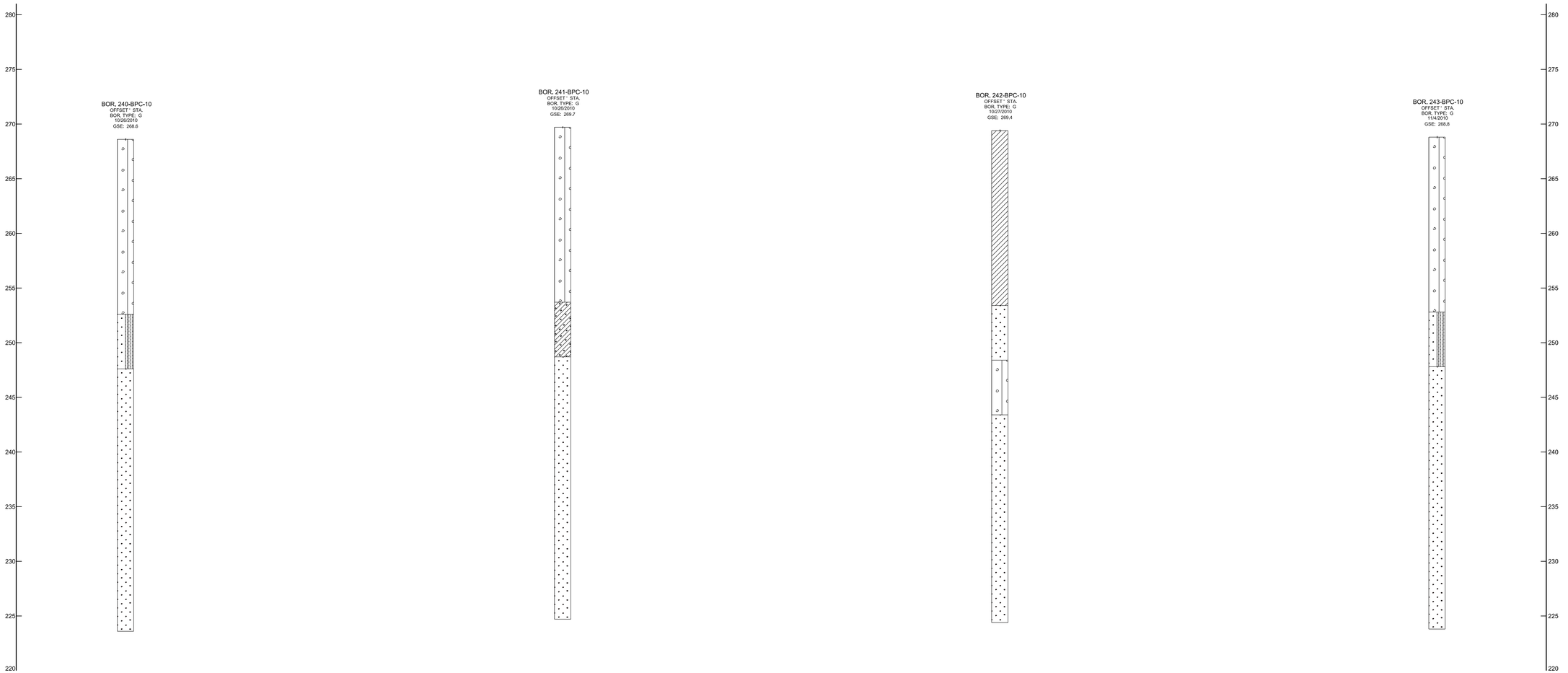
Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

Center Line
Levee Mile 21

Sheet ID
BP-070

auto_time

ALL ELEVATIONS IN FEET N.G.V.D



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U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

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DATE: 06/23/2017
SOLICITATION NO.:
CONTRACT NO.:
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PLOT SCALE: 1" = 20'
PLOT DATE: 6/27/2017
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St. Francis Drainage District of Clay and Greene Counties

Center Line
Levee Mile 22

Sheet ID
BP-071

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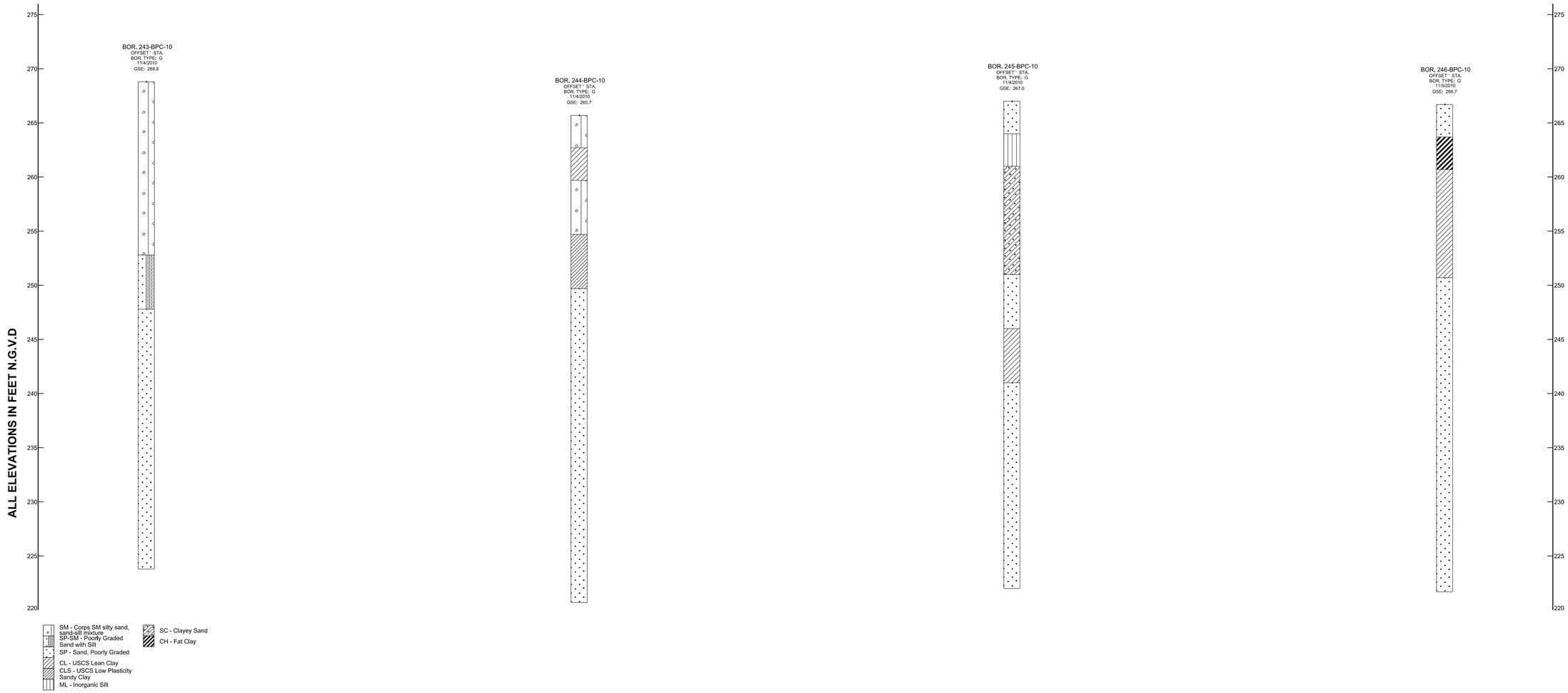

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U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

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PLOT SCALE: 1" = 10'
PLOT DATE: 06/23/2017
SIZE: ANSI D
FILE NAME: BP_Centerline23.dgn
DATE: 06/23/2017
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

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St. Francis Drainage District of Clay and Greene Counties

Center Line
Levee Mile 23

Sheet ID
BP-072

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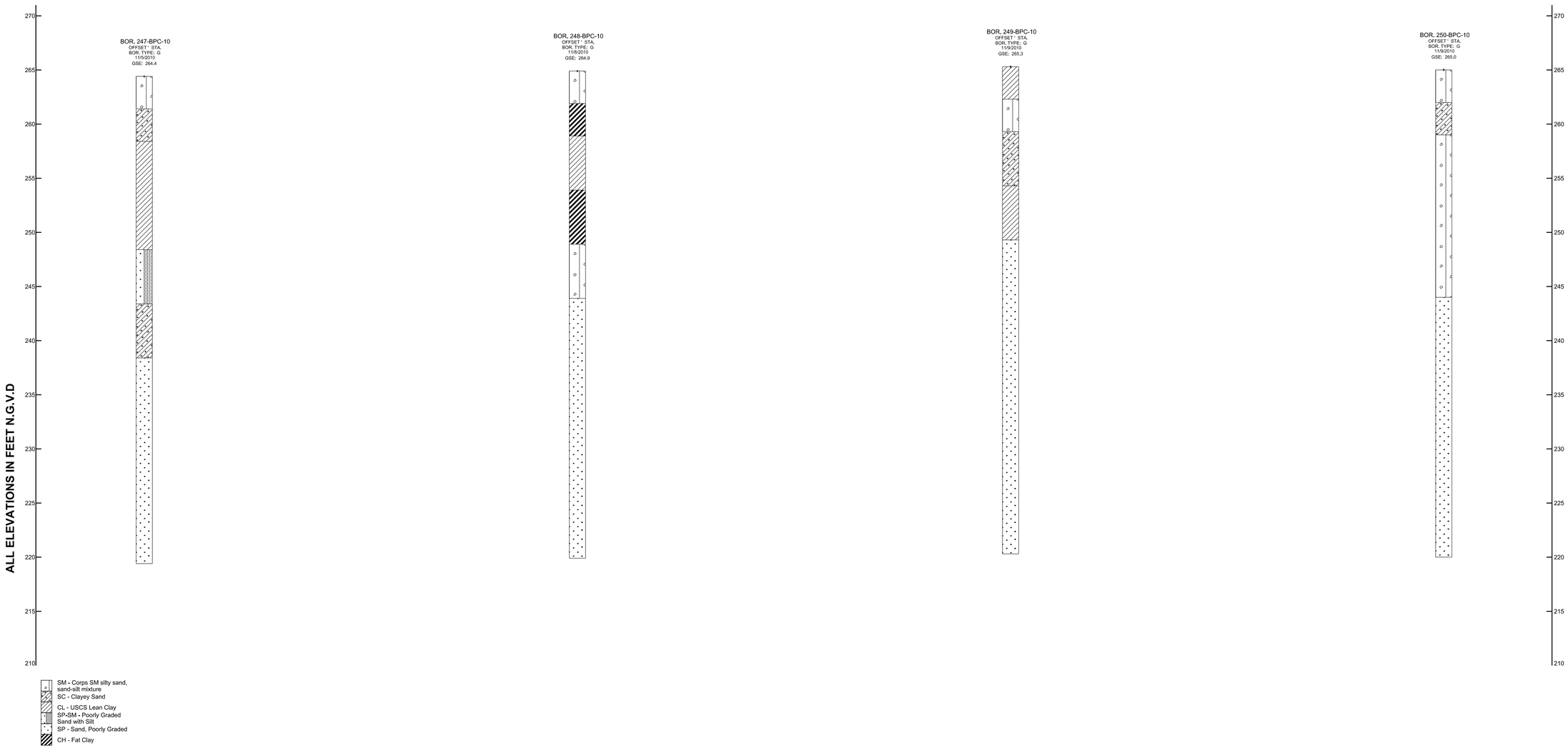

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U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

DESIGNED BY:
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CKD BY:
SUBMITTED BY:
PLOT SCALE: 1" = 10'
PLOT DATE: 06/23/2017
SIZE: ANSI D
FILE NAME: BP_Centerline24.dgn
DATE: 06/23/2017
SOLICITATION NO.:
CONTRACT NO.:
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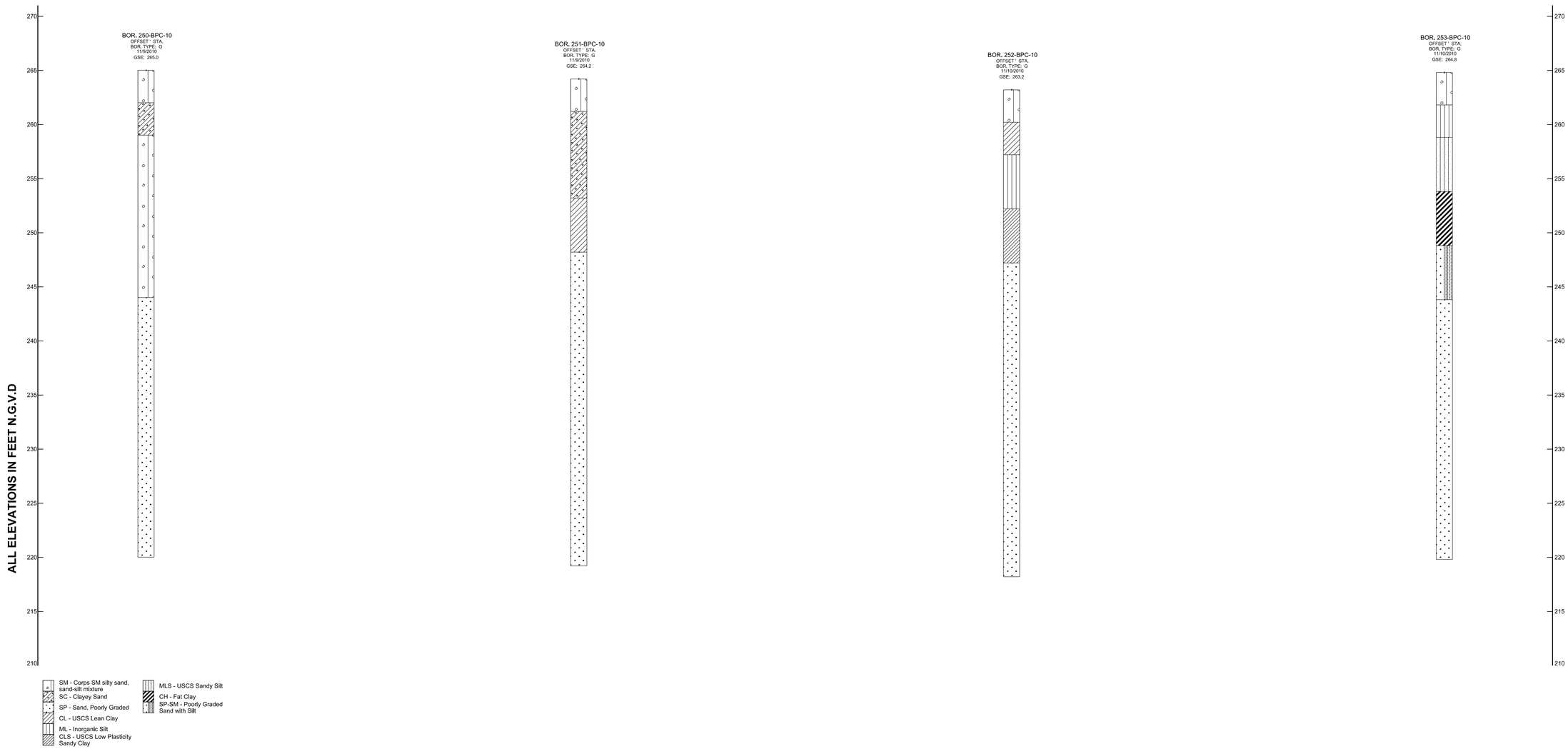
St. Francis Drainage District of Clay and Greene Counties

Center Line
Levee Mile 24

Sheet ID
BP-073

auto_time



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MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

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CKD BY:
SUBMITTED BY:
PLOT SCALE: 1" = 10'
PLOT DATE: 06/23/2017
SIZE: ANSI D
FILE NAME: BP_Centerline25.dgn
DATE: 06/23/2017
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

Center Line
Levee Mile 25

Sheet ID
BP-074

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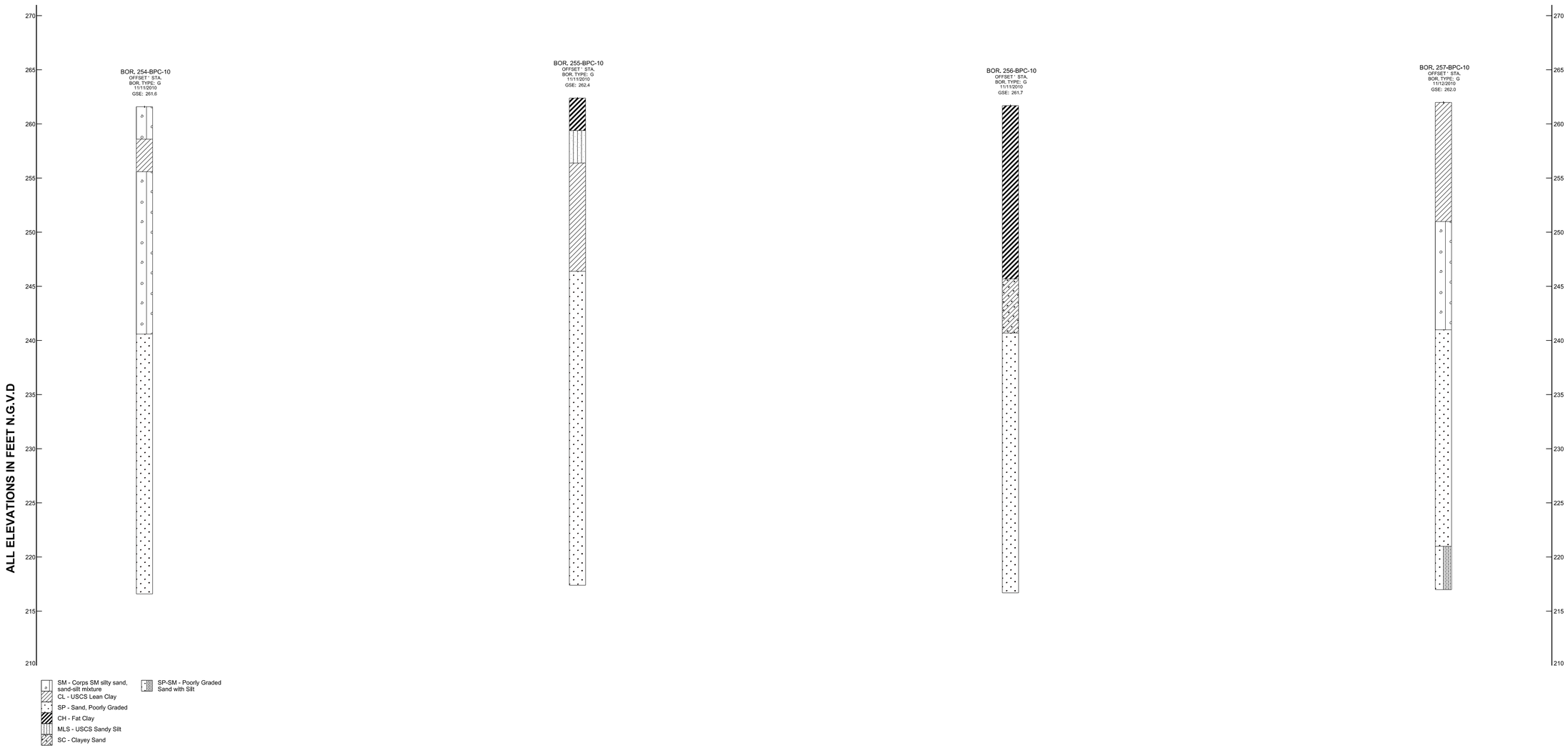

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MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

DESIGNED BY:
DWN BY:
CKD BY:
SUBMITTED BY:
PLOT SCALE: 1" = 10'
PLOT DATE: 06/23/2017
SIZE: ANSI D
FILE NAME: BP_Centerline26.dgn
DATE: 06/23/2017
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

Center Line
Levee Mile 26

Sheet ID
BP-075

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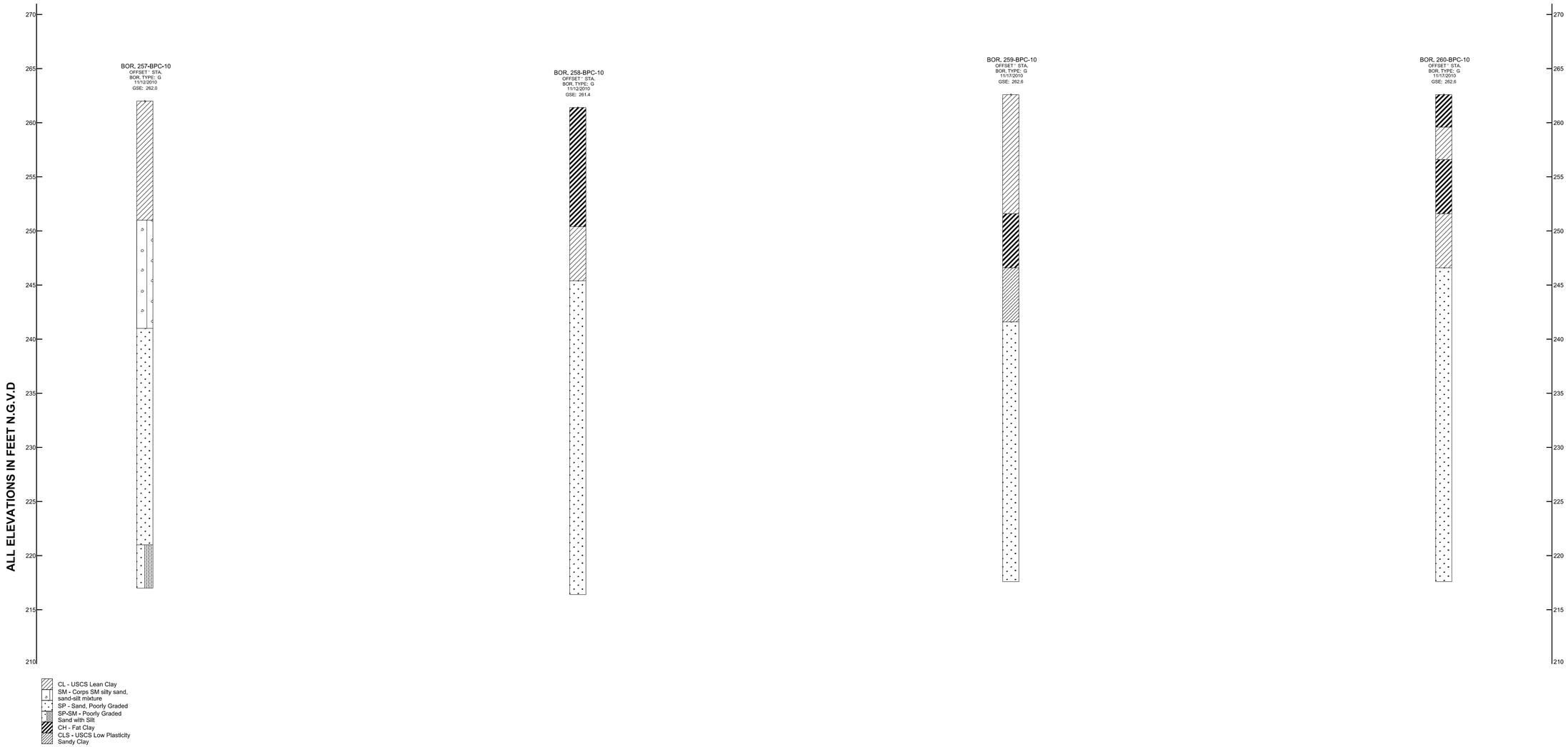

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MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

DESIGNED BY:
DWN BY:
CKD BY:
SUBMITTED BY:
PLOT SCALE: 1" = 10'
PLOT DATE: 06/23/2017
SIZE: ANSI D
FILE NAME: BP_Centerline27.dgn
DATE: 06/23/2017
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

Center Line
Levee Mile 27

Sheet ID
BP-076

outo_time

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MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

DESIGNED BY:
DWN BY:
CKD BY:
SUBMITTED BY:
PLOT SCALE: 1" = 10'
PLOT DATE: 06/23/2017
SIZE: ANSI D
FILE NAME: BP_Centerline28.dgn
DATE: 06/23/2017
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

Below Piggot Seepage Study
St. Francis Drainage District of Clay and Greene Counties

Center Line
Levee Mile 28

Sheet ID
BP-077

auto_time

Appendix D

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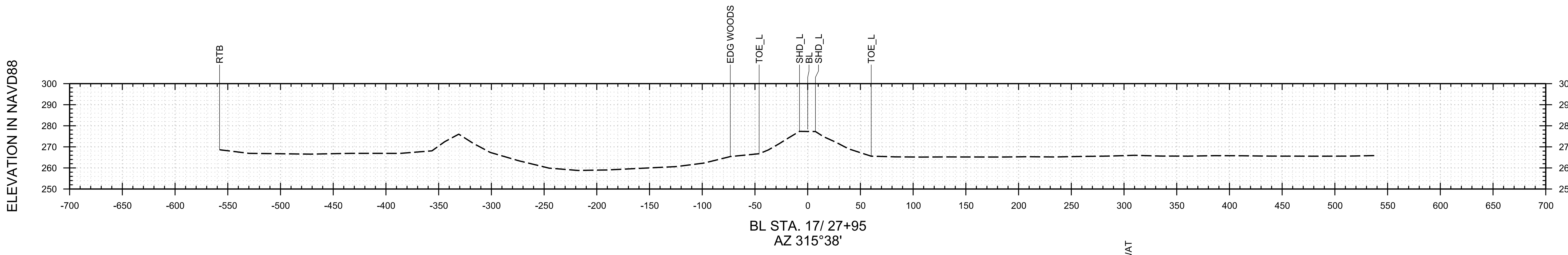
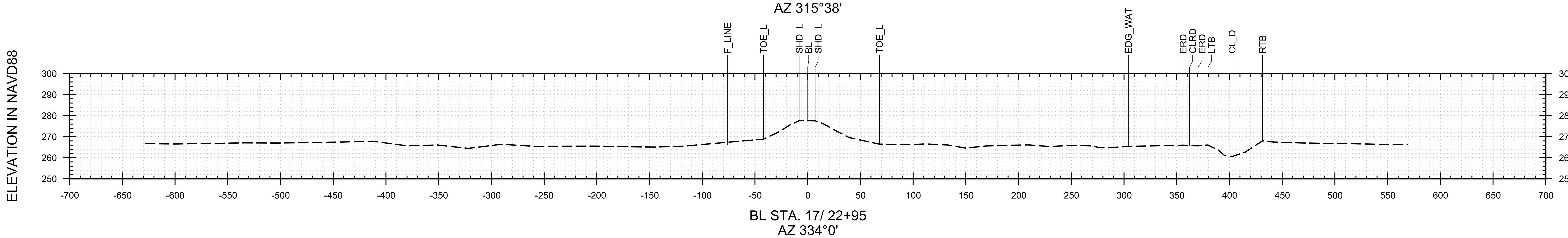
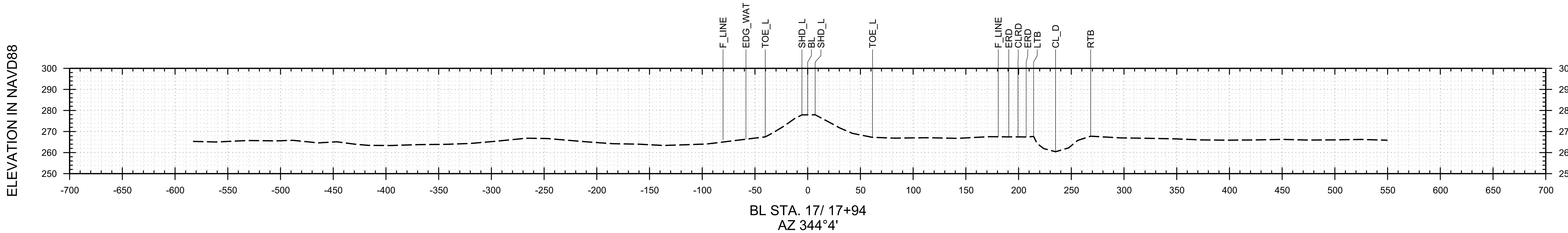
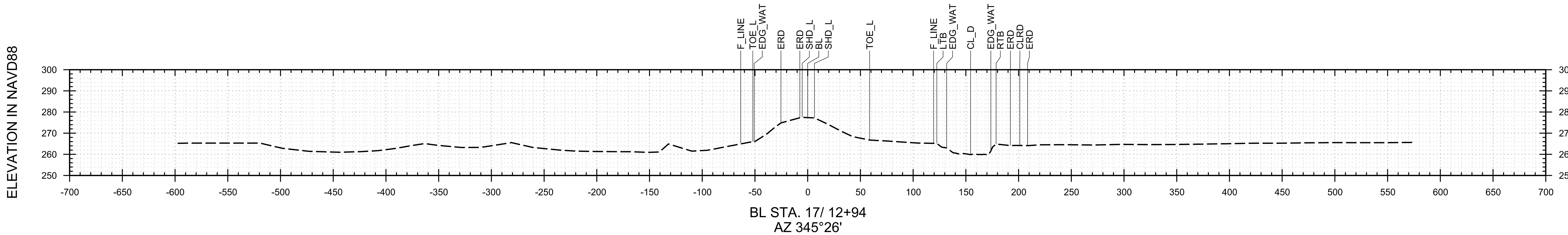
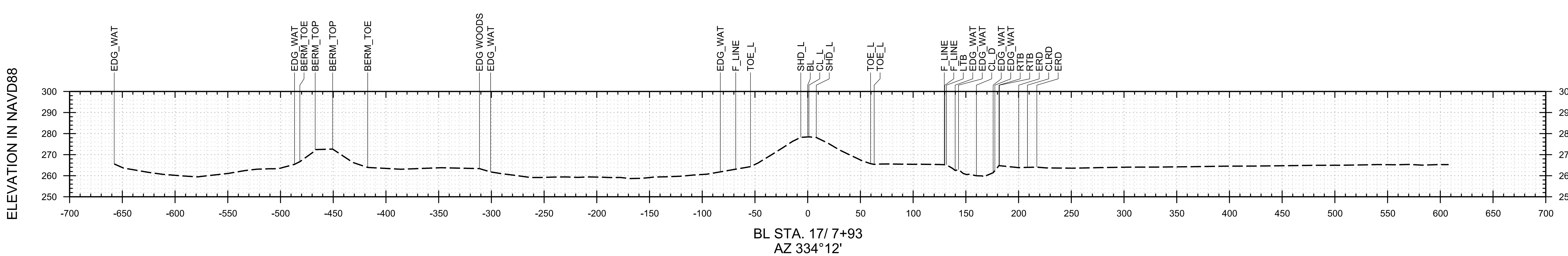










US Army Corps of Engineers®
Memphis District

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

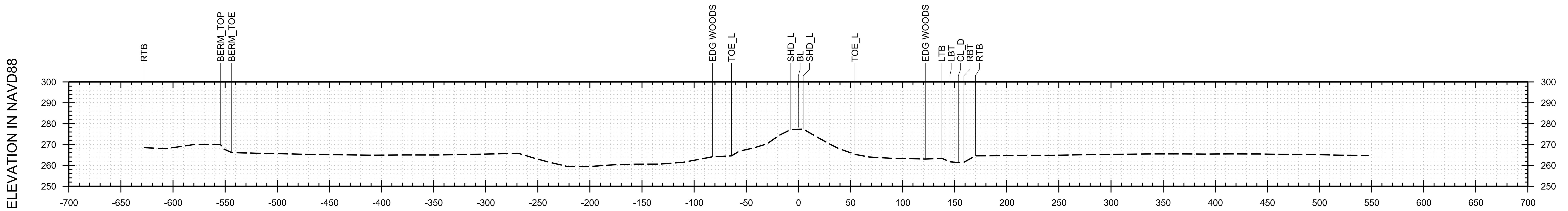
U.S. ARMY CORPS OF ENGINEERS
GREENE & CLAY COUNTY, AR
PIGGOTT, ARKANSAS

CHUSTZ SURVEYING, llc
211 RICHEY ST.
NEW ROADS, LOUISIANA 70760

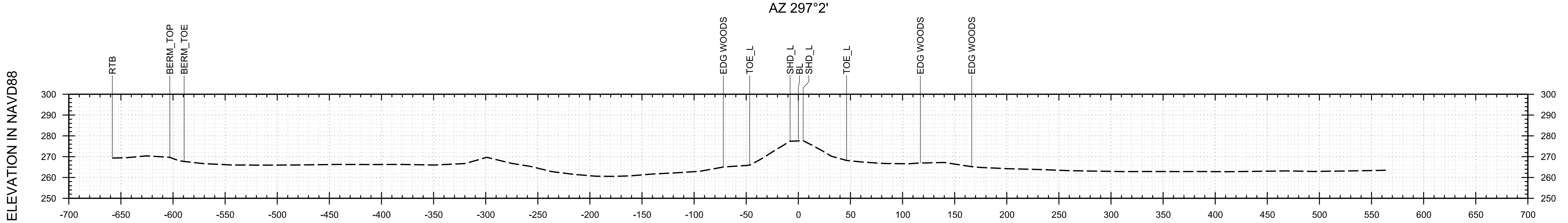
DESIGNED BY: | DATE: DECEMBER 2018
DWN BY: DBW | CKD BY: | SOLICITATION NO.: XXX-XX-X-XXXX
SUBMITTED BY: J CHUSTZ | CONTRACT NO.: W912EQ-18-D-0007
PLOT SCALE: 1"=60' H/30' V | PLOT DATE: 12-26-2018 | FILE NUMBER: xx-x-xx/xxx
SIZE: ANSI D | FILE NAME: CS11601001CXS.dgn

BELOW PIGGOTT SEEPAGE
PIGGOTT, ARKANSAS
CROSS SECTIONS & TOPOGRAPHIC SURVEY
STA. M17/ 7+99 TO STA. M17/ 28+00
CROSS SECTIONS

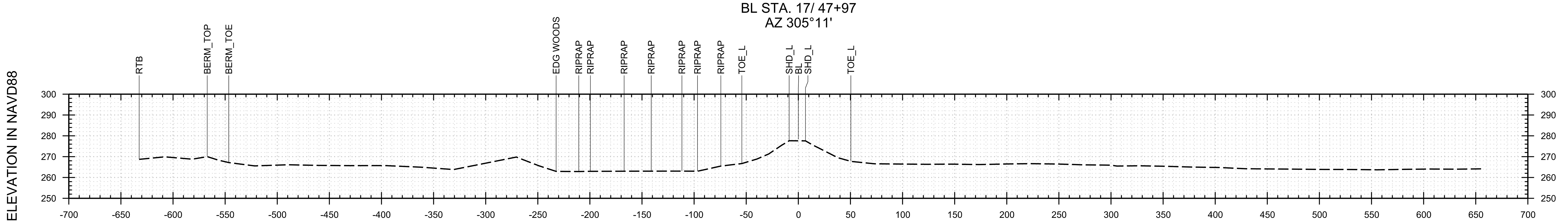
Sheet ID
013



BL STA. 17/ 53+01
AZ 297°2'



BL STA. 17/ 47+97
AZ 305°11'



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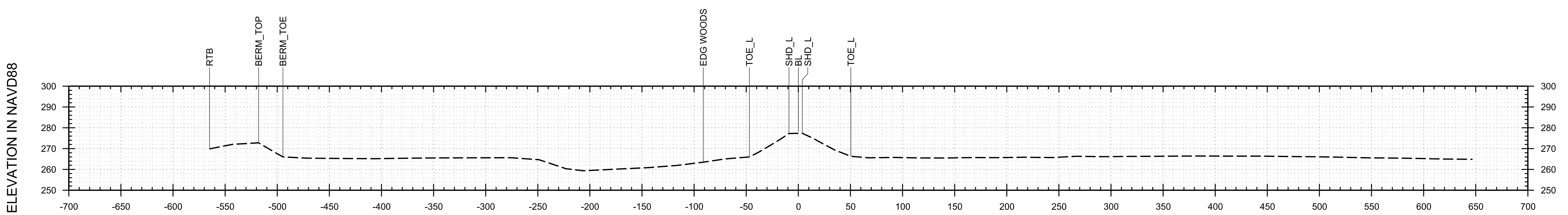
AZ 315°40'



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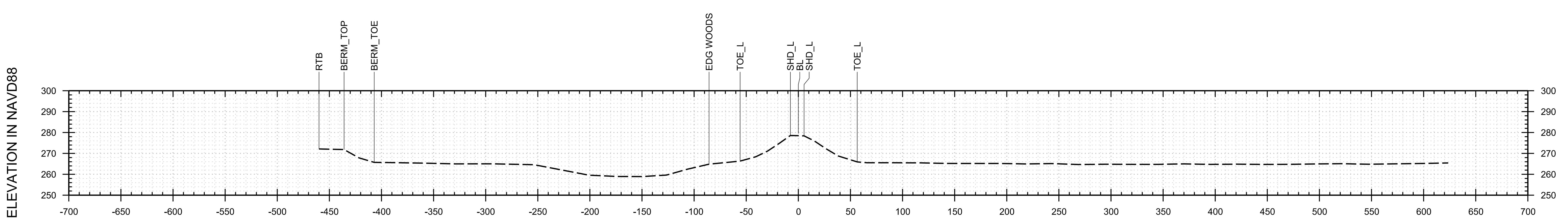
AZ 314°54'



BL STA. 17/ 32+97
AZ 313°2'

US Army Corps of Engineers®
Memphis District

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

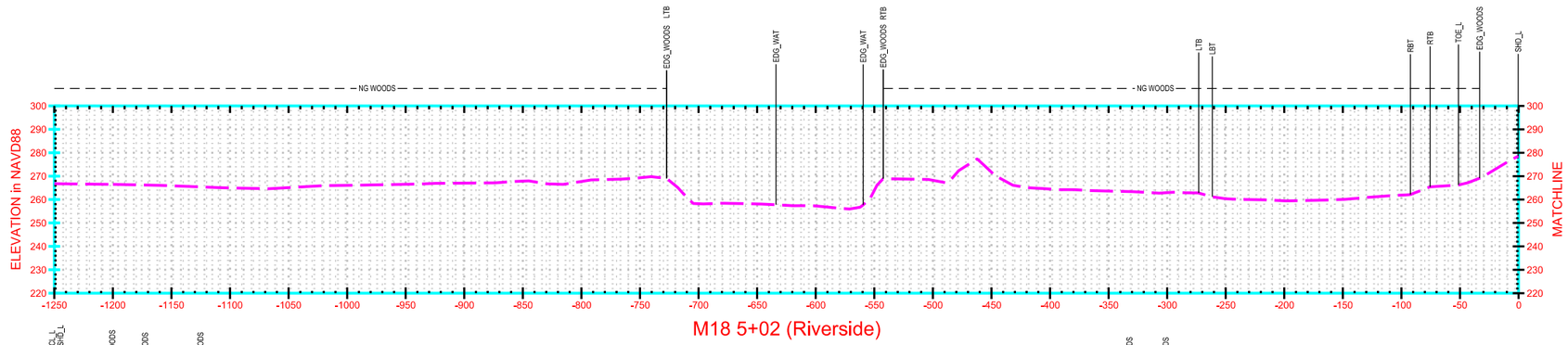
U.S. ARMY CORPS OF ENGINEERS
GREENE & CLAY COUNTY, AR
PIGGOTT, ARKANSAS

CHUSTZ SURVEYING, llc
211 RICHEY ST.
NEW ROADS, LOUISIANA 70760

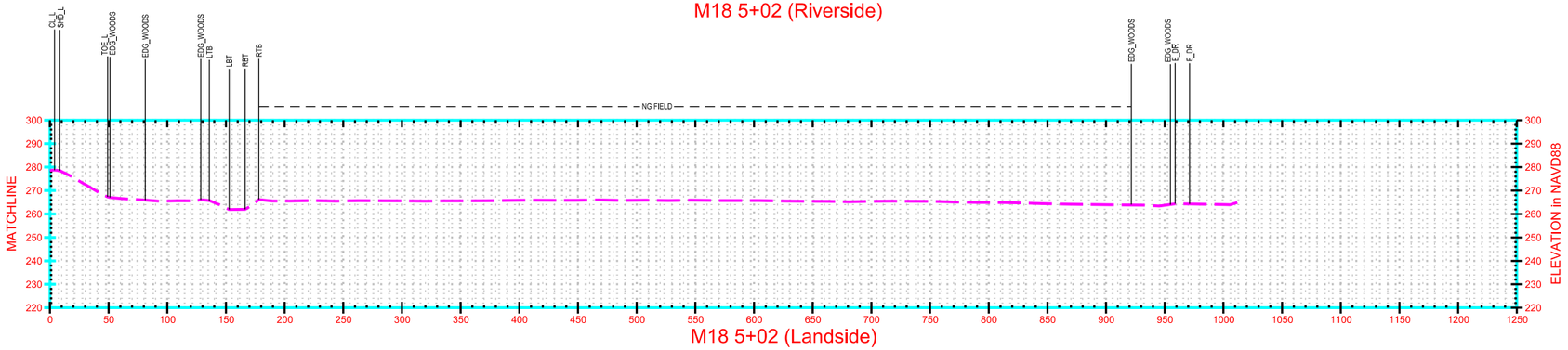
DESIGNED BY:		DATE: DECEMBER 2018
DWN BY: DBW	CKD BY:	SOLICITATION NO.: XXX-XX-X-XXXX
SUBMITTED BY: J CHUSTZ		CONTRACT NO.: W912EQ-16-D-0007
PLOT SCALE: 1"=60' H/30' V	PLOT DATE: 12-06-2018	FILE NUMBER: xx-x-xx/xxx
SIZE: ANSI D	FILE NAME: CSI1601001CXS.dgn	

BELOW PIGGOTT SEEPAGE
PIGGOTT, ARKANSAS
CROSS SECTIONS & TOPOGRAPHIC SURVEY
STA. M17/ 33+06 TO STA. M17/ 53+11
CROSS SECTIONS

Sheet
ID
014



M18 5+02 (Riverside)



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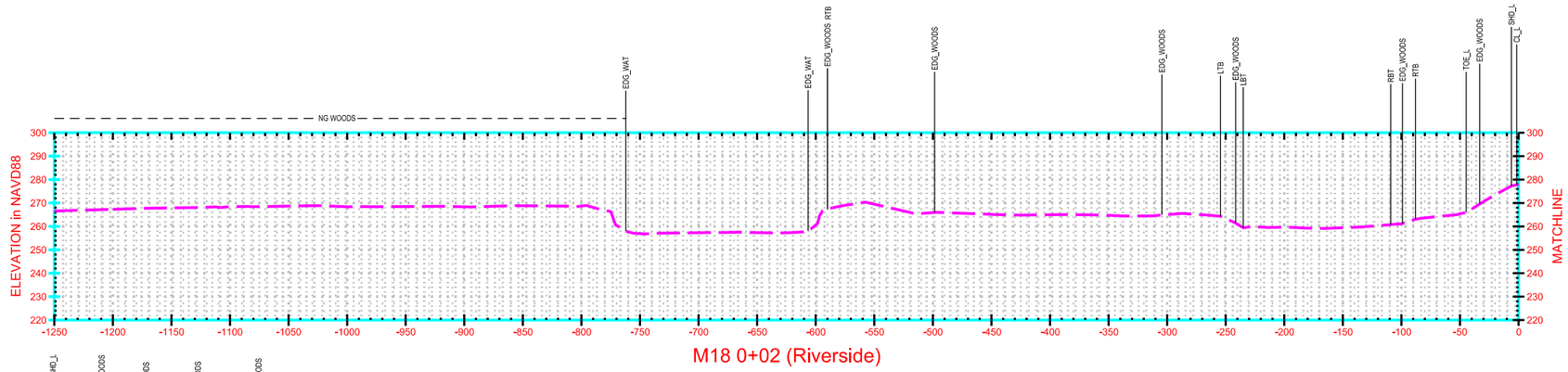
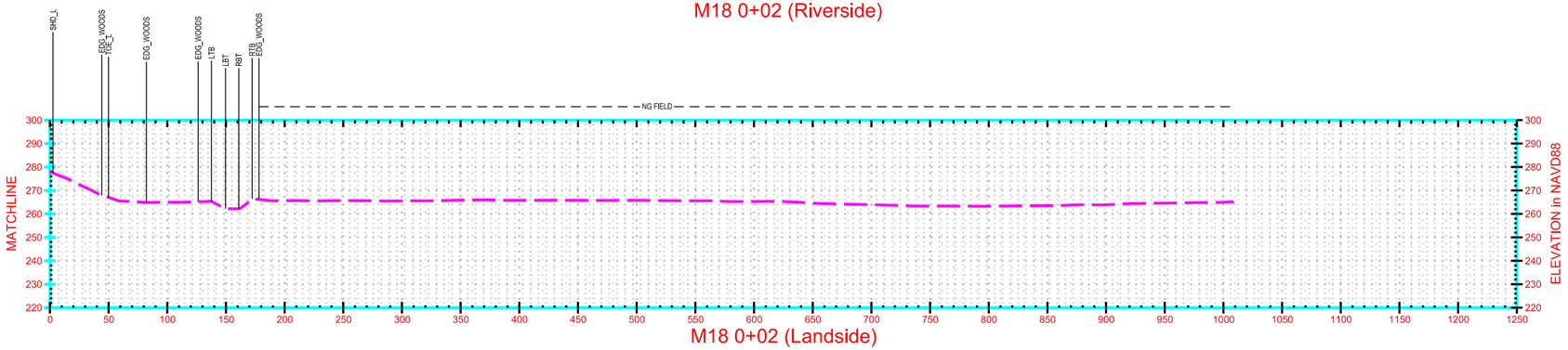


M18 0+02 (Riverside)



M18 0+02 (Landside)

SURVEY NOTES:

- ALL ELEVATIONS ARE REFERENCED TO NAVD 1988.
- PLANE COORDINATES ARE BASED ON NORTH AMERICAN DATUM OF 1893 (NAD 83) USING UTM ZONE 15 IN U.S. SURVEY FEET.

30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers®
Memphis District

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

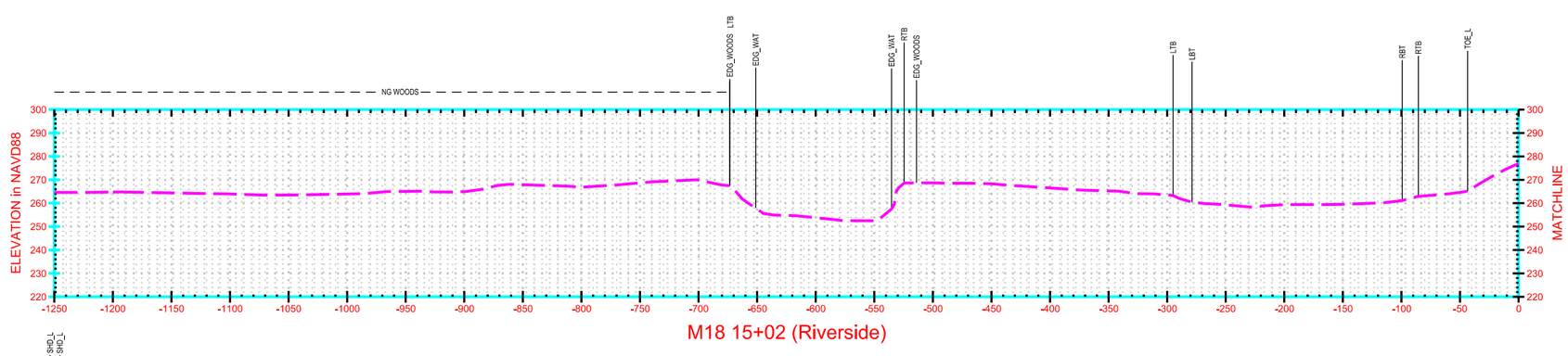
DESIGNED BY:
DWN BY: DEG
CKD BY: MCC
SUBMITTED BY: EMC, Inc.
PLOT SCALE: 1" = 60'
PLOT DATE: 01/14/2011
SIZE: ANSI D
FILE NAME: EMC10001001CXS.dgn
DATE: 01/14/2011
SOLICITATION NO.: W38XGR0172442B
CONTRACT NO.: W912EQ-10-D-0014
FILE NUMBER:

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

EMC
SURVEYING & MAPPING

MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Miles M18/0+02 to M18/5+02
CROSS SECTIONS
PLATE
DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
GEOTECHNICAL ENGINEERING BRANCH

Sheet ID
1 OF 63



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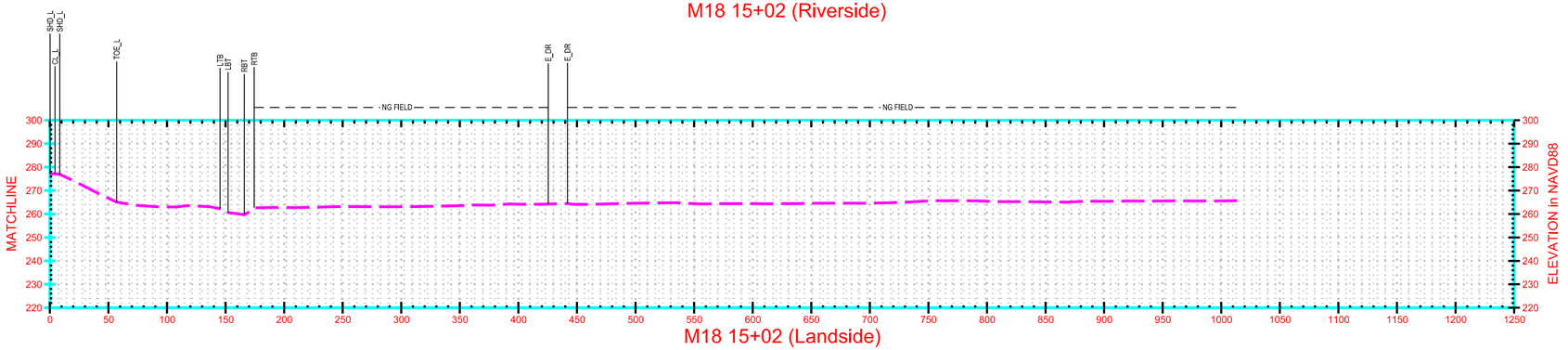

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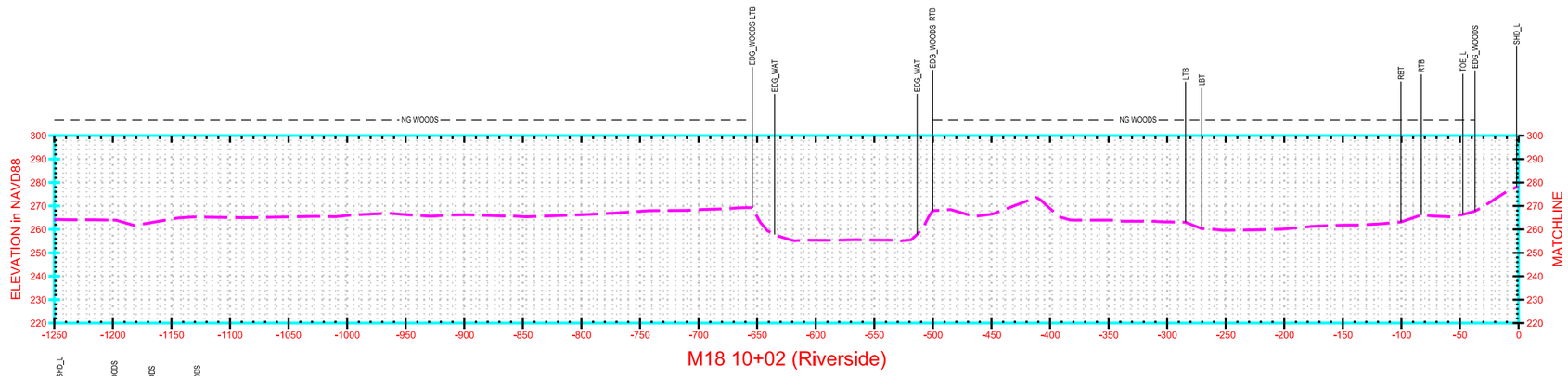
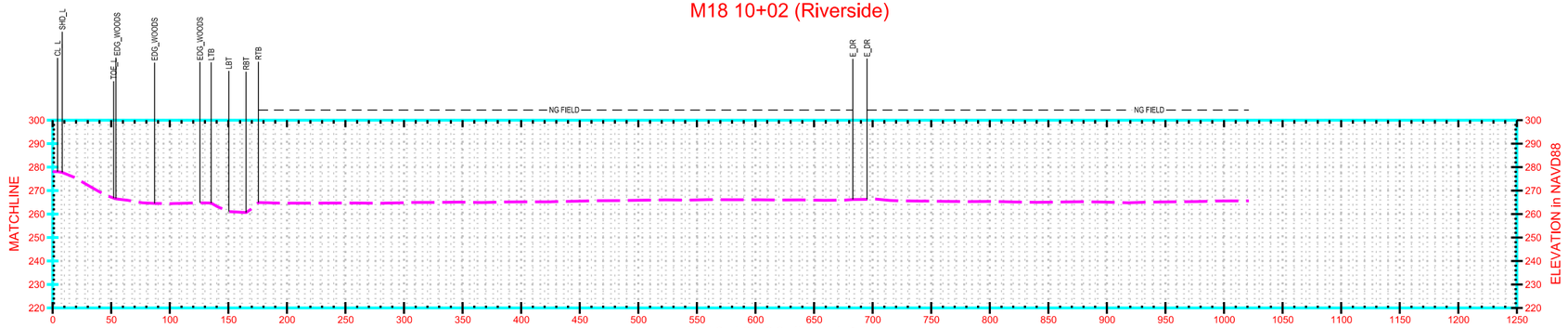


M18 10+02 (Riverside)



M18 10+02 (Landside)

SURVEY NOTES:

- ALL ELEVATIONS ARE REFERENCED TO NAVD 1988.
- PLANE COORDINATES ARE BASED ON NORTH AMERICAN DATUM OF 1893 (NAD 83) USING UTM ZONE 15 IN U.S. SURVEY FEET.

30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers®
Memphis District

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

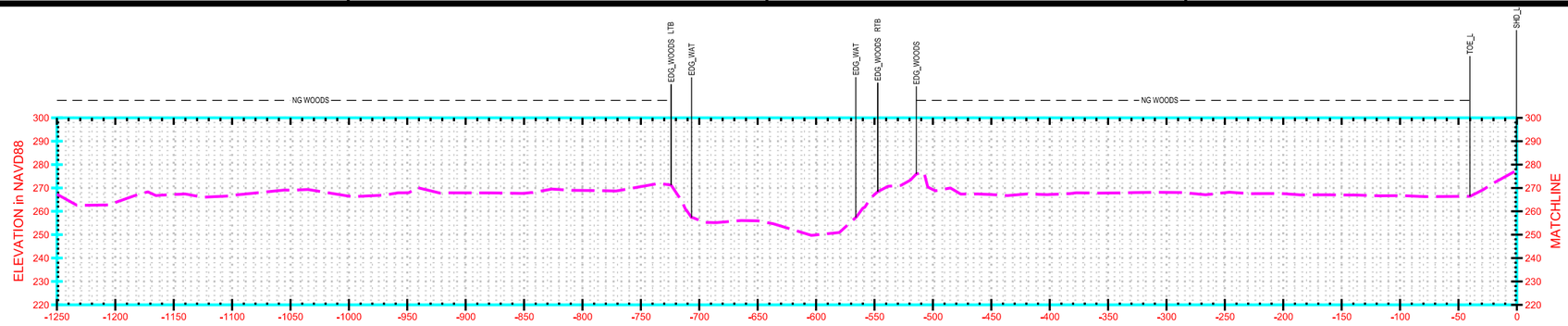
DESIGNED BY:
DWN BY: DEG
CKD BY: MCC
SUBMITTED BY: EMC, Inc.
PLOT SCALE: 1" = 60'
PLOT DATE: 01/14/2011
SIZE: ANSI D
FILE NAME: EMC10001001CXS.dgn
DATE: 01/14/2011
SOLICITATION NO.: W38XGR01724428
CONTRACT NO.: W912EQ-10-D-0014
FILE NUMBER:

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

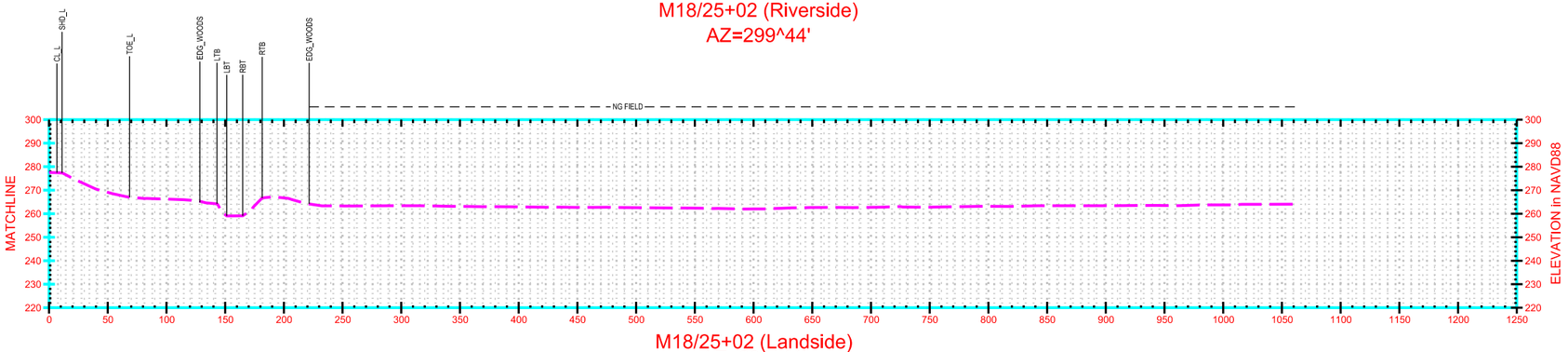
EMC
SURVEYING & MAPPING

MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Miles M18/10+02 to M18/15+02
CROSS SECTIONS
PLATE
DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
GEOTECHNICAL ENGINEERING BRANCH

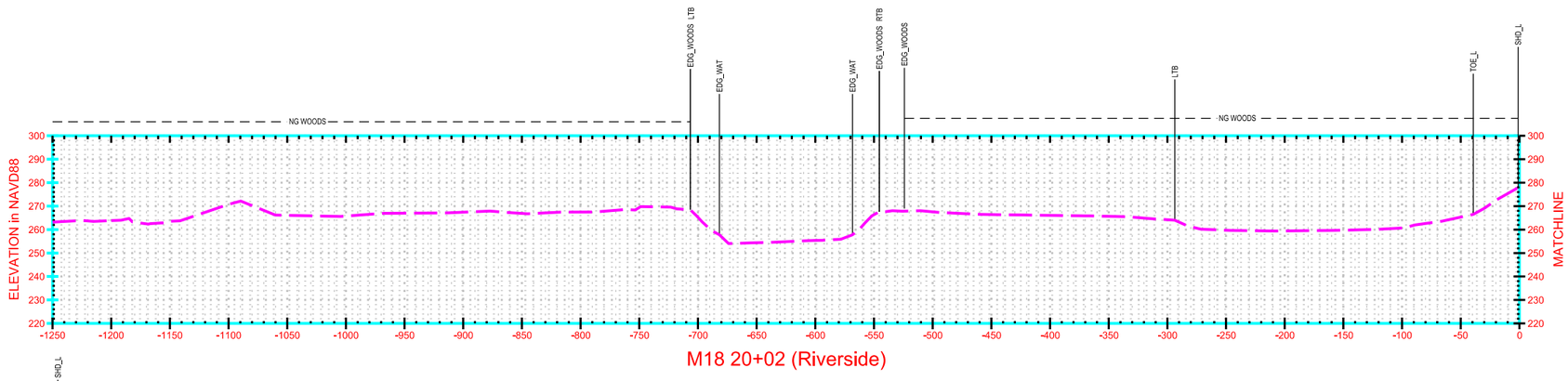
Sheet ID
2 OF 63



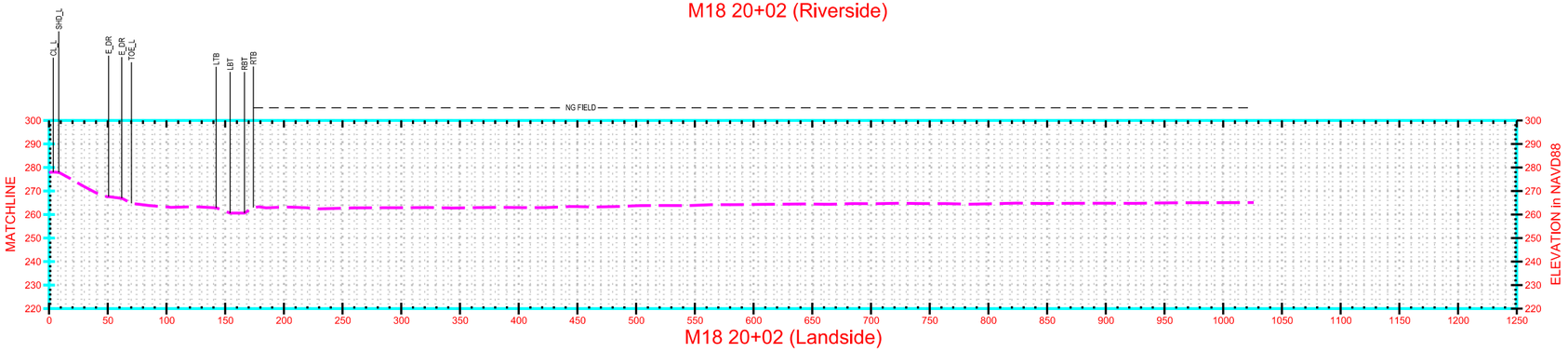
M18/25+02 (Riverside)
AZ=299^44'



M18/25+02 (Landside)
AZ=299^44'



M18 20+02 (Riverside)



M18 20+02 (Landside)

SURVEY NOTES:

- ALL ELEVATIONS ARE REFERENCED TO NAVD 1988.
- PLANE COORDINATES ARE BASED ON NORTH AMERICAN DATUM OF 1893 (NAD 83) USING UTM ZONE 15 IN U.S. SURVEY FEET.

30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers®
Memphis District

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

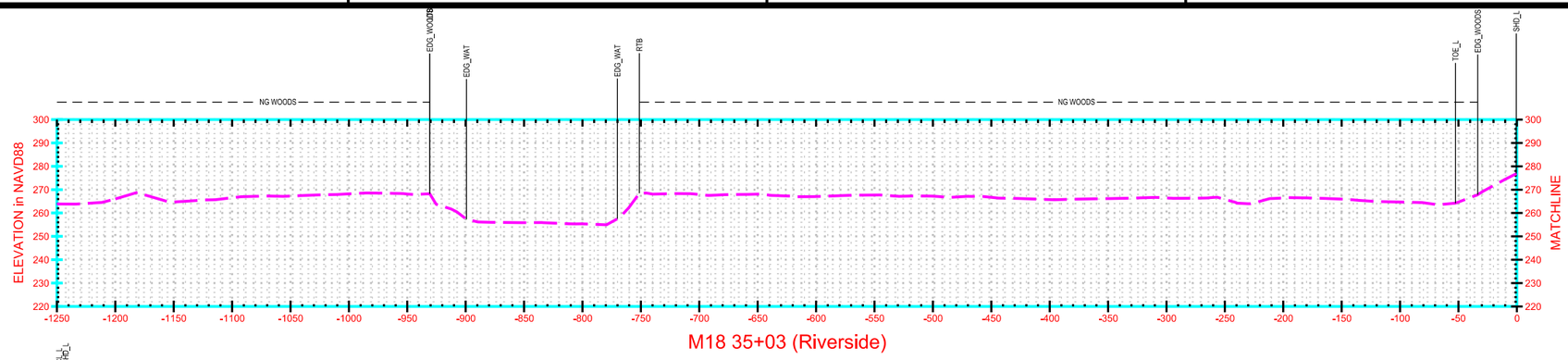
DESIGNED BY:
DWN BY: DEG
CKD BY: MOC
SUBMITTED BY: EMC, Inc.
PLOT SCALE: 1" = 60'
PLOT DATE: 01/14/2011
SIZE: ANSI D
FILE NAME: EMC10001001CXS.dgn
DATE: 01/14/2011
SOLICITATION NO.: W38XGR01724428
CONTRACT NO.: W912EQ-10-D-0014
FILE NUMBER:

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

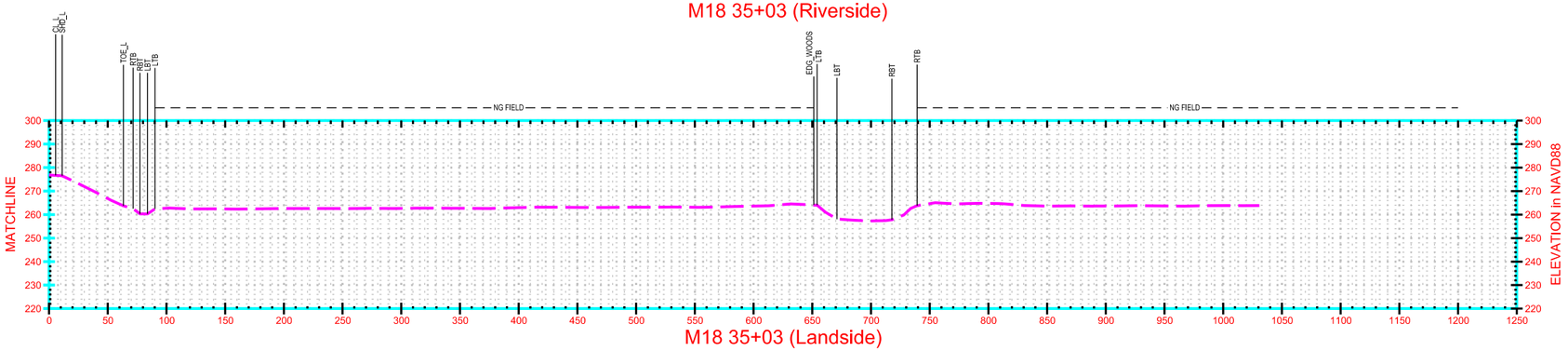
EMC
SURVEYING & MAPPING

MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Miles M18/20+02 to M18/25+02
CROSS SECTIONS
PLATE
DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
GEOTECHNICAL ENGINEERING BRANCH

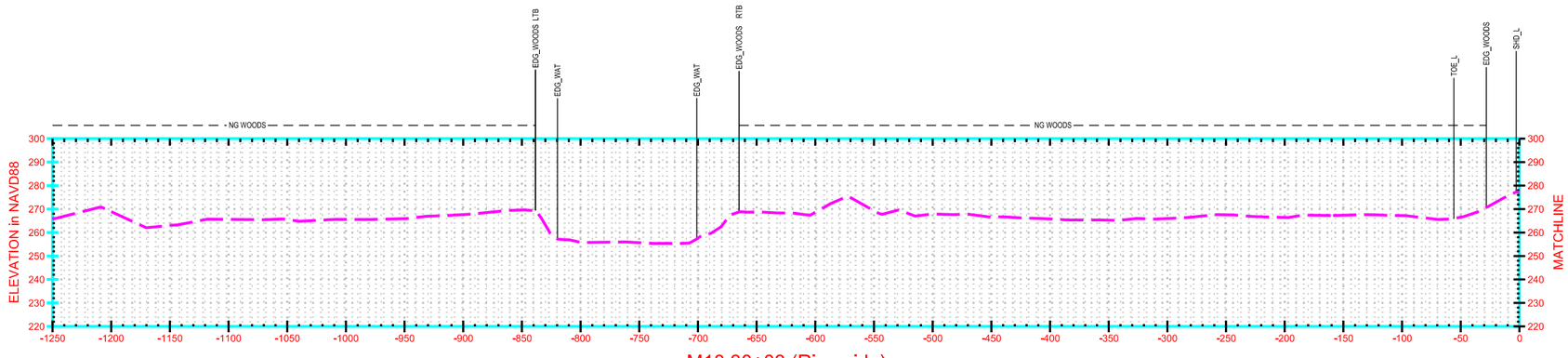
Sheet ID
3 OF 63



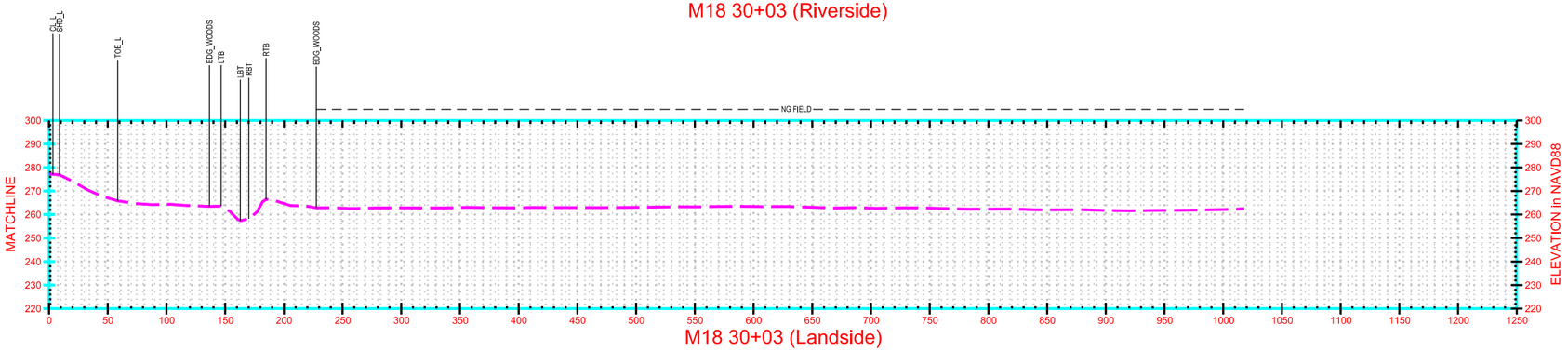
M18 35+03 (Riverside)



M18 35+03 (Landside)



M18 30+03 (Riverside)



M18 30+03 (Landside)

SURVEY NOTES:

- ALL ELEVATIONS ARE REFERENCED TO NAVD 1988.
- PLANE COORDINATES ARE BASED ON NORTH AMERICAN DATUM OF 1893 (NAD 83) USING UTM ZONE 15 IN U.S. SURVEY FEET.

30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers®
Memphis District

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

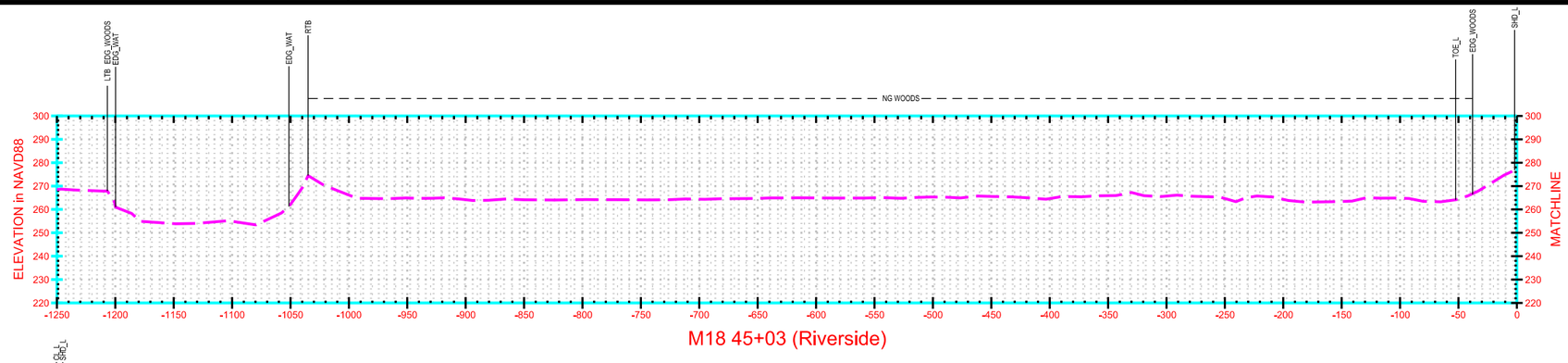
DESIGNED BY: | DATE: 01/14/2011
DWN BY: DEG | CKD BY: MOC | SOLICITATION NO.: W38XGR01724428
SUBMITTED BY: EMC, Inc. | CONTRACT NO.: W912EQ-10-D-0014
PLOT SCALE: 1" = 60' | PLOT DATE: 01/14/2011 | FILE NUMBER:
SIZE: ANSI D | FILE NAME: EMC10001001CXS.dgn

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

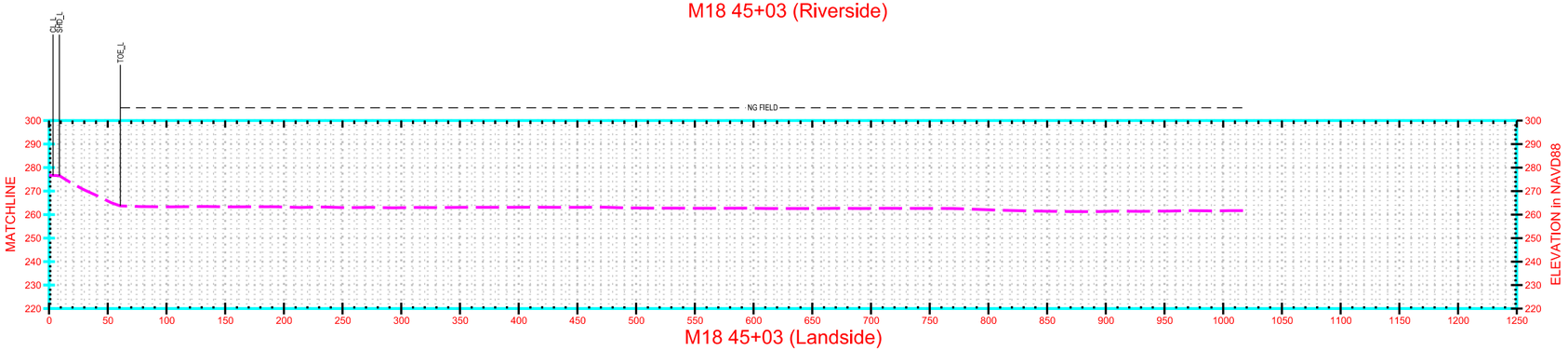
EMC SURVEYING & MAPPING

MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Miles M18/30+03 to M18/35+03
CROSS SECTIONS
PLATE
DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
GEOTECHNICAL ENGINEERING BRANCH

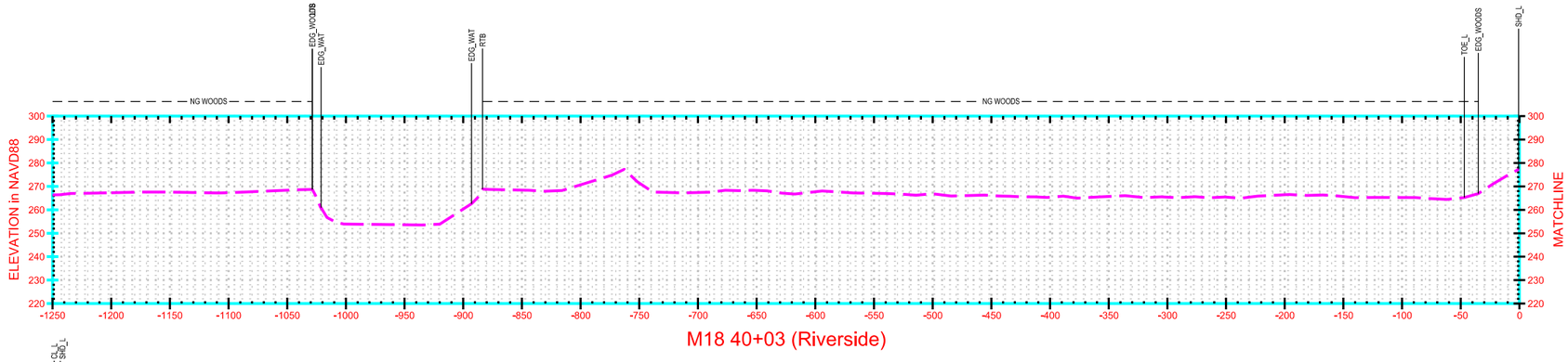
Sheet ID
4 OF 63



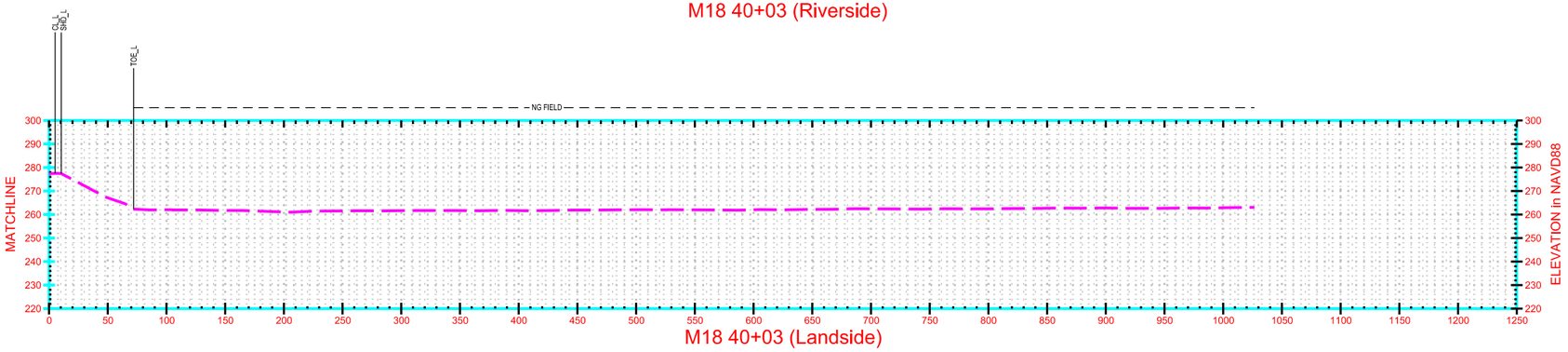
M18 45+03 (Riverside)



M18 45+03 (Landside)



M18 40+03 (Riverside)



M18 40+03 (Landside)

SURVEY NOTES:

- ALL ELEVATIONS ARE REFERENCED TO NAVD 1988.
- PLANE COORDINATES ARE BASED ON NORTH AMERICAN DATUM OF 1893 (NAD 83) USING UTM ZONE 15 IN U.S. SURVEY FEET.

30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers®
Memphis District

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

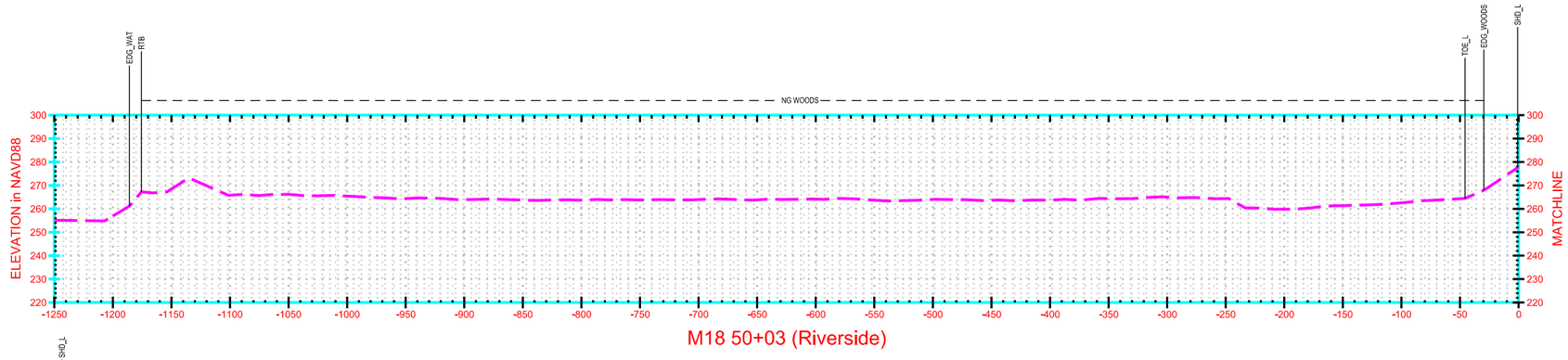
DESIGNED BY: | DATE: 01/14/2011
DWN BY: DEG | CKD BY: MOC | SOLICITATION NO.: W38XGR01724428
SUBMITTED BY: EMC, Inc. | CONTRACT NO.: W912EQ-10-D-0014
PLOT SCALE: 1" = 60' | PLOT DATE: 01/14/2011 | FILE NUMBER:
SIZE: ANSI D | FILE NAME: EMC10001001CXS.dgn

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

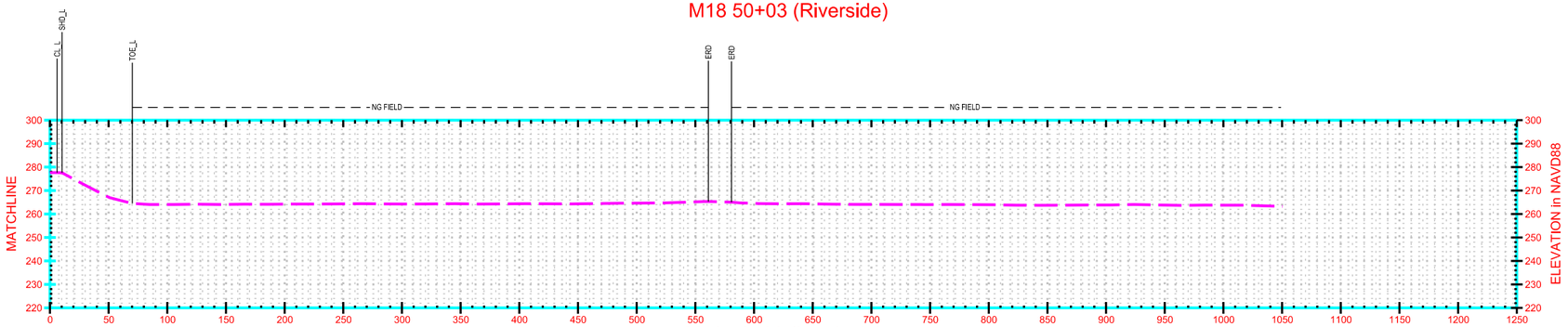
EMC SURVEYING & MAPPING

MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Miles M18/40+03 to M18/45+03
CROSS SECTIONS
PLATE
DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
GEOTECHNICAL ENGINEERING BRANCH

Sheet ID
5 OF 63



M18 50+03 (Riverside)



M18 50+03 (Landside)

SURVEY NOTES:

- ALL ELEVATIONS ARE REFERENCED TO NAVD 1988.

- PLANE COORDINATES ARE BASED ON NORTH AMERICAN DATUM OF 1893 (NAD 83) USING UTM ZONE 15 IN U.S. SURVEY FEET.

30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers®
Memphis District

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

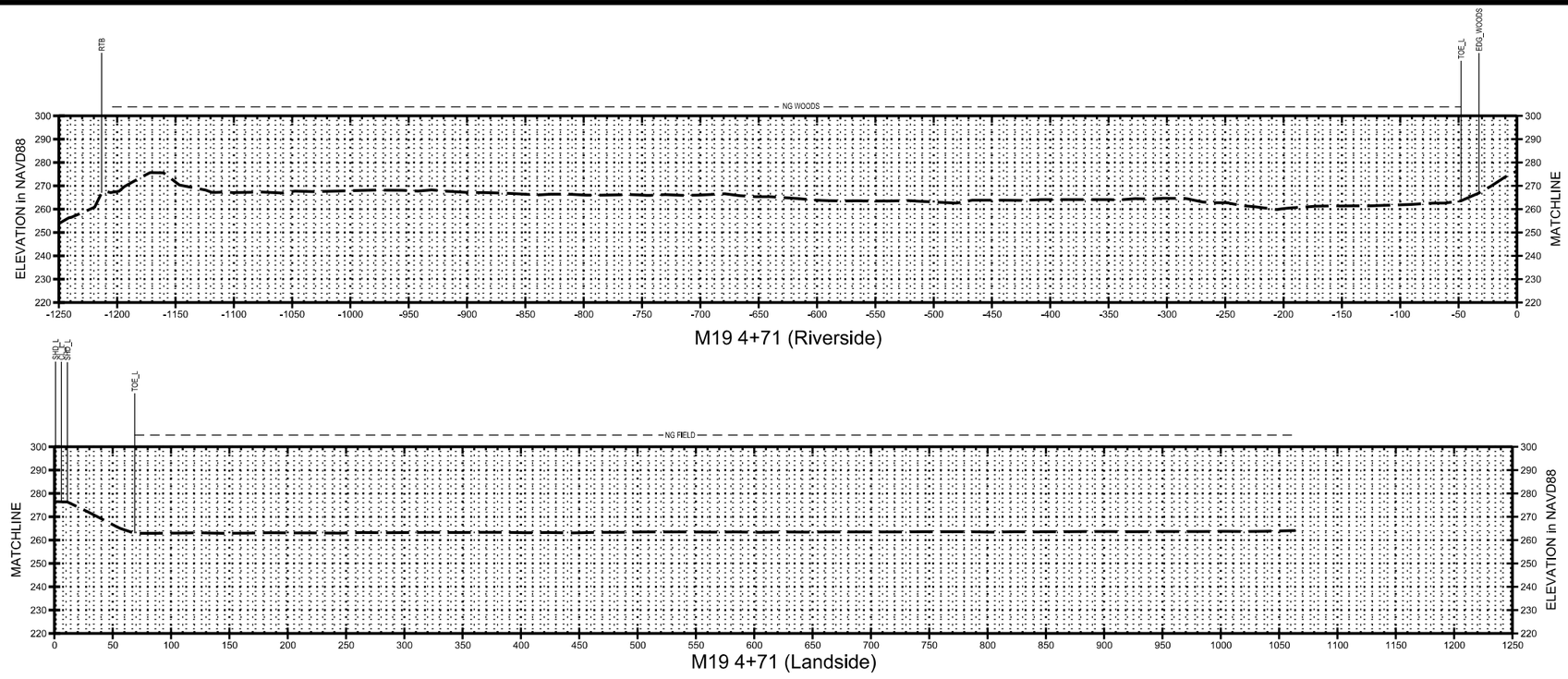
DESIGNED BY:
DWN BY: DEG
CKD BY: MOC
SUBMITTED BY: EMC, Inc.
PLOT SCALE: 1" = 60'
PLOT DATE: 01/14/2011
SIZE: ANSI D
FILE NAME: EMC10001001CXS.dgn
DATE: 01/14/2011
SOLICITATION NO.: W38XGR01724428
CONTRACT NO.: W912EQ-10-D-0014
FILE NUMBER:

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

EMC
SURVEYING & MAPPING

MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Mile M18/50+03
CROSS SECTIONS
PLATE
DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
GEOTECHNICAL ENGINEERING BRANCH

Sheet ID
6 OF 63



M19 4+71 (Riverside)

M19 4+71 (Landside)

SURVEY NOTES:

- ALL ELEVATIONS ARE REFERENCED TO NAVD 1988.

- PLANE COORDINATES ARE BASED ON NORTH AMERICAN DATUM OF 1893 (NAD 83) USING UTM ZONE 15 IN U.S. SURVEY FEET.

30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers
Memphis District

APPR.
DATE
DESCRIPTION
MARK

APPR.
DATE
DESCRIPTION
MARK

DESIGNED BY:
DWN BY: DEG
CKD BY: MOC
SUBMITTED BY: EMC, Inc.
PLOT SCALE: AS SHOWN
PLOT DATE: 01/14/2011
SIZE: ANSI D
DATE: 01/14/2011
SOLICITATION NO.: W38XGR91724428
CONTRACT NO.: W912EK-10-D-0014
FILE NUMBER:
FILE NAME: EMC1009100622CXS.dgn

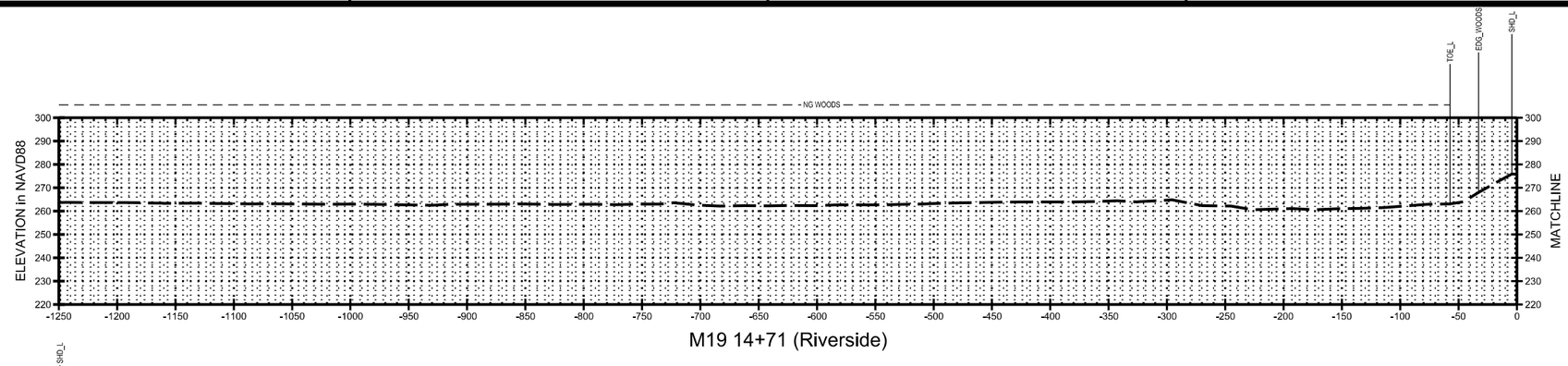
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

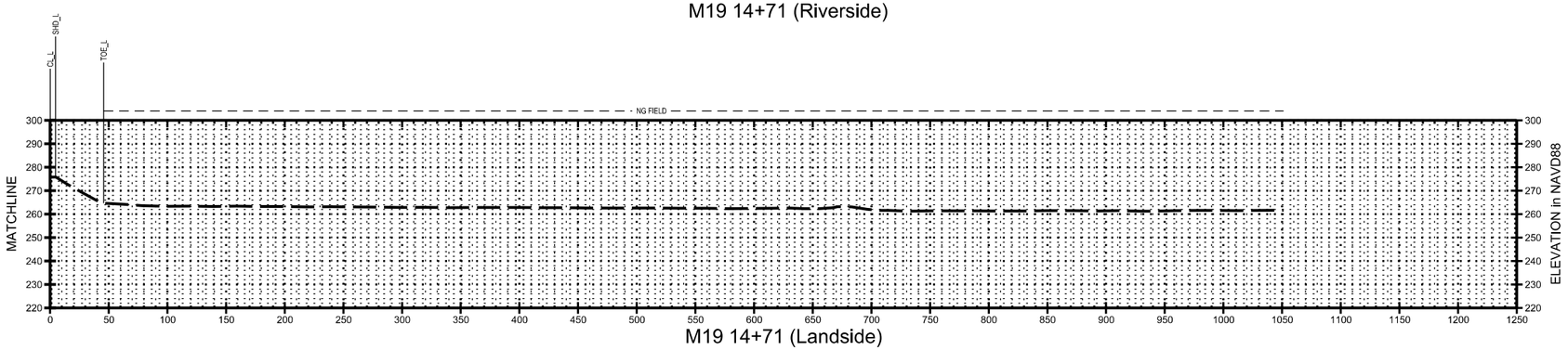
EMC DRAWING & MAPPING

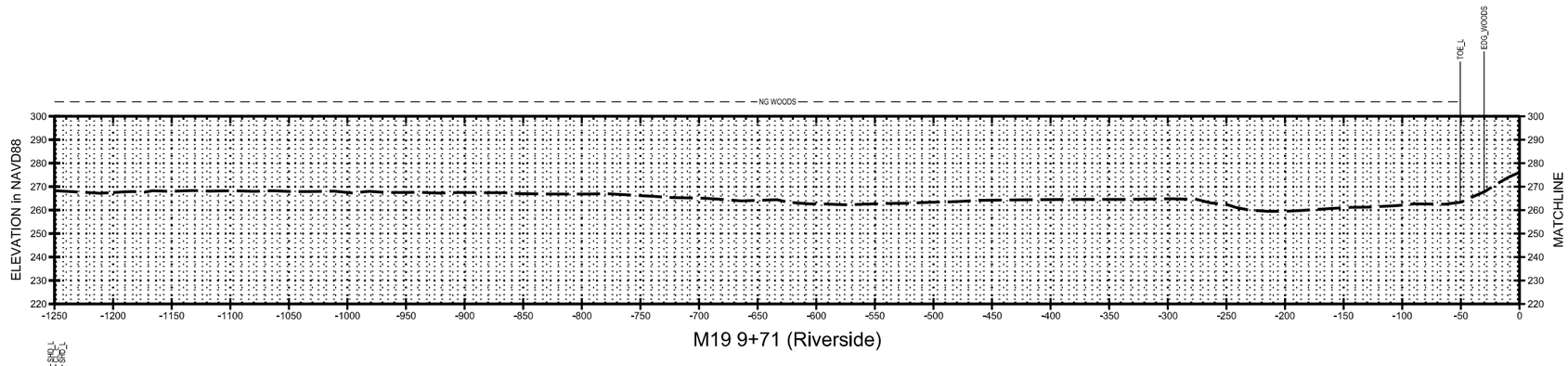
MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Mile M19/4+71
CROSS SECTIONS
PLATE

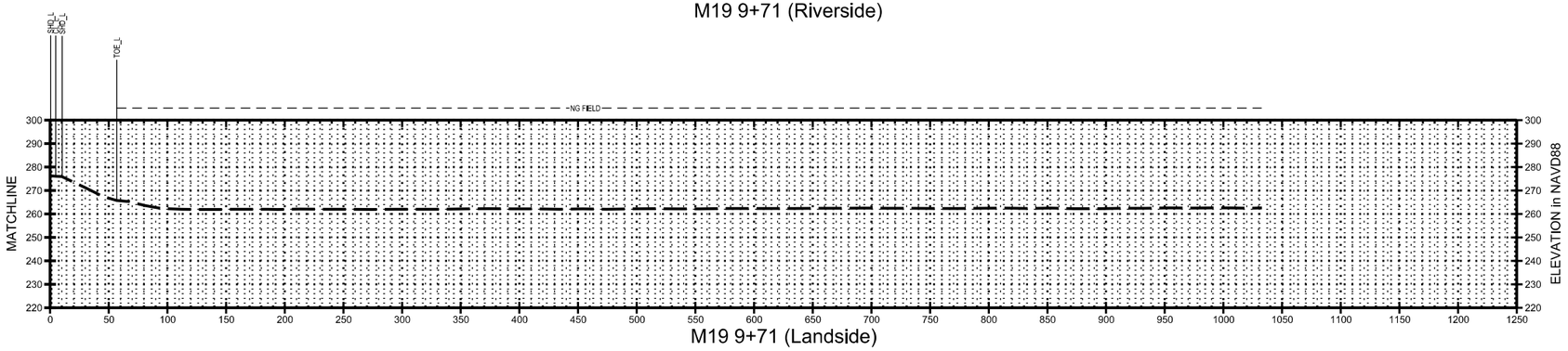
DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT CORPS OF ENGINEERS
GEOTECHNICAL ENGINEERING BRANCH

Sheet ID
7 OF 63









SURVEY NOTES:

- ALL ELEVATIONS ARE REFERENCED TO NAVD 1988.
- PLANE COORDINATES ARE BASED ON NORTH AMERICAN DATUM OF 1893 (NAD 83) USING UTM ZONE 15 IN U.S. SURVEY FEET.

30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers
Memphis District

MARK	DATE	APPR

MARK	DATE	APPR

DESIGNED BY:
DWN BY: DEG
CKD BY: MOC
SUBMITTED BY: EMC, Inc.
DATE: 01/14/2011
SOLICITATION NO.: W38XGR91724428
CONTRACT NO.: W912EK-10-D-0014
PLOT SCALE: 1:1
PLOT DATE: 01/14/2011
FILE NUMBER:
SIZE: ANSI D
FILE NAME: EMC100010DZCXS.dgn

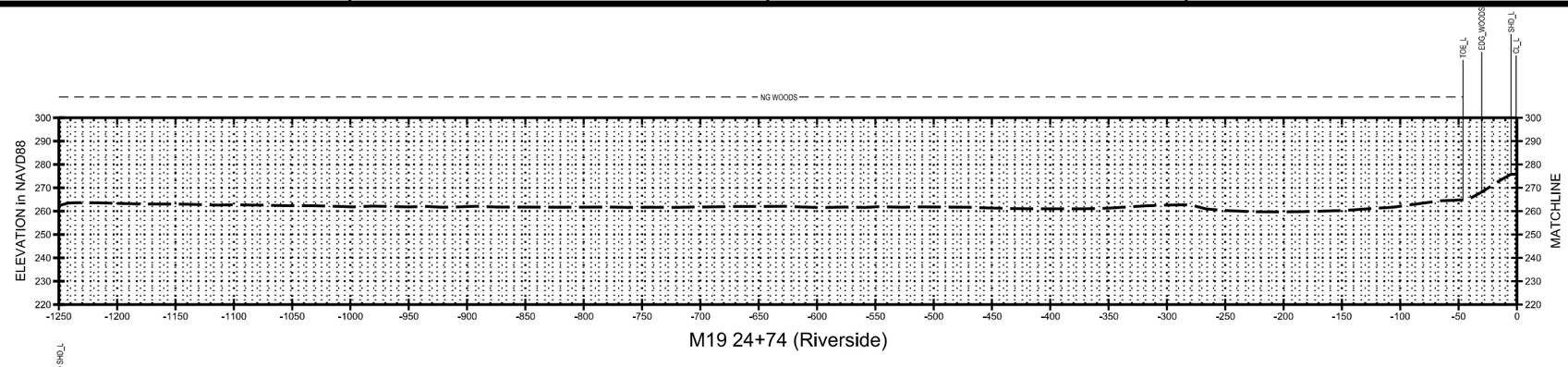
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

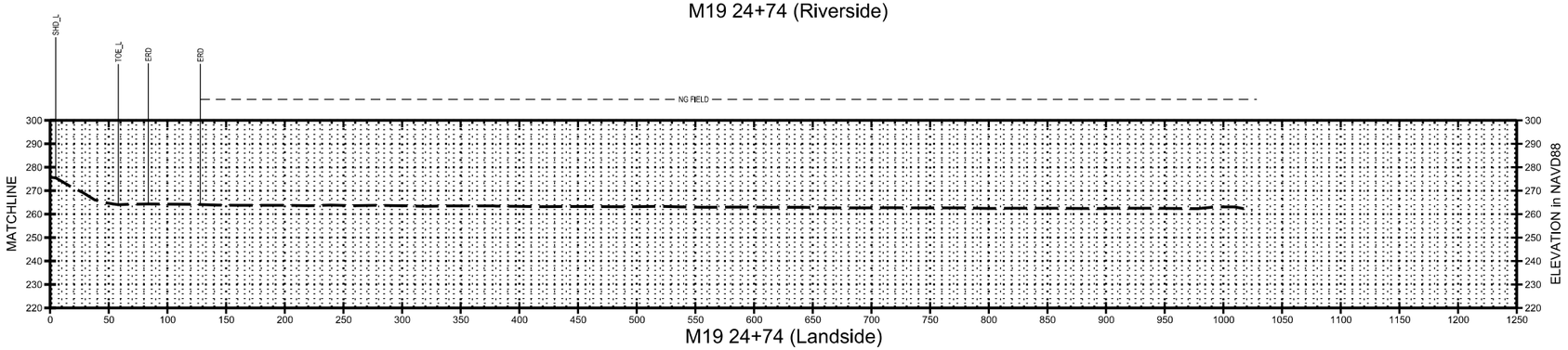
EMC DRAWING & MAPPING

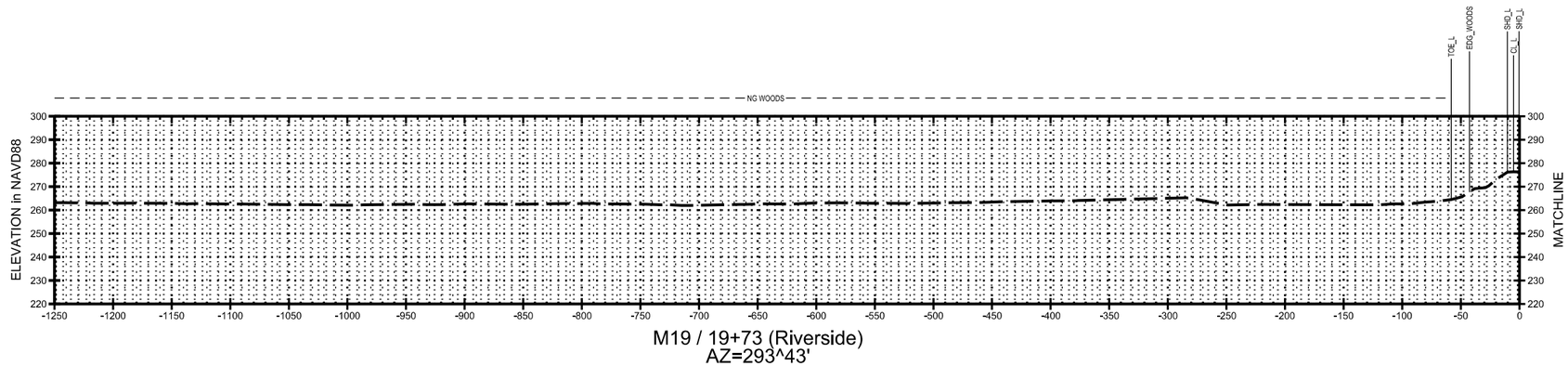
MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Miles M19/9+71 to M19/14+71
CROSS SECTIONS
PLATE

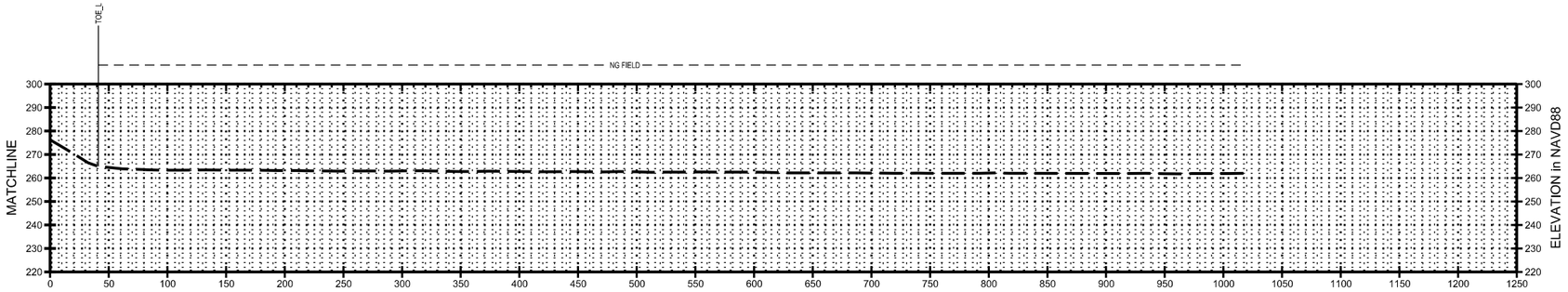
DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
GEOTECHNICAL ENGINEERING BRANCH

Sheet ID
8 OF 63









SURVEY NOTES:

- ALL ELEVATIONS ARE REFERENCED TO NAVD 1988.
- PLANE COORDINATES ARE BASED ON NORTH AMERICAN DATUM OF 1893 (NAD 83) USING UTM ZONE 15 IN U.S. SURVEY FEET.

30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers
Memphis District

MARK	DESCRIPTION	DATE	APPR
MARK	DESCRIPTION	DATE	APPR

DESIGNED BY:
DWN BY: DEG
CKD BY: MOC
SUBMITTED BY: EMC, Inc.
DATE: 01/14/2011
SOLICITATION NO.: W38XGR01724428
CONTRACT NO.: W912EK-10-D-0014
PLOT SCALE: 1:1
PLOT DATE: 01/14/2011
FILE NUMBER:
SIZE: ANSI D
FILE NAME: EMC100010DZCXS.dgn

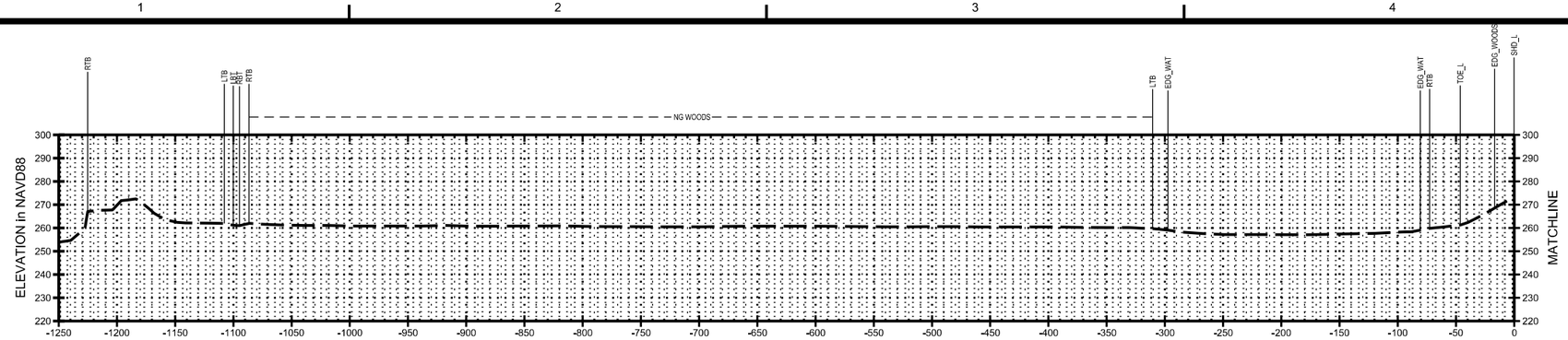
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

EMC DRAWING & MAPPING

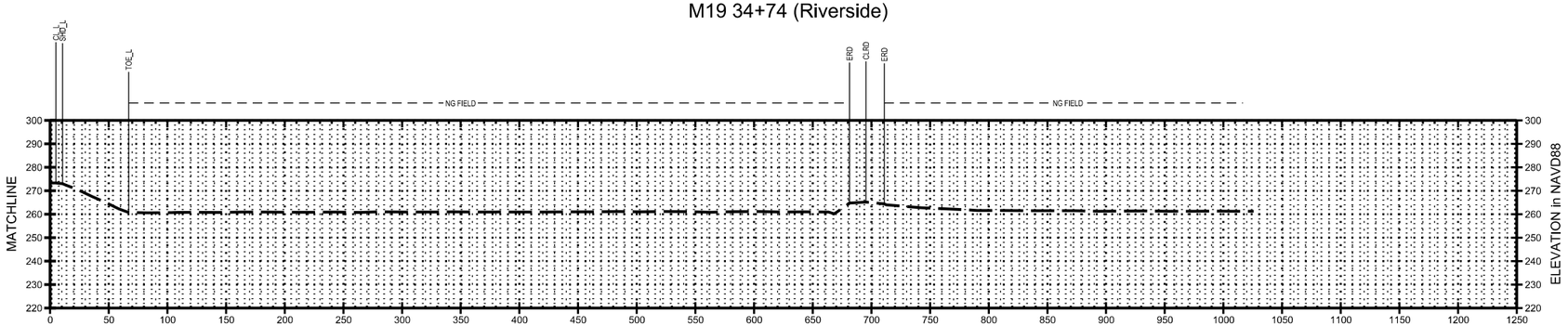
MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Miles M19/19+73 to M19/24+74
CROSS SECTIONS
PLATE

DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
SURVEYING & ENGINEERING BRANCH

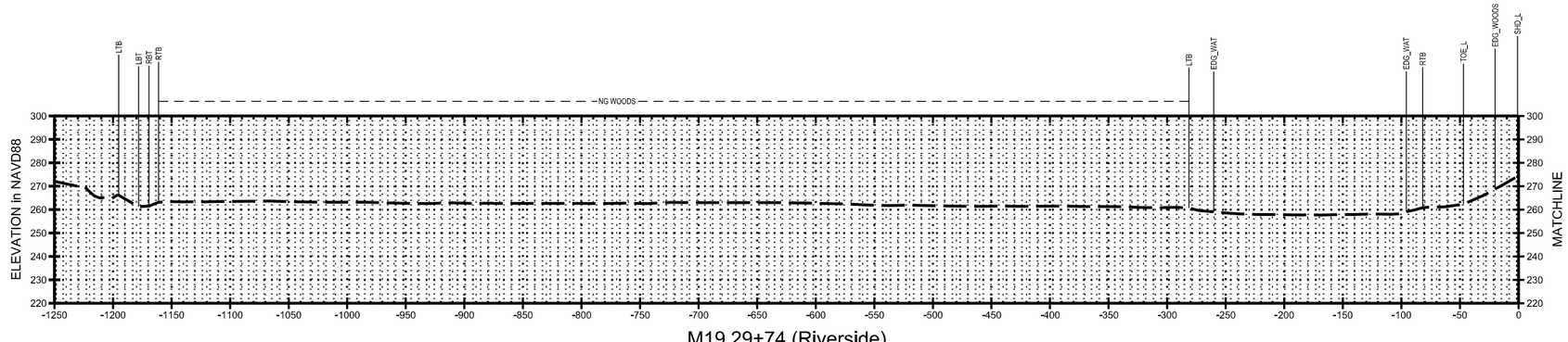
Sheet ID
9 OF 63



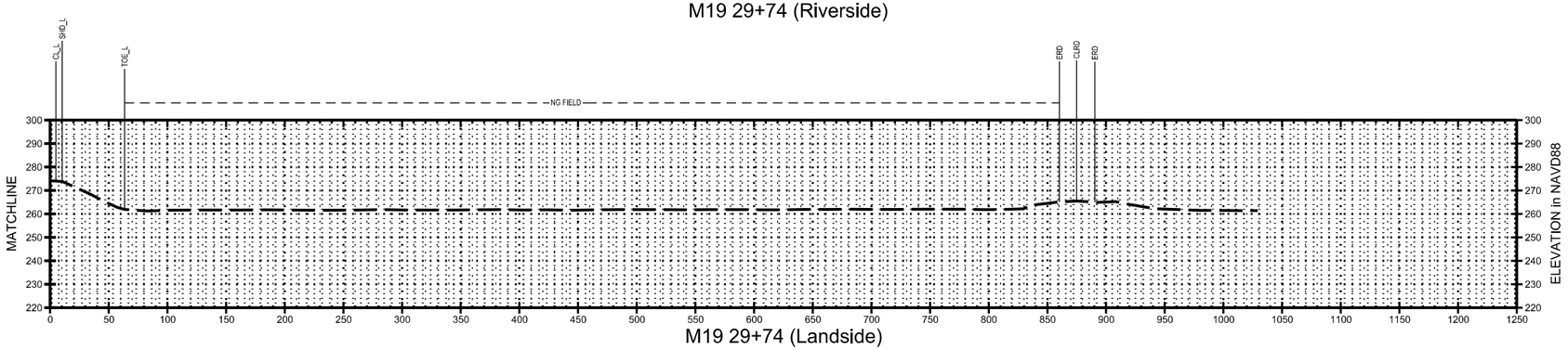
M19 34+74 (Riverside)



M19 34+74 (Landside)



M19 29+74 (Riverside)



M19 29+74 (Landside)

SURVEY NOTES:

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- PLANE COORDINATES ARE BASED ON NORTH AMERICAN DATUM OF 1893 (NAD 83) USING UTM ZONE 15 IN U.S. SURVEY FEET.

30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers®
Memphis District

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

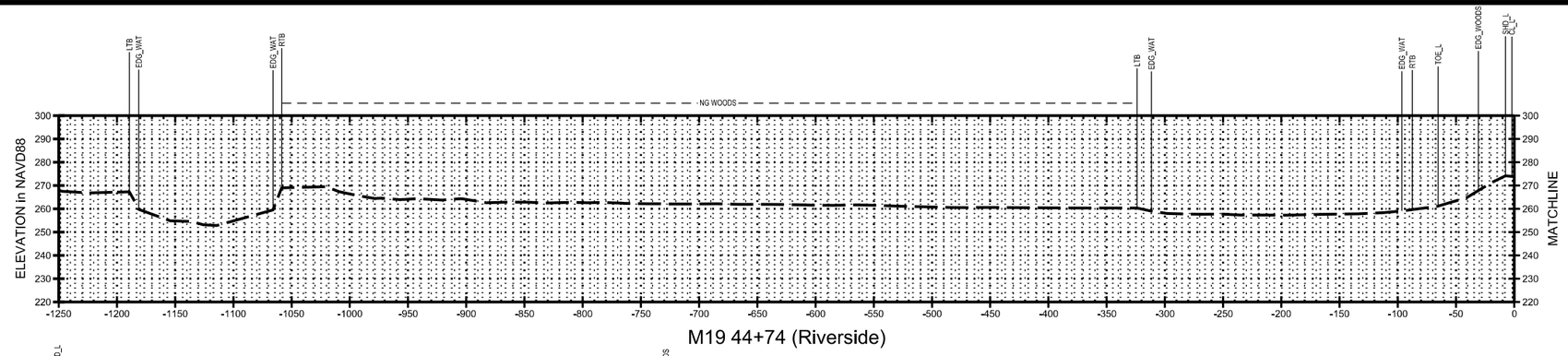
DESIGNED BY:
DWN BY: DEG
CKD BY: MCC
SUBMITTED BY: EMC, Inc.
PLOT SCALE: 1" = 60'
PLOT DATE: 01/14/2011
SIZE: ANSI D
FILE NAME: EMC10001002CXS.dgn
DATE: 01/14/2011
SOLICITATION NO.: W38XGR01724428
CONTRACT NO.: W912EQ-10-D-0014
FILE NUMBER:

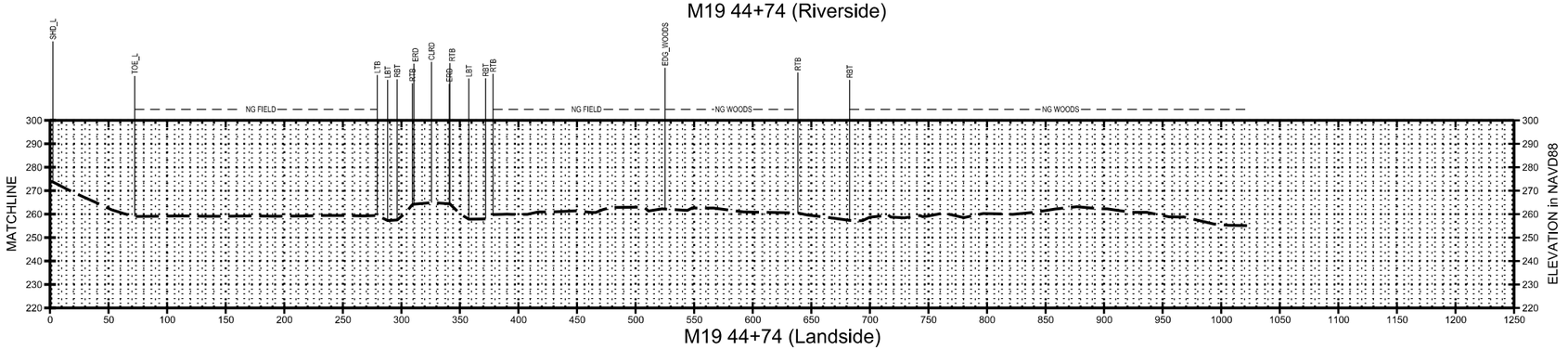
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

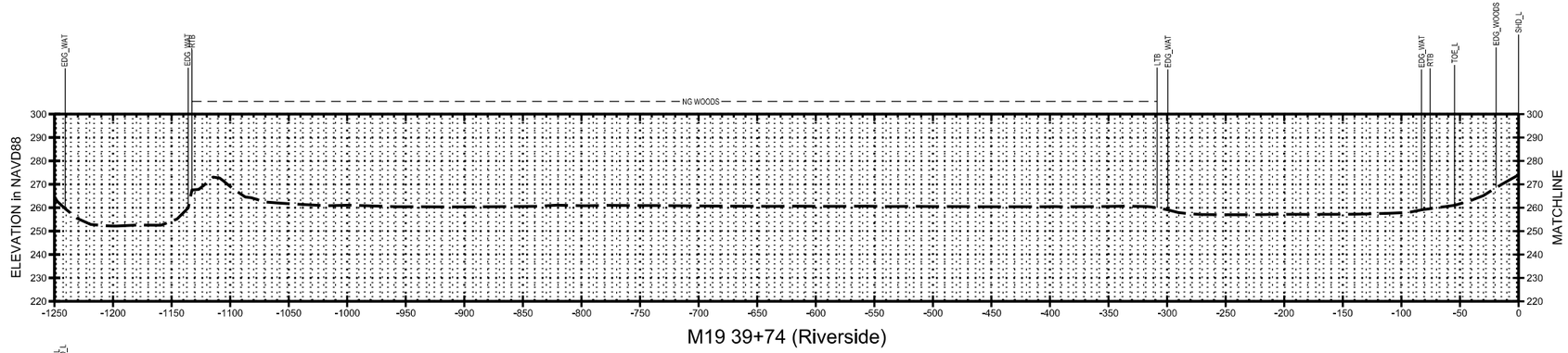
EMC SURVEYING & MAPPING

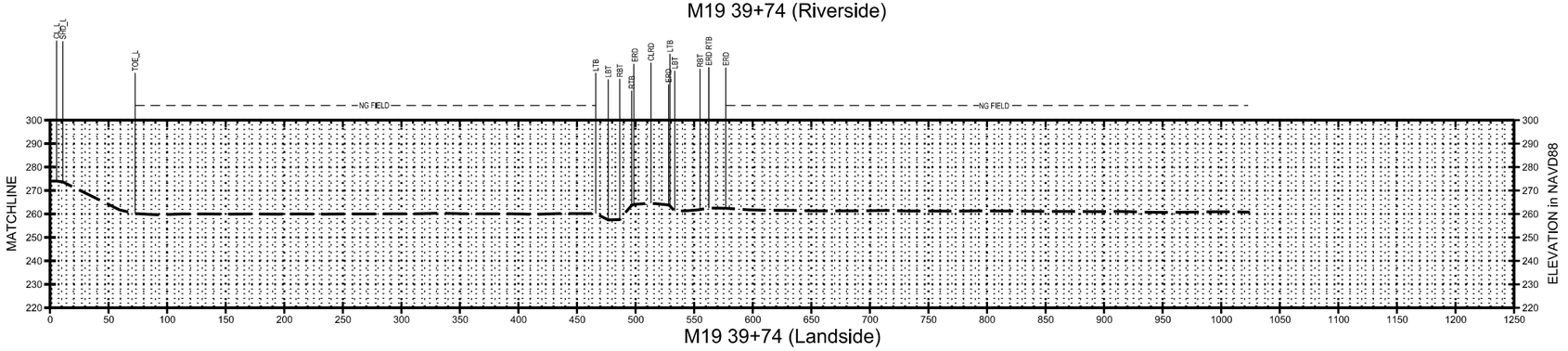
MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Miles M19/29+74 to M19/34+74
CROSS SECTIONS
PLATE
DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
GEOTECHNICAL ENGINEERING BRANCH

Sheet ID
10 OF 63









SURVEY NOTES:

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- PLANE COORDINATES ARE BASED ON NORTH AMERICAN DATUM OF 1893 (NAD 83) USING UTM ZONE 15 IN U.S. SURVEY FEET.

30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers
Memphis District

MARK	DESCRIPTION	DATE	APPR
MARK	DESCRIPTION	DATE	APPR

DESIGNED BY:
DWN BY: DEG
CKD BY: MOC
SUBMITTED BY: EMC, Inc.
DATE: 01/14/2011
SOLICITATION NO.: W38XGR91724428
CONTRACT NO.: W912EK-10-D-0014
PLOT DATE: 01/14/2011
PLOT SCALE: AS REQ'D
SIZE: ANSI D
FILE NUMBER:
FILE NAME: EMC100010G2CXS.dgn

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

EMC SURVEYING & MAPPING

MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Miles M19/39+74 to M19/44+74
CROSS SECTIONS
PLATE

DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT CORPS OF ENGINEERS
SURVEYING & ENGINEERING BRANCH

Sheet ID
11 OF 63

M19 49+78 (Riverside)

M19 49+78 (Landside)

SURVEY NOTES:

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30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers®
Memphis District

MARK	DESCRIPTION	DATE	APPR.

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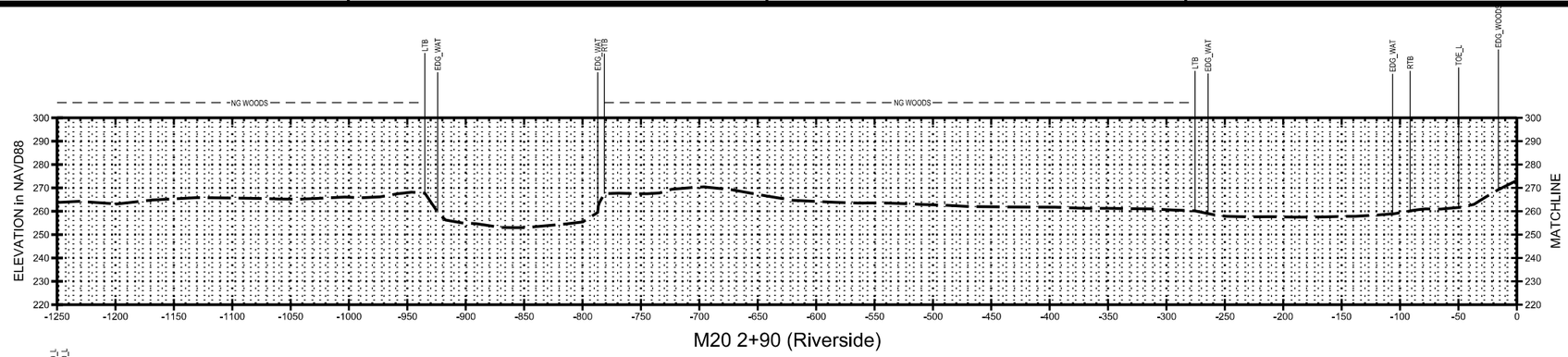
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

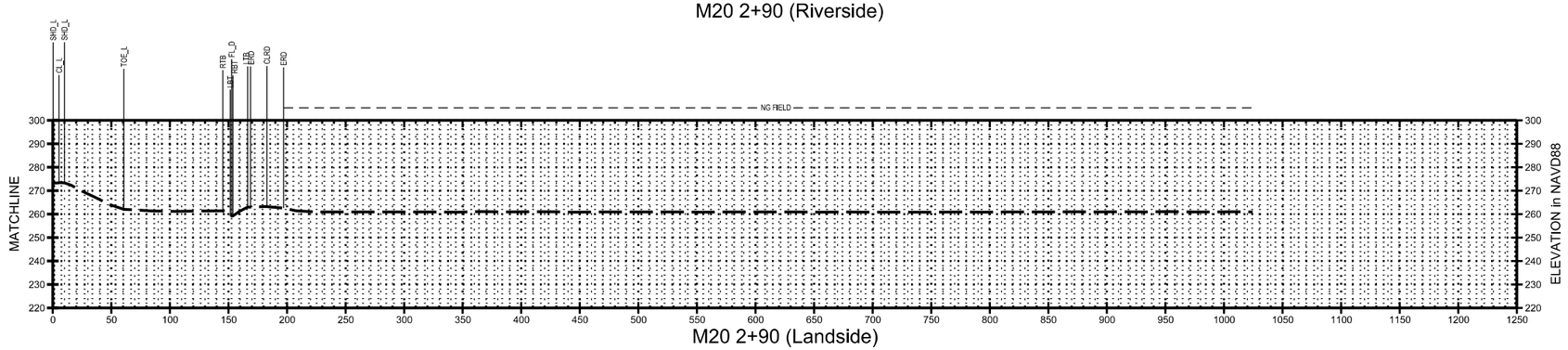
EMC SURVEYING & MAPPING

DESIGNED BY:
DWN BY: DEG
CKD BY: MOC
SUBMITTED BY: EMC, Inc.
PLOT SCALE: 1" = 60'
PLOT DATE: 01/14/2011
SIZE: ANSI D
FILE NAME: EMC10001002CXS.dgn
DATE: 01/14/2011
SOLICITATION NO.: W38XGR01724428
CONTRACT NO.: W912EQ-10-D-0014
FILE NUMBER:

MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Mile M19/49+78
CROSS SECTIONS
PLATE
DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
GEOTECHNICAL ENGINEERING BRANCH

Sheet
ID
12 OF 63





SURVEY NOTES:

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- PLANE COORDINATES ARE BASED ON NORTH AMERICAN DATUM OF 1893 (NAD 83) USING UTM ZONE 15 IN U.S. SURVEY FEET.

30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers
Memphis District

MARK	DESCRIPTION	DATE	APPR
MARK	DESCRIPTION	DATE	APPR

DESIGNED BY:
DRAWN BY: DEG
CKD BY: MOC
SUBMITTED BY: EMC, Inc.
DATE: 01/14/2011
SOLICITATION NO.: W38XGR91724428
CONTRACT NO.: W912EK-10-D-0014
PLOT DATE: 01/14/2011
PLOT SCALE: AS SHOWN
SIZE: ANSI D
FILE NUMBER:
FILE NAME: EMC1000105CSXS.dgn

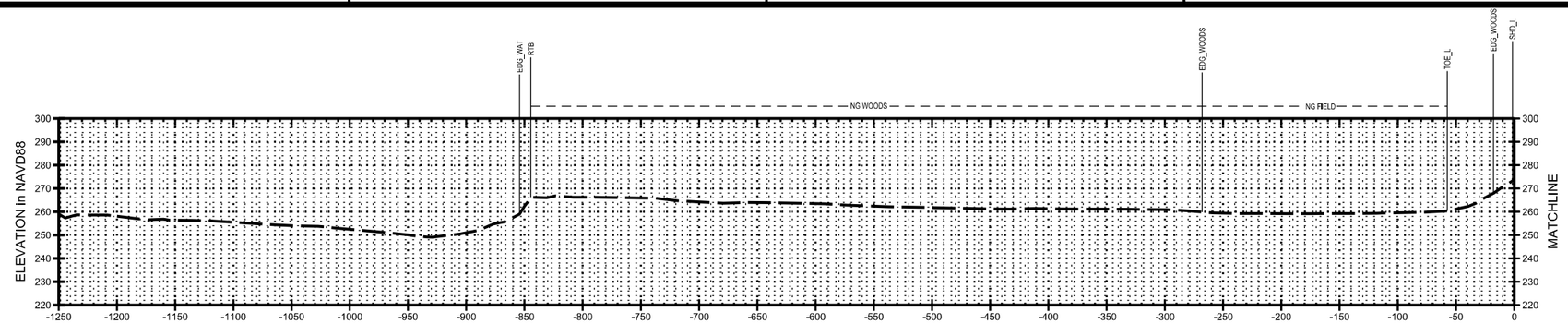
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

EMC DRAFTING & MAPPING

MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Mile M20/2+90
CROSS SECTIONS
PLATE

DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT CORPS OF ENGINEERS
GEOTECHNICAL ENGINEERING BRANCH

Sheet ID
13 OF 63



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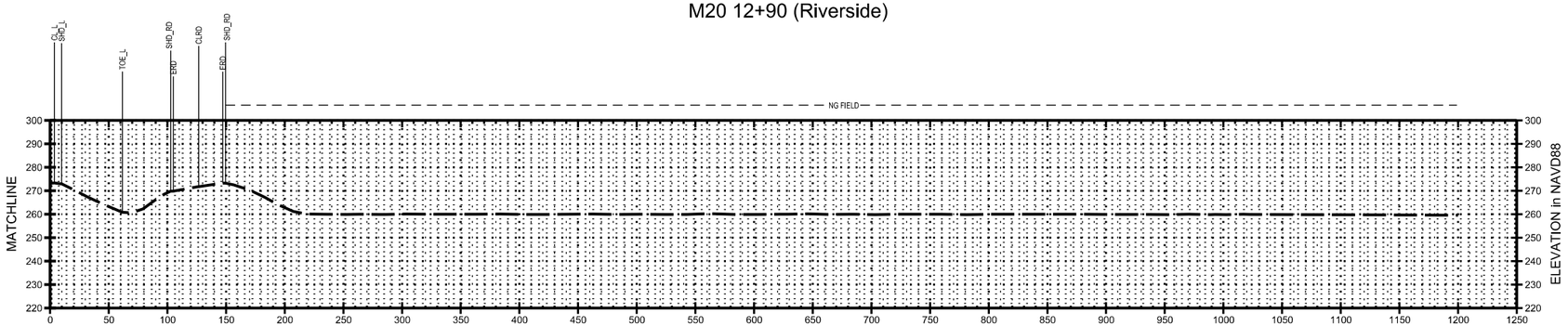

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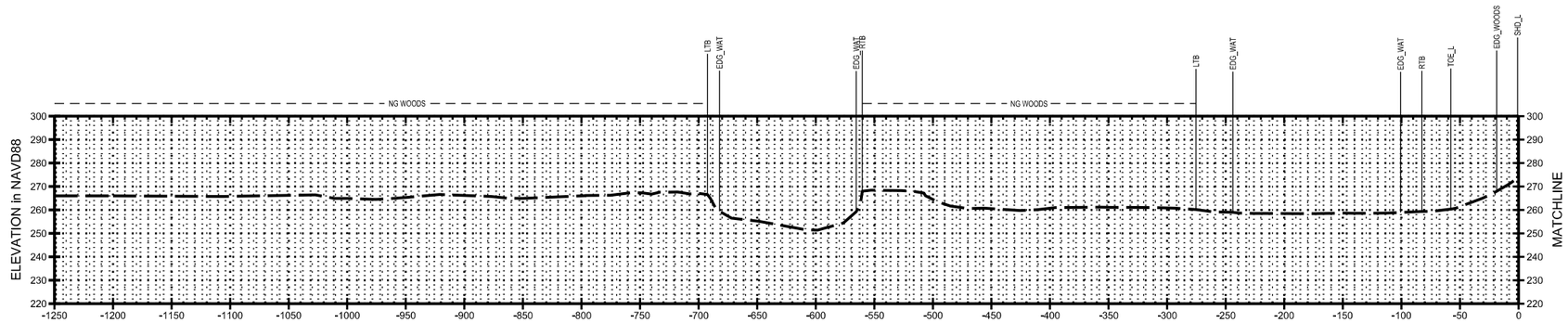

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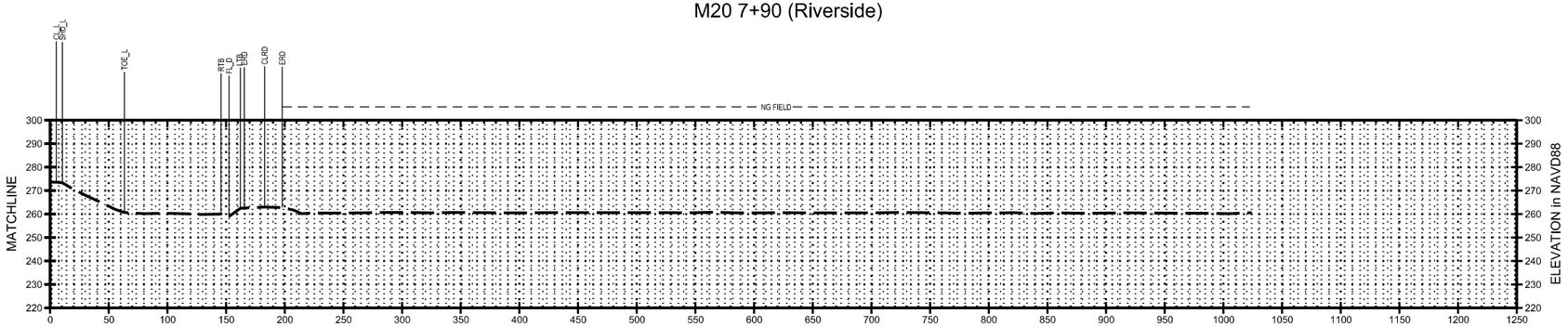

M20 7+90 (Landside)

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30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers®
Memphis District

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

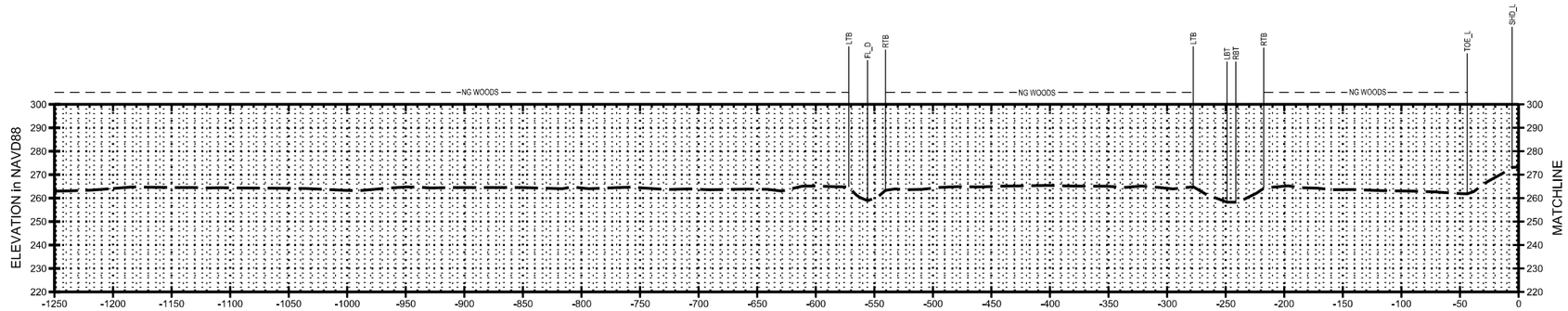
DESIGNED BY:
DWN BY: DEG
CKD BY: MCC
SUBMITTED BY: EMC, Inc.
PLOT SCALE: 1" = 60'
PLOT DATE: 01/14/2011
SIZE: ANSI D
FILE NAME: EMC10001003CXS.dgn
DATE: 01/14/2011
SOLICITATION NO.: W38XGR01724428
CONTRACT NO.: W912EQ-10-D-0014
FILE NUMBER:

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

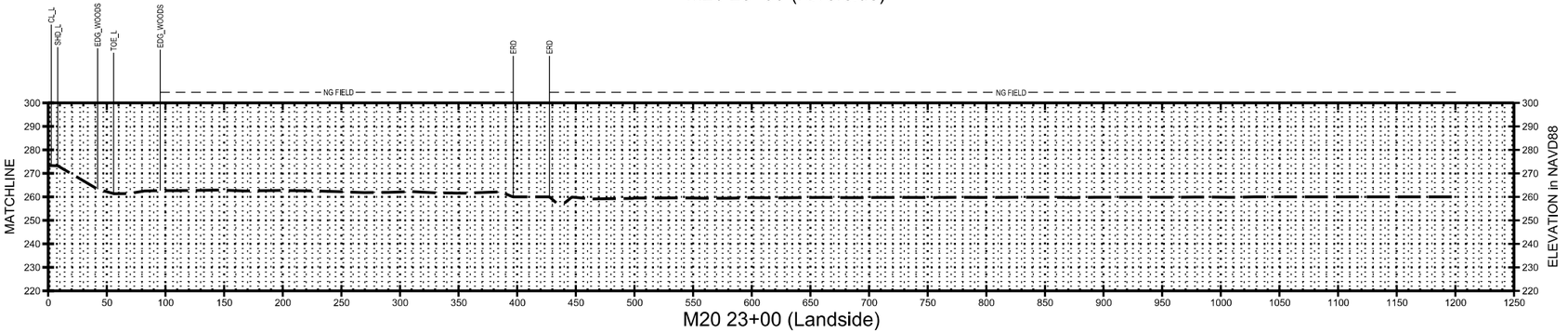
EMC SURVEYING & MAPPING

MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Miles M20/7+90 to M20/12+90
CROSS SECTIONS
PLATE
DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
GEOTECHNICAL ENGINEERING BRANCH

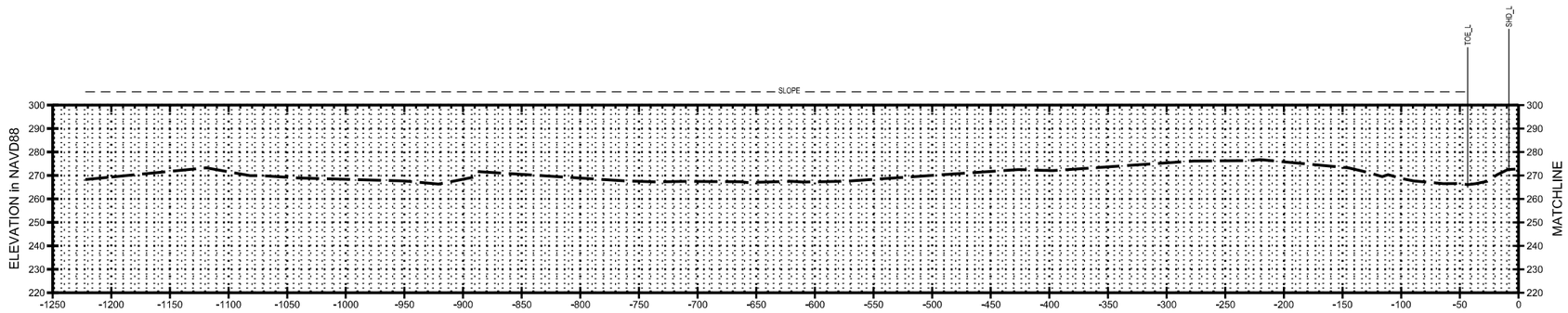
Sheet ID
14 OF 63



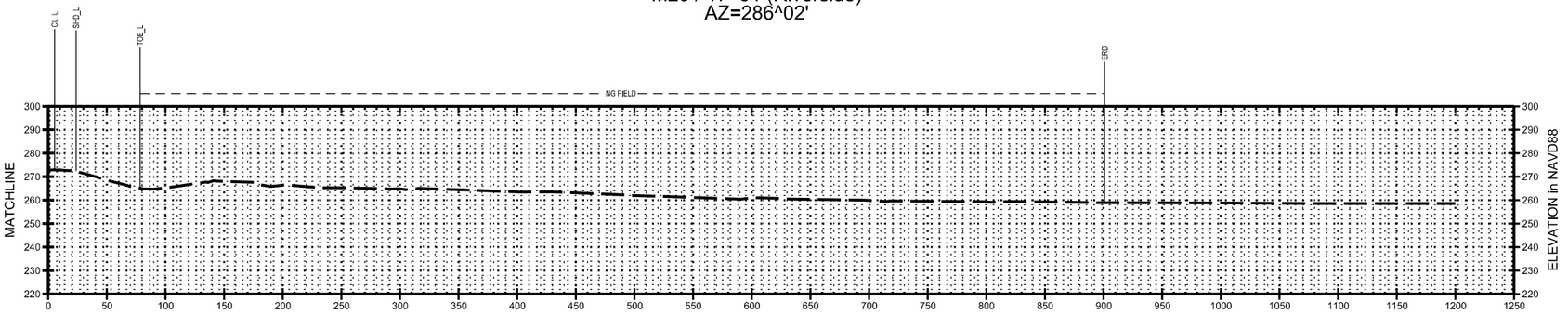
M20 23+00 (Riverside)



M20 23+00 (Landside)



M20 / 17+91 (Riverside)
AZ=286^02'



M20 / 17+91 (Landside)
AZ=286^02'

SURVEY NOTES:

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30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers®
Memphis District

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

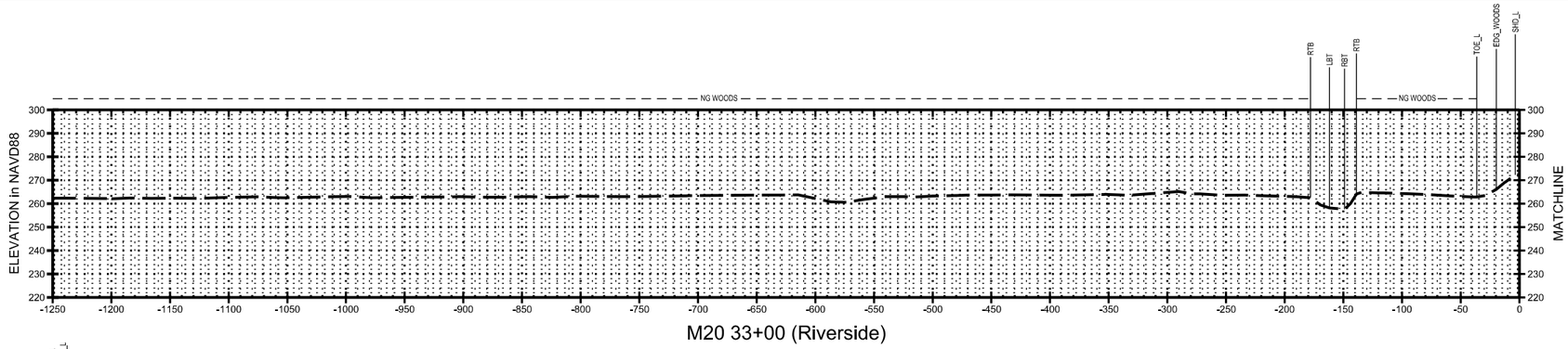
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

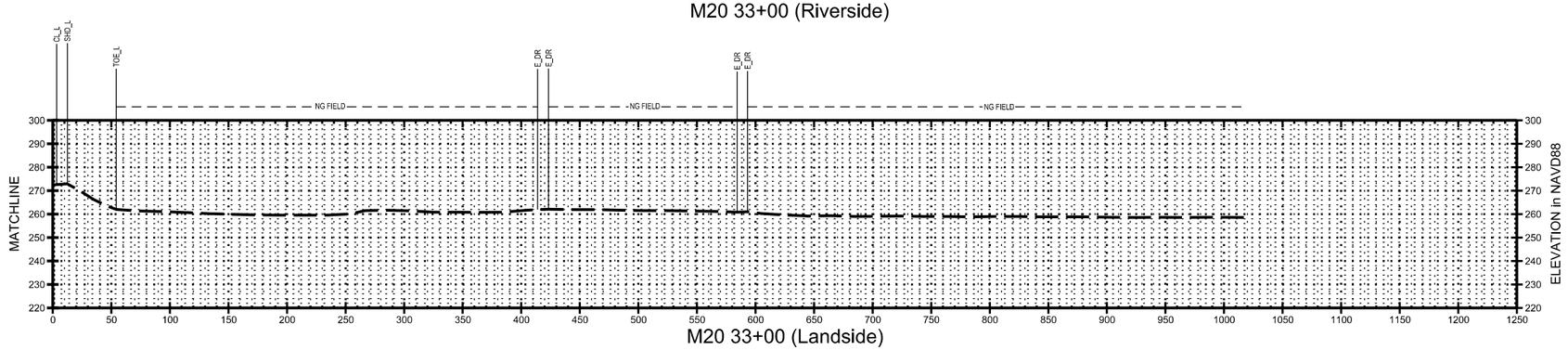
DESIGNED BY:
DWN BY: DEG
CKD BY: MCC
SUBMITTED BY: EMC, Inc.
PLOT SCALE: 1" = 60'
PLOT DATE: 01/14/2011
SIZE: ANSI D
FILE NAME: EMC10001003CXS.dgn
DATE: 01/14/2011
SOLICITATION NO.: W38XGR01724428
CONTRACT NO.: W912EQ-10-D-0014
FILE NUMBER:

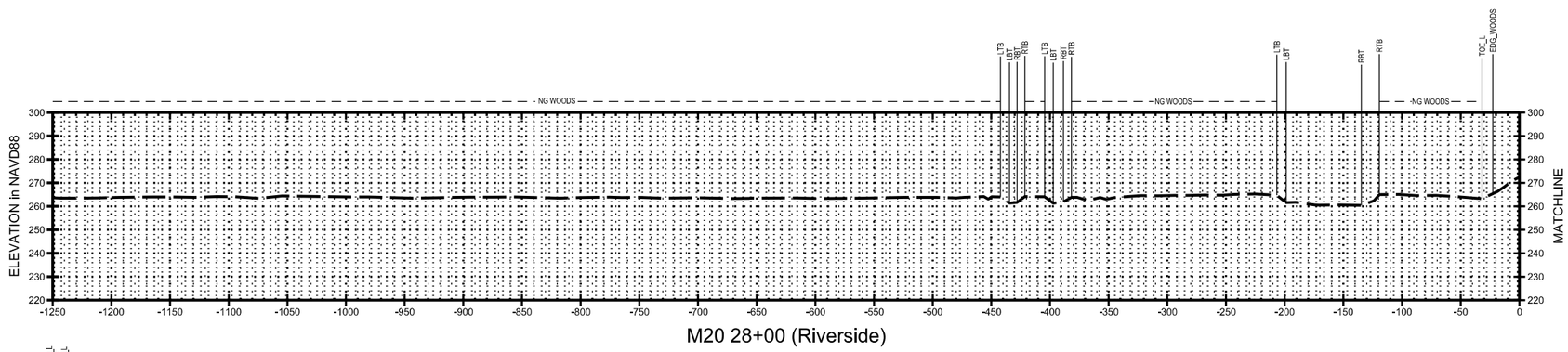
EMC SURVEYING & MAPPING

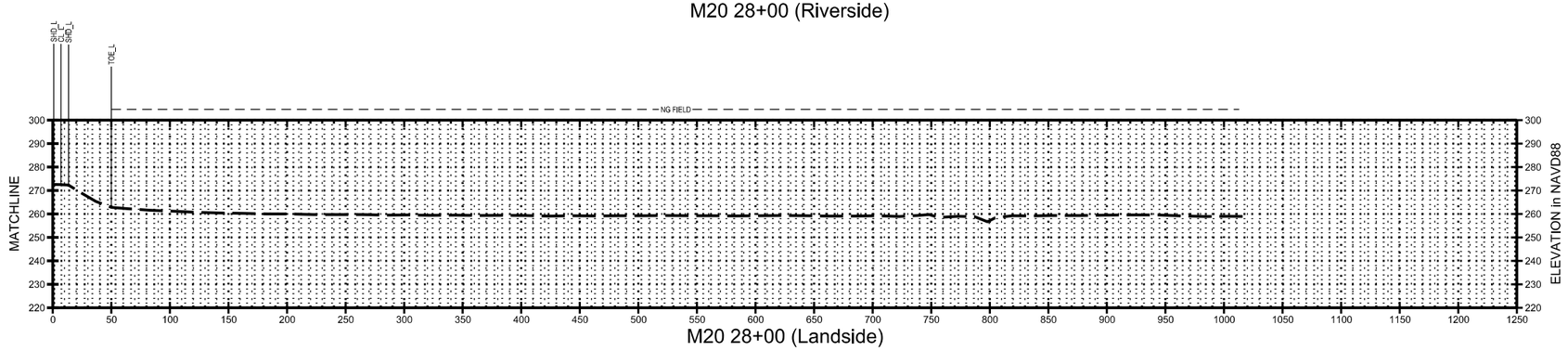
MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Miles M20/17+91 to M20/23+00
CROSS SECTIONS
PLATE
DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
GEOTECHNICAL ENGINEERING BRANCH

Sheet ID
15 OF 63









SURVEY NOTES:

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30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers
Memphis District

APPR.	DATE	DESCRIPTION
APPR.	DATE	DESCRIPTION

DESIGNED BY:
DWN BY: DEG
CKD BY: MOC
SUBMITTED BY: EMC, Inc.
DATE: 01/14/2011
SOLICITATION NO.: W38XGR91724428
CONTRACT NO.: W912EK-10-D-0014
PLOT SCALE: AS NOTED
PLOT DATE: 01/14/2011
FILE NUMBER:
SIZE: ANSI D
FILE NAME: EMC100010SCXS.dgn

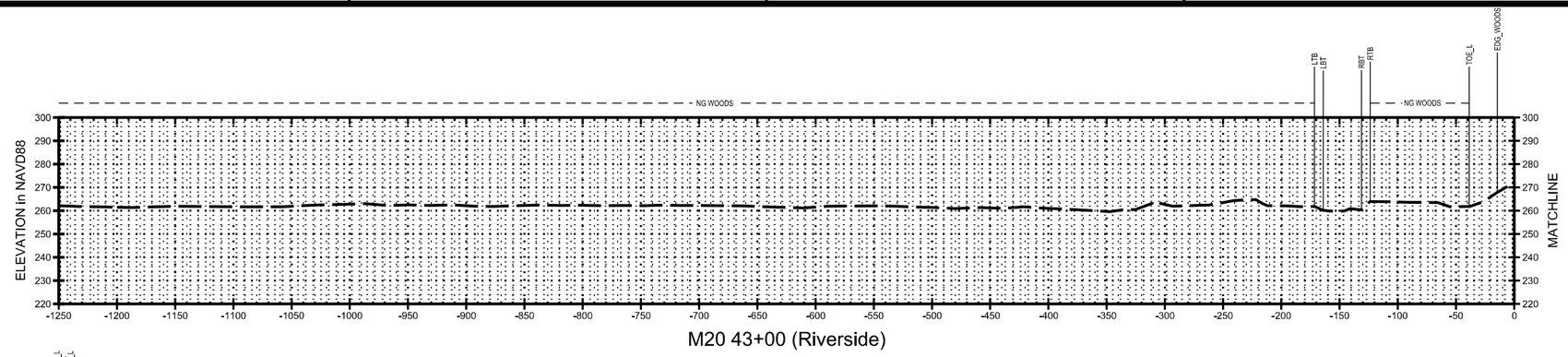
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

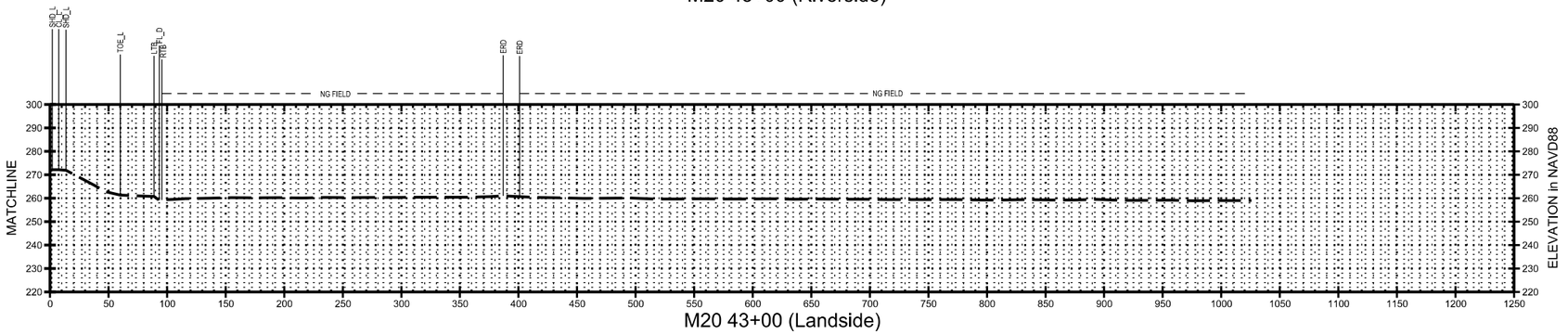
EMC DRAWING & MAPPING

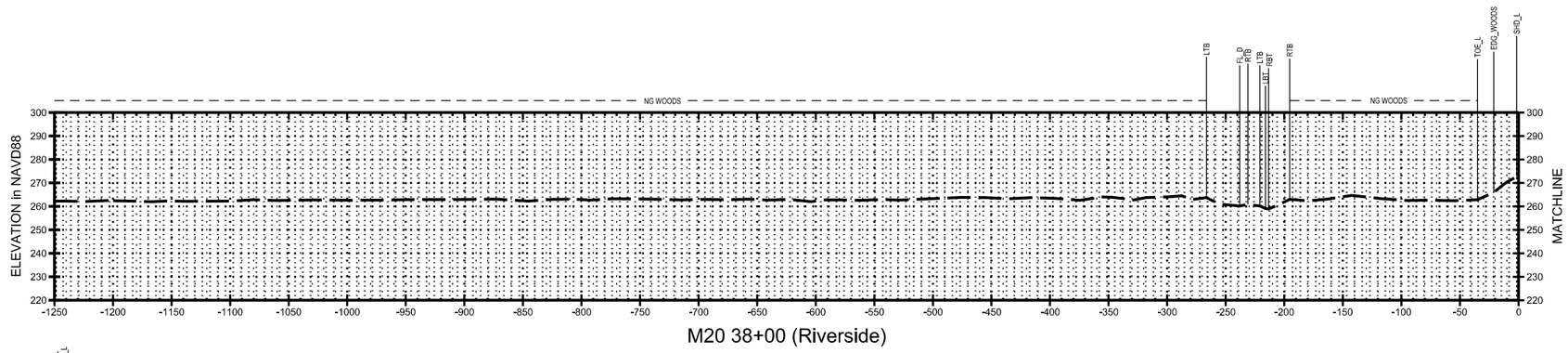
MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Miles M20/28+00 to M20/33+00
CROSS SECTIONS
PLATE

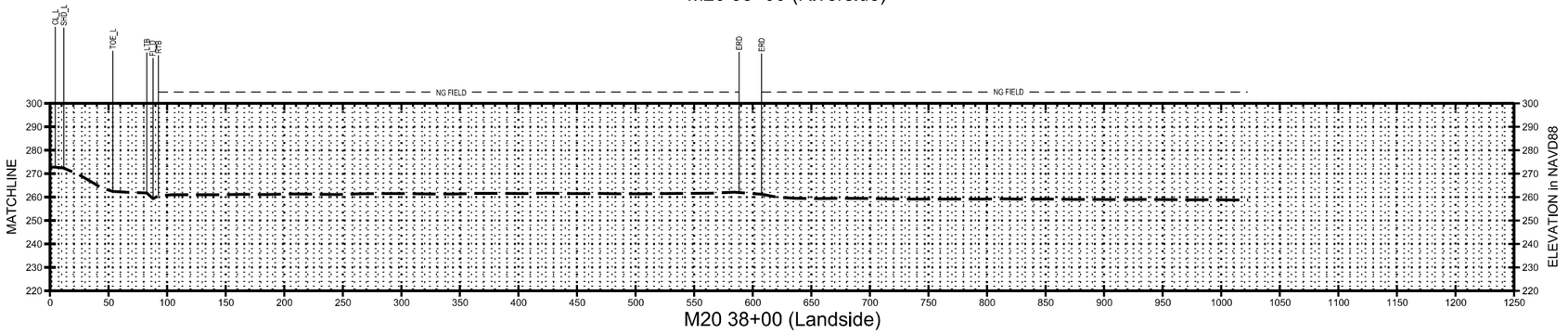
DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
ENGINEERING BRANCH

Sheet ID
16 OF 63









SURVEY NOTES:

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30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers
Memphis District

APPR.
DATE
DESCRIPTION
MARK
APPR.
DATE
DESCRIPTION
MARK

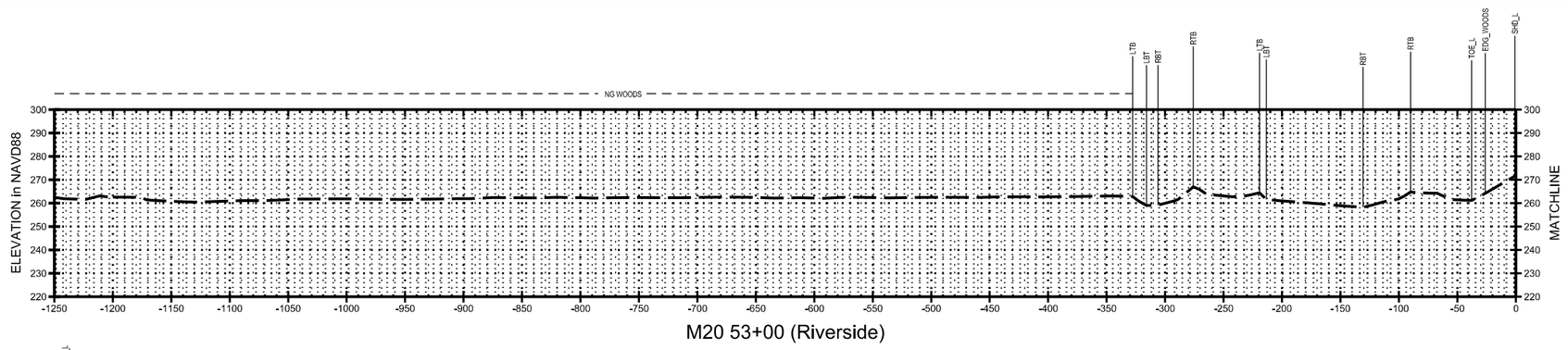
DESIGNED BY:
DATE: 01/14/2011
SOLICITATION NO.: W38XGR91724428
CONTRACT NO.: W912EK-10-D-0014
DWN BY: DEG
CKD BY: MOC
SUBMITTED BY: EMC, Inc.
PLOT DATE: 01/14/2011
PLOT SCALE: AS IS
FILE NUMBER:
SIZE: ANSI D
FILE NAME: EMC100010SCXS.dgn

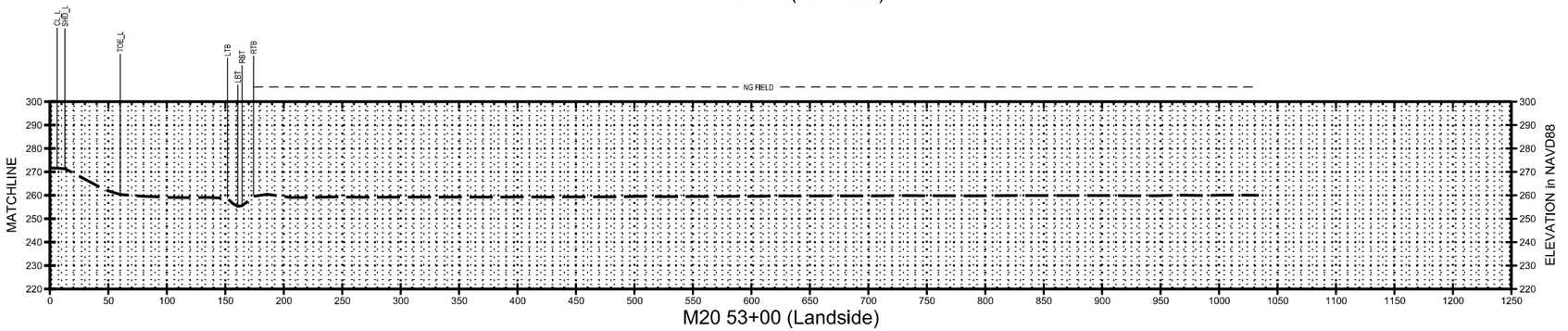
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

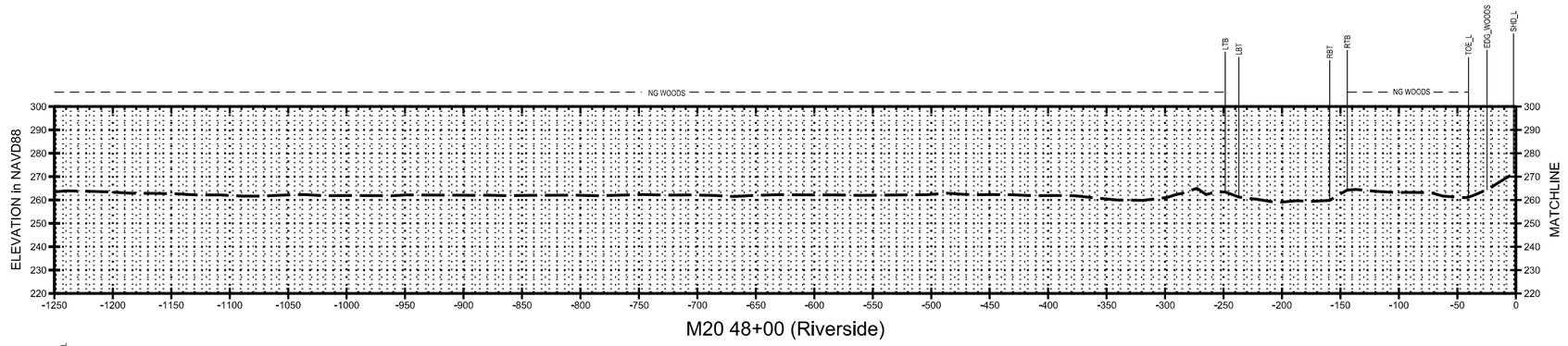
EMC
DRAFTING & MAPPING

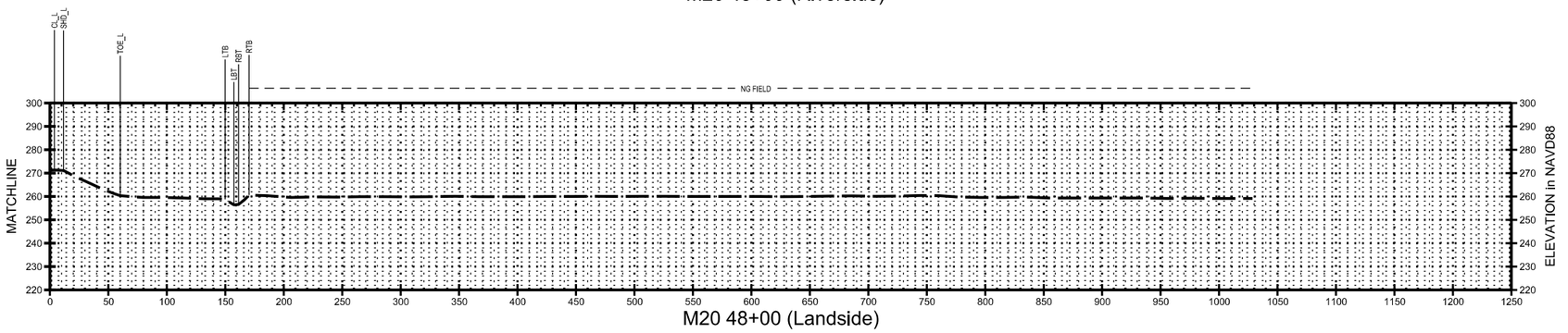
MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Miles M20/38+00 to M20/43+00
CROSS SECTIONS
PLATE
DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
SURVEYING & ENGINEERING BRANCH

Sheet ID
17 OF 63









SURVEY NOTES:

- ALL ELEVATIONS ARE REFERENCED TO NAVD 1988.

- PLANE COORDINATES ARE BASED ON NORTH AMERICAN DATUM OF 1893 (NAD 83) USING UTM ZONE 15 IN U.S. SURVEY FEET.

30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers®
Memphis District

MARK	DESCRIPTION	DATE	APPR.
MARK	DESCRIPTION	DATE	APPR.

DESIGNED BY:
DWN BY: DEG
CKD BY: MOC
SUBMITTED BY: EMC, Inc.
DATE: 01/14/2011
SOLICITATION NO.: W38XGR91724428
CONTRACT NO.: W912EK-10-D-0014
PLOT SCALE: AS NOTED
PLOT DATE: 01/14/2011
FILE NUMBER:
SIZE: ANSI D
FILE NAME: EMC100010SCXS.dgn

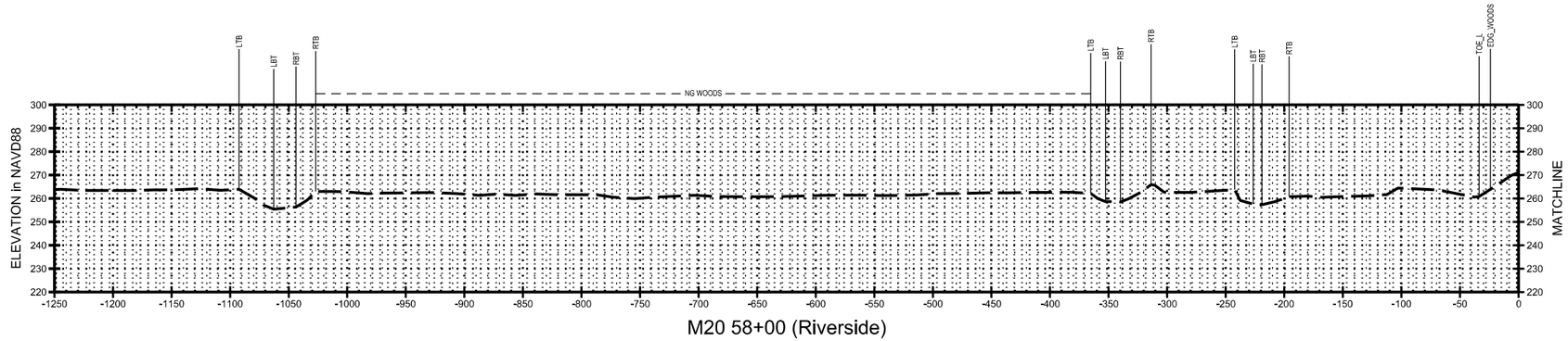
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

EMC DRAWING & MAPPING

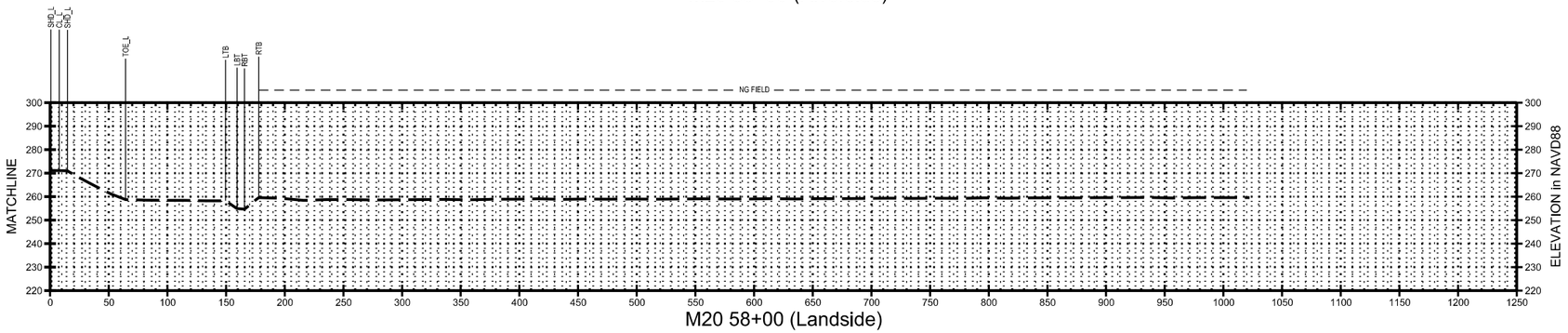
MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Miles M20/48+00 to M20/53+00
CROSS SECTIONS
PLATE

DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
SUPERVISORY ENGINEERING BRANCH

Sheet ID
18 OF 63



M20 58+00 (Riverside)



M20 58+00 (Landside)

SURVEY NOTES:

- ALL ELEVATIONS ARE REFERENCED TO NAVD 1988.
- PLANE COORDINATES ARE BASED ON NORTH AMERICAN DATUM OF 1893 (NAD 83) USING UTM ZONE 15 IN U.S. SURVEY FEET.

30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers®
Memphis District

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

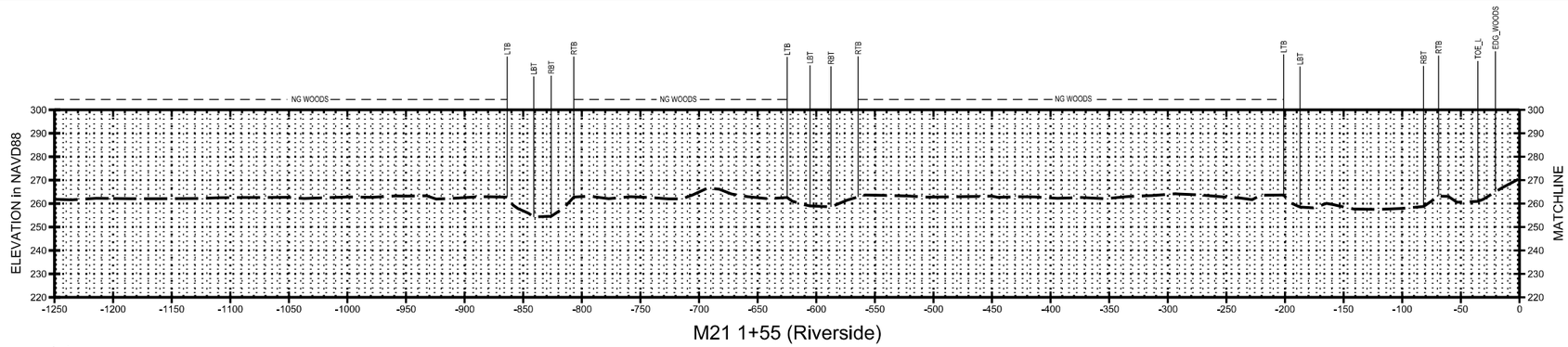
DESIGNED BY:
DWN BY: DEG
CKD BY: MCC
SUBMITTED BY: EMC, Inc.
PLOT SCALE: 1" = 60'
PLOT DATE: 01/14/2011
SIZE: ANSI D
FILE NAME: EMC10001003CXS.dgn
DATE: 01/14/2011
SOLICITATION NO.: W38XGR01724428
CONTRACT NO.: W912EQ-10-D-0014
FILE NUMBER:

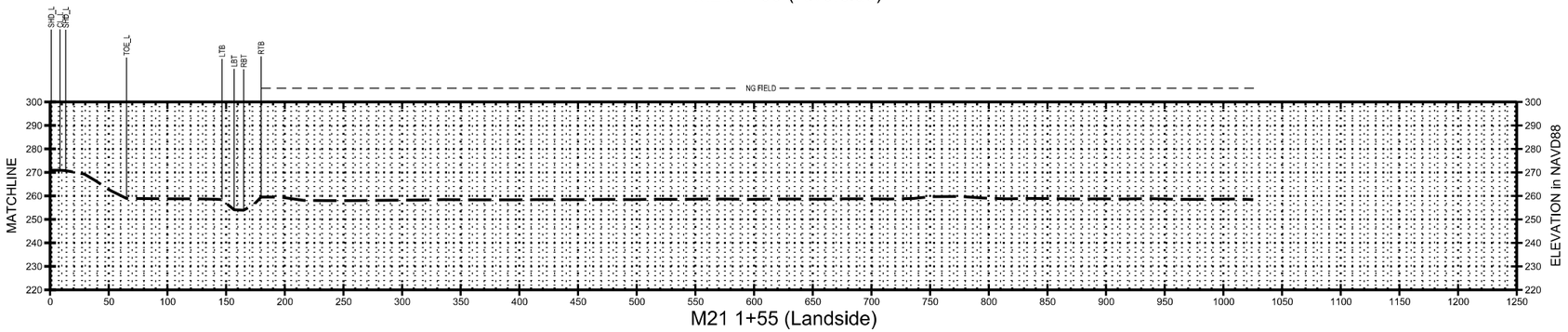
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

EMC SURVEYING & MAPPING

MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Mile M20/58+00
CROSS SECTIONS
PLATE
DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
GEOTECHNICAL ENGINEERING BRANCH

Sheet ID
19 OF 63





SURVEY NOTES:

- ALL ELEVATIONS ARE REFERENCED TO NAVD 1988.

- PLANE COORDINATES ARE BASED ON NORTH AMERICAN DATUM OF 1893 (NAD 83) USING UTM ZONE 15 IN U.S. SURVEY FEET.

30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers
Memphis District

MARK	DESCRIPTION	DATE	APPR
MARK	DESCRIPTION	DATE	APPR

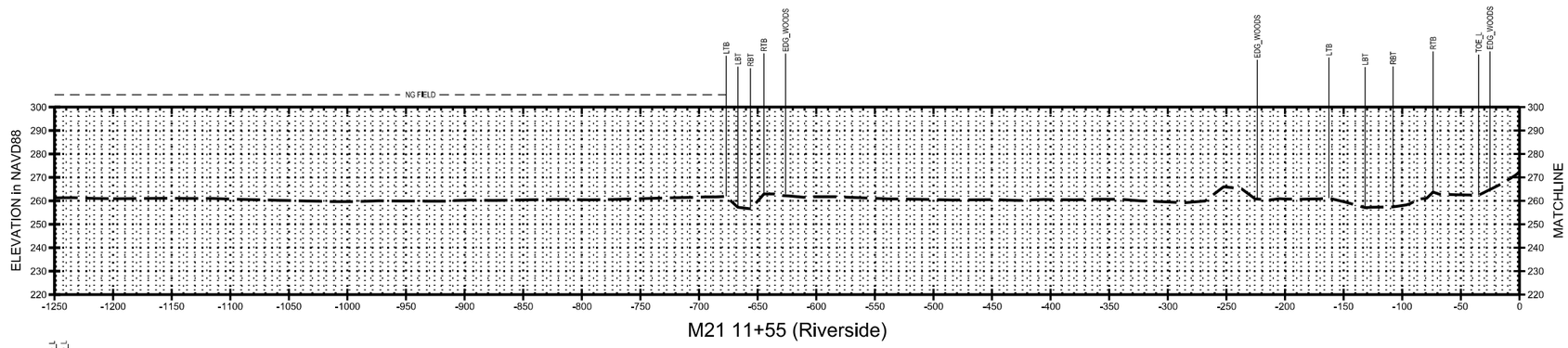
DESIGNED BY:
DRAWN BY: DEG
CKD BY: MOC
SUBMITTED BY: EMC, Inc.
DATE: 01/14/2011
SOLICITATION NO.: W38XGR91724428
CONTRACT NO.: W912EK-10-D-0014
PLOT SCALE: As Plotted
PLOT DATE: As Plotted
FILE NUMBER:
FILE NAME: EMC100010d4CXS.dgn
SIZE: ANSI D

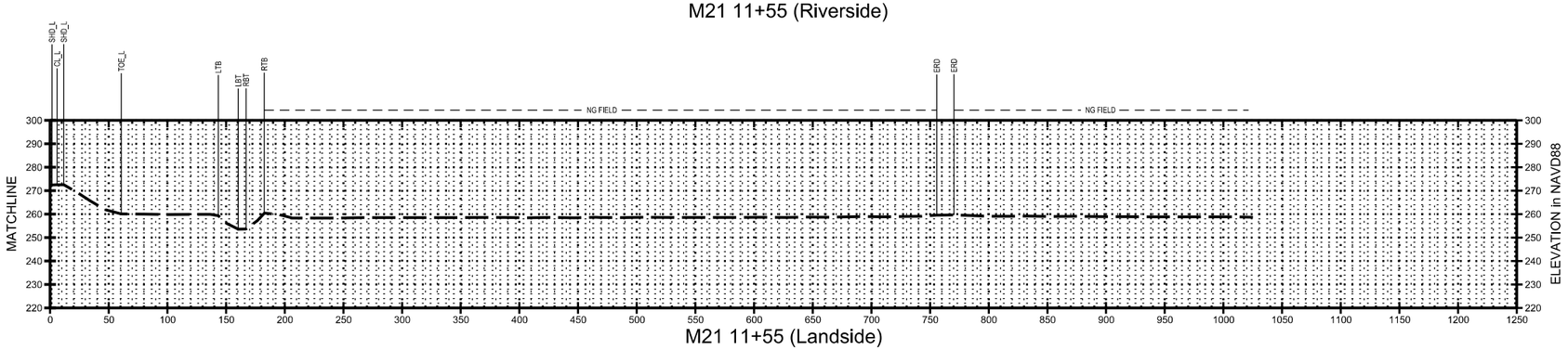
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

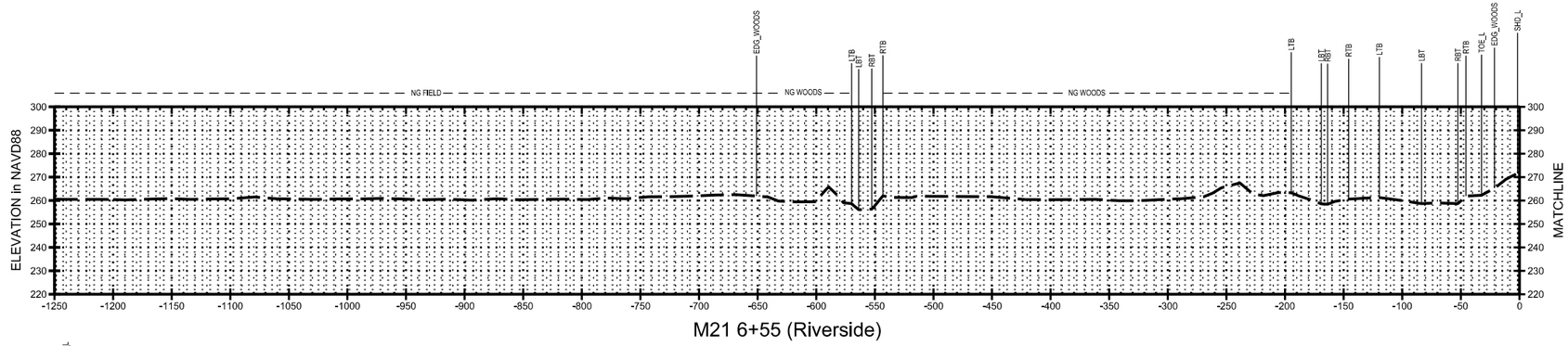
EMC DRAFTING & MAPPING

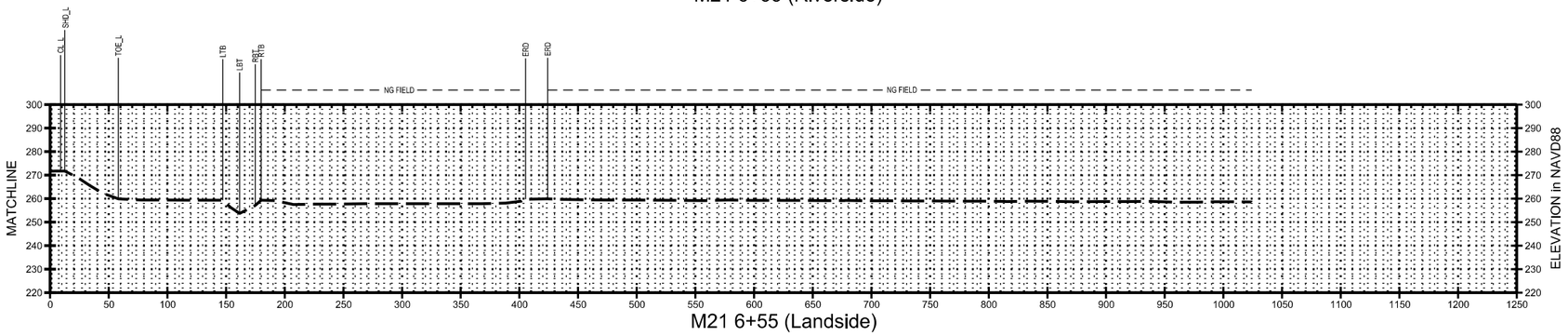
MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee MMs M211+55
CROSS SECTIONS
PLATE
DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT CORPS OF ENGINEERS
GEOTECHNICAL ENGINEERING BRANCH

Sheet ID
20 OF 63









SURVEY NOTES:

- ALL ELEVATIONS ARE REFERENCED TO NAVD 1988.
- PLANE COORDINATES ARE BASED ON NORTH AMERICAN DATUM OF 1893 (NAD 83) USING UTM ZONE 15 IN U.S. SURVEY FEET.

30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers
Memphis District

MARK	DESCRIPTION	DATE	APPR
MARK	DESCRIPTION	DATE	APPR

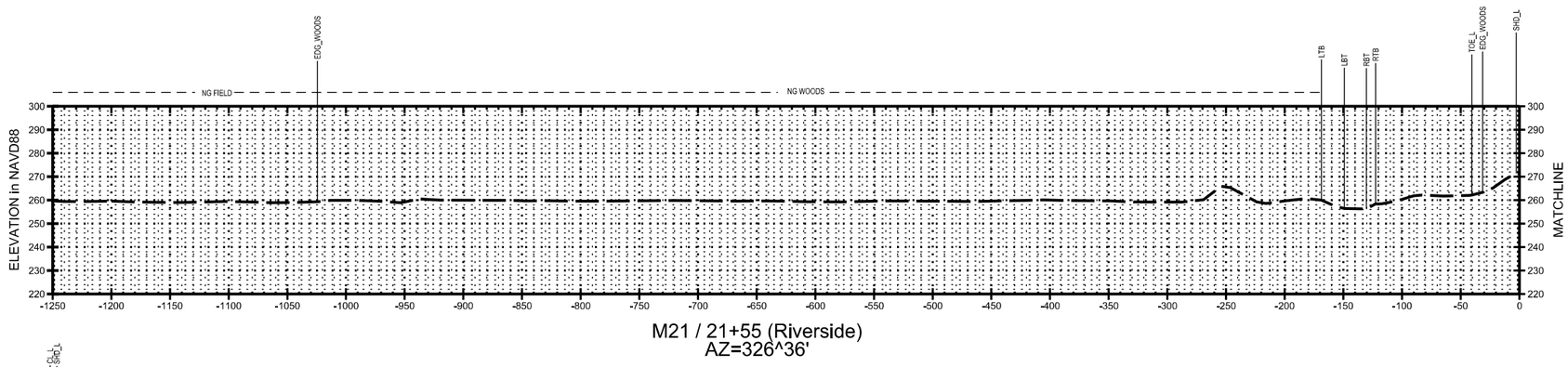
DESIGNED BY:
DATE: 01/14/2011
DWN BY: DEG
CKD BY: MOC
SUBMITTED BY: EMC, Inc.
SOLICITATION NO.: W38XGR91724428
CONTRACT NO.: W912EK-10-D-0014
PLOT DATE: 01/14/2011
PLOT SCALE: ASIS
SIZE: ANSI D
FILE NUMBER:
FILE NAME: EMC100010d4CXS.dgn

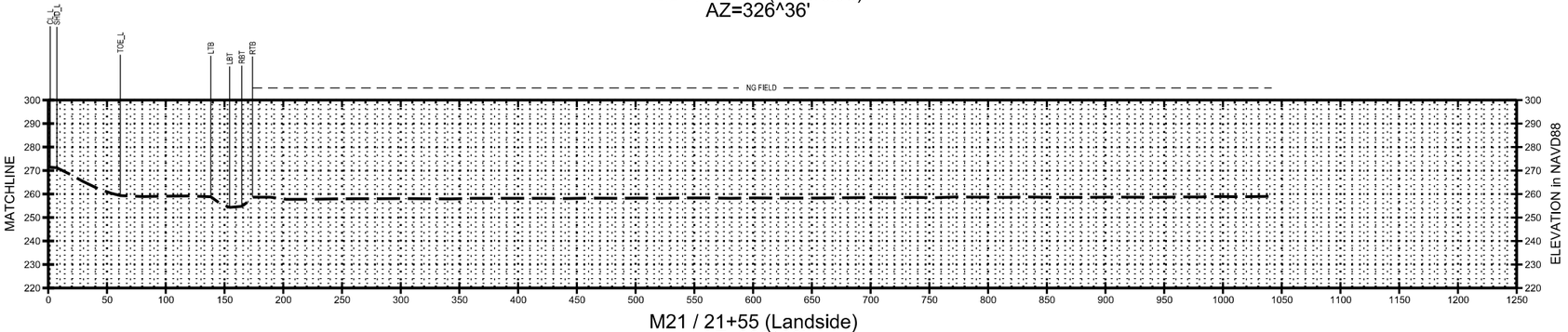
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

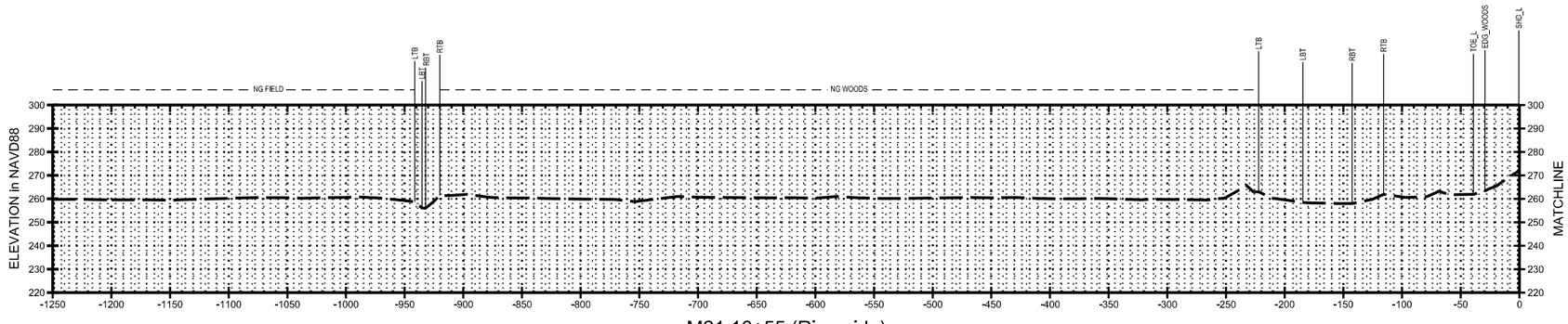
EMC DRAWING & MAPPING

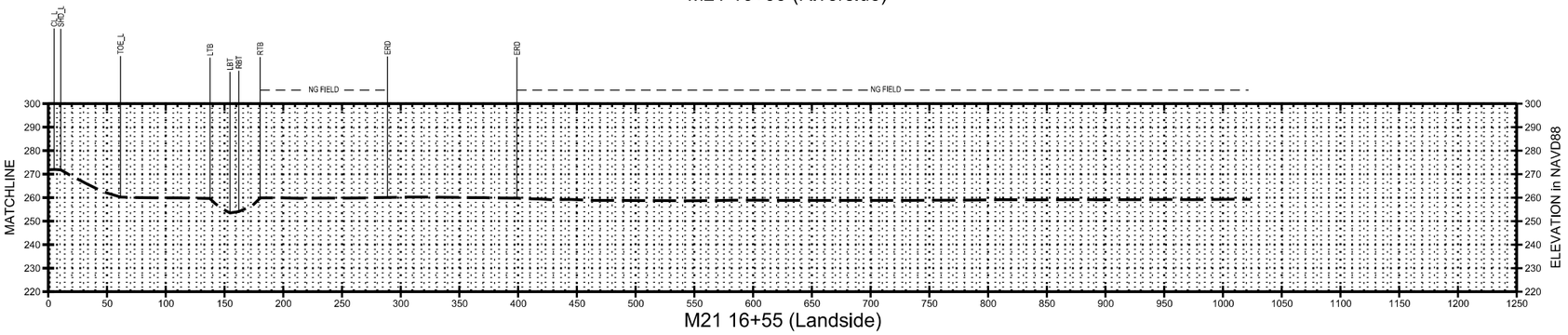
MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Miles M21.6+55 to M21/11+55
CROSS SECTIONS
PLATE
DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
SUPERVISING ENGINEERING BRANCH

Sheet ID
21 OF 63









SURVEY NOTES:

- ALL ELEVATIONS ARE REFERENCED TO NAVD 1988.

- PLANE COORDINATES ARE BASED ON NORTH AMERICAN DATUM OF 1893 (NAD 83) USING UTM ZONE 15 IN U.S. SURVEY FEET.

30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers
Memphis District

MARK	DESCRIPTION	DATE	APPR
MARK	DESCRIPTION	DATE	APPR

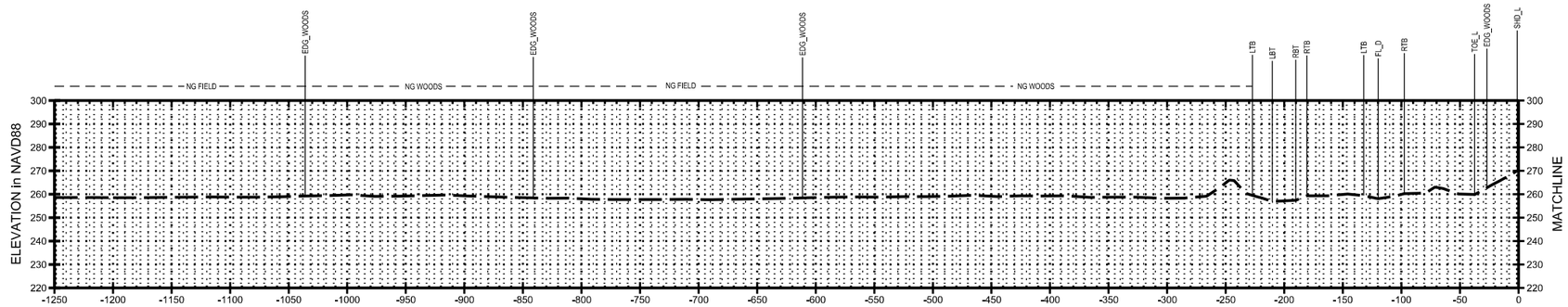
DESIGNED BY:
DRAWN BY: DEG
CKD BY: MOC
SUBMITTED BY: EMC, Inc.
DATE: 01/14/2011
SOLICITATION NO.: W38XGR91724428
CONTRACT NO.: W912EK-10-D-0014
PLOT DATE: 01/14/2011
PLOT SCALE: AS REP
SIZE: ANSI D
FILE NUMBER:
FILE NAME: EMC100010dCXS.dgn

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

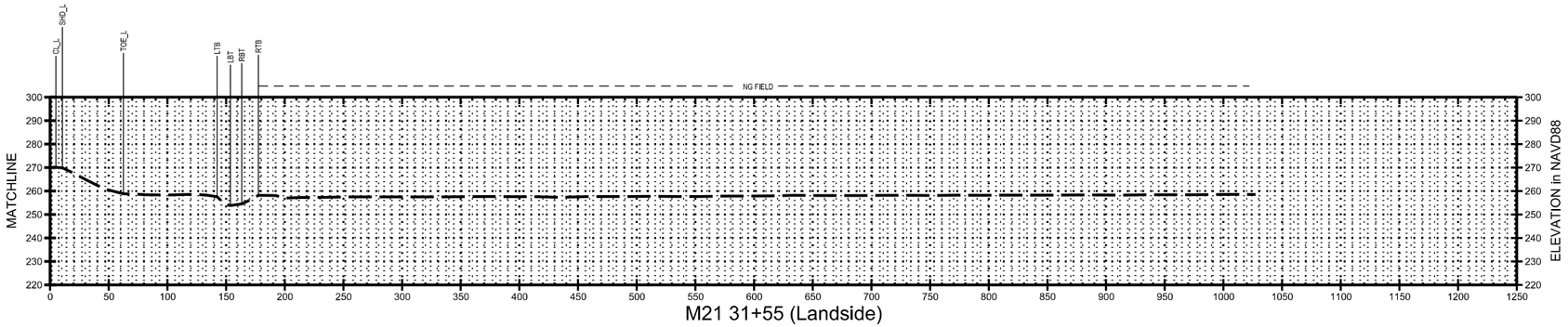
EMC DRAWING & MAPPING

MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Miles M21/16+55 to M21/21+55
CROSS SECTIONS
PLATE
DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
GEOTECHNICAL ENGINEERING BRANCH

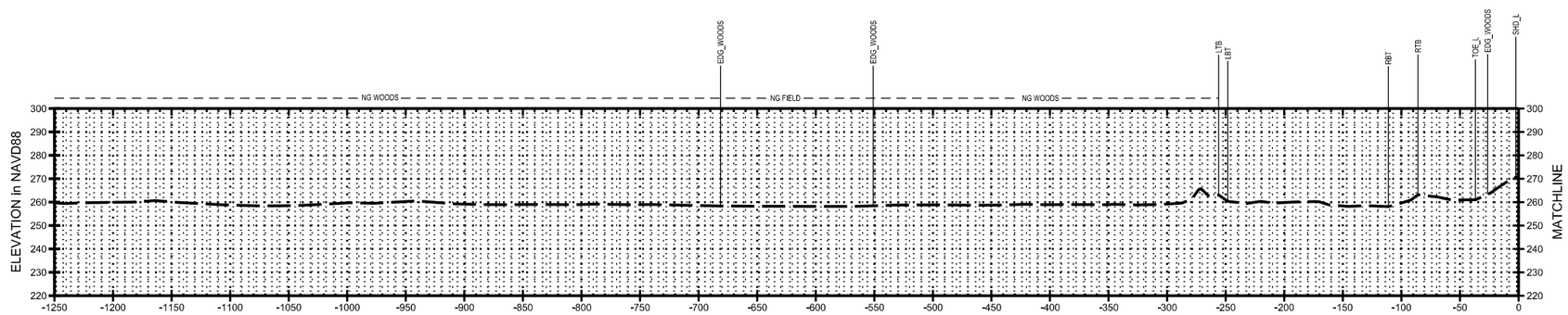
Sheet ID
22 OF 63



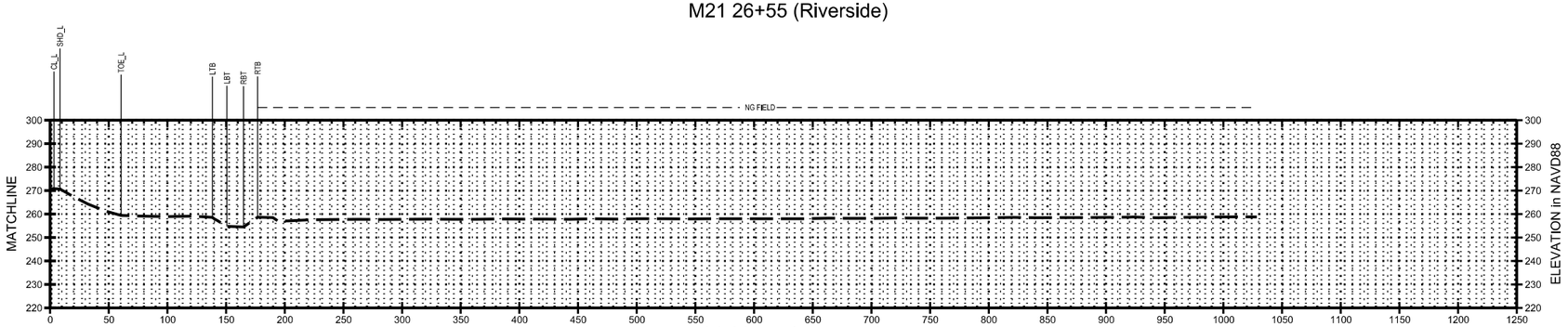
M21 31+55 (Riverside)



M21 31+55 (Landside)



M21 26+55 (Riverside)



M21 26+55 (Landside)

SURVEY NOTES:

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- PLANE COORDINATES ARE BASED ON NORTH AMERICAN DATUM OF 1893 (NAD 83) USING UTM ZONE 15 IN U.S. SURVEY FEET.

30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers®
Memphis District

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

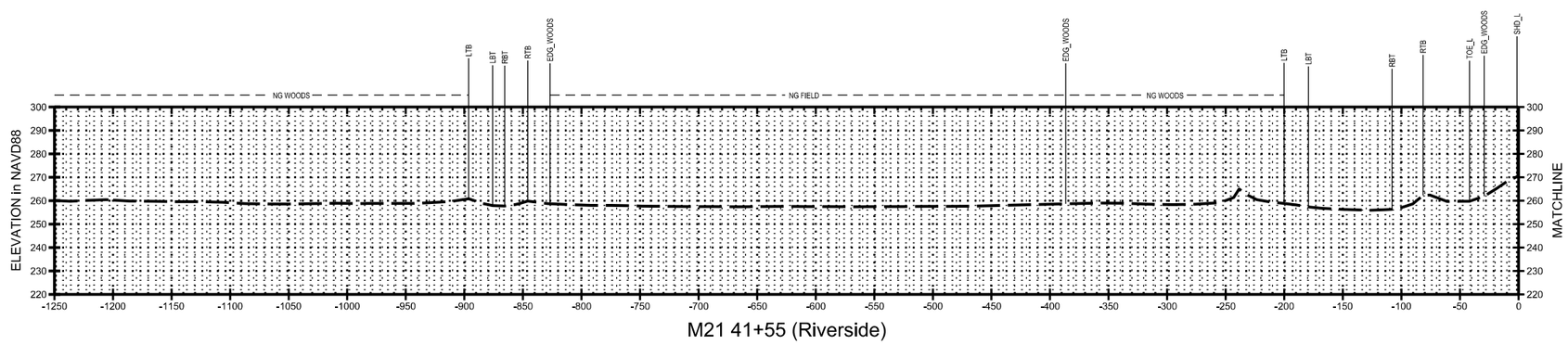
DESIGNED BY:
DWN BY: DEG
CKD BY: MCC
SUBMITTED BY: EMC, Inc.
PLOT SCALE: 1" = 60'
PLOT DATE: 01/14/2011
SIZE: ANSI D
FILE NAME: EMC10001004CXS.dgn
DATE: 01/14/2011
SOLICITATION NO.: W38XGR01724428
CONTRACT NO.: W912EQ-10-D-0014
FILE NUMBER:

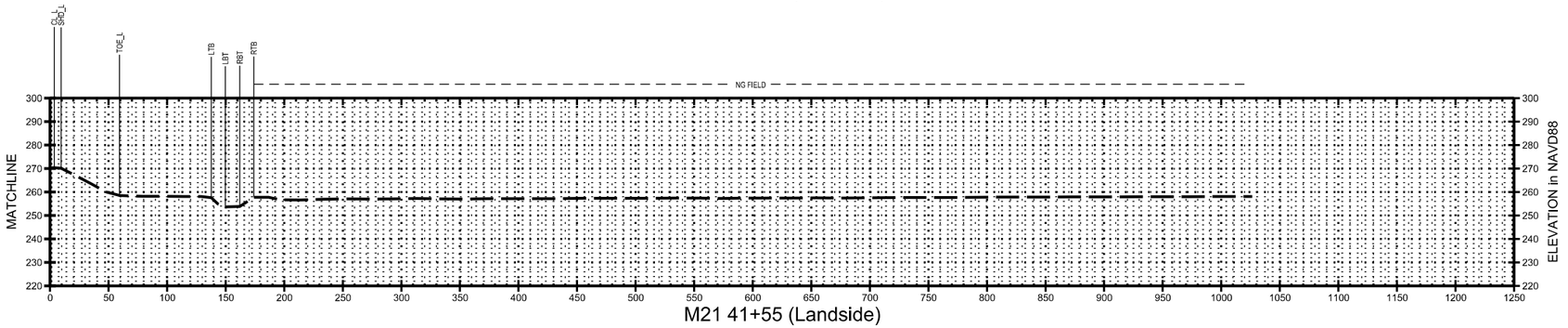
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

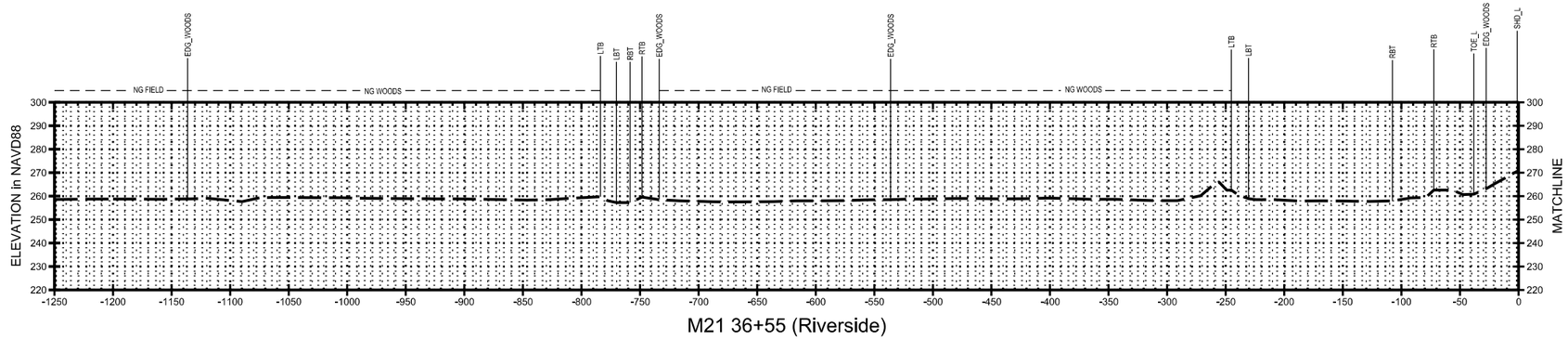
EMC SURVEYING & MAPPING

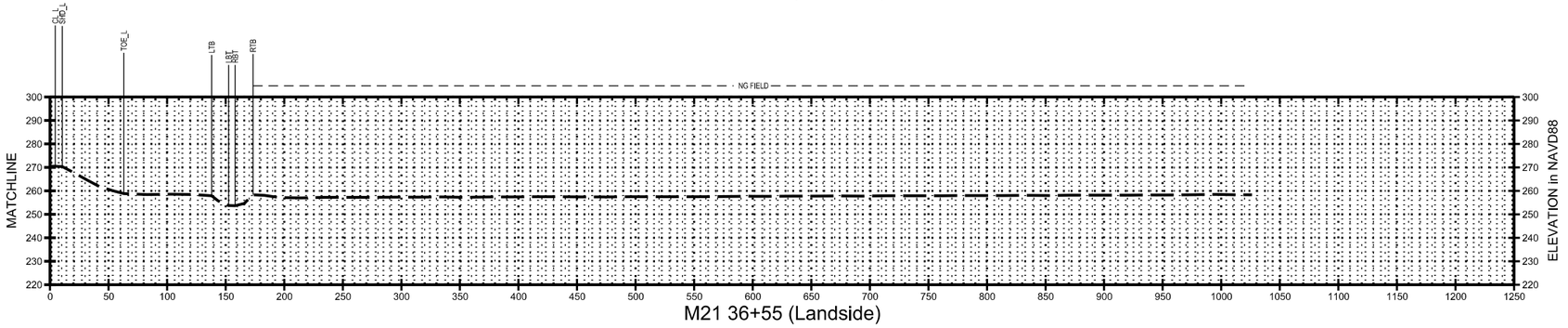
MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Miles M21/26+55 to M21/31+55
CROSS SECTIONS
PLATE
DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
GEOTECHNICAL ENGINEERING BRANCH

Sheet ID
23 OF 63









SURVEY NOTES:

- ALL ELEVATIONS ARE REFERENCED TO NAVD 1988.

- PLANE COORDINATES ARE BASED ON NORTH AMERICAN DATUM OF 1893 (NAD 83) USING UTM ZONE 15 IN U.S. SURVEY FEET.

30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers
Memphis District

MARK	DESCRIPTION	DATE	APPR
MARK	DESCRIPTION	DATE	APPR

DESIGNED BY:
DRAWN BY: DEG
CKD BY: MOC
SUBMITTED BY: EMC, Inc.
DATE: 01/14/2011
SOLICITATION NO.: W38XGR91724428
CONTRACT NO.: W912EK-10-D-0014
PLOT SCALE: AS SHOWN
PLOT DATE: 01/14/2011
SIZE: ANSI D
FILE NUMBER:
FILE NAME: EMC100010d4CXS.dgn

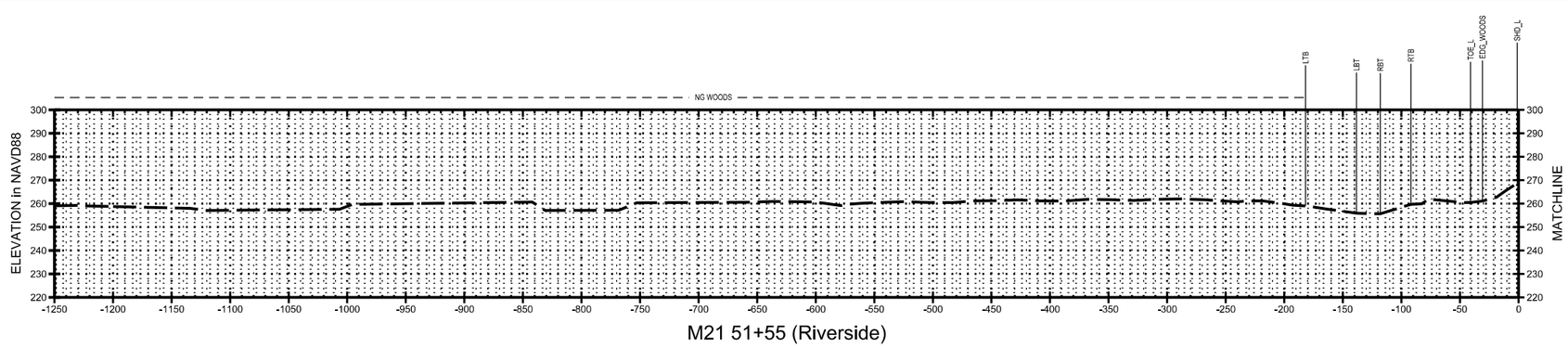
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

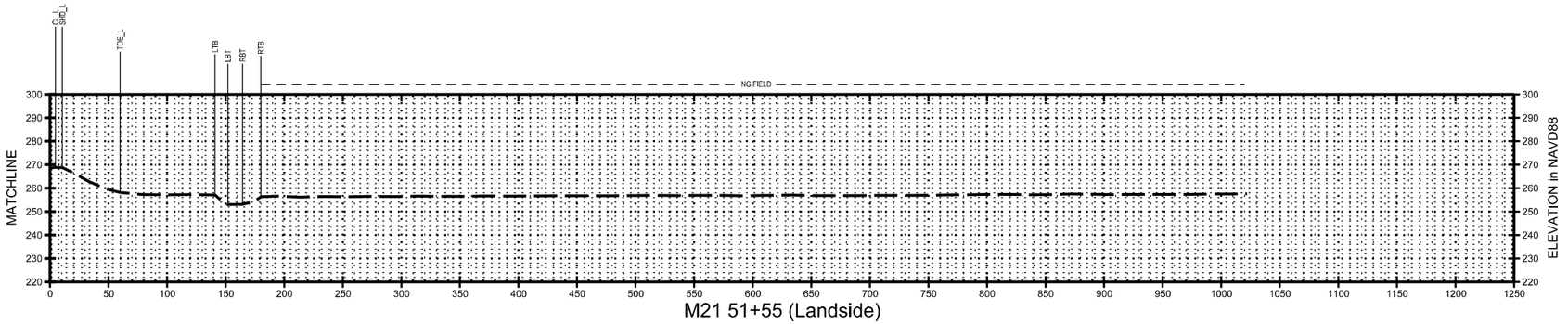
EMC DRAWING & MAPPING

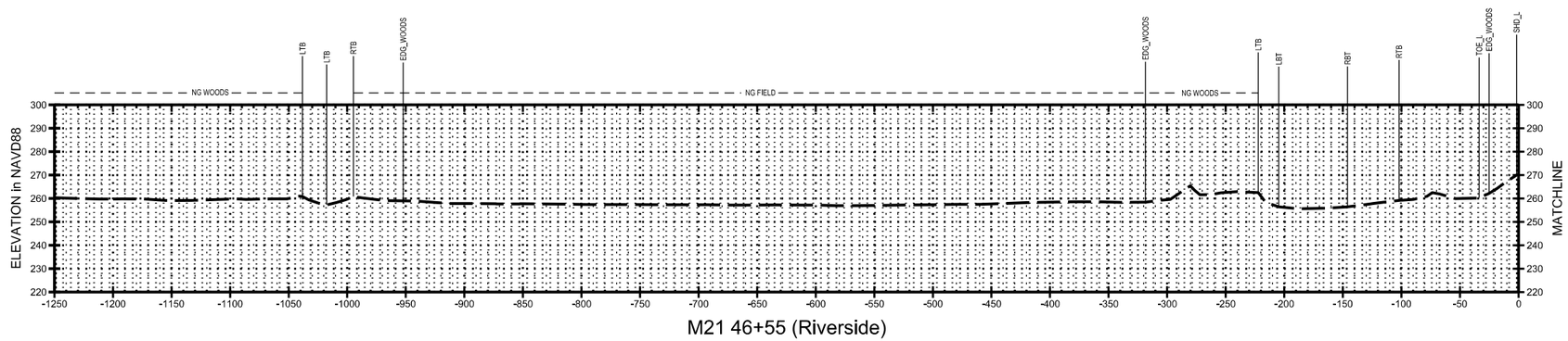
MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Miles M21/36+55 to M21/41+55
CROSS SECTIONS
PLATE

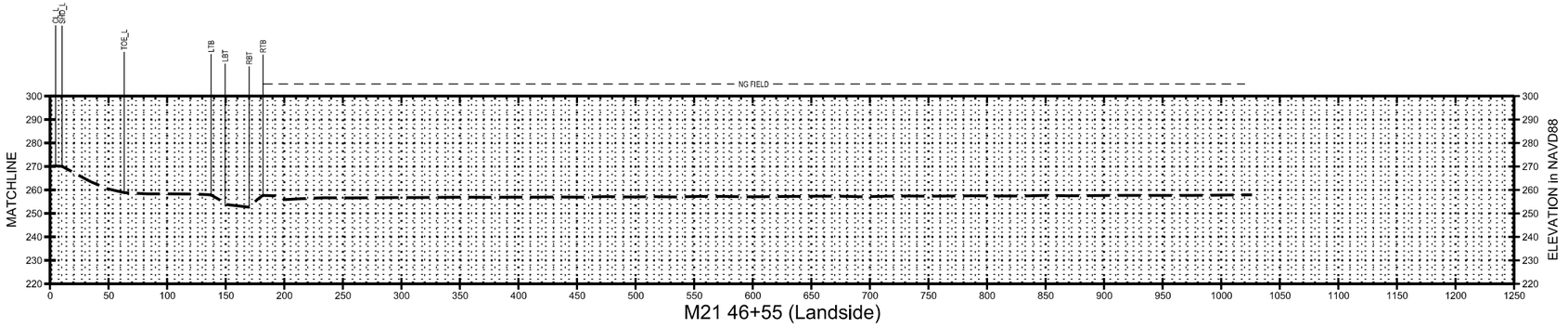
DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
SUPERVISORY ENGINEERING BRANCH

Sheet ID
24 OF 63









SURVEY NOTES:

- ALL ELEVATIONS ARE REFERENCED TO NAVD 1988.

- PLANE COORDINATES ARE BASED ON NORTH AMERICAN DATUM OF 1893 (NAD 83) USING UTM ZONE 15 IN U.S. SURVEY FEET.

30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers
Memphis District

MARK	APPR.	DATE	DESCRIPTION
MARK	APPR.	DATE	DESCRIPTION

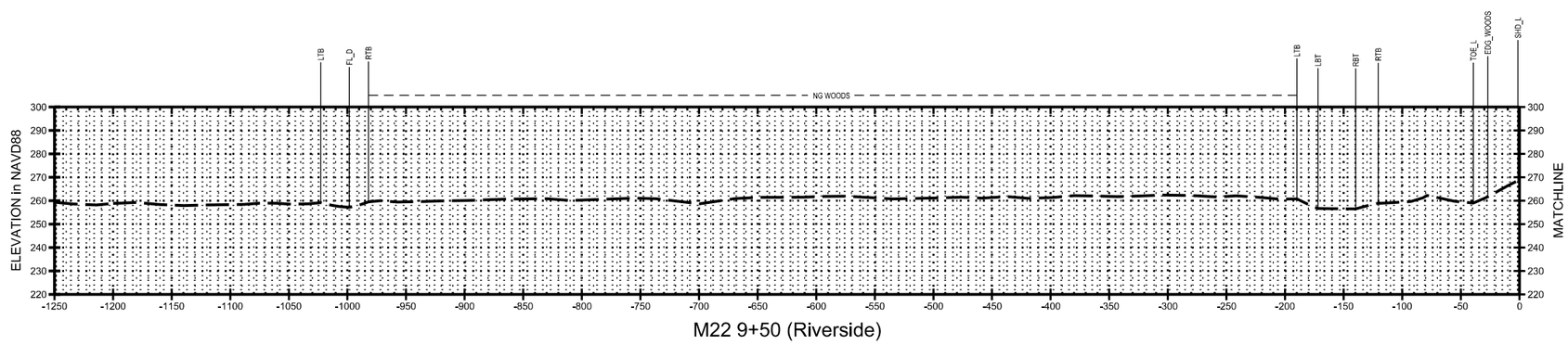
DESIGNED BY:
DRAWN BY: DEG
CKD BY: MOC
SUBMITTED BY: EMC, Inc.
DATE: 01/14/2011
SOLICITATION NO.: W38XGR91724428
CONTRACT NO.: W912EK-10-D-0014
PLOT DATE: 01/14/2011
PLOT SCALE: AS IS
SIZE: ANSI D
FILE NUMBER:
FILE NAME: EMC100010dCXS.dgn

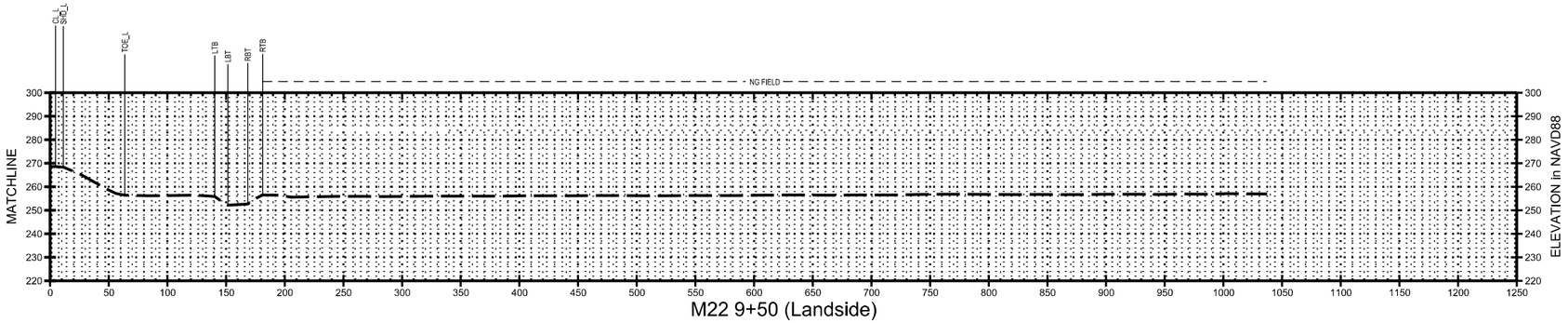
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

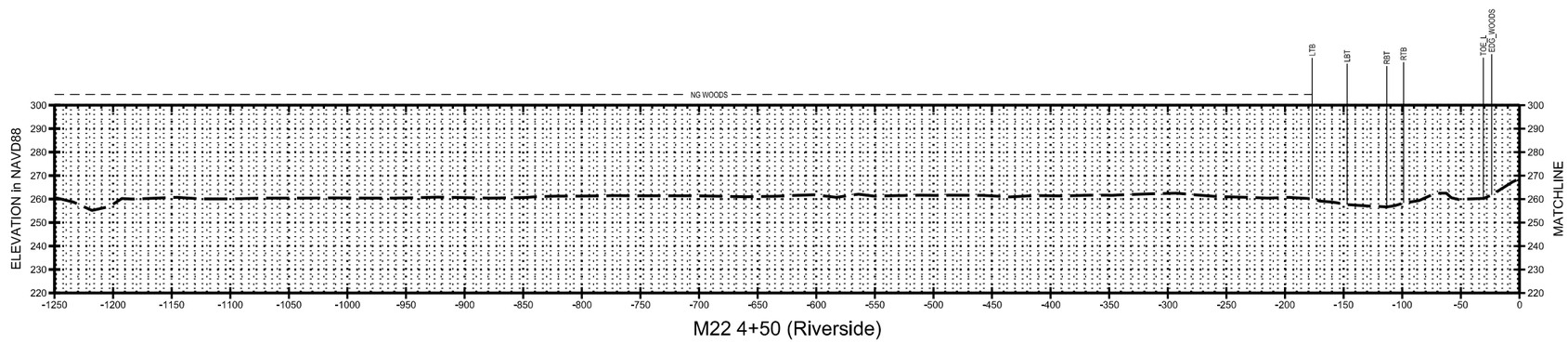
EMC DRAWING & MAPPING

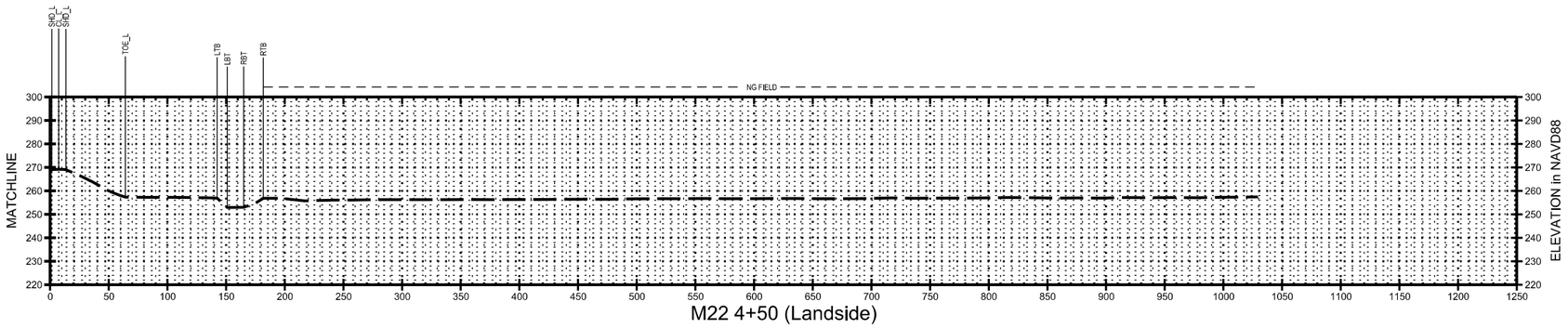
MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Miles M21/46+55 to M21/51+55
CROSS SECTIONS
PLATE
DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
SURVEYING & ENGINEERING BRANCH

Sheet ID
25 OF 63









SURVEY NOTES:

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- PLANE COORDINATES ARE BASED ON NORTH AMERICAN DATUM OF 1893 (NAD 83) USING UTM ZONE 15 IN U.S. SURVEY FEET.

30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers
Memphis District

MARK	DESCRIPTION	DATE	APPR
MARK	DESCRIPTION	DATE	APPR

DESIGNED BY:
DWN BY: DEG
CKD BY: MOC
SUBMITTED BY: EMC, Inc.
DATE: 01/14/2011
SOLICITATION NO.: W38XGR01724428
CONTRACT NO.: W912EK-10-D-0014
PLOT SCALE: 1:1
PLOT DATE: 01/14/2011
SIZE: ANSI D
FILE NUMBER:
FILE NAME: EMC100010565CXS.dgn

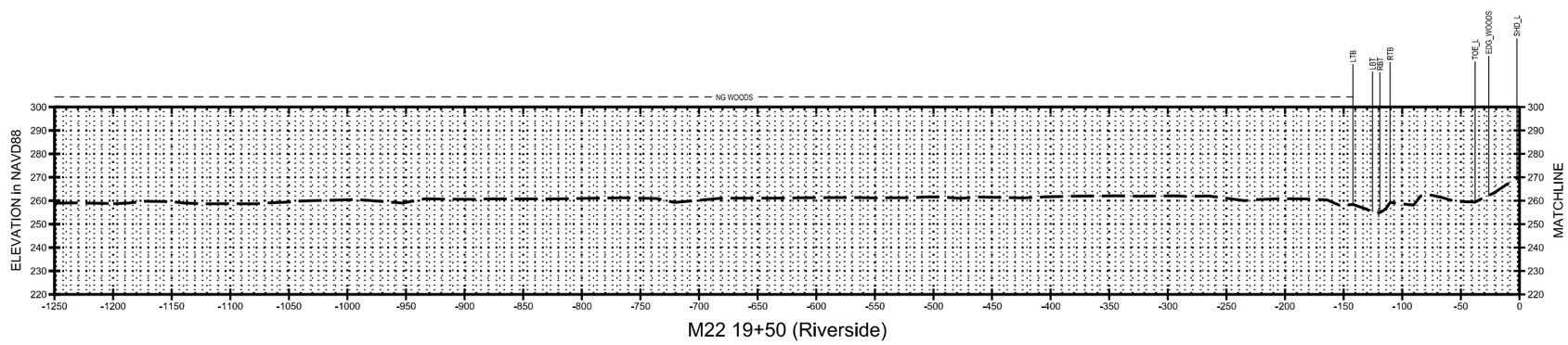
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

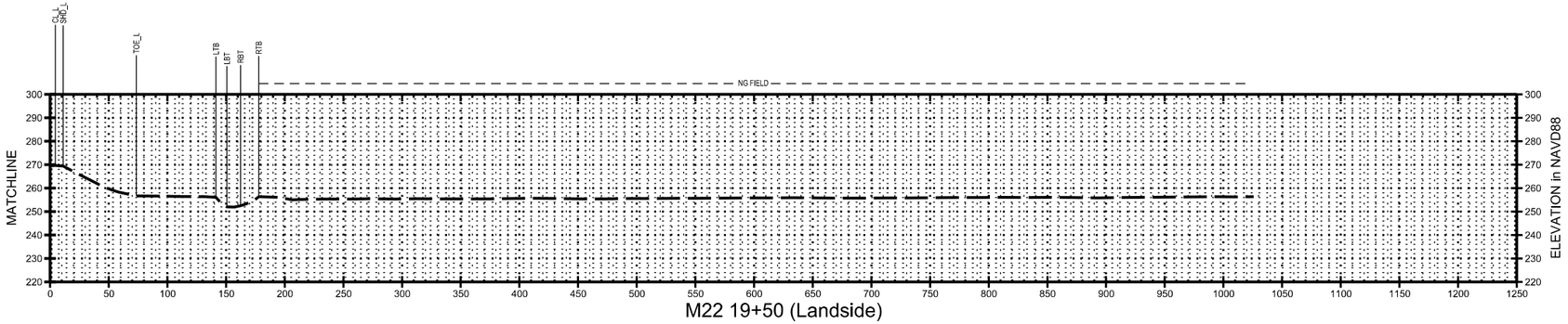
EMC DRAWING & MAPPING

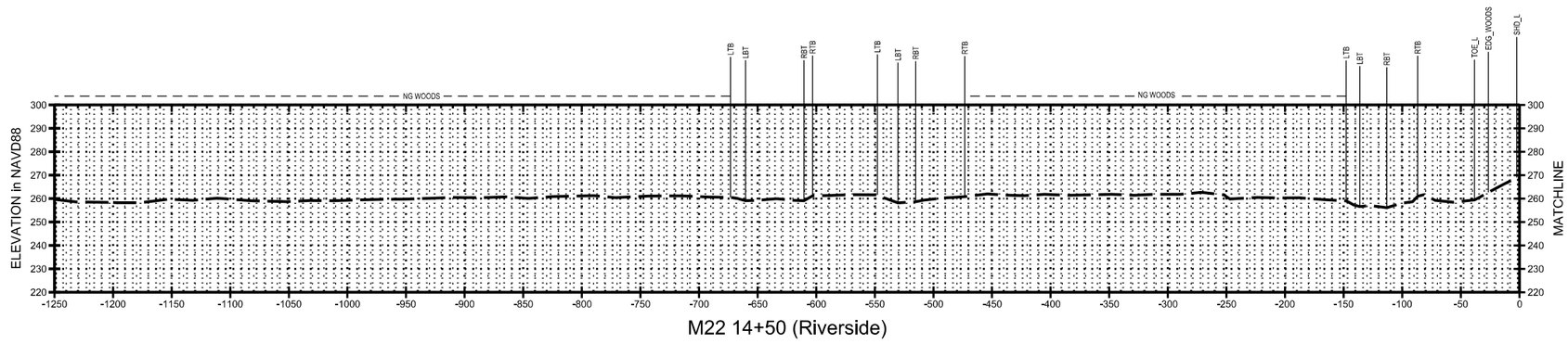
MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Miles M22/4+50 to M22/9+50
CROSS SECTIONS
PLATE

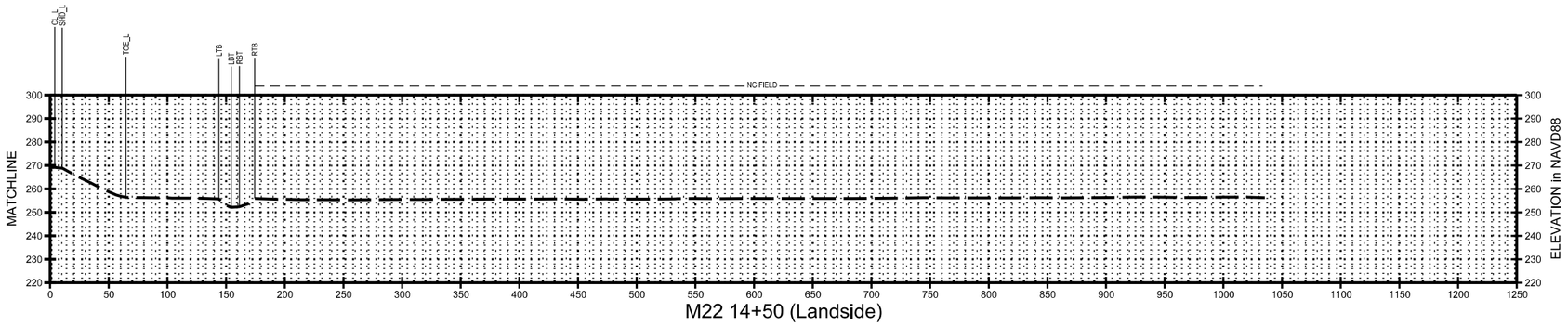
DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
ENGINEERING & CONSTRUCTION BRANCH

Sheet ID
26 OF 63









SURVEY NOTES:

- ALL ELEVATIONS ARE REFERENCED TO NAVD 1988.

- PLANE COORDINATES ARE BASED ON NORTH AMERICAN DATUM OF 1893 (NAD 83) USING UTM ZONE 15 IN U.S. SURVEY FEET.

30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers
Memphis District

	APPR.	DATE	DESCRIPTION
	APPR.	DATE	DESCRIPTION
	MARK		

DESIGNED BY:
DWN BY: DEG
CKD BY: MOC
SUBMITTED BY: EMC, Inc.
DATE: 01/14/2011
SOLICITATION NO.: W38XGR91724428
CONTRACT NO.: W912EK-10-D-0014
PLOT DATE: 01/14/2011
PLOT SCALE: AS NOTED
SIZE: ANSI D
FILE NUMBER:
FILE NAME: EMC1009105dCXS.dgn

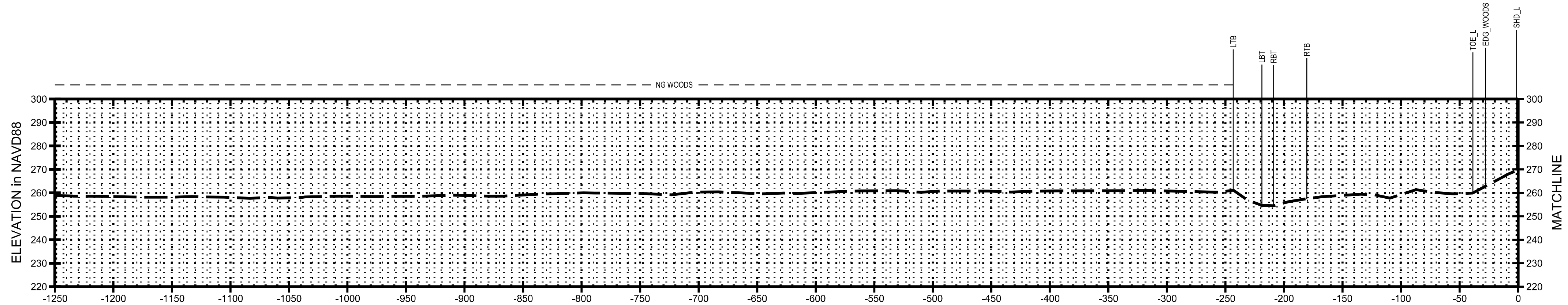
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

EMC ENGINEERING & MAPPING

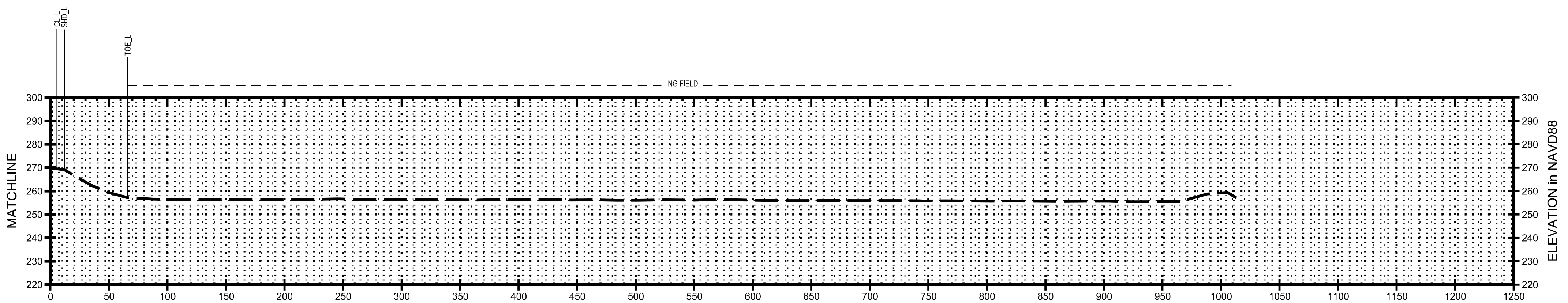
MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Miles M22/14+50 to M22/19+50
CROSS SECTIONS
PLATE

DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT CORPS OF ENGINEERS
SUPERVISORY ENGINEERING BRANCH

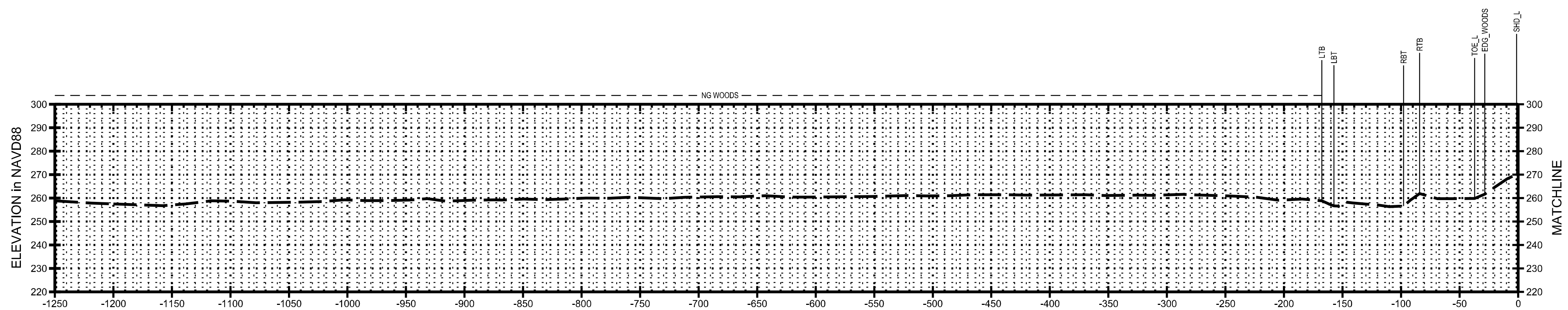
Sheet ID
27 OF 63



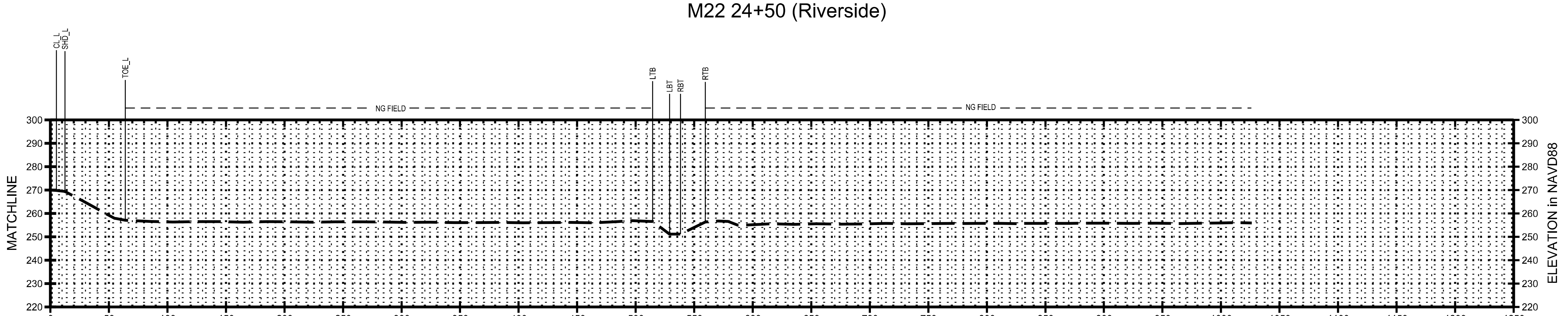
M22 29+50 (Riverside)



M22 29+50 (Landside)



M22 24+50 (Riverside)



M22 24+50 (Landside)

SURVEY NOTES:

- ALL ELEVATIONS ARE REFERENCED TO NAVD 1988.

- PLANE COORDINATES ARE BASED ON NORTH AMERICAN DATUM OF 1893 (NAD 83) USING UTM ZONE 15 IN U.S. SURVEY FEET.

30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers®
Memphis District

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

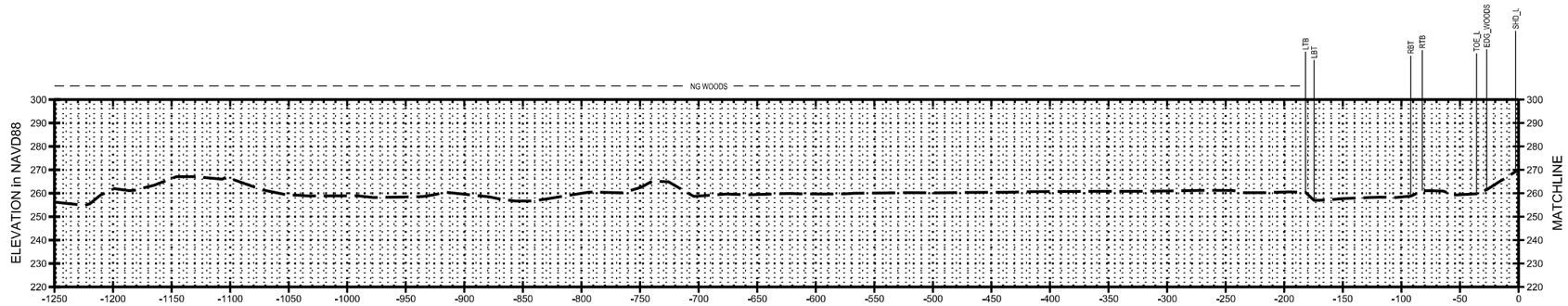
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

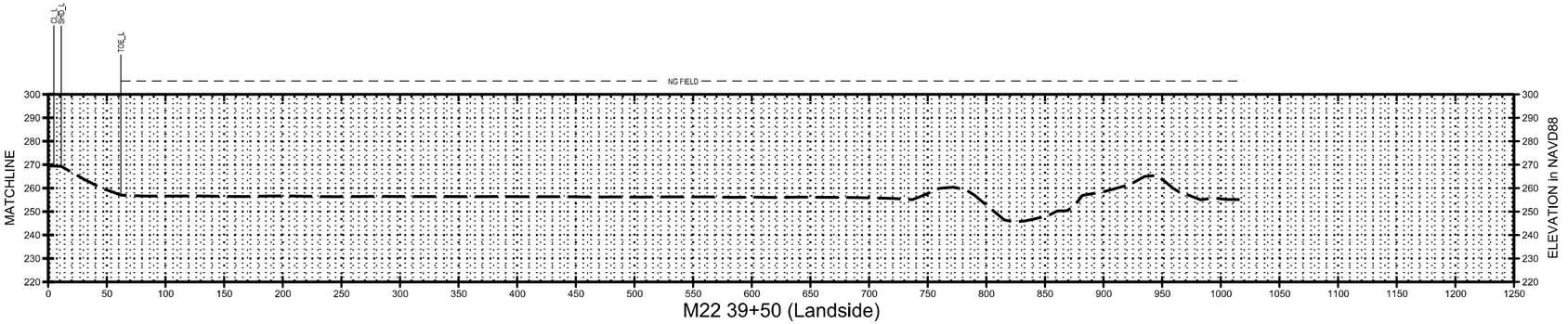
EMC SURVEYING & MAPPING

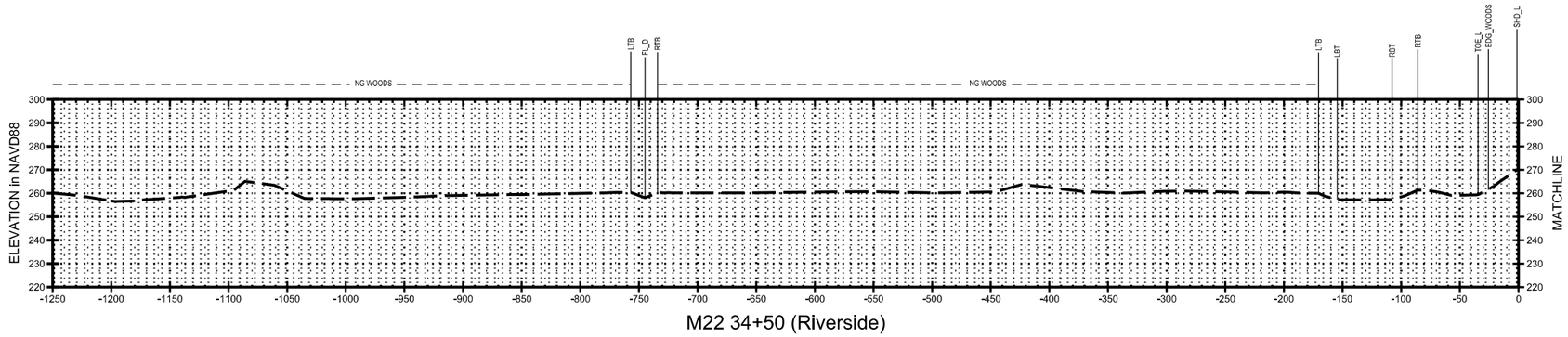
DESIGNED BY:		DATE: 01/14/2011
DWN BY: DEG	CKD BY: MOC	SOLICITATION NO.: W38XGR01724428
SUBMITTED BY: EMC, Inc.		CONTRACT NO.: W912EQ-10-D-0014
PLOT SCALE: 1" = 60'	PLOT DATE: 01/14/2011	FILE NUMBER:
SIZE: ANSI D	FILE NAME: EMC10001005CXS.dgn	

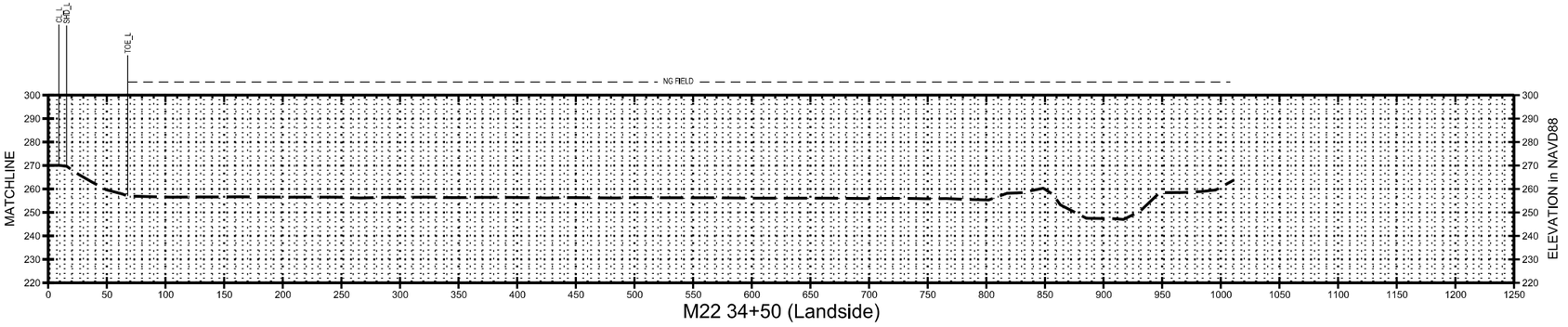
MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Miles M22/24+50 to M22/29+50
CROSS SECTIONS
PLATE
DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
GEOTECHNICAL ENGINEERING BRANCH

Sheet ID
28 OF 63









SURVEY NOTES:

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- PLANE COORDINATES ARE BASED ON NORTH AMERICAN DATUM OF 1893 (NAD 83) USING UTM ZONE 15 IN U.S. SURVEY FEET.

30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers®
Memphis District

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

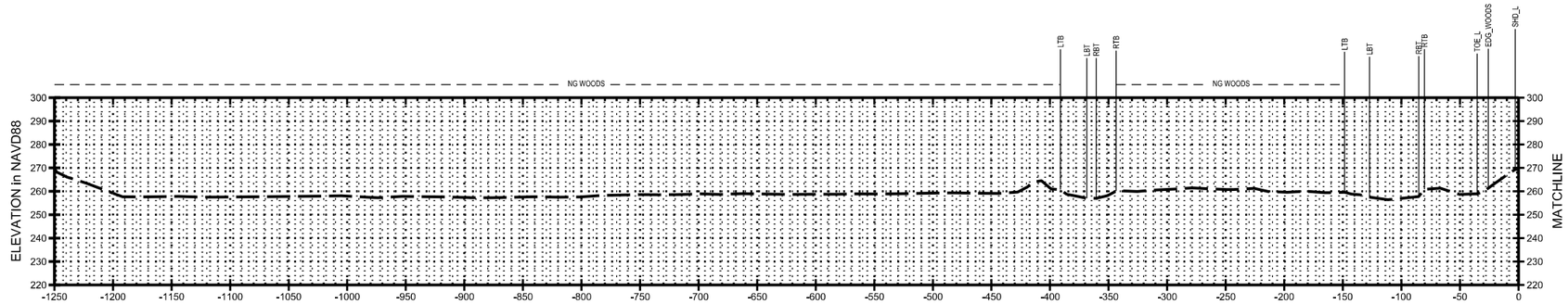
DESIGNED BY:
DWN BY: DEG
CKD BY: MCC
SUBMITTED BY: EMC, Inc.
PLOT SCALE: 1" = 60'
PLOT DATE: 01/14/2011
SIZE: ANSI D
FILE NAME: EMC10001005CXS.dgn
DATE: 01/14/2011
SOLICITATION NO.: W38XGR01724428
CONTRACT NO.: W912EQ-10-D-0014
FILE NUMBER:

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

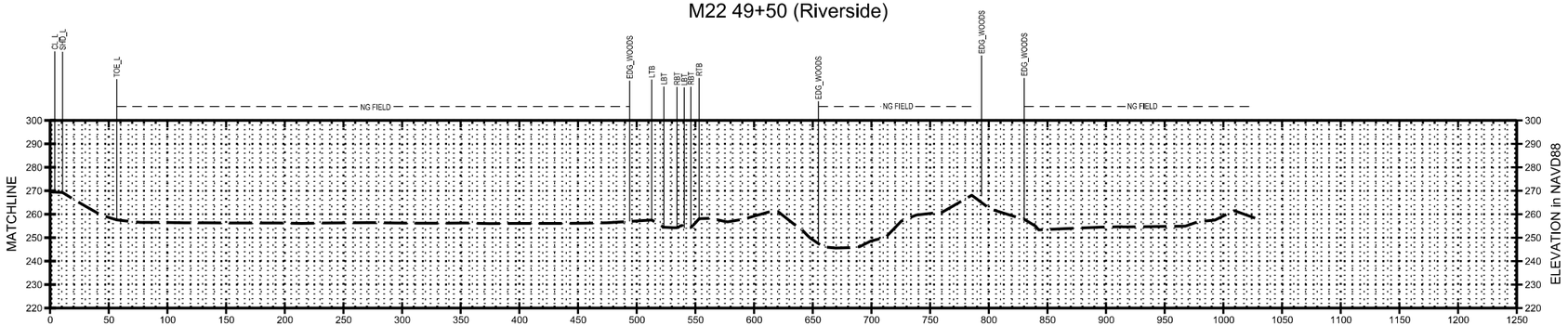
EMC SURVEYING & MAPPING

MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Miles M22/34+50 to M22/39+50
CROSS SECTIONS
PLATE
DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
GEOTECHNICAL ENGINEERING BRANCH

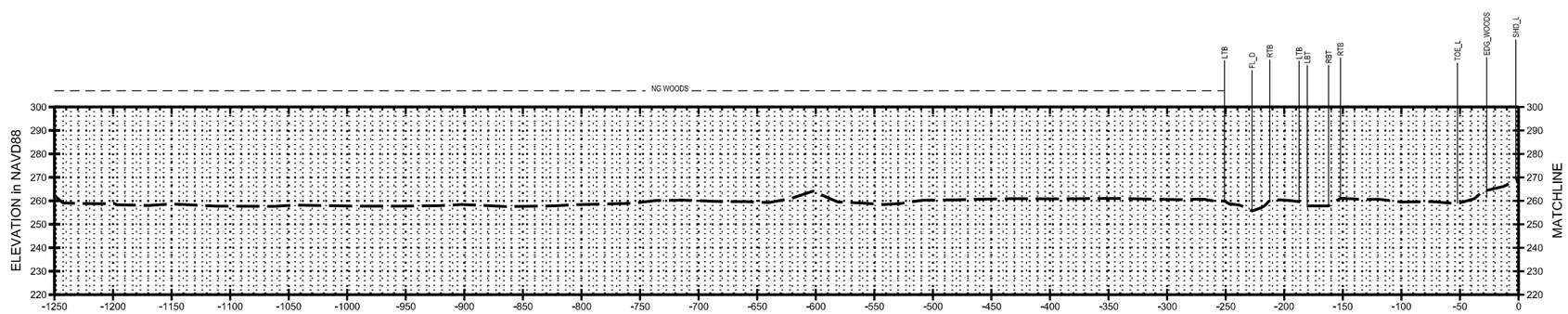
Sheet ID
29 OF 63



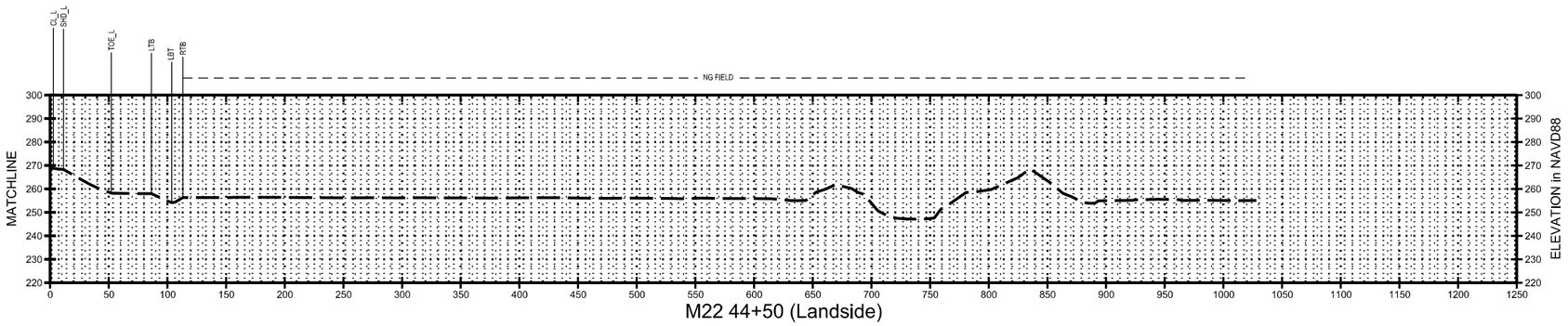
M22 49+50 (Riverside)



M22 49+50 (Landside)



M22 44+50 (Riverside)



M22 44+50 (Landside)

SURVEY NOTES:

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- PLANE COORDINATES ARE BASED ON NORTH AMERICAN DATUM OF 1893 (NAD 83) USING UTM ZONE 15 IN U.S. SURVEY FEET.

30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers®
Memphis District

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

DESIGNED BY:
DWN BY: DEG
CKD BY: MCC
SUBMITTED BY: EMC, Inc.
PLOT SCALE: 1" = 60'
PLOT DATE: 01/14/2011
SIZE: ANSI D
FILE NAME: EMC10001005CXS.dgn
DATE: 01/14/2011
SOLICITATION NO.: W38XGR01724428
CONTRACT NO.: W912EQ-10-D-0014
FILE NUMBER:

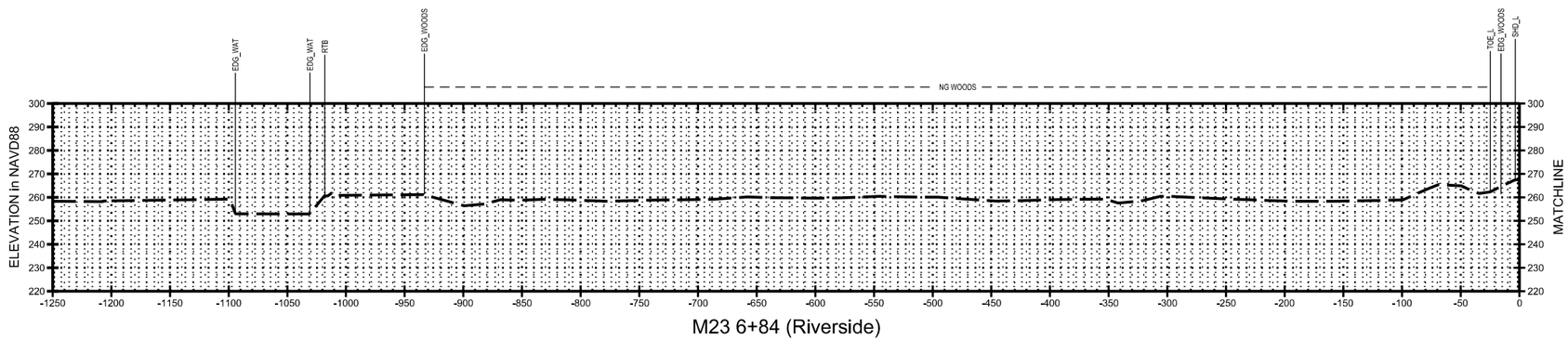
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

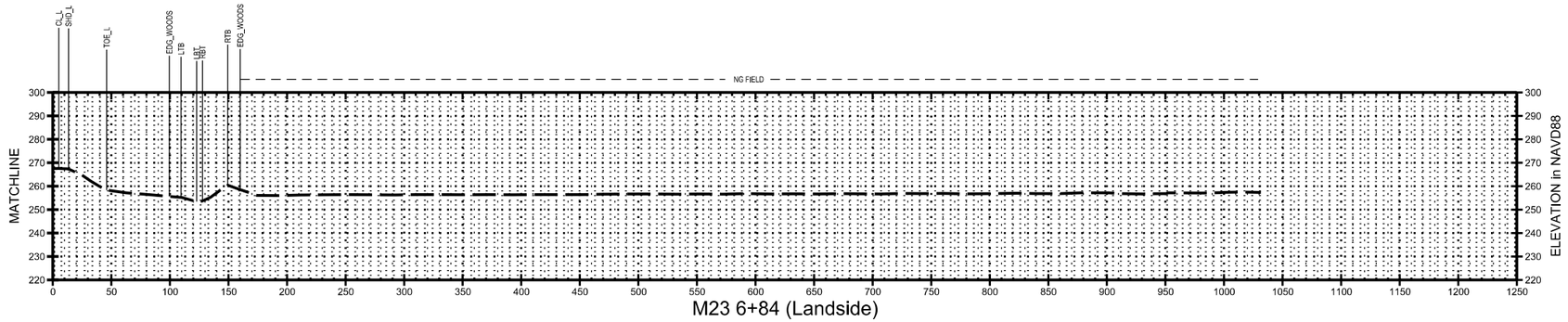
EMC SURVEYING & MAPPING

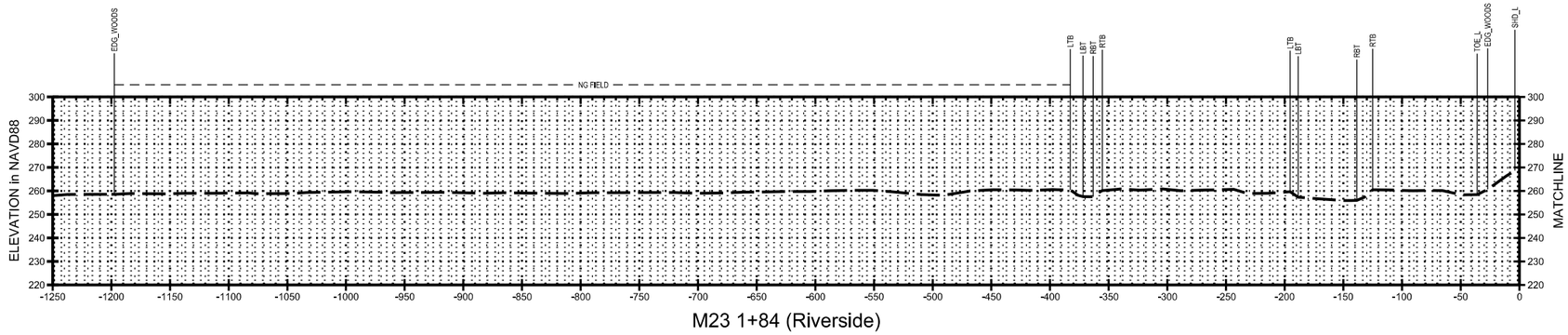
MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Miles M22/44+50 to M22/49+50
CROSS SECTIONS
PLATE

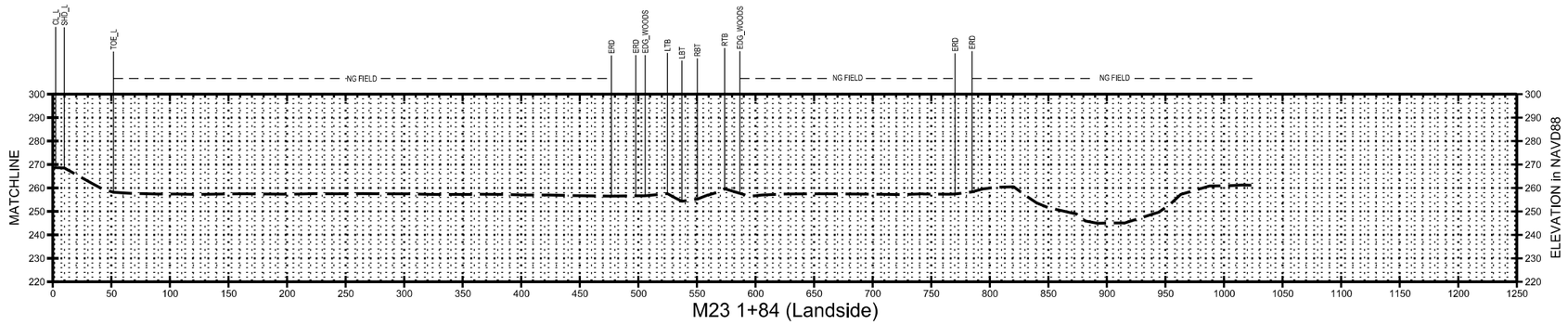
DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
GEOTECHNICAL ENGINEERING BRANCH

Sheet ID
30 OF 63









SURVEY NOTES:

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30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers
Memphis District

MARK	DESCRIPTION	DATE	APPR
MARK	DESCRIPTION	DATE	APPR

DESIGNED BY:
DWN BY: DEG
CKD BY: MOC
SUBMITTED BY: EMC, Inc.
DATE: 01/14/2011
SOLICITATION NO.: W38XGR91724428
CONTRACT NO.: W912EK-10-D-0014
PLOT SCALE: AS SHOWN
PLOT DATE: AS SHOWN
FILE NUMBER:
SIZE: ANSI D
FILE NAME: EMC100010SCXS.dgn

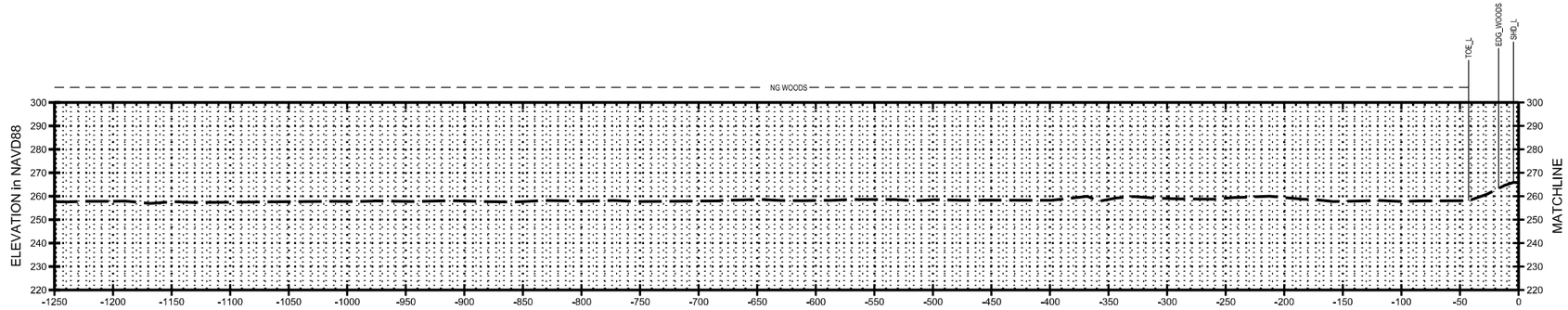
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

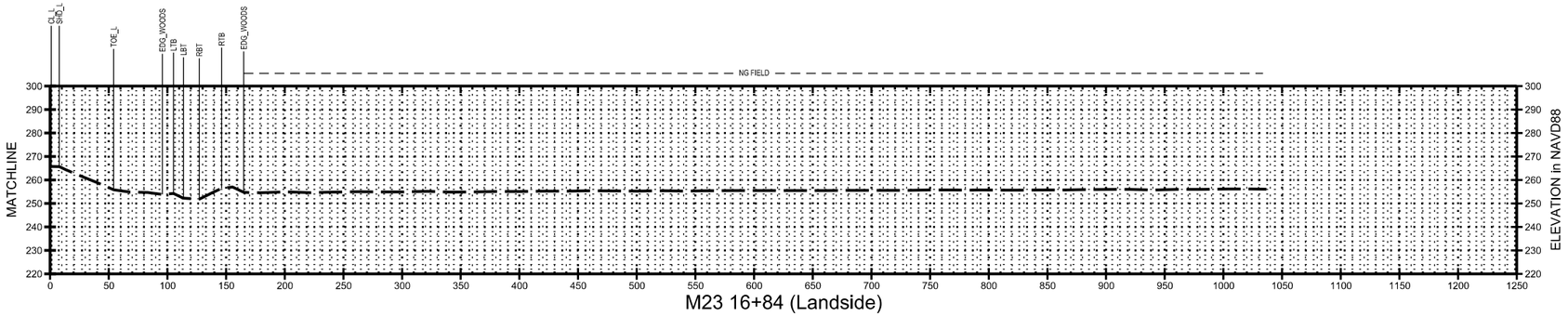
EMC DRAWING & MAPPING

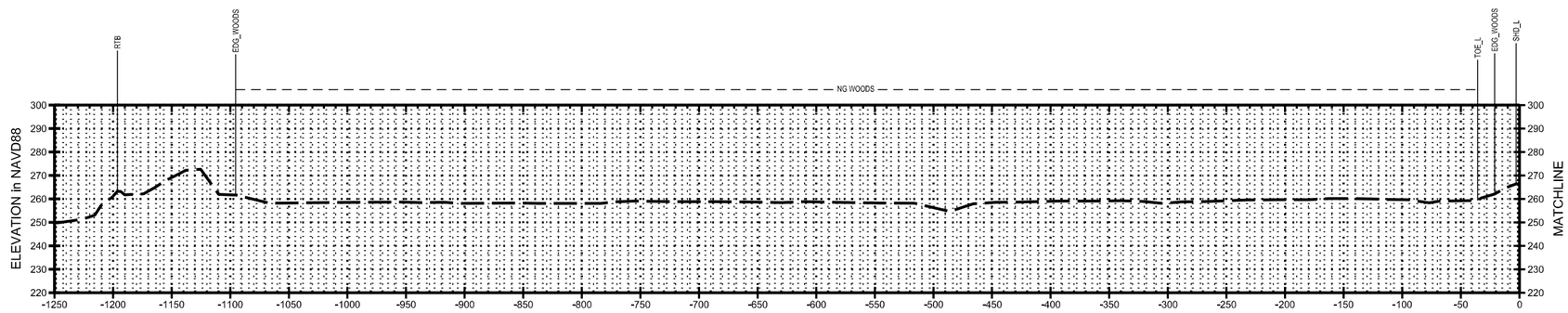
MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Miles M23/1+84 to M23/6+84
CROSS SECTIONS
PLATE

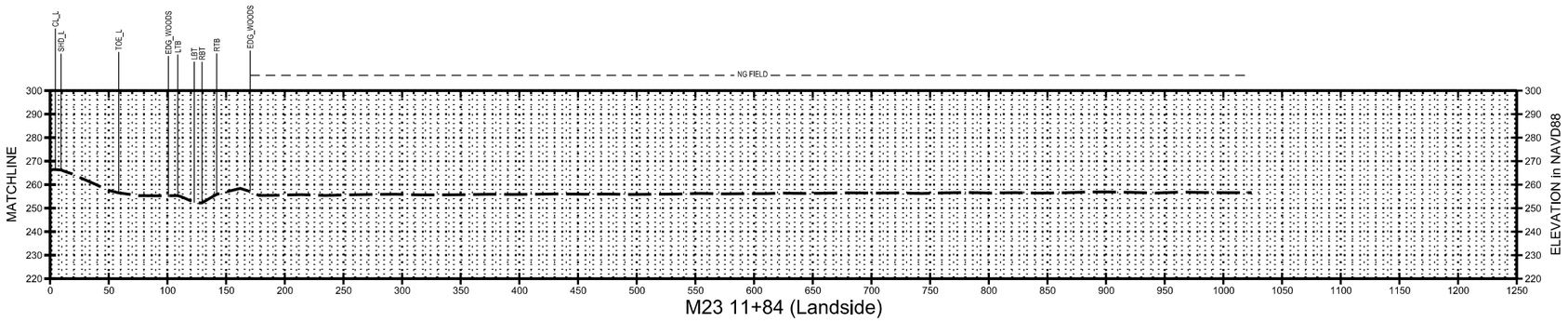
DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT CORPS OF ENGINEERS
SUPERVISORY ENGINEERING BRANCH

Sheet ID
31 OF 63









SURVEY NOTES:

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30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers®
Memphis District

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

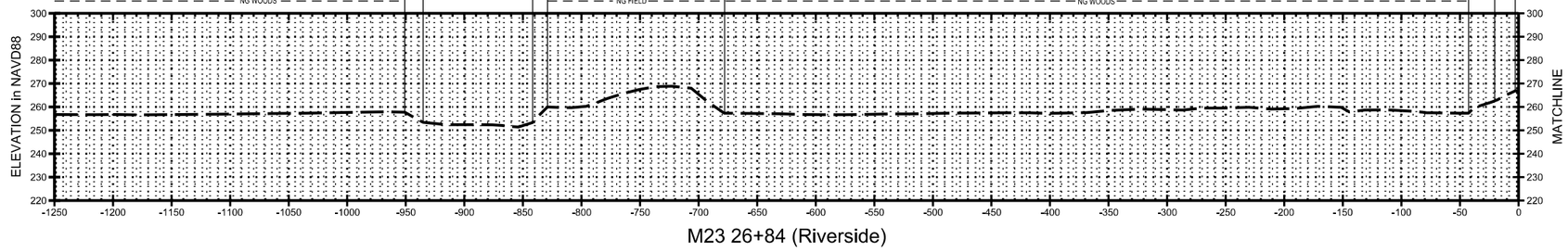
DESIGNED BY:
DWN BY: DEG
CKD BY: MCC
SUBMITTED BY: EMC, Inc.
PLOT SCALE: 1" = 60'
PLOT DATE: 01/14/2011
SIZE: ANSI D
FILE NAME: EMC10001007CXS.dgn
DATE: 01/14/2011
SOLICITATION NO.: W38XGR01724428
CONTRACT NO.: W912EQ-10-D-0014
FILE NUMBER:

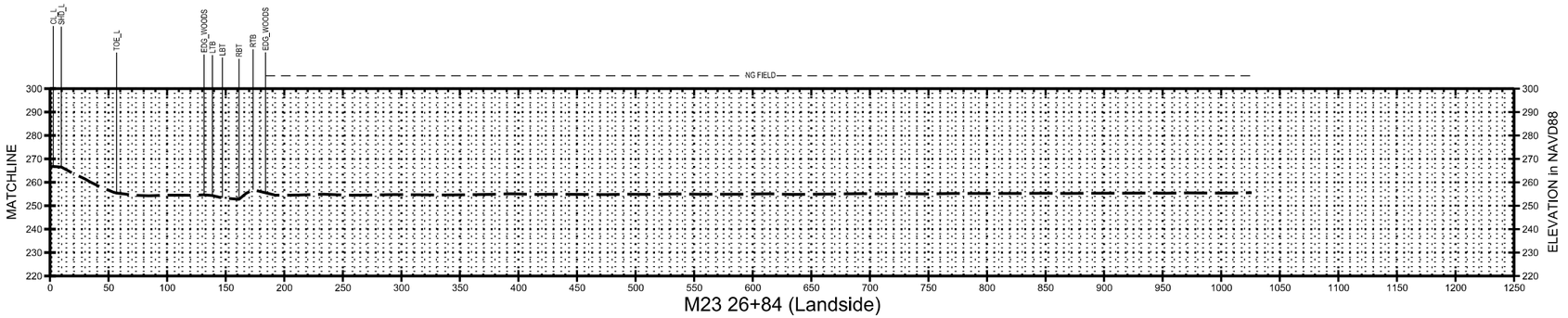
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

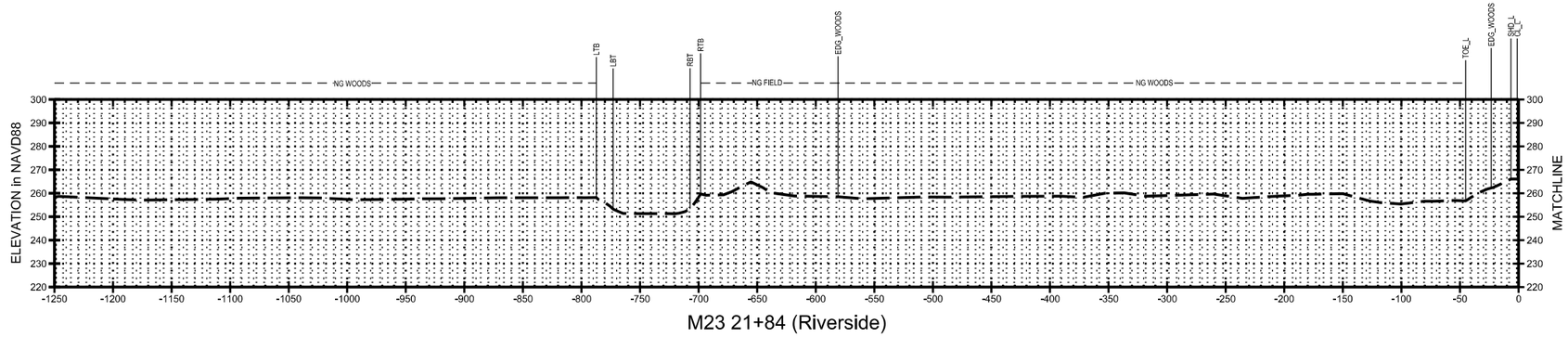
EMC SURVEYING & MAPPING

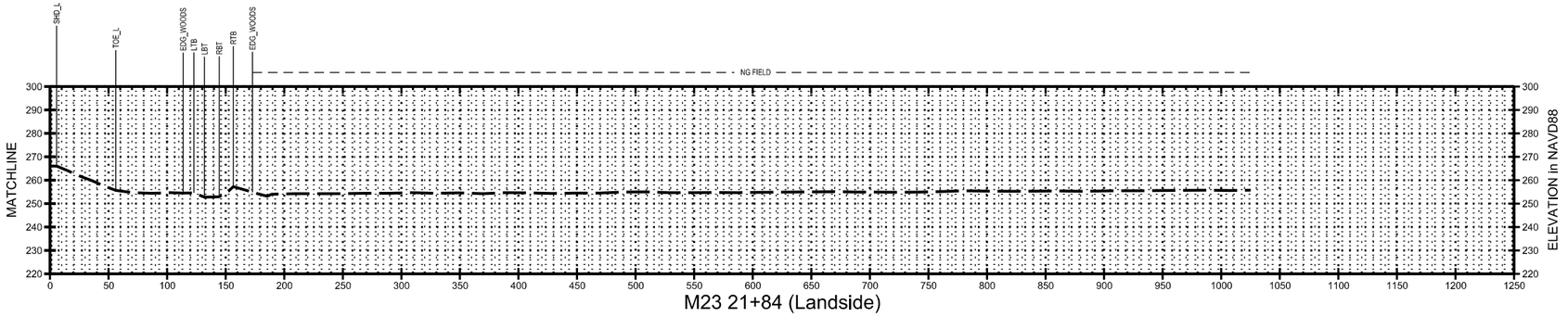
MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Miles M23/11+84 to M23/16+84
CROSS SECTIONS
PLATE
DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
GEOTECHNICAL ENGINEERING BRANCH

Sheet ID
32 OF 63









SURVEY NOTES:

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30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers®
Memphis District

MARK	DESCRIPTION	DATE	APPR
MARK	DESCRIPTION	DATE	APPR

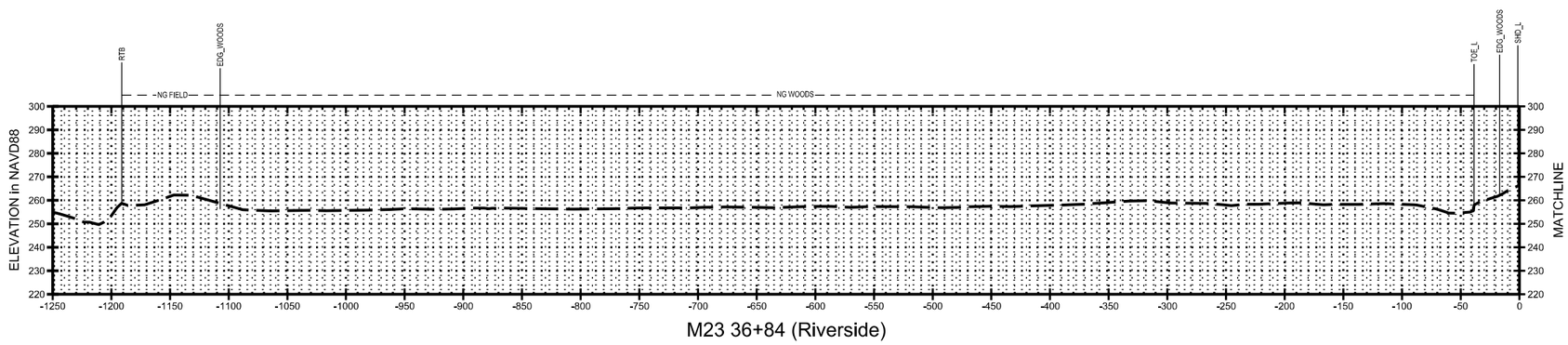
DESIGNED BY:
DRAWN BY: DEG
CKD BY: MOC
SUBMITTED BY: EMC, Inc.
DATE: 07/14/2011
SOLICITATION NO.: W38XGR91724428
CONTRACT NO.: W912EK-10-D-0014
PLOT DATE: 07/14/2011
PLOT SCALE: As noted
SIZE: ANSI D
FILE NUMBER:
FILE NAME: EMC100010SCXS.dgn

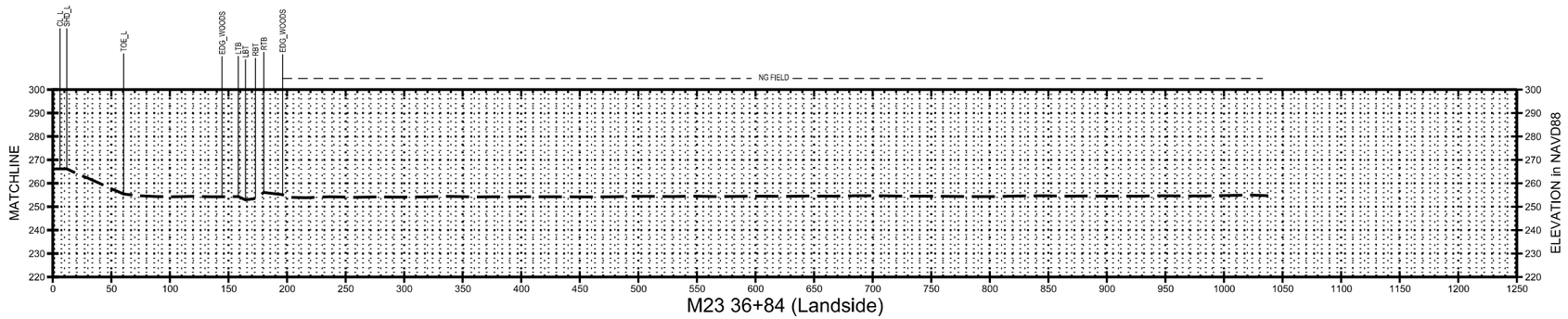
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

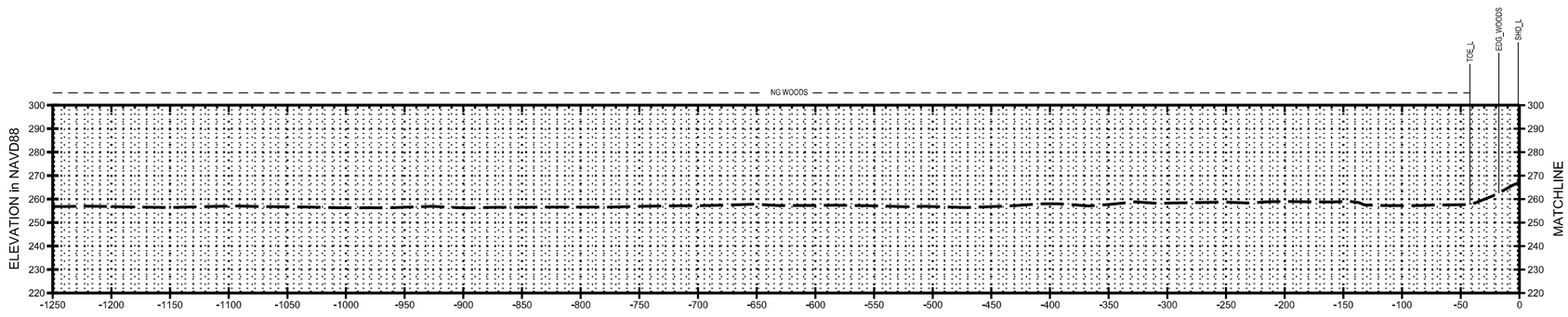
EMC DRAWING & MAPPING

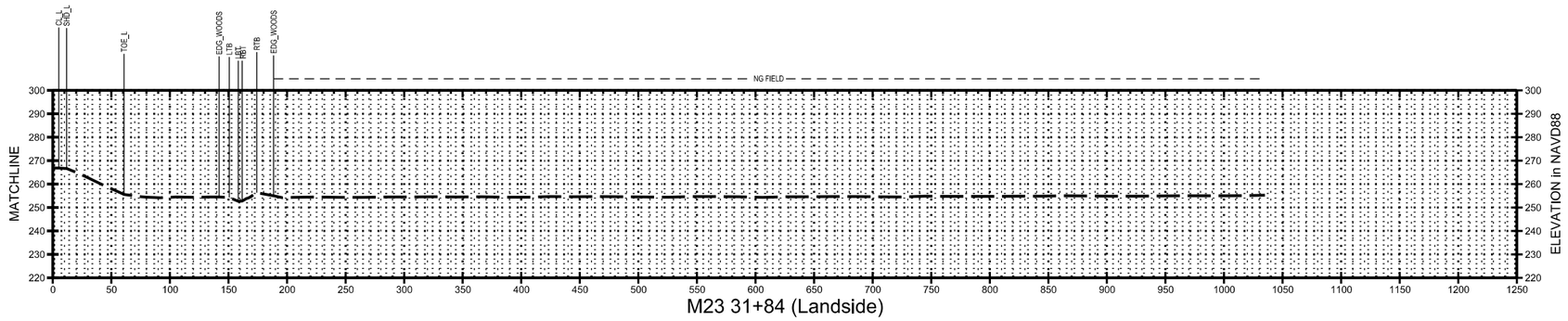
MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Miles M23/21+84 to M23/26+84
CROSS SECTIONS
PLATE
DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
SURVEYING & ENGINEERING BRANCH

Sheet ID
33 OF 63









SURVEY NOTES:

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30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers
Memphis District

MARK	DESCRIPTION	DATE	APPR
MARK	DESCRIPTION	DATE	APPR

DESIGNED BY:
DWN BY: DEG
CKD BY: MOC
SUBMITTED BY: EMC, Inc.
DATE: 01/14/2011
SOLICITATION NO.: W38XGR01724428
CONTRACT NO.: W912EK-10-D-0014
PLOT DATE: 01/14/2011
PLOT SCALE: AS IS
SIZE: ANSI D
FILE NUMBER:
FILE NAME: EMC100010SCXS.dgn

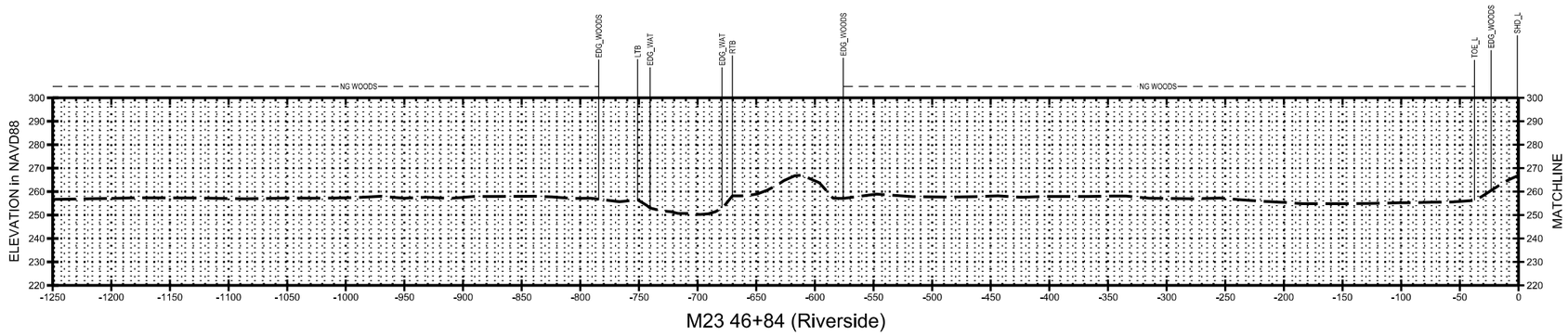
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

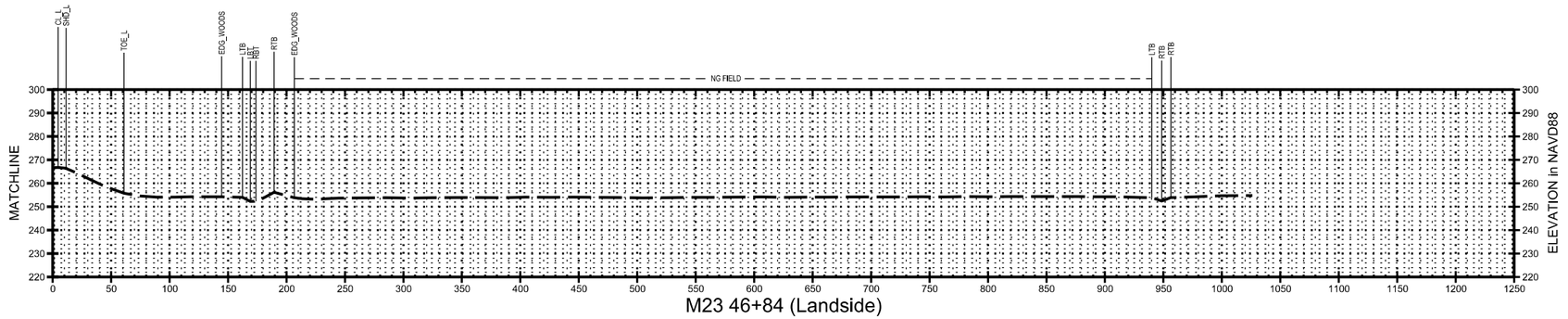
EMC DESIGNING & MAPPING

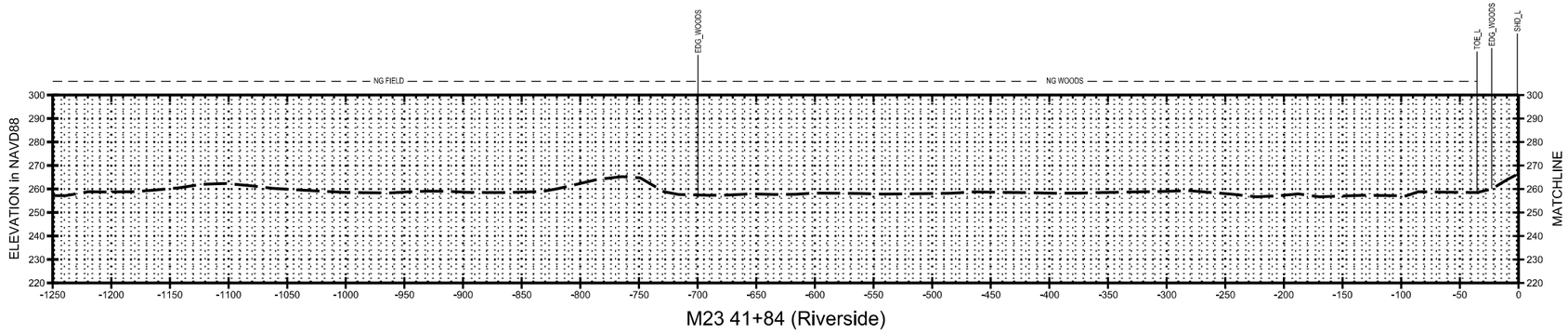
MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Miles M23/31+84 to M23/36+84
CROSS SECTIONS
PLATE

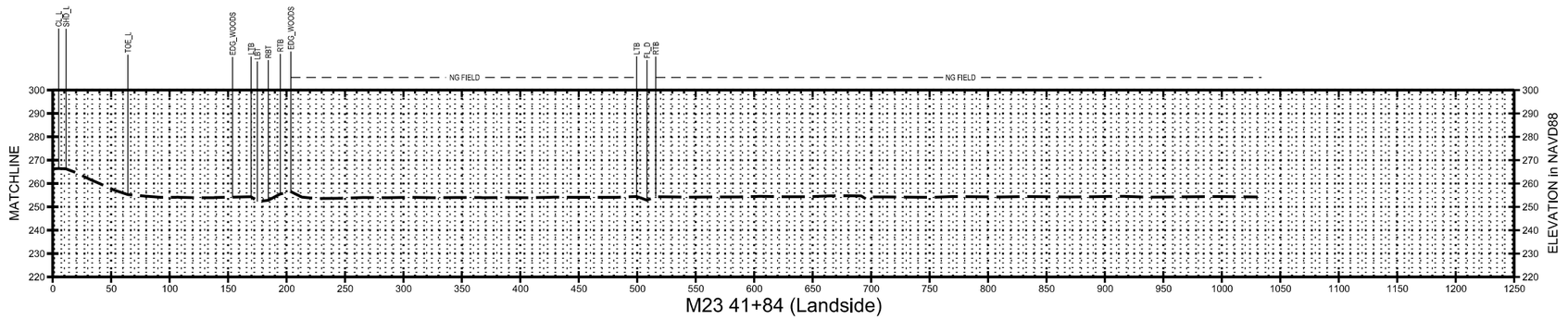
DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
SURVEYING & ENGINEERING BRANCH

Sheet ID
34 OF 63









SURVEY NOTES:

- ALL ELEVATIONS ARE REFERENCED TO NAVD 1988.

- PLANE COORDINATES ARE BASED ON NORTH AMERICAN DATUM OF 1893 (NAD 83) USING UTM ZONE 15 IN U.S. SURVEY FEET.

30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers®
Memphis District

MARK	DESCRIPTION	DATE	APPR.
MARK	DESCRIPTION	DATE	APPR.

DESIGNED BY:
DWN BY: DEG
CKD BY: MOC
SUBMITTED BY: EMC, Inc.
DATE: 01/14/2011
SOLICITATION NO.: W38XGR01724428
CONTRACT NO.: W912EK-10-D-0014
PLOT SCALE: AS SHOWN
PLOT DATE: 01/14/2011
FILE NUMBER:
SIZE: ANSI D
FILE NAME: EMC100010SCXS.dgn

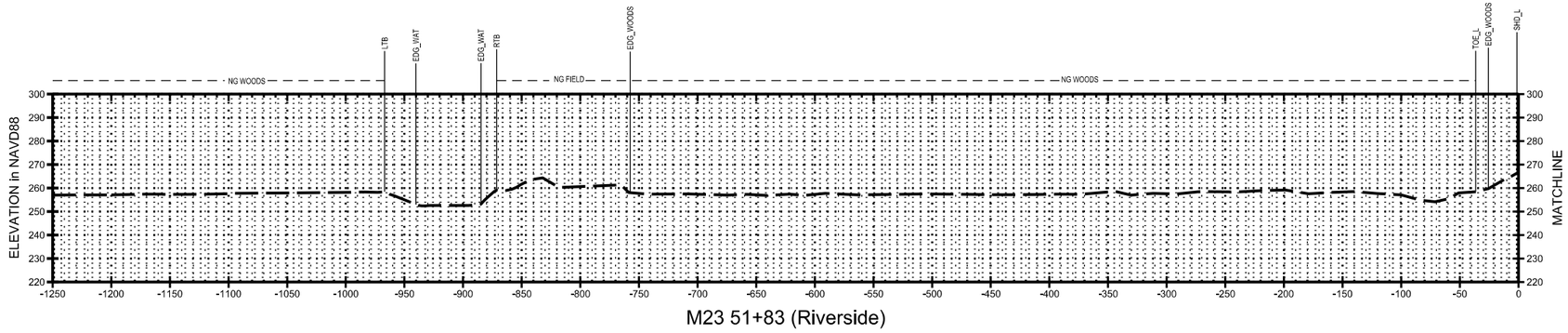
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

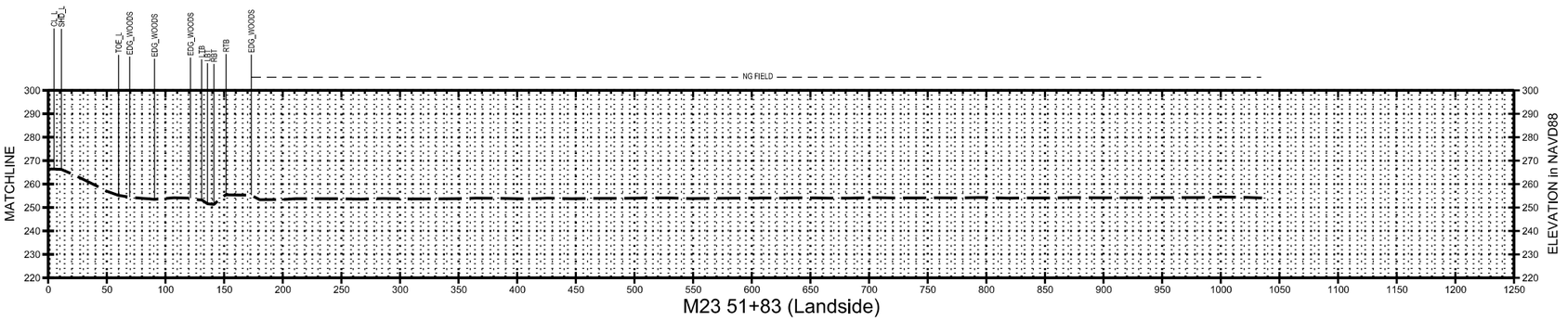
EMC DRAWING & MAPPING

MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Miles M23/41+84 to M23/46+84
CROSS SECTIONS
PLATE

DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT CORPS OF ENGINEERS
SURVEYING & ENGINEERING BRANCH

Sheet ID
35 OF 63





SURVEY NOTES:

- ALL ELEVATIONS ARE REFERENCED TO NAVD 1988.

- PLANE COORDINATES ARE BASED ON NORTH AMERICAN DATUM OF 1893 (NAD 83) USING UTM ZONE 15 IN U.S. SURVEY FEET.

30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers®
Memphis District

MARK	DESCRIPTION	DATE	APPR.
MARK	DESCRIPTION	DATE	APPR.

DESIGNED BY:
DWN BY: DEG
CKD BY: MOC
SUBMITTED BY: EMC, Inc.
DATE: 01/14/2011
SOLICITATION NO.: W38XGR01724428
CONTRACT NO.: W912EK-10-D-0014
PLOT SCALE: AS NOTED
PLOT DATE: 01/14/2011
FILE NUMBER:
FILE NAME: EMC1000105CXS.dgn
SIZE: ANSI D

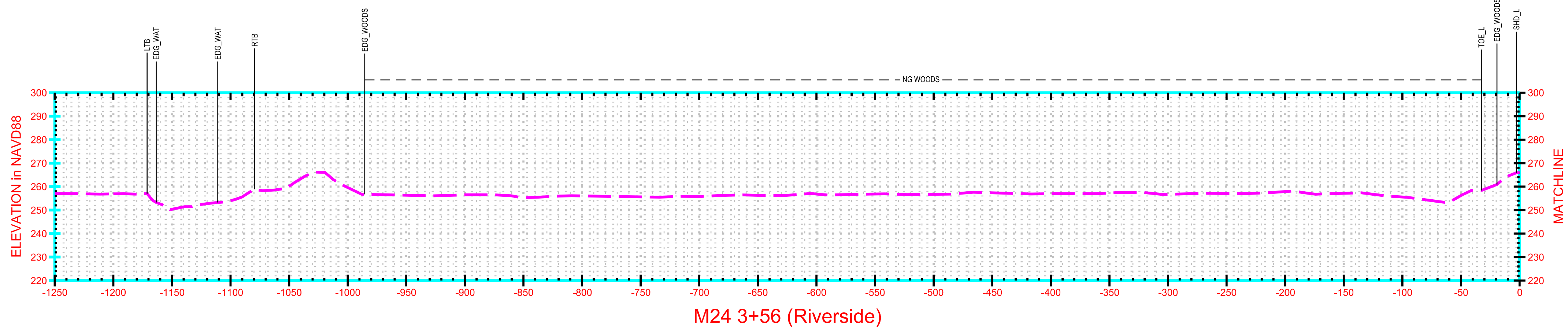
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

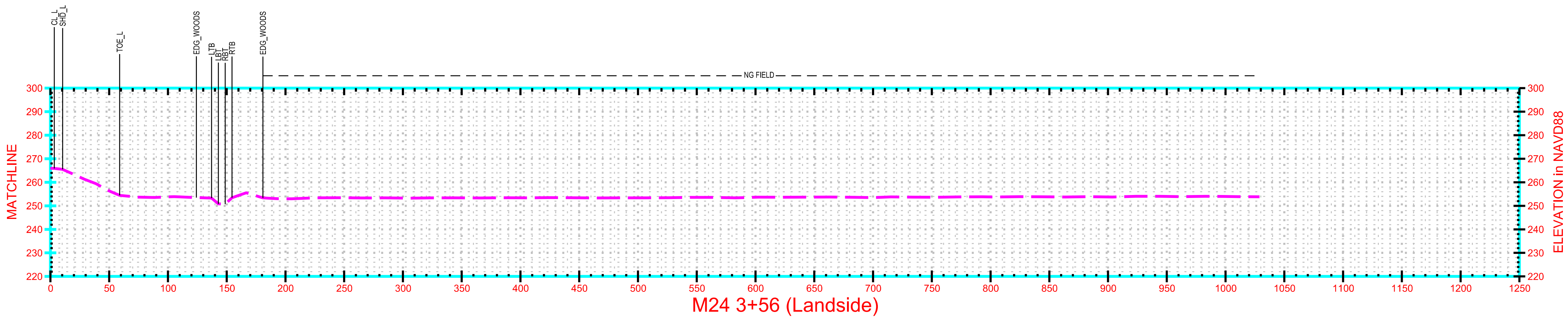
EMC DRAWING & MAPPING

MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Mile M23/51+83
CROSS SECTIONS
PLATE

DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT CORPS OF ENGINEERS
SUPERVISOR, ENGINEERING BRANCH

Sheet ID
36 OF 63





SURVEY NOTES:

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30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers®
Memphis District

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

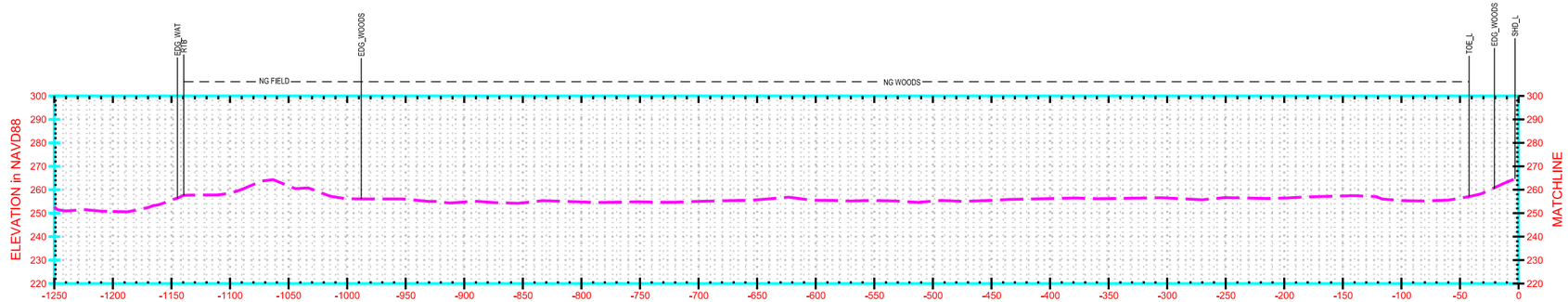
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

EMC SURVEYING & MAPPING

DESIGNED BY: | DATE: 01/14/2011
DWN BY: DEG | CKD BY: MOC | SOLICITATION NO.: W38XGR01724428
SUBMITTED BY: EMC, Inc. | CONTRACT NO.: W912EQ-10-D-0014
PLOT SCALE: 1" = 60' | PLOT DATE: 01/14/2011 | FILE NUMBER:
SIZE: ANSI D | FILE NAME: EMC10001007CXS.dgn

MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Mile M24/3+56
CROSS SECTIONS
PLATE
DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
GEOTECHNICAL ENGINEERING BRANCH

Sheet ID
37 OF 63



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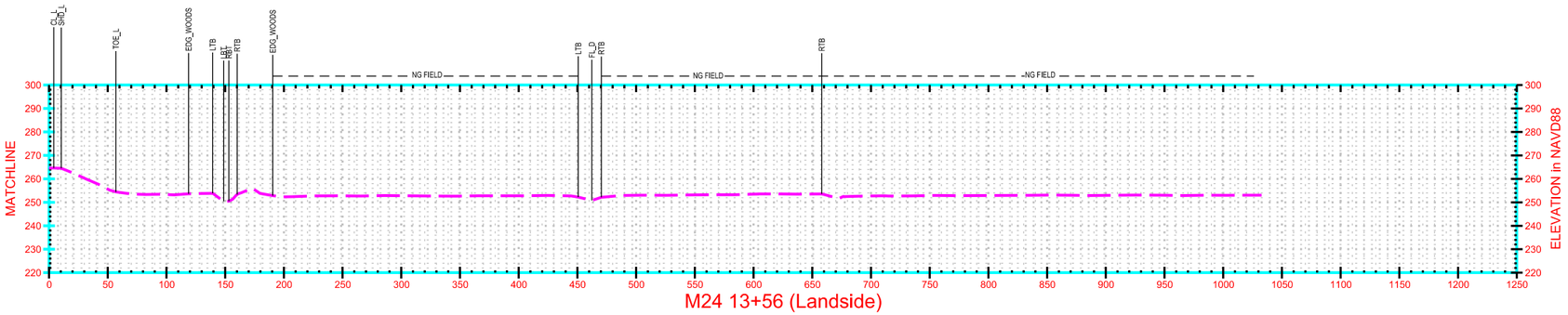
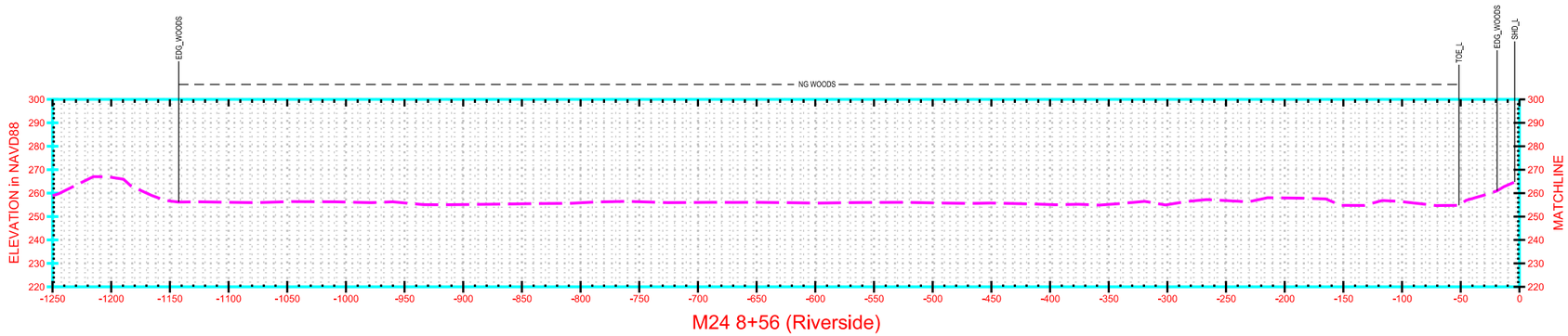
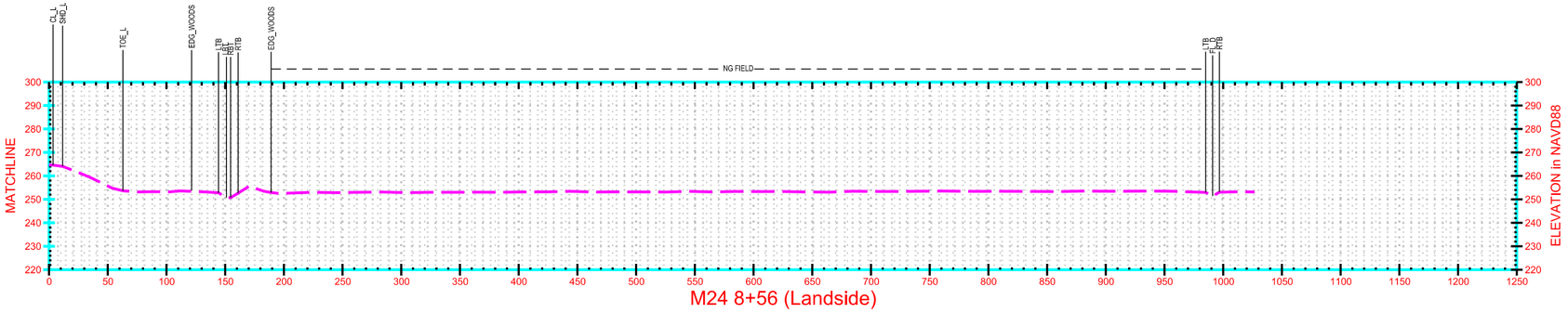


M24 13+56 (Landside)



M24 8+56 (Riverside)



M24 8+56 (Landside)

SURVEY NOTES:

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30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers®
Memphis District

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

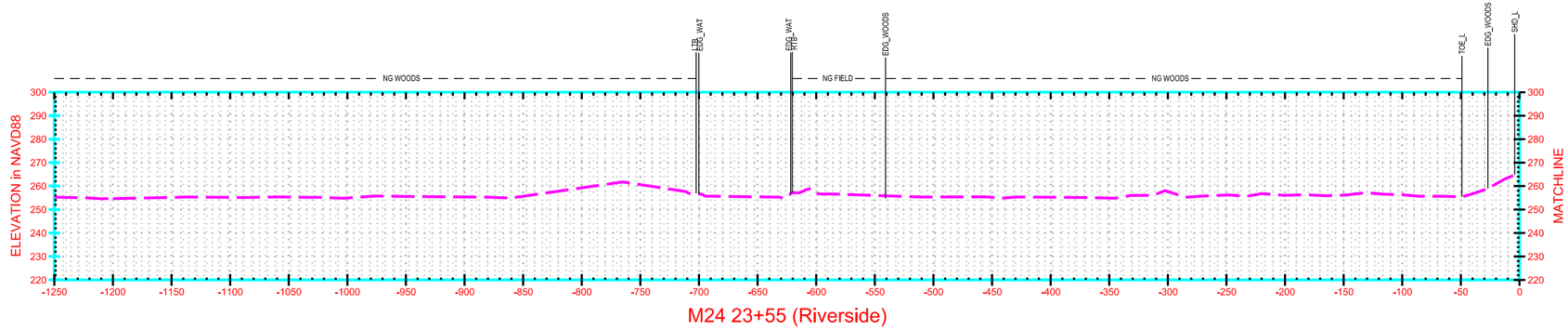
DESIGNED BY: | DATE: 01/14/2011
DWN BY: DEG | CKD BY: MOC | SOLICITATION NO.: W38XGR01724428
SUBMITTED BY: EMC, Inc. | CONTRACT NO.: W912EQ-10-D-0014
PLOT SCALE: 1" = 60' | PLOT DATE: 01/14/2011 | FILE NUMBER:
SIZE: ANSI D | FILE NAME: EMC10001007CXS.dgn

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

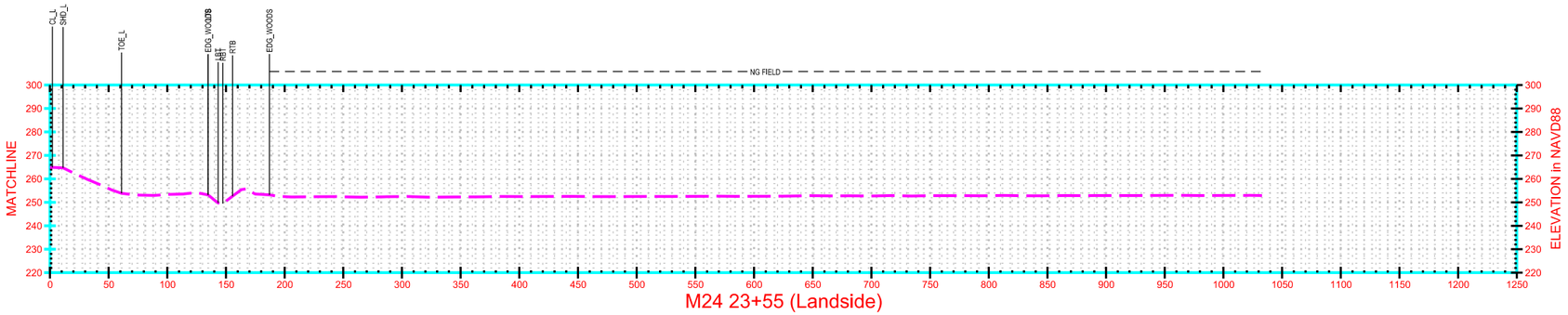
EMC
SURVEYING & MAPPING

MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Miles M24/8+56 to M24/13+56
CROSS SECTIONS
PLATE
DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
GEOTECHNICAL ENGINEERING BRANCH

Sheet ID
38 OF 63



M24 23+55 (Riverside)



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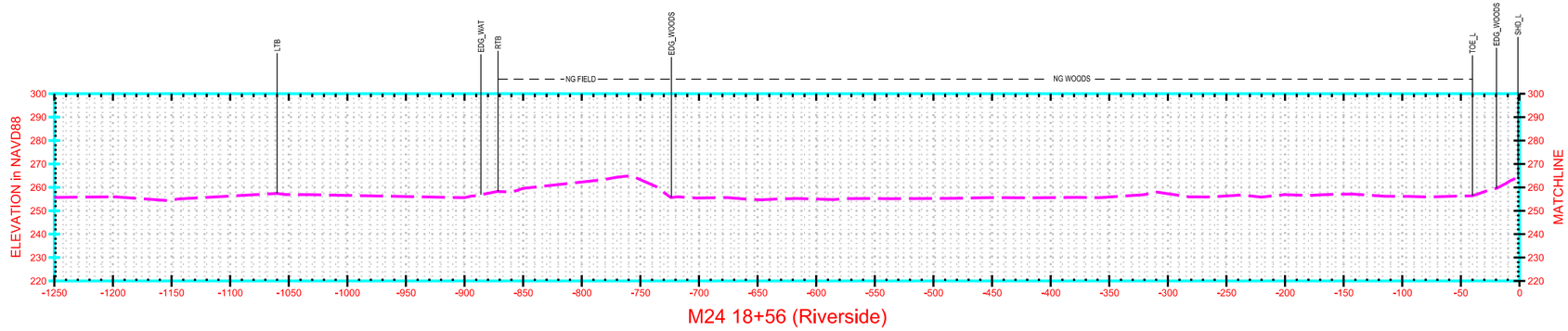
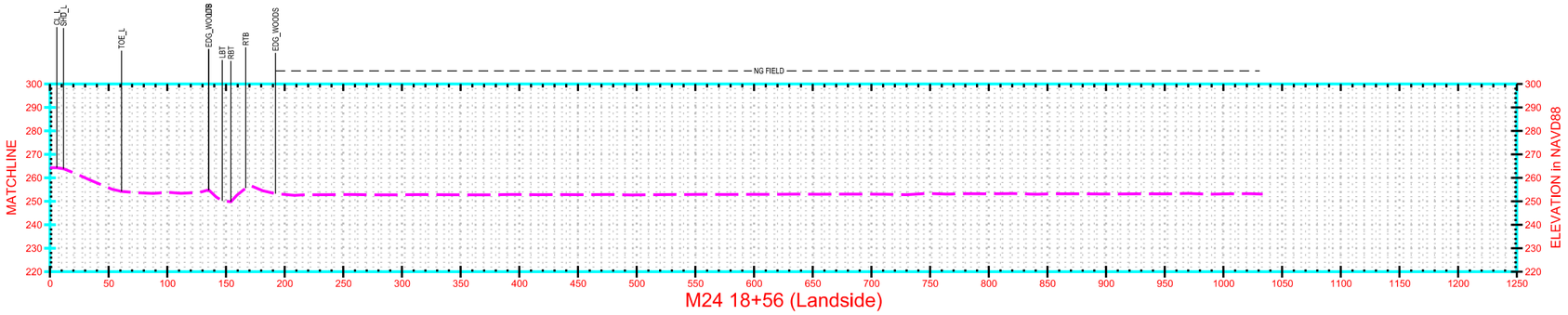


M24 18+56 (Riverside)



M24 18+56 (Landside)

SURVEY NOTES:

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30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers®
Memphis District

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

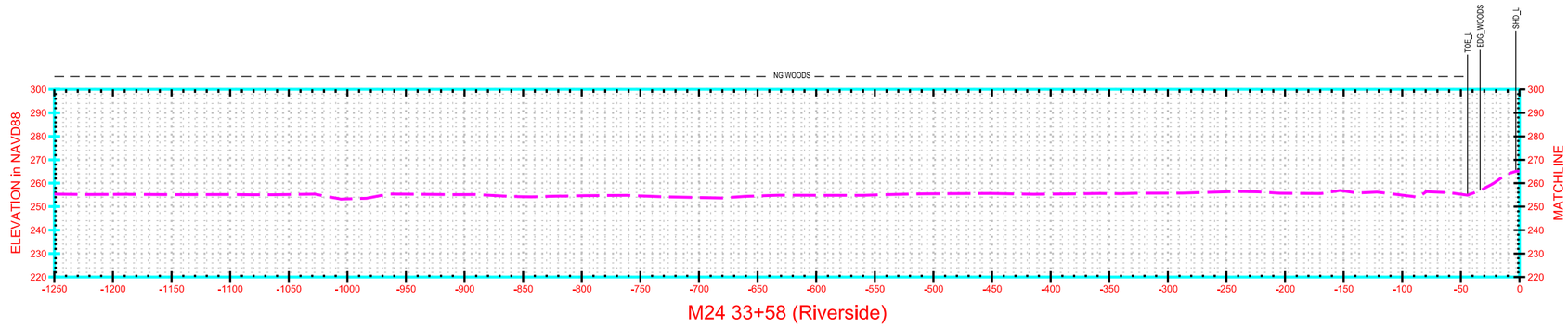
DESIGNED BY: | DATE: 01/14/2011
DWN BY: DEG | CKD BY: MCC | SOLICITATION NO.: W38XGR01724428
SUBMITTED BY: EMC, Inc. | CONTRACT NO.: W912EQ-10-D-0014
PLOT SCALE: 1" = 60' | PLOT DATE: 01/14/2011 | FILE NUMBER:
SIZE: ANSI D | FILE NAME: EMC10001007CXS.dgn

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

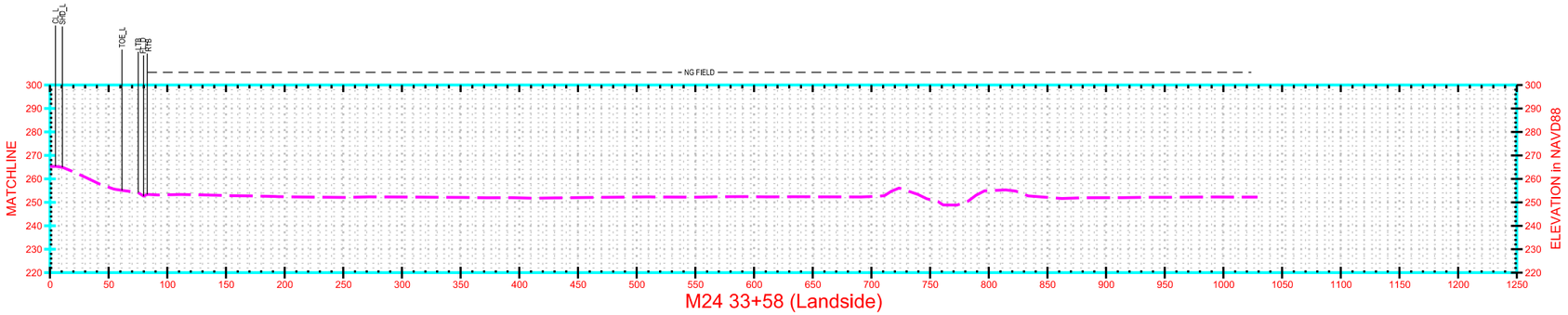
EMC
SURVEYING & MAPPING

MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Miles M24/18+56 to M24/23+55
CROSS SECTIONS
PLATE
DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
GEOTECHNICAL ENGINEERING BRANCH

Sheet ID
39 OF 63



M24 33+58 (Riverside)



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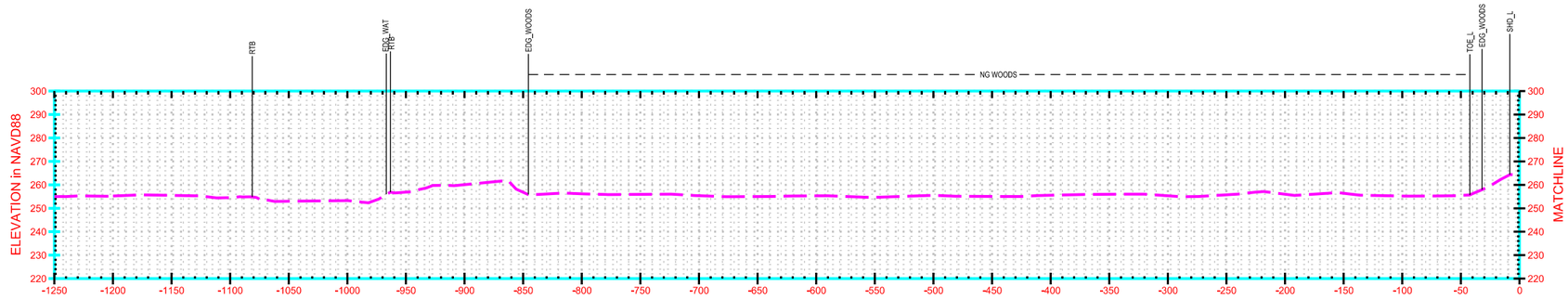
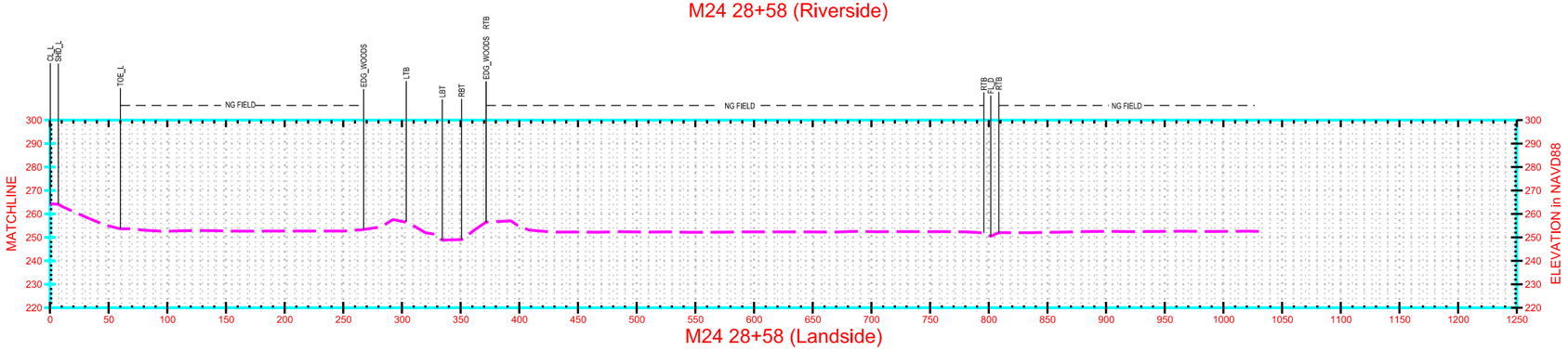


M24 28+58 (Riverside)



M24 28+58 (Landside)

SURVEY NOTES:

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- PLANE COORDINATES ARE BASED ON NORTH AMERICAN DATUM OF 1893 (NAD 83) USING UTM ZONE 15 IN U.S. SURVEY FEET.

30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers®
Memphis District

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

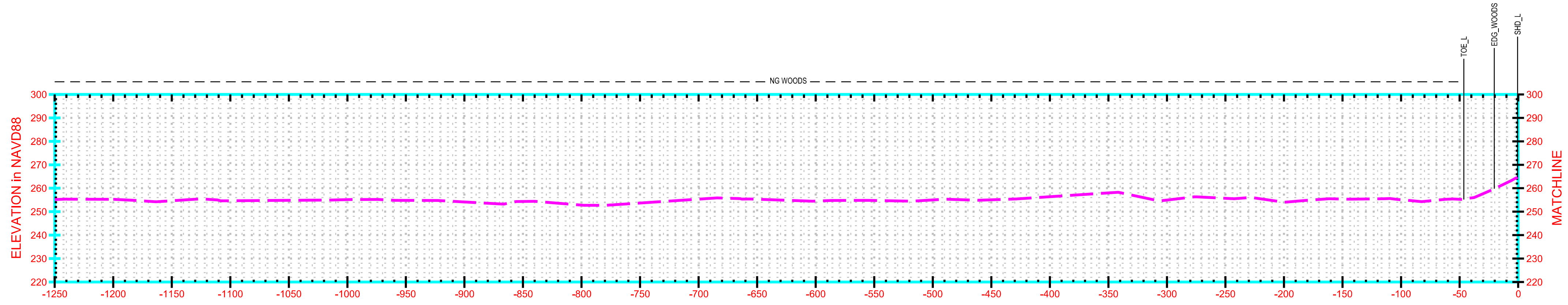
DESIGNED BY:
DWN BY: DEG
CKD BY: MOC
SUBMITTED BY: EMC, Inc.
PLOT SCALE: 1" = 60'
PLOT DATE: 01/14/2011
SIZE: ANSI D
FILE NAME: EMC10001007CXS.dgn
DATE: 01/14/2011
SOLICITATION NO.: W38XGR01724428
CONTRACT NO.: W912EQ-10-D-0014
FILE NUMBER:

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

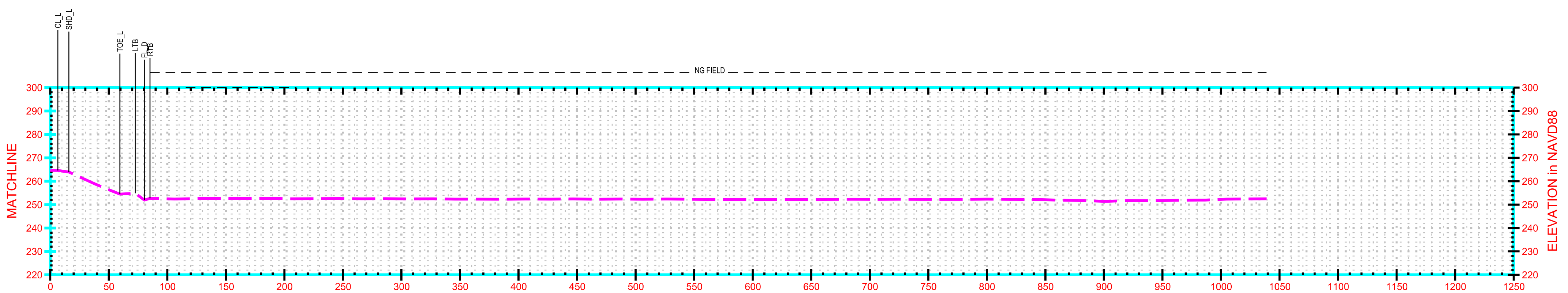
EMC
SURVEYING & MAPPING

MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Miles M24/28+58 to M24/33+58
CROSS SECTIONS
PLATE
DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
GEOTECHNICAL ENGINEERING BRANCH

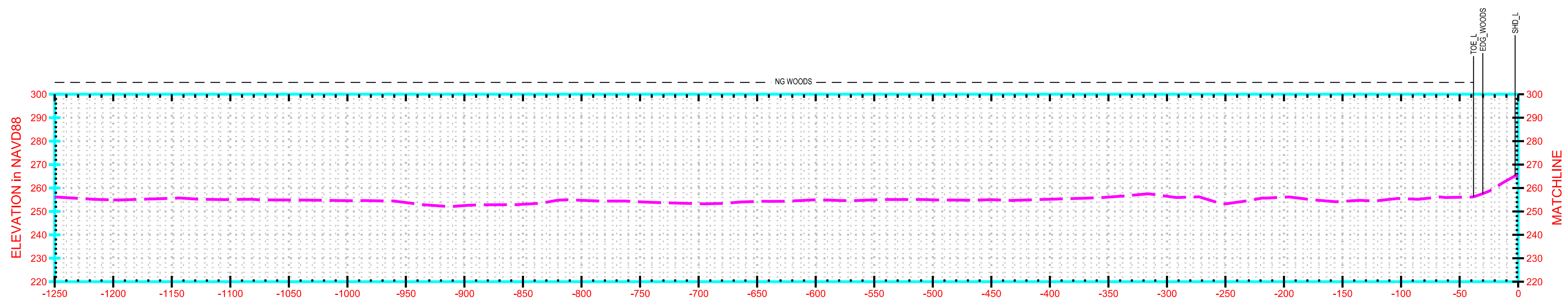
Sheet ID
40 OF 63



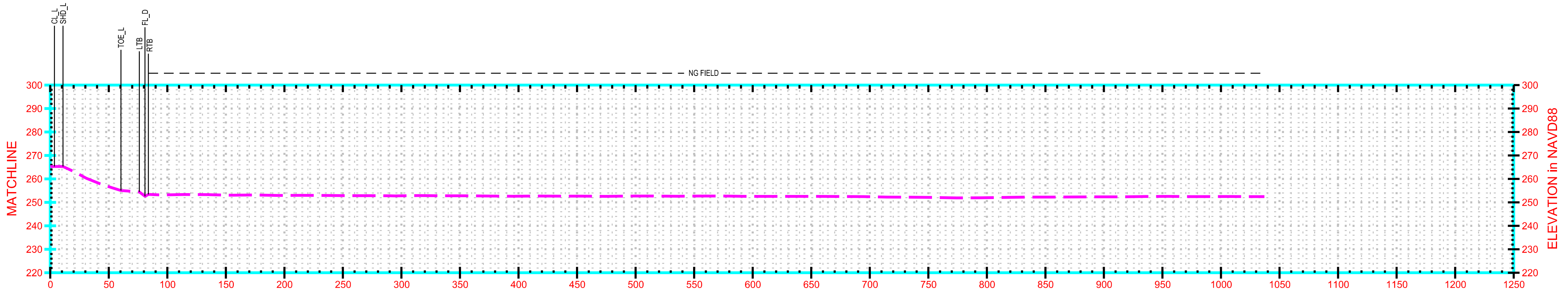
M24 43+58 (Riverside)



M24 43+58 (Landside)



M24 38+58 (Riverside)



M24 38+58 (Landside)

SURVEY NOTES:

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- PLANE COORDINATES ARE BASED ON NORTH AMERICAN DATUM OF 1893 (NAD 83) USING UTM ZONE 15 IN U.S. SURVEY FEET.

VERTICAL SCALE IS 1" = 30'

HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers®
Memphis District

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

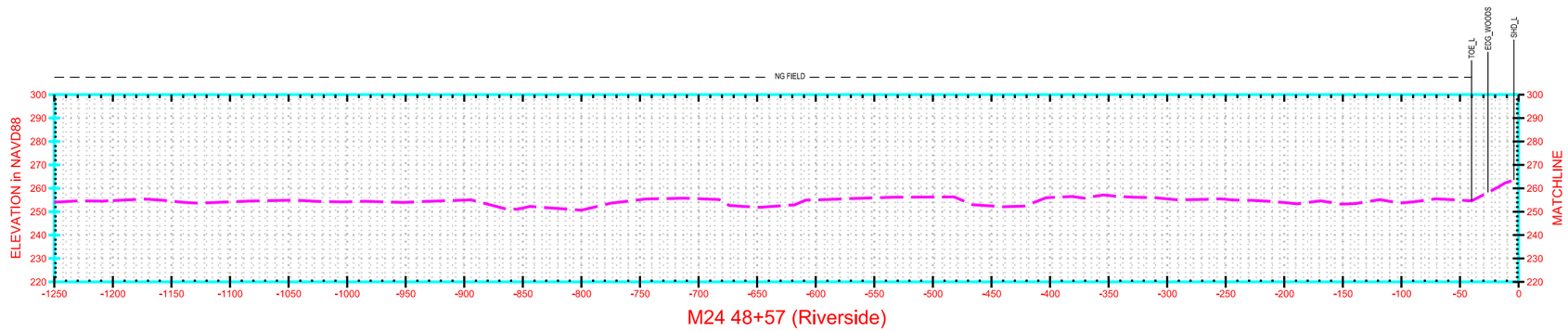
EMC SURVEYING & MAPPING

DESIGNED BY:		DATE: 01/14/2011
DWN BY: DEG	CKD BY: MOC	SOLICITATION NO.: W38XGR01724428
SUBMITTED BY: EMC, Inc.		CONTRACT NO.: W912EQ-10-D-0014
PLOT SCALE: 1" = 60'	PLOT DATE: 01/14/2011	FILE NUMBER:
SIZE: ANSI D	FILE NAME: EMC10001007CXS.dgn	

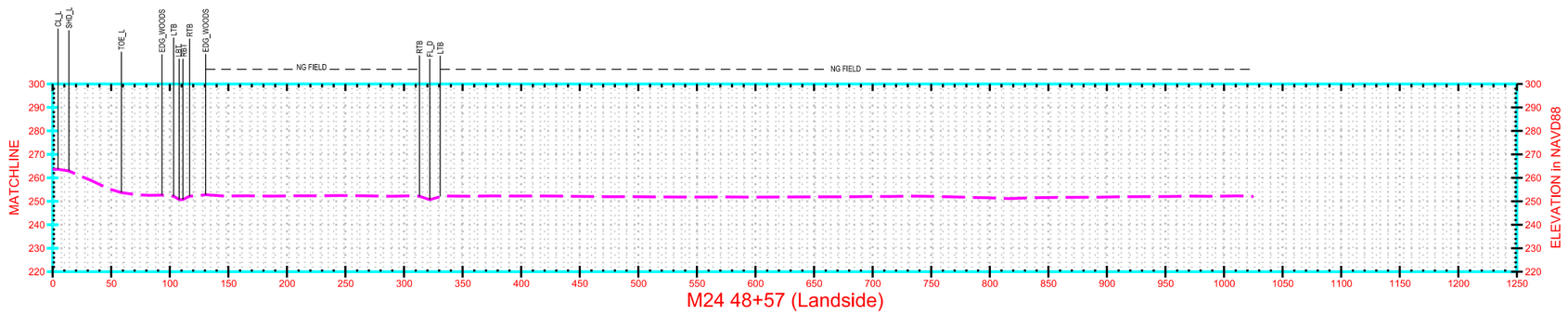
MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Miles M24/38+58 to M24/43+58
CROSS SECTIONS
PLATE

DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
GEOTECHNICAL ENGINEERING BRANCH

Sheet ID
41 OF 63



M24 48+57 (Riverside)



M24 48+57 (Landside)

SURVEY NOTES:

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30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers®
Memphis District

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

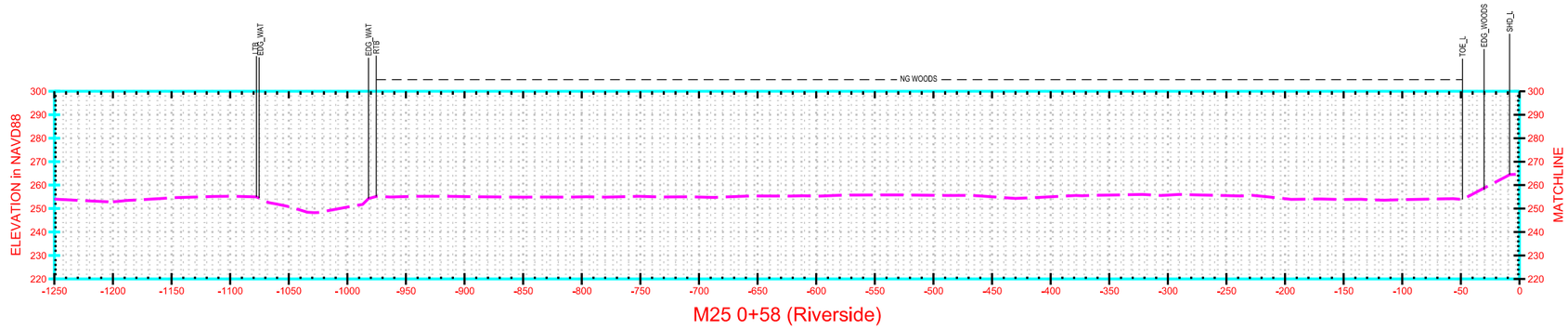
DESIGNED BY:
DWN BY: DEG
CKD BY: MOC
SUBMITTED BY: EMC, Inc.
PLOT SCALE: 1" = 60'
PLOT DATE: 01/14/2011
SIZE: ANSI D
FILE NAME: EMC10001007CXS.dgn
DATE: 01/14/2011
SOLICITATION NO.: W38XGR01724428
CONTRACT NO.: W912EQ-10-D-0014
FILE NUMBER:

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

EMC
SURVEYING & MAPPING

MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Mile M24/48+57
CROSS SECTIONS
PLATE
DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
GEOTECHNICAL ENGINEERING BRANCH

Sheet ID
42 OF 63



SURVEY NOTES:

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30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers®
Memphis District

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

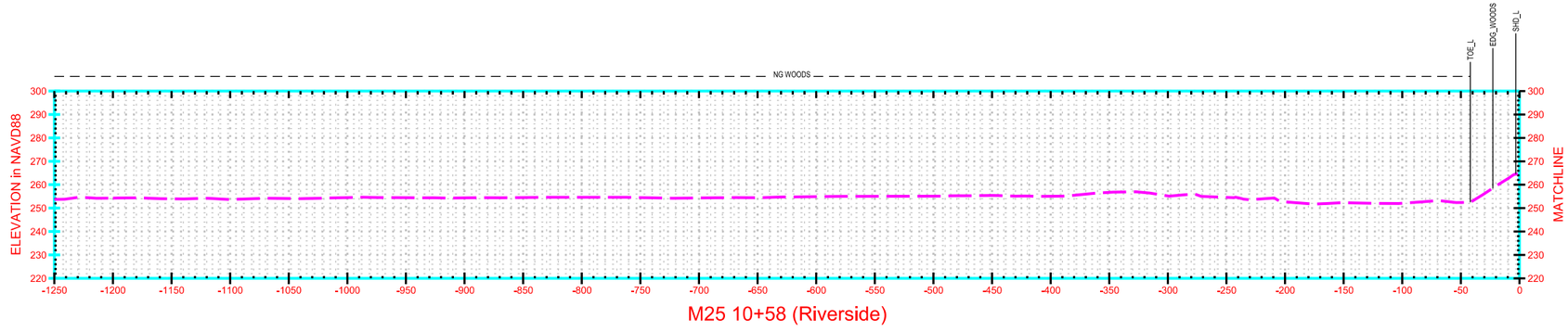
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

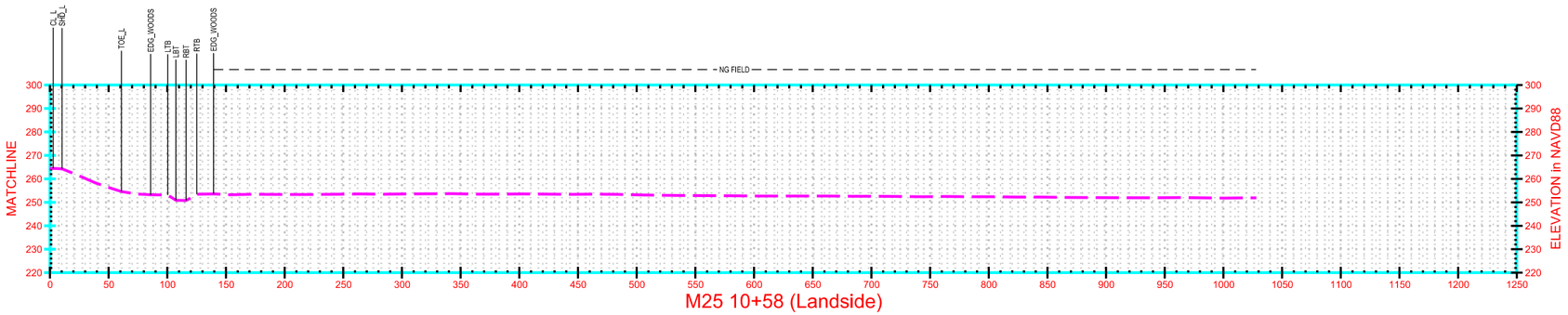
EMC SURVEYING & MAPPING

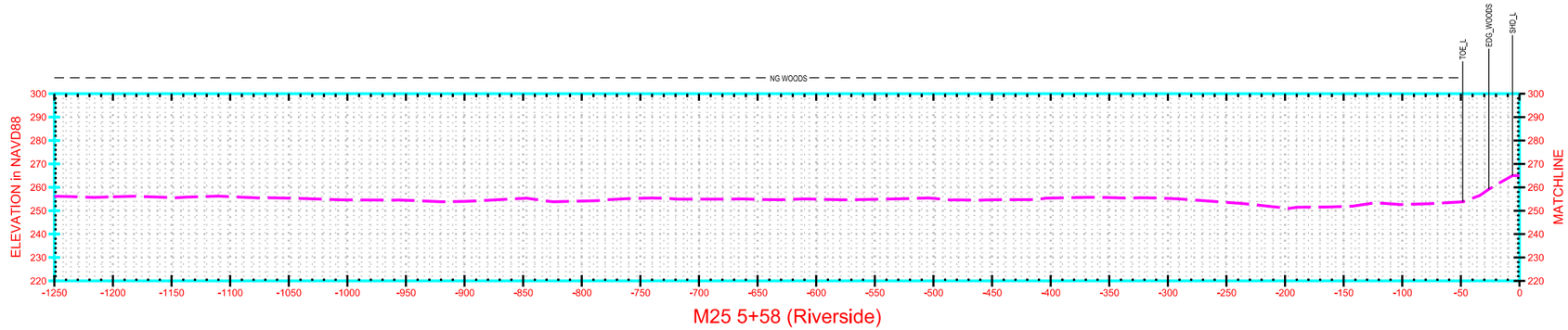
DESIGNED BY:
DWN BY: DEG
CKD BY: MCC
SUBMITTED BY: EMC, Inc.
PLOT SCALE: 1" = 60'
PLOT DATE: 01/14/2011
SIZE: ANSI D
FILE NAME: EMC10001008CXS.dgn
DATE: 01/14/2011
SOLICITATION NO.: W38XGR0172428
CONTRACT NO.: W912EQ-10-D-0014
FILE NUMBER:

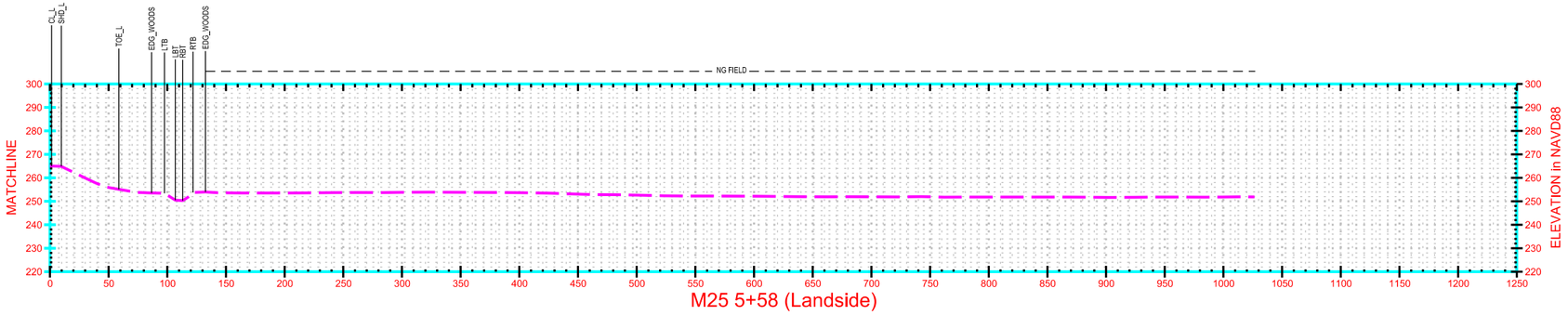
MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Mile M25/0+58
CROSS SECTIONS
PLATE
DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
GEOTECHNICAL ENGINEERING BRANCH

Sheet ID
43 OF 63









SURVEY NOTES:

- ALL ELEVATIONS ARE REFERENCED TO NAVD 1988.
- PLANE COORDINATES ARE BASED ON NORTH AMERICAN DATUM OF 1893 (NAD 83) USING UTM ZONE 15 IN U.S. SURVEY FEET.

30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers®
Memphis District

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

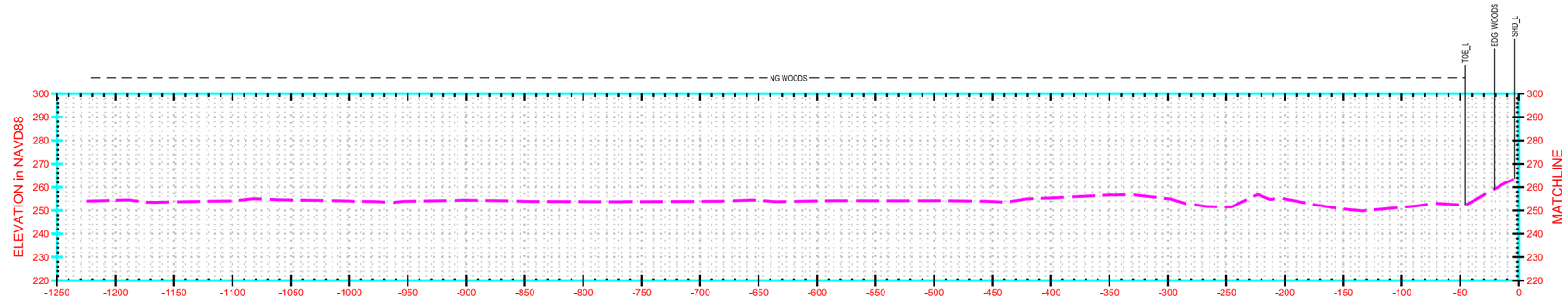
DESIGNED BY: | DATE: 01/14/2011
DWN BY: DEG | CKD BY: MOC | SOLICITATION NO.: W38XGR01724428
SUBMITTED BY: EMC, Inc. | CONTRACT NO.: W912EQ-10-D-0014
PLOT SCALE: 1" = 60' | PLOT DATE: 01/14/2011 | FILE NUMBER:
SIZE: ANSI D | FILE NAME: EMC10001008CXS.dgn

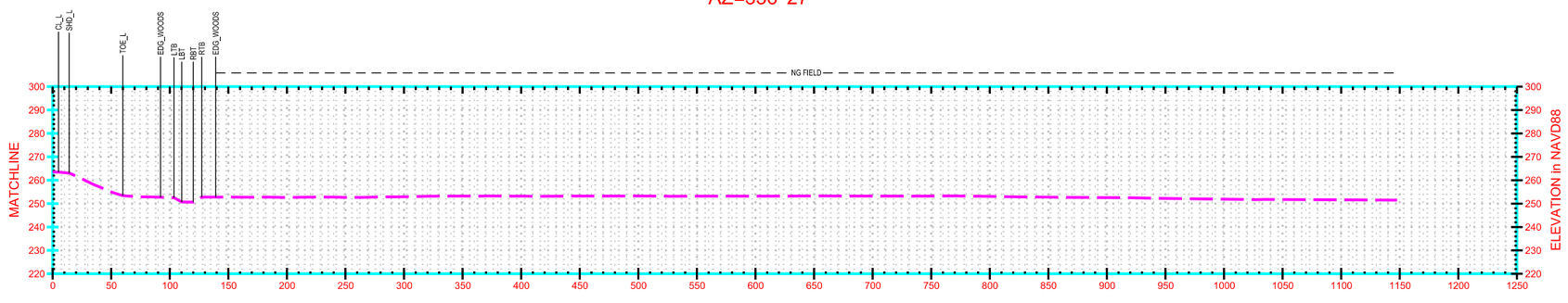
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

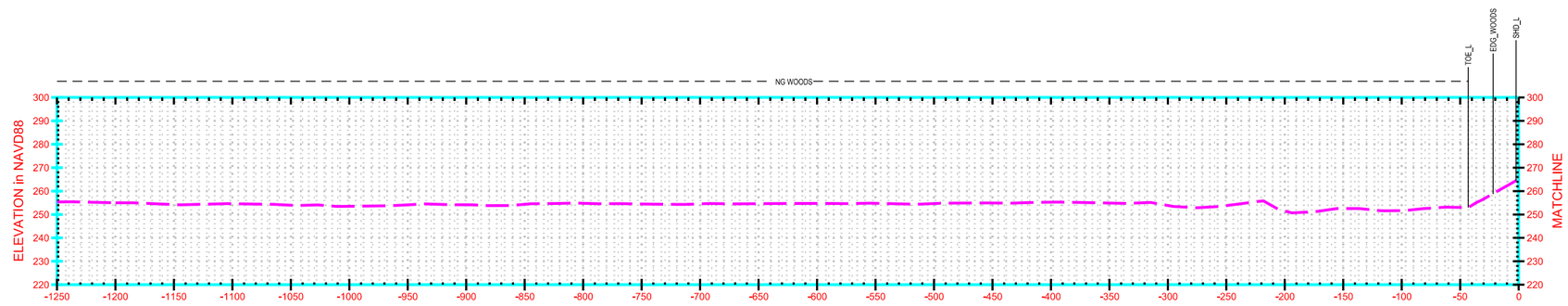
EMC
SURVEYING & MAPPING
Mid-Atlantic Environmental Services
2010 NORTH BEACH STREET, SUITE 1
MONTEREY, CALIFORNIA 93940

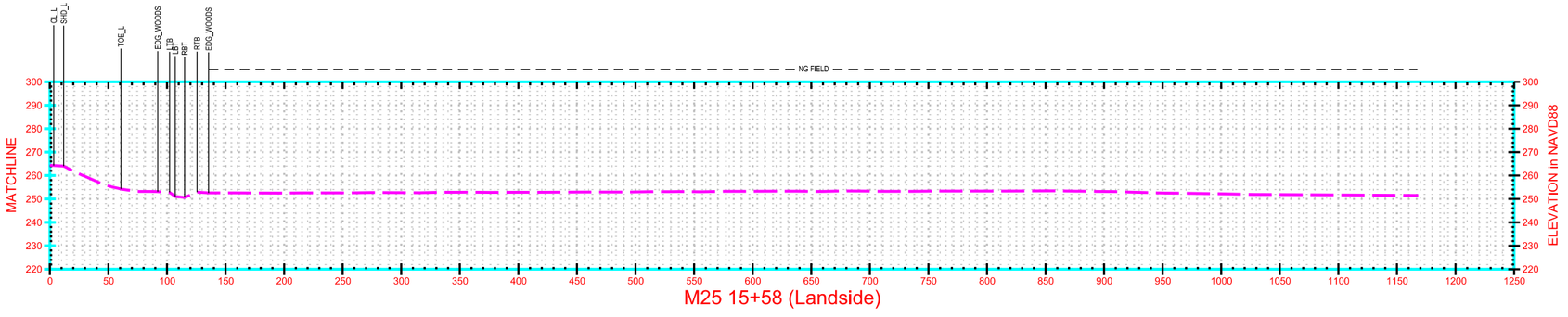
MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Miles M25/5+58 to M25/10+58
CROSS SECTIONS
PLATE
DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
GEOTECHNICAL ENGINEERING BRANCH

Sheet ID
44 OF 63









SURVEY NOTES:

- ALL ELEVATIONS ARE REFERENCED TO NAVD 1988.
- PLANE COORDINATES ARE BASED ON NORTH AMERICAN DATUM OF 1893 (NAD 83) USING UTM ZONE 15 IN U.S. SURVEY FEET.

30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers®
Memphis District

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

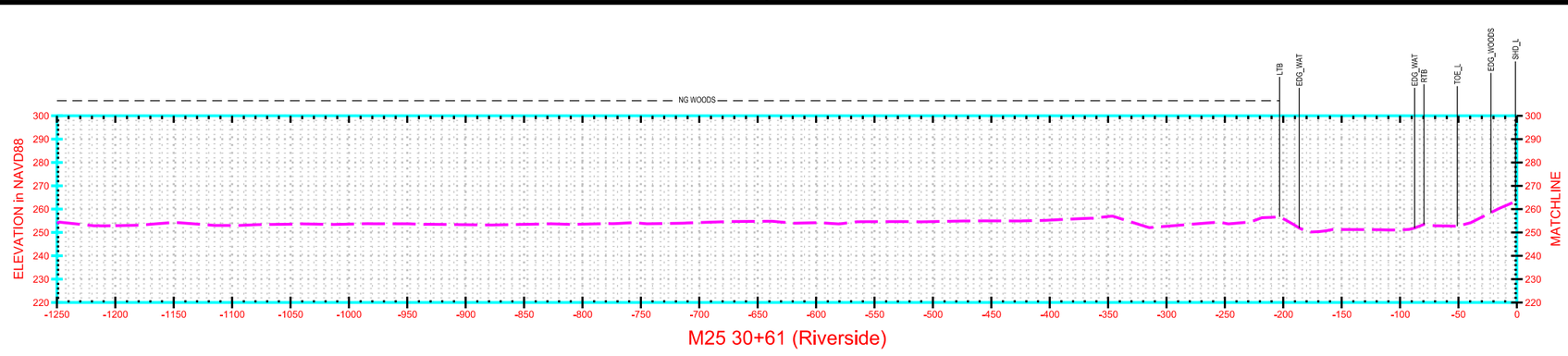
DESIGNED BY: | DATE: 01/14/2011
DWN BY: DEG | CKD BY: MOC | SOLICITATION NO.: W38XGR01724428
SUBMITTED BY: EMC, Inc. | CONTRACT NO.: W912EQ-10-D-0014
PLOT SCALE: 1" = 60' | PLOT DATE: 01/14/2011 | FILE NUMBER:
SIZE: ANSI D | FILE NAME: EMC10001008CXS.dgn

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

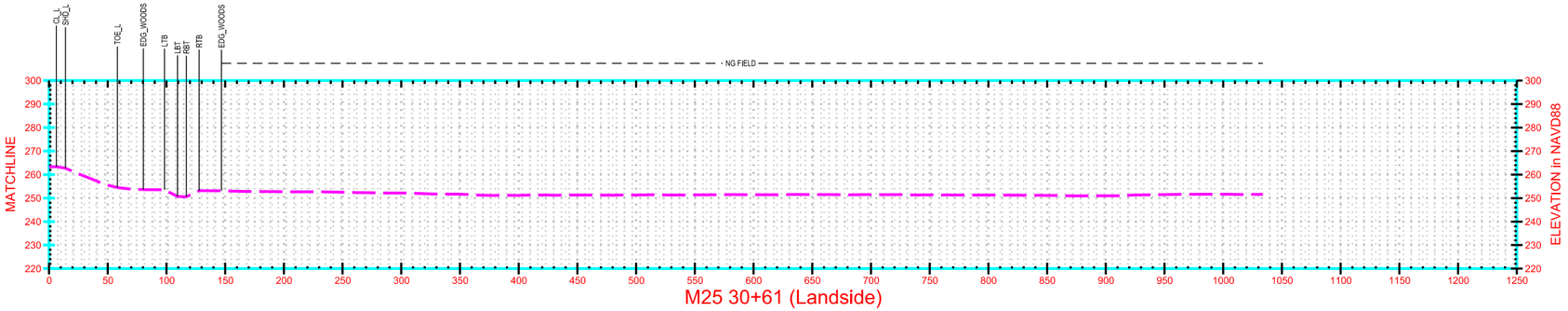
EMC
SURVEYING & MAPPING
1661 AUSTIN STREET, MEMPHIS, TENNESSEE
PHONE: (901) 452-7000 FAX: (901) 452-7000
WWW.EMCSURVEYING.COM

MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Miles M25/15+58 to M25/20+61
CROSS SECTIONS
PLATE
DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
GEOTECHNICAL ENGINEERING BRANCH

Sheet ID
45 OF 63



M25 30+61 (Riverside)



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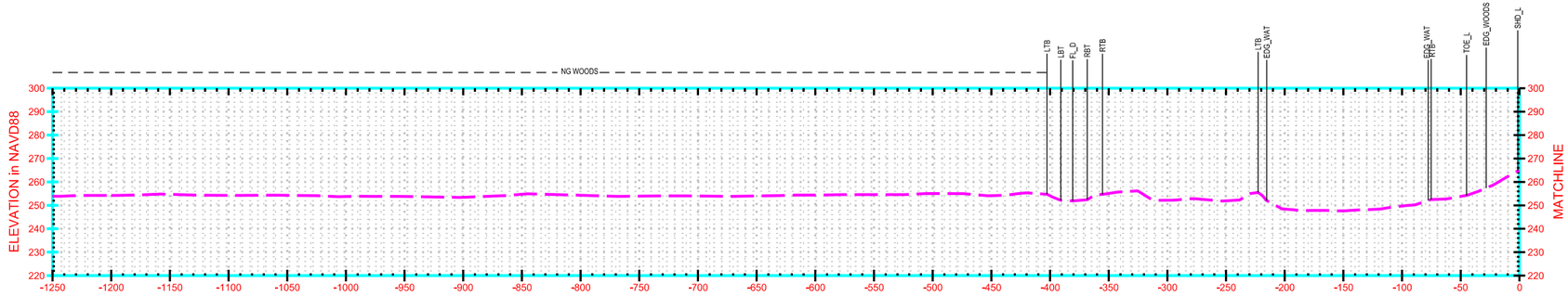
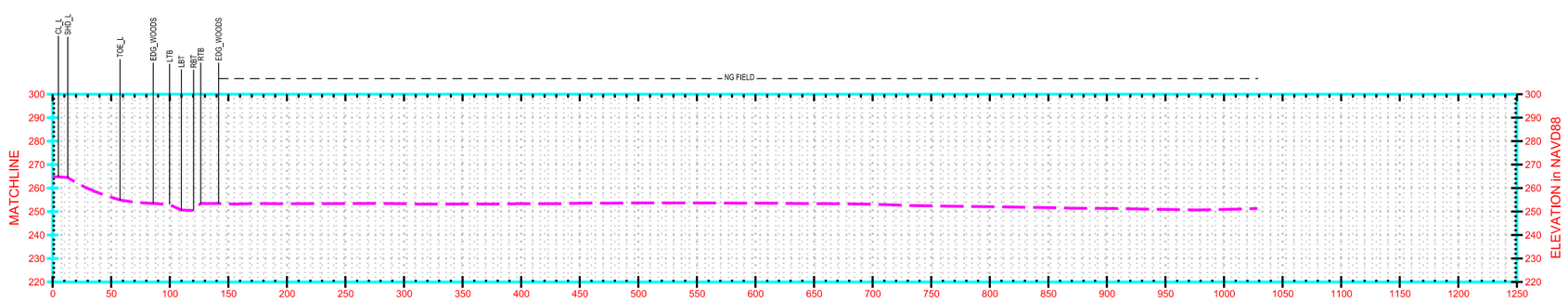


M25 25+61 (Riverside)



M25 25+61 (Landside)

SURVEY NOTES:

- ALL ELEVATIONS ARE REFERENCED TO NAVD 1988.
- PLANE COORDINATES ARE BASED ON NORTH AMERICAN DATUM OF 1893 (NAD 83) USING UTM ZONE 15 IN U.S. SURVEY FEET.

30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers®
Memphis District

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

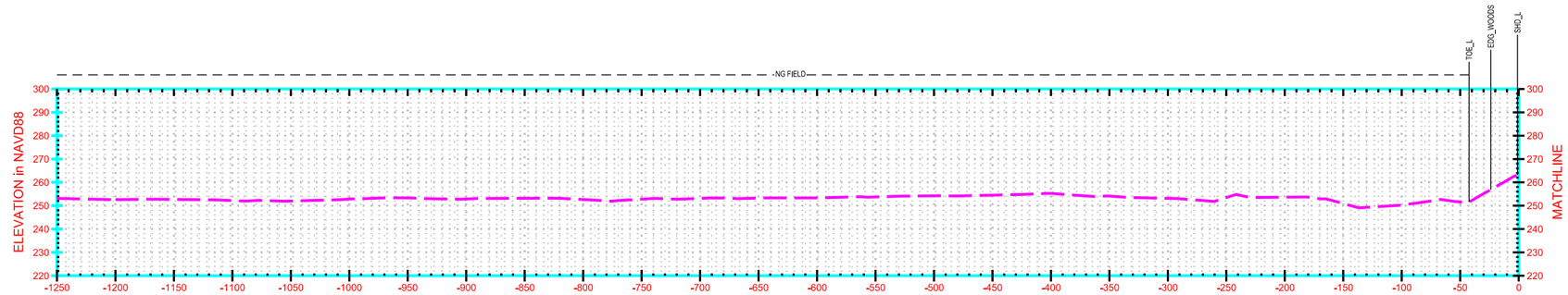
DESIGNED BY: | DATE: 01/14/2011
DWN BY: DEG | CKD BY: MCC | SOLICITATION NO.: W38XGR01724428
SUBMITTED BY: EMC, Inc. | CONTRACT NO.: W912EQ-10-D-0014
PLOT SCALE: 1" = 60' | PLOT DATE: 01/14/2011 | FILE NUMBER:
SIZE: ANSI D | FILE NAME: EMC10001008CXS.dgn

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

EMC SURVEYING & MAPPING

MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Miles M25/25+61 to M25/30+61
CROSS SECTIONS
PLATE
DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
GEOTECHNICAL ENGINEERING BRANCH

Sheet ID
46 OF 63



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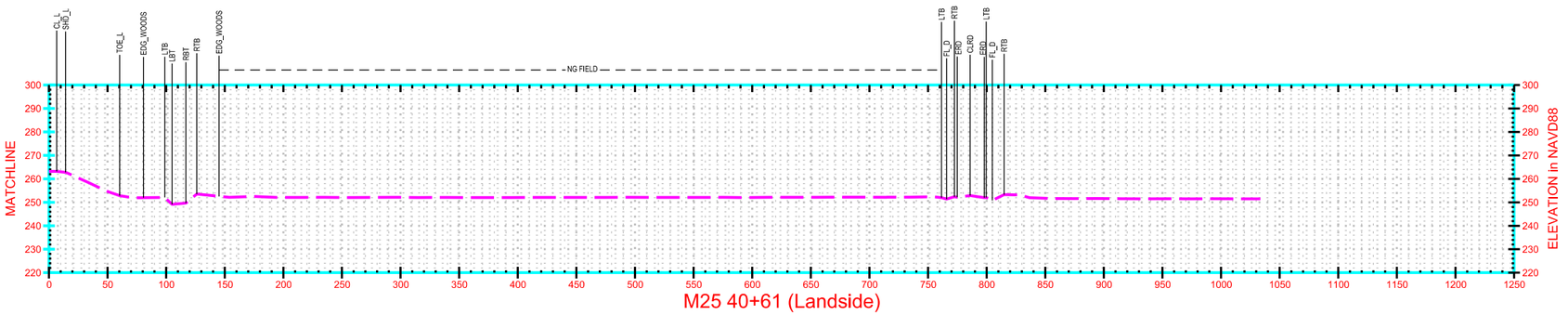

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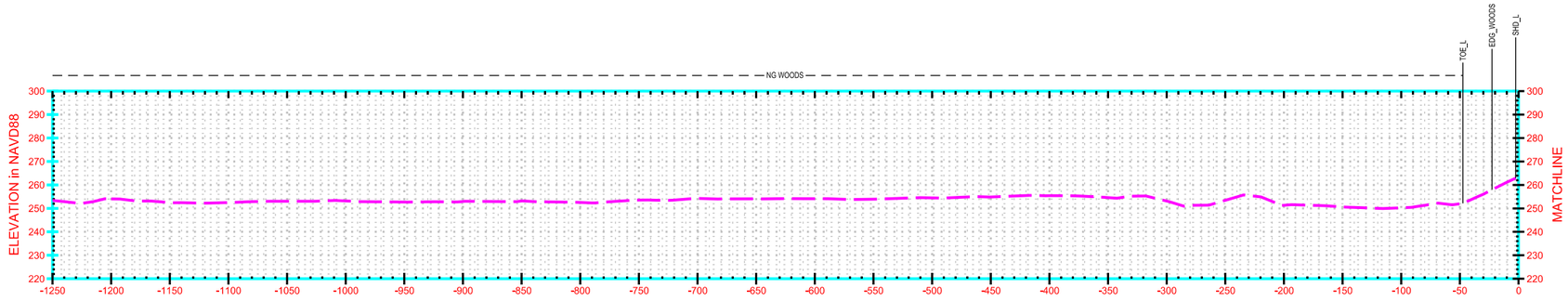

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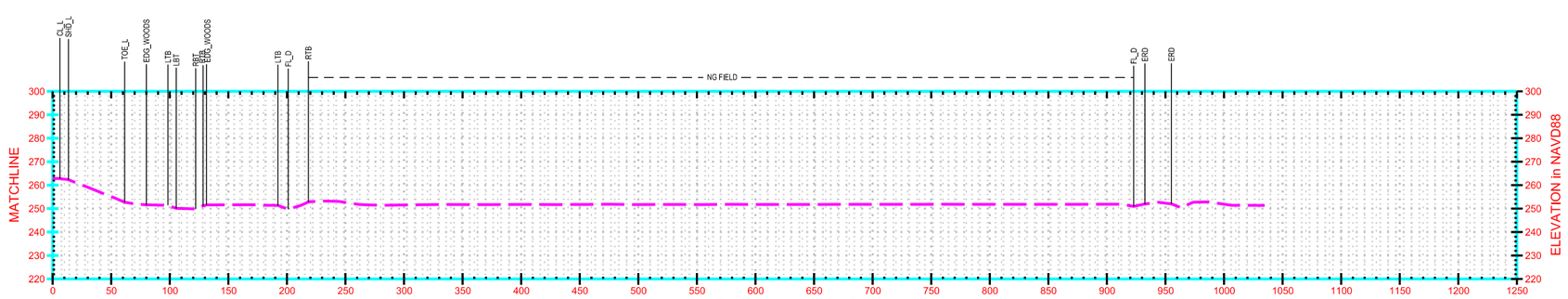

M25 35+61 (Landside)

SURVEY NOTES:

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- PLANE COORDINATES ARE BASED ON NORTH AMERICAN DATUM OF 1893 (NAD 83) USING UTM ZONE 15 IN U.S. SURVEY FEET.

30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers®
Memphis District

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

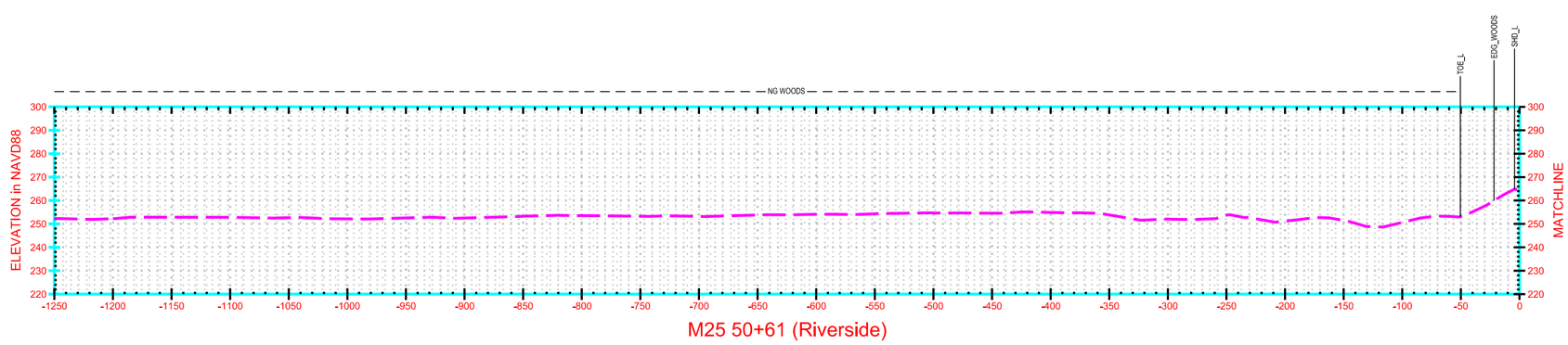
DESIGNED BY:
DWN BY: DEG
CKD BY: MOC
SUBMITTED BY: EMC, Inc.
PLOT SCALE: 1" = 60'
PLOT DATE: 01/14/2011
SIZE: ANSI D
FILE NAME: EMC10001008CXS.dgn
DATE: 01/14/2011
SOLICITATION NO.: W38XGR01724428
CONTRACT NO.: W912EQ-10-D-0014
FILE NUMBER:

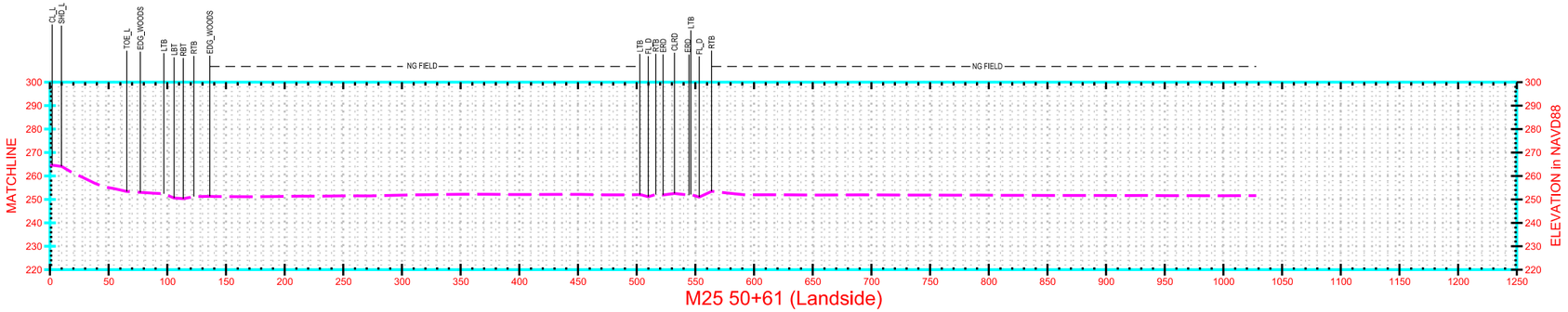
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

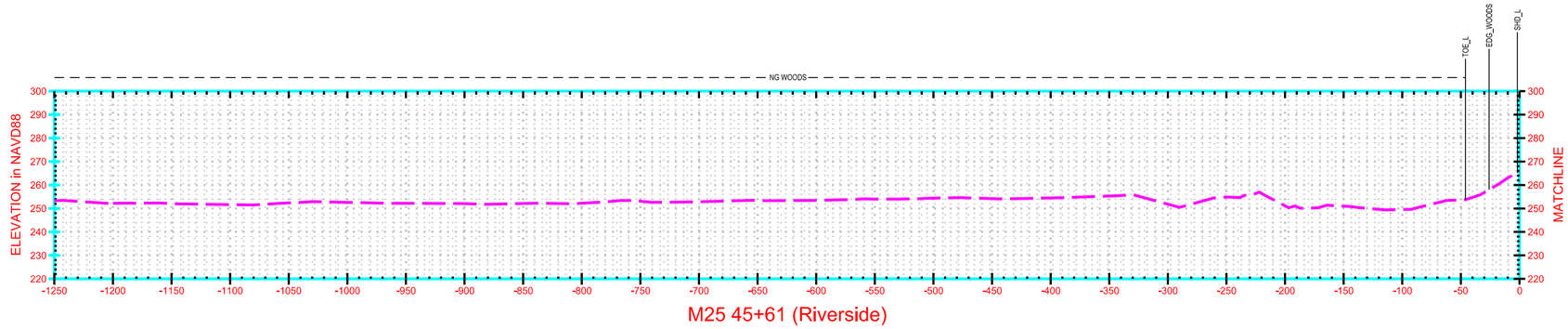
EMC
SURVEYING & MAPPING

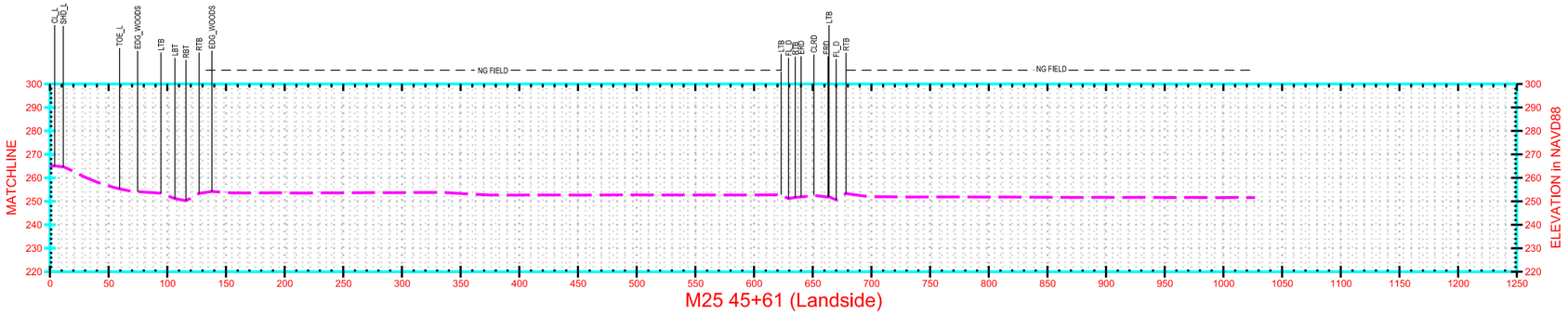
MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Miles M25/35+61 to M25/40+61
CROSS SECTIONS
PLATE
DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
GEOTECHNICAL ENGINEERING BRANCH

Sheet ID
47 OF 63









SURVEY NOTES:

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- PLANE COORDINATES ARE BASED ON NORTH AMERICAN DATUM OF 1893 (NAD 83) USING UTM ZONE 15 IN U.S. SURVEY FEET.

30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers
Memphis District

APVD	DATE	DESCRIPTION
APVD	DATE	DESCRIPTION

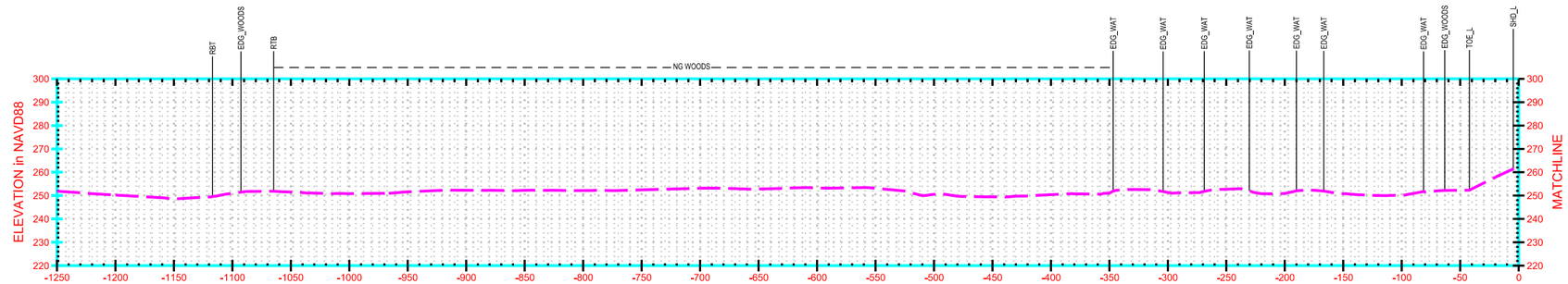
DESIGNED BY:
DWN BY: DEG
CKD BY: MDC
SUBMITTED BY: EMC, Inc.
DATE: 01/14/2011
SOLICITATION NO.: W38XGR91724428
CONTRACT NO.: W912EQ-13-D-0014
PLOT DATE: As noted
PLOT SCALE: As noted
SIZE: ANSI D
FILE NAME: EMC 100010908CKS.dgn
FILE NUMBER:

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

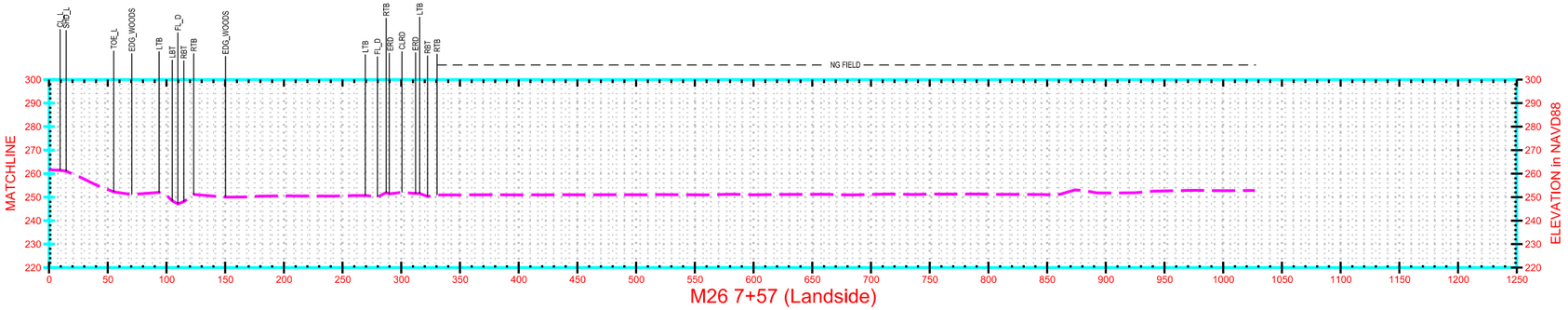
EMC
ENGINEERING & MAPPING CONSULTANTS, INC.

MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Miles M25/45+61 to M25/50+61
CROSS SECTIONS
PLATE
DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
SURVEYING & MAPPING BRANCH

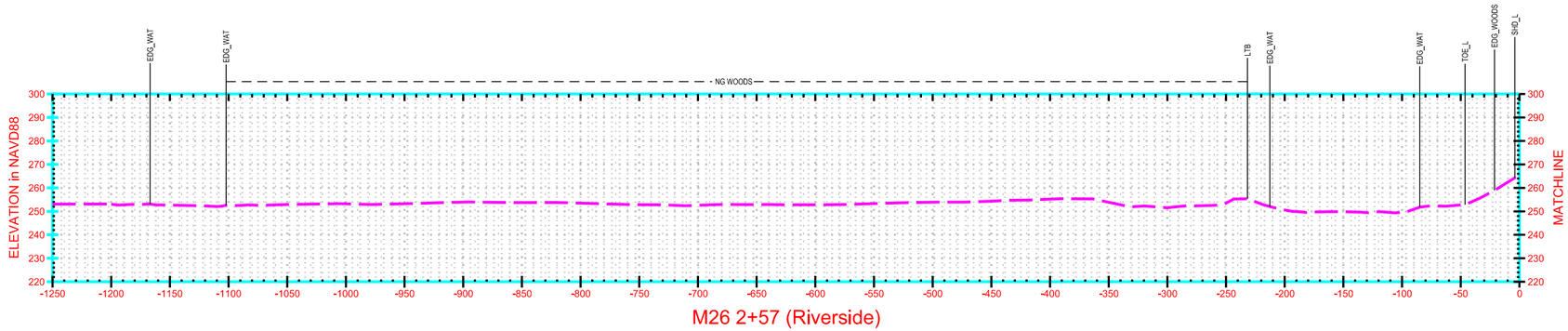
Sheet ID
48 OF 63



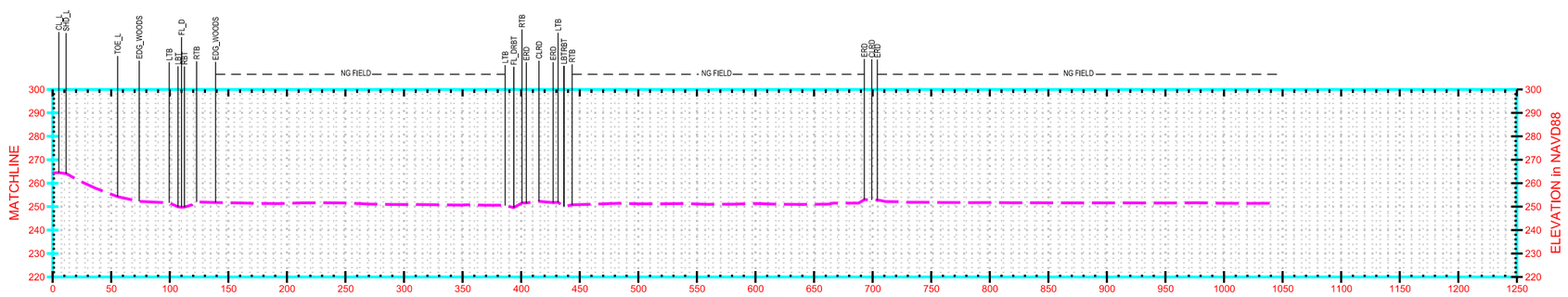
M26 7+57 (Riverside)



M26 7+57 (Landside)



M26 2+57 (Riverside)



M26 2+57 (Landside)

SURVEY NOTES:

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- PLANE COORDINATES ARE BASED ON NORTH AMERICAN DATUM OF 1893 (NAD 83) USING UTM ZONE 15 IN U.S. SURVEY FEET.

30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers®
Memphis District

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

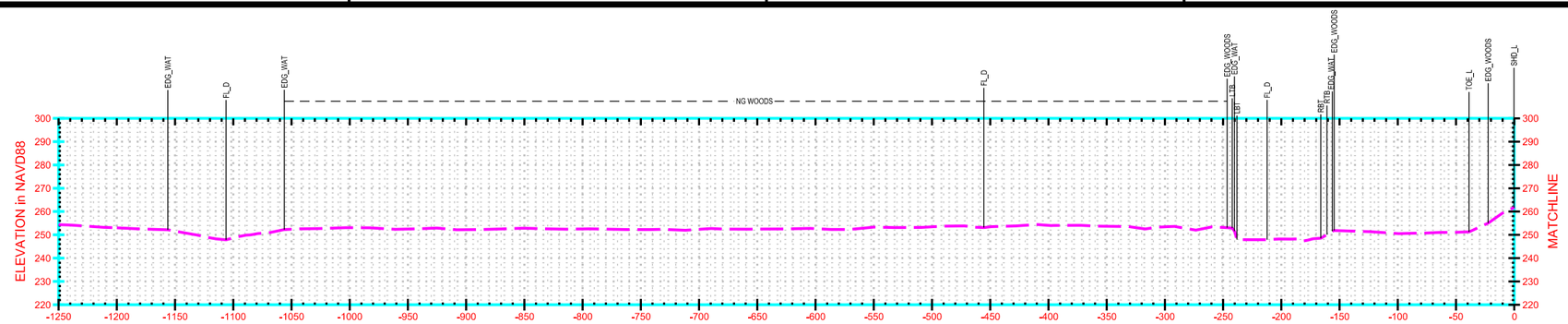
DESIGNED BY: | DATE: 01/14/2011
DWN BY: DEG | CKD BY: MCC | SOLICITATION NO.: W38XGR01724428
SUBMITTED BY: EMC, Inc. | CONTRACT NO.: W912EQ-10-D-0014
PLOT SCALE: 1" = 60' | PLOT DATE: 01/14/2011 | FILE NUMBER:
SIZE: ANSI D | FILE NAME: EMC10001009CXS.dgn

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

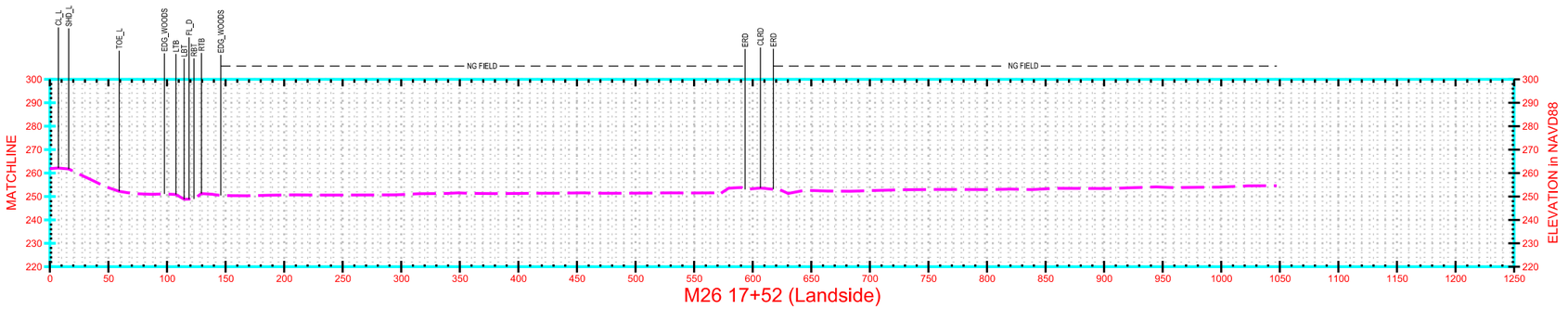
EMC SURVEYING & MAPPING

MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Miles M26/2+57 to M26/7+57
CROSS SECTIONS
PLATE
DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
GEOTECHNICAL ENGINEERING BRANCH

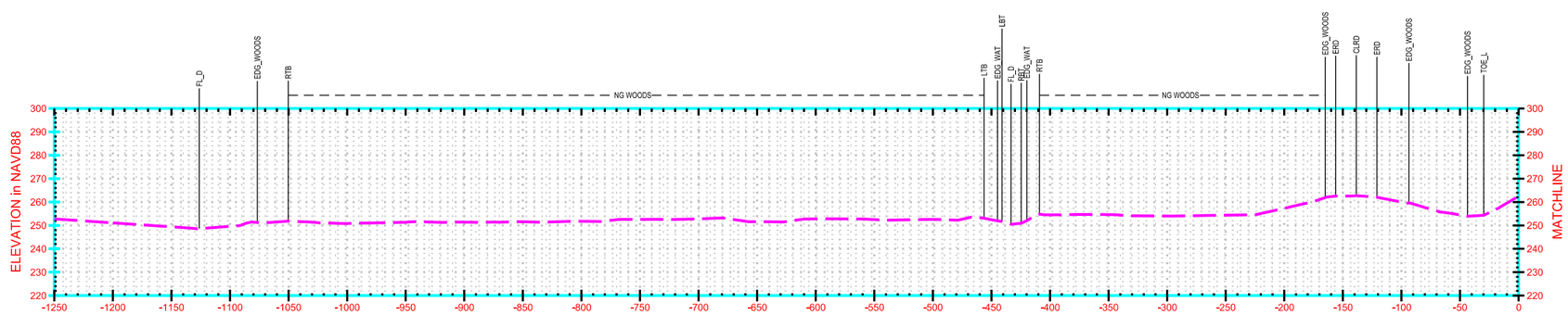
Sheet ID
49 OF 63



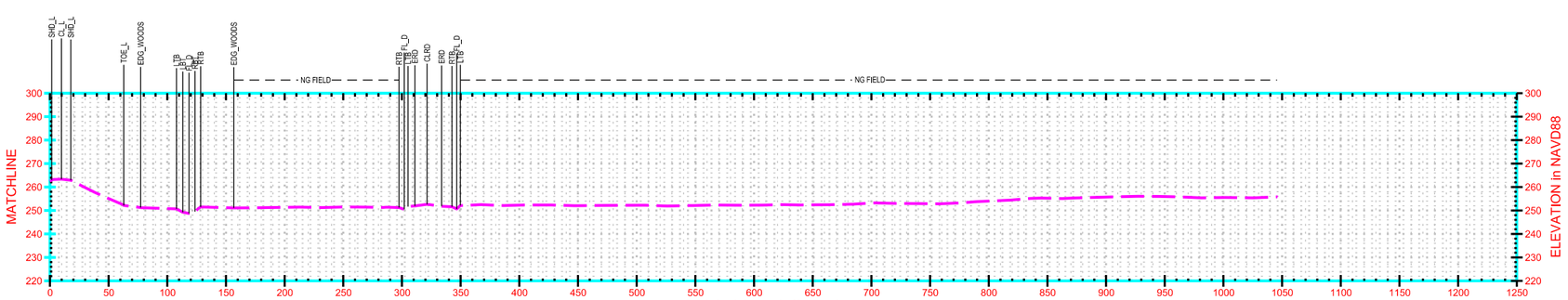
M26 17+52 (Riverside)



M26 17+52 (Landside)



M26 12+54 (Riverside)



M26 12+54 (Landside)

SURVEY NOTES:

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30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers®
Memphis District

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

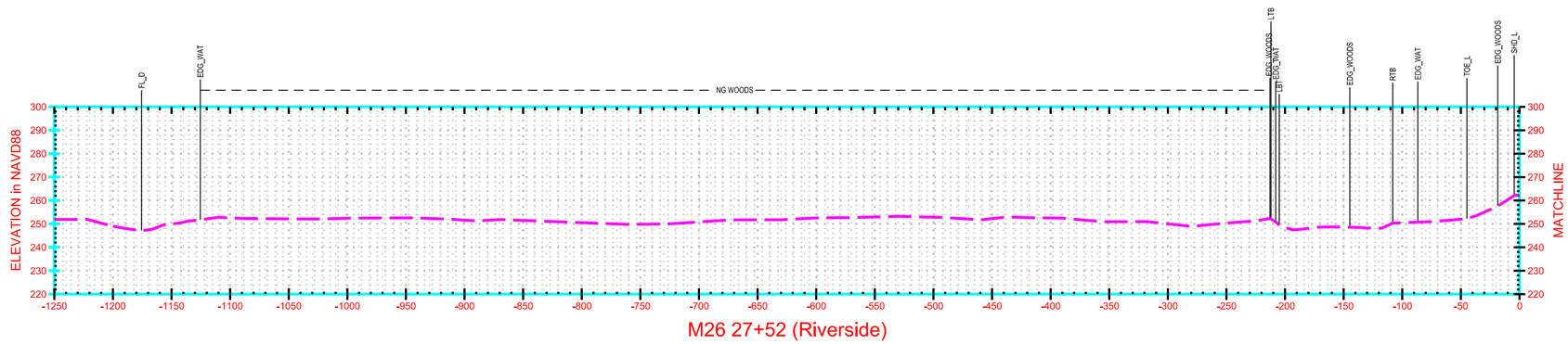
DESIGNED BY:
DWN BY: DEG
CKD BY: MOC
SUBMITTED BY: EMC, Inc.
PLOT SCALE: 1" = 60'
PLOT DATE: 01/14/2011
SIZE: ANSI D
FILE NAME: EMC10001009CXS.dgn
DATE: 01/14/2011
SOLICITATION NO.: W38XGR01724428
CONTRACT NO.: W912EQ-10-D-0014
FILE NUMBER:

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

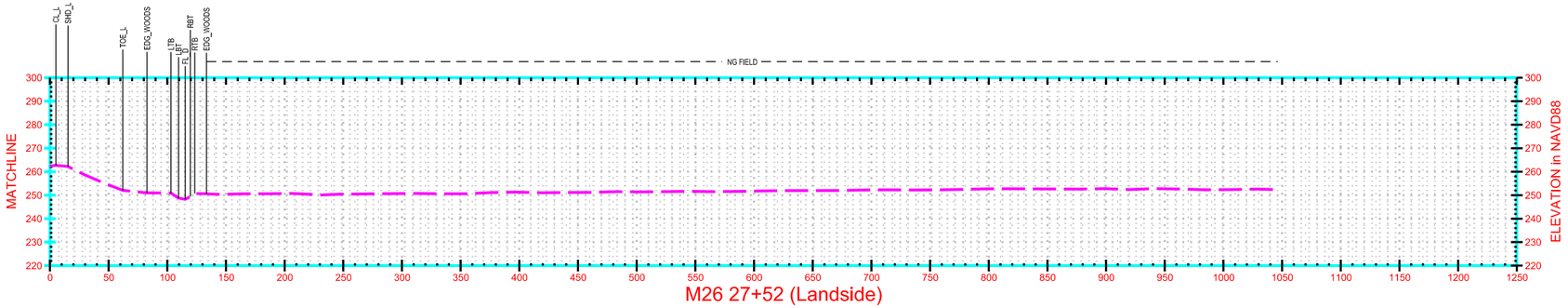
EMC
SURVEYING & MAPPING

MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Miles M26/12+54 to M26/17+52
CROSS SECTIONS
PLATE
DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
GEOTECHNICAL ENGINEERING BRANCH

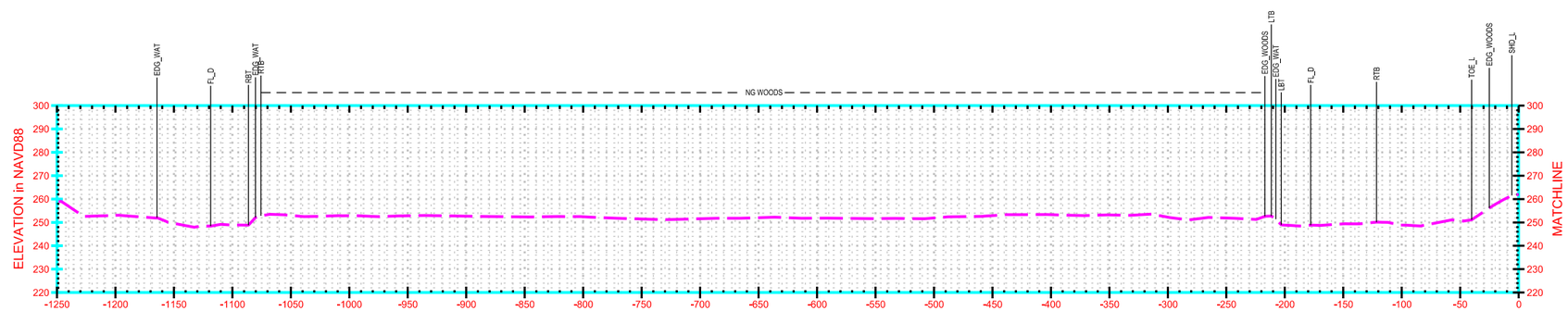
Sheet ID
50 OF 63



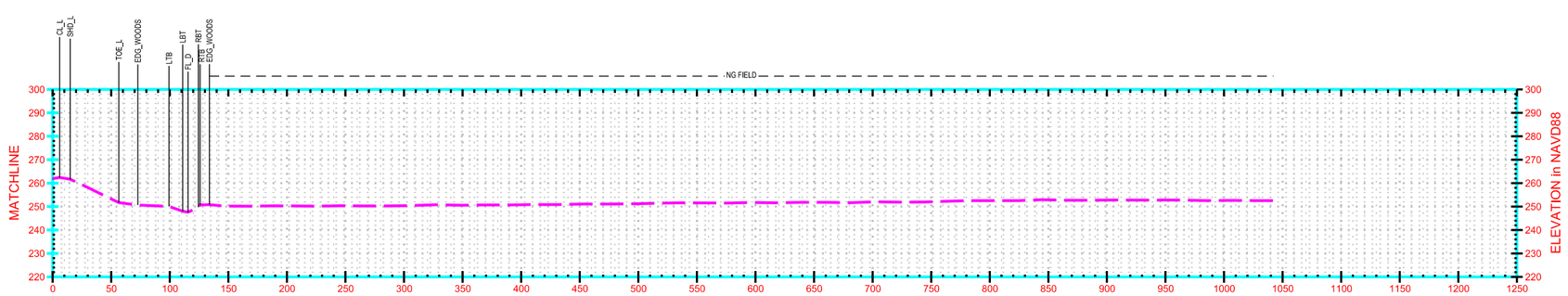
M26 27+52 (Riverside)



M26 27+52 (Landside)



M26 22+52 (Riverside)



M26 22+52 (Landside)

SURVEY NOTES:

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30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers®
Memphis District

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

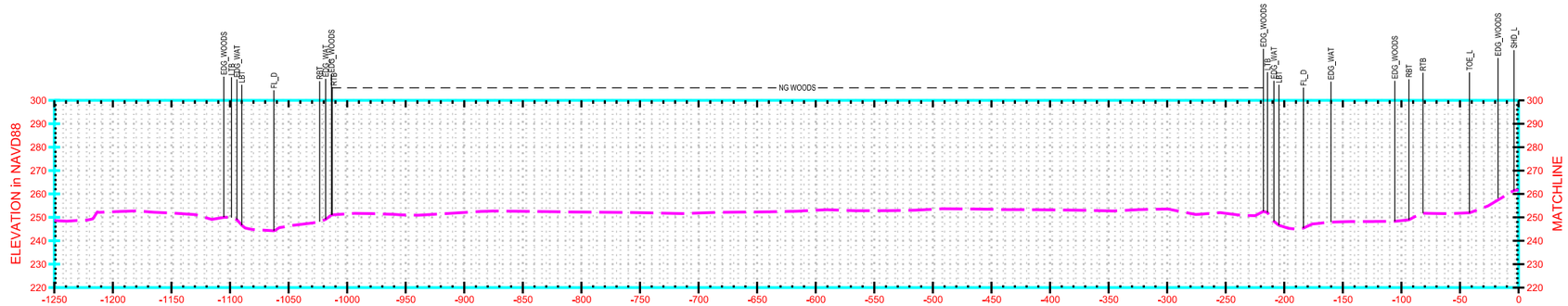
DESIGNED BY:
DWN BY: DEG
CKD BY: MOC
SUBMITTED BY: EMC, Inc.
PLOT SCALE: 1" = 60'
PLOT DATE: 01/14/2011
SIZE: ANSI D
FILE NAME: EMC10001009CXS.dgn
DATE: 01/14/2011
SOLICITATION NO.: W38XGR01724428
CONTRACT NO.: W912EQ-10-D-0014
FILE NUMBER:

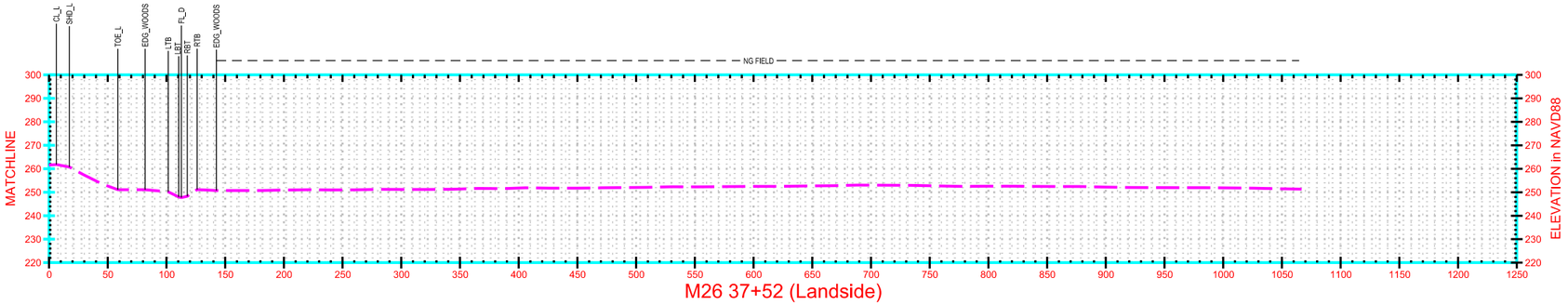
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

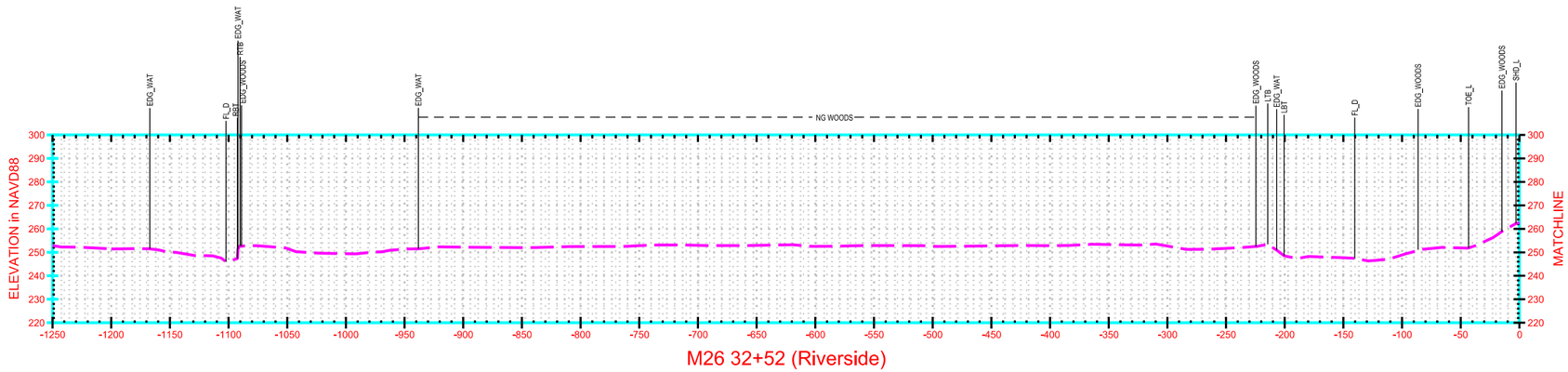
EMC
SURVEYING & MAPPING

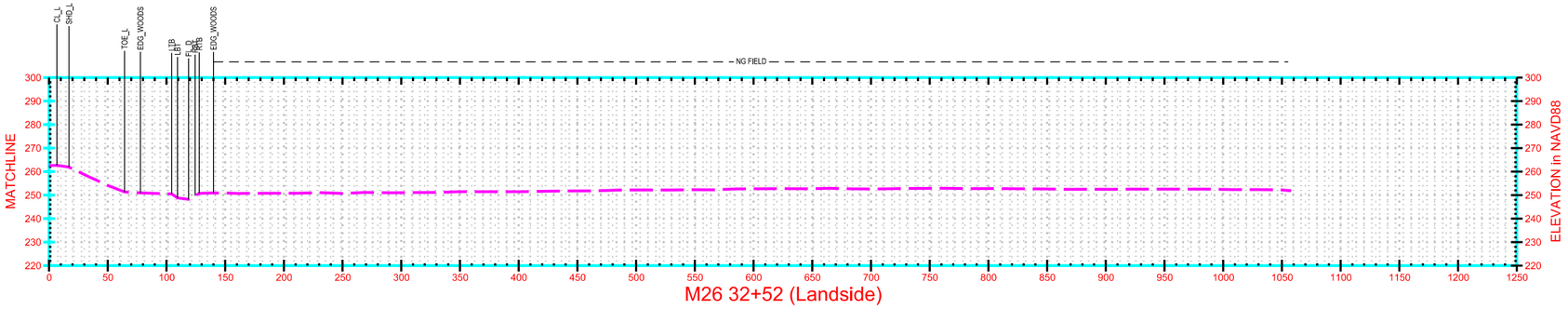
MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Miles M26/22+52 to M26/27+52
CROSS SECTIONS
PLATE
DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
GEOTECHNICAL ENGINEERING BRANCH

Sheet ID
51 OF 63









SURVEY NOTES:

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30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers®
Memphis District

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

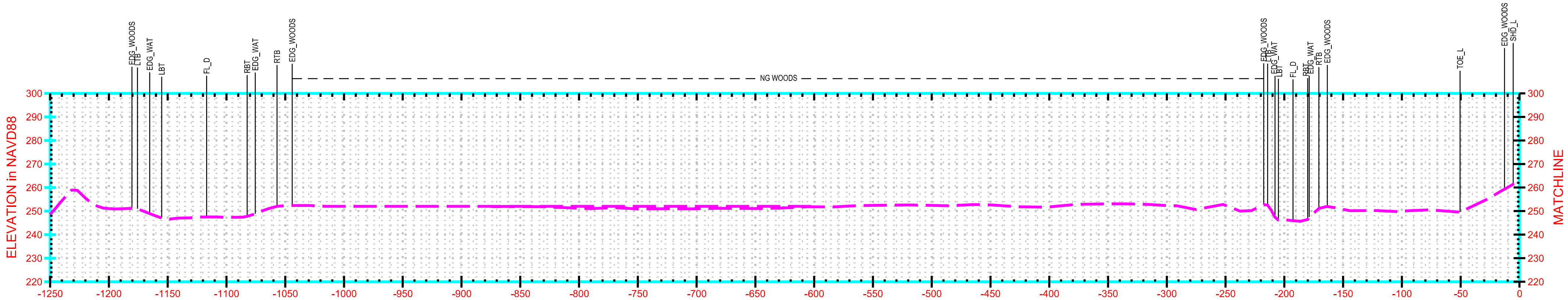
DESIGNED BY: | DATE: 01/14/2011
DWN BY: DEG | CKD BY: MCC | SOLICITATION NO.: W38XGR01724428
SUBMITTED BY: EMC, Inc. | CONTRACT NO.: W912EQ-10-D-0014
PLOT SCALE: 1" = 60' | PLOT DATE: 01/14/2011 | FILE NUMBER:
SIZE: ANSI D | FILE NAME: EMC10001009CXS.dgn

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

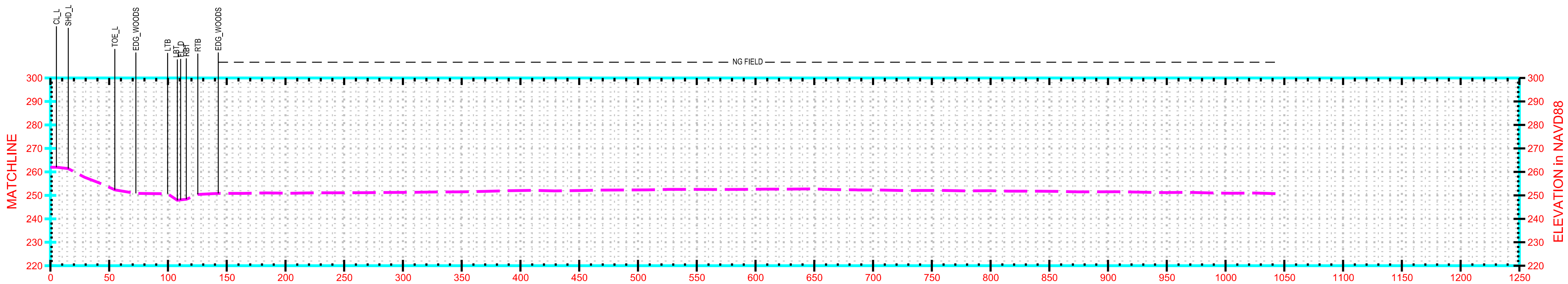
EMC SURVEYING & MAPPING

MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Miles M26/32+52 to M26/37+52
CROSS SECTIONS
PLATE
DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
GEOTECHNICAL ENGINEERING BRANCH

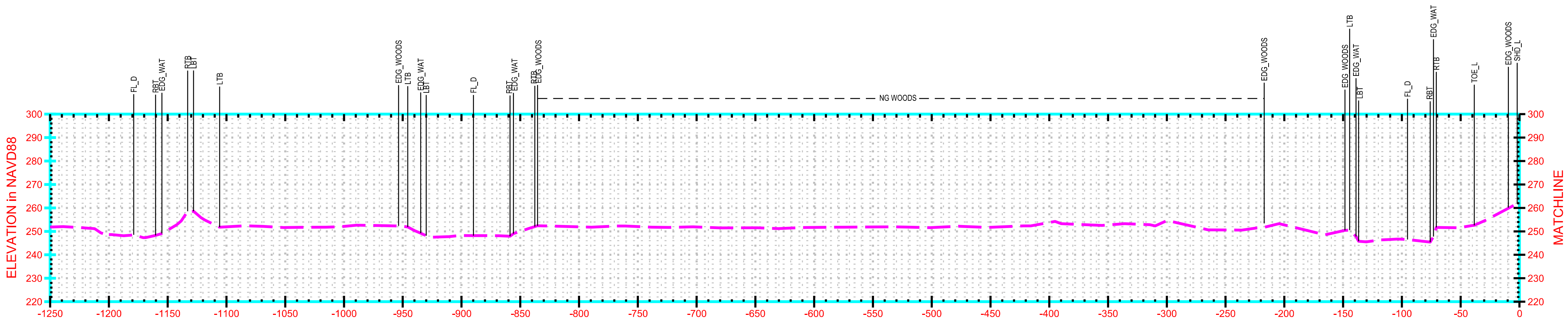
Sheet ID
52 OF 63



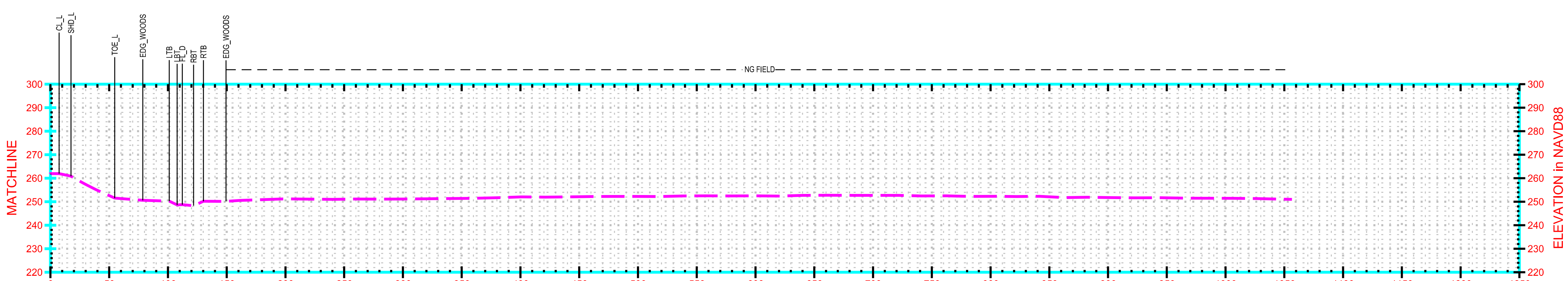
M26 47+52 (Riverside)



M26 47+52 (Landside)



M26 42+52 (Riverside)



M26 42+52 (Landside)

SURVEY NOTES:

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VERTICAL SCALE IS 1" = 30'

HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers® Memphis District

MARK	DESCRIPTION	DATE	APPR.

DESIGNED BY:
DATE: 01/14/2011
DWN BY: DEG
CKD BY: MOC
SOLICITATION NO.: W38XGR01724428
SUBMITTED BY: EMC, Inc.
CONTRACT NO.: W912EQ-10-D-0014
PLOT SCALE: 1" = 60'
PLOT DATE: 01/14/2011
FILE NUMBER:
SIZE: ANSI D
FILE NAME: EMC10001009CXS.dgn

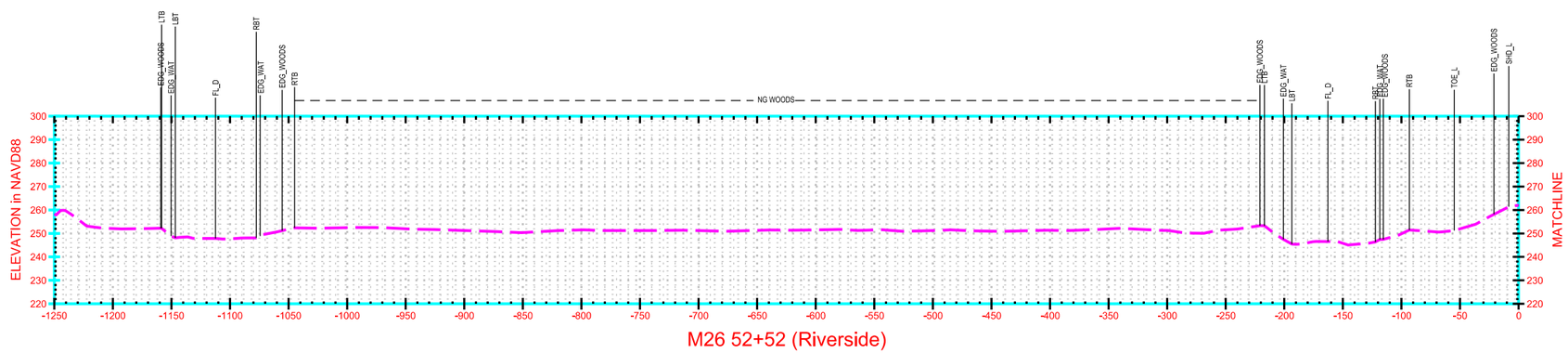
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

EMC SURVEYING & MAPPING

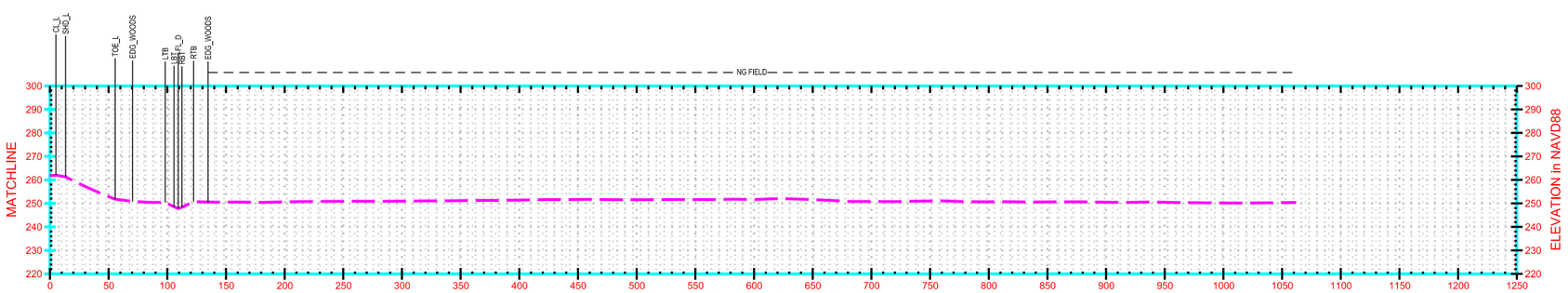
MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Miles M26/42+52 to M26/47+52
CROSS SECTIONS
PLATE

DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
GEOTECHNICAL ENGINEERING BRANCH

Sheet ID
53 OF 63



M26 52+52 (Riverside)



M26 52+52 (Landside)

SURVEY NOTES:

- ALL ELEVATIONS ARE REFERENCED TO NAVD 1988.
- PLANE COORDINATES ARE BASED ON NORTH AMERICAN DATUM OF 1893 (NAD 83) USING UTM ZONE 15 IN U.S. SURVEY FEET.

30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers®
Memphis District

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

DESIGNED BY:
DWN BY: DEG
CKD BY: MOC
SUBMITTED BY: EMC, Inc.
PLOT SCALE: 1" = 60'
PLOT DATE: 01/14/2011
SIZE: ANSI D
FILE NAME: EMC10001009CXS.dgn
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SOLICITATION NO.: W38XGR01724428
CONTRACT NO.: W912EQ-10-D-0014
FILE NUMBER:

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

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SURVEYING & MAPPING

MISSISSIPPI RIVER AND TRIBUTARIES
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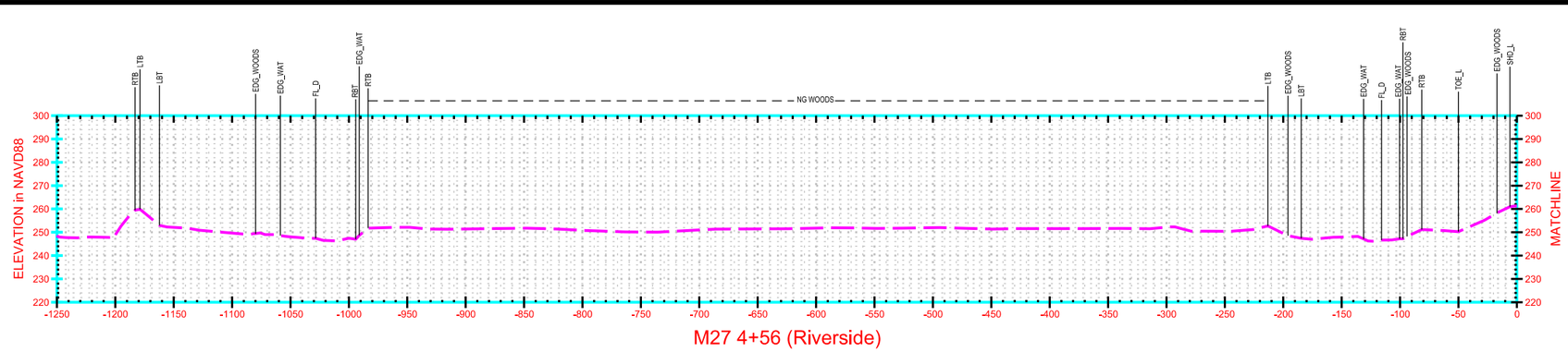
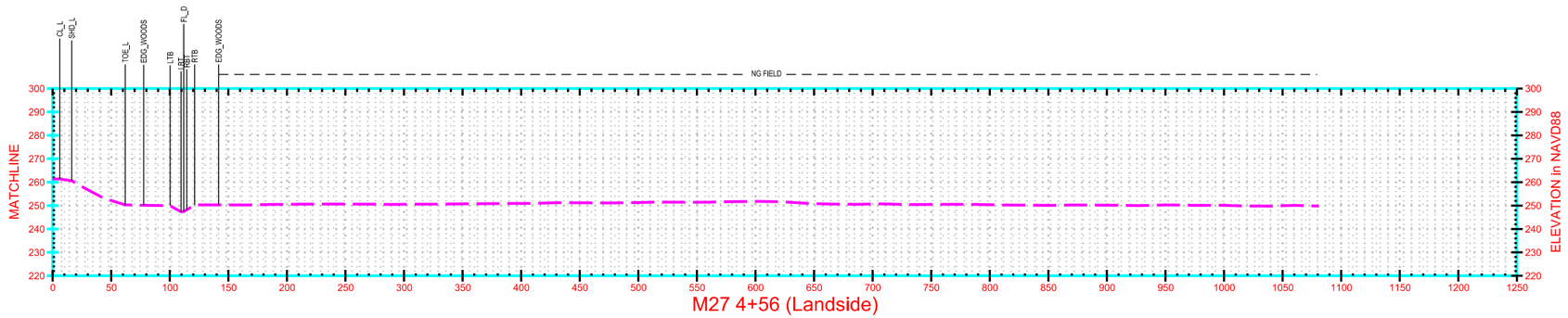
Levee Mile M26/52+52
CROSS SECTIONS
PLATE
DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
GEOTECHNICAL ENGINEERING BRANCH

Sheet ID
54 OF 63



M27 4+56 (Riverside)



M27 4+56 (Landside)

SURVEY NOTES:

- ALL ELEVATIONS ARE REFERENCED TO NAVD 1988.
- PLANE COORDINATES ARE BASED ON NORTH AMERICAN DATUM OF 1893 (NAD 83) USING UTM ZONE 15 IN U.S. SURVEY FEET.

30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers®
Memphis District

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

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MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

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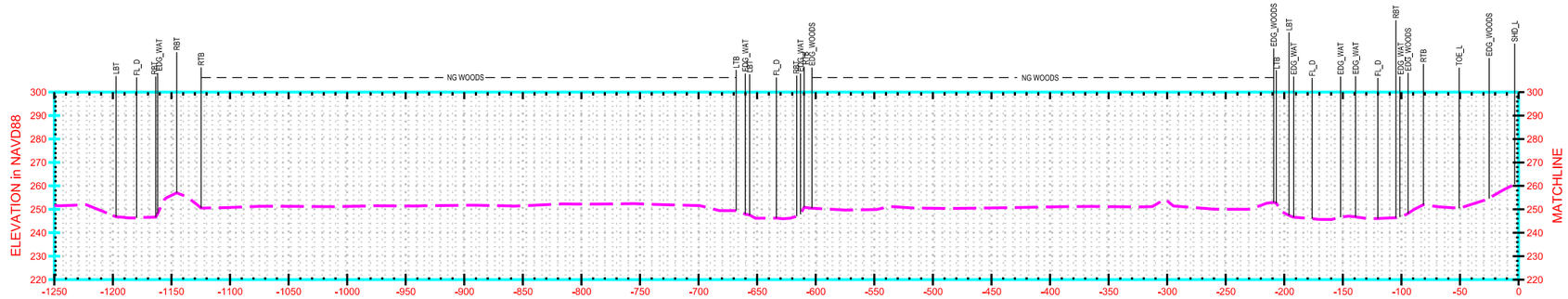
DESIGNED BY:
DWN BY: DEG
CKD BY: MCC
SUBMITTED BY: EMC, Inc.
PLOT SCALE: 1" = 60'
PLOT DATE: 01/14/2011
SIZE: ANSI D
FILE NAME: EMC10001010CXS.dgn
DATE: 01/14/2011
SOLICITATION NO.: W38XGR0172428
CONTRACT NO.: W912EQ-10-D-0014
FILE NUMBER:

MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Mile M27/4+56
CROSS SECTIONS
PLATE
DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
GEOTECHNICAL ENGINEERING BRANCH

Sheet ID
55 OF 63



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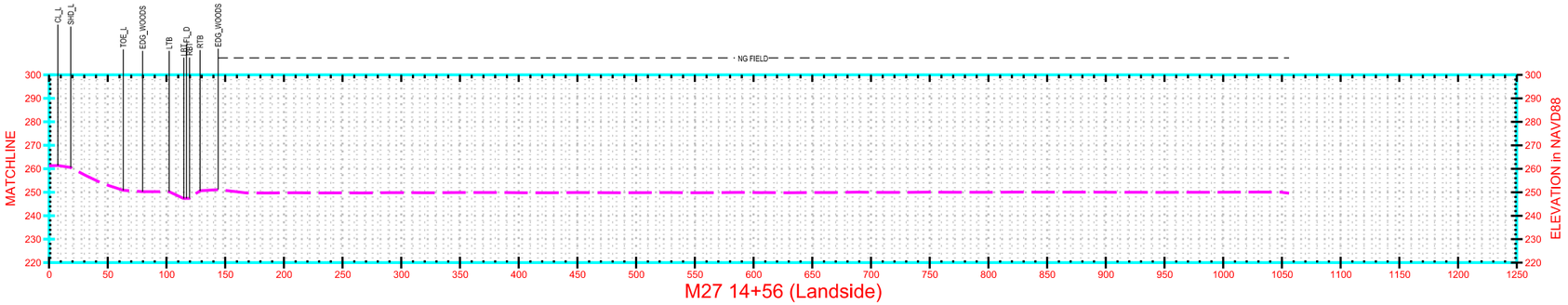
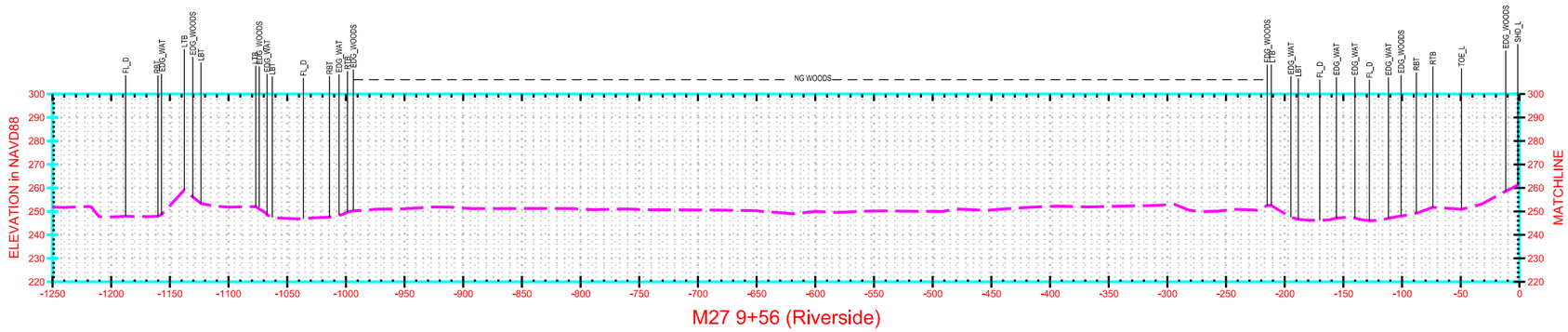
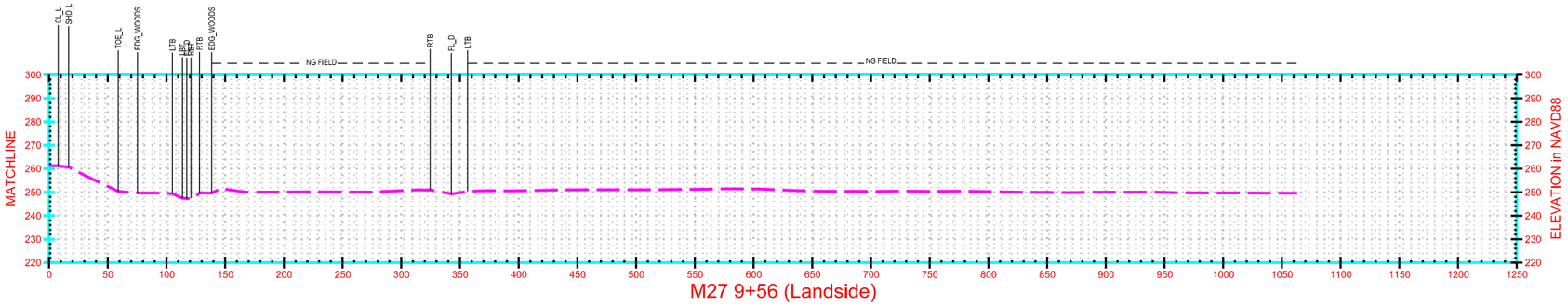


M27 14+56 (Landside)



M27 9+56 (Riverside)



M27 9+56 (Landside)

SURVEY NOTES:

- ALL ELEVATIONS ARE REFERENCED TO NAVD 1988.
- PLANE COORDINATES ARE BASED ON NORTH AMERICAN DATUM OF 1893 (NAD 83) USING UTM ZONE 15 IN U.S. SURVEY FEET.

30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

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MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

DESIGNED BY: | DATE: 01/14/2011
DWN BY: DEG | CKD BY: MCC | SOLICITATION NO.: W38XGR01724428
SUBMITTED BY: EMC, Inc. | CONTRACT NO.: W912EQ-10-D-0014
PLOT SCALE: 1" = 60' | PLOT DATE: 01/14/2011 | FILE NUMBER:
SIZE: ANSI D | FILE NAME: EMC10001010CXS.dgn

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

EMC SURVEYING & MAPPING

MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Miles M27/9+56 to M27/14+56
CROSS SECTIONS
PLATE
DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
GEOTECHNICAL ENGINEERING BRANCH

Sheet ID
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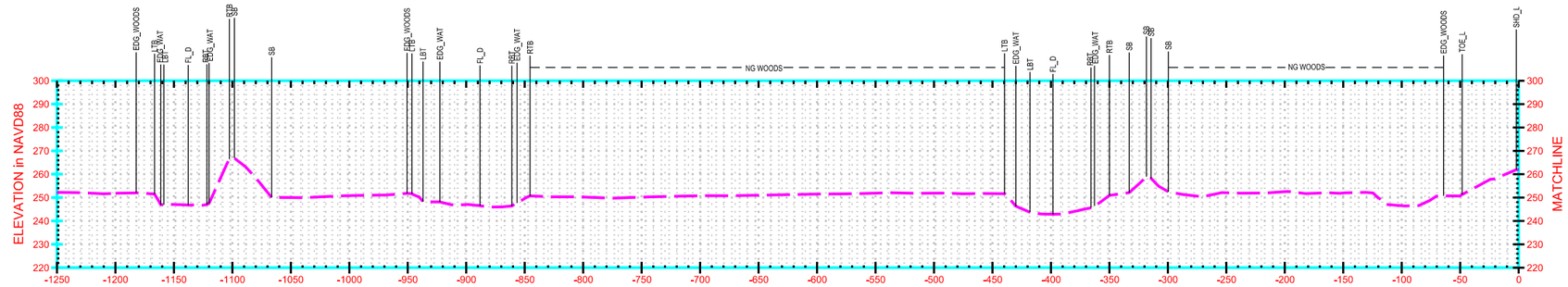
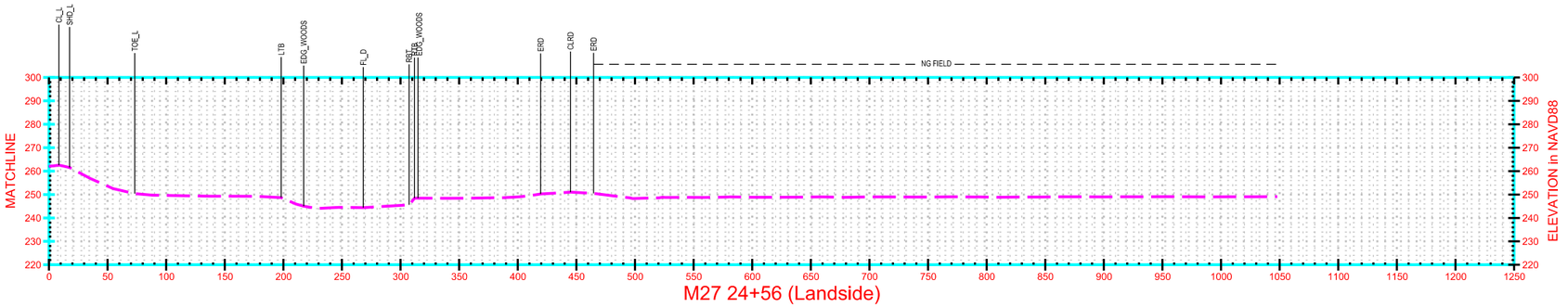


M27 24+56 (Riverside)



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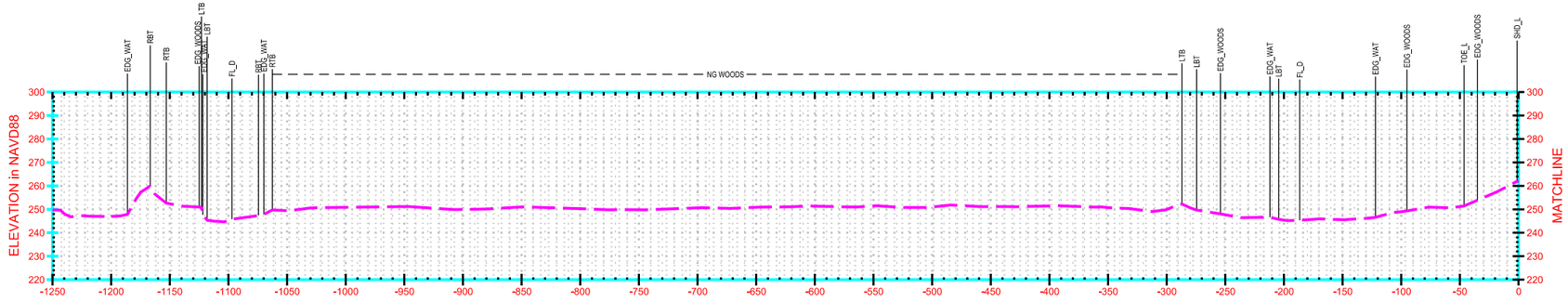
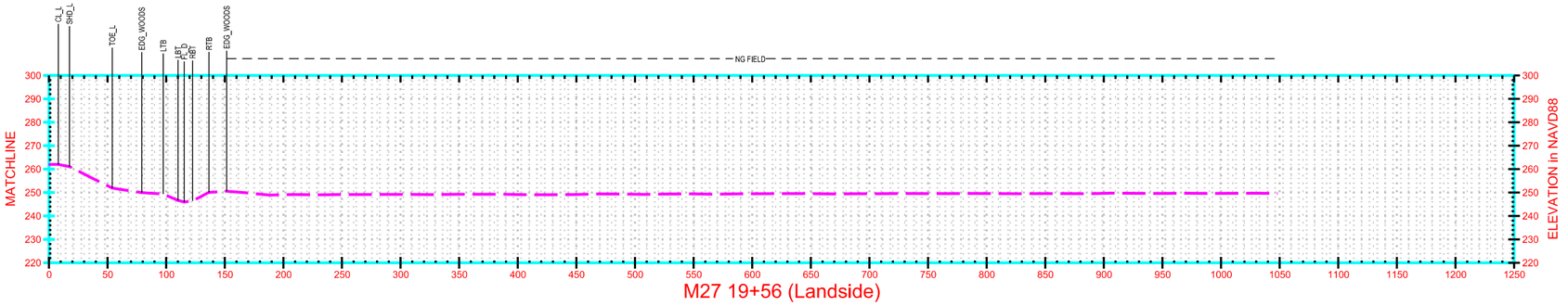


M27 19+56 (Riverside)



M27 19+56 (Landside)

SURVEY NOTES:

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30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers®
Memphis District

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

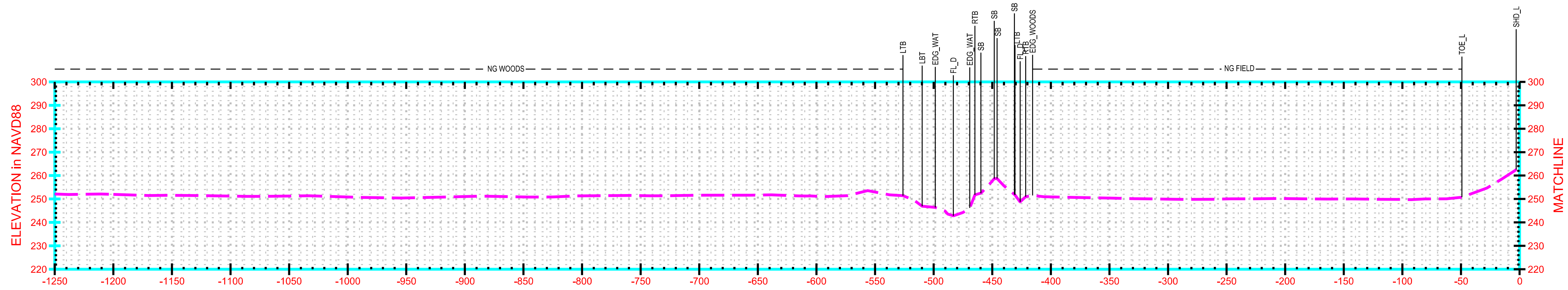
DESIGNED BY: | DATE: 01/14/2011
DWN BY: DEG | CKD BY: MOC | SOLICITATION NO.: W38XGR01724428
SUBMITTED BY: EMC, Inc. | CONTRACT NO.: W912EQ-10-D-0014
PLOT SCALE: 1" = 60' | PLOT DATE: 01/14/2011 | FILE NUMBER:
SIZE: ANSI D | FILE NAME: EMC10001010CXS.dgn

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

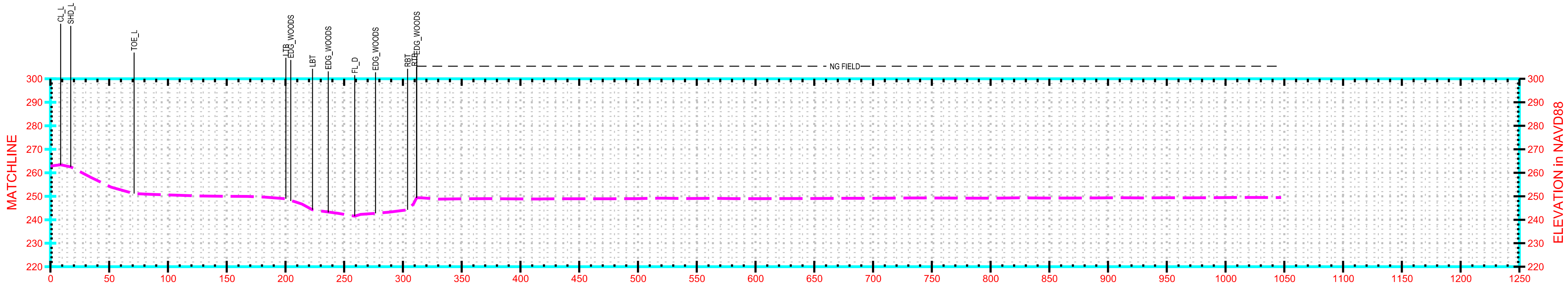
EMC SURVEYING & MAPPING

MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Miles M27/19+56 to M27/24+56
CROSS SECTIONS
PLATE
DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
GEOTECHNICAL ENGINEERING BRANCH

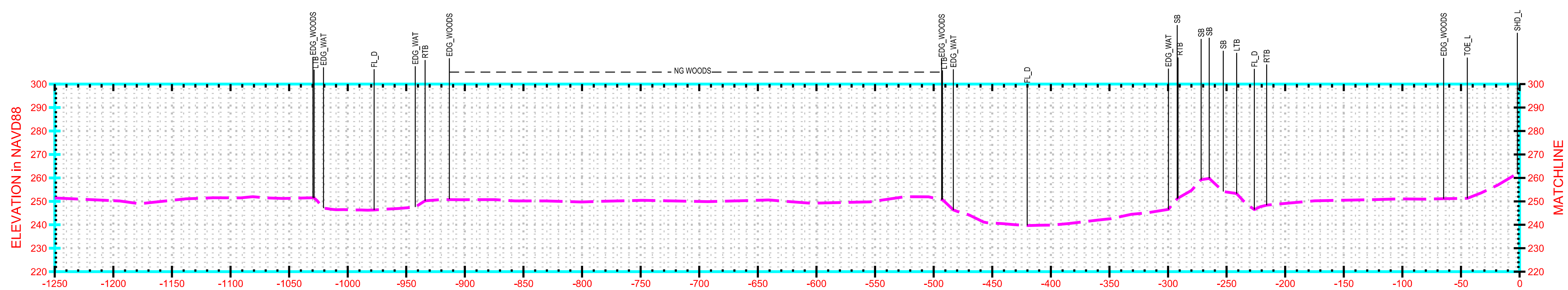
Sheet ID
57 OF 63



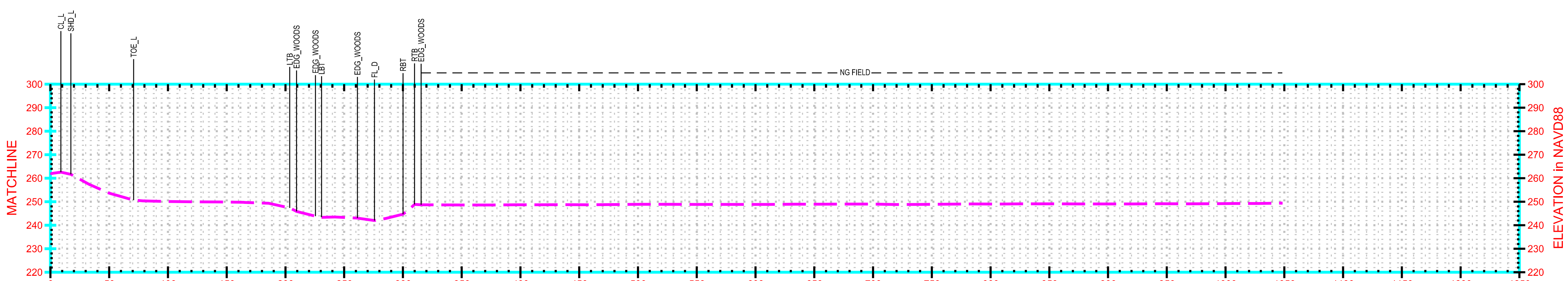
M27 34+56 (Riverside)



M27 34+56 (Landside)



M27 29+56 (Riverside)



M27 29+56 (Landside)

SURVEY NOTES:

- ALL ELEVATIONS ARE REFERENCED TO NAVD 1988.

- PLANE COORDINATES ARE BASED ON NORTH AMERICAN DATUM OF 1983 (NAD 83) USING UTM ZONE 15 IN U.S. SURVEY FEET.

VERTICAL SCALE IS 1" = 30'

HORIZONTAL SCALE IS 1" = 60'

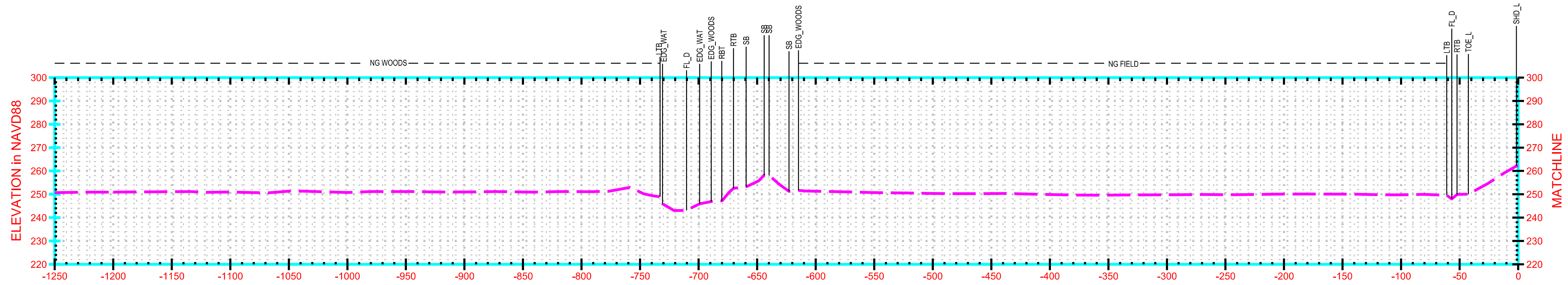
US Army Corps of Engineers
Memphis District

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

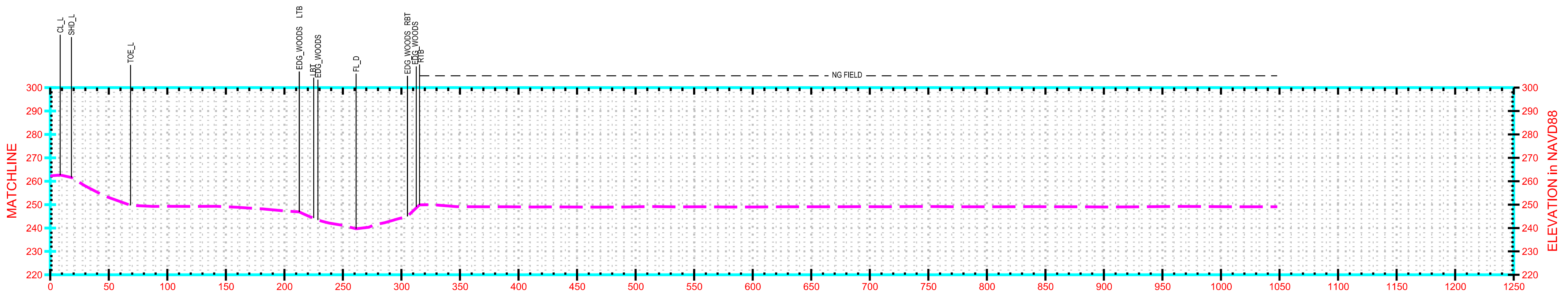
MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Miles M27/29+56 to M27/34+56
CROSS SECTIONS
PLATE

Sheet ID

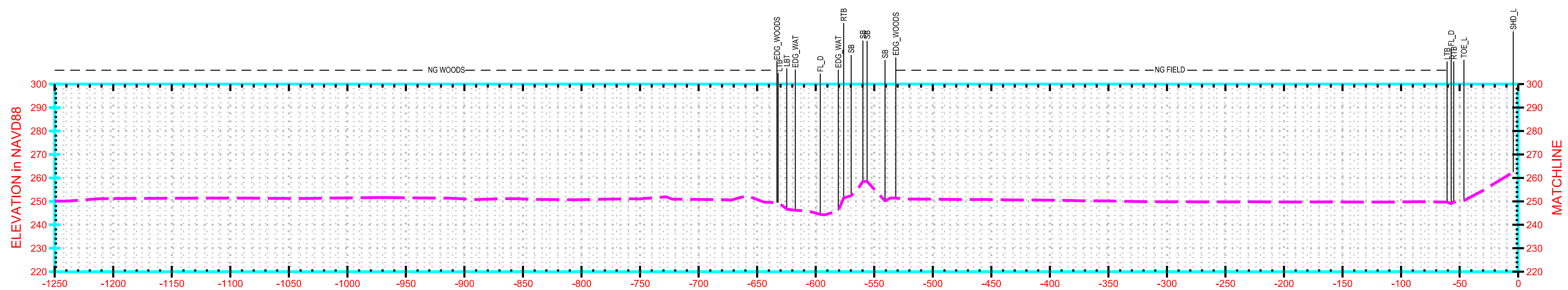
58 OF 63



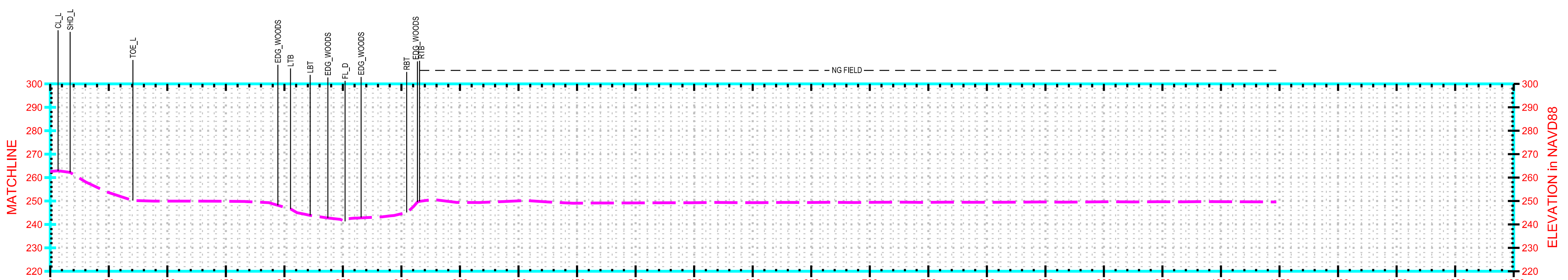
M27 44+56 (Riverside)



M27 44+56 (Landside)



M27 39+56 (Riverside)



M27 39+56 (Landside)

SURVEY NOTES:

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- PLANE COORDINATES ARE BASED ON NORTH AMERICAN DATUM OF 1893 (NAD 83) USING UTM ZONE 15 IN U.S. SURVEY FEET.

VERTICAL SCALE IS 1" = 30'

HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers®
Memphis District

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

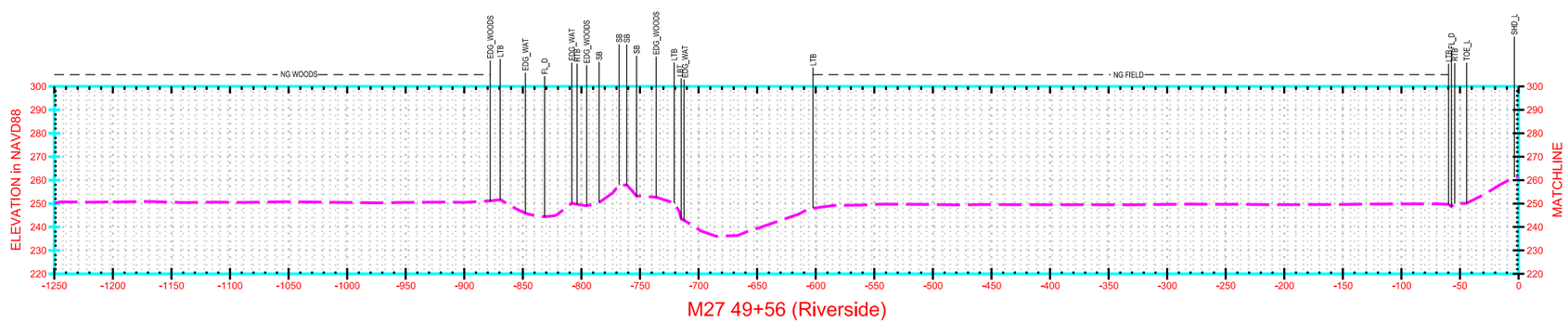
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

DESIGNED BY:
DATE: 01/14/2011
DWN BY: DEG
CKD BY: MOC
SOLICITATION NO.:
SUBMITTED BY: EMC, INC.
CONTRACT NO.: W912EQ-10-D-0014
PLOT SCALE: 1" = 60'
PLOT DATE: 01/14/2011
FILE NUMBER:
SIZE: ANSI D
FILE NAME: EMC10001010CXS.dgn

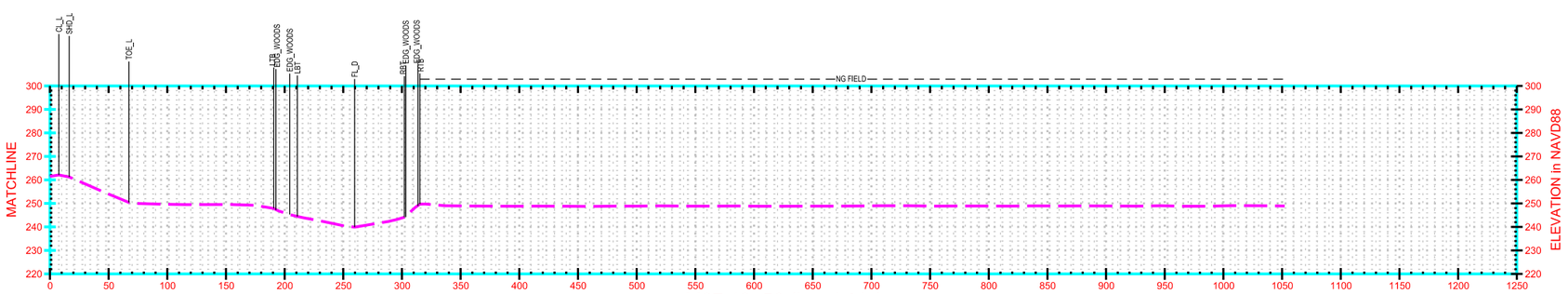
MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Miles M27/39+56 to M27/44+56
CROSS SECTIONS
PLATE

DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
GEOTECHNICAL ENGINEERING BRANCH

Sheet ID
59 OF 63



M27 49+56 (Riverside)



M27 49+56 (Landside)

SURVEY NOTES:

- ALL ELEVATIONS ARE REFERENCED TO NAVD 1988.
- PLANE COORDINATES ARE BASED ON NORTH AMERICAN DATUM OF 1893 (NAD 83) USING UTM ZONE 15 IN U.S. SURVEY FEET.

30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers®
Memphis District

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

DESIGNED BY: | DATE: 01/14/2011
DWN BY: DEG | CKD BY: MOC | SOLICITATION NO.: W38XGR01724428
SUBMITTED BY: EMC, Inc. | CONTRACT NO.: W912EQ-10-D-0014
PLOT SCALE: 1" = 60' | PLOT DATE: 01/14/2011 | FILE NUMBER:
SIZE: ANSI D | FILE NAME: EMC10001010CXS.dgn

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

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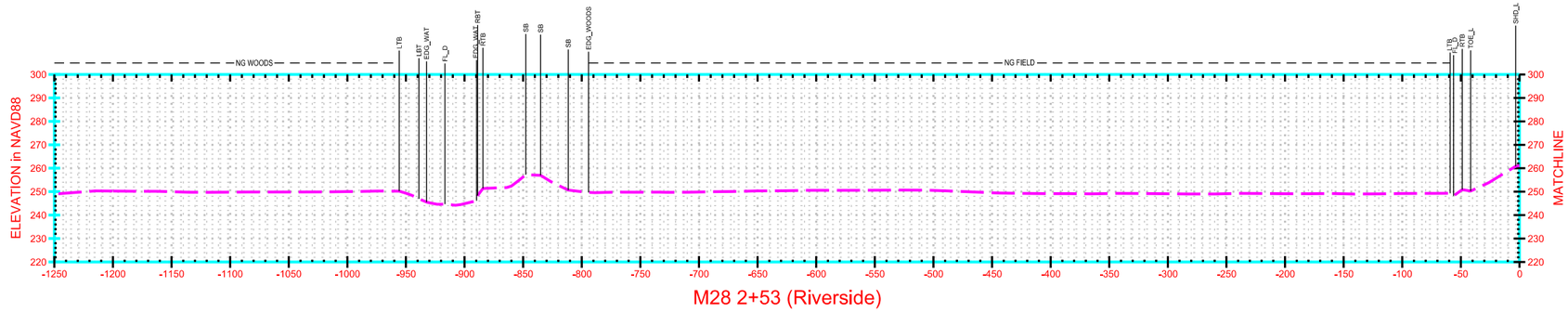
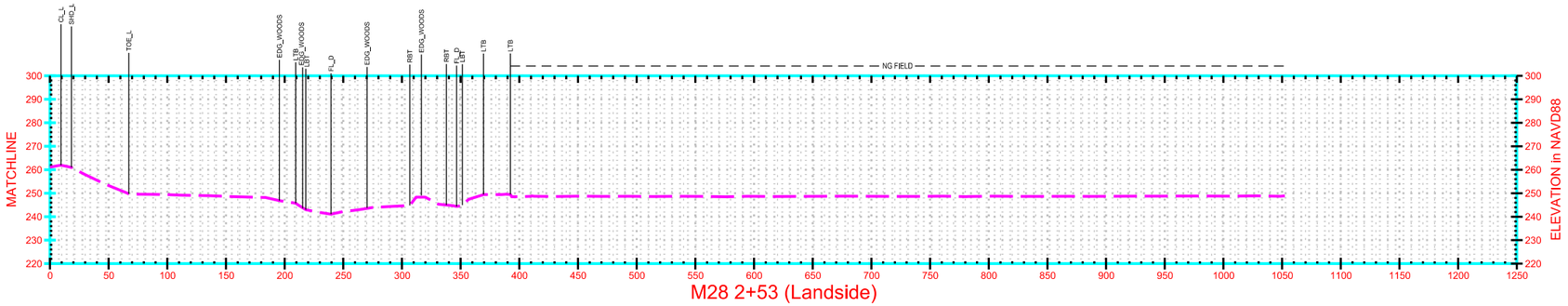
MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Mile M27/49+56
CROSS SECTIONS
PLATE
DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
GEOTECHNICAL ENGINEERING BRANCH

Sheet ID
60 OF 63



M28 2+53 (Riverside)



M28 2+53 (Landside)

SURVEY NOTES:

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- PLANE COORDINATES ARE BASED ON NORTH AMERICAN DATUM OF 1893 (NAD 83) USING UTM ZONE 15 IN U.S. SURVEY FEET.

30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers®
Memphis District

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

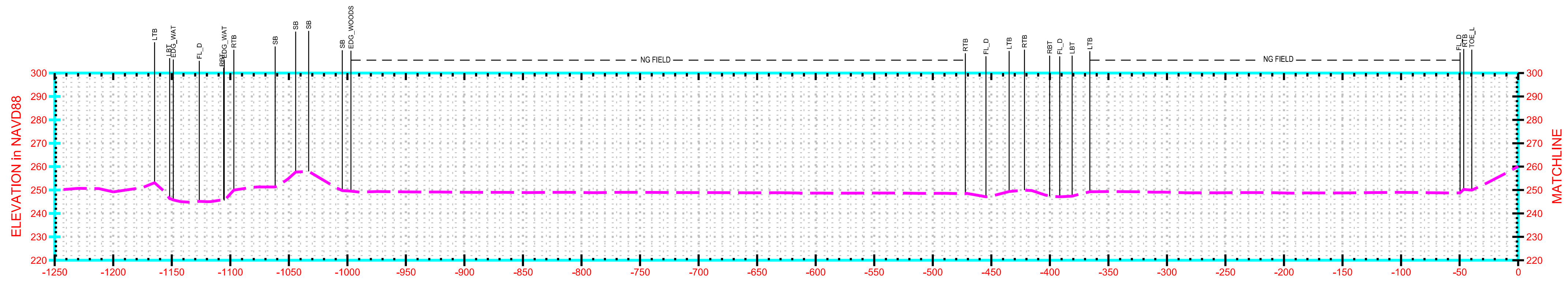
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

EMC SURVEYING & MAPPING

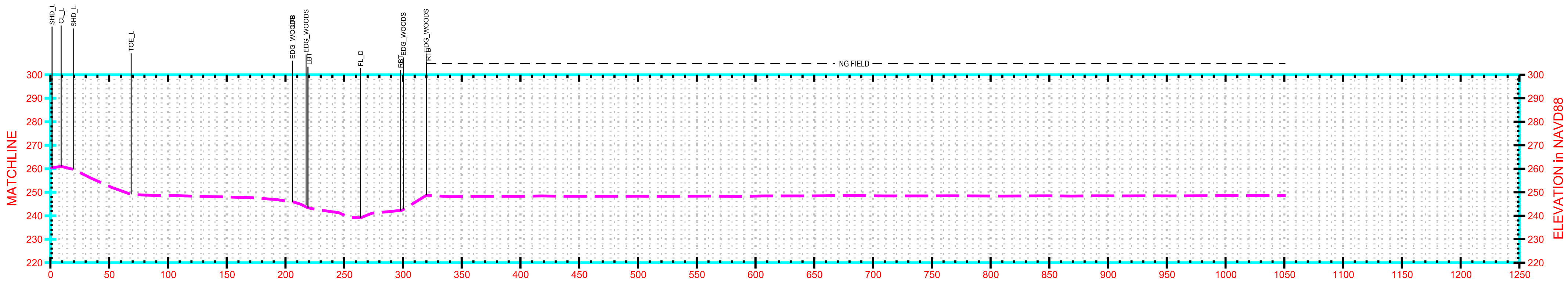
DESIGNED BY:
DWN BY: DEG
CKD BY: MCC
SUBMITTED BY: EMC, Inc.
PLOT SCALE: 1" = 60'
PLOT DATE: 01/14/2011
SIZE: ANSI D
FILE NAME: EMC10001011CXS.dgn
DATE: 01/14/2011
SOLICITATION NO.: W38XGR0172442B
CONTRACT NO.: W912EQ-10-D-0014
FILE NUMBER:

MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Mile M28/2+53
CROSS SECTIONS
PLATE
DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
GEOTECHNICAL ENGINEERING BRANCH

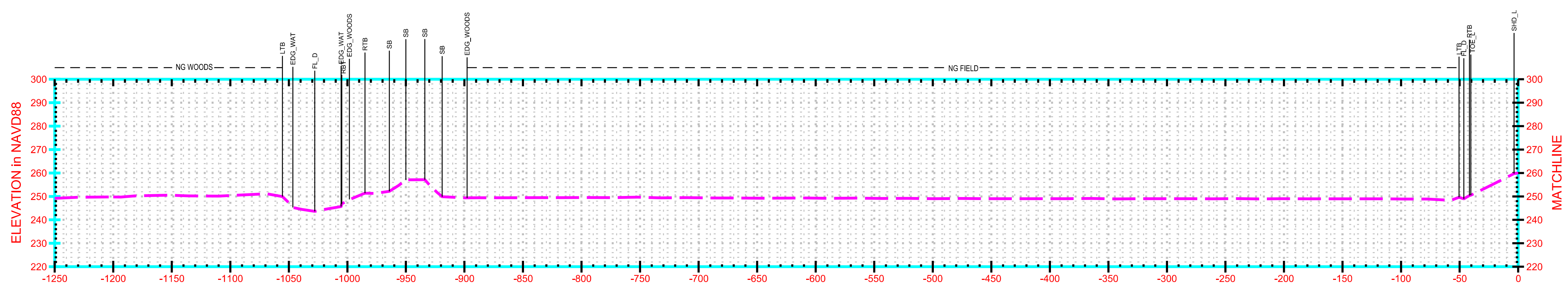
Sheet ID
61 OF 63



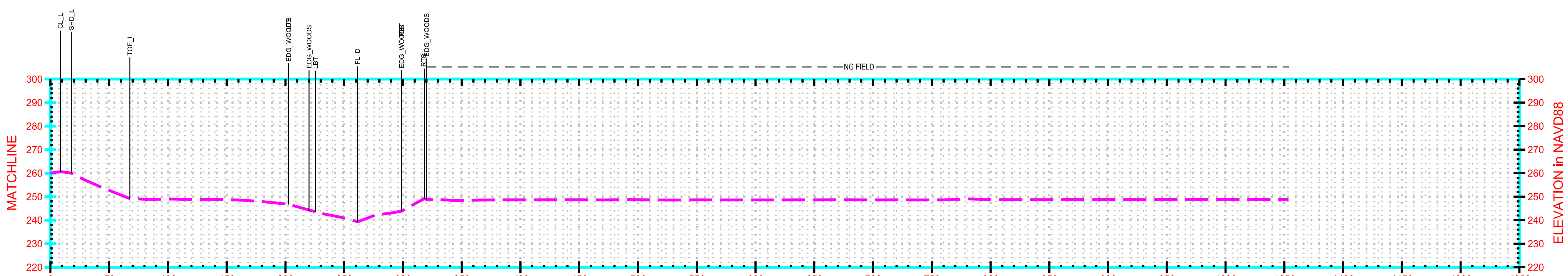
M28 12+53 (Riverside)



M28 12+53 (Landside)



M28 7+53 (Riverside)



M28 7+53 (Landside)

SURVEY NOTES:

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- PLANE COORDINATES ARE BASED ON NORTH AMERICAN DATUM OF 1893 (NAD 83) USING UTM ZONE 15 IN U.S. SURVEY FEET.

VERTICAL SCALE IS 1" = 30'

HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers®
Memphis District

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

DATE: 01/14/2011
SOLICITATION NO.: W38XGR01724428
CONTRACT NO.: W912EQ-10-D-0014
FILE NUMBER:
DESIGNED BY:
CKD BY: MOC
DWN BY: DEG
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PLOT DATE: 01/14/2011
PLOT SCALE: 1" = 60'
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SIZE: ANSI D

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

EMC SURVEYING & MAPPING
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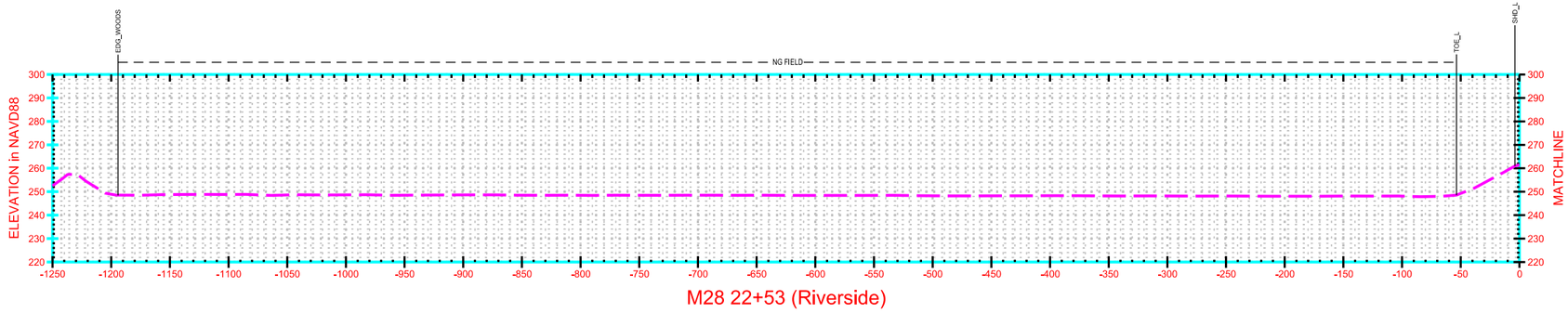
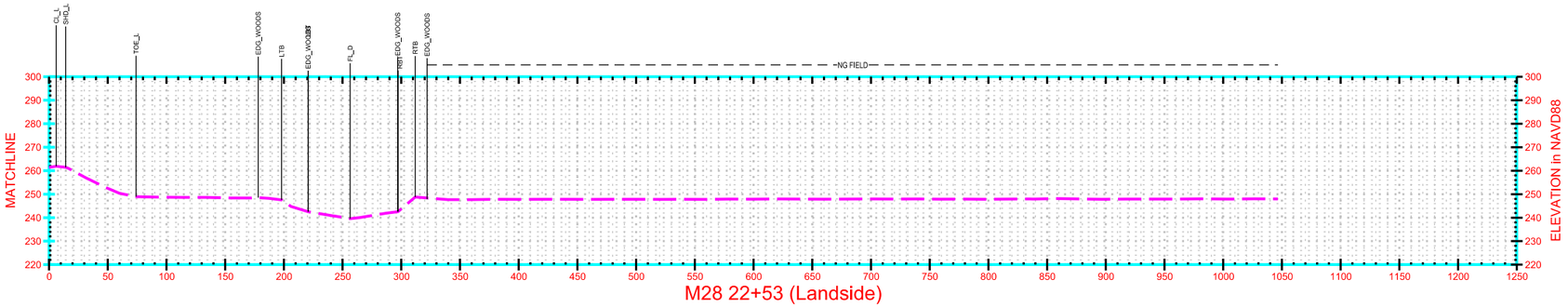
MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Miles M28/7+53 to M28/12+53
CROSS SECTIONS
PLATE
DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
GEOTECHNICAL ENGINEERING BRANCH

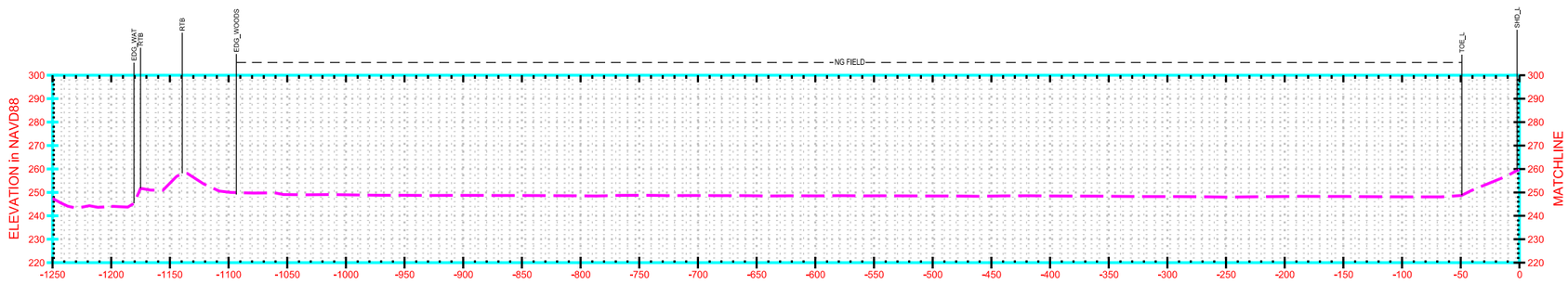
Sheet ID
62 OF 63



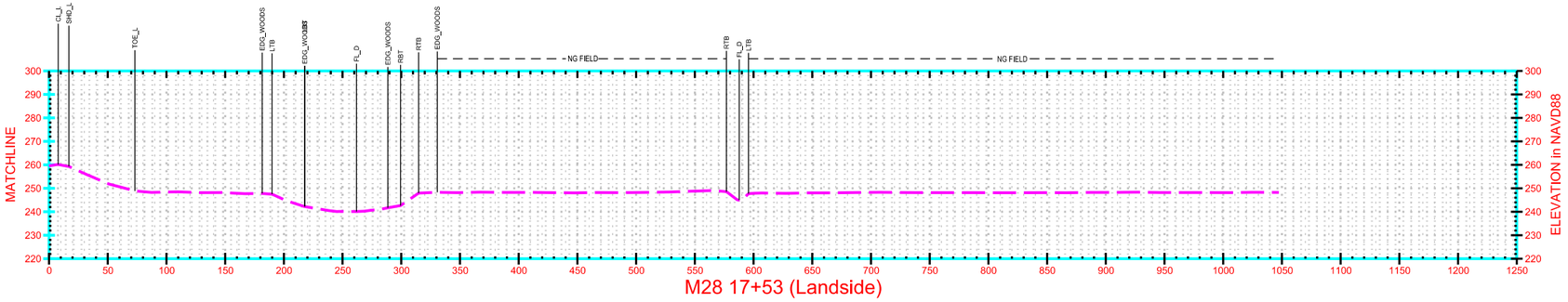
M28 22+53 (Riverside)



M28 22+53 (Landside)



M28 17+53 (Riverside)



M28 17+53 (Landside)

SURVEY NOTES:

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- PLANE COORDINATES ARE BASED ON NORTH AMERICAN DATUM OF 1893 (NAD 83) USING UTM ZONE 15 IN U.S. SURVEY FEET.

30 15 0 30
VERTICAL SCALE IS 1" = 30'

60 30 0 60
HORIZONTAL SCALE IS 1" = 60'

US Army Corps of Engineers®
Memphis District

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

DESIGNED BY:
DWN BY: DEG
CKD BY: MOC
SUBMITTED BY: EMC, Inc.
PLOT SCALE: 1" = 60'
PLOT DATE: 01/14/2011
SIZE: ANSI D
FILE NAME: EMC10001011CXS.dgn
DATE: 01/14/2011
SOLICITATION NO.: W38XGR01724428
CONTRACT NO.: W912EQ-10-D-0014
FILE NUMBER:

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

EMC
SURVEYING & MAPPING

MISSISSIPPI RIVER AND TRIBUTARIES
ST. FRANCIS WEST BANK SEEPAGE STUDY
Levee Miles M28/17+53 to M28/22+53
CROSS SECTIONS
PLATE
DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
GEOTECHNICAL ENGINEERING BRANCH

Sheet ID
63 OF 63

Appendix E

Below Piggott Seepage Study - General Seepage Evaluation, Seepage Berm Design, Existing Ditch Evaluations, and Preliminary New Ditch Evaluations

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm															
	From =>	17 / 1400	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)	(ft)	(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	250	250	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)		(gpm/ft)
1	17 / 1650	17 / 1900	1	1	sp	sp	70	i		700	105	8.58	8.58	0.00639	0.00639	250	250	355	272.3	267	267	5.3	5.5	ml	4.38	1200	175	0.0019478	i		510	510	5.5	3.12	0.57	1.891
	No New Ditch													X_1 Controlling:		RS Blanket										0.23622						γ_{avg}	FoS		
														250	320	250	320															115	1.48		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm															
	From =>	17 / 1900	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)	(ft)	(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	620	650	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)		(gpm/ft)
2	17 / 2150	17 / 2400	7	6	cl	cl	75	i		650	115	0.53	0.59	0.000598	0.000682	620	550	665	272.1	265.5	265.5	6.6	8	sm	8.03	1200	175	0.0021860	i		460	460	8	2.70	0.34	1.811
	No New Ditch													X_1 Controlling:		RS Blanket										0.23622						γ_{avg}	FoS		
														620	690	1300	1375															115	2.50		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm															
	From =>	17 / 2400	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)	(ft)	(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	240	300	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)		(gpm/ft)
3	17 / 2650	17 / 2900	2	1	sm	sp	80	i		400	115	6.00	8.58	0.00378	0.00639	240	240	355	272.0	265.5	265.5	6.5	4.5	cl	3.68	1200	175	0.0019736	i		510	510	4.5	3.83	0.85	2.320
	No Ditch													X_1 Controlling:		RS Blanket										0.23622						γ_{avg}	FoS		
														240	330	300	330															115	0.99		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm															
	From =>	17 / 2900	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)	(ft)	(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	330	330	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)		(gpm/ft)
4	17 / 3150	17 / 3400	3	1	cl	sp	80	i		450	110	0.79	8.58	0.001117	0.00639	330	330	440	271.9	265	265	6.9	3.5	sm	9.56	1200	175	0.0036065	i		280	280	3.5	2.68	0.77	2.958
	No Ditch													X_1 Controlling:		Pit										0.23622						γ_{avg}	FoS		
														420	330	600	330															115	1.10		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm															
	From =>	17 / 3400	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)	(ft)	(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	350	350	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)		(gpm/ft)
5	17 / 3650	17 / 3900	3.7	1	cl	sp	100	i		500	110	0.74	8.58	0.000974	0.00639	350	350	460	271.7	266	266	5.7	4	cl	3.80	1200	175	0.0021278	i		470	470	5	2.88	0.58	1.892
	No Ditch													X_1 Controlling:		Pit										0.23622						γ_{avg}	FoS		
														460	350	600	350															115	1.46		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm															
	From =>	17 / 3900	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)	(ft)	(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	330	300	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)		(gpm/ft)
6	17 / 4150	17 / 4400	3.5	2.5	sm	sm	30	i		600	125	4.50	5.35	0.002474	0.003192	330	330	455	271.6	266	266	5.6	5.5	sm	8.82	1200	175	0.0027636	i		360	360	5.5	2.47	0.45	2.121
	No Ditch													X_1 Controlling:		Pit										0.23622						γ_{avg}	FoS		
														360	330	300	330															115	1.87		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm															
	From =>	17 / 4400	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)	(ft)	(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	350	300	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)		(gpm/ft)
7	17 / 4650	17 / 4900	4	1	ml	sp	100	i		650	105	1.88	8.58	0.001495	0.00639	350	350	455	271.5	264.5	264.5	7.0	3	ml	5.09	1200	175	0.0028424	i		350	350	3	3.04	1.01	2.684
	No Ditch													X_1 Controlling:		Pit										0.23622						γ_{avg}	FoS		2.519
														500	350	400	350															115	0.83		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm															
	From =>	17 / 4900	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)	(ft)	(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	330	330	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)		(gpm/ft)
8	17 / 5150	17 / 5488	1.8	1	cl	sp	80	i		650	110	0.87	8.58	0.001517	0.00639	330	330	440	271.4	265	265	6.4	4	ml	4.80	1200	175	0.0023892	i		420	420	4	3.13	0.78	2.297
	Ditch 1													X_1 Controlling:		Pit										0.23622						γ_{avg}	FoS		
														500	330	600	330															115	1.08		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm															
	From =>	18 / 0	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)	(ft)	(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	450	575	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)		(gpm/ft)
9	18 / 125	18 / 250	7	1	cl	cl	50	i		575	110	0.53	0.93	0.000583	0.002046	450	450	560	271.3	265	265	6.3	3.5	sm	9.56	1250	177	0.0035136	i		280	280	3.5	2.10	0.60	2.439
	Ditch 1													X_1 Controlling:		Pit										0.24606						γ_{avg}	FoS		
														550	450	1300	650															115	1.40		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm															
	From =>	18 / 250	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)	(ft)	(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	520	550	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)		(gpm/ft)
10	18 / 500	18 / 750	5.5	5.2	cl	cl	155	i		550	105	0.62	0.64	0.000712	0.000744	520	520	625	271.2	265	265	6.2	3	sm	9.75	1250	177	0.0038331	i		260	260	3	1.82	0.61	2.279
	Ditch 1													X_1 Controlling:		RS Blanket										0.24606						γ_{avg}	FoS		
														520	680	1300	1455															115	1.39		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm															
	From =>	18 / 750	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)	(ft)	(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	260	350	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)		(gpm/ft)
11	18 / 1000	18 / 1250	4.5	1.5	ml	sm	50	i		550	105	1.81	6.96	0.001387	0.004714	260	260	365	271.0	264	264	7.0	7.5	sm	8.17	1250	167	0.0022848	i		440	440	7.5	3.83	0.51	2.668
	Ditch 1													X_1 Controlling:		Pit										0.24606						γ_{avg}	FoS		
														460	260	400	350															115	1.65		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm															
	From =>	18 / 1250	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)	(ft)	(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	530	550	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)		(gpm/ft)
12	18 / 1500	18 / 1750	7	4	cl	cl	50	i		550	105	0.53	0.72	0.0006	0.000926	530	530	635	270.9	263	263	7.9	5.5	cl	3.44	1250	167	0.0017310	i		580	580	5.5	3.77	0.69	1.995
	Ditch 1													X_1 Controlling:		RS Blanket										0.24606						γ_{avg}	FoS		
														530	560	1300	650															115	1.23		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm															
	From =>	18 / 1750	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)	(ft)	(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	350	350	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)		(gpm/ft)
13	18 / 2000	18 / 2250	7.5	2.5	sm	sm	50	i		570	110	3.04	5.35	0.001393	0.003201	350	350	460	270.7	263	263	7.7	3.5	sm	9.56	1250	167	0.0036173	i		280	280	3.5	2.91	0.83	3.193
	Ditch 1													X_1 Controlling:		Pit										0.24606						γ_{avg}	FoS		
														470	350	600	350															115	1.01		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm															
	From =>	18 / 2250	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)	(ft)	(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	480	550	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)		(gpm/ft)
14	18 / 2500	18 / 2750	5.5	5.5	ml	ml	0	i		550	110	1.67	1.67	0.001196	0.001196	480	480	590	270.6	263.5	263.5	7.1	6.5	sm	8.48	1250	170	0.0024783	i		400	400	6.5	2.87	0.44	2.240
	Ditch 1													X_1 Controlling:		RS Blanket										0.24606						γ_{avg}	FoS		
														480	480	800	800															115	1.91		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm															
	From =>	18 / 2750	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)	(ft)	(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	470	600	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)		(gpm/ft)
15	18 / 3000	18 / 3250	5.5	5.5	sm	sm	0	i		650	110	3.56	3.56	0.001746	0.001746	470	470	580	270.4	263	263	7.4	4	sm	9.37	1250	170	0.0033201	i		300	300	4	2.52	0.63	2.627
	Ditch 1													X_1 Controlling:		RS Blanket										0.24606						γ_{avg}	FoS		
														470	470	600	600															115	1.34		

Below Piggott Seepage Study - General Seepage Evaluation, Seepage Berm Design, Existing Ditch Evaluations, and Preliminary New Ditch Evaluations

Section 1

Section	Levee Station/Mile Central	From =>	To	Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$	
1	17 / 1650	17 / 1400	17 / 1900					0.50					
												Bligh's CR 101	

Low Points of Interest on Existing Landside X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
180	0.1	2.20	76.01	22.01	49.01	0.80	NG	NG	NG

Minimum Required Berm Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	65	9.301	2.8	0.51	3.2	0.30	1.2
Check:	OK			0.52			

Recommended Berm Design X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	
100	4.0	2.7	3.3	0.49	OK	-0.08	OK
		Width	Thickness				
Alt Rec'd?	yes	100	4				

X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
180	0.10	2.30	76.99	22.99	49.99	0.80	NG	NG	NG

Section 2

Section	Levee Station/Mile Central	From =>	To	Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$	
2	17 / 2150	17 / 1900	17 / 2400					0.50					
												Bligh's CR 128	

Low Points of Interest on Existing Landside X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
180	3.0	1.82	2.27	0.61	1.44	0.80	NG	OK	NG
2000	3.0	0.03	1.68	0.01	0.84	0.80	NG	OK	NG

Minimum Required Berm Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	0						
Check:	NA						

Recommended Berm Design X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	*
150	5.0	2.3	3.1	0.28	OK	-0.15	OK
No Berm Req		Width	Thickness				
Install Anyway?	yes	150	5				

X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
180	3.00	2.08	2.36	0.69	1.53	0.80	NG	OK	NG
2000	3.00	0.04	1.68	0.01	0.85	0.80	NG	OK	NG

Section 3

Section	Levee Station/Mile Central	From =>	To	Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$	
3	17 / 2650	17 / 2400	17 / 2900					0.50					

Low Points of Interest on Existing Landside X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL

Minimum Required Berm Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	120	8.983	3.1	0.70	3.9	0.30	2.0
Check:	OK			0.70			

Recommended Berm Design X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	
150	5.0	3.1	4.1	0.69	OK	-0.10	OK
Alt Rec'd?	no						

X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL

Section 4

Section	Levee Station/Mile Central	From =>	To	Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$	
4	17 / 3150	17 / 2900	17 / 3400					0.50					

Low Points of Interest on Existing Landside X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL

Minimum Required Berm Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	90	13.071	2.1	0.59	2.8	0.30	1.4
Check:	OK			0.60			

Recommended Berm Design X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	
150	5.0	2.0	3.2	0.57	OK	-0.21	OK
Alt Rec'd?	no						

X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL

Section 5

Section	Levee Station/Mile Central	From =>	To	Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$	
5	17 / 3650	17 / 3400	17 / 3900					0.50					

Low Points of Interest on Existing Landside X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL

Minimum Required Berm Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	65	10.641	2.6	0.51	2.9	0.30	1.1
Check:	OK			0.52			

Recommended Berm Design X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	
150	5.0	2.3	3.2	0.47	OK	-0.18	OK
Alt Rec'd?	no						

X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL

Section 6

Section	Levee Station/Mile Central	From =>	To	Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$	
6	17 / 4150	17 / 3900	17 / 4400					0.50					

Low Points of Interest on Existing Landside X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL

Minimum Required Berm Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	0						
Check:	NA						

Recommended Berm Design X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	*
150	5.0	2.0	2.9	0.36	OK	-0.20	OK
No Berm Req		Width	Thickness				
Install Anyway?	yes	150	5				

X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL

Section 7

Section	Levee Station/Mile Central	From =>	To	Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$	
7	17 / 4650	17 / 4400	17 / 4900	100	2.5	3.25	0.14	0.30	OK	2.47	0.82	0.63	NG
				555	303								

Low Points of Interest on Existing Landside X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL

Minimum Required Berm Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	140	11.426	2.2	0.75	3.3	0.30	1.8
Check:	OK			0.77			

Recommended Berm Design X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	
150	5.0	2.3	3.5	0.78	OK	-0.19	OK
Alt Rec'd?	no						

X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL

Section 8

Section	Levee Station/Mile Central	From =>	To	Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$	
8	17 / 5150	17 / 4900	17 / 5488					0.50					

Low Points of Interest on Existing Landside X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
171	2.5	2.08	1.43	0.83	1.13	0.80	NG	NG	NG
230	2.5	1.80	1.32	0.72	1.02	0.80	NG	OK	NG
825	2.5	0.44	0.77	0.17	0.47	0.80	OK	OK	OK

Minimum Required Berm Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	105	10.593	2.5	0.64	3.2	0.30	1.6
Check:	OK			0.65			

Recommended Berm Design X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	
150	5.0	2.5	3.5	0.62	OK	-0.17	OK
Alt Rec'd?	no						

X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
171	2.50	2.30	1.52	0.92	1.22	0.80	NG	NG	NG
230	2.50	2.00	1.40	0.80	1.10	0.80	NG	OK	NG
825	2.50	0.48	0.79	0.19	0.49	0.80	OK	OK	OK

Section 9

Section	Levee Station/Mile Central	From =>	To	Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$	
9	18 / 125	18 / 0	18 / 250					0.50					

Low Points of Interest on Existing Landside X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
171	2.3	1.15	1.02	0.50	0.76	0.80	NG	OK	OK
410	2.3	0.50	0.74	0.22	0.48	0.80	OK	OK	OK

Minimum Required Berm Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	65	15.484	1.7	0.50	2.2	0.30	0.9
Check:	OK			0.52			

Recommended Berm Design X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	
150	5.0	1.6	2.7	0.47	OK	-0.27	OK
Alt Rec'd?	no						

X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
171	2.30	1.46	1.16	0.64	0.90	0.80	NG	OK	NG
410	2.30	0.63	0.80	0.27	0.54	0.80	OK	OK	OK

Section 10

Section	Levee Station/Mile Central	From =>	To	Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$	
10	18 / 500	18 / 250	18 / 750					0.50					

Low Points of Interest on Existing Landside X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
171	1.5	0.95	1.63	0.63	1.13	0.80	NG	OK	NG
185	1.5	0.90	1.60	0.60	1.10	0.80	NG	OK	NG
2000	1.5	0.00	1.00	0.00	0.50	0.80	NG	OK	OK

Minimum Required Berm Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	65	17.399	1.5	0.50	1.9	0.30	0.8
Check:	OK			0.52			

Recommended Berm Design X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	
150	5.0	1.4	2.4	0.48	OK	-0.32	OK
Alt Rec'd?	no						

X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
171	1.50	1.26	1.84	0.84	1.34	0.80	NG	NG	NG
185	1.50	1.19	1.79	0.79	1.29	0.80	NG	OK	NG
2000	1.50	0.00	1.00	0.00	0.50	0.80	NG	OK	OK

Section 11

Section	Levee Station/Mile Central	From =>	To	Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$	
11	18 / 1000	18 / 750	18 / 1250					0.50					

Low Points of Interest on Existing Landside X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
171	5.5	2.59	0.83	0.47	0.65	0.80	NG	OK	OK
240	5.5	2.21	0.77	0.40	0.58	0.80	OK	OK	OK

Minimum Required Berm Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	50	10.088	3.5	0.46	3.9	0.30	1.2
Check:	OK			0.47			

Recommended Berm Design X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	
150	5.0	3.0	4.2	0.40	OK	-0.07	OK
Alt Rec'd?	no						

X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
171	5.50	2.81	0.87	0.51	0.69	0.80	NG	OK	OK
240	5.50	2.40	0.80	0.44	0.62	0.80	OK	OK	OK

Section 12

Section	Levee Station/Mile Central	From =>	To	Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$	
12	18 / 1500	18 / 1250	18 / 1750					0.50					

Low Points of Interest on Existing Landside X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
171	3.5	2.80	1.37	0.80	1.09	0.80	NG	OK	NG
220	3.5	2.58	1.31	0.74	1.02	0.80	NG	OK	NG
950	3.5	0.73	0.78	0.21	0.49	0.80	OK	OK	OK

Minimum Required Berm Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	90.4	10.923	3.3	0.60	3.9	0.30	1.7
Check:	OK			0.60			

Recommended Berm Design X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	
150	5.0	3.2	4.1	0.58	OK	-0.09	OK
Alt Rec'd?	no						

X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
171	3.50	3.02	1.43	0.86	1.15	0.80	NG	NG	NG
220	3.50	2.77	1.36	0.79	1.08	0.80	NG	OK	NG
950	3.50	0.78	0.80	0.22	0.51	0.80	OK	OK	OK

Section 13

Section	Levee Station/Mile Central	From =>	To	Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$	
13	18 / 2000	18 / 1750	18 / 2250					0.50					

Low Points of Interest on Existing Landside X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
171	1.5	1.57	2.38	1.05	1.71	0.80	NG	NG	NG
300	1.5	0.98	1.99	0.66	1.32	0.80	NG	OK	NG
2000	1.5	0.00	1.33	0.00	0.67	0.80	NG	OK	OK

Minimum Required Berm Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	100	13.263	2.2	0.63	3.1	0.30	1.6
Check:	OK			0.63			

Recommended Berm Design X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	
150	5.0	2.1	3.5	0.61	OK	-0.18	OK
Alt Rec'd?	no						

X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
171	1.50	1.89	2.59	1.26	1.92	0.80	NG	NG	NG
300	1.50	1.18	2.12	0.79	1.46	0.80	NG	OK	NG
2000	1.50	0.00	1.34	0.00	0.67	0.80	NG	OK	OK

Section 14

Section	Levee Station/Mile Central	From =>	To	Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$	
14	18 / 2500	18 / 2250	18 / 2750					0.50					

Low Points of Interest on Existing Landside X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
171	5.5	1.88	0.52	0.34	0.43	0.80	OK	OK	OK

Minimum Required Berm Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	0						
Check:	NA						

Recommended Berm Design X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	*
150	5.0	2.3	3.3	0.36	OK	-0.15	OK
No Berm Req		Width	Thickness				
Install Anyway?	yes	150	5				

X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
171	5.50	2.16	0.57	0.39	0.48	0.80	OK	OK	OK

Section 15

Section	Levee Station/Mile Central	From =>	To	Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$	
15	18 / 3000	18 / 2750	18 / 3250					0.50					

Low Points of Interest on Existing Landside X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
171	3.0	1.43	0.81	0.48	0.64	0.80	NG	OK	OK
240	3.0	1.14	0.71	0.38	0.55	0.80	OK	OK	OK

Minimum Required Berm Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	70	15.063	2.1	0.52	2.6	0.30	1.1
Check:	OK			0.53			

Recommended Berm Design X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	
150	5.0	2.0	3.1	0.49	OK	-0.21	OK
Alt Rec'd?	no						

X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
171	3.00	1.75	0.92	0.58	0.75	0.80	NG	OK	OK
240	3.00	1.39	0.80	0.46	0.63	0.80	OK	OK	OK

Below Piggott Seepage Study - General Seepage Evaluation, Seepage Berm Design, Existing Ditch Evaluations, and Preliminary New Ditch Evaluations

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	18 / 3250	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	610	750	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)		(gpm/ft)
16	18 / 3500	18 / 3750	6	6	ml	ml	0	i		750	110	1.61	1.61	0.001123	0.001123	610	610	720	270.3	262.5	262.5	7.8	4.5	sm	9.18	1250	170	0.0030988	i		320	320	4.5	2.40	0.53	2.343
	Ditch 2													X_1 Controlling:		RS Blanket										0.24606						γ_{avg}	FoS		
														610	610	800	800																115	1.58		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	18 / 3750	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	510	600	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)		(gpm/ft)
17	18 / 4000	18 / 4250	6	6	sm	sm	0	i		925	115	3.41	3.41	0.001813	0.001813	510	510	625	270.1	262	262	8.1	5.5	sm	8.82	1100	157	0.0030474	i		330	330	5.5	2.80	0.51	2.153
	Ditch 2													X_1 Controlling:		RS Blanket										0.21654						γ_{avg}	FoS		
														510	510	600	600																115	1.66		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	18 / 4250	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	720	800	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)		(gpm/ft)
18	18 / 4500	18 / 4750	6.5	6.5	ml	ml	0	i		1050	110	1.55	1.55	0.001173	0.001173	720	580	690	270.0	263	263	7.0	6	cl	3.32	1100	157	0.0017907	i		560	560	7	3.14	0.45	1.422
	No Ditch													X_1 Controlling:		RS Blanket										0.21654						γ_{avg}	FoS		
														720	720	800	800																115	1.88		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	18 / 4750	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	290	350	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)		(gpm/ft)
19	18 / 5000	19 / 220	6	2	sm	sm	50	i		1150	110	3.41	6.00	0.001813	0.004168	290	290	400	269.8	264	264	5.8	5.5	sm	8.82	1100	157	0.0030474	i		330	330	5.5	2.62	0.48	2.017
	No Ditch													X_1 Controlling:		Pit										0.21654						γ_{avg}	FoS		
														530	290	600	350																115	1.77		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	19 / 220	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	450	550	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)		(gpm/ft)
20	19 / 470	19 / 720	5	1	ml	ml	150	i		1200	110	1.74	2.29	0.001306	0.003348	450	450	560	269.7	263	263	6.7	5.5	sm	8.82	1200	170	0.0028039	i		360	360	5.5	2.62	0.48	2.184
	No Ditch													X_1 Controlling:		Pit										0.23622						γ_{avg}	FoS		
														700	450	800	550																115	1.77		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	19 / 720	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	430	375	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)		(gpm/ft)
21	19 / 970	19 / 1220	7	3	sm	sm	75	i		1300	110	3.15	4.87	0.001485	0.002821	430	430	540	269.6	263	263	6.6	3.5	sm	9.56	1200	170	0.0036592	i		270	270	3.5	2.20	0.63	2.443
	No Ditch													X_1 Controlling:		Pit										0.23622						γ_{avg}	FoS		
														650	430	600	375																115	1.34		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	19 / 1220	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	430	375	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)		(gpm/ft)
22	19 / 1470	19 / 1720	7	3	sm	sm	75	i		1400	100	3.15	4.87	0.001485	0.002821	430	430	530	269.4	263	263	6.4	3.5	sm	9.56	1200	170	0.0036592	i		270	270	3.5	2.16	0.62	2.399
	No Ditch													X_1 Controlling:		Pit										0.23622						γ_{avg}	FoS		
														650	430	600	375																115	1.37		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	19 / 1720	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	550	350	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)		(gpm/ft)
23	19 / 1970	19 / 2220	6.5	4.5	sm	sm	50	i		1380	105	3.27	3.95	0.001487	0.001965	550	550	655	269.3	263.5	263.5	5.8	4.5	sm	9.18	1250	182	0.0029949	i		330	330	4.5	1.94	0.43	1.969
	No Ditch													X_1 Controlling:		Pit										0.24606						γ_{avg}	FoS		
														650	550	600	350																115	1.95		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	19 / 2220	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	940	650	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)		(gpm/ft)
24	19 / 2470	19 / 2720	5	3.5	cl	cl	50	i		1350	100	0.65	0.75	0.000756	0.000971	940	740	840	269.2	263	263	6.2	1.5	sm	10.32	1250	182	0.0054995	i		180	180	1.5	1.09	0.73	2.033
	No Ditch													X_1 Controlling:		Pit										0.24606						γ_{avg}	FoS		
														1020	940	1300	650																115	1.16		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	19 / 2720	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	650	600	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)		(gpm/ft)
25	19 / 2970	19 / 3220	3	1.5	cl	cl	50	i		1250	110	0.79	0.89	0.001073	0.001616	650	650	760	269.1	262.5	262.5	6.6	5.5	sm	8.82	1250	182	0.0026552	i		380	380	5.5	2.20	0.40	1.936
	No Ditch													X_1 Controlling:		Pit										0.24606						γ_{avg}	FoS		
														810	650	600	650																115	2.11		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	19 / 3220	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	650	700	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)		(gpm/ft)
26	19 / 3470	19 / 3720	5	2	cl	cl	100	i		1200	110	0.65	0.86	0.000977	0.001774	650	650	760	268.9	260.5	260.5	8.4	5.5	cl	3.44	800	170	0.0021446	i		470	470	5.5	3.21	0.58	1.365
	No Ditch													X_1 Controlling:		Pit										0.15748						γ_{avg}	FoS		
														840	650	1300	700																115	1.44		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	19 / 3720	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	640	700	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)		(gpm/ft)
27	19 / 3970	19 / 4220	5.5	2	cl	cl	100	i		1100	110	0.62	0.86	0.000908	0.001774	640	640	750	268.8	260	260	8.8	3.5	cl	3.93	800	170	0.0028723	i		350	350	3.5	2.80	0.80	1.599
	No New Ditch													X_1 Controlling:		Pit										0.15748						γ_{avg}	FoS		
														840	640	1300	700																115	1.05		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	19 / 4220	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	580	650	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)		(gpm/ft)
28	19 / 4470	19 / 4720	5	2	cl	cl	50	i		1000	120	0.65	0.86	0.000977	0.001774	580	580	700	268.7	259	259	9.7	4	cl	3.80	800	170	0.0026441	i		380	380	4	3.41	0.85	1.796
	No New Ditch													X_1 Controlling:		Pit										0.15748						γ_{avg}	FoS		
														770	580	1300	650																115	0.99		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	19 / 4720	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	300	300	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)		(gpm/ft)
29	19 / 4970	20 / 40	3.5	1	sm	sp	50	i		900	115	4.50	8.58	0.002816	0.007276	300	300	415	268.6	260	260	8.6	3	cl	4.05	1000	162	0.0028875	i		350	350	4.5	3.93	0.87	2.677
	Ditch 3			Hwy 90										X_1 Controlling:		Pit										0.19685						γ_{avg}	FoS		
														350	300	300	300																115	0.96		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	20 / 40	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	490	400	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)		(gpm/ft)
30	20 / 290	20 / 540	9	4.5	sm	sm	100	i		650	110	2.77	3.95	0.001377	0.002328	490	490	600	268.5	261	261	7.5	2.5	sm	9.94	1000	162	0.0049552	i		200	200	2.5	1.88	0.75	2.233
	Ditch 3			Hwy 90										X_1 Controlling:		Pit										0.19685						γ_{avg}	FoS		
														520	490	600	400																115	1.12		

Below Piggott Seepage Study - General Seepage Evaluation, Seepage Berm Design, Existing Ditch Evaluations, and Preliminary New Ditch Evaluations

Section	Levee Station/Mile From	Levee Station/Mile To	Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$	h'_t	i_t'	$i_{t(allowable)}$
16	18 / 3500	18 / 3750					0.50			

Low Points of Interest on Existing Landside

X_{PI} (ft)	t_{PI} or z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
171	3.1	1.41	0.91	0.46	0.68	0.80	NG	OK	OK
400	3.0	0.69	0.73	0.23	0.48	0.80	OK	OK	OK

Minimum Required Berm

Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	55	16.940	2.1	0.46	2.5	0.30	0.9
Check:	OK			0.48			

Recommended Berm Design

X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o		X_{PI} (ft)	z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
150	5.0	1.9	3.0	0.43	OK	-0.21	OK	171	3.10	1.75	1.01	0.56	0.79	0.80	NG	OK	OK
								400	3.00	0.86	0.79	0.29	0.54	0.80	OK	OK	OK

Alt Rec'd? no

Section	Levee Station/Mile From	Levee Station/Mile To	Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$	h'_t	i_t'	$i_{t(allowable)}$
17	18 / 4000	18 / 4250					0.50			

Low Points of Interest on Existing Landside

X_{PI} (ft)	t_{PI} or z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
171	4.0	1.66	0.79	0.42	0.60	0.80	OK	OK	OK
230	4.0	1.39	0.72	0.35	0.53	0.80	OK	OK	OK

Minimum Required Berm

Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	50	15.334	2.5	0.45	2.9	0.30	0.9
Check:	OK			0.47			

Recommended Berm Design

X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o		X_{PI} (ft)	z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
150	5.0	2.2	3.4	0.40	OK	-0.16	OK	171	4.00	1.99	0.87	0.50	0.69	0.80	NG	OK	OK
								230	4.00	1.66	0.79	0.42	0.60	0.80	OK	OK	OK

Alt Rec'd? no

Section	Levee Station/Mile From	Levee Station/Mile To	Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$	h'_t	i_t'	$i_{t(allowable)}$
18	18 / 4500	18 / 4750					0.50			

Low Points of Interest on Existing Landside

X_{PI} (ft)	t_{PI} or z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL

Minimum Required Berm

Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	0						
Check:	NA						

Recommended Berm Design

X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	*	X_{PI} (ft)	z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
150	5.0	2.7	3.4	0.38	OK	-0.13	OK										

No Berm Req — Width 150 — Thickness 5

Install Anyway? yes

Section	Levee Station/Mile From	Levee Station/Mile To	Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$	h'_t	i_t'	$i_{t(allowable)}$
19	18 / 5000	19 / 220					0.50			

Low Points of Interest on Existing Landside

X_{PI} (ft)	t_{PI} or z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL

Minimum Required Berm

Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	0						
Check:	NA						

Recommended Berm Design

X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	*	X_{PI} (ft)	z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
150	5.0	2.0	3.1	0.37	OK	-0.18	OK										

No Berm Req — Width 150 — Thickness 5

Install Anyway? yes

Section	Levee Station/Mile From	Levee Station/Mile To	Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$	h'_t	i_t'	$i_{t(allowable)}$
20	19 / 470	19 / 720					0.50			

Low Points of Interest on Existing Landside

X_{PI} (ft)	t_{PI} or z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL

Minimum Required Berm

Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	0						
Check:	NA						

Recommended Berm Design

X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	*	X_{PI} (ft)	z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
150	5.0	2.1	3.1	0.38	OK	-0.18	OK										

No Berm Req — Width 150 — Thickness 5

Install Anyway? yes

Section	Levee Station/Mile From	Levee Station/Mile To	Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$	h'_t	i_t'	$i_{t(allowable)}$
21	19 / 970	19 / 1220					0.50			

Low Points of Interest on Existing Landside

X_{PI} (ft)	t_{PI} or z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL

Minimum Required Berm

Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	70	15.375	1.8	0.51	2.3	0.30	1.0
Check:	OK			0.53			

Recommended Berm Design

X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o		X_{PI} (ft)	z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
150	5.0	1.7	2.8	0.48	OK	-0.26	OK										

Alt Rec'd? no

Section	Levee Station/Mile From	Levee Station/Mile To	Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$	h'_t	i_t'	$i_{t(allowable)}$
22	19 / 1470	19 / 1720					0.50			

Low Points of Interest on Existing Landside

X_{PI} (ft)	t_{PI} or z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL

Minimum Required Berm

Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	65	15.308	1.8	0.51	2.2	0.30	0.9
Check:	OK			0.52			

Recommended Berm Design

X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o		X_{PI} (ft)	z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
150	5.0	1.7	2.7	0.47	OK	-0.26	OK										

Alt Rec'd? no

Section	Levee Station/Mile From	Levee Station/Mile To	Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$	h'_t	i_t'	$i_{t(allowable)}$
23	19 / 1970	19 / 2220					0.50			

Low Points of Interest on Existing Landside

X_{PI} (ft)	t_{PI} or z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL

Minimum Required Berm

Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	0						
Check:	NA						

Recommended Berm Design

X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	*	X_{PI} (ft)	z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
150	5.0	1.6	2.4	0.36	OK	-0.27	OK										

No Berm Req — Width 150 — Thickness 5

Install Anyway? yes

Section	Levee Station/Mile From	Levee Station/Mile To	Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$	h'_t	i_t'	$i_{t(allowable)}$
24	19 / 2470	19 / 2720					0.50			

Low Points of Interest on Existing Landside

X_{PI} (ft)	t_{PI} or z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL

Minimum Required Berm

Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	75	27.636	0.8	0.54	1.2	0.30	0.6
Check:	OK			0.55			

Recommended Berm Design

X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o		X_{PI} (ft)	z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
150	5.0	0.9	1.8	0.59	OK	-0.49	OK										

Alt Rec'd? no

Section	Levee Station/Mile From	Levee Station/Mile To	Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$	h'_t	i_t'	$i_{t(allowable)}$
25	19 / 2970	19 / 3220					0.50			

Low Points of Interest on Existing Landside

X_{PI} (ft)	t_{PI} or z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL

Minimum Required Berm

Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	0						
Check:	NA						

Recommended Berm Design

X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	*	X_{PI} (ft)	z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
150	5.0	1.8	2.7	0.34	OK	-0.22	OK										

No Berm Req — Width 150 — Thickness 5

Install Anyway? yes

Section	Levee Station/Mile From	Levee Station/Mile To	Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$	h'_t	i_t'	$i_{t(allowable)}$
26	19 / 3470	19 / 3720					0.50			

Low Points of Interest on Existing Landside

X_{PI} (ft)	t_{PI} or z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL

Minimum Required Berm

Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	70	13.580	2.8	0.52	3.3	0.30	1.3
Check:	OK			0.53			

Recommended Berm Design

X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o		X_{PI} (ft)	z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
150	5.0	2.7	3.6	0.48	OK	-0.13	OK										

Alt Rec'd? no

Section	Levee Station/Mile From	Levee Station/Mile To	Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$	h'_t	i_t'	$i_{t(allowable)}$
27	19 / 3970	19 / 4220					0.50			

Low Points of Interest on Existing Landside

X_{PI} (ft)	t_{PI} or z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
400	1.0	0.89	3.39	0.89	2.14	0.80	NG	NG	NG
500	1.0	0.67	3.17	0.67	1.92	0.80	NG	OK	NG
400	1.5	0.89	1.93	0.59	1.26	0.80	NG	OK	NG

Minimum Required Berm

Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	105	15.396	2.2	0.64	3.0	0.30	1.5
Check:	OK			0.65			

Recommended Berm Design

X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o		X_{PI} (ft)	z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
150	5.0	2.2	3.3	0.64	OK	-0.20	OK	400	1.00	1.05	3.55	1.05	2.30	0.80	NG	NG	NG
								500	1.00	0.79	3.29	0.79	2.04	0.80	NG	OK	NG
								400	1.50	1.05	2.03	0.70	1.37	0.80	NG	OK	NG

Alt Rec'd? no

Section	Levee Station/Mile From	Levee Station/Mile To	Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$	h'_t	i_t'	$i_{t(allowable)}$
28	19 / 4470	19 / 4720					0.50			

Low Points of Interest on Existing Landside

X_{PI} (ft)	t_{PI} or z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
220	2.0	1.91	1.95	0.95	1.45	0.80	NG	NG	NG
340	2.0	1.39	1.69	0.69	1.19	0.80	NG	OK	NG
220	2.8	1.91	1.15	0.69	0.92	0.80	NG	OK	NG

Minimum Required Berm

Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	115	13.953	2.7	0.68	3.6	0.30	1.9
Check:	OK			0.68			

Recommended Berm Design

X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o		X_{PI} (ft)	z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
150	5.0	2.7	3.9	0.68	OK	-0.12	OK	220	2.00	2.19	2.09	1.09	1.59	0.80	NG	NG	NG
								340	2.00	1.59	1.80	0.80	1.30	0.80	NG	OK	NG
								220	2.75	2.19	1.25	0.80	1.02	0.80	NG	OK	NG

Alt Rec'd? no

Section	Levee Station/Mile From	Levee Station/Mile To	Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$	h'_t	i_t'	$i_{t(allowable)}$
29	19 / 4970	20 / 40					0.50			

Low Points of Interest on Existing Landside

X_{PI} (ft)	t_{PI} or z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
80	0.5	3.12	14.25	6.25	10.25	0.66	NG	NG	NG
80	3.0	3.12	1.54	1.04	1.29	0.66	NG	NG	NG
145	4.0	2.59	0.77	0.65	0.71	0.79	OK	OK	OK

Minimum Required Berm

Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	115	11.119	3.0	0.67	4.2	0.30	2.2
Check:	OK			0.68			

Recommended Berm Design

X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o		X_{PI} (ft)	z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
115	2.5	3.1	4.2	0.68	OK	0.24	OK	80	0.50	3.31	0.56	0.56	0.56	0.57	OK	OK	OK
								80	Covered								
								145	4.00	2.74	0.81	0.69	0.75	0.80	NG	OK	OK

Alt Rec'd? yes — Width 115 — Thickness 2.5

Section	Levee Station/Mile From	Levee Station/Mile To	Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$	h'_t	i_t'	$i_{t(allowable)}$
30	20 / 290	20 / 540					0.50			

Low Points of Interest on Existing Landside

X_{PI} (ft)	t_{PI} or z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
100	0.0	1.14	#DIV/0!	#DIV/0!	#DIV/0!	0.70	###	###	###
100	0.1	1.14	35.42	11.42	23.42	0.70	NG	NG	NG

Minimum Required Berm

Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	80	19.765	1.4	0.56	2.0	0.30	1.0
Check:	OK			0.57			

Recommended Berm Design

X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o		X_{PI} (ft)	z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
115	2.5	1.4	2.3	0.55	OK	-0.04	OK	100	0.00	1.40	0.56	0.56	0.56	0.63	OK	OK	OK
								100	Covered								

Alt Rec'd? yes — Width 115 — Thickness 2.5

Below Piggott Seepage Study - General Seepage Evaluation, Seepage Berm Design, Existing Ditch Evaluations, and Preliminary New Ditch Evaluations

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	20 / 540	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	440	500	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
31	20 / 790	20 / 1040	5.5	3	cl	cl		i		500	110	0.62	0.79	0.000832	0.001272	440	440	550	268.5	260	260	8.5	4.5	sm	9.18	1000	162	0.0035490	i		280	280	4.5	2.87	0.64	2.439
			Ditch 3		Hwy 90									X_1 Controlling:		Pit										0.19685						γ_{avg}	FoS		
														470	440	1300	600															115	1.32		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	20 / 1040	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	340	300	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)		(gpm/ft)
32	20 / 1290	20 / 1540	3.5	2.5	sm	sm	50	i		650	110	4.50	5.35	0.002606	0.003363	340	340	450	268.5	260	260	8.5	4.5	sm	9.18	1100	172	0.0032840	i		300	300	4.5	3.40	0.76	3.152
			No Ditch		Hwy 90									X_1 Controlling:		Pit										0.21654						γ_{avg}	FoS		
														360	340	300	350															115	1.12		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	20 / 1540	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	530	500	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)		(gpm/ft)
33	20 / 1790	20 / 2040	5.5	4.5	sm	sm	200	i		1200	100	3.56	3.95	0.001851	0.002154	530	530	630	268.5	263	263	5.5	2	sm	10.13	1100	172	0.0051752	i		190	190	2	1.27	0.64	1.865
			No Ditch											X_1 Controlling:		RS Blanket										0.21654						γ_{avg}	FoS		
														530	660	600	500															115	1.32		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	20 / 2040	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	840	600	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)		(gpm/ft)
34	20 / 2290	20 / 2540	12	7	sm	sm	200	i		1600	100	2.38	3.15	0.001025	0.001542	840	550	650	267.7	261	261	6.7	5	cl	3.56	1100	172	0.0019398	i		520	520	4	2.98	0.74	1.593
			No Ditch											X_1 Controlling:		Pit										0.21654						γ_{avg}	FoS		
														910	840	600	800															115	1.13		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	20 / 2540	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	220	380	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)		(gpm/ft)
35	20 / 2790	20 / 3040	3	1	cl	sm	80	i		2000	90	0.79	8.58	0.001241	0.007102	220	220	310	267.5	260	260	7.5	5	sm	9.00	1000	170	0.0032538	i		310	310	5	3.75	0.75	3.023
			No Ditch											X_1 Controlling:		Pit										0.19685						γ_{avg}	FoS		
														790	220	600	380															115	1.12		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	20 / 3040	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	380	400	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)		(gpm/ft)
36	20 / 3290	20 / 3540	9.5	2.5	sm	sm	100	i		2200	85	2.69	5.35	0.00129	0.003548	380	380	465	267.2	260	260	7.2	2.5	cl	4.18	1000	170	0.0031355	i		320	320	4.5	2.94	0.65	2.292
			No Ditch											X_1 Controlling:		Pit										0.19685						γ_{avg}	FoS		
														770	380	600	400															115	1.29		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	20 / 3540	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	440	500	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
37	20 / 3790	20 / 4040	6	2	sm	sm	200	i		2000	90	3.41	6.00	0.001828	0.004201	440	440	530	266.9	261	261	5.9	6	sm	8.65	1000	170	0.0029120	i		340	340	6	2.31	0.38	1.695
			Ditch 4											X_1 Controlling:		Pit										0.19685						γ_{avg}	FoS		
														550	440	600	500															115	2.19		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	20 / 4040	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	930	600	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
38	20 / 4290	20 / 4540	3.5	3.5	cl	cl	100	i		1700	90	0.75	0.75	0.001005	0.001005	930	670	760	266.6	260	260	6.6	3.5	ml	4.94	1250	170	0.0025775	i		390	390	8	2.24	0.28	1.793
			Ditch 4											X_1 Controlling:		RS Blanket										0.24606						γ_{avg}	FoS		
														930	1030	600	700															115	3.01		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	20 / 4540	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	1110	700	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)		(gpm/ft)
39	20 / 4790	20 / 5040	7.5	4.5	cl	cl	100	i		1500	100	0.50	0.68	0.000559	0.000845	1110	930	1030	266.3	259	259	7.3	3.5	cl	3.93	1250	170	0.0022979	i		440	440	3.5	2.19	0.62	1.551
			Ditch 4											X_1 Controlling:		Pit										0.24606						γ_{avg}	FoS		
														1230	1110	1300	700															115	1.35		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	20 / 5040	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	780	700	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
40	20 / 5290	20 / 5540	6	2	cl	cl	100	i		1450	100	0.59	0.86	0.000678	0.001419	780	780	880	266.1	259	259	7.1	3.5	sm	9.56	1250	170	0.0035852	i		280	280	5	1.71	0.34	1.912
			Ditch 4											X_1 Controlling:		Pit										0.24606						γ_{avg}	FoS		
														1110	780	1300	700															115	2.46		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	20 / 5540	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	790	750	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
41	20 / 5790	20 / 6040	7	2	cl	cl	150	i		1500	100	0.53	0.86	0.000639	0.001526	790	780	880	265.8	258	258	7.8	6	cl	3.32	1100	167	0.0017362	i		580	580	8	3.10	0.39	1.443
			Ditch 4											X_1 Controlling:		Pit										0.21654						γ_{avg}	FoS		
														1160	790	1300	750															115	2.18		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	20 / 6040	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	600	650	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)		(gpm/ft)
42	21 / 145	21 / 395	6.5	1.5	cl	cl	50	i		1650	100	0.56	0.89	0.000682	0.001798	600	600	700	265.6	258	258	7.6	4	cl	3.80	1100	167	0.0022751	i		440	440	5	2.93	0.59	1.800
			Ditch 4											X_1 Controlling:		Pit										0.21654						γ_{avg}	FoS		
														1190	600	1300	650															115	1.44		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	21 / 395	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	1060	650	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
43	21 / 645	21 / 895	6	4.5	cl	cl	50	i		1750	100	0.59	0.68	0.000729	0.000909	1060	610	710	265.5	259	259	6.5	10	cl	2.45	1100	167	0.0011557	i		870	870	10	3.58	0.36	1.111
			Ditch 4											X_1 Controlling:		Pit										0.21654						γ_{avg}	FoS		
														1170	1060	1300	650															115	2.36		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	21 / 895	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	350	350	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
44	21 / 1145	21 / 1395	3	1	cl	sp	100	i		1850	100	0.79	8.58	0.001319	0.00755	350	350	450	265.5	259	259	6.5	5	cl	3.56	850	177	0.0021753	i		460	460	7.5	3.29	0.44	1.580
			Ditch 4											X_1 Controlling:		Pit										0.16732						γ_{avg}	FoS		
														750	350	600	350															115	1.92		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	21 / 1395	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	520	400	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
45	21 / 1645	21 / 1895	4.5	2.5	ml	ml	100	i		1900	100	1.81	2.09	0.001634	0.002358	520	520	620	265.4	260	260	5.4	3.5	sm	9.56	850	177	0.0042609	i		230	230	3.5	1.46	0.42	1.405
			Ditch 4											X_1 Controlling:		Pit										0.16732						γ_{avg}	FoS		
														610	520	400	500															115	2.02		

Below Piggott Seepage Study - General Seepage Evaluation, Seepage Berm Design, Existing Ditch Evaluations, and Preliminary New Ditch Evaluations

Section	Levee Station/Mile From =>	20 / 540	Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$	t	h'_o	i_o'	$i_{o(allowable)}$	h'_t	i_t'	$i_{t(allowable)}$	Low Points of Interest on Existing Landside X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	Minimum Required Berm Berm	$X_{(LSP,S,P)}$	A	h'_t	i'_t	h'_o	i'_o	t	Recommended Berm Design X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o		X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)							(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	Type	(ft)		(ft)		(ft)		(ft)	(ft)	(ft)		(ft)				(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
31	20 / 790	20 / 1040					0.50				100	1.0	2.01	5.51	2.01	3.76	0.70	NG	NG	NG	SP	70	15.208	2.3	0.52	3.0	0.30	1.3	115	2.5	2.2	3.2	0.48	OK	0.10	OK	100	1.00	2.23	0.22	0.22	0.22	0.63	OK	OK	OK
											100	3.5	2.01	0.86	0.57	0.72	0.70	NG	OK	NG	Check:	OK			0.53						Width	Thickness					100	Covered								
																													Alt Rec'd?	yes	115	2.5															

Section	Levee Station/Mile From =>	20 / 1040	Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$	t	h'_o	i_o'	$i_{o(allowable)}$	h'_t	i_t'	$i_{t(allowable)}$	Low Points of Interest on Existing Landside X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	Minimum Required Berm Berm	$X_{(LSP,S,P)}$	A	h'_t	i'_t	h'_o	i'_o	t	Recommended Berm Design X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o		X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)							(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	Type	(ft)		(ft)		(ft)		(ft)	(ft)	(ft)		(ft)				(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
32	20 / 1290	20 / 1540					0.50														SP	90	12.750	2.7	0.59	3.6	0.30	1.7	115	2.5	2.6	3.7	0.57	OK	0.17	OK													
																					Check:	OK			0.60						Width	Thickness															
																													Alt Rec'd?	yes	115	2.5															

Section	Levee Station/Mile From =>	20 / 1540	Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$	t	h'_o	i_o'	$i_{o(allowable)}$	h'_t	i_t'	$i_{t(allowable)}$	Low Points of Interest on Existing Landside X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	Minimum Required Berm Berm	$X_{(LSP,S,P)}$	A	h'_t	i'_t	h'_o	i'_o	t	Recommended Berm Design X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o		X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)							(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	Type	(ft)		(ft)		(ft)		(ft)	(ft)	(ft)		(ft)				(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
33	20 / 1790	20 / 2040					0.50														SP	60	21.916	1.0	0.50	1.4	0.30	0.6	115	2.5	1.0	1.7	0.49	OK	-0.18	OK													
																					Check:	OK			0.50						Width	Thickness															
																													Alt Rec'd?	yes	115	2.5															

Section	Levee Station/Mile From =>	20 / 2040	Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$	t	h'_o	i_o'	$i_{o(allowable)}$	h'_t	i_t'	$i_{t(allowable)}$	Low Points of Interest on Existing Landside X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	Minimum Required Berm Berm	$X_{(LSP,S,P)}$	A	h'_t	i'_t	h'_o	i'_o	t	Recommended Berm Design X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o		X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)							(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	Type	(ft)		(ft)		(ft)		(ft)	(ft)	(ft)		(ft)				(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
34	20 / 2290	20 / 2540					0.50														SP	105	11.481	2.5	0.63	3.1	0.30	1.4	115	2.5	2.5	3.1	0.63	OK	0.10	OK													
																					Check:	OK			0.65						Width	Thickness															
																													Alt Rec'd?	yes	115	2.5															

Section	Levee Station/Mile From =>	20 / 2540	Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$	t	h'_o	i_o'	$i_{o(allowable)}$	h'_t	i_t'	$i_{t(allowable)}$	Low Points of Interest on Existing Landside X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	Minimum Required Berm Berm	$X_{(LSP,S,P)}$	A	h'_t	i'_t	h'_o	i'_o	t	Recommended Berm Design X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o		X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)							(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	Type	(ft)		(ft)		(ft)		(ft)	(ft)	(ft)		(ft)				(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
35	20 / 2790	20 / 3040					0.50														SP	90	10.500	2.9	0.59	3.9	0.30	1.9	150	5.0	2.7	4.2	0.54	OK	-0.08	OK													
																					Check:	OK			0.60																					
																													Alt Rec'd?	no																	

Section	Levee Station/Mile From =>	20 / 3040	Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$	t	h'_o	i_o'	$i_{o(allowable)}$	h'_t	i_t'	$i_{t(allowable)}$	Low Points of Interest on Existing Landside X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	Minimum Required Berm Berm	$X_{(LSP,S,P)}$	A	h'_t	i'_t	h'_o	i'_o	t	Recommended Berm Design X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o		X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)							(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	Type	(ft)		(ft)		(ft)		(ft)	(ft)	(ft)		(ft)				(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
36	20 / 3290	20 / 3540					0.50														SP	75	12.737	2.4	0.54	3.0	0.30	1.3	150	5.0	2.2	3.4	0.50	OK	-0.16	OK													
																					Check:	OK			0.55																					
																													Alt Rec'd?	no																	

Section	Levee Station/Mile From =>	20 / 3540	Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$	t	h'_o	i_o'	$i_{o(allowable)}$	h'_t	i_t'	$i_{t(allowable)}$	Low Points of Interest on Existing Landside X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	Minimum Required Berm Berm	$X_{(LSP,S,P)}$	A	h'_t	i'_t	h'_o	i'_o	t	Recommended Berm Design X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)							(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	Type	(ft)		(ft)		(ft)		(ft)	(ft)	(ft)		(ft)				(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
37	20 / 3790	20 / 4040					0.50				40	3.5	2.05	1.30	0.59	0.94	0.58	NG	NG	NG	SP	0							150	5.0	1.9	2.8	0.31	OK	-0.20	OK	40	Covered								
											171	4.5	1.40	0.64	0.31	0.48	0.80	OK	OK	OK	Check:	NA							No Berm Req		Width	Thickness					171	4.50	1.70	0.71	0.38	0.54	0.80	OK	OK	OK
																													Install Anyway?	yes	150	5															

Section	Levee Station/Mile From =>	20 / 4040	Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$	t	h'_o	i_o'	$i_{o(allowable)}$	h'_t	i_t'	$i_{t(allowable)}$	Low Points of Interest on Existing Landside X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	Minimum Required Berm Berm	$X_{(LSP,S,P)}$	A	h'_t	i'_t	h'_o	i'_o	t	Recommended Berm Design X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)							(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	Type	(ft)		(ft)		(ft)		(ft)	(ft)	(ft)		(ft)				(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
38	20 / 4290	20 / 4540					0.50				40	8.0	2.02	0.25	0.25	0.25	0.58	OK	OK	OK	SP	0							150	5.0	1.9	2.7	0.24	OK	-0.18	OK	40	Covered								
											171	8.0	1.44	0.18	0.18	0.18	0.80	OK	OK	OK	Check:	NA							No Berm Req		Width	Thickness					171	8.00	1.75	0.22	0.22	0.22	0.80	OK	OK	OK
																													Install Anyway?	yes	150	5															

Section	Levee Station/Mile From =>	20 / 4540	Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$	t	h'_o	i_o'	$i_{o(allowable)}$	h'_t	i_t'	$i_{t(allowable)}$	Low Points of Interest on Existing Landside X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	Minimum Required Berm Berm	$X_{(LSP,S,P)}$	A	h'_t	i'_t	h'_o	i'_o	t	Recommended Berm Design X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)							(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	Type	(ft)		(ft)		(ft)		(ft)	(ft)	(ft)		(ft)				(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
39	20 / 4790	20 / 5040					0.50				100	1.0	1.74	4.24	1.74	2.99	0.70	NG	NG	NG	SP	75	16.853	1.9	0.54	2.3	0.30	0.9	150	5.0	1.9	2.6	0.53	OK	-0.28	OK	100	Covered								
											171	2.0	1.48	1.49	0.74	1.11	0.80	NG	OK	NG	Check:	OK			0.55														171	2.00	1.74	1.62	0.87	1.25	0.80	NG	NG	NG
											210	2.0	1.35	1.42	0.67	1.05	0.80	NG	OK	NG																				210	2.00	1.59	1.55	0.80	1.17	0.80	NG	OK	NG
																													Alt Rec'd?	no																	

Section	Levee Station/Mile From =>	20 / 5040	Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$	t	h'_o	i_o'	$i_{o(allowable)}$	h'_t	i_t'	$i_{t(allowable)}$	Low Points of Interest on Existing Landside X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	Minimum Required Berm Berm	$X_{(LSP,S,P)}$	A	h'_t	i'_t	h'_o	i'_o	t	Recommended Berm Design X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)							(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	Type	(ft)		(ft)		(ft)		(ft)	(ft)	(ft)		(ft)				(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
40	20 / 5290	20 / 5540					0.50				100	3.0	1.20	1.07	0.40	0.73	0.70	NG	OK	NG	SP	0							150	5.0	1.5	2.4	0.29	OK	-0.26	OK	100	Covered								
											171	3.5	0.93	0.69	0.27	0.48	0.80	OK	OK	OK	Check:	NA							No Berm Req		Width	Thickness					171	3.50	1.29	0.80	0.37	0.58	0.80	OK	OK	OK
																													Install Anyway?	yes	150	5															

Section	Levee Station/Mile From =>	20 / 5540	Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$	t	h'_o	i_o'	$i_{o(allowable)}$	h'_t	i_t'	$i_{t(allowable)}$	Low Points of Interest on Existing Landside X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	Minimum Required Berm Berm	$X_{(LSP,S,P)}$	A	h'_t	i'_t	h'_o	i'_o	t	Recommended Berm Design X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)							(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	Type	(ft)		(ft)		(ft)		(ft)	(ft)	(ft)		(ft)				(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
41	20 / 5790	20 / 6040					0.50				100	4.0	2.60	1.65	0.65	1.15	0.70	NG	OK	NG	SP	0							150	5.0	2.7	3.4	0.33	OK	-0.12	OK	100	Covered								
											171	6.5	2.30	0.59	0.35	0.47	0.80	OK	OK	OK	Check:	NA							No Berm Req		Width	Thickness					171	6.50	2.54	0.62	0.39	0.51	0.80	OK	OK	OK
																													Install Anyway?	yes	150	5															

Section	Levee Station/Mile From =>	20 / 6040	Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$	t	h'_o	i_o'	$i_{o(allowable)}$	h'_t	i_t'	$i_{t(allowable)}$	Low Points of Interest on Existing Landside X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	Minimum Required Berm Berm	$X_{(LSP,S,P)}$	A	h'_t	i'_t	h'_o	i'_o	t	Recommended Berm Design X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)							(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	Type	(ft)		(ft)		(ft)		(ft)	(ft)	(ft)		(ft)				(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
42	21 / 145	21 / 395					0.50				100	1.5	2.34	3.89	1.56	2.72	0.70	NG	NG	NG	SP	70	13.457	2.6	0.51	3.0	0.30	1.2	150	5.0	2.4	3.3	0.48	OK	-0.17	OK	100	Covered								
											171	3.5	1.99	1.00	0.57	0.78	0.80	NG	OK	OK	Check:	OK			0.53														171	3.50	2.26	1.07	0.64	0.86	0.80	NG	OK	NG
											425	3.5	1.12	0.75	0.32	0.53	0.80	OK	OK	OK																				425	3.50	1.27	0.79	0.36	0.58	0.80	OK	OK	OK
																													Alt Rec'd?	no																	

Section	Levee Station/Mile From =>	21 / 395	Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$	t	h'_o	i_o'	$i_{o(allowable)}$	h'_t	i_t'	$i_{t(allowable)}$	Low Points of Interest on Existing Landside X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	Minimum Required Berm Berm	$X_{(LSP,S,P)}$	A	h'_t	i'_t	h'_o	i'_o	t	Recommended Berm Design X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)							(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	Type	(ft)		(ft)		(ft)		(ft)	(ft)	(ft)		(ft)				(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
43	21 / 645	21 / 895					0.50				100	5.0	3.19	1.64	0.64	1.14	0.70	NG	OK	NG	SP	0							No Berm Req																					
											171	8.5	2.94	0.52	0.35	0.43	0.80	OK	OK	OK	Check:	NA							No Berm Req																					
																													Install Anyway?	no																	

Section	Levee Station/Mile From =>	21 / 895	Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$	t	h'_o	i_o'	$i_{o(allowable)}$	h'_t	i_t'	$i_{t(allowable)}$	Low Points of Interest on Existing Landside X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	Minimum Required Berm Berm	$X_{(LSP,S,P)}$	A	h'_t	i'_t	h'_o	i'_o	t	Recommended Berm Design X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)							(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	Type	(ft)		(ft)		(ft)		(ft)	(ft)	(ft)		(ft)				(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
44	21 / 1145	21 / 1395					0.50				100	1.5	2.64	5.76	1.76	3.76	0.70	NG	NG	NG	SP	0							No Berm Req																					
											171	6.0	2.27	0.63	0.38	0.50	0.80	OK	OK	OK	Check:	NA							No Berm Req																					
																													Install Anyway?	no																	

Section	Levee Station/Mile From =>	21 / 1395	Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$	t	h'_o	i_o'	$i_{o(allowable)}$	h'_t	i_t'	$i_{t(allowable)}$	Low Points of Interest on Existing Landside X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	Minimum Required Berm Berm	$X_{(LSP,S,P)}$	A	h'_t	i'_t	h'_o	i'_o	t	Recommended Berm Design X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)							(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	Type	(ft)		(ft)		(ft)		(ft)	(ft)	(ft)		(ft)				(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
45	21 / 1645	21 / 1895					0.50				100	0.1	0.95	43.54	9.54	26.54	0.70	NG	NG	NG	SP	0							No Berm Req																					
											171	2.0	0.71	1.10	0.35	0.73	0.80	NG	OK	OK	Check:	NA							No Berm Req																					
											700	2.0	0.07	0.79	0.04	0.41	0.80	OK	OK	OK									Install Anyway?	no																	

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																
	From =>	21 / 1895	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	850	700	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
46	21 / 2145	21 / 2395	6	3	cl	cl	100	i		2000	100	0.59	0.79	0.000806	0.001319	850	720	820	265.4	259	259	6.4	6.5	ml	4.13	850	177	0.0020551	i		490	490	8.5	2.39	0.28	1.080
	Ditch 4													X_1 Controlling:		Pit										0.16732						γ_{avg}	FoS		
														1150	850	1300	700															115	2.99		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																
	From =>	21 / 2395	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	590	600	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
47	21 / 2645	21 / 2895	6	5	sm	sm	70	i		2100	100	3.41	3.74	0.001683	0.001933	590	590	690	265.3	258	258	7.3	4	cl	3.80	1200	167	0.0021782	i		460	460	6	2.92	0.49	1.870
	Ditch 4													X_1 Controlling:		RS Blanket										0.23622						γ_{avg}	FoS		
														590	590	600	670															115	1.73		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																
	From =>	21 / 2895	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	1310	1300	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
48	21 / 3145	21 / 3395	7	5.5	cl	cl	100	i		2000	100	0.53	0.62	0.000612	0.000748	1310	770	870	265.2	258	258	7.2	3.5	cl	3.93	1200	167	0.0023662	i		420	420	3.5	2.34	0.67	1.644
	Ditch 4													X_1 Controlling:		Pit										0.23622						γ_{avg}	FoS		
														1370	1310	1300	1400															115	1.26		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																
	From =>	21 / 3395	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	850	600	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
49	21 / 3645	21 / 3895	10	9	sm	sm	100	i		1850	100	2.62	2.77	0.001143	0.001238	850	850	950	265.2	257.5	257.5	7.7	7.5	sm	8.17	1200	167	0.0023319	i		430	430	7.5	2.40	0.32	1.644
	Ditch 4													X_1 Controlling:		RS Blanket										0.23622						γ_{avg}	FoS		
														850	890	600	700															115	2.64		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																
	From =>	21 / 3895	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	950	700	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
50	21 / 4145	21 / 4395	5	3	cl	cl	100	i		1750	100	0.65	0.79	0.000798	0.001133	950	740	840	265.1	257.5	257.5	7.6	7	cl	3.09	1200	170	0.0014717	i		680	680	7	3.40	0.49	1.499
	Ditch 4													X_1 Controlling:		Pit										0.23622						γ_{avg}	FoS		
														1110	950	1300	700															115	1.74		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																
	From =>	21 / 4395	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	540	400	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
51	21 / 4645	21 / 4895	6	4	sm	sm	100	i		1600	100	3.41	4.20	0.001668	0.002268	540	540	640	265.1	257	257	8.1	4.5	ml	4.65	1200	170	0.0022514	i		440	440	4.5	3.30	0.73	2.249
	Ditch 4													X_1 Controlling:		Pit										0.23622						γ_{avg}	FoS		
														590	540	600	400															115	1.15		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																
	From =>	21 / 4895	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	1340	1400	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
52	21 / 5145	22 / 190	12	8	cl	cl	100	i		1500	100	0.29	0.47	0.000342	0.000537	1340	740	840	265.0	256.5	256.5	8.5	8	cl	2.87	1200	170	0.0013264	i		750	750	8	4.01	0.50	1.603
	Ditch 4													X_1 Controlling:		Pit										0.23622						γ_{avg}	FoS		
														1380	1340	2500	1400															115	1.68		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																
	From =>	22 / 190	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	1020	700	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
53	22 / 440	22 / 690	9.5	4.5	cl	cl	100	i		1450	100	0.39	0.68	0.000501	0.000959	1020	1020	1120	264.9	256.5	256.5	8.4	9.5	cl	2.55	1100	150	0.0012766	i		780	780	9.5	3.45	0.36	1.072
	Ditch 4													X_1 Controlling:		Pit										0.21654						γ_{avg}	FoS		
														1240	1020	1300	700															115	2.32		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																
	From =>	22 / 690	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	1240	1400	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
54	22 / 940	22 / 1190	12	7	cl	cl	100	i		1500	100	0.29	0.53	0.000381	0.000675	1240	1140	1240	264.8	256	256	8.8	5	cl	3.56	1100	150	0.0020772	i		480	480	5	2.46	0.49	1.241
	Ditch 4													X_1 Controlling:		Pit										0.21654						γ_{avg}	FoS		
														1360	1240	2500	1400															115	1.72		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																
	From =>	22 / 1190	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	1070	700	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
55	22 / 1440	22 / 1690	8	4.5	cl	cl	100	i		1700	100	0.47	0.68	0.000597	0.000959	1070	1070	1170	264.7	256	256	8.7	7.5	cl	2.98	1100	150	0.0015521	i		640	640	7.5	3.08	0.41	1.166
	Ditch 4													X_1 Controlling:		Pit										0.21654						γ_{avg}	FoS		
														1290	1070	1300	700															115	2.06		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																
	From =>	22 / 1690	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	1320	1400	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
56	22 / 1940	22 / 2190	11	6.5	cl	cl	100	i		1800	100	0.33	0.56	0.000411	0.000697	1320	1180	1280	264.6	256	256	8.6	3	cl	4.05	1100	160	0.0027703	i		360	360	3	1.89	0.63	1.357
	Ditch 4													X_1 Controlling:		Pit										0.21654						γ_{avg}	FoS		
														1530	1320	2500	1400															115	1.34		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																
	From =>	22 / 2190	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	1140	1300	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
57	22 / 2440	22 / 2690	9	5	cl	cl	100	i		1700	100	0.42	0.65	0.000514	0.000859	1140	670	770	264.4	256	256	8.4	5	cl	3.56	1100	160	0.0020112	i		500	500	5	3.31	0.66	1.711
	No New Ditch													X_1 Controlling:		Pit										0.21654						γ_{avg}	FoS		
														1370	1140	1300	1400															115	1.27		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																
	From =>	22 / 2690	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	440	450	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
58	22 / 2940	22 / 3190	5.5	2.5	cl	sm	150	i		1400	100	0.62	5.35	0.000799	0.003487	440	440	540	264.3	256	256	8.3	7.5	cl	2.98	1100	160	0.0015028	i		670	670	7.5	4.60	0.61	1.775
	No Ditch													X_1 Controlling:		Pit										0.21654						γ_{avg}	FoS		
														1010	440	1300	450															115	1.38		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																
	From =>	22 / 3190	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	1010	1200	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
59	22 / 3440	22 / 3690	9	6	cl	cl	70	i		1200	100	0.42	0.59	0.000536	0.000777	1010	670	770	264.2	256	256	8.2	5.5	cl	3.44	1100	147	0.0019668	i		510	510	5.5	3.27	0.59	1.523
	No Ditch													X_1 Controlling:		Pit										0.21654						γ_{avg}	FoS		
														1060	1010	1300	1370															115	1.42		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																
	From =>	22 / 3690	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	1020	1150	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
60	22 / 3940	22 / 4190	9	6	cl	cl	100	i		1150	100	0.42	0.59	0.000536	0.000777	1020	1020	1120	264.1	256	256	8.1	3	sm	9.75	1100	147	0.0044837	i		220	220	3	1.33	0.44	1.437
	No Ditch													X_1 Controlling:		RS Blanket										0.21654						γ_{avg}	FoS		
														1020	1020	1300	1400															115	1.90		

Below Piggott Seepage Study - General Seepage Evaluation, Seepage Berm Design, Existing Ditch Evaluations, and Preliminary New Ditch Evaluations

Section	Levee Station/Mile		Existing Landside Berm (assumed semipervious)										Low Points of Interest on Existing Landside										Minimum Required Berm									Recommended Berm Design																	
	From =>	21 / 1895	$X_{sp(existing)}$	t	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$		X_{PI}	t_{PI} or z_{tPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	Berm	$X_{(I,SP,S,P)}$	A	h'_t	i'_t	h'_o	i'_o	t		X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{tPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)									(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	Type	(ft)		(ft)		(ft)		(ft)		(ft)	(ft)	(ft)	(ft)				*	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
46	21 / 2145	21 / 2395					0.50						100	4.5	1.95	1.32	0.43	0.88	0.70	NG	OK	NG	SP	0								No Berm Req																	
													171	7.0	1.68	0.45	0.24	0.35	0.80	OK	OK	OK	Check:	NA								No Berm Req																	
																																Install Anyway?	no																

Section	Levee Station/Mile		Existing Landside Berm (assumed semipervious)										Low Points of Interest on Existing Landside										Minimum Required Berm									Recommended Berm Design																	
	From =>	21 / 2395	$X_{sp(existing)}$	t	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$		X_{PI}	t_{PI} or z_{tPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	Berm	$X_{(I,SP,S,P)}$	A	h'_t	i'_t	h'_o	i'_o	t		X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{tPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)									(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	Type	(ft)		(ft)		(ft)		(ft)		(ft)	(ft)	(ft)	(ft)				*	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
47	21 / 2645	21 / 2895					0.50						100	1.5	2.35	4.57	1.57	3.07	0.70	NG	NG	NG	SP	0								No Berm Req																	
													171	4.5	2.01	0.78	0.45	0.61	0.80	OK	OK	OK	Check:	NA								No Berm Req																	
													210	4.5	1.85	0.74	0.41	0.58	0.80	OK	OK	OK										Install Anyway?	no																

Section	Levee Station/Mile		Existing Landside Berm (assumed semipervious)										Low Points of Interest on Existing Landside										Minimum Required Berm									Recommended Berm Design																	
	From =>	21 / 2895	$X_{sp(existing)}$	t	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$		X_{PI}	t_{PI} or z_{tPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	Berm	$X_{(I,SP,S,P)}$	A	h'_t	i'_t	h'_o	i'_o	t		X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o		X_{PI}	z_{tPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)									(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	Type	(ft)		(ft)		(ft)		(ft)		(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
48	21 / 3145	21 / 3395					0.50						171	2.0	1.56	1.53	0.78	1.16	0.80	NG	OK	NG	SP	85	15.410	2.0	0.57	2.4	0.30	1.1		150	5.0	2.0	2.7	0.56	OK	-0.26	OK	171	2.00	1.83	1.67	0.92	1.29	0.80	NG	NG	NG
													230	2.0	1.36	1.43	0.68	1.06	0.80	NG	OK	NG	Check:	OK			0.58													230	2.00	1.60	1.55	0.80	1.17	0.80	NG	OK	NG
													1400	2.0	0.09	0.79	0.04	0.42	0.80	OK	OK	OK										Alt Rec'd?	no							1400	2.00	0.10	0.80	0.05	0.43	0.80	OK	OK	OK

Section	Levee Station/Mile		Existing Landside Berm (assumed semipervious)										Low Points of Interest on Existing Landside										Minimum Required Berm									Recommended Berm Design																	
	From =>	21 / 3395	$X_{sp(existing)}$	t	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$		X_{PI}	t_{PI} or z_{tPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	Berm	$X_{(I,SP,S,P)}$	A	h'_t	i'_t	h'_o	i'_o	t		X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{tPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)									(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	Type	(ft)		(ft)		(ft)		(ft)		(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
49	21 / 3645	21 / 3895					0.50						100	5.5	1.90	0.71	0.35	0.53	0.70	NG	OK	OK	SP	0								150	5.0	2.1	2.9	0.27	OK	-0.17	OK	100	Covered								
													171	7.0	1.61	0.30	0.23	0.27	0.80	OK	OK	OK	Check:	NA								No Berm Req		Width	Thickness					171	7.00	1.92	0.35	0.27	0.31	0.80	OK	OK	OK
																																Install Anyway?	yes	150	5														

Section	Levee Station/Mile		Existing Landside Berm (assumed semipervious)										Low Points of Interest on Existing Landside										Minimum Required Berm									Recommended Berm Design																	
	From =>	21 / 3895	$X_{sp(existing)}$	t	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$		X_{PI}	t_{PI} or z_{tPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	Berm	$X_{(I,SP,S,P)}$	A	h'_t	i'_t	h'_o	i'_o	t		X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{tPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)									(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	Type	(ft)		(ft)		(ft)		(ft)		(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
50	21 / 4145	21 / 4395					0.50						100	4.5	2.93	1.21	0.65	0.93	0.70	NG	OK	NG	SP	0								150	5.0	3.0	3.7	0.42	OK	-0.11	OK	100	Covered								
													171	5.0	2.64	0.93	0.53	0.73	0.80	NG	OK	OK	Check:	NA								No Berm Req		Width	Thickness					171	5.00	2.84	0.97	0.57	0.77	0.80	NG	OK	OK
													400	5.0	1.89	0.78	0.38	0.58	0.80	OK	OK	OK										Install Anyway?	yes	150	5					400	5.00	2.03	0.81	0.41	0.61	0.80	NG	OK	OK

Section	Levee Station/Mile		Existing Landside Berm (assumed semipervious)										Low Points of Interest on Existing Landside										Minimum Required Berm									Recommended Berm Design																	
	From =>	21 / 4395	$X_{sp(existing)}$	t	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$		X_{PI}	t_{PI} or z_{tPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	Berm	$X_{(I,SP,S,P)}$	A	h'_t	i'_t	h'_o	i'_o	t		X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o		X_{PI}	z_{tPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)									(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	Type	(ft)		(ft)		(ft)		(ft)		(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
51	21 / 4645	21 / 4895					0.50						171	2.5	2.25	1.70	0.90	1.30	0.80	NG	NG	NG	SP	95	12.486	2.8	0.62	3.4	0.30	1.6		150	5.0	2.7	3.7	0.60	OK	-0.14	OK	171	2.50	2.51	1.81	1.01	1.41	0.80	NG	NG	NG
													275	2.5	1.78	1.51	0.71	1.11	0.80	NG	OK	NG	Check:	OK			0.62													275	2.50	1.99	1.60	0.80	1.20	0.80	NG	OK	NG
													3000	2.5	0.00	0.80	0.00	0.40	0.80	OK	OK	OK										Alt Rec'd?	no							3000	2.50	0.00	0.80	0.00	0.40	0.80	OK	OK	OK

Section	Levee Station/Mile		Existing Landside Berm (assumed semipervious)										Low Points of Interest on Existing Landside										Minimum Required Berm									Recommended Berm Design																	
	From =>	21 / 4895	$X_{sp(existing)}$	t	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$		X_{PI}	t_{PI} or z_{tPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	Berm	$X_{(I,SP,S,P)}$	A	h'_t	i'_t	h'_o	i'_o	t		X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{tPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)									(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	Type	(ft)		(ft)		(ft)		(ft)		(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
52	21 / 5145	22 / 190					0.50						100	3.5	3.51	2.29	1.00	1.65	0.70	NG	NG	NG	SP	0								150	5.0	3.5	4.2	0.44	OK	-0.06	OK	100	Covered								
													171	6.0	3.20	0.87	0.53	0.70	0.80	NG	OK	OK	Check:	NA								No Berm Req		Width	Thickness					171	6.00	3.38	0.90	0.56	0.73	0.80	NG	OK	OK
													250	6.0	2.88	0.81	0.48	0.65	0.80	NG	OK	OK										Install Anyway?	yes	150	5					250	6.00	3.05	0.84	0.51	0.67	0.80	NG	OK	OK

Section	Levee Station/Mile		Existing Landside Berm (assumed semipervious)										Low Points of Interest on Existing Landside										Minimum Required Berm									Recommended Berm Design																	
	From =>	22 / 190	$X_{sp(existing)}$	t	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$		X_{PI}	t_{PI} or z_{tPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	Berm	$X_{(I,SP,S,P)}$	A	h'_t	i'_t	h'_o	i'_o	t		X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{tPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)									(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	Type	(ft)		(ft)		(ft)		(ft)		(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
53	22 / 440	22 / 690					0.50						100	6.0	3.04	1.09	0.51	0.80	0.70	NG	OK	NG	SP	0								150	5.0	3.1	3.7	0.32	OK	-0.09	OK	100	Covered								
													171	7.5	2.77	0.64	0.37	0.50	0.80	OK	OK	OK	Check:	NA								No Berm Req		Width	Thickness					171	7.50	2.97	0.66	0.40	0.53	0.80	OK	OK	OK
																																Install Anyway?	yes	150	5														

Section	Levee Station/Mile		Existing Landside Berm (assumed semipervious)										Low Points of Interest on Existing Landside										Minimum Required Berm									Recommended Berm Design																	
	From =>	22 / 690	$X_{sp(existing)}$	t	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$		X_{PI}	t_{PI} or z_{tPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	Berm	$X_{(I,SP,S,P)}$	A	h'_t	i'_t	h'_o	i'_o	t		X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{tPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)									(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	Type	(ft)		(ft)		(ft)		(ft)		(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
54	22 / 940	22 / 1190					0.50						100	1.5	2.00	3.66	1.33	2.50	0.70	NG	NG	NG	SP	0								150	5.0	2.1	2.9	0.43	OK	-0.21	OK	100	Covered								
													171	3.0	1.72	1.24	0.57	0.91	0.80	NG	OK	NG	Check:	NA								No Berm Req		Width	Thickness					171	3.00	2.01	1.34	0.67	1.00	0.80	NG	OK	NG
													1000	3.0	0.31	0.77	0.10	0.44	0.80	OK	OK	OK										Install Anyway?	yes	150	5					1000	3.00	0.36	0.79	0.12	0.45	0.80	OK	OK	OK

Section	Levee Station/Mile		Existing Landside Berm (assumed semipervious)										Low Points of Interest on Existing Landside										Minimum Required Berm									Recommended Berm Design																	
	From =>	22 / 1190	$X_{sp(existing)}$	t	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$		X_{PI}	t_{PI} or z_{tPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	Berm	$X_{(I,SP,S,P)}$	A	h'_t	i'_t	h'_o	i'_o	t		X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{tPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)									(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	Type	(ft)		(ft)		(ft)		(ft)		(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
55	22 / 1440	22 / 1690					0.50						100	4.0	2.63	1.53	0.66	1.10	0.70	NG	OK	NG	SP	0								150	5.0	2.7	3.4	0.36	OK	-0.13	OK	100	Covered								
													171	5.5	2.36	0.79	0.43	0.61	0.80	OK	OK	OK	Check:	NA								No Berm Req		Width	Thickness					171	5.50	2.60	0.84	0.47	0.65	0.80	NG	OK	OK
													220	5.5	2.19	0.76	0.40	0.58	0.80	OK	OK	OK										Install Anyway?	yes	150	5					220	5.50	2.41	0.80	0.44	0.62	0.80	OK	OK	OK

Section	Levee Station/Mile		Existing Landside Berm (assumed semipervious)										Low Points of Interest on Existing Landside										Minimum Required Berm									Recommended Berm Design																	
	From =>	22 / 1690	$X_{sp(existing)}$	t	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$		X_{PI}	t_{PI} or z_{tPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	Berm	$X_{(I,SP,S,P)}$	A	h'_t	i'_t	h'_o	i'_o	t		X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o		X_{PI}	z_{tPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)									(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	Type	(ft)		(ft)		(ft)		(ft)		(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
56	22 / 1940	22 / 2190					0.50						171	1.0	1.18	3.18	1.18	2.18	0.80	NG	NG	NG	SP	75	22.485	1.6	0.54	2.0	0.30	0.8		150	5.0	1.6	2.4	0.54	OK	-0.33	OK	171	1.00	1.48	3.48	1.48	2.48	0.80	NG	NG	NG
													400	1.0	0.62	2.62	0.62	1.62	0.80	NG	OK	NG	Check:	OK			0.55													400	1.00	0.79	2.79	0.79	1.79	0.80	NG	OK	NG
													1500	1.0	0.03	2.03	0.03	1.03	0.80	NG	OK	NG										Alt Rec'd?	no							1500	1.00	0.04	2.04	0.04	1.04	0.80	NG	OK	NG

Section	Levee Station/Mile		Existing Landside Berm (assumed semipervious)										Low Points of Interest on Existing Landside										Minimum Required Berm									Recommended Berm Design																	
	From =>	22 / 2190	$X_{sp(existing)}$	t	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$		X_{PI}	t_{PI} or z_{tPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	Berm	$X_{(I,SP,S,P)}$	A	h'_t	i'_t	h'_o	i'_o	t		X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o		X_{PI}	z_{tPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)									(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	Type	(ft)		(ft)		(ft)		(ft)		(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
57	22 / 2440	22 / 2690					0.50						475	0.5	1.27	11.54	2.54	7.04	0.80	NG	NG	NG	SP	85	12.996	2.9	0.58	3.4	0.30	1.5		150	5.0	2.8	3.7	0.55	OK	-0.13	OK	475	0.50	1.41	11.82	2.82	7.32	0.80	NG	NG	NG
													475	1.8	1.27	2.48	0.71	1.60	0.80	NG	OK	NG	Check:	OK			0.58													475	1.80	1.41	2.56	0.78	1.67	0.80	NG	OK	NG
													475	3.6	1.27	0.74	0.35	0.55	0.80	OK	OK	OK										Alt Rec'd?	no							475	3.60	1.41	0.78	0.39	0.59	0.80	OK	OK	OK

Section	Levee Station/Mile		Existing Landside Berm (assumed semipervious)										Low Points of Interest on Existing Landside										Minimum Required Berm									Recommended Berm Design																	
	From =>	22 / 2690	$X_{sp(existing)}$	t	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$		X_{PI}	t_{PI} or z_{tPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$				Berm	$X_{(I,SP,S,P)}$	A	h'_t	i'_t	h'_o	i'_o	t		X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o		X_{PI}	z_{tPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)									(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	Type	(ft)		(ft)		(ft)		(ft)		(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
58	22 / 2940	22 / 3190					0.50																SP	80	9.698	4.1	0.55	4.7	0.30	1.9		150	5.0	3.9	4.8	0.52	OK	-0.01	OK										
																							Check:	OK			0.57																						
																																Alt Rec'd?	no																

Section	Levee Station/Mile		Existing Landside Berm (assumed semipervious)										Low Points of Interest on Existing Landside										Minimum Required Berm									Recommended Berm Design																	
	From =>	22 / 3190	$X_{sp(existing)}$	t	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$		X_{PI}	t_{PI} or z_{tPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	Berm	$X_{(I,SP,S,P)}$	A	h'_t	i'_t	h'_o	i'_o	t		X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o		X_{PI}	z_{tPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)									(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	Type	(ft)		(ft)		(ft)		(ft)		(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
59	22 / 3440	22 / 3690					0.50																SP	70	13.077	2.9	0.53	3.3	0.30	1.3		150	5.0	2.7	3.6	0.50	OK	-0.13	OK										
																							Check:	OK			0.53																						
																																Alt Rec'd?	no																

Section	Levee Station/Mile		Existing Landside Berm (assumed semipervious)										Low Points of Interest on Existing Landside										Minimum Required Berm									Recommended Berm Design																	
	From =>	22 / 3690	$X_{sp(existing)}$	t	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$		X_{PI}	t_{PI} or z_{tPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	Berm	$X_{(I,SP,S,P)}$	A	h'_t	i'_t	h'_o	i'_o	t		X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{tPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)									(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	Type	(ft)		(ft)		(ft)		(ft)		(ft)	(ft)	(ft)	(ft)				*	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
60	22 / 3940	22 / 4190					0.50																SP	0								No Berm Req																	
																							Check:	NA								No Berm Req																	
																																Install Anyway?	no																

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	22 / 4190	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	1080	1230	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
61	22 / 4440	22 / 4690	9.5	5.5	cl	cl	150	i		1250	100	0.39	0.62	0.000506	0.000833	1080	840	940	264.0	256	256	8.0	10	sm	7.52	1100	147	0.0021565	i		460	460	10	2.63	0.26	1.358
	No New Ditch													X_1 Controlling:		Pit										0.21654						γ_{avg}	FoS		
														1110	1080	1300	1450															115	3.21		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	22 / 4690	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	680	750	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
62	22 / 4940	22 / 5190	5	2	cl	cl	150	i		1300	100	0.65	0.86	0.001027	0.001864	680	680	780	263.9	256	256	7.9	7.5	cl	2.98	850	145	0.0017958	i		560	560	7.5	3.30	0.44	1.068
	No New Ditch													X_1 Controlling:		Pit										0.16732						γ_{avg}	FoS		
														850	680	1300	750															115	1.91		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	22 / 5190	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	770	700	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
63	23 / 174	23 / 424	7	3.5	cl	cl	100	i		1050	100	0.53	0.75	0.000781	0.001319	770	740	840	263.7	257	257	6.7	8	sm	8.03	850	145	0.0028535	i		350	350	8	1.97	0.25	1.020
	Ditch 5													X_1 Controlling:		Pit										0.16732						γ_{avg}	FoS		
														860	770	1300	700															115	3.42		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	23 / 424	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	540	600	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
64	23 / 674	23 / 924	3	1.5	cl	cl	100	i		1000	100	0.79	0.89	0.001458	0.002196	540	540	640	263.6	256	256	7.6	6	sm	8.65	850	145	0.0034199	i		290	290	6	2.37	0.39	1.481
	Ditch 5													X_1 Controlling:		Pit										0.16732						γ_{avg}	FoS		
														620	540	600	700															115	2.13		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	23 / 924	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	890	1050	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
65	23 / 1174	23 / 1424	7.5	4.5	cl	cl	450	i		1050	100	0.50	0.68	0.000713	0.001079	890	740	840	263.4	255.5	255.5	7.9	4	cl	3.80	800	163	0.0027003	i		370	370	6	2.42	0.40	1.252
	Ditch 5													X_1 Controlling:		RS Blanket										0.15748						γ_{avg}	FoS		
														890	1200	1300	1050															115	2.09		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	23 / 1424	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	850	900	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)		(gpm/ft)
66	23 / 1674	23 / 1924	11.5	11.5	cl	cl	0	i		900	100	0.31	0.31	0.000452	0.000452	850	790	890	263.3	254.5	254.5	8.8	6	cl	3.32	800	163	0.0020607	i		490	490	6	3.12	0.52	1.222
	Ditch 5													X_1 Controlling:		RS Blanket										0.15748						γ_{avg}	FoS		
														850	850	2500	2500															115	1.62		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	23 / 1924	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	610	650	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)		(gpm/ft)
67	23 / 2174	23 / 2424	8	8	cl	cl	50	i		650	100	0.47	0.47	0.000671	0.000671	610	610	710	263.1	254.5	254.5	8.6	7.5	cl	2.98	800	163	0.0017459	i		570	570	7.5	3.83	0.51	1.288
	Ditch 5													X_1 Controlling:		RS Blanket										0.15748						γ_{avg}	FoS		
														610	660	1300	1350															115	1.65		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	23 / 2424	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	630	650	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)		(gpm/ft)
68	23 / 2674	23 / 2924	9	8	cl	cl	50	i		650	100	0.42	0.47	0.000514	0.000578	630	630	730	262.9	254.5	254.5	8.4	7.5	cl	2.98	1100	160	0.0015028	i		670	670	7.5	4.02	0.54	1.552
	Ditch 5													X_1 Controlling:		RS Blanket										0.21654						γ_{avg}	FoS		
														630	670	1300	1350															115	1.57		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	23 / 2924	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	760	900	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)		(gpm/ft)
69	23 / 3174	23 / 3424	5	5	cl	cl	50	i		900	100	0.65	0.65	0.000859	0.000859	760	760	860	262.8	254.5	254.5	8.3	5	cl	3.56	1100	160	0.0020112	i		500	500	5	3.05	0.61	1.579
	Ditch 5													X_1 Controlling:		RS Blanket										0.21654						γ_{avg}	FoS		
														760	810	1300	1350															115	1.38		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	23 / 3424	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	600	420	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
70	23 / 3674	23 / 3924	5	4	cl	ml	20	i		1150	100	0.65	1.88	0.000859	0.001633	600	600	700	262.6	254	254	8.6	10	cl	2.45	1100	160	0.0011807	i		850	850	10	4.72	0.47	1.435
	Ditch 5													X_1 Controlling:		Pit										0.21654						γ_{avg}	FoS		
														880	600	1300	420															115	1.79		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	23 / 3924	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	680	700	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
71	23 / 4174	23 / 4424	10	9.5	cl	cl	50	i		700	100	0.37	0.39	0.000463	0.00049	680	680	780	262.5	254	254	8.5	15.5	cl	1.49	1100	157	0.0007456	i		1340	1340	15.5	5.37	0.35	1.018
	Ditch 5													X_1 Controlling:		RS Blanket										0.21654						γ_{avg}	FoS		
														680	720	1300	1350															115	2.43		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	23 / 4424	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	590	600	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)		(gpm/ft)
72	23 / 4674	23 / 4924	12	9	cl	cl	100	i		600	100	0.29	0.42	0.000372	0.000519	590	590	690	262.3	254	254	8.3	8	cl	2.87	1100	157	0.0014416	i		690	690	8	4.15	0.52	1.527
	Ditch 5													X_1 Controlling:		RS Blanket										0.21654						γ_{avg}	FoS		
														590	680	2500	1400															115	1.62		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	23 / 4924	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	640	600	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
73	23 / 5174	24 / 97	3.5	3.5	cl	cl	30	i		800	100	0.75	0.75	0.001115	0.001115	640	640	740	262.1	254	254	8.1	11	cl	2.26	1100	157	0.0010902	i		920	920	11	4.49	0.41	1.239
	Ditch 5													X_1 Controlling:		RS Blanket										0.21654						γ_{avg}	FoS		
														640	670	600	630															115	2.07		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	24 / 97	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	810	1000	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
74	24 / 347	24 / 597	6.5	5	cl	cl	20	i		1000	100	0.56	0.65	0.000754	0.000929	810	810	910	262.1	253.5	253.5	8.6	8	cl	2.87	850	177	0.0015445	i		650	650	8	3.58	0.45	1.219
	Ditch 5													X_1 Controlling:		Pit										0.16732						γ_{avg}	FoS		
														850	810	1300	1320															115	1.88		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	24 / 597	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	1000	1100	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
75	24 / 847	24 / 1097	10	8	cl	cl	100	i		1100	105	0.37	0.47	0.000496	0.000625	1000	950	1055	261.9	253	253	8.9	8	cl	2.87	850	177	0.0015445	i		650	650	8	3.39	0.42	1.154
	Ditch 5													X_1 Controlling:		RS Blanket										0.16732						γ_{avg}	FoS		
														1000	1050	1300	1400															115	1.99		

Below Piggott Seepage Study - General Seepage Evaluation, Seepage Berm Design, Existing Ditch Evaluations, and Preliminary New Ditch Evaluations

Section	Levee Station/Mile		Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$	
	From =>	22 / 4190										
	Central	To										
61	22 / 4440	22 / 4690					0.50					

Low Points of Interest on Existing Landside X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
50	8.0	2.36	0.54	0.29	0.42	0.60	OK	OK	OK

Minimum Required Berm: Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	0						
Check:	NA						

Recommended Berm Design: X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	*	X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
No Berm Req																	
No Berm Req																	
Install Anyway?	no																

Section	Levee Station/Mile		Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$	
	From =>	22 / 4690										
	Central	To										
62	22 / 4940	22 / 5190					0.50					

Low Points of Interest on Existing Landside X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
480	5.5	1.39	0.62	0.25	0.44	0.80	OK	OK	OK

Minimum Required Berm: Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	0						
Check:	NA						

Recommended Berm Design: X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	*	X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
No Berm Req																	
No Berm Req																	
Install Anyway?	no																

Section	Levee Station/Mile		Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$	
	From =>	22 / 5190										
	Central	To										
63	23 / 174	23 / 424					0.50					

Low Points of Interest on Existing Landside X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
480	5.0	0.50	0.70	0.10	0.40	0.80	OK	OK	OK
171	6.5	1.21	0.42	0.19	0.30	0.80	OK	OK	OK

Minimum Required Berm: Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	0						
Check:	NA						

Recommended Berm Design: X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	*	X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
No Berm Req																	
No Berm Req																	
Install Anyway?	no																

Section	Levee Station/Mile		Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$	
	From =>	23 / 424										
	Central	To										
64	23 / 674	23 / 924					0.50					

Low Points of Interest on Existing Landside X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
70	3.5	1.87	1.25	0.53	0.89	0.64	NG	OK	NG
171	4.5	1.32	0.63	0.29	0.46	0.80	OK	OK	OK

Minimum Required Berm: Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	0						
Check:	NA						

Recommended Berm Design: X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	*	X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
No Berm Req																	
No Berm Req																	
Install Anyway?	no																

Section	Levee Station/Mile		Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$	
	From =>	23 / 924										
	Central	To										
65	23 / 1174	23 / 1424					0.50					

Low Points of Interest on Existing Landside X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
65	4.0	2.03	1.01	0.51	0.76	0.63	NG	OK	NG
171	4.5	1.52	0.67	0.34	0.50	0.80	OK	OK	OK

Minimum Required Berm: Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	0						
Check:	NA						

Recommended Berm Design: X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	*	X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
No Berm Req																	
No Berm Req																	
Install Anyway?	no																

Section	Levee Station/Mile		Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$	
	From =>	23 / 1424										
	Central	To										
66	23 / 1674	23 / 1924					0.50					

Low Points of Interest on Existing Landside X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
65	4.0	2.73	1.18	0.68	0.93	0.63	NG	NG	NG
171	4.5	2.20	0.82	0.49	0.65	0.80	NG	OK	OK
250	4.5	1.87	0.75	0.41	0.58	0.80	OK	OK	OK

Minimum Required Berm: Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	55	14.831	2.8	0.47	3.2	0.30	1.1
Check:	OK			0.48			

Recommended Berm Design: X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o		X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
150	5.0	2.6	3.5	0.44	OK	-0.13	OK	65	Covered								
								171	4.50	2.47	0.88	0.55	0.72	0.80	NG	OK	OK
Alt Rec'd?	no							250	4.50	2.10	0.80	0.47	0.63	0.80	OK	OK	OK

Section	Levee Station/Mile		Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$	
	From =>	23 / 1924										
	Central	To										
67	23 / 2174	23 / 2424					0.50					

Low Points of Interest on Existing Landside X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
75	6.0	3.36	0.81	0.56	0.68	0.65	NG	OK	NG
171	6.0	2.84	0.72	0.47	0.60	0.80	OK	OK	OK

Minimum Required Berm: Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	55	12.056	3.5	0.47	3.9	0.30	1.2
Check:	OK			0.48			

Recommended Berm Design: X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o		X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
150	5.0	3.2	4.1	0.43	OK	-0.07	OK	75	Covered								
								171	6.00	3.07	0.76	0.51	0.64	0.80	OK	OK	OK
Alt Rec'd?	no																

Section	Levee Station/Mile		Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$	
	From =>	23 / 2424										
	Central	To										
68	23 / 2674	23 / 2924					0.50					

Low Points of Interest on Existing Landside X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
100	6.0	3.46	0.83	0.58	0.70	0.70	NG	OK	OK
171	5.5	3.11	0.93	0.57	0.75	0.80	NG	OK	OK
400	5.5	2.20	0.76	0.40	0.58	0.80	OK	OK	OK

Minimum Required Berm: Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	60	11.230	3.7	0.50	4.1	0.30	1.4
Check:	OK			0.50			

Recommended Berm Design: X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o		X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
150	5.0	3.4	4.3	0.46	OK	-0.06	OK	100	Covered								
								171	5.50	3.31	0.96	0.60	0.78	0.80	NG	OK	OK
Alt Rec'd?	no							400	5.50	2.34	0.79	0.43	0.61	0.80	OK	OK	OK

Section	Levee Station/Mile		Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$	
	From =>	23 / 2924										
	Central	To										
69	23 / 3174	23 / 3424					0.50					

Low Points of Interest on Existing Landside X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
171	3.0	2.16	1.39	0.72	1.05	0.80	NG	OK	NG
180	3.0	2.12	1.37	0.71	1.04	0.80	NG	OK	NG
1100	3.0	0.33	0.78	0.11	0.44	0.80	OK	OK	OK

Minimum Required Berm: Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	75	13.975	2.7	0.54	3.1	0.30	1.3
Check:	OK			0.55			

Recommended Berm Design: X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o		X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
150	5.0	2.6	3.4	0.51	OK	-0.16	OK	171	3.00	2.42	1.47	0.81	1.14	0.80	NG	NG	NG
								180	3.00	2.38	1.46	0.79	1.13	0.80	NG	OK	NG
Alt Rec'd?	no							1100	3.00	0.37	0.79	0.12	0.46	0.80	OK	OK	OK

Section	Levee Station/Mile		Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$	
	From =>	23 / 3424										
	Central	To										
70	23 / 3674	23 / 3924					0.50					

Low Points of Interest on Existing Landside X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
100	8.5	4.19	0.67	0.49	0.58	0.70	OK	OK	OK
171	8.0	3.85	0.73	0.48	0.61	0.80	OK	OK	OK

Minimum Required Berm: Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	0						
Check:	NA						

Recommended Berm Design: X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	*	X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
150	5.0	4.1	4.9	0.41	OK	-0.01	OK	100	Covered								
No Berm Req		Width	Thickness					171	8.00	4.01	0.75	0.50	0.63	0.80	OK	OK	OK
Install Anyway?	yes	150	5														

Section	Levee Station/Mile		Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$	
	From =>	23 / 3924										
	Central	To										
71	23 / 4174	23 / 4424					0.50					

Low Points of Interest on Existing Landside X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
110	14.0	4.95	0.46	0.35	0.41	0.72	OK	OK	OK
171	13.5	4.73	0.50	0.35	0.42	0.80	OK	OK	OK

Minimum Required Berm: Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	0						
Check:	NA						

Recommended Berm Design: X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	*	X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
150	5.0	4.9	5.5	0.32	OK	0.02	OK	110	Covered								
No Berm Req		Width	Thickness					171	13.50	4.82	0.51	0.36	0.43	0.80	OK	OK	OK
Install Anyway?	yes	150	5														

Section	Levee Station/Mile		Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$	
	From =>	23 / 4424										
	Central	To										
72	23 / 4674	23 / 4924					0.50					

Low Points of Interest on Existing Landside X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
110	6.0	3.54	0.92	0.59	0.76	0.72	NG	OK	NG
171	6.0	3.24	0.87	0.54	0.71	0.80	NG	OK	OK
310	6.0	2.65	0.78	0.44	0.61	0.80	OK	OK	OK

Minimum Required Berm: Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	55	10.862	3.9	0.48	4.2	0.30	1.4
Check:	OK			0.48			

Recommended Berm Design: X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o		X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
150	5.0	3.6	4.4	0.45	OK	-0.05	OK	110	Covered								
								171	6.00	3.43	0.91	0.57	0.74	0.80	NG	OK	OK
Alt Rec'd?	no							310	6.00	2.81	0.80	0.47	0.63	0.80	OK	OK	OK

Section	Levee Station/Mile		Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$	
	From =>	23 / 4924										
	Central	To										
73	23 / 5174	24 / 97					0.50					

Low Points of Interest on Existing Landside X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
80	9.0	4.11	0.68	0.46	0.57	0.66	NG	OK	OK
171	9.0	3.73	0.64	0.41	0.53	0.80	OK	OK	OK

Minimum Required Berm: Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	0						
Check:	NA						

Recommended Berm Design: X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	*	X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
No Berm Req																	
No Berm Req																	
Install Anyway?	no																

Section	Levee Station/Mile		Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$	
	From =>	24 / 97										
	Central	To										
74	24 / 347	24 / 597					0.50					

Low Points of Interest on Existing Landside X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
80	5.5	3.17	1.03	0.58	0.80	0.66	NG	OK	NG
171	6.0	2.75	0.79	0.46	0.63	0.80	OK	OK	OK
210	6.0	2.59	0.77	0.43	0.60	0.80	OK	OK	OK

Minimum Required Berm: Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	0						
Check:	NA						

Recommended Berm Design: X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	*	X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
No Berm Req																	
No Berm Req																	
Install Anyway?	no																

Section	Levee Station/Mile		Existing Landside Berm (assumed semipervious) $X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$	
	From =>	24 / 597										
	Central	To										
75	24 / 847	24 / 1097					0.50					

Low Points of Interest on Existing Landside X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
90	5.5	2.95	0.99	0.54	0.76	0.68	NG	OK	NG
171	6.0	2.61	0.77	0.43	0.60	0.80	OK	OK	OK
180	6.0	2.57	0.76	0.43	0.59	0.80	OK	OK	OK

Minimum Required Berm: Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	0						
Check:	NA						

Recommended Berm Design: X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	*	X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
No Berm Req																	
No Berm Req																	
Install Anyway?	no																

Below Piggott Seepage Study - General Seepage Evaluation, Seepage Berm Design, Existing Ditch Evaluations, and Preliminary New Ditch Evaluations

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																
	From =>	24 / 1097	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	810	900	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
76	24 / 1347	24 / 1597	7.5	7.5	cl	cl	40	i		900	105	0.50	0.50	0.000664	0.000664	810	740	845	261.7	253	253	8.7	10	cl	2.45	850	177	0.0012770	i		780	780	10	4.18	0.42	1.184
	Ditch 5													X_1 Controlling:		RS Blanket										0.16732						γ_{avg}	FoS		
														810	850	1300	1340															115	2.02		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																
	From =>	24 / 1597	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	540	600	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
77	24 / 1847	24 / 2097	5	5	cl	cl	0	i		600	100	0.65	0.65	0.000963	0.000963	540	540	640	261.6	253	253	8.6	3.5	cl	3.93	800	175	0.0028310	i		350	350	5.5	3.04	0.55	1.788
	Ditch 5													X_1 Controlling:		RS Blanket										0.15748						γ_{avg}	FoS		
														540	540	1300	1300															115	1.52		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																
	From =>	24 / 2097	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	530	550	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
78	24 / 2347	24 / 2597	7.5	7.5	cl	cl	0	i		550	100	0.50	0.50	0.000688	0.000688	530	530	630	261.4	252.5	252.5	8.9	5	cl	3.56	800	175	0.0022551	i		440	440	5	3.66	0.73	1.712
	Ditch 5													X_1 Controlling:		RS Blanket										0.15748						γ_{avg}	FoS		
														530	530	1300	1300															115	1.15		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																
	From =>	24 / 2597	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	450	400	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
79	24 / 2847	24 / 3097	3.5	3.5	ml	ml	0	i		750	100	1.95	1.95	0.001995	0.001995	450	450	550	261.3	252	252	9.3	12.5	cl	1.98	800	175	0.0010640	i		940	940	12.5	5.87	0.47	1.285
	No New Ditch													X_1 Controlling:		RS Blanket										0.15748						γ_{avg}	FoS		
														450	450	400	400															115	1.80		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																
	From =>	24 / 3097	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	850	1000	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
80	24 / 3347	24 / 3597	7	5	cl	cl	50	i		1000	100	0.53	0.65	0.000678	0.000892	850	670	770	261.1	252	252	9.1	5	cl	3.56	950	172	0.0020873	i		480	480	9	3.49	0.39	1.749
	No New Ditch													X_1 Controlling:		Pit										0.18701						γ_{avg}	FoS		
														870	850	1300	1350															115	2.17		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																
	From =>	24 / 3597	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	720	600	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
81	24 / 3847	24 / 4097	3.5	1.5	cl	cl	200	i		1350	100	0.75	0.89	0.001146	0.001907	720	720	820	261.0	252.5	252.5	8.5	5	cl	3.56	950	172	0.0020873	i		480	480	5	3.14	0.63	1.571
	No Ditch													X_1 Controlling:		Pit										0.18701						γ_{avg}	FoS		
														800	720	600	800															115	1.34		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																
	From =>	24 / 4097	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	1070	1300	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
82	24 / 4347	24 / 4597	7.5	5.5	cl	cl	250	i		1300	100	0.50	0.62	0.000637	0.000829	1070	880	980	260.9	252	252	8.9	10	cl	2.45	950	172	0.0012254	i		820	820	10	4.05	0.41	1.188
	No Ditch													X_1 Controlling:		RS Blanket										0.18701						γ_{avg}	FoS		
														1070	1210	1300	1550															115	2.08		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																
	From =>	24 / 4597	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	1060	1300	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
83	24 / 4847	25 / 5097	8	6	cl	cl	250	i		1300	100	0.47	0.59	0.000649	0.000837	1060	950	1050	260.7	252	252	8.7	7.5	cl	2.98	850	164	0.0016886	i		590	590	7.5	3.13	0.42	1.087
	Ditch 6													X_1 Controlling:		RS Blanket										0.16732						γ_{avg}	FoS		
														1060	1200	1300	1550															115	2.02		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																
	From =>	25 / 5097	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	810	950	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
84	25 / 48	25 / 298	6.5	5.5	cl	cl	75	i		950	100	0.56	0.62	0.000783	0.000897	810	810	910	260.6	252	252	8.6	5	cl	3.56	850	164	0.0022599	i		440	440	5	2.80	0.56	1.305
	Ditch 6													X_1 Controlling:		RS Blanket										0.16732						γ_{avg}	FoS		
														810	850	1300	1375															115	1.50		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																
	From =>	25 / 298	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	660	650	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
85	25 / 548	25 / 798	6.5	2.5	cl	cl	50	i		1100	100	0.56	0.82	0.000783	0.001535	660	660	760	260.4	252.5	252.5	7.9	4	cl	3.80	850	164	0.0026117	i		380	380	4	2.63	0.66	1.420
	Ditch 6													X_1 Controlling:		Pit										0.16732						γ_{avg}	FoS		
														890	660	1300	650															115	1.28		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																
	From =>	25 / 798	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	1030	1300	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
86	25 / 1048	25 / 1298	7.5	5	cl	cl	75	i		1300	100	0.50	0.65	0.000588	0.000823	1030	720	820	260.2	253	253	7.2	2.5	cl	4.18	1200	160	0.0029504	i		340	340	2.5	2.11	0.84	1.752
	Ditch 6													X_1 Controlling:		Pit										0.23622						γ_{avg}	FoS		
														1090	1030	1300	1375															115	1.00		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																
	From =>	25 / 1298	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	520	400	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
87	25 / 1548	25 / 1798	4	2	ml	ml	100	i		1200	100	1.88	2.16	0.001564	0.002372	520	520	620	260.0	252.5	252.5	7.5	5.5	cl	3.44	1200	160	0.0018049	i		550	550	5.5	3.53	0.64	1.809
	Ditch 6													X_1 Controlling:		Pit										0.23622						γ_{avg}	FoS		
														610	520	400	500															115	1.32		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																
	From =>	25 / 1798	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	840	650	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
88	25 / 2048	25 / 2298	6.5	3	cl	cl	50	i		1400	100	0.56	0.79	0.000667	0.001168	840	720	820	259.8	252.5	252.5	7.3	8.5	cl	2.76	1200	160	0.0013013	i		770	770	8.5	3.54	0.42	1.296
	Ditch 6													X_1 Controlling:		Pit										0.23622						γ_{avg}	FoS		
														1100	840	1300	650															115	2.03		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																
	From =>	25 / 2298	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	680	650	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
89	25 / 2548	25 / 2798	8.5	2.5	cl	cl	50	i		1800	100	0.44	0.82	0.000625	0.001569	680	680	780	259.6	253	253	6.6	2.5	cl	4.18	850	157	0.0035389	i		280	280	2.5	1.74	0.70	1.221
	Ditch 6													X_1 Controlling:		Pit										0.16732						γ_{avg}	FoS		
														1290	680	1300	650															115	1.21		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																
	From =>	25 / 2798	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	680	650	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
90	25 / 3048	25 / 3298	6	2.5	cl	cl	50	i		1800	100	0.59	0.82	0.000855	0.001569	680	680	780	259.4	252	252	7.4	5.5	cl	3.44	850	157	0.0021650	i		460	460	7	2.75	0.39	1.171
	Ditch 6													X_1 Controlling:		Pit										0.16732						γ_{avg}	FoS		
														1070	680	1300	650															115	2.15		

Below Piggott Seepage Study - General Seepage Evaluation, Seepage Berm Design, Existing Ditch Evaluations, and Preliminary New Ditch Evaluations

Section 76

Section	Levee Station/Mile From =>	Central	To	$X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$	h'_t	i_t'	$i_{t(allowable)}$
76	24 / 1097	24 / 1347	24 / 1597					0.50			

Low Points of Interest on Existing Landside

X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
90	7.0	3.72	0.96	0.53	0.75	0.68	NG	OK	NG
171	8.0	3.36	0.67	0.42	0.54	0.80	OK	OK	OK

Minimum Required Berm

Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	0						
Check:	NA						

Recommended Berm Design

X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	* *
No Berm Req							
No Berm Req							
Install Anyway?	no						

X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL

Section 77

Section	Levee Station/Mile From =>	Central	To	$X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$	h'_t	i_t'	$i_{t(allowable)}$
77	24 / 1597	24 / 1847	24 / 2097					0.50			

Low Points of Interest on Existing Landside

X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
90	2.5	2.36	2.14	0.94	1.54	0.68	NG	NG	NG
171	3.5	1.87	1.11	0.54	0.82	0.80	NG	OK	NG
525	3.5	0.69	0.77	0.20	0.48	0.80	OK	OK	OK

Minimum Required Berm

Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	60	14.777	2.6	0.48	3.1	0.30	1.1
Check:	OK			0.50			

Recommended Berm Design

X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	
150	5.0	2.4	3.6	0.44	OK	-0.14	OK
Alt Rec'd?	no						

X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
90	Covered								
171	3.50	2.20	1.20	0.63	0.91	0.80	NG	OK	NG
525	3.50	0.81	0.80	0.23	0.52	0.80	OK	OK	OK

Section 78

Section	Levee Station/Mile From =>	Central	To	$X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$	h'_t	i_t'	$i_{t(allowable)}$
78	24 / 2097	24 / 2347	24 / 2597					0.50			

Low Points of Interest on Existing Landside

X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
171	3.0	2.49	1.50	0.83	1.16	0.80	NG	NG	NG
235	3.0	2.15	1.38	0.72	1.05	0.80	NG	OK	NG
1025	3.0	0.36	0.79	0.12	0.45	0.80	OK	OK	OK

Minimum Required Berm

Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	95	12.385	3.1	0.61	3.8	0.30	1.8
Check:	OK			0.62			

Recommended Berm Design

X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	
150	5.0	2.9	4.1	0.59	OK	-0.09	OK
Alt Rec'd?	no						

X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
171	3.00	2.77	1.59	0.92	1.26	0.80	NG	NG	NG
235	3.00	2.40	1.47	0.80	1.13	0.80	NG	OK	NG
1025	3.00	0.40	0.80	0.13	0.47	0.80	OK	OK	OK

Section 79

Section	Levee Station/Mile From =>	Central	To	$X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$	h'_t	i_t'	$i_{t(allowable)}$
79	24 / 2597	24 / 2847	24 / 3097					0.50			

Low Points of Interest on Existing Landside

X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
270	9.5	4.40	0.78	0.46	0.62	0.80	OK	OK	OK

Minimum Required Berm

Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	0						
Check:	NA						

Recommended Berm Design

X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	*
150	5.0	5.1	6.0	0.41	OK	0.06	OK
No Berm Req		Width	Thickness				
Install Anyway?	yes	150	5				

X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
270	9.50	4.51	0.79	0.47	0.63	0.80	OK	OK	OK

Section 80

Section	Levee Station/Mile From =>	Central	To	$X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$	h'_t	i_t'	$i_{t(allowable)}$
80	24 / 3097	24 / 3347	24 / 3597					0.50			

Low Points of Interest on Existing Landside

X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
700	6.5	0.81	0.51	0.12	0.32	0.80	OK	OK	OK

Minimum Required Berm

Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	0						
Check:	NA						

Recommended Berm Design

X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	*
150	5.0	2.9	3.9	0.32	OK	-0.08	OK
No Berm Req		Width	Thickness				
Install Anyway?	yes	150	5				

X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
700	6.50	0.90	0.52	0.14	0.33	0.80	OK	OK	OK

Section 81

Section	Levee Station/Mile From =>	Central	To	$X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$	h'_t	i_t'	$i_{t(allowable)}$
81	24 / 3597	24 / 3847	24 / 4097					0.50			

Low Points of Interest on Existing Landside

X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL

Minimum Required Berm

Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	80	13.838	2.7	0.55	3.2	0.30	1.3
Check:	OK			0.57			

Recommended Berm Design

X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	
150	5.0	2.6	3.5	0.52	OK	-0.15	OK
Alt Rec'd?	no						

X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL

Section 82

Section	Levee Station/Mile From =>	Central	To	$X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$	h'_t	i_t'	$i_{t(allowable)}$
82	24 / 4097	24 / 4347	24 / 4597					0.50			

Low Points of Interest on Existing Landside

X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL

Minimum Required Berm

Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	0						
Check:	NA						

Recommended Berm Design

X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	*
150	5.0	3.6	4.3	0.36	OK	-0.05	OK
No Berm Req		Width	Thickness				
Install Anyway?	yes	150	5				

X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL

Section 83

Section	Levee Station/Mile From =>	Central	To	$X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$	h'_t	i_t'	$i_{t(allowable)}$
83	24 / 4597	24 / 4847	24 / 5097					0.50			

Low Points of Interest on Existing Landside

X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
50	5.5	2.88	0.89	0.52	0.70	0.60	NG	OK	NG
171	6.0	2.34	0.64	0.39	0.52	0.80	OK	OK	OK

Minimum Required Berm

Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	0						
Check:	NA						

Recommended Berm Design

X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	*
150	5.0	2.7	3.5	0.36	OK	-0.12	OK
No Berm Req		Width	Thickness				
Install Anyway?	yes	150	5				

X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
50	Covered								
171	6.00	2.59	0.68	0.43	0.56	0.80	OK	OK	OK

Section 84

Section	Levee Station/Mile From =>	Central	To	$X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$	h'_t	i_t'	$i_{t(allowable)}$
84	24 / 5097	25 / 48	25 / 298					0.50			

Low Points of Interest on Existing Landside

X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
50	3.0	2.50	1.50	0.83	1.17	0.60	NG	NG	NG
171	3.5	1.90	0.97	0.54	0.76	0.80	NG	OK	OK
400	3.5	1.14	0.75	0.32	0.54	0.80	OK	OK	OK

Minimum Required Berm

Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	65	15.807	2.5	0.50	2.9	0.30	1.1
Check:	OK			0.52			

Recommended Berm Design

X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	
150	5.0	2.3	3.2	0.47	OK	-0.18	OK
Alt Rec'd?	no						

X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
50	Covered								
171	3.50	2.20	1.06	0.63	0.84	0.80	NG	OK	NG
400	3.50	1.31	0.80	0.37	0.59	0.80	OK	OK	OK

Section 85

Section	Levee Station/Mile From =>	Central	To	$X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$	h'_t	i_t'	$i_{t(allowable)}$
85	25 / 298	25 / 548	25 / 798					0.50			

Low Points of Interest on Existing Landside

X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
50	2.0	2.31	2.16	1.16	1.66	0.60	NG	NG	NG
171	2.5	1.68	1.27	0.67	0.97	0.80	NG	OK	NG
700	2.5	0.42	0.77	0.17	0.47	0.80	OK	OK	OK

Minimum Required Berm

Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	80	15.176	2.2	0.56	2.7	0.30	1.2
Check:	OK			0.57			

Recommended Berm Design

X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	
150	5.0	2.1	3.1	0.54	OK	-0.21	OK
Alt Rec'd?	no						

X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
50	Covered								
171	2.50	1.98	1.39	0.79	1.09	0.80	NG	OK	NG
700	2.50	0.50	0.80	0.20	0.50	0.80	OK	OK	OK

Section 86

Section	Levee Station/Mile From =>	Central	To	$X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$	h'_t	i_t'	$i_{t(allowable)}$
86	25 / 798	25 / 1048	25 / 1298					0.50			

Low Points of Interest on Existing Landside

X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
171	1.0	1.27	2.77	1.27	2.02	0.80	NG	NG	NG
400	1.0	0.65	2.15	0.65	1.40	0.80	NG	OK	NG
1500	1.0	0.03	1.53	0.03	0.78	0.80	NG	OK	OK

Minimum Required Berm

Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	110	16.491	1.7	0.66	2.3	0.30	1.2
Check:	OK			0.67			

Recommended Berm Design

X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	
150	5.0	1.7	2.6	0.69	OK	-0.32	OK
Alt Rec'd?	no						

X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
171	1.00	1.56	3.06	1.56	2.31	0.80	NG	NG	NG
400	1.00	0.79	2.29	0.79	1.54	0.80	NG	OK	NG
1500	1.00	0.03	1.53	0.03	0.78	0.80	NG	OK	OK

Section 87

Section	Levee Station/Mile From =>	Central	To	$X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$	h'_t	i_t'	$i_{t(allowable)}$
87	25 / 1298	25 / 1548	25 / 1798					0.50			

Low Points of Interest on Existing Landside

X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
60	3.5	3.16	1.48	0.90	1.19	0.62	NG	NG	NG
171	3.5	2.59	1.31	0.74	1.03	0.80	NG	OK	NG
860	3.5	0.75	0.78	0.21	0.50	0.80	OK	OK	OK

Minimum Required Berm

Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	80	11.172	3.1	0.57	3.6	0.30	1.5
Check:	OK			0.57			

Recommended Berm Design

X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	
150	5.0	2.9	3.8	0.54	OK	-0.11	OK
Alt Rec'd?	no						

X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
60	Covered								
171	3.50	2.81	1.37	0.80	1.09	0.80	NG	OK	NG
860	3.50	0.81	0.80	0.23	0.52	0.80	OK	OK	OK

Section 88

Section	Levee Station/Mile From =>	Central	To	$X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$	h'_t	i_t'	$i_{t(allowable)}$
88	25 / 1798	25 / 2048	25 / 2298					0.50			

Low Points of Interest on Existing Landside

X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
60	6.0	3.27	0.96	0.54	0.75	0.62	NG	OK	NG
171	6.5	2.83	0.74	0.44	0.59	0.80	OK	OK	OK

Minimum Required Berm

Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	0						
Check:	NA						

Recommended Berm Design

X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	*
150	5.0	3.1	3.8	0.37	OK	-0.09	OK
No Berm Req		Width	Thickness				
Install Anyway?	yes	150	5				

X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
60	Covered								
171	6.50	3.00	0.77	0.46	0.62	0.80	OK	OK	OK

Section 89

Section	Levee Station/Mile From =>	Central	To	$X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$	h'_t	i_t'	$i_{t(allowable)}$
89	25 / 2298	25 / 2548	25 / 2798					0.50			

Low Points of Interest on Existing Landside

X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
171	0.5	0.95	5.90	1.90	3.90	0.80	NG	NG	NG
500	0.5	0.30	4.59	0.59	2.59	0.80	NG	OK	NG
1500	0.5	0.01	4.02	0.02	2.02	0.80	NG	OK	NG

Minimum Required Berm

Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	80	18.782	1.4	0.56	1.8	0.30	0.8
Check:	OK			0.57			

Recommended Berm Design

X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	
150	5.0	1.4	2.3	0.56	OK	-0.36	OK
Alt Rec'd?	no						

X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
171	0.50	1.25	6.51	2.51	4.51	0.80	NG	NG	NG
500	0.50	0.39	4.78	0.78	2.78	0.80	NG	OK	NG
1500	0.50	0.01	4.02	0.02	2.02	0.80	NG	OK	NG

Section 90

Section	Levee Station/Mile From =>	Central	To	$X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$	h'_t	i_t'	$i_{t(allowable)}$
90	25 / 2798	25 / 3048	25 / 3298					0.50			

Low Points of Interest on Existing Landside

X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
60	4.5	2.41	1.09	0.54	0.81	0.62	NG	OK	NG
171	5.0	1.90	0.78	0.38	0.58	0.80	OK	OK	OK
210	5.0	1.74	0.75	0.35	0.55	0.80	OK	OK	OK

Minimum Required Berm

Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)
SP	0						
Check:	NA						

Recommended Berm Design

X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	* *
No Berm Req							
No Berm Req							
Install Anyway?	no						

X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	25 / 3298	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	920	675	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
91	25 / 3548	25 / 3798	7.5	4	cl	cl	75	i		1900	100	0.50	0.72	0.000705	0.001159	920	840	940	269.2	252	252	7.2	8	cl	2.87	850	157	0.0016400	i		610	610	8	2.83	0.35	0.911
	Ditch 6													X_1 Controlling:		Pit										0.16732						γ_{avg}	FoS		
														1240	920	1300	675															115	2.38		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	25 / 3798	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	1180	1300	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
92	25 / 4048	25 / 4298	9	5	cl	cl	100	i		1900	100	0.42	0.65	0.000511	0.000855	1180	940	1040	259.0	252	252	7.0	8	cl	2.87	1200	148	0.0014216	i		700	700	8	2.82	0.35	1.050
	Ditch 6													X_1 Controlling:		Pit										0.23622						γ_{avg}	FoS		
														1470	1180	1300	1400															115	2.39		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	25 / 4298	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	800	600	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
93	25 / 4548	25 / 4798	4	2.5	cl	cl	75	i		1800	100	0.72	0.82	0.001004	0.00136	800	600	700	258.8	253	253	5.8	10	sm	7.52	1200	148	0.0020577	i		490	490	10	2.39	0.24	1.272
	Ditch 6													X_1 Controlling:		Pit										0.23622						γ_{avg}	FoS		
														940	800	600	675															115	3.53		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	25 / 4798	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	325	325	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
94	25 / 5048	25 / 5298	5.5	1	sm	sp	75	i		1700	100	3.56	8.58	0.00191	0.006949	325	330	430	258.6	252	252	6.6	4	cl	3.80	1200	148	0.0023138	i		430	430	6.5	3.30	0.51	2.004
	Ditch 6													X_1 Controlling:		Pit										0.23622						γ_{avg}	FoS		
														520	325	600	325															115	1.66		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	25 / 5298	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	320	350	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
95	26 / 244	26 / 494	6	2.5	sm	sm	50	i		1400	100	3.41	5.35	0.001874	0.003638	320	320	420	258.4	251	251	7.4	7	cl	3.09	1100	147	0.0016530	i		600	600	7	4.35	0.62	1.724
	Ditch 6													X_1 Controlling:		Pit										0.21654						γ_{avg}	FoS		
														530	320	600	350															115	1.36		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	26 / 494	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	980	1250	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
96	26 / 744	26 / 994	7	5	cl	cl	75	i		1250	100	0.53	0.65	0.000682	0.000896	980	590	690	258.3	251	251	7.3	6	cl	3.32	1100	147	0.0018506	i		540	540	6	3.20	0.53	1.411
	Ditch 6													X_1 Controlling:		Pit										0.21654						γ_{avg}	FoS		
														1020	980	1300	1375															115	1.58		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	26 / 994	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	940	1000	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
97	26 / 1244	26 / 1494	11	8	cl	cl	370	i		1000	100	0.33	0.47	0.000429	0.000603	940	940	1040	258.1	251	251	7.1	7.5	cl	2.98	1100	147	0.0015678	i		640	640	7.5	2.70	0.36	1.005
	Ditch 6													X_1 Controlling:		RS Blanket										0.21654						γ_{avg}	FoS		
														940	1260	2500	1670															115	2.34		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	26 / 1494	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	970	1000	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
98	26 / 1744	26 / 1994	9	5	cl	cl	120	i		1000	100	0.42	0.65	0.000321	0.000538	970	970	1070	258.0	251	251	7.0	8	cl	2.87	2900	155	0.0008936	i		1120	1120	8	3.58	0.45	2.112
	Ditch 6													X_1 Controlling:		RS Blanket										0.57087						γ_{avg}	FoS		
														970	1030	1300	1420															115	1.88		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	26 / 1994	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	890	650	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
99	26 / 2244	26 / 2494	6	3	cl	cl	50	i		1000	100	0.59	0.79	0.000466	0.000763	890	890	990	257.9	250.5	250.5	7.4	8.5	cl	2.76	2900	155	0.0008505	i		1180	1180	8.5	4.02	0.47	2.253
	Ditch 6													X_1 Controlling:		Pit										0.57087						γ_{avg}	FoS		
														930	890	1300	650															115	1.78		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	26 / 2494	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	930	700	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
100	26 / 2744	26 / 2994	5.5	2	cl	cl	100	i		1150	100	0.62	0.86	0.0005	0.000976	930	680	780	257.7	250.5	251	6.7	7	cl	3.09	2900	155	0.0009915	i		1010	1010	7	3.78	0.54	2.473
	Ditch 6													X_1 Controlling:		Pit										0.57087	155					γ_{avg}	FoS		
														1040	930	1300	700															115	1.56		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	26 / 2994	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	460	675	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
101	26 / 3244	26 / 3494	5.5	1	cl	cl	75	i		1050	100	0.62	0.93	0.000887	0.002549	460	460	560	257.6	251	251	6.6	7.5	cl	2.98	950	150	0.0016701	i		600	600	7.5	3.41	0.46	1.192
	Ditch 6													X_1 Controlling:		Pit										0.18701						γ_{avg}	FoS		
														820	460	1300	675															115	1.85		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	26 / 3494	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	850	730	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
102	26 / 3744	26 / 3994	11	4	cl	cl	130	i		1000	100	0.33	0.72	0.000456	0.001121	850	580	680	257.4	251	251	6.4	8	cl	2.87	950	150	0.0015870	i		630	630	8	3.08	0.38	1.023
	Ditch 6													X_1 Controlling:		Pit										0.18701						γ_{avg}	FoS		
														940	850	2500	730															115	2.19		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	26 / 3994	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	300	300	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
103	26 / 4244	26 / 4494	6	1	cl	sp	50	i		850	100	0.59	8.58	0.000828	0.007757	300	300	400	257.3	251	251	6.3	10	cl	2.45	950	150	0.0013122	i		760	760	10	4.13	0.41	1.138
	Ditch 6													X_1 Controlling:		Pit										0.18701						γ_{avg}	FoS		
														730	300	1300	300															115	2.04		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	26 / 4494	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	380	380	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
104	26 / 4744	26 / 4994	5	1	cl	sp	130	i		900	100	0.65	8.58	0.000773	0.006279	380	380	480	257.2	251	251	6.2	10	cl	2.45	1500	145	0.0010621	i		940	940	10	4.10	0.41	1.396
	Ditch 6													X_1 Controlling:		Pit										0.29528						γ_{avg}	FoS		
														780	380	1300	380															115	2.05		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																	
	From =>	26 / 4994	z_{eR}	$z_{eR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{eR}	$k_{eR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	360	350	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
105	26 / 5244	27 / 198	5.5	1	cl	sp	100	i		1050	100	0.62	8.58	0.000718	0.006279	350	350	450	257.0	250.5	250.5	6.5	13	cl	1.89	1500	145	0.0008183	i		1220	1220	13	4.75	0.37	1.244
	Ditch 6													X_1 Controlling:		Pit										0.29528						γ_{avg}	FoS		
														890	350	1300	350															115	2.31		

Levee Station/Mile and Existing Landside Berm (assumed semipervious) (section 91 block has no berm title printed)

Section	Central	From =>	To	$X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$	
91	25 / 3548	25 / 3298	25 / 3798					0.50					
92	25 / 4048	25 / 3798	25 / 4298					0.50					
93	25 / 4548	25 / 4298	25 / 4798					0.50					
94	25 / 5048	25 / 4798	25 / 5298					0.50					
95	26 / 244	25 / 5298	26 / 494					0.50					
96	26 / 744	26 / 494	26 / 994					0.50					
97	26 / 1244	26 / 994	26 / 1494					0.50					
98	26 / 1744	26 / 1494	26 / 1994					0.50					
99	26 / 2244	26 / 1994	26 / 2494					0.50					
100	26 / 2744	26 / 2494	26 / 2994					0.50					
101	26 / 3244	26 / 2994	26 / 3494					0.50					
102	26 / 3744	26 / 3494	26 / 3994					0.50					
103	26 / 4244	26 / 3994	26 / 4494					0.50					
104	26 / 4744	26 / 4494	26 / 4994					0.50					
105	26 / 5244	26 / 4994	27 / 198					0.50					

Low Points of Interest on Existing Landside

Section	X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
91	60	6.0	2.57	0.76	0.43	0.59	0.62	NG	OK	OK
91	171	6.0	2.14	0.69	0.36	0.52	0.80	OK	OK	OK
92	50	5.0	2.62	1.12	0.52	0.82	0.60	NG	OK	NG
92	171	6.0	2.21	0.70	0.37	0.53	0.80	OK	OK	OK
93	50	7.0	2.15	0.74	0.31	0.52	0.60	NG	OK	OK
93	171	8.0	1.68	0.46	0.21	0.33	0.80	OK	OK	OK
94	50	4.5	2.94	1.10	0.65	0.88	0.60	NG	NG	NG
94	171	4.5	2.22	0.94	0.49	0.72	0.80	NG	OK	OK
94	360	4.5	1.43	0.76	0.32	0.54	0.80	OK	OK	OK
95	50	5.0	4.01	1.20	0.80	1.00	0.60	NG	NG	NG
95	171	5.0	3.28	1.06	0.66	0.86	0.80	NG	OK	NG
95	500	5.0	1.90	0.78	0.38	0.58	0.80	OK	OK	OK
96	50	2.5	2.92	2.57	1.17	1.87	0.60	NG	NG	NG
96	171	4.0	2.34	1.08	0.58	0.83	0.80	NG	OK	NG
96	600	4.0	1.06	0.76	0.26	0.51	0.80	OK	OK	OK
97	50	5.5	2.50	0.82	0.45	0.64	0.60	NG	OK	NG
97	171	6.5	2.07	0.47	0.32	0.40	0.80	OK	OK	OK
98	55	3.0	3.41	2.80	1.14	1.97	0.61	NG	NG	NG
98	171	7.0	3.07	0.58	0.44	0.51	0.80	OK	OK	OK
99	50	6.0	3.86	1.06	0.64	0.85	0.60	NG	NG	NG
99	171	7.5	3.48	0.60	0.46	0.53	0.80	OK	OK	OK
100	50	4.5	3.60	1.36	0.80	1.08	0.60	NG	NG	NG
100	171	6.0	3.19	0.70	0.53	0.62	0.80	OK	OK	OK
101	50	4.5	3.14	1.36	0.70	1.03	0.60	NG	NG	NG
101	171	6.5	2.57	0.55	0.39	0.47	0.80	OK	OK	OK
101	80	4.5	2.99	1.33	0.66	1.00	0.66	NG	OK	NG
102	50	5.0	2.84	1.17	0.57	0.87	0.60	NG	OK	NG
102	700	5.0	1.01	0.80	0.20	0.50	0.80	OK	OK	OK
102	171	6.5	2.35	0.59	0.36	0.48	0.80	OK	OK	OK
103	50	7.0	3.87	0.98	0.55	0.77	0.60	NG	OK	NG
103	350	7.0	2.61	0.80	0.37	0.59	0.80	OK	OK	OK
103	171	8.5	3.30	0.56	0.39	0.48	0.80	OK	OK	OK
104	50	7.0	3.89	0.98	0.56	0.77	0.60	NG	OK	NG
104	410	7.0	2.66	0.81	0.38	0.59	0.80	NG	OK	OK
104	171	8.5	3.42	0.58	0.40	0.49	0.80	OK	OK	OK
105	50	11.0	4.56	0.60	0.41	0.51	0.60	OK	OK	OK
105	171	11.5	4.13	0.49	0.36	0.42	0.80	OK	OK	OK

Minimum Required Berm

Section	Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)	Check:
91	SP	0							NA
92	SP	0							NA
93	SP	0							NA
94	SP	50	10.929	3.0	0.46 / 0.47	3.3	0.30	1.1	OK
95	SP	80	9.212	3.9	0.55 / 0.57	4.4	0.30	1.8	OK
96	SP	60	12.133	2.9	0.49 / 0.50	3.2	0.30	1.1	OK
97	SP	0							NA
98	SP	0							NA
99	SP	0							NA
100	SP	0							NA
101	SP	0							NA
102	SP	0							NA
103	SP	0							NA
104	SP	0							NA
105	SP	0							NA

Recommended Berm Design

Section	X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	*	Notes	Install Anyway? / Alt Rec'd?	Width	Thickness
91	No Berm Req							*	No Berm Req	Install Anyway? no		
92	No Berm Req							*	No Berm Req	Install Anyway? no		
93	No Berm Req							*	No Berm Req	Install Anyway? no		
94	150	5.0	2.6	3.6	0.40	OK	-0.12	OK		Alt Rec'd? no		
95	150	5.0	3.6	4.6	0.52	OK	-0.03	OK		Alt Rec'd? no		
96	135	5.0	2.7	3.5	0.46	OK	-0.14	OK		Alt Rec'd? yes	135	5
97	135	5.0	2.4	3.0	0.32	OK	-0.16	OK	No Berm Req	Install Anyway? yes	135	5
98	150	5.0	3.3	3.7	0.41	OK	-0.10	OK	No Berm Req	Install Anyway? yes	150	5
99	150	5.0	3.7	4.2	0.43	OK	-0.06	OK	No Berm Req	Install Anyway? yes	150	5
100	150	5.0	3.4	3.9	0.48	OK	-0.09	OK		Alt Rec'd? yes	150	5
101	No Berm Req							*	No Berm Req	Install Anyway? no		
102	No Berm Req							*	No Berm Req	Install Anyway? no		
103	No Berm Req							*	No Berm Req	Install Anyway? no		
104	No Berm Req							*	No Berm Req	Install Anyway? no		
105	No Berm Req							*	No Berm Req	Install Anyway? no		

Recommended Berm Design – Points of Interest

Section	X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
94	50	Covered								
94	171	4.50	2.46	0.99	0.55	0.77	0.80	NG	OK	OK
94	360	4.50	1.59	0.80	0.35	0.57	0.80	OK	OK	OK
95	50	Covered								
95	171	5.00	3.45	1.09	0.69	0.89	0.80	NG	OK	NG
95	500	5.00	2.00	0.80	0.40	0.60	0.80	OK	OK	OK
96	50	Covered								
96	171	4.00	2.54	1.14	0.64	0.89	0.80	NG	OK	NG
96	600	4.00	1.15	0.79	0.29	0.54	0.80	OK	OK	OK
97	50	Covered								
97	171	6.50	2.27	0.50	0.35	0.43	0.80	OK	OK	OK
98	55	Covered								
98	171	7.00	3.19	0.60	0.46	0.53	0.80	OK	OK	OK
99	50	Covered								
99	171	7.50	3.59	0.61	0.48	0.55	0.80	OK	OK	OK
100	50	Covered								
100	171	6.00	3.31	0.72	0.55	0.63	0.80	OK	OK	OK

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																
	From =>	27 / 198	z_{bR}	$z_{bR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{sR}	$k_{sR(pit)}$	c_R	$c_{R(pit)}$	X_1	X_{1-eff}	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	X_{3-eff}	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)	(ft)	(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	610	660	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
106	27 / 448	27 / 698	6.5	1.5	cl	cl	60	i		950	100	0.56	0.89	0.000627	0.001653	610	610	710	256.9	250.5	250.5	6.4	10	cl	2.45	1500	145	0.0010621	i		940	940	10	3.65	0.36	1.240
			Ditch 6											X_1 Controlling:		Pit						0.29528										γ_{avg}	FoS		
														850	610	1300	660															115	2.31		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																
	From =>	27 / 698	z_{bR}	$z_{bR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{sR}	$k_{sR(pit)}$	c_R	$c_{R(pit)}$	X_1	X_{1-eff}	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	X_{3-eff}	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)	(ft)	(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	650	675	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
107	27 / 948	27 / 1198	8.5	3.5	cl	cl	75	i		700	100	0.44	0.75	0.000567	0.001151	650	650	750	256.7	250	250	6.7	11	cl	2.26	1000	162	0.0011257	i		890	890	11	3.64	0.33	0.973
			Ditch 6											X_1 Controlling:		Pit						0.19685										γ_{avg}	FoS		
														670	650	1300	675															115	2.55		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																
	From =>	27 / 1198	z_{bR}	$z_{bR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{sR}	$k_{sR(pit)}$	c_R	$c_{R(pit)}$	X_1	X_{1-eff}	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	X_{3-eff}	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)	(ft)	(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	640	650	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
108	27 / 1448	27 / 1698	13.5	8.5	cl	cl	60	i		650	100	0.23	0.44	0.000327	0.000567	640	610	710	256.6	250	250	6.6	10	cl	2.45	1000	162	0.0012307	i		810	810	10	3.52	0.35	1.034
			Ditch 6											X_1 Controlling:		RS Blanket						0.19685										γ_{avg}	FoS		
														640	680	2500	1360															115	2.40		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																
	From =>	27 / 1698	z_{bR}	$z_{bR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{sR}	$k_{sR(pit)}$	c_R	$c_{R(pit)}$	X_1	X_{1-eff}	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	X_{3-eff}	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)	(ft)	(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	350	350	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
109	27 / 1948	27 / 2198	5	1	cl	sp	100	i		800	100	0.65	8.58	0.000896	0.007276	350	350	450	256.5	249	249	7.5	13	cl	1.89	1000	162	0.0009482	i		1050	1050	13	5.25	0.40	1.191
			Ditch 6											X_1 Controlling:		Pit						0.19685										γ_{avg}	FoS		
														690	350	1300	350															115	2.09		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																
	From =>	27 / 2198	z_{bR}	$z_{bR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{sR}	$k_{sR(pit)}$	c_R	$c_{R(pit)}$	X_1	X_{1-eff}	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	X_{3-eff}	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)	(ft)	(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	500	500	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
110	27 / 2448	27 / 2698	3	1	cl	sp	250	i		850	100	0.79	8.58	0.001098	0.006285	500	500	600	256.3	249	249	7.3	10	cl	2.45	1300	167	0.0010631	i		940	940	10	4.46	0.45	1.513
			Ditch 6											X_1 Controlling:		Pit						0.25591										γ_{avg}	FoS		
														670	500	600	500															115	1.89		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																
	From =>	27 / 2698	z_{bR}	$z_{bR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{sR}	$k_{sR(pit)}$	c_R	$c_{R(pit)}$	X_1	X_{1-eff}	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	X_{3-eff}	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)	(ft)	(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	650	650	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
111	27 / 2948	27 / 3198	5.5	1	ml	sp	400	i		900	100	1.67	8.58	0.001183	0.006285	650	650	750	256.2	249	249	7.2	2.5	cl	4.18	1300	167	0.0027746	i		360	360	4.5	2.34	0.52	2.070
			No New Ditch											X_1 Controlling:		Pit						0.25591										γ_{avg}	FoS		
														670	650	800	650															115	1.62		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																
	From =>	27 / 3198	z_{bR}	$z_{bR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{sR}	$k_{sR(pit)}$	c_R	$c_{R(pit)}$	X_1	X_{1-eff}	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	X_{3-eff}	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)	(ft)	(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	870	600	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
112	27 / 3448	27 / 3698	4.5	2.5	cl	cl	430	i		1100	100	0.68	0.82	0.000836	0.00123	870	820	920	256.1	249	249	7.1	7	ml	4.01	1300	167	0.0016247	i		620	620	7	2.86	0.41	1.471
			No New Ditch											X_1 Controlling:		RS Blanket						0.25591										γ_{avg}	FoS		
														870	1140	600	1030															115	2.06		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																
	From =>	27 / 3698	z_{bR}	$z_{bR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{sR}	$k_{sR(pit)}$	c_R	$c_{R(pit)}$	X_1	X_{1-eff}	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	X_{3-eff}	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)	(ft)	(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	1140	1300	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
113	27 / 3948	27 / 4198	8	7	cl	cl	550	i		1300	100	0.47	0.53	0.000501	0.000567	1140	820	920	255.9	249	249	6.9	7.5	cl	2.98	1400	167	0.0013039	i		770	770	7.5	3.14	0.42	1.403
			No New Ditch											X_1 Controlling:		RS Blanket						0.27559										γ_{avg}	FoS		
														1140	1660	1300	1850															115	2.01		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																
	From =>	27 / 4198	z_{bR}	$z_{bR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{sR}	$k_{sR(pit)}$	c_R	$c_{R(pit)}$	X_1	X_{1-eff}	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	X_{3-eff}	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)	(ft)	(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	650	650	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
114	27 / 4448	27 / 4698	5.5	1	cl	sp	400	i		1450	100	0.62	8.58	0.000693	0.006056	650	650	750	255.8	249	249	6.8	8	cl	2.87	1400	167	0.0012390	i		810	810	8	3.53	0.44	1.498
			No New Ditch											X_1 Controlling:		Pit						0.27559										γ_{avg}	FoS		
														1100	650	1300	650															115	1.91		

Section	Levee Station/Mile		Riverside Conditions																Landside Conditions w/o Berm																
	From =>	27 / 4698	z_{bR}	$z_{bR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{sR}	$k_{sR(pit)}$	c_R	$c_{R(pit)}$	X_1	X_{1-eff}	S	Ele. FL	Ele. LS	Ele. TW	H	z_{sL}	Soil Type	k_{sL}	k_f	D	c_L	Exit	L_3	X_3	X_{3-eff}	z_t	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)	(ft)	(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	850	850	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
115	27 / 4948	27 / 5198	5.5	1	cl	sp	600	i		1400	100	0.62	8.58	0.000693	0.006056	850	820	920	255.7	249	249	6.7	10	cl	2.45	1400	167	0.0010244	i		980	980	10	3.46	0.35	1.212
			No New Ditch											X_1 Controlling:		Pit						0.27559										γ_{avg}	FoS		
														1080	850	1300	850															115	2.44		

Below Piggott Seepage Study - General Seepage Evaluation, Seepage Berm Design, Existing Ditch Evaluations, and Preliminary New Ditch Evaluations

Section 106

Section	Levee Station/Mile		Existing Landside Berm (assumed semipervious)									
	From =>	27 / 198	$X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$	
	Central	To										
106	27 / 448	27 / 698					0.50					

Low Points of Interest on Existing Landside									
X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
55	7.0	3.44	0.92	0.49	0.71	0.61	NG	OK	NG
325	7.0	2.58	0.80	0.37	0.58	0.80	OK	OK	OK
171	8.5	3.04	0.53	0.36	0.45	0.80	OK	OK	OK

Minimum Required Berm								
Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)	
SP	0							
Check:	NA							

Recommended Berm Design																	
X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	*	X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
No Berm Req																	
No Berm Req																	
Install Anyway?	no																

Section 107

Section	Levee Station/Mile		Existing Landside Berm (assumed semipervious)									
	From =>	27 / 698	$X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$	
	Central	To										
107	27 / 948	27 / 1198					0.50					

Low Points of Interest on Existing Landside									
X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
55	8.0	3.42	0.80	0.43	0.61	0.61	NG	OK	OK
135	8.0	3.12	0.77	0.39	0.58	0.77	OK	OK	OK
171	9.5	3.00	0.47	0.32	0.39	0.80	OK	OK	OK

Minimum Required Berm								
Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)	
SP	0							
Check:	NA							

Recommended Berm Design																	
X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	*	X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
No Berm Req																	
No Berm Req																	
Install Anyway?	no																

Section 108

Section	Levee Station/Mile		Existing Landside Berm (assumed semipervious)									
	From =>	27 / 1198	$X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$	
	Central	To										
108	27 / 1448	27 / 1698					0.50					

Low Points of Interest on Existing Landside									
X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
55	7.5	3.29	0.77	0.44	0.60	0.61	NG	OK	OK
120	7.5	3.03	0.74	0.40	0.57	0.74	OK	OK	OK
171	8.0	2.85	0.61	0.36	0.48	0.80	OK	OK	OK

Minimum Required Berm								
Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)	
SP	0							
Check:	NA							

Recommended Berm Design																	
X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	*	X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
No Berm Req																	
No Berm Req																	
Install Anyway?	no																

Section 109

Section	Levee Station/Mile		Existing Landside Berm (assumed semipervious)									
	From =>	27 / 1698	$X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$	
	Central	To										
109	27 / 1948	27 / 2198					0.50					

Low Points of Interest on Existing Landside									
X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
55	9.5	4.98	0.89	0.52	0.71	0.61	NG	OK	NG
220	9.5	4.26	0.82	0.45	0.63	0.80	NG	OK	OK
171	11.0	4.46	0.59	0.41	0.50	0.80	OK	OK	OK

Minimum Required Berm								
Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)	
SP	0							
Check:	NA							

Recommended Berm Design																	
X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	*	X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
No Berm Req																	
No Berm Req																	
Install Anyway?	no																

Section 110

Section	Levee Station/Mile		Existing Landside Berm (assumed semipervious)									
	From =>	27 / 2198	$X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$	
	Central	To										
110	27 / 2448	27 / 2698					0.50					

Low Points of Interest on Existing Landside									
X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
170	5.0	3.72	1.74	0.74	1.24	0.80	NG	OK	NG
2000	5.0	0.53	1.11	0.11	0.61	0.80	NG	OK	OK

Minimum Required Berm								
Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)	
SP	0							
Check:	NA							

Recommended Berm Design																	
X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	*	X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
No Berm Req																	
No Berm Req																	
Install Anyway?	no																

Section 111

Section	Levee Station/Mile		Existing Landside Berm (assumed semipervious)									
	From =>	27 / 2698	$X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$	
	Central	To										
111	27 / 2948	27 / 3198					0.50					

Low Points of Interest on Existing Landside									
X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
175	0.1	1.44	58.37	14.37	36.37	0.80	NG	NG	NG

Bligh's CR:	Pt1:	128.5	Pt 2:		Pt 3:	
Fine SP:		OK				
Medium SP:		OK				
Coarse SP:		OK				

Minimum Required Berm								
Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)	
SP	50	16.268	2.1	0.46	2.4	0.30	0.8	
Check:	OK			0.47				
I	60	NA	2.2	0.49	2.6	0.30	0.9	
Check:	OK			0.50				
S	50	NA	2.1	0.47	2.4	0.30	0.8	
Check:	OK			0.47				
P	50	NA	2.0	0.45	2.3	0.30	0.8	
Check:	OK			0.47		Q_P (gpm/ft) =	0.3	

Recommended Berm Design																		
Berm Type	X_{berm} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t 50		i'_o 0.794		X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
sp	150	5.0	1.9	2.8	0.43	OK	-0.23	OK	175	0.10	1.74	61.38	17.38	39.38	0.80	NG	NG	NG
Alt Rec'd?	no																	

Section 112

Section	Levee Station/Mile		Existing Landside Berm (assumed semipervious)									
	From =>	27 / 3198	$X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$	
	Central	To										
112	27 / 3448	27 / 3698					0.50					

Low Points of Interest on Existing Landside									
X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
175	0.1	2.15	90.51	21.51	56.01	0.80	NG	NG	NG

Bligh's CR:	Pt1:	154.2	Pt 2:		Pt 3:	
Fine SP:		OK				
Medium SP:		OK				
Coarse SP:		OK				

Minimum Required Berm								
Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)	
SP	0							
Check:	NA							

Recommended Berm Design																	
X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	*	X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
No Berm Req																	
No Berm Req																	
Install Anyway?	no																

Section 113

Section	Levee Station/Mile		Existing Landside Berm (assumed semipervious)									
	From =>	27 / 3698	$X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$	
	Central	To										
113	27 / 3948	27 / 4198					0.50					

Low Points of Interest on Existing Landside									
X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
175	0.1	2.50	99.02	25.02	62.02	0.80	NG	NG	NG

Bligh's CR:	Pt1:	158.7	Pt 2:		Pt 3:	
Fine SP:		OK				
Medium SP:		OK				
Coarse SP:		OK				

Minimum Required Berm								
Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)	
SP	0							
Check:	NA							

Recommended Berm Design																	
X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	*	X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
No Berm Req																	
No Berm Req																	
Install Anyway?	no																

Section 114

Section	Levee Station/Mile		Existing Landside Berm (assumed semipervious)									
	From =>	27 / 4198	$X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$	
	Central	To										
114	27 / 4448	27 / 4698					0.50					

Low Points of Interest on Existing Landside									
X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
175	0.1	2.84	107.43	28.43	67.93	0.80	NG	NG	NG

Bligh's CR:	Pt1:	136.0	Pt 2:		Pt 3:	
Fine SP:		OK				
Medium SP:		OK				
Coarse SP:		OK				

Minimum Required Berm								
Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)	
SP	0							
Check:	NA							

Recommended Berm Design																	
X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	*	X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
No Berm Req																	
No Berm Req																	
Install Anyway?	no																

Section 115

Section	Levee Station/Mile		Existing Landside Berm (assumed semipervious)									
	From =>	27 / 4698	$X_{sp(existing)}$ (ft)	t (ft)	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$	
	Central	To										
115	27 / 4948	27 / 5198					0.50					

Low Points of Interest on Existing Landside									
X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
175	1.0	2.89	11.89	2.89	7.39	0.80	NG	NG	NG
175	0.1	2.89	127.89	28.89	78.39	0.80	NG	NG	NG

Bligh's CR:	Pt1:		Pt 2:	163.43	Pt 3:	
Fine SP:				OK		
Medium SP:				OK		
Coarse SP:				OK		

Minimum Required Berm								
Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)	
SP	0							
Check:	NA							

Recommended Berm Design																	
X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	*	X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
No Berm Req																	
No Berm Req																	
Install Anyway?	no																

Section	Levee Station/Mile		Riverside Conditions																	Landside Conditions w/o Berm																
	From =>	27 / 5198	z_{bR}	$z_{bR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{bR}	$k_{bR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{bL}	Soil Type	k_{bL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_f	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	1040	1300	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
116	28 / 245	28 / 495	5.5	2.5	cl	cl	850	i		1350	100	0.62	0.82	0.000723	0.001237	1040	990	1090	255.5	248	248	7.5	12	cl	2.07	1300	165	0.0008970	i		1110	1110	12	3.78	0.32	1.075
	No New Ditch													X_1 Controlling:		RS Blanket										0.25591						γ_{avg}	FoS		
														1040	1600	1300	1450																115	2.67		

Section	Levee Station/Mile		Riverside Conditions																	Landside Conditions w/o Berm																
	From =>	28 / 495	z_{bR}	$z_{bR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{bR}	$k_{bR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{bL}	Soil Type	k_{bL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_f	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	1060	1225	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
117	28 / 745	28 / 995	5.5	2.5	cl	cl	625	i		1400	100	0.62	0.82	0.000723	0.001237	1060	1060	1160	255.4	248	248	7.4	5	cl	3.56	1300	165	0.0018218	i		550	550	5	2.38	0.48	1.365
	No New Ditch													X_1 Controlling:		RS Blanket										0.25591						γ_{avg}	FoS		
														1060	1380	1300	1225																115	1.77		

Section	Levee Station/Mile		Riverside Conditions																	Landside Conditions w/o Berm																
	From =>	28 / 995	z_{bR}	$z_{bR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{bR}	$k_{bR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{bL}	Soil Type	k_{bL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_f	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	1020	975	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
118	28 / 1245	28 / 1495	5.5	4	cl	cl	375	i		1300	100	0.62	0.72	0.000723	0.000914	1020	980	1080	255.3	248	248	7.3	8	cl	2.87	1300	165	0.0012935	i		770	770	8	3.04	0.38	1.244
	No New Ditch													X_1 Controlling:		RS Blanket										0.25591						γ_{avg}	FoS		
														1020	1280	1300	975																115	2.22		

Section	Levee Station/Mile		Riverside Conditions																	Landside Conditions w/o Berm																
	From =>	28 / 1495	z_{bR}	$z_{bR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{bR}	$k_{bR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{bL}	Soil Type	k_{bL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_f	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	840	1300	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
119	28 / 1745	28 / 1995	5	1	cl	cl	1200	i		1350	100	0.65	0.93	0.001057	0.002822	840	840	940	255.1	248	248	7.1	10.5	cl	2.35	750	155	0.0013889	i		720	720	10.5	3.08	0.29	0.731
	No New Ditch													X_1 Controlling:		RS Blanket										0.14764						γ_{avg}	FoS		
														840	1550	1300	1800																115	2.87		

Section	Levee Station/Mile		Riverside Conditions																	Landside Conditions w/o Berm																
	From =>	28 / 1995	z_{bR}	$z_{bR(pit)}$	Soil Type	Soil Type	To Pit	Riverside	$L_{1(block)}$	$L_{1(river)}$	L_2	k_{bR}	$k_{bR(pit)}$	c_R	$c_{R(pit)}$	X_1	$X_{1\text{-eff}}$	S	Ele. FL	Ele. LS	Ele. TW	H	z_{bL}	Soil Type	k_{bL}	k_f	D	c_L	Exit	L_3	X_3	$X_{3\text{-eff}}$	z_f	h_o	i_o	Q_S
	Central	To	(ft)	(ft)		*Pit*	(ft)	Condition	(ft)		(ft)	($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	870	1300	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		($x10^{-4}$ cm/s)	($x10^{-4}$ cm/s)	(ft)		Condition	(ft)	(ft)	(ft)	(ft)	(ft)	*	(gpm/ft)
120	28 / 2245	28 / 2495	5	1	cl	cl	1250	i		1500	100	0.65	0.93	0.001057	0.002822	870	870	970	255.0	248	248	7.0	10	cl	2.45	750	155	0.0014528	i		690	690	10	2.91	0.29	0.721
	No New Ditch													X_1 Controlling:		RS Blanket										0.14764						γ_{avg}	FoS		
														870	1600	1300	1850																115	2.90		

Section	Levee Station/Mile		Existing Landside Berm (assumed semipervious)									
	From =>	27 / 5198	$X_{sp(existing)}$	t	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$	
	Central	To	(ft)	(ft)								
116	28 / 245	28 / 495					0.50					

Low Points of Interest on Existing Landside									
X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
175	5.0	3.23	2.05	0.65	1.35	0.80	NG	OK	NG
2000	5.0	0.63	1.53	0.13	0.83	0.80	NG	OK	NG

Bligh's CR:	Pt1:		Pt 2:		Pt 3:	
Fine SP:						
Medium SP:						
Coarse SP:						

Minimum Required Berm								
Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)	
SP	0							
Check:	NA							

Recommended Berm Design																	
X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	* *	X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
No Berm Req																	
No Berm Req																	
Install Anyway?	no																

Section	Levee Station/Mile		Existing Landside Berm (assumed semipervious)									
	From =>	28 / 495	$X_{sp(existing)}$	t	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$	
	Central	To	(ft)	(ft)								
117	28 / 745	28 / 995					0.50					

Low Points of Interest on Existing Landside									
X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
175	0.1	1.73	66.30	17.30	41.80	0.80	NG	NG	NG

Bligh's CR:	Pt1:	180.4	Pt 2:		Pt 3:	
Fine SP:		OK				
Medium SP:		OK				
Coarse SP:		OK				

Minimum Required Berm								
Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)	
SP	0							
Check:	NA							

Recommended Berm Design																	
X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	* *	X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
No Berm Req																	
No Berm Req																	
Install Anyway?	no																

Section	Levee Station/Mile		Existing Landside Berm (assumed semipervious)									
	From =>	28 / 995	$X_{sp(existing)}$	t	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$	
	Central	To	(ft)	(ft)								
118	28 / 1245	28 / 1495					0.50					

Low Points of Interest on Existing Landside									
X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
175	0.1	2.42	103.23	24.23	63.73	0.80	NG	NG	NG

Bligh's CR:	Pt1:	171.9	Pt 2:		Pt 3:	
Fine SP:		OK				
Medium SP:		OK				
Coarse SP:		OK				

Minimum Required Berm								
Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)	
SP	0							
Check:	NA							

Recommended Berm Design																	
X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	* *	X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
No Berm Req																	
No Berm Req																	
Install Anyway?	no																

Section	Levee Station/Mile		Existing Landside Berm (assumed semipervious)									
	From =>	28 / 1495	$X_{sp(existing)}$	t	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$	
	Central	To	(ft)	(ft)								
119	28 / 1745	28 / 1995					0.50					

Low Points of Interest on Existing Landside									
X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
175	2.5	2.42	4.17	0.97	2.57	0.80	NG	NG	NG
310	2.5	2.00	4.00	0.80	2.40	0.80	NG	OK	NG
2000	2.5	0.19	3.28	0.08	1.68	0.80	NG	OK	NG

Minimum Required Berm								
Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)	
SP	0							
Check:	NA							

Recommended Berm Design																	
X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	* *	X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
No Berm Req																	
No Berm Req																	
Install Anyway?	no																

Section	Levee Station/Mile		Existing Landside Berm (assumed semipervious)									
	From =>	28 / 1995	$X_{sp(existing)}$	t	h'_o	i_o'	$i_{o(allowable)}$		h'_t	i_t'	$i_{t(allowable)}$	
	Central	To	(ft)	(ft)								
120	28 / 2245	28 / 2495					0.50					

Low Points of Interest on Existing Landside									
X_{PI} (ft)	t_{PI} or z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
180	2.0	2.24	5.12	1.12	3.12	0.80	NG	NG	NG
410	2.0	1.60	4.80	0.80	2.80	0.80	NG	OK	NG
2000	2.0	0.16	4.08	0.08	2.08	0.80	NG	OK	NG

Minimum Required Berm								
Berm Type	$X_{(I,SP,S,P)}$ (ft)	A	h'_t (ft)	i'_t	h'_o (ft)	i'_o	t (ft)	
SP	0							
Check:	NA							

Recommended Berm Design																	
X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	* *	X_{PI} (ft)	z_{tPI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
No Berm Req																	
No Berm Req																	
Install Anyway?	no																

Table 1. Below Piggott Seepage Study Berm Summary

Section #	Central Station	Approx Section Width (ft)	X_{SP}, Existing Berm (ft)	Existing Berm Thickness (ft)	Existing Berm Crown Thickness (ft)	Total Seepage Flow Under Levee (gpm/100ft)	X_{SP}, Minimum Berm (ft)	Minimum Berm Thickness (ft)	X_{SP}, Design Berm (ft)	Design Berm Thickness (ft)	Design Berm Elevation @ Levee Toe (ft)	Design Berm Crown Thickness (ft)	Approx Berm Slope 1H:xV	Approx Existing Berm Area (ft^2)	Approx Proposed Berm Area (ft^2)	Approx Net Berm Soil Required (yd^3)	Existing and New Ditch Locations	Seepage History/Site Conditions/Design Recommendations
1	17 + 1650	500	0	0		189	65	1.2	100	4.0	271.0	2.0	50	0	330	6110	No New Ditch	CCR-528
2	17 + 2150	500	0	0		181	No Berm Req		150	5.0	270.5	2.0	50	0	570	10560	No New Ditch	
3	17 + 2650	500	0	0		232	120	2.0	150	5.0	270.5	2.0	50	0	570	10560	No Ditch	
4	17 + 3150	500	0	0		296	90	1.4	150	5.0	270.0	2.0	50	0	570	10560	No Ditch	
5	17 + 3650	500	0	0		189	65	1.1	150	5.0	271.0	2.0	50	0	570	10560	No Ditch	
6	17 + 4150	500	0	0		212	No Berm Req		150	5.0	271.0	2.0	50	0	570	10560	No Ditch	
7	17 + 4650	500	100	2.5	1.00	268	140	1.8	150	5.0	269.5	2.0	50	190	570	7040	No Ditch	
8	17 + 5150	500	0	0		230	105	1.6	150	5.0	270.0	2.0	50	0	570	10560	Ditch 1	
9	18 + 125	500	0	0		244	65	0.9	150	5.0	270.0	2.0	50	0	570	10560	Ditch 1	
10	18 + 500	500	0	0		228	65	0.8	150	5.0	270.0	2.0	50	0	570	10560	Ditch 1	
11	18 + 1000	500	0	0		267	50	1.2	150	5.0	269.0	2.0	50	0	570	10560	Ditch 1	
12	18 + 1500	500	0	0		200	90	1.7	150	5.0	268.0	2.0	50	0	570	10560	Ditch 1	Sand boil 60' from toe 2011
13	18 + 2000	500	0	0		319	100	1.6	150	5.0	268.0	2.0	50	0	570	10560	Ditch 1	
14	18 + 2500	500	0	0		224	No Berm Req		150	5.0	268.5	2.0	50	0	570	10560	Ditch 1	
15	18 + 3000	500	0	0		263	70	1.1	150	5.0	268.0	2.0	50	0	570	10560	Ditch 1	
16	18 + 3500	500	0	0		234	55	0.9	150	5.0	267.5	2.0	50	0	570	10560	Ditch 2	Boils in ditch 2011, 2015, 2017
17	18 + 4000	500	0	0		215	50	0.9	150	5.0	267.0	2.0	50	0	570	10560	Ditch 2	
18	18 + 4500	500	0	0		142	No Berm Req		150	5.0	268.0	2.0	50	0	570	10560	No Ditch	
19	18 + 5000	500	0	0		202	No Berm Req		150	5.0	269.0	2.0	50	0	570	10560	No Ditch	
20	19 + 470	500	0	0		218	No Berm Req		150	5.0	268.0	2.0	50	0	570	10560	No Ditch	
21	19 + 970	500	0	0		244	70	1.0	150	5.0	268.0	2.0	50	0	570	10560	No Ditch	
22	19 + 1470	500	0	0		240	65	0.9	150	5.0	268.0	2.0	50	0	570	10560	No Ditch	
23	19 + 1970	500	0	0		197	No Berm Req		150	5.0	268.5	2.0	50	0	570	10560	No Ditch	
24	19 + 2470	500	0	0		203	75	0.6	150	5.0	268.0	2.0	50	0	570	10560	No Ditch	
25	19 + 2970	500	0	0		194	No Berm Req		150	5.0	267.5	2.0	50	0	570	10560	No Ditch	
26	19 + 3470	500	0	0		137	70	1.3	150	5.0	265.5	2.0	50	0	570	10560	No Ditch	
27	19 + 3970	500	0	0		160	105	1.5	150	5.0	265.0	2.0	50	0	570	10560	No New Ditch	Boils @toe 2011 & 2017
28	19 + 4470	500	0	0		180	115	1.9	150	5.0	264.0	2.0	50	0	570	10560	No New Ditch	
29	19 + 4970	500	0	0		268	115	2.2	115	2.5	262.5	1.0	77	0	210	3890	Ditch 3	Hwy 90
30	20 + 290	500	0	0		223	80	1.0	115	2.5	263.5	1.0	77	0	210	3890	Ditch 3	Hwy 90
31	20 + 790	500	0	0		244	70	1.3	115	2.5	262.5	1.0	77	0	210	3890	Ditch 3	Hwy 90
32	20 + 1290	500	0	0		315	90	1.7	115	2.5	262.5	1.0	77	0	210	3890	No Ditch	Hwy 90
33	20 + 1790	500	0	0		187	60	0.6	115	2.5	265.5	1.0	77	0	210	3890	No Ditch	Hwy 90
34	20 + 2290	500	0	0		159	105	1.4	115	2.5	263.5	1.0	77	0	210	3890	No Ditch	Hwy 90
35	20 + 2790	500	0	0		302	90	1.9	150	5.0	265.0	2.0	50	0	570	10560	No Ditch	
36	20 + 3290	500	0	0		229	75	1.3	150	5.0	265.0	2.0	50	0	570	10560	No Ditch	
37	20 + 3790	500	0	0		169	No Berm Req		150	5.0	266.0	2.0	50	0	570	10560	Ditch 4	
38	20 + 4290	500	0	0		179	No Berm Req		150	5.0	265.0	2.0	50	0	570	10560	Ditch 4	
39	20 + 4790	500	0	0		155	75	0.9	150	5.0	264.0	2.0	50	0	570	10560	Ditch 4	
40	20 + 5290	500	0	0		191	No Berm Req		150	5.0	264.0	2.0	50	0	570	10560	Ditch 4	
41	20 + 5790	500	0	0		144	No Berm Req		150	5.0	263.0	2.0	50	0	570	10560	Ditch 4	
42	21 + 145	500	0	0		180	70	1.2	150	5.0	263.0	2.0	50	0	570	10560	Ditch 4	Pin boil @toe 2017, extend berm to 21/6+45
43	21 + 645	500	0	0		111	No Berm Req		No Berm Req								Ditch 4	Boil in ditch 2011 (ditch to be filled)
44	21 + 1145	500	0	0		158	No Berm Req		No Berm Req								Ditch 4	
45	21 + 1645	500	0	0		141	No Berm Req		No Berm Req								Ditch 4	
46	21 + 2145	500	0	0		108	No Berm Req		No Berm Req								Ditch 4	
47	21 + 2645	500	0	0		187	No Berm Req		No Berm Req								Ditch 4	
48	21 + 3145	500	0	0		164	85	1.1	150	5.0	263.0	2.0	50	0	570	10560	Ditch 4	
49	21 + 3645	500	0	0		164	No Berm Req		150	5.0	262.5	2.0	50	0	570	10560	Ditch 4	
50	21 + 4145	500	0	0		150	No Berm Req		150	5.0	262.5	2.0	50	0	570	10560	Ditch 4	Boil in ditch 2011
51	21 + 4645	500	0	0		225	95	1.6	150	5.0	262.0	2.0	50	0	570	10560	Ditch 4	
52	21 + 5145	500	0	0		160	No Berm Req		150	5.0	261.5	2.0	50	0	570	10560	Ditch 4	
53	22 + 440	500	0	0		107	No Berm Req		150	5.0	261.5	2.0	50	0	570	10560	Ditch 4	
54	22 + 940	500	0	0		124	No Berm Req		150	5.0	261.0	2.0	50	0	570	10560	Ditch 4	Pin boil @toe 2011
55	22 + 1440	500	0	0		117	No Berm Req		150	5.0	261.0	2.0	50	0	570	10560	Ditch 4	
56	22 + 1940	500	0	0		136	75	0.8	150	5.0	261.0	2.0	50	0	570	10560	Ditch 4	
57	22 + 2440	500	0	0		171	85	1.5	150	5.0	261.0	2.0	50	0	570	10560	No New Ditch	
58	22 + 2940	500	0	0		177	80	1.9	150	5.0	261.0	2.0	50	0	570	10560	No Ditch	
59	22 + 3440	500	0	0		152	70	1.3	150	5.0	261.0	2.0	50	0	570	10560	No Ditch	
60	22 + 3940	500	0	0		144	No Berm Req		No Berm Req								No Ditch	
61	22 + 4440	500	0	0		136	No Berm Req		No Berm Req								No New Ditch	
62	22 + 4940	500	0	0		107	No Berm Req		No Berm Req								No New Ditch	
63	23 + 174	500	0	0		102	No Berm Req		No Berm Req								Ditch 5	
64	23 + 674	500	0	0		148	No Berm Req		No Berm Req								Ditch 5	
65	23 + 1174	500	0	0		125	No Berm Req		No Berm Req								Ditch 5	
66	23 + 1674	500	0	0		122	55	1.1	150	5.0	259.5	2.0	50	0	570	10560	Ditch 5	
67	23 + 2174	500	0	0		129	55	1.2	150	5.0	259.5	2.0	50	0	570	10560	Ditch 5	
68	23 + 2674	500	0	0		155	60	1.4	150	5.0	259.5	2.0	50	0	570	10560	Ditch 5	
69	23 + 3174	500	0	0		158	75	1.3	150	5.0	259.5	2.0	50	0	570	10560	Ditch 5	
70	23 + 3674	500	0	0		144	No Berm Req		150	5.0	259.0	2.0	50	0	570	10560	Ditch 5	
71	23 + 4174	500	0	0		102	No Berm Req		150	5.0	259.0	2.0	50	0	570	10560	Ditch 5	
72	23 + 4674	500	0	0		153	55	1.4	150	5.0	259.0	2.0	50	0	570	10560	Ditch 5	extend berm to 23/51+74
73	23 + 5174	500	0	0		124	No Berm Req		No Berm Req								Ditch 5	Pin boil @toe 2017
74	24 + 347	500	0	0		122	No Berm Req		No Berm Req								Ditch 5	
75	24 + 847	500	0	0		115	No Berm Req		No Berm Req								Ditch 5	
76	24 + 1347	500	0	0		118	No Berm Req		No Berm Req								Ditch 5	
77	24 + 1847	500	0	0		179	60	1.1	150	5.0	258.0	2.0	50	0	570	10560	Ditch 5	
78	24 + 2347	500	0	0		171	95	1.8	150	5.0	257.5	2.0	50	0	570	10560	Ditch 5	Pin boil @toe 2017
79	24 + 2847	500	0	0		128	No Berm Req		150	5.0	257.0	2.0	50	0	570	10560	No New Ditch	Boil @toe 2011
80	24 + 3347	500	0	0		175	No Berm Req		150	5.0	257.0	2.0	50	0	570	10560	No New Ditch	
81	24 + 3847	500	0	0		157	80	1.3	150	5.0	257.5	2.0	50	0	570	10560	No Ditch	
82	24 + 4347	500	0	0		119	No Berm Req		150	5.0	257.0	2.0	50	0	570	10560	No Ditch	
83	24 + 4847	500	0	0		109	No Berm Req		150	5.0	257.0	2.0	50	0	570	10560	Ditch 6	
84	25 + 48	500	0	0		131	65	1.1	150	5.0	257.0	2.0	50	0	570	10560	Ditch 6	
85	25 + 548	500	0	0		142	80	1.2	150	5.0	257.5	2.0	50	0	570	10560	Ditch 6	
86	25 + 1048	500	0	0		175	110	1.2	150	5.0	258.0	2.0	50	0	570	10560	Ditch 6	
87	25 + 1548	500	0	0		181	80	1.5	150	5.0	257.5	2.0	50	0	570	10560	Ditch 6	
88	25 + 2048	500	0	0		130	No Berm Req		150	5.0	257.5	2.0	50	0	570	10560	Ditch 6	
89	25 + 2548	500	0	0		122	80	0.8	150	5.0	258.0	2.0	50	0	570	10560	Ditch 6	
90	25 + 3048	500	0	0		117	No Berm Req		No Berm Req								Ditch 6	
91	25 + 3548	500	0	0		91	No Berm Req		No Berm Req								Ditch 6	
92	25 + 4048	500	0	0		105	No Berm Req		No Berm Req								Ditch 6	
93	25 + 4548	500	0	0		127	No Berm Req		No Berm Req								Ditch 6	
94	25 + 5048	500	0	0		200	50	1.1	150	5.0	257.0	2.0	50	0	570	10560	Ditch 6	
95	26 + 244	500	0	0		172	80	1.8	150	5.0	256.0	2.0	50	0	570	10560	Ditch 6	
96	26 + 744	500	0	0		141	60	1.1	135	5.0	256.0	2.0	45	0	520	9630	Ditch 6	GCR-807
97	26 + 1244	500	0	0		100	No Berm Req		135	5.0	256.0	2.0	45	0	520	9630	Ditch 6	GCR-807
98	26 + 1744	500	0	0		211	No Berm Req		150	5.0	256.0	2.0	50	0	570	10560	Ditch 6	
99	26 + 2244	500	0	0		225	No Berm Req		150	5.0	255.5	2.0	50	0	570	10560	Ditch 6	
100	26 + 2744	500	0	0		247	No Berm Req		150	5.0	255.5	2.0	50	0	570	10560	Ditch 6	
101	26 + 3244	500	0	0		119	No Berm Req		No Berm Req								Ditch 6	
102	26 + 3744	500	0	0		102	No Berm Req		No Berm Req								Ditch 6	
103	26 + 4244	500	0	0		114	No Berm Req		No Berm Req								Ditch 6	
104	26 + 4744	500	0	0		140	No Berm Req		No Berm Req								Ditch 6	
105	26 + 5244	500	0	0		124	No Berm Req		No Berm Req								Ditch 6	
106	27 + 448	500	0	0		124	No Berm Req		No Berm Req								Ditch 6	
107	27 + 948	500	0	0		97	No Berm Req		No Berm Req								Ditch 6	
108	27 + 1448	500	0	0		103	No Berm Req		No Berm Req								Ditch 6	
109	27 + 1948	500	0	0		119	No Berm Req		No Berm Req								Ditch 6	
110	27 + 2448	500	0	0		151	No Berm Req		No Berm Req								Ditch 6	
111	27 + 2948	500	0	0		207	50	0.8	150	5.0	254.0	2.0	50	0	570	10560	No New Ditch	
112	27 + 3448	500	0	0		147	No Berm Req		No Berm Req								No New Ditch	
113	27 + 3948	500	0	0		140	No Berm Req		No Berm Req								No New Ditch	
114	27 + 4448	500	0	0		150	No Berm Req		No Berm Req								No New Ditch	
115	27 + 4948	500	0	0		121	No Berm Req		No Berm Req								No New Ditch	
116	28 + 245	500	0	0		107	No Berm Req		No Berm Req								No New Ditch	
117	28 + 745	500	0	0		136	No Berm Req		No Berm Req								No New Ditch	
118	28 + 1245	500	0	0		124	No Berm Req		No Berm Req								No New Ditch	
119	28 + 1745	500	0	0		73	No Berm Req		No Berm Req								No New Ditch	
120	28 + 2245	500	0	0		72	No Berm Req		No Berm Req								No New Ditch	
															TOTAL:	**yd^3** 10560		

Below Piggott Seepage Study - Final Ditch Evaluation

Section	Levee Station/Mile From =>	Central	To	Low Points of Interest on Existing Landside X_{PI} (ft)	t_{PI} or z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL	Recommended Berm Design X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o		X_{PI} (ft)	z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
1	17 / 1650	17 / 1900		180	0.1	2.20	76.01	22.01	49.01	0.80	NG	NG	NG	100	4.0	2.7	3.3	0.49	OK	-0.08	OK	180	0.10	2.30	76.99	22.99	49.99	0.80	NG	NG	NG
	No New Ditch															Width	Thickness														
														Alt Rec'd?	yes	100	4														

Section	Levee Station/Mile From =>	Central	To	Low Points of Interest on Existing Landside X_{PI} (ft)	t_{PI} or z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL	Recommended Berm Design X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	*	X_{PI} (ft)	z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
2	17 / 2150	17 / 2400		180	3.0	1.82	2.27	0.61	1.44	0.80	NG	OK	NG	150	5.0	2.3	3.1	0.28	OK	-0.15	OK	180	3.00	2.08	2.36	0.69	1.53	0.80	NG	OK	NG
	No New Ditch			2000	3.0	0.03	1.68	0.01	0.84	0.80	NG	OK	NG	No Berm Req		Width	Thickness					2000	3.00	0.04	1.68	0.01	0.85	0.80	NG	OK	NG
														Install Anyway?	yes	150	5														

Section	Levee Station/Mile From =>	Central	To	Low Points of Interest on Existing Landside X_{PI} (ft)	t_{PI} or z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL	Recommended Berm Design X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o		X_{PI} (ft)	z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
3	17 / 2650	17 / 2900												150	5.0	3.1	4.1	0.69	OK	-0.10	OK										
	No Ditch													Alt Rec'd?	no																

Section	Levee Station/Mile From =>	Central	To	Low Points of Interest on Existing Landside X_{PI} (ft)	t_{PI} or z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL	Recommended Berm Design X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o		X_{PI} (ft)	z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
4	17 / 3150	17 / 3400												150	5.0	2.0	3.2	0.57	OK	-0.21	OK										
	No Ditch													Alt Rec'd?	no																

Section	Levee Station/Mile From =>	Central	To	Low Points of Interest on Existing Landside X_{PI} (ft)	t_{PI} or z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL	Recommended Berm Design X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o		X_{PI} (ft)	z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
5	17 / 3650	17 / 3900												150	5.0	2.3	3.2	0.47	OK	-0.18	OK										
	No Ditch													Alt Rec'd?	no																

Section	Levee Station/Mile From =>	Central	To	Low Points of Interest on Existing Landside X_{PI} (ft)	t_{PI} or z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL	Recommended Berm Design X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	*	X_{PI} (ft)	z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
6	17 / 4150	17 / 4400												150	5.0	2.0	2.9	0.36	OK	-0.20	OK										
	No Ditch													No Berm Req		Width	Thickness														
														Install Anyway?	yes	150	5														

Section	Levee Station/Mile From =>	Central	To	Low Points of Interest on Existing Landside X_{PI} (ft)	t_{PI} or z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL	Recommended Berm Design X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o		X_{PI} (ft)	z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
7	17 / 4650	17 / 4900												150	5.0	2.3	3.5	0.78	OK	-0.19	OK										
	No Ditch													Alt Rec'd?	no																

Section	Levee Station/Mile From =>	Central	To	Low Points of Interest on Existing Landside X_{PI} (ft)	t_{PI} or z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL	Recommended Berm Design X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o		X_{PI} (ft)	z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
8	17 / 5150	17 / 5488		171	0.1	2.08	59.77	20.77	40.27	0.80	NG	NG	NG	150	5.0	2.5	3.5	0.62	OK	-0.17	OK	171	0.10	2.30	62.05	23.05	42.55	0.80	NG	NG	NG
	Ditch 1																														
														Alt Rec'd?	no																

Section	Levee Station/Mile From =>	Central	To	Low Points of Interest on Existing Landside X_{PI} (ft)	t_{PI} or z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL	Recommended Berm Design X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o		X_{PI} (ft)	z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
9	18 / 125	18 / 250		171	0.1	1.15	45.52	11.52	28.52	0.80	NG	NG	NG	150	5.0	1.6	2.7	0.47	OK	-0.27	OK	171	0.10	1.46	48.63	14.63	31.63	0.80	NG	NG	NG
	Ditch 1																														
														Alt Rec'd?	no																

Section	Levee Station/Mile From =>	Central	To	Low Points of Interest on Existing Landside X_{PI} (ft)	t_{PI} or z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL	Recommended Berm Design X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o		X_{PI} (ft)	z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
10	18 / 500	18 / 750		171	0.1	0.95	38.46	9.46	23.96	0.80	NG	NG	NG	150	5.0	1.4	2.4	0.48	OK	-0.32	OK	171	0.10	1.26	41.58	12.58	27.08	0.80	NG	NG	NG
	Ditch 1																														
														Alt Rec'd?	no																

Section	Levee Station/Mile From =>	Central	To	Low Points of Interest on Existing Landside X_{PI} (ft)	t_{PI} or z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL	Recommended Berm Design X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o		X_{PI} (ft)	z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
11	18 / 1000	18 / 1250		171	3.0	2.59	2.36	0.86	1.61	0.80	NG	NG	NG	150	5.0	3.0	4.2	0.40	OK	-0.07	OK	171	3.00	2.81	2.44	0.94	1.69	0.80	NG	NG	NG
	Ditch 1																														
														Alt Rec'd?	no																

Section	Levee Station/Mile From =>	Central	To	Low Points of Interest on Existing Landside X_{PI} (ft)	t_{PI} or z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL	Recommended Berm Design X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o		X_{PI} (ft)	z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
12	18 / 1500	18 / 1750		171	1.5	2.80	4.54	1.87	3.20	0.80	NG	NG	NG	150	5.0	3.2	4.1	0.58	OK	-0.09	OK	171	1.50	3.02	4.68	2.01	3.34	0.80	NG	NG	NG
	Ditch 1			171	3.0	2.80	1.77	0.93	1.35	0.80	NG	NG	NG									171	3.00	3.02	1.84	1.01	1.42	0.80	NG	NG	NG
														Alt Rec'd?	no																

Section	Levee Station/Mile From =>	Central	To	Low Points of Interest on Existing Landside X_{PI} (ft)	t_{PI} or z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL	Recommended Berm Design X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o		X_{PI} (ft)	z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
13	18 / 2000	18 / 2250		171	0.1	1.57	49.70	15.70	32.70	0.80	NG	NG	NG	150	5.0	2.1	3.5	0.61	OK	-0.18	OK	171	0.10	1.89	52.86	18.86	35.86	0.80	NG	NG	NG
	Ditch 1																														
														Alt Rec'd?	no																

Section	Levee Station/Mile From =>	Central	To	Low Points of Interest on Existing Landside X_{PI} (ft)	t_{PI} or z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL	Recommended Berm Design X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o	*	X_{PI} (ft)	z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
14	18 / 2500	18 / 2750		171	2.5	1.88	2.35	0.75	1.55	0.80	NG	OK	NG	150	5.0	2.3	3.3	0.36	OK	-0.15	OK	171	2.50	2.16	2.46	0.86	1.66	0.80	NG	NG	NG
	Ditch 1													No Berm Req		Width	Thickness														
														Install Anyway?	yes	150	5														

Section	Levee Station/Mile From =>	Central	To	Low Points of Interest on Existing Landside X_{PI} (ft)	t_{PI} or z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL	Recommended Berm Design X_{SP} (ft)	t_{final} (ft)	h'_t (ft)	h'_o (ft)	i'_t		i'_o		X_{PI} (ft)	z_{PI} (ft)	h'_{PI} (ft)	i'_{PI} DRY	i'_{PI} FULL	i'_{PI} 1/2 FULL	$i_{t(allowable)}$	DRY	FULL	1/2 FULL
15	18 / 3000	18 / 3250		171	0.1	1.43	53.30	14.30	33.80	0.80	NG	NG	NG	150	5.0	2.0	3.1	0.49	OK	-0.21	OK	171	0.10	1.75	56.52	17.52	37.02	0.80	NG	NG	NG
	Ditch 1																														
														Alt Rec'd?	no																

Below Piggott Seepage Study - Final Ditch Evaluation

Section	Levee Station/Mile From =>	18 / 3250	Low Points of Interest on Existing Landside										Recommended Berm Design																			
	Central	To	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
			(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
16	18 / 3500	18 / 3750	171	0.5	1.41	10.83	2.83	6.83	0.80	NG	NG	NG	150	5.0	1.9	3.0	0.43	OK	-0.21	OK	171	0.50	1.75	11.49	3.49	7.49	0.80	NG	NG	NG
	Ditch 2																													
													Alt Rec'd?	no																

Section	Levee Station/Mile From =>	18 / 3750	Low Points of Interest on Existing Landside										Recommended Berm Design																			
	Central	To	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o		X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
			(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
17	18 / 4000	18 / 4250	171	3.0	1.66	1.39	0.55	0.97	0.80	NG	OK	NG	150	5.0	2.2	3.4	0.40	OK	-0.16	OK	171	3.00	1.99	1.50	0.66	1.08	0.80	NG	OK	NG
	Ditch 2																													
													Alt Rec'd?	no																

Section	Levee Station/Mile From =>	18 / 4250	Low Points of Interest on Existing Landside										Recommended Berm Design																			
	Central	To	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
			(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
18	18 / 4500	18 / 4750											150	5.0	2.7	3.4	0.38	OK	-0.13	OK										
	No Ditch												No Berm Req		Width	Thickness														
													Install Anyway?	yes	150	5														

Section	Levee Station/Mile From =>	18 / 4750	Low Points of Interest on Existing Landside										Recommended Berm Design																			
	Central	To	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
			(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
19	18 / 5000	19 / 220											150	5.0	2.0	3.1	0.37	OK	-0.18	OK										
	No Ditch												No Berm Req		Width	Thickness														
													Install Anyway?	yes	150	5														

Section	Levee Station/Mile From =>	19 / 220	Low Points of Interest on Existing Landside										Recommended Berm Design																			
	Central	To	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
			(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
20	19 / 470	19 / 720											150	5.0	2.1	3.1	0.38	OK	-0.18	OK										
	No Ditch												No Berm Req		Width	Thickness														
													Install Anyway?	yes	150	5														

Section	Levee Station/Mile From =>	19 / 720	Low Points of Interest on Existing Landside										Recommended Berm Design																			
	Central	To	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o		X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
			(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
21	19 / 970	19 / 1220											150	5.0	1.7	2.8	0.48	OK	-0.26	OK										
	No Ditch																													
													Alt Rec'd?	no																

Section	Levee Station/Mile From =>	19 / 1220	Low Points of Interest on Existing Landside										Recommended Berm Design																			
	Central	To	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o		X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
			(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
22	19 / 1470	19 / 1720											150	5.0	1.7	2.7	0.47	OK	-0.26	OK										
	No Ditch																													
													Alt Rec'd?	no																

Section	Levee Station/Mile From =>	19 / 1720	Low Points of Interest on Existing Landside										Recommended Berm Design																			
	Central	To	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
			(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
23	19 / 1970	19 / 2220											150	5.0	1.6	2.4	0.36	OK	-0.27	OK										
	No Ditch												No Berm Req		Width	Thickness														
													Install Anyway?	yes	150	5														

Section	Levee Station/Mile From =>	19 / 2220	Low Points of Interest on Existing Landside										Recommended Berm Design																			
	Central	To	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o		X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
			(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
24	19 / 2470	19 / 2720											150	5.0	0.9	1.8	0.59	OK	-0.49	OK										
	No Ditch																													
													Alt Rec'd?	no																

Section	Levee Station/Mile From =>	19 / 2720	Low Points of Interest on Existing Landside										Recommended Berm Design																			
	Central	To	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
			(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
25	19 / 2970	19 / 3220											150	5.0	1.8	2.7	0.34	OK	-0.22	OK										
	No Ditch												No Berm Req		Width	Thickness														
													Install Anyway?	yes	150	5														

Section	Levee Station/Mile From =>	19 / 3220	Low Points of Interest on Existing Landside										Recommended Berm Design																			
	Central	To	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o		X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
			(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
26	19 / 3470	19 / 3720											150	5.0	2.7	3.6	0.48	OK	-0.13	OK										
	No Ditch																													
													Alt Rec'd?	no																

Section	Levee Station/Mile From =>	19 / 3720	Low Points of Interest on Existing Landside										Recommended Berm Design																			
	Central	To	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o		X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
			(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
27	19 / 3970	19 / 4220	400	1.0	0.89	3.39	0.89	2.14	0.80	NG	NG	NG	150	5.0	2.2	3.3	0.64	OK	-0.20	OK	400	1.00	1.05	3.55	1.05	2.30	0.80	NG	NG	NG
	No Ditch		500	1.0	0.67	3.17	0.67	1.92	0.80	NG	OK	NG									500	1.00	0.79	3.29	0.79	2.04	0.80	NG	OK	NG
			400	1.5	0.89	1.93	0.59	1.26	0.80	NG	OK	NG	Alt Rec'd?	no							400	1.50	1.05	2.03	0.70	1.37	0.80	NG	OK	NG

Section	Levee Station/Mile From =>	19 / 4220	Low Points of Interest on Existing Landside										Recommended Berm Design																			
	Central	To	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o		X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
			(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
28	19 / 4470	19 / 4720	220	2.0	1.91	1.95	0.95	1.45	0.80	NG	NG	NG	150	5.0	2.7	3.9	0.68	OK	-0.12	OK	220	2.00	2.19	2.09	1.09	1.59	0.80	NG	NG	NG
	No Ditch		340	2.0	1.39	1.69	0.69	1.19	0.80	NG	OK	NG									340	2.00	1.59	1.80	0.80	1.30	0.80	NG	OK	NG
			220	2.8	1.91	1.15	0.69	0.92	0.80	NG	OK	NG	Alt Rec'd?	no							220	2.75	2.19	1.25	0.80	1.02	0.80	NG	OK	NG

Section	Levee Station/Mile From =>	19 / 4720	Low Points of Interest on Existing Landside										Recommended Berm Design																			
	Central	To	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o		X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
			(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
29	19 / 4970	20 / 40	82	0.5	3.11	16.21	6.21	11.21	0.66	NG	NG	NG	115	2.5	3.1	4.2	0.55	OK	0.21	OK	82	0.50	3.29	0.46	0.46	0.46	0.57	OK	OK	OK
	Ditch 3		82	3.0	3.11	1.87	1.04	1.45	0.66	NG	NG	NG			Width	Thickness					82	Covered								
			145	4.3	2.59	0.90	0.61	0.76	0.79	NG	OK	OK	Alt Rec'd?	yes	115	2.5					145	4.25	2.74	0.94	0.64	0.79	0.80	NG	OK	OK

Section	Levee Station/Mile From =>	20 / 40	Low Points of Interest on Existing Landside										Recommended Berm Design																			
	Central	To	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o		X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
			(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
30	20 / 290	20 / 540	95	0.0	1.17	#DIV/0!	#DIV/0!	#DIV/0!	0.69	####	####	####	115	2.5	1.4	2.3	0.55	OK	-0.04	OK	95	0.00	1.44	0.58	0.58	0.58	0.62	OK	OK	OK
	Ditch 3		95	0.1	1.17	35.71	11.71	23.71	0.69	NG	NG	NG			Width	Thickness					95	Covered								
													Alt Rec'd?	yes	115	2.5														

Below Piggott Seepage Study - Final Ditch Evaluation

Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																			
	From =>	20 / 540	X_{PI}	t_{PI} or z_{iPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o		X_{PI}	z_{iPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
31	20 / 790	20 / 1040	95	1.0	2.05	5.55	2.05	3.80	0.69	NG	NG	NG	115	2.5	2.2	3.2	0.48	OK	0.10	OK	95	1.00	2.27	0.23	0.23	0.23	0.62	OK	OK	OK
	Ditch 3		95	3.5	2.05	0.87	0.58	0.73	0.69	NG	OK	NG			Width	Thickness					95	Covered								
													Alt Rec'd?	yes	115	2.5														
Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																			
	From =>	20 / 1040	X_{PI}	t_{PI} or z_{iPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o		X_{PI}	z_{iPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
32	20 / 1290	20 / 1540											115	2.5	2.6	3.7	0.57	OK	0.17	OK										
	No Ditch														Width	Thickness														
													Alt Rec'd?	yes	115	2.5														
Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																			
	From =>	20 / 1540	X_{PI}	t_{PI} or z_{iPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o		X_{PI}	z_{iPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
33	20 / 1790	20 / 2040											115	2.5	1.0	1.7	0.49	OK	-0.18	OK										
	No Ditch														Width	Thickness														
													Alt Rec'd?	yes	115	2.5														
Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																			
	From =>	20 / 2040	X_{PI}	t_{PI} or z_{iPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o		X_{PI}	z_{iPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
34	20 / 2290	20 / 2540											115	2.5	2.5	3.1	0.63	OK	0.10	OK										
	No Ditch														Width	Thickness														
													Alt Rec'd?	yes	115	2.5														
Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																			
	From =>	20 / 2540	X_{PI}	t_{PI} or z_{iPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o		X_{PI}	z_{iPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
35	20 / 2790	20 / 3040											150	5.0	2.7	4.2	0.54	OK	-0.08	OK										
	No Ditch																													
													Alt Rec'd?	no																
Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																			
	From =>	20 / 3040	X_{PI}	t_{PI} or z_{iPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o		X_{PI}	z_{iPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
36	20 / 3290	20 / 3540											150	5.0	2.2	3.4	0.50	OK	-0.16	OK										
	No Ditch																													
													Alt Rec'd?	no																
Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																			
	From =>	20 / 3540	X_{PI}	t_{PI} or z_{iPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{iPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
37	20 / 3790	20 / 4040	40	3.5	2.05	1.30	0.59	0.94	0.58	NG	NG	NG	150	5.0	1.9	2.8	0.31	OK	-0.20	OK	40	Covered								
	Ditch 4		171	4.5	1.40	0.64	0.31	0.48	0.80	OK	OK	OK	No Berm Req		Width	Thickness					171	4.50	1.70	0.71	0.38	0.54	0.80	OK	OK	OK
													Install Anyway?	yes	150	5														
Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																			
	From =>	20 / 4040	X_{PI}	t_{PI} or z_{iPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{iPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
38	20 / 4290	20 / 4540	40	6.5	2.02	0.54	0.31	0.43	0.58	OK	OK	OK	150	5.0	1.9	2.7	0.24	OK	-0.18	OK	40	Covered								
	Ditch 4		171	6.5	1.44	0.45	0.22	0.34	0.80	OK	OK	OK	No Berm Req		Width	Thickness					171	6.50	1.75	0.50	0.27	0.38	0.80	OK	OK	OK
													Install Anyway?	yes	150	5														
Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																			
	From =>	20 / 4540	X_{PI}	t_{PI} or z_{iPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{iPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
39	20 / 4790	20 / 5040	100	1.0	1.74	4.24	1.74	2.99	0.70	NG	NG	NG	150	5.0	1.9	2.6	0.53	OK	-0.28	OK	100	Covered								
	Ditch 4		171	1.5	1.48	2.32	0.98	1.65	0.80	NG	NG	NG									171	1.50	1.74	2.49	1.16	1.83	0.80	NG	NG	NG
													Alt Rec'd?	no																
Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																			
	From =>	20 / 5040	X_{PI}	t_{PI} or z_{iPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{iPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
40	20 / 5290	20 / 5540	100	3.0	1.20	1.07	0.40	0.73	0.70	NG	OK	NG	150	5.0	1.5	2.4	0.29	OK	-0.26	OK	100	Covered								
	Ditch 4		171	3.5	0.93	0.69	0.27	0.48	0.80	OK	OK	OK	No Berm Req		Width	Thickness					171	3.50	1.29	0.80	0.37	0.58	0.80	OK	OK	OK
													Install Anyway?	yes	150	5														
Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																			
	From =>	20 / 5540	X_{PI}	t_{PI} or z_{iPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{iPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
41	20 / 5790	20 / 6040	100	4.0	2.60	1.65	0.65	1.15	0.70	NG	OK	NG	150	5.0	2.7	3.4	0.33	OK	-0.12	OK	100	Covered								
	Ditch 4		171	6.0	2.30	0.72	0.38	0.55	0.80	OK	OK	OK	No Berm Req		Width	Thickness					171	6.00	2.54	0.76	0.42	0.59	0.80	OK	OK	OK
													Install Anyway?	yes	150	5														
Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																			
	From =>	20 / 6040	X_{PI}	t_{PI} or z_{iPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{iPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
42	21 / 145	21 / 395	100	1.5	2.34	3.89	1.56	2.72	0.70	NG	NG	NG	150	5.0	2.4	3.3	0.48	OK	-0.17	OK	100	Covered								
	Ditch 4		171	3.0	1.99	1.33	0.66	1.00	0.80	NG	OK	NG									171	3.00	2.26	1.42	0.75	1.09	0.80	NG	OK	NG
													Alt Rec'd?	no																
Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																			
	From =>	21 / 395	X_{PI}	t_{PI} or z_{iPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{iPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)				*	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
43	21 / 645	21 / 895	100	5.0	3.19	1.64	0.64	1.14	0.70	NG	OK	NG	No Berm Req																	
	Ditch 4		171	7.0	2.94	0.85	0.42	0.63	0.80	NG	OK	OK	No Berm Req																	
													Install Anyway?	no																
Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																			
	From =>	21 / 895	X_{PI}	t_{PI} or z_{iPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{iPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)				*	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
44	21 / 1145	21 / 1395	100	1.5	2.64	5.76	1.76	3.76	0.70	NG	NG	NG	No Berm Req																	
	Ditch 4		171	4.5	2.27	1.17	0.50	0.84	0.80	NG	OK	NG	No Berm Req																	
													Install Anyway?	no																
Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																			
	From =>	21 / 1395	X_{PI}	t_{PI} or z_{iPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{iPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)				*	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
45	21 / 1645	21 / 1895	100	0.1	0.95	43.54	9.54	26.54	0.70	NG	NG	NG	No Berm Req																	
	Ditch 4		171	0.1	0.71	41.05	7.05	24.05	0.80	NG	NG	NG	No Berm Req																	
													Install Anyway?	no																

Below Piggott Seepage Study - Final Ditch Evaluation

Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																					
	From =>	21 / 1895	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)				*	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
46	21 / 2145	21 / 2395	100	4.5	1.95	1.32	0.43	0.88	0.70	NG	OK	NG	No Berm Req																					
	Ditch 4		171	4.5	1.68	1.26	0.37	0.82	0.80	NG	OK	NG	No Berm Req																					
													Install Anyway?	no																				
Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																					
	From =>	21 / 2395	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)				*	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
47	21 / 2645	21 / 2895	100	1.5	2.35	4.57	1.57	3.07	0.70	NG	NG	NG	No Berm Req																					
	Ditch 4		171	3.5	2.01	1.29	0.57	0.93	0.80	NG	OK	NG	No Berm Req																					
													Install Anyway?	no																				
Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																					
	From =>	21 / 2895	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o		X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
48	21 / 3145	21 / 3395	171	0.5	1.56	9.13	3.13	6.13	0.80	NG	NG	NG	150	5.0	2.0	2.7	0.56	OK	-0.26	OK	171	0.50	1.83	9.67	3.67	6.67	0.80	NG	NG	NG
	Ditch 4																															
													Alt Rec'd?	no																			
Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																					
	From =>	21 / 3395	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)				*	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
49	21 / 3645	21 / 3895	100	5.5	1.90	0.71	0.35	0.53	0.70	NG	OK	OK	150	5.0	2.1	2.9	0.27	OK	-0.17	OK	100	Covered										
	Ditch 4		171	6.5	1.61	0.40	0.25	0.32	0.80	OK	OK	OK	No Berm Req		Width	Thickness					171	6.50	1.92	0.45	0.30	0.37	0.80	OK	OK	OK
													Install Anyway?	yes	150	5																
Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																					
	From =>	21 / 3895	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)				*	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
50	21 / 4145	21 / 4395	100	4.5	2.93	1.21	0.65	0.93	0.70	NG	OK	NG	150	5.0	3.0	3.7	0.42	OK	-0.11	OK	100	Covered										
	Ditch 4		171	5.0	2.64	0.93	0.53	0.73	0.80	NG	OK	OK	No Berm Req		Width	Thickness					171	5.00	2.84	0.97	0.57	0.77	0.80	NG	OK	OK
													Install Anyway?	yes	150	5																
Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																					
	From =>	21 / 4395	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o		X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
51	21 / 4645	21 / 4895	171	2.5	2.25	1.70	0.90	1.30	0.80	NG	NG	NG	150	5.0	2.7	3.7	0.60	OK	-0.14	OK	171	2.50	2.51	1.81	1.01	1.41	0.80	NG	NG	NG
	Ditch 4																															
													Alt Rec'd?	no																			
Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																					
	From =>	21 / 4895	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)				*	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
52	21 / 5145	22 / 190	100	3.5	3.51	2.29	1.00	1.65	0.70	NG	NG	NG	150	5.0	3.5	4.2	0.44	OK	-0.06	OK	100	Covered										
	Ditch 4		171	5.5	3.20	1.04	0.58	0.81	0.80	NG	OK	NG	No Berm Req		Width	Thickness					171	5.50	3.38	1.07	0.61	0.84	0.80	NG	OK	NG
													Install Anyway?	yes	150	5																
Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																					
	From =>	22 / 190	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)				*	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
53	22 / 440	22 / 690	100	6.0	3.04	1.09	0.51	0.80	0.70	NG	OK	NG	150	5.0	3.1	3.7	0.32	OK	-0.09	OK	100	Covered										
	Ditch 4		171	6.5	2.77	0.89	0.43	0.66	0.80	NG	OK	OK	No Berm Req		Width	Thickness					171	6.50	2.97	0.92	0.46	0.69	0.80	NG	OK	OK
													Install Anyway?	yes	150	5																
Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																					
	From =>	22 / 690	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)				*	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
54	22 / 940	22 / 1190	100	1.5	2.00	3.66	1.33	2.50	0.70	NG	NG	NG	150	5.0	2.1	2.9	0.43	OK	-0.21	OK	100	Covered										
	Ditch 4		171	2.0	1.72	2.36	0.86	1.61	0.80	NG	NG	NG	No Berm Req		Width	Thickness					171	2.00	2.01	2.50	1.00	1.75	0.80	NG	NG	NG
													Install Anyway?	yes	150	5																
Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																					
	From =>	22 / 1190	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)				*	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
55	22 / 1440	22 / 1690	100	4.0	2.63	1.53	0.66	1.10	0.70	NG	OK	NG	150	5.0	2.7	3.4	0.36	OK	-0.13	OK	100	Covered										
	Ditch 4		171	4.5	2.36	1.19	0.52	0.86	0.80	NG	OK	NG	No Berm Req		Width	Thickness					171	4.50	2.60	1.24	0.58	0.91	0.80	NG	OK	NG
													Install Anyway?	yes	150	5																
Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																					
	From =>	22 / 1690	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o		X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
56	22 / 1940	22 / 2190	171	0.1	1.18	40.75	11.75	26.25	0.80	NG	NG	NG	150	5.0	1.6	2.4	0.54	OK	-0.33	OK	171	0.10	1.48	43.84	14.84	29.34	0.80	NG	NG	NG
	Ditch 4																															
													Alt Rec'd?	no																			
Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																					
	From =>	22 / 2190	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)				*	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
57	22 / 2440	22 / 2690	475	0.5	1.27	11.54	2.54	7.04	0.80	NG	NG	NG	150	5.0	2.8	3.7	0.55	OK	-0.13	OK	475	0.50	1.41	11.82	2.82	7.32	0.80	NG	NG	NG
	No New Ditch		475	1.8	1.27	2.48	0.71	1.60	0.80	NG	OK	NG									475	1.80	1.41	2.56	0.78	1.67	0.80	NG	OK	NG
			475	3.6	1.27	0.74	0.35	0.55	0.80	OK	OK	OK	Alt Rec'd?	no							475	3.60	1.41	0.78	0.39	0.59	0.80	OK	OK	OK
Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																					
	From =>	22 / 2690	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o		X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
58	22 / 2940	22 / 3190											150	5.0	3.9	4.8	0.52	OK	-0.01	OK										
	No Ditch																															
													Alt Rec'd?	no																			
Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																					
	From =>	22 / 3190	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o		X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
59	22 / 3440	22 / 3690											150	5.0	2.7	3.6	0.50	OK	-0.13	OK										
	No Ditch																															
													Alt Rec'd?	no																			
Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																					
	From =>	22 / 3690	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)				*	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
60	22 / 3940	22 / 4190											No Berm Req																					
	No Ditch												No Berm Req																					
													Install Anyway?	no																				

Below Piggott Seepage Study - Final Ditch Evaluation

Section	Levee Station/Mile From =>		Low Points of Interest on Existing Landside										Recommended Berm Design																		
			X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)				*	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
61	22 / 4440	22 / 4690	50	8.0	2.36	0.54	0.29	0.42	0.60	OK	OK	OK	No Berm Req																		
	No New Ditch												No Berm Req																		
													Install Anyway?	no																	
62	22 / 4940	22 / 5190	480	5.5	1.39	0.62	0.25	0.44	0.80	OK	OK	OK	No Berm Req																		
	No New Ditch												No Berm Req																		
													Install Anyway?	no																	
63	23 / 174	23 / 424	480	5.0	0.50	0.70	0.10	0.40	0.80	OK	OK	OK	No Berm Req																		
	No New Ditch												No Berm Req																		
													Install Anyway?	no																	
64	23 / 674	23 / 924	70	3.5	1.87	1.25	0.53	0.89	0.64	NG	OK	NG	No Berm Req																		
	Ditch 5		171	4.0	1.32	0.83	0.33	0.58	0.80	NG	OK	OK	No Berm Req																		
													Install Anyway?	no																	
65	23 / 1174	23 / 1424	65	4.0	2.03	1.01	0.51	0.76	0.63	NG	OK	NG	No Berm Req																		
	Ditch 5		171	4.5	1.52	0.67	0.34	0.50	0.80	OK	OK	OK	No Berm Req																		
													Install Anyway?	no																	
66	23 / 1674	23 / 1924	65	4.0	2.73	1.18	0.68	0.93	0.63	NG	NG	NG	150	5.0	2.6	3.5	0.44	OK	-0.13	OK	65	Covered								
	Ditch 5		171	4.5	2.20	0.82	0.49	0.65	0.80	NG	OK	OK									171	4.50	2.47	0.88	0.55	0.72	0.80	NG	OK	OK
													Alt Rec'd?	no																	
67	23 / 2174	23 / 2424	75	6.0	3.36	0.81	0.56	0.68	0.65	NG	OK	NG	150	5.0	3.2	4.1	0.43	OK	-0.07	OK	75	Covered								
	Ditch 5		171	6.0	2.84	0.72	0.47	0.60	0.80	OK	OK	OK									171	6.00	3.07	0.76	0.51	0.64	0.80	OK	OK	OK
													Alt Rec'd?	no																	
68	23 / 2674	23 / 2924	100	6.0	3.46	0.83	0.58	0.70	0.70	NG	OK	OK	150	5.0	3.4	4.3	0.46	OK	-0.06	OK	100	Covered								
	Ditch 5		171	5.5	3.11	0.93	0.57	0.75	0.80	NG	OK	OK									171	5.50	3.31	0.96	0.60	0.78	0.80	NG	OK	OK
													Alt Rec'd?	no																	
69	23 / 3174	23 / 3424	171	2.5	2.16	1.87	0.87	1.37	0.80	NG	NG	NG	150	5.0	2.6	3.4	0.51	OK	-0.16	OK	171	2.50	2.42	1.97	0.97	1.47	0.80	NG	NG	NG
	Ditch 5																														
													Alt Rec'd?	no																	
70	23 / 3674	23 / 3924	100	8.5	4.19	0.67	0.49	0.58	0.70	OK	OK	OK	150	5.0	4.1	4.9	0.41	OK	-0.01	OK	100	Covered								
	Ditch 5		171	8.0	3.85	0.73	0.48	0.61	0.80	OK	OK	OK	No Berm Req		Width	Thickness					171	8.00	4.01	0.75	0.50	0.63	0.80	OK	OK	OK
													Install Anyway?	yes	150	5															
71	23 / 4174	23 / 4424	110	14.0	4.95	0.46	0.35	0.41	0.72	OK	OK	OK	150	5.0	4.9	5.5	0.32	OK	0.02	OK	110	Covered								
	Ditch 5		171	13.0	4.73	0.56	0.36	0.46	0.80	OK	OK	OK	No Berm Req		Width	Thickness					171	13.00	4.82	0.56	0.37	0.47	0.80	OK	OK	OK
													Install Anyway?	yes	150	5															
72	23 / 4674	23 / 4924	110	6.0	3.54	0.92	0.59	0.76	0.72	NG	OK	NG	150	5.0	3.6	4.4	0.45	OK	-0.05	OK	110	Covered								
	Ditch 5		171	6.0	3.24	0.87	0.54	0.71	0.80	NG	OK	OK									171	6.00	3.43	0.91	0.57	0.74	0.80	NG	OK	OK
													Alt Rec'd?	no																	
73	23 / 5174	24 / 97	80	9.0	4.11	0.68	0.46	0.57	0.66	NG	OK	OK	No Berm Req																		
	Ditch 5		171	8.5	3.73	0.73	0.44	0.59	0.80	OK	OK	OK	No Berm Req																		
													Install Anyway?	no																	
74	24 / 347	24 / 597	80	5.5	3.17	1.03	0.58	0.80	0.66	NG	OK	NG	No Berm Req																		
	Ditch 5		171	5.5	2.75	0.95	0.50	0.73	0.80	NG	OK	OK	No Berm Req																		
													Install Anyway?	no																	
75	24 / 847	24 / 1097	90	5.5	2.95	0.99	0.54	0.76	0.68	NG	OK	NG	No Berm Req																		
	Ditch 5		171	5.5	2.61	0.93	0.47	0.70	0.80	NG	OK	OK	No Berm Req																		
													Install Anyway?	no																	

Below Piggott Seepage Study - Final Ditch Evaluation

Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																			
	From =>	24 / 1097	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)				*	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
76	24 / 1347	24 / 1597	90	7.0	3.72	0.96	0.53	0.75	0.68	NG	OK	NG	No Berm Req																			
	Ditch 5		171	7.5	3.36	0.78	0.45	0.61	0.80	OK	OK	OK	No Berm Req																			
													Install Anyway?	no																	

Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																			
	From =>	24 / 1597	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o		X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
77	24 / 1847	24 / 2097	90	2.5	2.36	2.14	0.94	1.54	0.68	NG	NG	NG	150	5.0	2.4	3.6	0.44	OK	-0.14	OK	90	Covered								
	Ditch 5		171	3.0	1.87	1.46	0.62	1.04	0.80	NG	OK	NG									171	3.00	2.20	1.57	0.73	1.15	0.80	NG	OK	NG
													Alt Rec'd?	no																

Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																			
	From =>	24 / 2097	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o		X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
78	24 / 2347	24 / 2597	171	2.5	2.49	2.00	1.00	1.50	0.80	NG	NG	NG	150	5.0	2.9	4.1	0.59	OK	-0.09	OK	171	2.50	2.77	2.11	1.11	1.61	0.80	NG	NG	NG
	Ditch 5																													
													Alt Rec'd?	no																

Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																			
	From =>	24 / 2597	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)				*	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
79	24 / 2847	24 / 3097	270	9.5	4.40	0.78	0.46	0.62	0.80	OK	OK	OK	150	5.0	5.1	6.0	0.41	OK	0.06	OK	270	9.50	4.51	0.79	0.47	0.63	0.80	OK	OK	OK
	No New Ditch												No Berm Req		Width	Thickness														
													Install Anyway?	yes	150	5														

Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																			
	From =>	24 / 3097	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)				*	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
80	24 / 3347	24 / 3597	700	6.5	0.81	0.51	0.12	0.32	0.80	OK	OK	OK	150	5.0	2.9	3.9	0.32	OK	-0.08	OK	700	6.50	0.90	0.52	0.14	0.33	0.80	OK	OK	OK
	No New Ditch												No Berm Req		Width	Thickness														
													Install Anyway?	yes	150	5														

Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																			
	From =>	24 / 3597	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o		X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
81	24 / 3847	24 / 4097											150	5.0	2.6	3.5	0.52	OK	-0.15	OK										
	No Ditch																													
													Alt Rec'd?	no																

Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																			
	From =>	24 / 4097	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o		X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
82	24 / 4347	24 / 4597											150	5.0	3.6	4.3	0.36	OK	-0.05	OK										
	No Ditch												No Berm Req		Width	Thickness														
													Install Anyway?	yes	150	5														

Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																			
	From =>	24 / 4597	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)				*	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
83	24 / 4847	24 / 5097	50	5.5	2.88	0.89	0.52	0.70	0.60	NG	OK	NG	150	5.0	2.7	3.5	0.36	OK	-0.12	OK	50	Covered								
	Ditch 6		171	6.0	2.34	0.64	0.39	0.52	0.80	OK	OK	OK	No Berm Req		Width	Thickness					171	6.00	2.59	0.68	0.43	0.56	0.80	OK	OK	OK
													Install Anyway?	yes	150	5														

Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																			
	From =>	24 / 5097	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o		X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
84	25 / 48	25 / 298	50	3.0	2.50	1.50	0.83	1.17	0.60	NG	NG	NG	150	5.0	2.3	3.2	0.47	OK	-0.18	OK	50	Covered								
	Ditch 6		171	3.5	1.90	0.97	0.54	0.76	0.80	NG	OK	OK									171	3.50	2.20	1.06	0.63	0.84	0.80	NG	OK	NG
													Alt Rec'd?	no																

Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																			
	From =>	25 / 298	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o		X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
85	25 / 548	25 / 798	50	2.0	2.31	2.16	1.16	1.66	0.60	NG	NG	NG	150	5.0	2.1	3.1	0.54	OK	-0.21	OK	50	Covered								
	Ditch 6		171	1.5	1.68	2.79	1.12	1.96	0.80	NG	NG	NG									171	1.50	1.98	2.99	1.32	2.16	0.80	NG	NG	NG
													Alt Rec'd?	no																

Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																			
	From =>	25 / 798	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o		X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
86	25 / 1048	25 / 1298	171	0.1	1.27	36.74	12.74	24.74	0.80	NG	NG	NG	150	5.0	1.7	2.6	0.69	OK	-0.32	OK	171	0.10	1.56	39.59	15.59	27.59	0.80	NG	NG	NG
	Ditch 6																													
													Alt Rec'd?	no																

Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																			
	From =>	25 / 1298	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o		X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
87	25 / 1548	25 / 1798	60	3.5	3.16	1.48	0.90	1.19	0.62	NG	NG	NG	150	5.0	2.9	3.8	0.54	OK	-0.11	OK	60	Covered								
	Ditch 6		171	3.0	2.59	1.70	0.86	1.28	0.80	NG	NG	NG									171	3.00	2.81	1.77	0.94	1.35	0.80	NG	NG	NG
													Alt Rec'd?	no																

Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																			
	From =>	25 / 1798	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)				*	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
88	25 / 2048	25 / 2298	60	6.0	3.27	0.96	0.54	0.75	0.62	NG	OK	NG	150	5.0	3.1	3.8	0.37	OK	-0.09	OK	60	Covered								
	Ditch 6		171	5.5	2.83	1.06	0.51	0.79	0.80	NG	OK	OK	No Berm Req		Width	Thickness					171	5.50	3.00	1.09	0.55	0.82	0.80	NG	OK	NG
													Install Anyway?	yes	150	5														

Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																			
	From =>	25 / 2298	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o		X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
89	25 / 2548	25 / 2798	171	0.1	0.95	33.52	9.52	21.52	0.80	NG	NG	NG	150	5.0	1.4	2.3	0.56	OK	-0.36	OK	171	0.10	1.25	36.55	12.55	24.55	0.80	NG	NG	NG
	Ditch 6																													
													Alt Rec'd?	no																

Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																			
	From =>	25 / 2798	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)				*	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
90	25 / 3048	25 / 3298	60	4.5	2.41	1.09	0.54	0.81	0.62	NG	OK	NG	No Berm Req																			
	Ditch 6		171	4.0	1.90	1.22	0.47	0.85	0.80	NG	OK	NG	No Berm Req																			
													Install Anyway?	no																

Below Piggott Seepage Study - Final Ditch Evaluation

Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																				
	From =>	25 / 3298	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)				*	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
91	25 / 3548	25 / 3798	60	6.0	2.57	0.76	0.43	0.59	0.62	NG	OK	OK	No Berm Req																				
	Ditch 6		171	5.0	2.14	1.03	0.43	0.73	0.80	NG	OK	OK	No Berm Req																				
													Install Anyway?	no																			

Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																				
	From =>	25 / 3798	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)				*	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
92	25 / 4048	25 / 4298	50	5.0	2.62	1.12	0.52	0.82	0.60	NG	OK	NG	No Berm Req																				
	Ditch 6		171	4.5	2.21	1.27	0.49	0.88	0.80	NG	OK	NG	No Berm Req																				
													Install Anyway?	no																			

Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																				
	From =>	25 / 4298	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)				*	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
93	25 / 4548	25 / 4798	50	7.0	2.15	0.74	0.31	0.52	0.60	NG	OK	OK	No Berm Req																				
	Ditch 6		171	5.5	1.68	1.12	0.31	0.71	0.80	NG	OK	OK	No Berm Req																				
													Install Anyway?	no																			

Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																				
	From =>	25 / 4798	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o		X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
94	25 / 5048	25 / 5298	50	4.5	2.94	1.10	0.65	0.88	0.60	NG	NG	NG	150	5.0	2.6	3.6	0.40	OK	-0.12	OK	50	Covered										
	Ditch 6		171	3.0	2.22	1.91	0.74	1.32	0.80	NG	OK	NG									171	3.00	2.46	1.99	0.82	1.40	0.80	NG	NG	NG
													Alt Rec'd?	no																		

Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																				
	From =>	25 / 5298	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o		X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
95	26 / 244	26 / 494	50	5.0	4.01	1.20	0.80	1.00	0.60	NG	NG	NG	150	5.0	3.6	4.6	0.52	OK	-0.03	OK	50	Covered										
	Ditch 6		171	4.0	3.28	1.57	0.82	1.20	0.80	NG	NG	NG									171	4.00	3.45	1.61	0.86	1.24	0.80	NG	NG	NG
													Alt Rec'd?	no																		

Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																				
	From =>	26 / 494	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o		X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
96	26 / 744	26 / 994	50	2.5	2.92	2.57	1.17	1.87	0.60	NG	NG	NG	150	5.0	2.7	3.5	0.45	OK	-0.13	OK	50	Covered										
	Ditch 6		171	3.0	2.34	1.78	0.78	1.28	0.80	NG	OK	NG									171	3.00	2.56	1.85	0.85	1.35	0.80	NG	NG	NG
													Alt Rec'd?	no																		

Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																				
	From =>	26 / 994	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)				*	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
97	26 / 1244	26 / 1494	50	5.5	2.50	0.82	0.45	0.64	0.60	NG	OK	NG	150	5.0	2.4	3.0	0.32	OK	-0.16	OK	50	Covered										
	Ditch 6		171	4.5	2.07	1.13	0.46	0.79	0.80	NG	OK	OK	No Berm Req		Width	Thickness					171	4.50	2.29	1.18	0.51	0.84	0.80	NG	OK	NG
													Install Anyway?	yes	150	5																

Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																				
	From =>	26 / 1494	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o		X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
98	26 / 1744	26 / 1994	55	3.0	3.41	2.80	1.14	1.97	0.61	NG	NG	NG	150	5.0	3.3	3.7	0.41	OK	-0.10	OK	55	Covered										
	Ditch 6		171	5.0	3.07	1.21	0.61	0.91	0.80	NG	OK	NG	No Berm Req		Width	Thickness					171	5.00	3.19	1.24	0.64	0.94	0.80	NG	OK	NG
													Install Anyway?	yes	150	5																

Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																				
	From =>	26 / 1994	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o		X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
99	26 / 2244	26 / 2494	50	6.0	3.86	1.06	0.64	0.85	0.60	NG	NG	NG	150	5.0	3.7	4.2	0.43	OK	-0.06	OK	50	Covered										
	Ditch 6		171	6.0	3.48	1.00	0.58	0.79	0.80	NG	OK	OK	No Berm Req		Width	Thickness					171	6.00	3.59	1.02	0.60	0.81	0.80	NG	OK	NG
													Install Anyway?	yes	150	5																

Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																				
	From =>	26 / 2494	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o		X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)					(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
100	26 / 2744	26 / 2994	50	4.5	3.60	1.36	0.80	1.08	0.60	NG	NG	NG	150	5.0	3.4	3.9	0.48	OK	-0.09	OK	50	Covered										
	Ditch 6		171	4.0	3.19	1.55	0.80	1.17	0.80	NG	OK	NG			Width	Thickness					171	4.00	3.31	1.58	0.83	1.20	0.80	NG	NG	NG
													Alt Rec'd?	yes	150	5																

Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																				
	From =>	26 / 2994	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)				*	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
101	26 / 3244	26 / 3494	50	4.5	3.14	1.36	0.70	1.03	0.60	NG	NG	NG	No Berm Req																				
	Ditch 6		171	4.5	2.57	1.24	0.57	0.90	0.80	NG	OK	NG	No Berm Req																				
													Install Anyway?	no																			

Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																				
	From =>	26 / 3494	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)				*	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
102	26 / 3744	26 / 3994	50	5.0	2.84	1.17	0.57	0.87	0.60	NG	OK	NG	No Berm Req																				
	Ditch 6		171	4.5	2.35	1.30	0.52	0.91	0.80	NG	OK	NG	No Berm Req																				
													Install Anyway?	no																			

Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																				
	From =>	26 / 3994	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)				*	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
103	26 / 4244	26 / 4494	50	7.0	3.87	0.98	0.55	0.77	0.60	NG	OK	NG	No Berm Req																				
	Ditch 6		171	6.5	3.30	1.05	0.51	0.78	0.80	NG	OK	OK	No Berm Req																				
													Install Anyway?	no																			

Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																				
	From =>	26 / 4494	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)				*	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
104	26 / 4744	26 / 4994	50	7.0	3.89	0.98	0.56	0.77	0.60	NG	OK	NG	No Berm Req																				
	Ditch 6		171	6.0	3.42	1.24	0.57	0.90	0.80	NG	OK	NG	No Berm Req																				
													Install Anyway?	no																			

Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																				
	From =>	26 / 4994	X_{PI}	t_{PI} or z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{PI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)				*	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
105	26 / 5244	27 / 198	50	11.0	4.56	0.60	0.41	0.51	0.60	OK	OK	OK	No Berm Req																				
	Ditch 6		171	9.0	4.13	0.90	0.46	0.68	0.80	NG	OK	OK	No Berm Req																				
													Install Anyway?	no																			

Below Piggott Seepage Study - Final Ditch Evaluation

	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																			
	From =>	27 / 198	X_{PI}	t_{PI} or z_{IPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{IPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)				*	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
106	27 / 448	27 / 698	55	7.0	3.44	0.92	0.49	0.71	0.61	NG	OK	NG	No Berm Req																			
	Ditch 6		171	6.0	3.04	1.17	0.51	0.84	0.80	NG	OK	NG	No Berm Req																			
													Install Anyway?	no																		

Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																			
	From =>	27 / 698	X_{PI}	t_{PI} or z_{IPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{IPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)				*	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
107	27 / 948	27 / 1198	55	8.0	3.42	0.80	0.43	0.61	0.61	NG	OK	OK	No Berm Req																			
	Ditch 6		171	7.0	3.00	1.00	0.43	0.71	0.80	NG	OK	OK	No Berm Req																			
													Install Anyway?	no																		

Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																			
	From =>	27 / 1198	X_{PI}	t_{PI} or z_{IPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{IPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)				*	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
108	27 / 1448	27 / 1698	55	7.5	3.29	0.77	0.44	0.60	0.61	NG	OK	OK	No Berm Req																			
	Ditch 6		171	5.0	2.85	1.57	0.57	1.07	0.80	NG	OK	NG	No Berm Req																			
													Install Anyway?	no																		

Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																			
	From =>	27 / 1698	X_{PI}	t_{PI} or z_{IPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{IPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)				*	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
109	27 / 1948	27 / 2198	55	9.5	4.98	0.89	0.52	0.71	0.61	NG	OK	NG	No Berm Req																			
	Ditch 6		171	9.0	4.46	0.94	0.50	0.72	0.80	NG	OK	OK	No Berm Req																			
													Install Anyway?	no																		

Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																			
	From =>	27 / 2198	X_{PI}	t_{PI} or z_{IPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{IPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)				*	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
110	27 / 2448	27 / 2698	170	5.0	3.72	1.74	0.74	1.24	0.80	NG	OK	NG	No Berm Req																			
	Ditch 6		2000	5.0	0.53	1.11	0.11	0.61	0.80	NG	OK	OK	No Berm Req																			
													Install Anyway?	no																		

Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																			
	From =>	27 / 2698	X_{PI}	t_{PI} or z_{IPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{berm}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{IPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)	"		"="		(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
111	27 / 2948	27 / 3198	175	0.1	1.44	58.37	14.37	36.37	0.80	NG	NG	NG	150	5.0	1.9	2.8	0.43	OK	-0.23	OK	175	0.10	1.74	61.38	17.38	39.38	0.80	NG	NG	NG
	No New Ditch																															
													Alt Rec'd?	no																		
			128.5	Pt 2:		Pt 3:																										
			OK																													
			OK																													
			OK																													

Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																			
	From =>	27 / 3198	X_{PI}	t_{PI} or z_{IPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{IPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)				*	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
112	27 / 3448	27 / 3698	175	0.1	2.15	90.51	21.51	56.01	0.80	NG	NG	NG	No Berm Req																			
	No New Ditch												No Berm Req																			
													Install Anyway?	no																		
			154.2	Pt 2:		Pt 3:																										
			OK																													
			OK																													
			OK																													

Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																			
	From =>	27 / 3698	X_{PI}	t_{PI} or z_{IPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{IPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)				*	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
113	27 / 3948	27 / 4198	175	0.1	2.50	99.02	25.02	62.02	0.80	NG	NG	NG	No Berm Req																			
	No New Ditch												No Berm Req																			
													Install Anyway?	no																		
			158.7	Pt 2:		Pt 3:																										
			OK																													
			OK																													
			OK																													

Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																			
	From =>	27 / 4198	X_{PI}	t_{PI} or z_{IPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{IPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)				*	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
114	27 / 4448	27 / 4698	175	0.1	2.84	107.43	28.43	67.93	0.80	NG	NG	NG	No Berm Req																			
	No New Ditch												No Berm Req																			
													Install Anyway?	no																		
			136.0	Pt 2:		Pt 3:																										
			OK																													
			OK																													
			OK																													

Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																			
	From =>	27 / 4698	X_{PI}	t_{PI} or z_{IPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{IPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)				*	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
115	27 / 4948	27 / 5198	175	1.0	2.89	11.89	2.89	7.39	0.80	NG	NG	NG	No Berm Req																			
	No New Ditch		175	0.1	2.89	127.89	28.89	78.39	0.80	NG	NG	NG	No Berm Req																			
													Install Anyway?	no																		
				Pt 2:	163.43	Pt 3:																										
					OK																											
					OK																											
					OK																											

Below Piggott Seepage Study - Final Ditch Evaluation

Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																					
	From =>	27 / 5198	X_{PI}	t_{PI} or z_{IPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{IPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$		1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)				*	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
116	28 / 245	28 / 495	175	5.0	3.23	2.05	0.65	1.35	0.80	NG	OK	NG	No Berm Req																		
No New Ditch			2000	5.0	0.63	1.53	0.13	0.83	0.80	NG	OK	NG	No Berm Req																		
													Install Anyway?	no																	
				Pt 2:		Pt 3:																									

Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																					
	From =>	28 / 495	X_{PI}	t_{PI} or z_{IPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{IPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$		1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)				*	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
117	28 / 745	28 / 995	175	0.1	1.73	66.30	17.30	41.80	0.80	NG	NG	NG	No Berm Req																		
No New Ditch													No Berm Req																		
													Install Anyway?	no																	
			180.4	Pt 2:		Pt 3:																									
			OK																												
			OK																												
			OK																												

Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																					
	From =>	28 / 995	X_{PI}	t_{PI} or z_{IPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{IPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$		1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)				*	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
118	28 / 1245	28 / 1495	175	0.1	2.42	103.23	24.23	63.73	0.80	NG	NG	NG	No Berm Req																		
No New Ditch													No Berm Req																		
													Install Anyway?	no																	
			171.9	Pt 2:		Pt 3:																									
			OK																												
			OK																												
			OK																												

Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																					
	From =>	28 / 1495	X_{PI}	t_{PI} or z_{IPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{IPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$		1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)				*	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
119	28 / 1745	28 / 1995	175	2.5	2.42	4.17	0.97	2.57	0.80	NG	NG	NG	No Berm Req																		
No New Ditch			310	2.5	2.00	4.00	0.80	2.40	0.80	NG	OK	NG	No Berm Req																		
			2000	2.5	0.19	3.28	0.08	1.68	0.80	NG	OK	NG	Install Anyway?	no																	

Section	Levee Station/Mile		Low Points of Interest on Existing Landside										Recommended Berm Design																					
	From =>	28 / 1995	X_{PI}	t_{PI} or z_{IPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$			1/2	X_{SP}	t_{final}	h'_t	h'_o	i'_t		i'_o	*	X_{PI}	z_{IPI}	h'_{PI}	i'_{PI}	i'_{PI}	i'_{PI}	$i_{t(allowable)}$		1/2
	Central	To	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL	(ft)	(ft)	(ft)	(ft)				*	(ft)	(ft)	(ft)	DRY	FULL	1/2 FULL		DRY	FULL	FULL
120	28 / 2245	28 / 2495	180	2.0	2.24	5.12	1.12	3.12	0.80	NG	NG	NG	No Berm Req																		
No New Ditch			410	2.0	1.60	4.80	0.80	2.80	0.80	NG	OK	NG	No Berm Req																		
			2000	2.0	0.16	4.08	0.08	2.08	0.80	NG	OK	NG	Install Anyway?	no																	

DDR - Appendix C

Civil Design

General

The general concept of the project is to increase resistance to seepage in problem areas by lengthening the seepage pathways under the West Bank St. Francis Levee. In select locations, it was more advantageous to perform grade fixes instead of constructing a full-sized berm.

Key design parameters for the berm:

- Typically 150' from theoretical toe to berm toe, sloped at 2% to drain.
-Typically 5' thick at levee toe and 2' at berm toe (150' off of levee toe).
-Tie-in elevation over ground was defined by Geotech.
-At Hwy 90, the berm was allowed by Geotech to be reduced to 115' wide or where it intersects with the highway embankment. The minimum thickness was reduced to 3', and the slope flattened to 1.3%.

Key design parameters for ditches:

-Typically 10' min from seepage berm toe to top of bank.
- Min. depth and bottom width established by H&H.
-Sideslopes typically 3:1.
-Where indicated by Geotech, an inverted filter will be installed. This consists of overexcavating 15", laying down a non-woven geotextile and backfilling with 6" #57 stone and a 9" surface layer of #1 "launch" stone.
-On the land side, another berm will be installed to prevent uncontrolled field runoff. 24" CMPs will be installed at select locations (possibly increasing to 30" at larger watersheds). This berm will be 12' wide, 3' high, with a 5:1 landside slope and 3:1 ditch side slope.
-Existing toe ditches where there is no seepage berm will be filled, and a new ditch (if warranted) will be reconstructed a minimum of 150' from the existing levee toe.

Programs and Standards for Design and Drawings

The computer-aided drafting and design (CADD) program used for the drawings utilized MicroStation V8i (SELECT series 4) with integrated InRoads/OpenRoads technology was used to generate topographic data including Digital Terrain Model (DTM) files, profiles, and cross sections. All drawings adhere to Mississippi Valley Division CAD standards.

Design Methodology

A previous geotechnical study indicated the seepage risk in this reach warranted remediation. The limits where initially designed from Mile 17 to Mile 27. Further refinement allowed for

certain reaches to be removed, leaving six segments from M17/13+10 to M27/32+00. Special attention was given to the following locations:

-POB (M17/13+10 to M17/19+00): Reduced width at C.R. 528. Extended berm to fill low ground at north end of project. One culvert will be removed with the change in grade.

-Vicinity Hwy 90 (M19/45+00 to): Intersect with ramp, Hwy 90 embankment, grading around electrical tower, grout and abandon two culverts, reduction of width at C.R. 508.

-C.R. 807 (M26/8+00 to M26/14+00). Berm reduced slightly to allow open-channel ditch between berm toe and existing utilities.

-Segment 6 (M27/26+00 to M27/32+00). Berm width reduced to toe out at the top bank of existing ditch.

Limits were revised April 2019. Limits were originally drawn to edge of seepage reaches. PDT determined it would be better to extend coverage 250' past the seepage reaches. Plans and real estate exhibits were revised as well. Final limits are

Segment 1: 17/13+10 to 21/5+00
Segment 2: 21/28+00 to 22/38+00
Segment 3: 23/13+25 to 23/50+25
Segment 4: 24/15+00 to 25/29+00
Segment 5: 25/47+00 to 26/31+00
Segment 6: 27/26+00 to 27/33+00

Ditches were laid out to move water away from the berm toe towards Mayo ditch. This brought large ditches out into farm fields. This was not acceptable to the sponsor and land owners. The PDT reassessed and determined that a toe ditch would be acceptable, with the following caveats:

-Ditch must be 10' min from berm toe to top of ditch.

-Must meet minimum depth to satisfy H&H parameters, while not being deep enough to draw seepage.

-Where indicated by Geotech analysis, install an inverted filter to prevent sediment transport into the ditch.

Inverted filter limits set by geotech on 17APR2019. Limits of filter are
- Ditch 1: Full length of ditch: 3500 LF.
- Ditch 2: Full length of ditch: 720 LF.
- Ditch 3: No filter needed.
- Ditch 4: Full length of ditch: 9390 LF.
- Ditch 5: Filter needed from 23/29+50 to 23/34+50 and also from 24/16+00 to the ditch end, for a total of 1644 LF of lined ditch.
- Ditch 6: Full length of ditch: 13320 LF.

The geotextile was also changed from a Mirafi 140N to 180N based on soil conditions and durability considerations.

Ditches were proposed by H&H. Civil laid in an alignment and grade, which was send back to H&H for confirmation that this design would be acceptable. Alignment adjustments were made, and several ditches were combined (ditches 1, 2, & 3, and ditches 8 & 9). Once agreed, the ditch design was analyzed by Geotech to assess the need for an inverted filter.

The sponsor was provided the opportunity to provide feedback at various times during the design process. Where practical, and based on cost effectiveness and engineering feasibility, the PDT sought to accommodate sponsor concerns.

In March 2019, a change in scope was added to provide a 12' wide berm to act as a sediment trap. The berm was originally to be 3' high with a 3:1 foreslope (ditch side) and 5:1 backslope (farm side). However, this was reduced to 2' after determining that the difference in volume between a 2' and 3' berm is double. Where culverts drain farm fields into the project ditches, the backslope will be reduced to 3:1. A min. of 1' of cover is recovered over the culvert. The design culverts were sized to match existing culverts. Legths assume a 1' depth of field swale, and may be field fit with approval of the KO.

The sediment berm mimics the exiting spoil pile at the edge of the ditch and performs a similar function. Currently, spoil at the top of the exiting ditch forms a 3' high berm along the west top of bank. Existing culverts pass through the spoil to drain to the ditch. See table below for comparisons of existing and proposed culvert sizes at each location.

Ditch will be lined with #1 and #57 stone where an inverted filter is indicated, and turfed where there is no filter. The stone and turf provide adequate protection against potential scour from the culvert outflow.

See the H&H apprendix for further information on field culverts.

CULVERT INSTALLATION SCHEDULE			
STATION	CULVERT	Existing conditions	Sheef
M18 17+90	59 LF 30" DIA. CMP CULVERT	20.0 LF 18" DIA. CMP CULVERT	C-113
M18 20+80	33 LF 24" DIA. CMP CULVERT	20.0 LF 18" DIA. CMP CULVERT	C-113
M21 3+36	33 LF 24" DIA. CMP CULVERT	26.3 LF 24" DIA. STEEL PIPE CULVERT	C-119
M21 4+65	33 LF 24" DIA. CMP CULVERT	23.2 LF 18" DIA. STEEL PIPE CULVERT	C-119
M21 26+60	33 LF 24" DIA. CMP CULVERT	20.7 LF 18" DIA. STEEL PIPE CULVERT	C-120
M21 33+40	33 LF 24" DIA. CMP CULVERT	23.2 LF 18" DIA. STEEL PIPE CULVERT	C-120
M21 46+60	33 LF 24" DIA. CMP CULVERT	23.0 LF 24" DIA. STEEL PIPE CULVERT	C-121
M21 49+00	33 LF 24" DIA. CMP CULVERT	21.0 LF 24" DIA. STEEL PIPE CULVERT	C-121
M22 2+40	33 LF 24" DIA. CMP CULVERT	21.5 LF 18" DIA. STEEL PIPE CULVERT	C-121
M22 7+50	33 LF 24" DIA. CMP CULVERT	23.0 LF 24" DIA. STEEL PIPE CULVERT	C-121
M22 12+10	33 LF 24" DIA. CMP CULVERT	21.3 LF 18" DIA. STEEL PIPE CULVERT	C-121
M22 14+80	33 LF 24" DIA. CMP CULVERT	21.1 LF 18" DIA. STEEL PIPE CULVERT	C-121
M22 20+60	33 LF 24" DIA. CMP CULVERT	23.5 LF 30" DIA. STEEL PIPE CULVERT	C-122
M23 25+10	33 LF 24" DIA. CMP CULVERT	18.8 LF 24" DIA. CMP CULVERT	C-124
M23 29+05	33 LF 24" DIA. CMP CULVERT	20.8 LF 24" DIA. CMP CULVERT	C-124
M23 43+15	33 LF 24" DIA. CMP CULVERT	19.6 LF 24" DIA. CMP CULVERT	C-125
M23 50+05	33 LF 24" DIA. CMP CULVERT	20.4 LF 24" DIA. CMP CULVERT	C-125
M24 15+24	36 LF 30" DIA. CMP CULVERT	2x 24.3 LF 24" CMP CULVERTS	C-126
M26 9+82.6	(2) 46 LF 24" DIA. CMP CULVERT	26.4 LF 24" DIA. CMP CULVERT	C-130

Proposed vs. existing culverts

Engineering Drawings for Civil Features and Site Work

Drawings produced for construction of Below Piggott utilized the following information:

- Corps of Engineers Field Survey Data (topographic and hydrographic)
- MicroStation V8i (SELECT series 4) model and sheet seed files
- Design files including user-generated alignments, profiles, cross sections and DTM files

Erosion Control

The primary method of temporary erosion control will be an erosion control berm (ECB) on the west (land) side of the project. Silt fence will be used in ditch outlets, for Segment 6, and at Hwy 90 where there is not enough ROW in use ECB. Stone check dams will be placed every 200 LF in the constructed ditches.

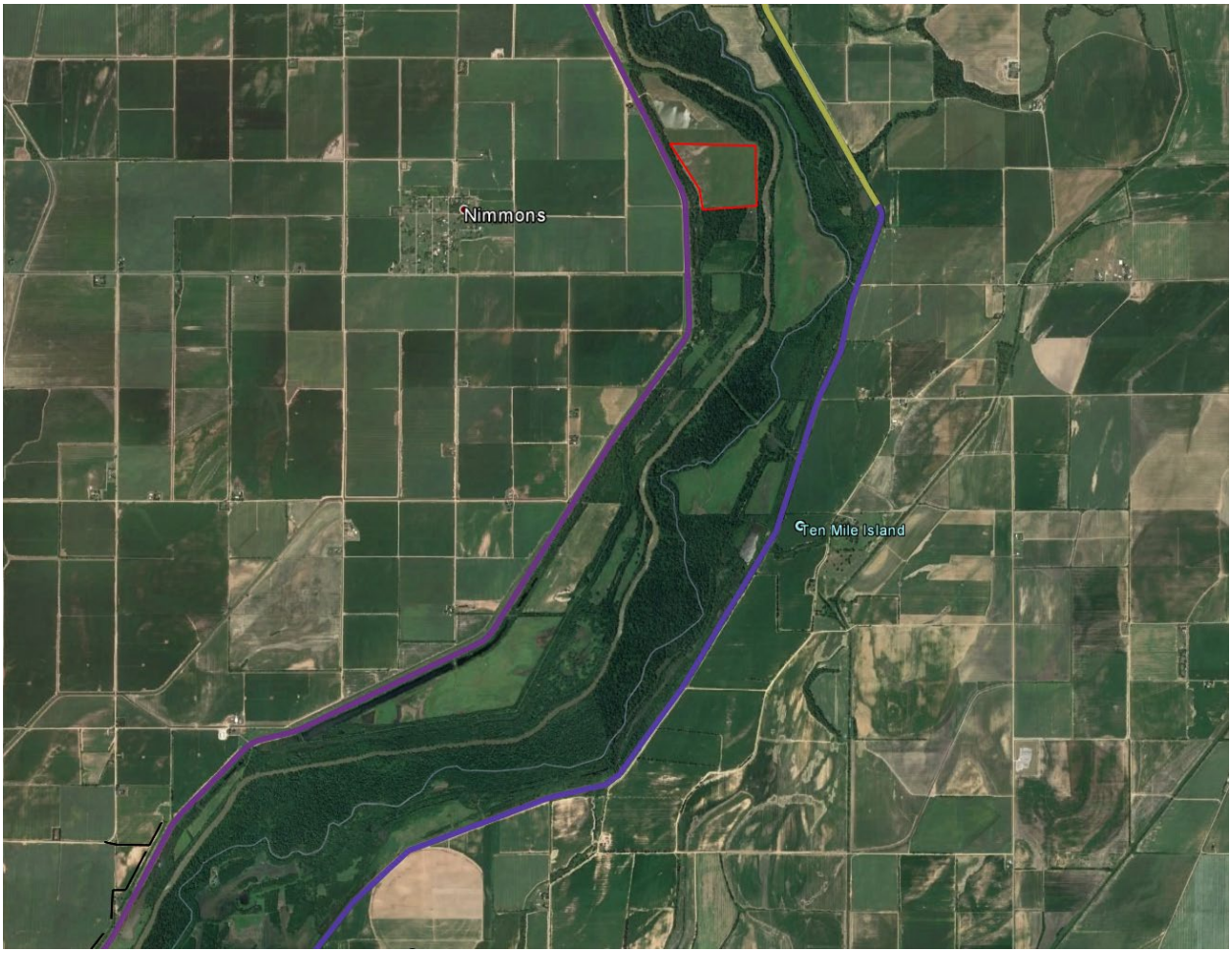
Permanent erosion control will be accomplished by stone placement in select ditches and turfing embankment in accordance with Section 32 92 32.01 11.

Borrow

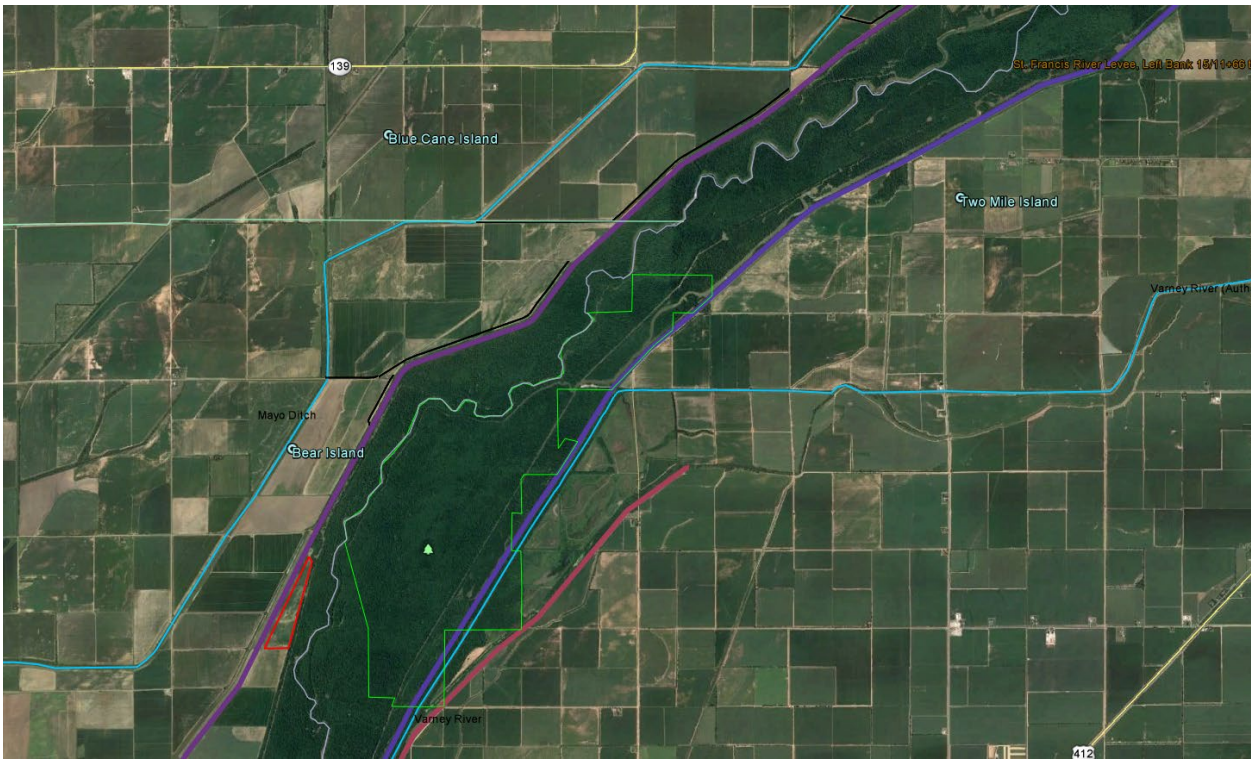
As of November 2019, all borrow for the project will come from the Hwy 90 cleanout project. This represents approx. 670,000 CY of previously-excavated material on top bank of the St. Francis River, plus an additional 362,000 CY estimated to be excavated as part of the channel cleanout.

Previously, other borrow sites were considered but determined to not be needed. These two additional possible borrow pits were also identified north and south of the project site. Though they would serve to lower haul cycles, reducing the cost of the project if either could be acquired, they represent additional costs and environmental considerations.

As of NOV 2019, all borrow will come from the Below Highway 90 channel cleanout.



Previously-considered north borrow site. 50 acres.



Previously-considered south borrow site. 30 acres

Quantities

Cut and fill quantities for the berm and ditches were calculated using the end area method. Other quantities were calculated using MicroStation triangle surface comparison between the existing ground and design surfaces.

Relocations, demolition, and utilities

The following demolition items were noted:

UTILITITES AND RELOCATIONS		
STATION	**ITEM**	**DISPOSITION**
M17 13+50 TO 19+50	610 LF FENCE	CONTRACTOR TO REMOVE AND REPLACE
M17 14+00	40 LF 24" DIA. CMP CULVERT	CONTRACTOR TO REMOVE
M17 14+40	2x 72 LF 48" DIA. CMP CULVERTS	DO NOT DISTURB
M17 24+00	LEVEE RAMP 1	CONTRACTOR TO RECONSTRUCT PER C-501
M17 25+00 TO 27+00	310 LF FENCE	CONTRACTOR TO REMOVE AND REPLACE
M18 12+75 TO 30+00	2750 LF FENCE	CONTRACTOR TO REMOVE AND REPLACE
M18 18+70	20.5 LF 36" DIA. CMP CULVERT	CONTRACTOR TO REMOVE
M18 19+00	STRUCTURES: HOUSE, SHED, SILO	CONTRACTOR TO REMOVE 3 STRUCTURES PER SECTION 02 41 00.
M18 20+00	LEVEE RAMP 2	CONTRACTOR TO RECONSTRUCT PER C-501
M18 20+80	20.0 LF 18" DIA. CMP CULVERT	CONTRACTOR TO REMOVE
M18 31+00	40.5 LF 24" DIA. STEEL PIPE CULVERT	CONTRACTOR TO REMOVE
M18 39+00	23.8 LF 12" DIA. STEEL PIPE CULVERT	CONTRACTOR TO REMOVE
M19 24+50	WELL	TO BE [REMOVED] [OR RAISED] BY OTHERS
M19 44+20	50.7 LF 24" DIA. CMP CULVERT	DO NOT DISTURB
M19 45+80	57.5 LF 6' DOUBLE BOX CULVERT	DO NOT DISTURB; REMOVE SILT TO INVERT
M19 46+00	LEVEE RAMP 3	CONTRACTOR TO RECONSTRUCT PER C-502
M20 13+00	203 LF CONC. CULVERT	CONTRACTOR TO GROUT AND ABANDON IN PLACE PER SECTION 02 41 00.
M20 16+50	GAS PIPELINE	DO NOT DISTURB
M20 17+00	120 LF CMP CULVERT	CONTRACTOR TO GROUT AND ABANDON IN PLACE PER SECTION 02 41 00.
M20 20+00 TO 22+00	POWER POLES AND TRANSFORMER	TO BE REMOVED BY OTHERS
M20 41+10	20.5 LF 18" CONC. PIPE CULVERT	CONTRACTOR TO REMOVE
M21 3+20	26.3 LF 24" DIA. STEEL PIPE CULVERT	CONTRACTOR TO REMOVE
M21 4+65	23.2 LF 18" DIA. STEEL PIPE CULVERT	CONTRACTOR TO REMOVE
M21 10+10	46.1 LF 24" DIA. STEEL PIPE CULVERT	CONTRACTOR TO REMOVE
M21 15+80	35.7 LF 24" DIA. STEEL PIPE CULVERT	CONTRACTOR TO REMOVE
M21 26+60	20.7 LF 18" DIA. STEEL PIPE CULVERT	CONTRACTOR TO REMOVE
M21 33+40	23.2 LF 18" DIA. STEEL PIPE CULVERT	CONTRACTOR TO REMOVE
M21 46+60	23.0 LF 24" DIA. STEEL PIPE CULVERT	CONTRACTOR TO REMOVE
M21 49+00	21.0 LF 24" DIA. STEEL PIPE CULVERT	CONTRACTOR TO REMOVE
M22 2+40	21.5 LF 18" DIA. STEEL PIPE CULVERT	CONTRACTOR TO REMOVE
M22 7+50	23.0 LF 24" DIA. STEEL PIPE CULVERT	CONTRACTOR TO REMOVE
M22 12+10	21.3 LF 18" DIA. STEEL PIPE CULVERT	CONTRACTOR TO REMOVE
M22 14+80	21.1 LF 18" DIA. STEEL PIPE CULVERT	CONTRACTOR TO REMOVE
M22 20+60	23.5 LF 30" DIA. STEEL PIPE CULVERT	CONTRACTOR TO REMOVE
M22 43+70	50 LF FENCE	CONTRACTOR TO REMOVE AND REPLACE
M23 25+10	18.8 LF 24" DIA. CMP CULVERT	CONTRACTOR TO REMOVE
M23 29+05	20.8 LF 24" DIA. CMP CULVERT	CONTRACTOR TO REMOVE
M23 43+55	19.6 LF 24" DIA. CMP CULVERT	CONTRACTOR TO REMOVE
M23 51+15	20.4 LF 24" DIA. CMP CULVERT	CONTRACTOR TO REMOVE
M24 16+35	2x 24.3 LF 24" CMP CULVERTS	CONTRACTOR TO REMOVE
M24 25+80	80 LF FENCE	CONTRACTOR TO REMOVE
M26 10+40	26.4 LF 24" DIA. CMP CULVERT	CONTRACTOR TO REMOVE
M26 10+50	LEVEE RAMP 4	CONTRACTOR TO RECONSTRUCT PER C-502
M26 44+50 TO 52+50	800 LF FENCE	CONTRACTOR TO REMOVE
M27 8+50 TO 20+00	1100 LF FENCE	CONTRACTOR TO REMOVE

Coordination with pipeline and high-tension powerline owners was made. Project will not affect these utilities.

Contractor will remove 20 24” and 1 30” culverts and replace in kind with 33 LF CMP (36 LF for 30”).

Three structures are to be demolished under this contract. As they were built prior to 1978, all three structures will be tested for lead and asbestos. If either of these substances are present, abatement will be paid as an option in the bid sheet.

Additional exhibits are attached following quantities. These were submitted on the dates indicated for the purpose of securing agreements with utility owners.

Levee Resurfacing

The levee crown will be graveled 6” deep and 12’ wide from M17 10+00 to M27 40+00 (18,850 LF), requiring approx. 20,000 TN gravel, when ramps are included.

Ditch	LF LENGTH	CY VOL Ditch	SF AREA	TN 6" #57 stone	TN 9" surge st	Check Dams	
1	3500	7122	93800	2011.5	2866.5	3	Check Dams: 1000' ma
2	720	910	15000	255	369	1	Stone converted at 1.5
3	2011	0	9876	225.2	276.5	2	North of ramp
4	9390	10200	182000	3952.5	5502	9	From InRoads triangle
5	7500	9774	166000	937.5	1354.5	7	
6	13320	30000	377000	8052	11340	13	
TOTALS	36441	58006	843676	15433.65	21708.5	35	39059.07
							Basic
		SY	93741.77778				
			93800				

**Surface Area calculated using InRoads SA tool, which measures true SA along slopes and not simply planar SA

Adjustment to stone 0.428 SF/LF each side Measured from drawing
0.856 SF/LF for both sides
28574 LF total inverted filter
24459.34 CF change
1358.852 TN change -1350 +1350
14083.65 23058.5
14100 **23100**

	CY EXCV	CY EMB	
Berm	0	882095.13	
Ditches	94923.10	0	
Excv for stone	included	0	
Fill existing ditches	included	included above	Cut out old EME, fill existing ditches
Farm road	0	included above	2' high, 12' wide, 3:1 one side, 5:1 other
Ramps	0	1704	
			40SF/LF 53986.67
TOTALS	94923.1	883799.1296	
	95000	**884000**	

Aggregate

Ramp	LF	
1	120	
2	320	
3	150	
4	200	
	790	

14 ft width
11060 SF
307.2222222 TN @ 6" depth

Levee aggregate 6" thick
12' wide
56552 LF M17 10+00 to M27 40+00

18850.67 TN On top of levee
307.2222 on ramp

Fill

Ramp	CY	
1	241	From InRoads triangle
2	704	
3	288	
4	471	
	1704	

Stone converted at 1.5 TN/CY

19157.89 Sum
19200 for bid sheet

		24"	30"		
Replacement culverts:	20 24" @ 33 LF	660			
	1 30" at 36 LF	0	36		M18 17+91.2
	D1: 59 LF		59		M26 9+80.0
	D6: 2@46 LF	92			
		752	**95**	LF for bid sheet	

Seepage berm Silt berm

Sheet	Event	BL STA	CL STA	LF	CUT AREA (SF)	VOL CUT (BCY)	FILL AREA (SF)		FILL TOTAL FOR SHEETS	VOL FILL (CCY)	NET VOL (CCY)	MASS (CY	
	Berm toe		0+00		**0**		**0**	**0**	**0**				Add start/stop stations with a 0 SF area
C-301	Begin berm	M17 13+10	0+40	40	0	0.00	159.7	0	**159.7**	118.30	118.2962963	118.2963	
		M17 18+00	4+45	405	0	0.00	331.4	0	**331.4**	3683.25	3683.25	3801.546	
		M17 22+95	10+35	590	0	0.00	472.7	0	**472.7**	8785.54	8785.537037	12587.08	
		M17 23+90	11+95	160	0	0.00	229	0	**229**	2079.11	2079.111111	14666.19	
		M17 28+00	16+20	425	0	0.00	559.8	0	**559.8**	6208.15	6208.148148	20874.34	
		M17 33+00	21+20	500	0	0.00	559.2	0	**559.2**	10361.11	10361.11111	31235.45	
C-302		M17 38+00	26+20	500	0	0.00	637.7	0	**637.7**	11082.41	11082.40741	42317.86	
		M17 43+00	31+20	500	0	0.00	406.6	0	**406.6**	9669.44	9669.444444	51987.31	
		M17 48+00	36+20	500	0	0.00	242.1	0	**242.1**	6006.48	6006.481481	57993.79	
		M17 50+80	38+00	180	0	0.00	500	0	**500**	2473.67	2473.666667	60467.45	Ditch excv only (without filter
		M17 51+00	38+20	20	60	22.22	500	36	**536**	383.70	365.1851852	60832.64	Ditch 1 start
		M17 53+00	41+50	330	60.8	738.22	785.2	36	**821.2**	8294.00	7678.814815	68511.45	
		M18 0+00	43+50	200	96.8	583.70	555.4	42.7	**598.1**	5256.67	4770.246914	73281.7	
		M18 5+00	48+45	495	109.2	1888.33	563.3	39	**602.3**	11003.67	9430.055556	82711.76	
C-303		M18 10+00	53+50	505	86	1825.48	544.6	40.7	**585.3**	11106.26	9585.024691	92296.78	
		M18 15+00	58+45	495	48.6	1233.83	650.7	39.7	**690.4**	11693.92	10665.72222	102962.5	
		M18 20+00	63+50	505	52.2	942.67	567.1	38	**605.1**	12115.32	11329.76852	114292.3	
		M18 25+00	68+55	505	88	1311.13	445.1	38.9	**484**	10185.10	9092.493827	123384.8	
		M18 30+00	73+25	470	91.1	1558.83	542.1	36.3	**578.4**	9246.81	7947.787037	131332.6	
		M18 31+45	74+70	145	91.1	489.24	542	36.3	**578.3**	3105.95	2698.253086	134030.8	Ditch 1 end
		M18 31+50	74+75	5	0	8.44	600	0	**600**	109.10	102.0725309	134132.9	
		M18 31+55	74+80	5	52.2	4.83	645	38	**683**	118.80	114.7685185	134247.6	Ditch 2 start
C-304		M18 35+00	78+25	345	52.2	667.00	645	38	**683**	8727.22	8171.388889	142419	
		M18 39+00	82+25	400	52.2	773.33	625	38	**663**	9970.37	9325.925926	151745	Ditch 2 end
		M18 39+10	82+35	10	0	9.67	625	0	**625**	238.52	230.462963	151975.4	
		M18 40+00	83+25	90	0	0.00	601.8	0	**601.8**	2044.67	2044.666667	144463.7	
		M18 45+00	88+20	495	0	0.00	551	0	**551**	10567.33	10567.33333	155031	
		M18 50+00	93+25	505	0	0.00	527.6	0	**527.6**	10086.91	10086.90741	165117.9	
		M19 4+70	98+20	495	0	0.00	578.3	0	**578.3**	10137.42	10137.41667	175255.4	
		M19 9+70	103+20	500	0	0.00	672.6	0	**672.6**	11582.41	11582.40741	186837.8	
C-305		M19 14+70	108+20	500	0	0.00	494.1	0	**494.1**	10802.78	10802.77778	197640.5	
		M19 19+60	113+60	540	0	0.00	553.1	0	**553.1**	10472.00	10472	208112.5	
		M19 24+70	118+70	510	0	0.00	401.7	0	**401.7**	9017.56	9017.555556	217130.1	
		M19 29+70	123+70	500	0	0.00	735.4	0	**735.4**	10528.70	10528.7037	227658.8	
		M19 34+70	128+70	500	0	0.00	544	0	**544**	11846.30	11846.2963	239505.1	
		M19 39+70	133+70	500	0	0.00	597.6	0	**597.6**	10570.37	10570.37037	250075.5	
C-306		M19 44+75	138+70	500	0	0.00	557.5	0	**557.5**	10695.37	10695.37037	260770.8	
	End full section		140+10	140	0	0.00	**550**	0	**550**	2871.30	2871.296296	263642.1	
		M19 49+70	144+00	390	0	0.00	144.9	0	**144.9**	5018.72	5018.722222	268660.9	
		M20 2+90	149+10	510	0	0.00	174.8	0	**174.8**	3019.39	3019.388889	271680.2	
		M20 7+90	154+10	500	0	0.00	197.8	0	**197.8**	3450.00	3450	275130.2	
		M20 12+90	159+10	500	0	0.00	34.4	0	**34.4**	2150.00	2150	277280.2	
	Hwy 90 gap		**159+50**	**40**	**0**	**0.00**	**0**	0	**0**	25.48	25.48148148	277305.7	
			159+80	**30**	**0**	**0.00**	**0**	0	**0**	0.00	0	277305.7	
C-307		M20 16+20	162+40	260	0	0.00	269	0	**269**	1295.19	1295.185185	278600.9	
		M20 23+00	167+80	540	0	0.00	65.4	0	**65.4**	3344.00	3344	281944.9	
	Resume full section		169+90	210	0	0.00	**395**	0	**395**	1790.44	1790.444444	283735.4	
		M20 28+00	172+80	290	0	0.00	395	0	**395**	4242.59	4242.592593	287978	
		M20 33+00	177+80	500	0	0.00	510.5	0	**510.5**	8384.26	8384.259259	296362.2	
		M20 38+00	182+85	505	0	0.00	549	0	**549**	9908.29	9908.287037	306270.5	
		M20 40+90	185+75	290	0	0.00	550	0	**550**	5902.04	5902.037037	312172.5	Ditch excv only (without filter
		M20 41+00	185+85	10	17	3.15	550	40.3	**590.3**	211.17	208.5432099	312381.1	Ditch 4 start
C-308		M20 43+00	187+85	200	17	125.93	556.5	40.3	**596.8**	4396.67	4291.728395	316672.8	7.5
		M20 48+00	192+85	500	20.6	348.15	521.9	40	**561.9**	10728.70	10438.58025	327111.4	10
		M20 53+00	197+85	500	21.2	387.04	561.2	39.8	**601**	10767.59	10445.06173	337556.4	10.4
		M20 58+00	202+85	500	24	418.52	552.5	40.3	**592.8**	11053.70	10704.93827	348261.4	24.9

		M21 1+50	207+80	495	33.4	526.17	536.6	38.4	575	10704.83	10266.36111	358527.7		18.1
	End berm		211+30	350	34	436.85	536	38	574	7447.22	7083.179012	365610.9		18
	Berm toe		211+60	30	34	37.78	0	38	38	340.00	308.5185185	365919.4		18
C-309		M21 6+50	212+80	120	34.6	152.44	106.8	37.7	144.5	405.56	278.5185185	366198		19
		M21 11+60	217+85	505	53.2	821.09	124.9	37.4	162.3	2869.15	2184.904321	368382.9		41.7
		M21 16+50	222+75	490	99.8	1388.33	139.2	38.5	177.7	3085.19	1928.240741	370311.1		72
		M21 21+55	227+65	490	45.9	1322.09	86.4	37.6	124	2737.65	1635.904321	371947		38.1
		M21 26+55	232+70	505	43.1	832.31	71.7	38.2	109.9	2187.40	1493.802469	373440.8		36.3
	Berm toe		233+80	110	42	173.35	70	38	108	443.87	299.4104938	373740.2		30
	Begin berm	M21 30+00	234+15	35	41	53.80	630	38	668	502.96	458.132716	374198.4		25
C-310		M21 31+55	237+70	355	40.3	534.47	631.8	37.7	669.5	8792.82	8347.430556	382545.8		23.3
		M21 36+55	242+70	500	39.2	736.11	549.9	39.6	589.5	11657.41	11043.98148	393589.8		22.6
		M21 41+55	247+70	500	48.5	812.04	621.4	38.5	659.9	11568.52	10891.82099	404481.6		28.4
		M21 46+50	252+65	495	50.6	908.42	530.1	39.8	569.9	11273.17	10516.15278	414997.7		30.1
		M21 51+60	257+75	510	57.2	1018.11	591.4	40	631.4	11345.61	10497.18519	425494.9		35.4
C-311		M22 4+50	262+75	500	60.7	1091.67	553.5	37.2	590.7	11315.74	10406.01852	435900.9		38.2
		M22 9+50	267+75	500	69.4	1204.63	644.8	41	685.8	11819.44	10815.58642	446716.5		49
		M22 14+50	272+75	500	85	1429.63	667.1	38.1	705.2	12879.63	11688.2716	458404.8		56.8
		M22 19+50	277+75	500	97.2	1687.04	621	37.8	658.8	12629.63	11223.76543	469628.6		61.3
		M22 21+45	279+70	195	97.2	702.00	600	37.8	637.8	4682.17	4097.166667	473725.7	Ditch 4 end	
		M22 21+55	279+80	10	0	18.00	525	0	525	215.33	200.3333333	473926.1		
		M22 24+50	282+75	295	0	0.00	485.5	0	485.5	5520.32	5520.324074	479446.4		
C-312		M22 29+50	287+75	500	0	0.00	483.1	0	483.1	8968.52	8968.518519	488414.9		
		M22 34+55	292+95	520	0	0.00	453.2	0	453.2	9016.22	9016.222222	497431.1		
	End Berm	M22 38+00	296+37	342	0	0.00	450	0	450	5720.27	5720.266667	503151.4		
	Bem toe		296+70	33	0	0.00	0	0	0	275.00	275	503426.4		
		M22 39+50	297+90	120	0	0.00	0	0	0	0.00	0	503426.4		
		M22 44+50	302+90	500	0	0.00	27.3	0	27.3	252.78	252.7777778	503679.2		
		M22 49+50	307+90	500	0	0.00	0	0	0	252.78	252.7777778	503932		
C-313		M23 1+85	312+90	500	0	0.00	0	0	0	0.00	0	503932		
		M23 5+77	316+82	392	0	0.00	0	0	0	0.00	0	503932		Ditch excv only (without filter
		M23 5+87	316+92	10	111.8	20.70	60	37.7	97.7	18.09	0.839506173	503932.8	Ditch 5 start	
		M23 6+85	317+90	98	111.8	405.79	67.4	37.7	105.1	368.04	29.88395062	503962.7		100.5
		M23 11+80	322+80	490	92.9	1857.46	56.9	40.4	97.3	1836.59	288.7067901	504251.4		81.8
	Berm toe		323+70	90	92.9	309.67	50	38	88	308.83	50.77777778	504302.2		12
	Begin berm	M23 13+25	324+25	55	25	120.08	560	38	598	698.70	598.6342593	504900.8		12
		M23 16+90	327+90	365	25	337.96	586.1	36.4	622.5	8249.68	7968.040123	512868.8		11.9
		M23 21+80	332+65	475	26.3	451.25	565	39	604	10788.66	10412.61574	523281.5		12.8
C-314		M23 26+80	337+65	500	68.7	879.63	587	41.9	628.9	11415.74	10682.71605	533964.2		44
		M23 31+80	342+65	500	63.4	1223.15	607.4	37.8	645.2	11797.22	10777.9321	544742.1		47.5
		M23 34+50	345+35	270	63.4	634.00	575	38	613	6291.00	5762.666667	550504.8	End inverted filter	
		M23 34+52	345+37	2	39	3.79	550	38	588	44.48	41.32098765	550546.1		
		M23 36+85	347+65	228	39	329.33	538.6	38.3	576.9	4918.47	4644.022222	555190.1		46.6
		M23 41+85	352+65	500	34	675.93	536.1	37.4	573.5	10651.85	10088.58025	565278.7		44.7
		M23 46+85	357+65	500	35.8	646.30	542.6	39.3	581.9	10698.15	10159.5679	575438.3		44.9
	End Berm	M23 50+25	361+45	380	36	505.26	540	39	579	8169.30	7748.246914	583186.5		40
	Berm toe		361+80	35	102	89.44	20	39	59	413.52	338.9814815	583525.5		40
C-315		M23 51+85	363+00	120	101.9	453.11	21.4	39.8	61.2	267.11	-110.4814815	583415		102
		M24 3+55	368+00	500	83.3	1714.81	24.7	41.4	66.1	1178.70	-250.308642	583164.7		83.3
		M24 8+55	373+00	500	79.3	1505.56	24	38.5	62.5	1190.74	-63.88888889	583100.8		79.2
		M24 13+55	378+00	500	88.8	1556.48	38.9	39.9	78.8	1308.33	11.2654321	583112.1		88.6
	Berm toe		379+10	110	88	360.15	25	40	65	292.93	-7.197530864	583104.9		80
	Begin berm	M24 15+00	379+45	35	50	89.44	530	40	570	411.57	337.037037	583441.9		70
		M24 15+98	380+48	103	50	190.74	530	41	571	2176.35	2017.401235	585459.3		
		M24 16+00	380+50	2	88	5.11	530	42	572	42.33	38.07407407	585497.4	Begin inverted filter	
		M24 18+50	383+00	250	87	810.19	531.3	43.3	574.6	5308.33	4633.179012	590130.6		60.5
C-316		M24 23+60	388+00	500	78.7	1534.26	523.5	38.8	562.3	10526.85	9248.302469	599378.9		51.2
		M24 27+45	391+85	385	78.7	1122.20	500	38.8	538.8	7850.44	6915.265432	606294.1	Ditch 5 end	
			391+95	10	0	14.57	480	0	480	188.67	176.5216049	606470.7		
		M24 28+55	392+95	100	0	0.00	465.3	0	465.3	1750.56	1750.555556	608221.2		
		M24 33+55	397+95	500	0	0.00	401	0	401	8021.30	8021.296296	616242.5		

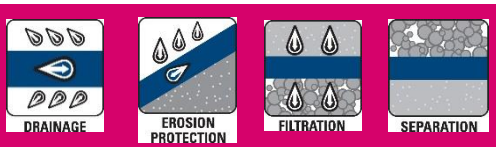
		M24 38+55	402+95	500	0	0.00	443	0	**443**	7814.81	7814.814815	624057.3		
		M24 43+55	407+95	500	0	0.00	475.1	0	**475.1**	8500.93	8500.925926	632558.3		
		M24 47+80	412+45	450	0	0.00	500	0	**500**	8125.83	8125.833333	640684.1		Ditch excv only (without filter
		M24 47+90	412+55	10	13.8	2.56	525	40.1	**565.1**	197.24	195.1111111	640879.2	Ditch 6 start	
C-317		M24 48+55	413+20	65	13.8	16.61	545.2	40.1	**585.3**	1384.74	1370.898148	642250.1		5.5
		M25 0+60	418+25	505	34.3	449.82	504.7	36.8	**541.5**	10537.67	10162.81327	652412.9		17.8
		M25 5+60	423+25	500	77.8	1037.96	453	40	**493**	9578.70	8713.734568	661126.6		62.8
		M25 10+60	428+25	500	76.3	1426.85	565.1	40.1	**605.2**	10168.52	8979.475309	670106.1		51.6
C-318		M25 15+60	433+25	500	63	1289.81	591.2	37.2	**628.4**	11422.22	10347.37654	680453.5		46.3
		M25 20+70	437+50	425	71.4	1057.78	626.5	35	**661.5**	10151.99	9270.509259	689724		50.4
		M25 25+60	442+40	490	101.4	1568.00	550	39.5	**589.5**	11351.67	10045	699769		61.5
	End Berm	M25 29+00	**445+80**	**340**	**95**	**1236.59**	**550**	40	**590**	7426.48	6395.987654	706165		**60**
	Berm toe		**446+15**	**35**	**88**	**118.61**	**36**	42	**78**	432.96	334.1203704	706499.1		**500**
		M25 30+70	447+50	510	119.7	1961.61	36.5	44.2	**80.7**	1498.83	-135.8425926	706363.3		54.7
C-319		M25 35+60	452+40	490	157.5	2515.33	55	59.9	**114.9**	1774.89	-321.2222222	706042		74.7
		M25 40+60	457+40	500	147.5	2824.07	68.8	39.8	**108.6**	2069.44	-283.9506173	705758.1		53.1
		M25 45+60	462+40	500	196.1	3181.48	58.5	39	**97.5**	1908.33	-742.9012346	705015.2		103.7
	Berm toe		**463+40**	**100**	**110**	**566.85**	**60**	39	**99**	363.89	-108.4876543	704906.7		**60**
	Begin berm	M25 47+00	**463+80**	**40**	**90**	**148.15**	**650**	39	**689**	583.70	460.2469136	705367		**45**
		M25 50+60	467+40	360	69.1	1060.67	653.2	39.7	**692.9**	9212.67	8328.777778	713695.7		45
C-320		M25 2+55	472+40	500	78.2	1363.89	492.3	50.9	**543.2**	11445.37	10308.7963	724004.5		52.7
		M26 7+60	477+45	505	51.5	1212.94	670	35.7	**705.7**	11679.53	10668.74846	734673.3		41.1
		M26 9+95	480+20	275	**70**	618.75	479	0	**479**	6033.19	5517.569444	740190.8		72.3 Culverts and ramp; excavation keyed in
		M26 12+50	483+00	280	89.6	827.56	559.4	42	**601.4**	5602.07	4912.444444	745103.3		61.2
C-321		M26 17+50	488+30	530	69	1556.63	644.8	39.2	**684**	12615.96	11318.7716	756422.1		43.8
		M26 22+50	493+30	500	61	1203.70	653.3	42	**695.3**	12771.30	11768.20988	768190.3		37.4
		M26 27+50	498+30	500	63.7	1154.63	546.9	37.6	**584.5**	11850.00	10887.80864	779078.1		39.4
	End Berm		**501+80**	**350**	**70**	**866.57**	**540**	36	**576**	7521.76	6799.614198	785877.7		**45**
	Berm toe		**502+15**	**35**	**78**	**95.93**	**25**	35	**60**	412.22	332.2839506	786210		**52**
		M26 32+50	503+30	115	84.8	346.70	25.5	34	**59.5**	254.49	-34.42901235	786175.6		56.8
C-322		M26 37+50	508+30	500	97.5	1687.96	34.9	36.4	**71.3**	1211.11	-195.5246914	785980		69.1
		M26 42+50	513+30	500	110.1	1922.22	36.5	40.5	**77**	1373.15	-228.7037037	785751.3		78.7
		M26 47+50	518+30	500	124.1	2168.52	40.5	38	**78.5**	1439.81	-367.2839506	785384		90.9
		M26 52+50	523+30	500	126.9	2324.07	22.2	40.2	**62.4**	1304.63	-632.0987654	784751.9		93.3
C-323		M27 4+50	528+30	500	130.6	2384.26	33.4	41.6	**75**	1272.22	-714.6604938	784037.3		96.6
		M27 9+55	533+35	505	122	2362.28	33.6	30.6	**64.2**	1301.78	-666.787037	783370.5		131.7
		M27 14+55	538+35	500	120.8	2248.15	39.6	37.4	**77**	1307.41	-566.0493827	782804.4		112.8
		M27 19+55	543+35	500	109.4	2131.48	63.1	39.2	**102.3**	1660.19	-116.0493827	782688.4		110.8
		M27 21+75	545+55	220	109.4	891.41	63	39.2	**102.2**	833.15	90.30864198	782778.7	Ditch 6 end	
		M27 21+85	545+65	10	0	20.26	0	0	**0**	18.93	2.043209877	782780.7		
	Berm toe		**549+40**	375	**0**	0.00	**0**	0	**0**	0.00	0	782780.7		
	Begin berm	M27 26+00	**549+70**	**30**	**0**	**0.00**	**390**	0	**390**	216.67	216.6666667	782997.4		
C-324		M27 29+60	553+40	370	0	0.00	390.2	0	**390.2**	5345.81	5345.814815	788343.2		
	End Berm	M27 33+00	**556+80**	**340**	**0**	**0.00**	**390**	0	**390**	4912.37	4912.37037	793255.6		
	Berm toe		**557+05**	**25**	**0**	**0.00**	**0**	0	**0**	180.56	180.5555556	793436.2		

	Total LF	Total (BCY)	Total (CCY)
LF	56080.00	94923.10	882095.13
MILES	10.62121		

Does this include filter?? 824600
Yes!

TENCATE GEOSYNTHETICS
Americas

Mirafi® 180N



Mirafi® 180N is a needlepunched nonwoven geotextile composed of polypropylene fibers, which are formed into a stable network such that the fibers retain their relative position. Mirafi® 180N is inert to biological degradation and resists naturally encountered chemicals, alkalis, and acids. Mirafi® 180N meets AASHTO M288 Class 1 for Elongation > 50%.

TenCate Geosynthetics Americas Laboratories are accredited by Geosynthetic Accreditation Institute – Laboratory Accreditation Program (GAI-LAP). NTPEP Listed

Mechanical Properties	Test Method	Unit	Minimum Average Roll Value	
			MD	CD
Grab Tensile Strength	ASTM D4632	lbs (N)	205 (912)	205 (912)
Grab Tensile Elongation	ASTM D4632	%	50	50
Trapezoid Tear Strength	ASTM D4533	lbs (N)	80 (356)	80 (356)
CBR Puncture Strength	ASTM D6241	lbs (N)	500 (2224)	
			Maximum Opening Size	
Apparent Opening Size (AOS)	ASTM D4751	U.S. Sieve (mm)	80 (0.18)	
			Minimum Roll Value	
Permittivity	ASTM D4491	sec^{-1}	1.4	
Flow Rate	ASTM D4491	$gal/min/ft^2$ ($l/min/m^2$)	95 (3870)	
			Minimum Test Value	
UV Resistance (at 500 hours)	ASTM D4355	% strength retained	70	

Physical Properties	Unit	Roll Sizes	
Roll Dimensions (width x length)	ft (m)	12.5 x 360 (3.8 x 110)	15 x 300 (4.57 x 91.4)
Roll Area	yd^2 (m^2)	500 (418)	

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ETQR72

GAI-LAP-25-97

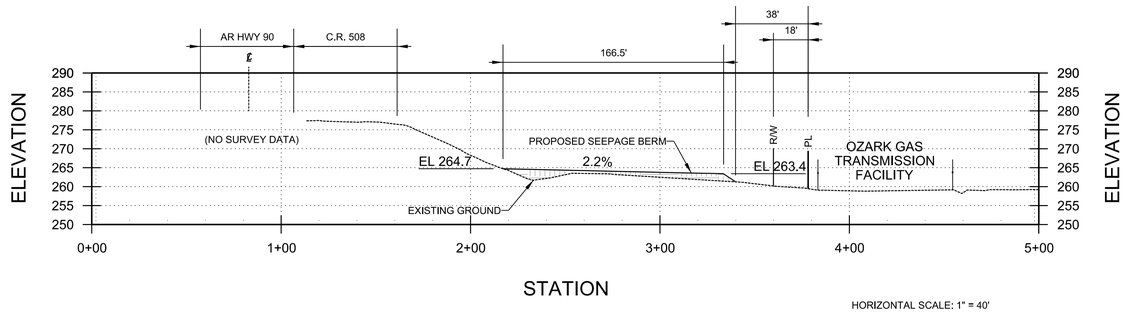
CLAY COUNTY
ARKANSAS

0+00
1+00
2+00
3+00
4+00
5+00

PROFILE ALIGNMENT
APPROXIMATE PIPELINE ALIGNMENT
M20 10+00
M20 20+00
LEVEE BASAELINE
EXISTING LEVEE
EXISTING CULVERT TO BE ABANDONED
EXISTING CULVERT TO BE ABANDONED
AR HWY 90
CR 508
PROPOSED SEEPAGE BERM TOE
EXISTING ROW
PROPOSED SEEPAGE BERM TOE
PROPERTY LINE
PROPOSED ROW LINE
NOARK PIPELINE SYSTEM
051-05890-001E
ROPAC CORP
051-05890-000
SPEER JIM & NIKKI
051-05887-000

PLAN NORTH

0 40' 80'
SCALE: 1" = 40'



HORIZONTAL SCALE: 1" = 40'
VERTICAL SCALE: 1' = 20'

NOTES:
1. PROPERTY LINES AND ROW LINES ARE APPROXIMATE, FOR DISCUSSION ONLY. THIS IS NOT A BOUNDARY-LINE SURVEY.
2. LOCATION OF PIPELINE IS UNKNOWN; A REPRESENTATIVE SECTION WAS TAKEN FOR DISCUSSION ONLY.
3. EXITING GROUNDLINE PROVIDED WHERE SURVEY DATA IS AVAILABLE.
4. MAX. DEPTH OF FILL IS APPROX. 3.0'.
5. DESIGN IS PRELIMINARY (35%) AND IS SUBJECT TO MODIFICATION.
6. DRAINAGE MODIFICATION WILL NOT AFFECT THE OZARK GAS SITE.

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY:	J. KORNELIUSSEN, PE
DRAWN BY:	JEK
CHECKED BY:	JPG
SUBMITTED BY:	D. CALLAHAN, PE
DATE:	
ANSI D	

ISSUE DATE: 1/11/2019
SOLICITATION NO.:
CONTRACT NO.:

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

ST. FRANCIS RIVER BASIN CONSTRUCTION
BELOW PIGGOTT SEEPAGE REMEDIATION
DRAINAGE DISTRICT OF CLAY AND GREENE COUNTY
CLAY AND GREENE COUNTIES, ARKANSAS

PIPELINE EXHIBIT

SHEET ID

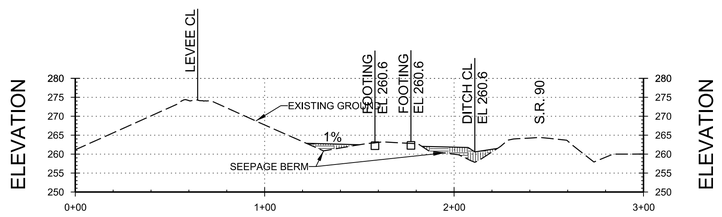
X-001

CLAY COUNTY
ARKANSAS

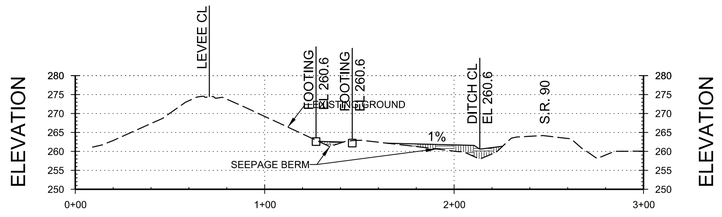
LEVEE BASELINE M19 48+60
LEVEE BASELINE M19 49+20
EQNBK M19 51+87.47
EQNAHD M20 0+00.00
M19 50+00
LEVEE BASELINE
EXISTING LEVEE CROWN
EXISTING LEVEE TOE
EXISTING LEVEE EASEMENT
EXISTING CMP CULVERT
BERM TIE-IN
BERM CROWN
BERM TOE
PROPOSED DRAINAGE EASEMENT
PROPOSED BERM EASEMENT
BERM TIE-IN
PROPOSED DITCH
ARKANSAS STATE HWY 90
EXISTING BOX CULVERT
EXISTING OVERHEAD ELECTRICAL LINES

PLAN NORTH

0 40' 80'
SCALE: 1" = 40'



M19 48+60



M19 49+20

NOTES:
1. LANDOWNER AT THE TOWER SITE IS THE US ARMY CORPS OF ENGINEERS.
2. MAX. DEPTH OF FILL IS APPROX. 3.0'. NO FILL WILL BE PLACED OVER FOOTINGS.
3. FILL MATERIAL IS SEMI-COMPACTED RANDOM FILL, SEEDED FOR VEGATATIVE COVER.
4. DESIGN IS PRELIMINARY (35%) AND IS SUBJECT TO MODIFICATION.
5. DRAINAGE MODIFICATION WILL NOT AFFECT THE ELECTRICAL SUPPORT STRUCTURE.

HORIZONTAL SCALE: 1" = 40'
VERTICAL SCALE: 1" = 20'

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: J. KORNELIUSSEN, PE
DRAWN BY: JEK
CHECKED BY: JPG
SUBMITTED BY: D.CALLAHAN, PE
SIZE: ANSI D

ISSUE DATE: 1/28/2019
SOLICITATION NO.:
CONTRACT NO.:

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

ST. FRANCIS RIVER BASIN CONSTRUCTION
BELOW PIGGOTT SEEPAGE REMEDIATION
DRAINAGE DISTRICT OF CLAY AND GREENE COUNTY
CLAY AND GREENE COUNTIES, ARKANSAS

POWERLINE EXHIBIT

SHEET ID

X-002

DDR - Appendix D

US Army Corps of Engineers ®
Memphis District

VE Report

Big Island and Below Piggott Seepage Remediation
Sponsor: Memphis District
U.S. Army Corps of Engineers
At Memphis District
Memphis, TN
15 – 19 April 2019

DOD Service: USACE – Memphis District
Value Engineering Officer: Neal E. Newman, CCC, AVS – Memphis District
Value Engineering Report No: MVM19-04

Value Engineering Study Report on

Big Island Seepage Remediation and Below Piggott Project, Memphis District

15 – 19 April 2019

Sponsor: Memphis District

Hosted by: Memphis District

Value Engineering Study Team Leader:
Neal E. Newman, CCC, 901-544-0890

Value Engineering Study Team Members

Caroline (Mckenzie) Gabaldon, EC-H (MVM Hydraulic Engineer)
John R. Holloway, EC-C (MVM Civil Engineer – Construction)
Cody M. Isbell, FE, EC-G (MVM Geotechnical Engineer)
Benjamin (Ben) A. Mowers P.E., EC-D (MVM Civil Engineer)
Neal E. Newman, CCC, VEO, EC-D (MVM Value Engineer)
Conrad R. Stacks, CCC, EC-D (MVM Cost Engineer)

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Project Locations

The project site graphically noted below:

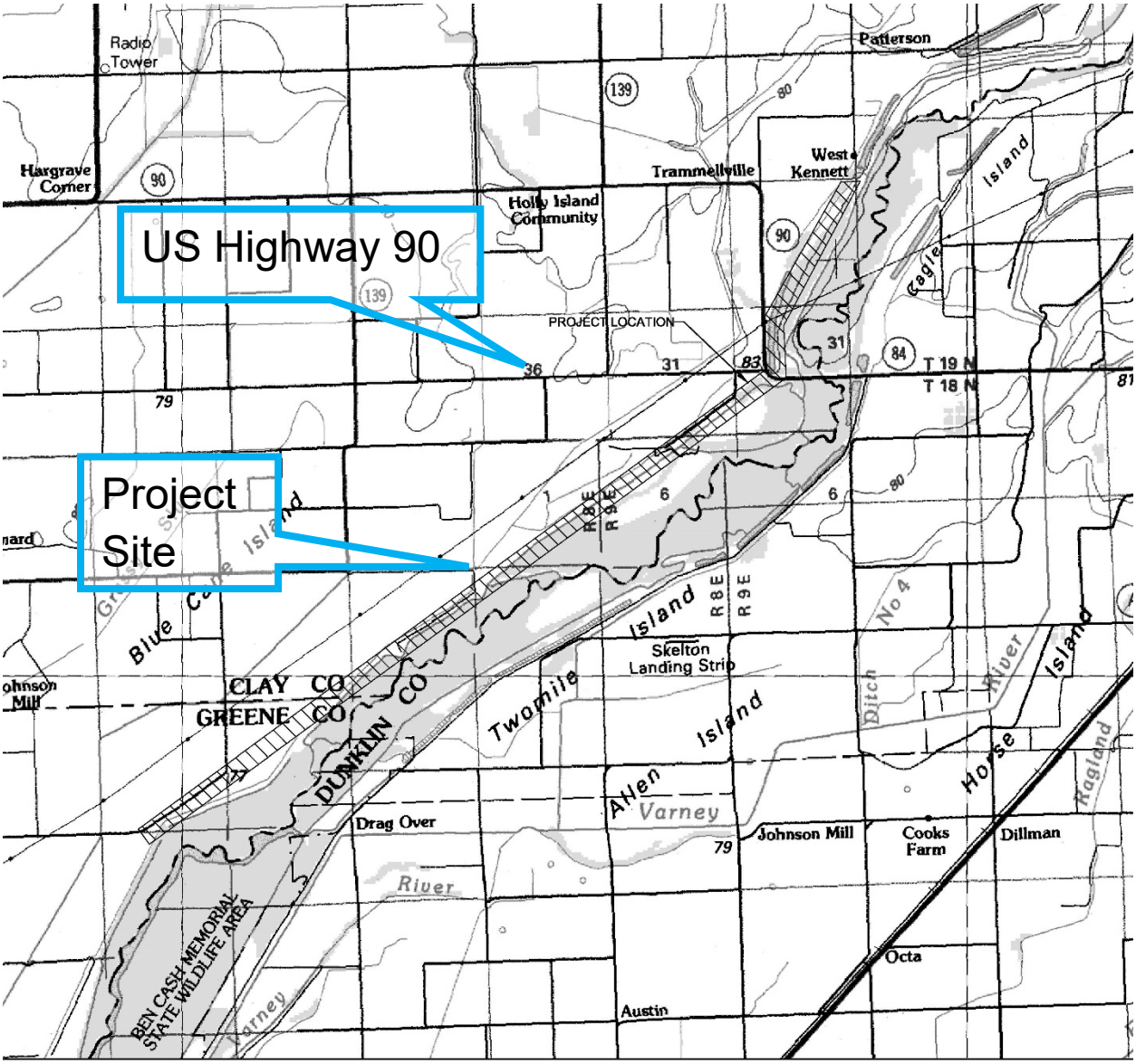


Figure 1: Below Piggott is located north of Big Island Project with project limits both north and south of US Highway 90.

The project site is located in System 10 Segment 033 and graphically noted below:

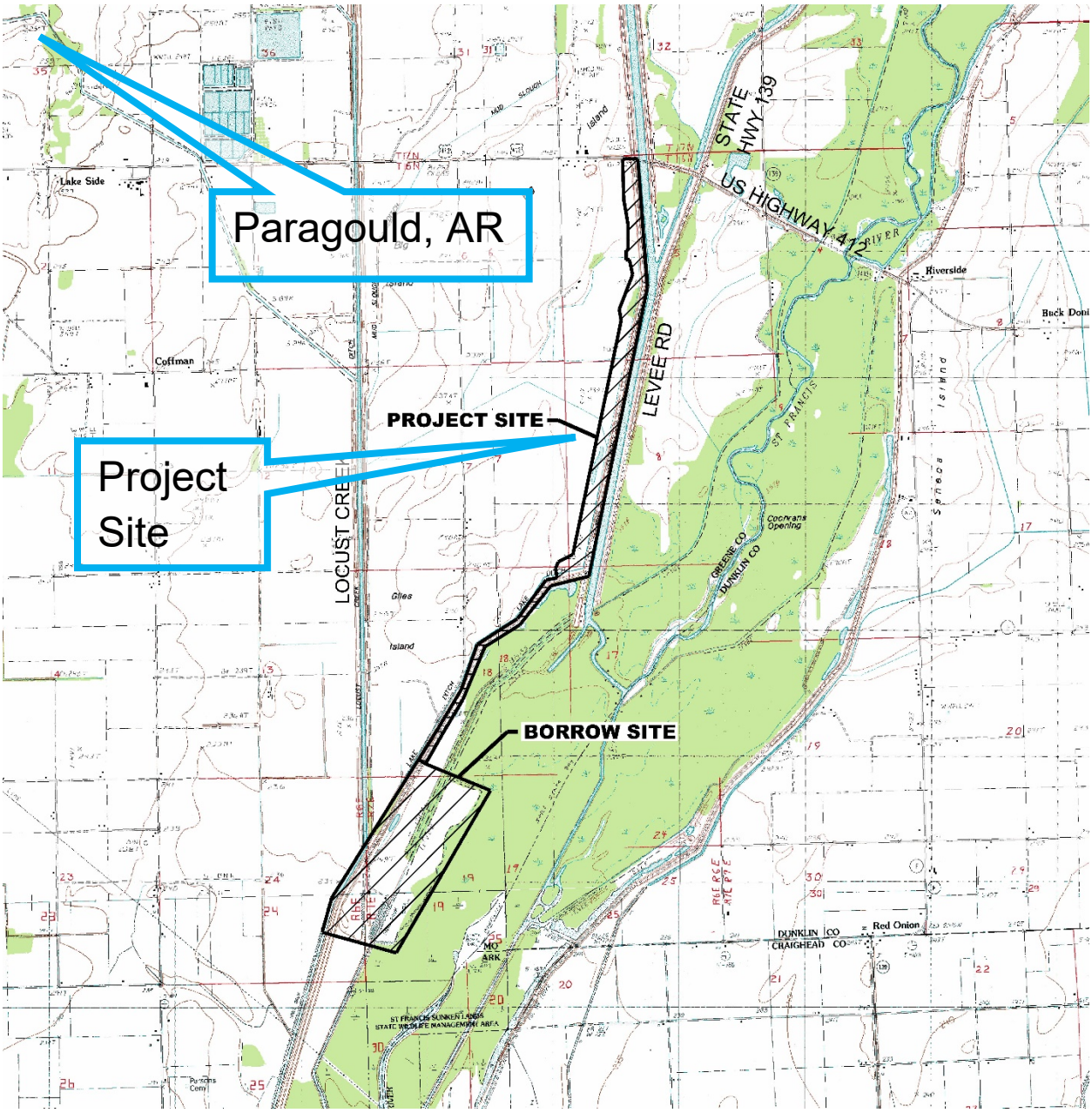


Figure 2: Big Island is located south of Below Piggott Project and southeast of Paragould, AR just south of US Highway 412.

Scope of Work

Figure 3: The Below Piggott scope of work included 43,060 lineal feet of new levee berm and 36,440 lineal feet of new ditches of which 30,980 lineal feet requiring inverted filter blankets.

Figure 4: The Big Island scope of work included 3,500 lineal feet of new levee berm and 10,940 lineal feet of new ditches of which 3,920 lineal feet require inverted filter blankets.

Description	Below Piggott	Big Island
Berms	43,060 LF	3,500 LF
Ditches	36,400 LF	10,940 LF
Inverted Filter	30,980 LF	3,920 LF
Embankment	782,500 CY	121,945 CY
Excavation	107,000 CY	26,400 CY
Geotextile	95,520 SY	22,920 SY
Aggregate Surface	20,000 TN	6,355 TN
Course Aggregate Stone #1	35,000 TN	6,355 TN
Course Aggregate Stone #57	23,500 TN	5,545 TN

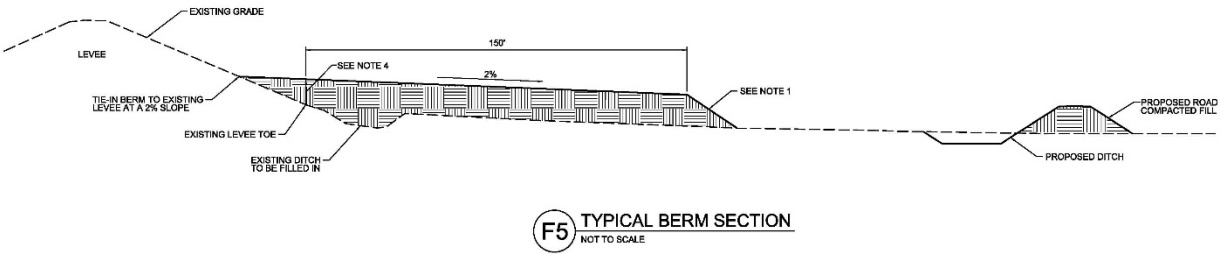


Figure 5: Typical cross section showing filling in the existing ditch located near the toe of the levee, adding a new 150' berm, a new ditch and a "Potato Berm" or Proposed Road.

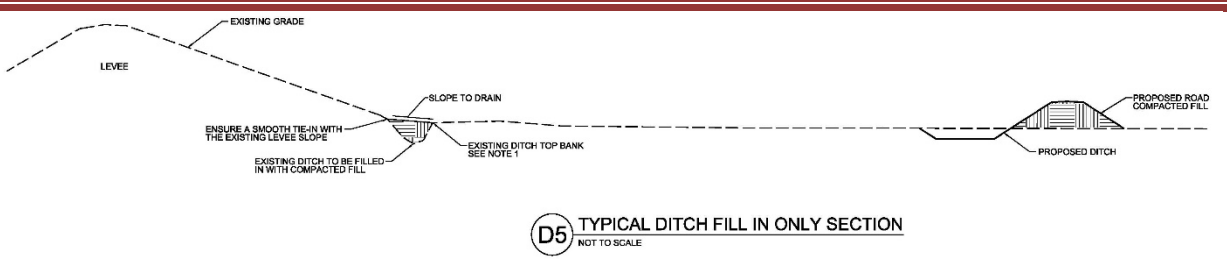


Figure 6: Big Island has some typical cross sections showing filling in the existing ditch located near the toe of the levee, adding a new ditch and a "Potato Berm" noted as Proposed Road.

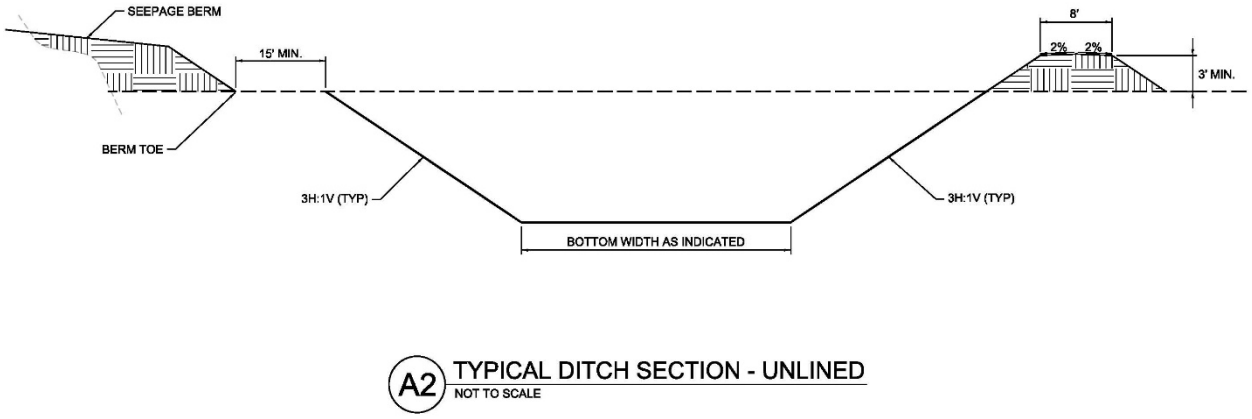


Figure 7: Typical cross section showing adding a new "Unlined" ditch adjacent to the toe of the new berm as well as adding a "Potato Berm" or Proposed Road.

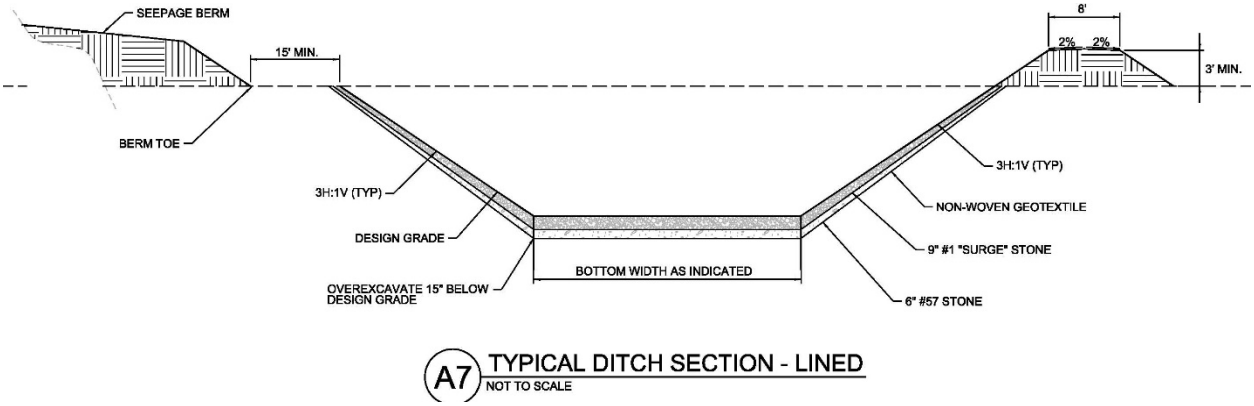


Figure 8: Typical cross section showing adding a new "Lined" ditch adjacent to the toe of the new berm as well as adding a "Potato Berm" noted as Proposed Road. The new Lined Ditch requires an inverted filter blanket which includes Non-Woven Geotextile, 9" of #1 Surge Stone and 6" of #57 Stone.

Executive Summary

The Value Engineering (VE) Study was conducted at the Memphis District office on 15 – 19 Apr 2018. During the VE Study Speculation Phase, **43** ideas were suggested by team members. Of these ideas, **3** ideas were developed as alternative proposals offering specific revisions to project design and construction features, **2** ideas were combined with other developed alternatives, **16** ideas were developed as comments as they were intangibles or a dollar amount could not be assigned to them, **0** ideas are already being done and **22** ideas were not developed because under further examination they had little or no merit or they fell outside the identified scope of the VE Study. The level of detail for the project is at 65% design.

Summmary of Recommendations/Actions

The following captures the original Alternative Recommendations by the VE Team.

Recommendations				
#	**Recommendation**	**Below Piggot Value Added**	**Big Island Value Added**	**Rec. Action**
A	**Design the Potato Berm as a Berm and not a Road**	**$284,000**	**$84,000**	**Accept**
B	**Not Used**			
C	**C-1 - Use 2.5 on 1 for the ditch side slopes in lieu of 3 on 1.** **C-2 - Use 2.5 on 1 for the potato berm in lieu of 3 on 1.**	**$41,000** **$12,000**	**$7,000** **$3,000**	**Accept** **Accept**
D	**Uniform 15' Bottom Width**	**N/A**	**$260,000**	**Accept**
E	**Concrete Lined Channel with Steeper Side Slopes**	**$0**	**$0**	**Reject**
Estimated Potential Total Savings for		**$325,000**	**$344,000**	

Proposals

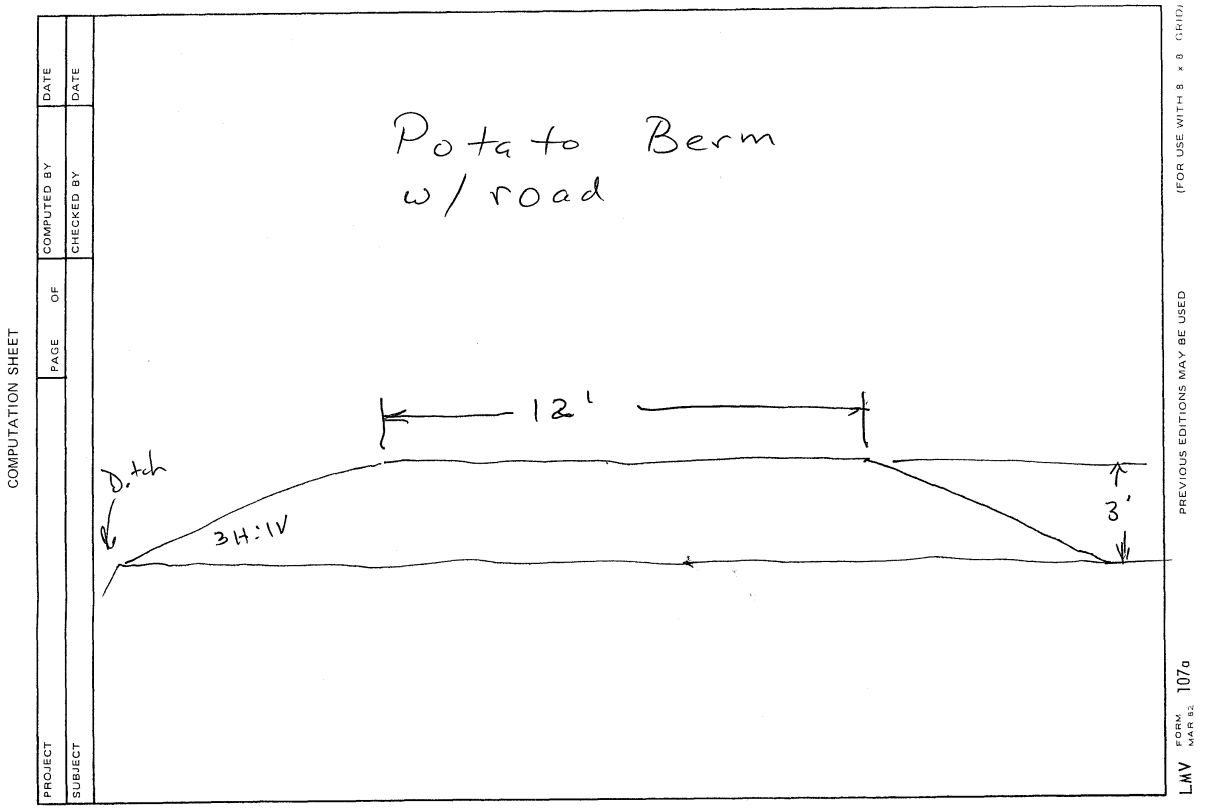
A: (Below Piggott) Design the Potato Berm as a Berm and not a Road.

Alternative No.: A	Page 1 of 5
Title: (Below Piggott) Design the Potato Berm as a Berm and not a Road	

1. **Original Design:**

   a. The Potato Berm as designed has a 12 foot crown to provide an access road for the land owner.

2. **Drawing/Sketch of Original Concept:**

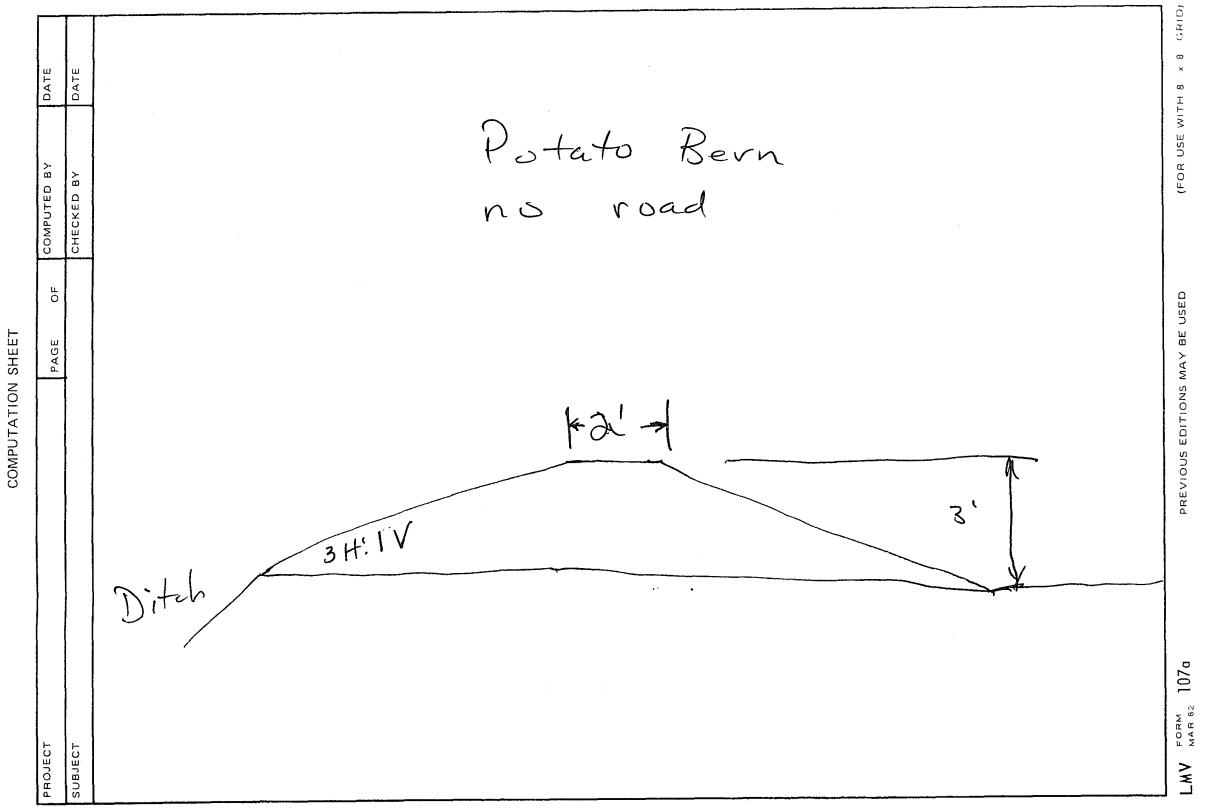


Alternative No.: A	Page 2 of 5
Title: (Below Piggott) Design the Potato Berm as a Berm and not a Road	

3. **Proposed Design:**

   a. The proposed Potato Berm will only have a 2 foot crown.

4. **Drawing/Sketch of Proposed Idea:**



Alternative No.: A	Page 3 of 5
Title: (Below Piggott) Design the Potato Berm as a Berm and not a Road	

5. **Advantages:**
   a. The Potato Berm will be cheaper and easier to build if the crown is smaller.
6. **Disadvantages:**
   a. The land owner will not have an elevated access road next to the new seepage berm and the new ditch.
   b. Farmer won't have access on a road to inspect or maintain the culverts.
7. **Discussion/Justification:**
   a. The smaller Potato Berm will provide the same protection as the potato berm and access road. The advantage is that the smaller potato berm will cost less to build.
8. **Cost Analysis:**

VE Alternative for Below Piggott Seepage Remediation, DD Clay and Green County, Clay and Green Counties, AR, Memphis District

Reduce the potato berm to a 2 foot crown instead of a 12 foot crown	ALT #	SHEET
	A	1

Cost Analysis		Original Concept			Alternative Concept		
Description	Unit	Quantity	Unit Cost	Total	Quantity	Unit Cost	Total
Excavation	CY	85,030	$3.50	$297,605	44,540	$3.50	$155,890
Compacted fill	CY	85,030	$1.50	$127,545	44,540	$1.50	$66,810
24" CMP Culvert	LF	690	$48.00	$33,120	490	$48.00	$23,520
30" CMP Culvert	LF	33	$66.00	$2,178	23	$66.00	$1,518
Turfing	AC	25.9	$1,600	$41,440	17.5	$1,600	$28,000
Real Estate	AC	25.9	$6,888	$178,399	17.5	$6,888	$120,540
Sub-Total				$680,287			$396,278
Project Mark-ups							
Total (Rounded Nearest $1,000)				$680,000			$396,000
						Savings	$284,000

Alternative No.: A	Page 4 of 5
Title: (Below Piggott) Design the Potato Berm as a Berm and not a Road	

9. Calculations and Assumptions:

COMPUTATION SHEET

PROJECT Below Piggott	PAGE OF	COMPUTED BY	DATE
SUBJECT		CHECKED BY	DATE

Assume:
1) Excavated and compacted fill will be the same.
2) length of the potato berm is 36,440 ft

calculate fill:
12 ft crown –
$\frac{1}{2}(3' \times 9') + (12' \times 3') + \frac{1}{2}(3' \times 9') = 63 ft^2$
or $= 7 yd^2$

fill $= 7 yd^2 \times 36440 ft$
$= 7 \times \frac{36440}{3} = 85,027$ cy
say 85,030 cy

2 ft crown
$\frac{1}{2}(3' \times 9') + (2' \times 3') + \frac{1}{2}(3' \times 9') = 33 ft^2$
or $= 3.67 yd^2$

fill $= 3.67 yd^2 \times 36440 ft$
$= 3.67 \times \frac{36440}{3} = 44,537.8$ cy
say $= 44,540$ cy

Acreage calculation:
$2(9.487) + 12 = 30.97$
$2(9.487) + 2 = 20.97$

$\frac{30.97 \times 36,440}{43560} = 25.9 ac$
$\frac{20.97 \times 36,440}{43560} = 17.5 ac$

LMV FORM MAR 82 107a PREVIOUS EDITIONS MAY BE USED (FOR USE WITH 8 x 8 GRID)

Alternative No.: A	Page 5 of 5
Title: (Below Piggott) Design the Potato Berm as a Berm and not a Road	

10. Assessment of Performance Measures /Attributes:

a. Operations and Maintenance (OM):

i. Operations will be the same. The smaller potato berm should be easier to maintain.

b. Reliability and Functionality (RF):

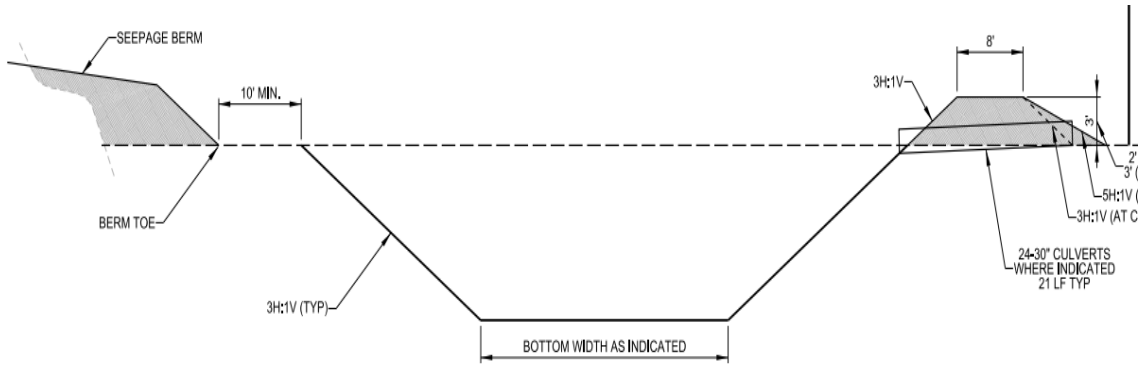
i. Reliability and functionality will be the same.

B: Not Used.

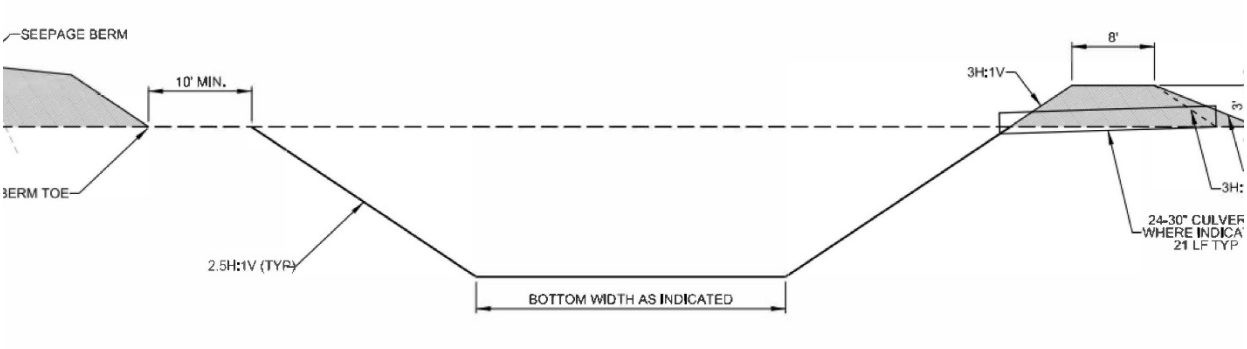
C-1: (Below Piggott) Use 2.5 on 1 for the ditch side slopes in lieu of 3 on 1.

Alternative No.: C-1	Page 1 of 5
Title: (Below Piggott) Use 2.5 on 1 for the ditch side slopes in lieu of 3 on 1.	

1. **Original Design:**
   - **a.** 3:1 ditch side slopes
2. **Drawing/Sketch of Original Concept:**



3. **Proposed Design:**
   - **a.** 2.5 to 1 ditch side slopes
4. **Drawing/Sketch of Proposed Idea:**



Alternative No.: C-1	Page 2 of 5
Title: (Below Piggott) Use 2.5 on 1 for the ditch side slopes in lieu of 3 on 1.	

5. **Advantages:**

   a. Reduces required excavation, real estate, stabilization, and clearing costs for ditches, minimizing required earthwork for project.

6. **Disadvantages:**

   a. Steeper side slopes increase difficulty for maintenance of ditch sides.

   b. Steeper slopes could result in increased erosion for the side slopes of the ditch.

   c. Steeper side slopes can make ditch slightly more difficult to traverse.

   d. Decreased capacity of ditch.

7. **Discussion/Justification:**

   a. This alternative simply reduces the amount of excavation required for the proposed ditch by increasing the side slopes of the ditch, thus reducing cost in the project.

   b. The “Original Concept” and “Proposed Concept” cost estimates were developed using calculated quantities and unit prices by only looking at the changes to the “Original” design and what’s required for the “Proposed” design. Similar scopes of work are not included in the cost estimates to provide clear differences between the “Original Concept” and “Proposed Concept”. All of the “Quantities”, “Unit Costs”, “Sub-Totals” and “Totals” are shown as positive numbers. The “Total (Rounded Nearest $1,000)” estimated cost for the “Proposed Concept” is then subtracted from the “Original Concept” to determine if there are “No Savings – Added Cost” or “Savings”. See paragraph 8. Cost Analysis for further details.

   c. The unit costs include all overhead markups, profit and any escalation if required. These unit costs were developed by experience, historical data, current working estimates, and/or cost estimating data bases such as M2, Cost Works, or Means. A 0% markup was included to allow for E&D, S&A, and contingencies.

Alternative No.: C-1	Page 3 of 5
Title: (Below Piggott) Use 2.5 on 1 for the ditch side slopes in lieu of 3 on 1.	

8. Cost Analysis:

VE Alternative for Below Piggott Seepage Remediation, DD Clay and Green County, Clay and Green Counties, AR, Memphis District

Use 2.5 on 1 for the ditch side slopes in lieu of 3 on 1.

ALT # C1 | SHEET 1

Cost Analysis		Original Concept			Alternative Concept		
Description	Unit	Quantity	Unit Cost	Total	Quantity	Unit Cost	Total
Potato Embankment	CY	49,600	$3.5	$173,600	41,333	$3.5	$144,666
Real Estate	AC	8.8	$6,888	$60,477	7.3	$6,888	$50,351
Turfing	AC	7.5	$1,600	$11,952	6.2	$1,600	$9,968
Clearing	AC	8.8	$350	$3,073	7.3	$350	$2,559
Sub-Total				$249,102			$207,543
Project Mark-ups							
Total (Rounded Nearest $1,000)				$249,000			$208,000
						Savings	$41,000

Alternative No.: C-1	Page 4 of 5
Title: (Below Piggott) Use 2.5 on 1 for the ditch side slopes in lieu of 3 on 1.	

9. Calculations and Assumptions:

Assumptions made in the design and calculations of the change in side slopes of the ditch are as follows:

- The side slopes of the ditch were broken into triangles and found the unit area change between a 3:1 side slope and 2.5:1 side slope. The areas were then multiplied that for the length of the ditch to find the total cubic yard of fill change.
- The assumed average height of 2.5 feet for the overall ditch based on the plans provided.

Ditch Lengh	36441	ft			Ditch Lengh	36441	ft
Assumed Ditch Height	3.5	ft			Assumed Ditch Height	3.5	ft
3:1 Side Slope area	18.375	ft^2	(one side)		2.5:1 Side Slope area	15.3125	ft^2
H	3.5	ft			H	3.5	ft
B	10.5	ft			B	8.75	ft
Total Side Slope 3:1 area	36.75	ft^2			Total Side Slope 2.5:1 area	30.625	ft^2
3:1 Ditch Excavation Total	49600.25	yd^3			2.5:1 Ditch Excavation Total	41333.54	yd^3
Excavation unit cost	$ 3.50	$/yd^3$			Excavation unit cost	$ 3.50	$/yd^3$
Total Excavation Cost	$173,600.88	$			Total Excavation Cost	$144,667.40	$
Real Estate	8.783987603	ac			Real Estate	7.319989669	ac
turf	7.478236915	ac			turf	6.231864096	ac
clearing	8.783987603	ac			clearing	7.319989669	ac

Alternative No.: C-1	Page 5 of 5
Title: (Below Piggott) Use 2.5 on 1 for the ditch side slopes in lieu of 3 on 1.	

10. Assessment of Performance Measures /Attributes:

a. Operations and Maintenance (OM):

i. Additional operation and maintenance costs with this design alternative will largely be contributed to the potential additional maintenance of the increased side slopes.

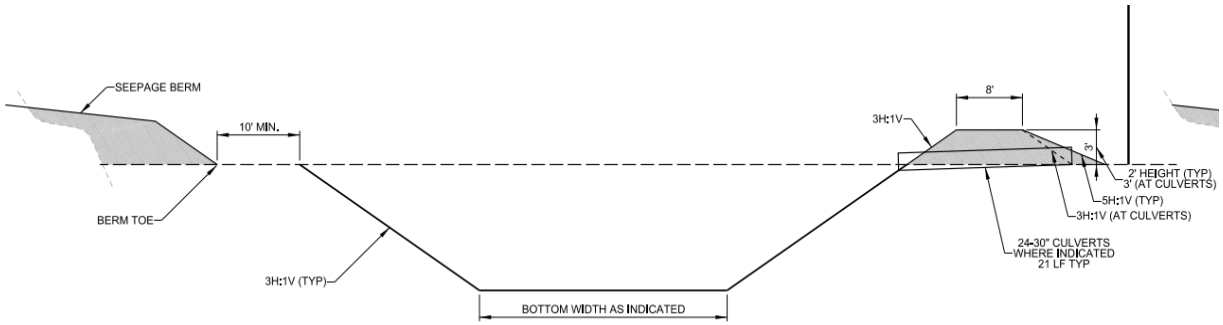
b. Reliability and Functionality (RF):

i. This design alternative does not impact the reliability of the ditch, but does decrease the capacity of the ditch so it would need to be checked in order to ensure it meets all functionality requirements.

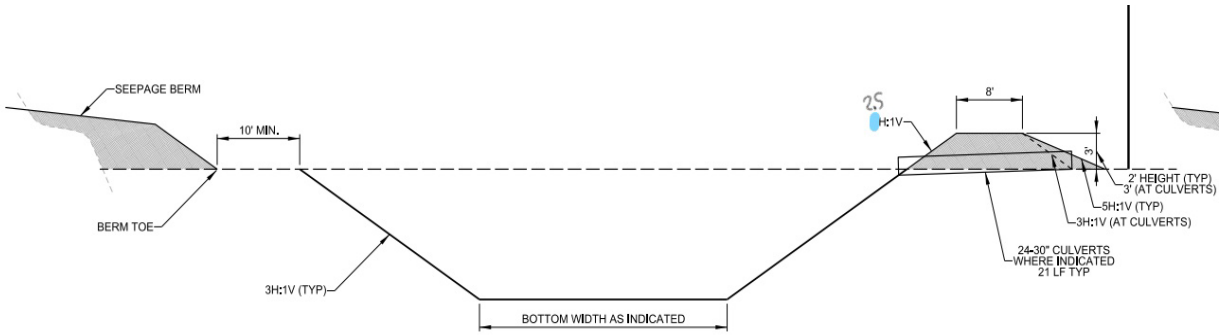
C-2: (Below Piggott) Use 2.5 on 1 for the potato berm in lieu of 3 on 1.

Alternative No.: C-2	**Page 1 of 4**
Title: (Below Piggott) Use 2.5 on 1 for the potato berm in lieu of 3 on 1.	

1. **Original Design:**
   - **a.** 3:1 berm side slopes.
2. **Drawing/Sketch of Original Concept:**



3. **Proposed Design:**
   - **a.** 2.5 to 1 berm side slopes.
4. **Drawing/Sketch of Proposed Idea:**



Alternative No.: C-2	Page 2 of 4
Title: (Below Piggott) Use 2.5 on 1 for the potato berm in lieu of 3 on 1.	

5. **Advantages:**

   a. Reduces required borrow, real estate, stabilization, and clearing costs for potato berms, minimizing required earthwork for project.

6. **Disadvantages:**

   a. Steeper side slopes increase difficulty for maintenance of berm sides.

   b. Steeper slopes could result in increased erosion for the side slopes of the potato berm.

   c. Steeper side slopes can make potato berm slightly more difficult to traverse

Alternative No.: C-2	Page 3 of 4
Title: (Below Piggott) Use 2.5 on 1 for the potato berm in lieu of 3 on 1.	

7. Discussion/Justification:

a. This alternative simply reduces the amount of embankment required for the proposed potato berm by increasing the side slopes of the potato berm, thus reducing cost in the project.

b. The "Original Concept" and "Proposed Concept" cost estimates were developed using calculated quantities and unit prices by only looking at the changes to the "Original" design and what's required for the "Proposed" design. Similar scopes of work are not included in the cost estimates to provide clear differences between the "Original Concept" and "Proposed Concept". All of the "Quantities", "Unit Costs", "Sub-Totals" and "Totals" are shown as positive numbers. The "Total (Rounded Nearest $1,000)" estimated cost for the "Proposed Concept" is then subtracted from the "Original Concept" to determine if there are "No Savings – Added Cost" or "Savings". See paragraph 8. Cost Analysis for further details.

c. The unit costs include all overhead markups, profit and any escalation if required. These unit costs were developed by experience, historical data, current working estimates, and/or cost estimating data bases such as M2, Cost Works, or Means. A 0% markup was included to allow for E&D, S&A, and contingencies.

8. Cost Analysis:

VE Alternative for Below Piggott Seepage Remediation, DD Clay and Green County, Clay and Green Counties, AR, Memphis District

Use 2.5 on 1 for the potato berm in lieu of 3 on 1.

ALT # C2 | SHEET 1

Cost Analysis		Original Concept			Alternative Concept		
Description	Unit	Quantity	Unit Cost	Total	Quantity	Unit Cost	Total
Potato Embankment	CY	17,816	$1.5	$26,723	14,864	$1.5	$22,296
Real Estate	AC	5.0	$6,888	$34,509	4.2	$6,888	$28,792
Turfing	AC	5.0	$1,600	$8,016	4.2	$1,600	$6,688
Clearing	AC	5.0	$350	$1,754	4.2	$350	$1,463
Sub-Total				$71,002			$59,239
Project Mark-ups							
Total (Rounded Nearest $1,000)				$71,000			$59,000
						Savings	$12,000

Alternative No.: C-2	Page 4 of 4
Title: (Below Piggott) Use 2.5 on 1 for the potato berm in lieu of 3 on 1.	

9. Calculations and Assumptions:

Assumptions made in the design and calculations of the change in side slopes of the potato berm are as follows:

- The side slopes of the potato berm were broken into triangles and the unit area change was found between a 3:1 side slope and 2.5:1 side slope. These areas were then multiplied that for the length of the berm to find the total cubic yard of fill change.
- It was assumed the potato berm was for the entire length of the proposed ditch.
- A compaction factor of 1.1 was used for the embanking.

									Compaction Factor	1.1
Berm Lengh	10940	ft			Berm Lengh	10940	ft			
3:1 Side Slope area	6	ft^2	(one side)		2.5:1 Side Slope area	5	ft^2			
H	2	ft			H	2	ft			
B	6	ft			B	5	ft			
Total Side Slope 3:1 area	12	ft^2			Total Side Slope 2.5:1 area	10	ft^2			
Total Side Slope 3:1 area Compacted	13.2				Total Side Slope 2.5:1 area Compacted	11				
3:1 Embankment Berm Total	5348.444444	yd^3			2.5:1 Embankment Berm Total	4457.037037	yd^3			
Embankment unit cost	$ 1.50	$/yd^3$			Emnbankment unit cost	$ 1.50	$/yd^3$			
Total Borrow Cost	$ 8,022.67				Total Borrow Cost	$ 6,685.56				
Real Estate	1.506887052	ac			1.25573921	ac				
Turfing	1.506887052	ac			1.25573921	ac				
clearing	1.506887052	ac			1.25573921	ac				

10. Assessment of Performance Measures /Attributes:

a. Operations and Maintenance (OM):

i. Potential Additional operation and maintenance costs with this design alternative will largely be contributed to the potential additional maintenance of the increased side slopes.

b. Reliability and Functionality (RF):

i. This design alternative does not impact the reliability of functionality of the original design as the potato berm still serves its initial purpose.

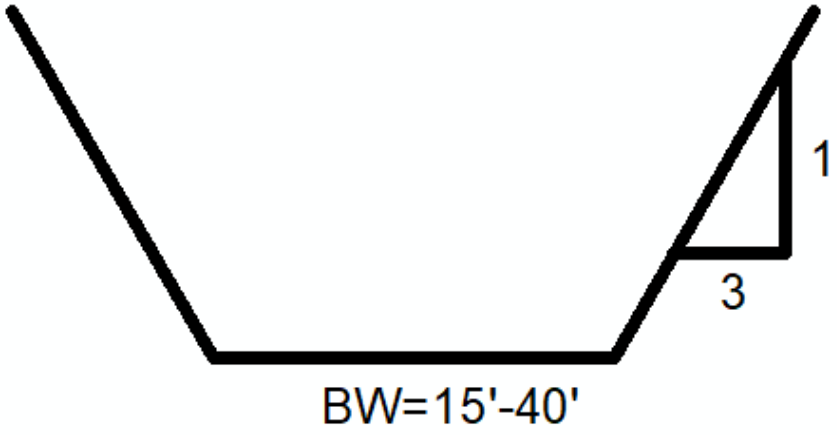
D: (Big Island) Uniform 15’ Bottom Width.

Alternative No.: D	Page 1 of 8
Title: (Big Island) Uniform 15’ Bottom Width	

1. **Original Design:**

The original ditch design recommendation for Big Island consists of a trapezoidal channel with 3:1 side slopes with a varying bottom width from 15’-40’.

2. **Drawing/Sketch of Original Concept:**

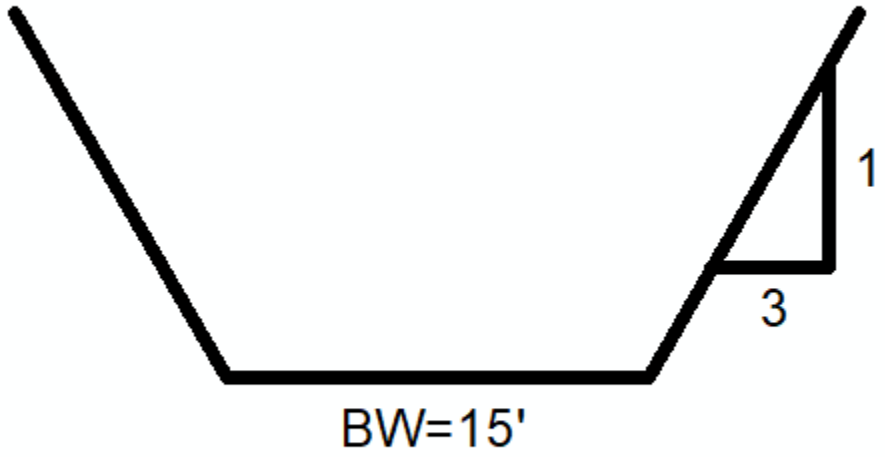


Alternative No.: D	Page 2 of 8
Title: (Big Island) Uniform 15’ Bottom Width	

3. Proposed Design:

The proposed design for Big Island consists of a consistent 15’ bottom width trapezoidal ditch with 3:1 side slopes.

4. Drawing/Sketch of Proposed Idea:



Alternative No.: D	Page 3 of 8
Title: (Big Island) Uniform 15' Bottom Width	

5. **Advantages:**
   - **a.** Save 12,100 yd^3 of excavation by reducing varying bottom with to consistent bottom width.
   - **b.** Save approximately 4 acres of ROW.
   - **c.** Saving clearing, grubbing, and turfing.
   - **d.** Appease property owner by reducing real estate acquisition.
6. **Disadvantages:**
   - **a.** This would increase water surface elevations.
7. **Discussion/Justification:**
   - **a.** The smaller ditch should be acceptable because the current design assumes the ditch will overflow and pool between the toe of the berm and the potato berm. The smaller ditch would increase water surface elevations but are still within the confines of the potato berm.
   - **b.** The "Original Concept" and "Proposed Concept" cost estimates were developed using calculated quantities and unit prices by only looking at the changes to the "Original" design and what's required for the "Proposed" design. Similar scopes of work are not included in the cost estimates to provide clear differences between the "Original Concept" and "Proposed Concept". All of the "Quantities", "Unit Costs", "Sub-Totals" and "Totals" are shown as positive numbers. The "Total (Rounded Nearest $1,000)" estimated cost for the "Proposed Concept" is then subtracted from the "Original Concept" to determine if there are "No Savings – Added Cost" or "Savings". See paragraph 8. Cost Analysis for further details.
   - **c.** The unit costs include all overhead markups, profit and any escalation if required. These unit costs were developed by experience, historical data, current working estimates, and/or cost estimating data bases such as M2, Cost Works, or Means. A 0% markup was included to allow for E&D, S&A, and contingencies.

Alternative No.: D	Page 4 of 8
Title: (Big Island) Uniform 15' Bottom Width	

8. **Cost Analysis:**

VE Alternative for Big Island Seepage Remediation, Mud Slough DD No. 1, Greene County, AR, Memphis District

Uniform 15' Bottom Width Ditch — ALT # D — SHEET 1

Cost Analysis		Original Concept			Alternative Concept		
Description	Unit	Quantity	Unit Cost	Total	Quantity	Unit Cost	Total
Ditch Excavation	CY	28,000	$3.50	$98,000	15,900	$3.50	$55,650
Clearing/Grubbing	AC	10.5	$350	$3,668	6.6	$350	$2,303
Turfing	AC	10.5	$1,600	$16,768	6.6	$1,600	$10,528
Geotextile, Non-Woven	SY	51,455	$2.50	$128,638	32,600	$2.50	$81,500
#57 Stone	TN	5,570	$32.00	$178,240	3,860	$32.00	$123,520
#1 Stone	TN	8,320	$32.00	$266,240	5,795	$32.00	$185,440
Right-of-Way Savings (95% OF $7250)	AC	10.5	$6,888	$72,186	6.6	$6,888	$45,461
Sub-Total				$763,740			$504,402
Project Mark-ups							
Total (Rounded Nearest $1,000)				$764,000			$504,000
						Savings	$260,000

Alternative No.: D	Page 5 of 8
Title: (Big Island) Uniform 15' Bottom Width	

9. Calculations and Assumptions:

Alternative: Varying 15' Bottom Width

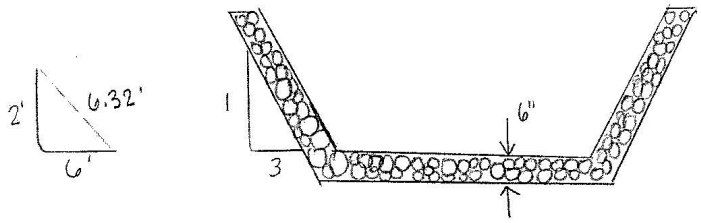
Channel Constants								
Station	**Length**	**Side Slope**	**Height**	**Bottom Width**	**Wetted Perimeter**	**Top Width**	**Geotextile**	**Volume of Excavation**
	(ft)	**H:V**	**ft**	**ft**	**ft**	**ft**	**yd^2**	**yd^3**
1900		3	2.8	15	32.7	31.8		
	2354						7803.0	3973.46
4254		3	1.1	20	27.0	26.6		
	1495						4688.0	1727.00
5749		3	1.5	20	29.5	29		
	1247						5343.8	2742.25
6996		3	2	35	47.6	47		
	2254						12559.6	7262.89
9250		3	2	40	52.6	52		
	3600						21059.6	12266.67
12850		3	2	40	52.6	52		
Total							51453.9	27972.27

Alternative: Consistent 15' Bottom Width

Channel Constants								
Station	**Length**	**Side Slope**	**Height**	**Bottom Width**	**Wetted Perimeter**	**Top Width**	**Geotextile**	**Volume of Excavation**
	(ft)	**H:V**	**ft**	**ft**	**ft**	**ft**	**yd^2**	**yd^3**
1900		3	2.8	15	32.7	31.8		
	2354						7149.1	3733.71
4254		3	1.1	15	22.0	21.6		
	1495						3857.4	1367.09
5749		3	1.5	15	24.5	24		
	1247						3611.9	1645.35
6996		3	2	15	27.6	27		
	2254						6924.6	3506.22
9250		3	2	15	27.6	27		
	3600						11059.6	5600.00
12850		3	2	15	27.6	27		
Total							32602.6	15852.37

Alternative No.: D	Page 6 of 8
Title: (Big Island) Uniform 15' Bottom Width	

SUBJECT:	COMPUTED BY: CMG	DATE:	FILE NO.
#57 STONE CALCS	CHECKED BY:	4/18/19 DATE:	SHEET NO.



- ASSUME 2' DEPTH
- THICKNESS = 6"

VARYING 15'-40' BW

$A_1 = \left[2(6.32\text{ft}) + 15\text{ft}\right]\left(6\text{in}\right)\left(\frac{1\text{ft}}{12\text{in}}\right) \approx 14\text{ ft}^2$

$A_m = \left[2(6.32\text{ft}) + 27.5\text{ft}\right]\left(6\text{in}\right)\left(\frac{1\text{ft}}{12\text{in}}\right) \approx 20\text{ ft}^2$

$A_2 = \left[2(6.32\text{ft}) + 40\text{ft}\right]\left(6\text{in}\right)\left(\frac{1\text{ft}}{12\text{in}}\right) \approx 27\text{ ft}^2$

$V = \frac{1}{6}\left(14\text{ft}^2 + 4(20\text{ft}^2) + 27\text{ft}^2\right)(3920\text{ft}) \approx 79{,}095\text{ ft}^3$

$V \approx 79{,}055\text{ ft}^3 \approx 2930\text{ yd}^3 \approx 5570\text{ TONS}\ (1.9 \times 2930\text{ yd}^3)$

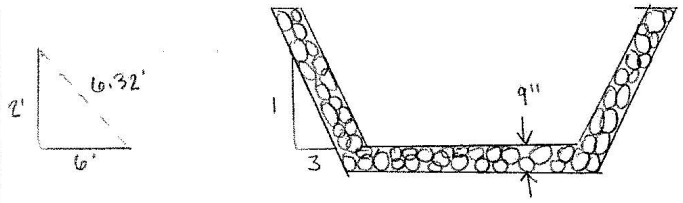
CONSISTENT 15' BW

$A = \left[2(6.32\text{ft}) + 15\text{ft}\right]\left(6\text{in}\right)\left(\frac{1\text{ft}}{12\text{in}}\right) = 13.82\text{ ft}^2$ SAY 14 ft^2

$V = 14\text{ft}^2(3920\text{ft}) = 54880\text{ft}^3 \approx 2040\text{yd}^3 \approx 3862$ TONS

WES FORM NO. 1253
REV OCT 1968

SUBJECT:	COMPUTED BY: CMG	DATE: 4/18/19	FILE NO.
#1 STONE CALCS	CHECKED BY:	DATE:	SHEET NO.



NPTS

- ASSUME 2' DEPTH
- THICKNESS = 9"

VARYING 15' - 40' BW

$A_1 = \left[2(6.32\,ft) + 15\,ft\right]\left(9in\right)\left(\frac{1\,ft}{12in}\right) = 20.73\,ft^2$ SAY $21\,ft^2$

$A_m = \left[2(6.32\,ft) + 27.5\,ft\right]\left(9in\right)\left(\frac{1\,ft}{12in}\right) = 30.1\,ft^2$ SAY $30\,ft^2$

$A_2 = \left[2(6.32\,ft) + 40\,ft\right]\left(9in\right)\left(\frac{1\,ft}{12in}\right) = 39.48\,ft^2$ SAY $40\,ft^2$

$V = \frac{1}{6}\left(21\,ft^2 + 4(30\,ft^2) + 40\,ft^2\right)\left(3920\,ft\right) = 118{,}253\,ft^3$

$V = 118253\,ft^3 \approx 4400\,yd^3 \approx 8320$ TONS

CONSISTENT 15' BW

$A = \left[2(6.32ft) + 15ft\right]\left(9in\right)\left(\frac{1ft}{12in}\right) = 20.73\,ft^2$ SAY $21\,ft^2$

$V = 21\,ft^2\,(3920\,ft) = 82{,}320\,ft^3$

$V = 82{,}320\,ft^3 \approx 3050\,yd^3 \approx 5793$ TONS

WES FORM NO. 1253
REV OCT 1968

Alternative No.: D	Page 8 of 8
Title: (Big Island) Uniform 15' Bottom Width	

10. Assessment of Performance Measures /Attributes:

a. Operations and Maintenance (OM):

i. The operation and maintenance costs for the new design will result in less maintenance as the original concept design.

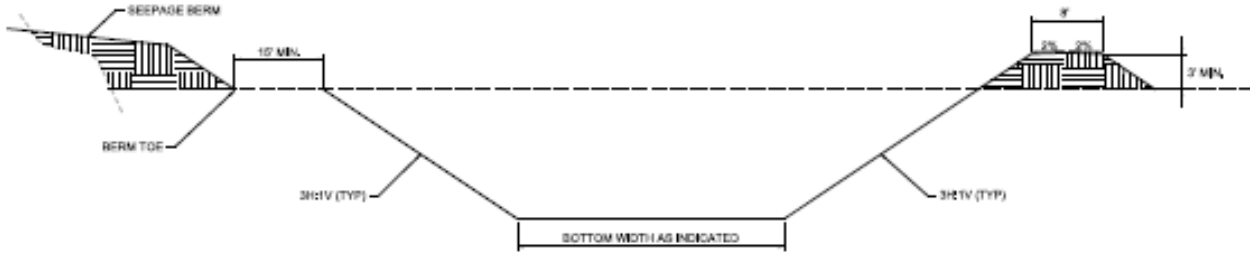
b. Reliability and Functionality (RF):

i. The reliability and functionality of the new design should stay the same as the proposed design.

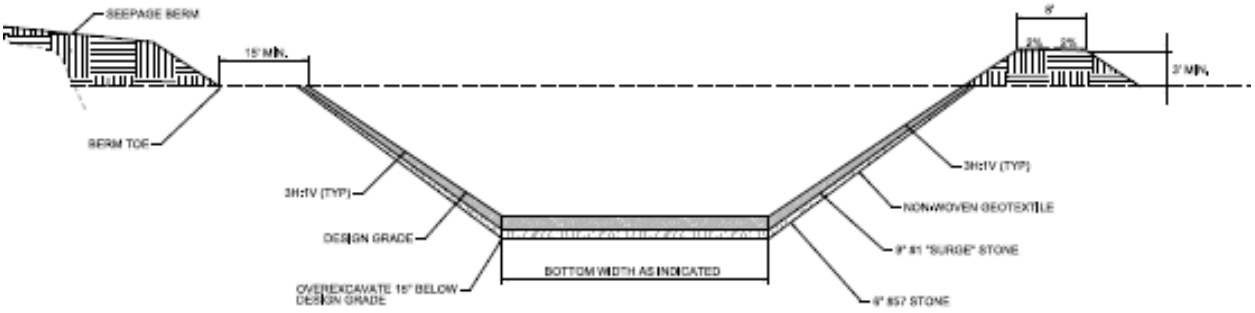
E: (Big Island) Concrete Lined Channel with Steeper Side Slopes.

Alternative No.: E	Page 1 of 5
Title: (Big Island) Concrete Lined Channel with Steeper Side Slopes	

1. **Original Design:**
   - **a.** The current design uses 2 scenarios: a typical unlined ditch and a ditch lined with an inverted filter.
2. **Drawing/Sketch of Original Concept:**



A2 TYPICAL DITCH SECTION - UNLINED
NOT TO SCALE



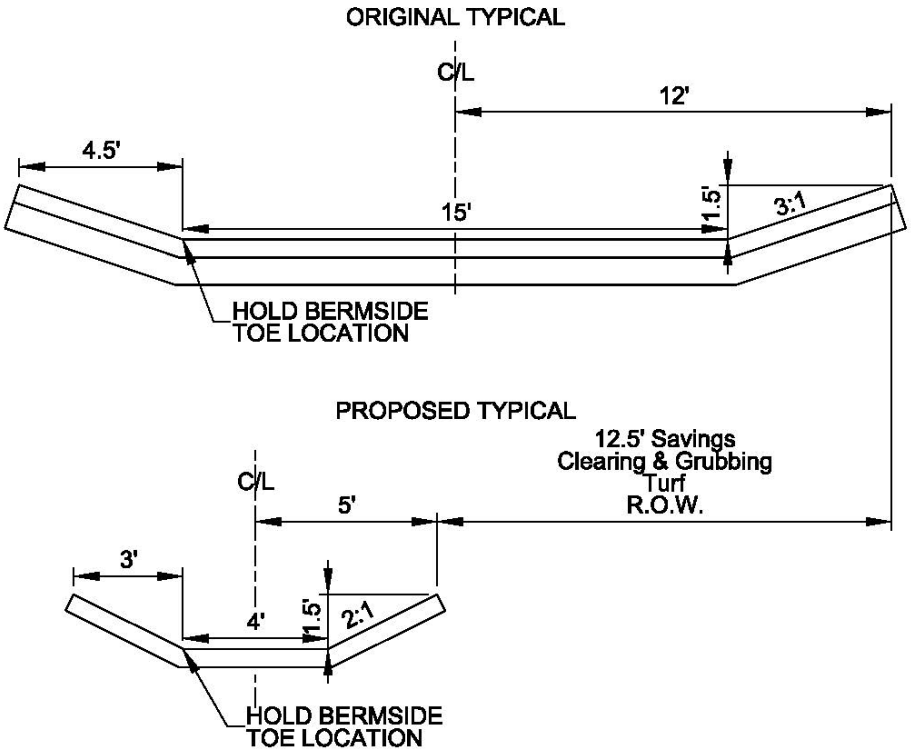
A7 TYPICAL DITCH SECTION - LINED
NOT TO SCALE

Alternative No.: E	Page 2 of 5
Title: (Big Island) Concrete Lined Channel with Steeper Side Slopes	

3. **Proposed Design:**

   a. Design a concrete lined open channel system with steeper side slopes to increase flow velocity and reduce channel size. The channel can also include drains to control seepage issues.

4. **Drawing/Sketch of Proposed Idea:**



Although not evaluated, may want to consider in the future a less expensive alternative like this Smart Ditch" HDPE Ribbed Ditch for smaller ditches.

Alternative No.: E	Page 3 of 5
Title: (Big Island) Concrete Lined Channel with Steeper Side Slopes	

5. **Advantages:**
   - **a.** Reduce the amount of R.O.W., Clearing and Grubbing, and Turf needed.
6. **Disadvantages:**
   - **a.** Concrete does not add value to the project.
7. **Discussion/Justification:**
   - **a.** It works but it is not cost effective. Evaluation was stopped at this point.
   - **b.** The "Original Concept" and "Proposed Concept" cost estimates were developed using calculated quantities and unit prices by only looking at the changes to the "Original" design and what's required for the "Proposed" design. Similar scopes of work are not included in the cost estimates to provide clear differences between the "Original Concept" and "Proposed Concept". All of the "Quantities", "Unit Costs", "Sub-Totals" and "Totals" are shown as positive numbers. The "Total (Rounded Nearest $1,000)" estimated cost for the "Proposed Concept" is then subtracted from the "Original Concept" to determine if there are "No Savings – Added Cost" or "Savings". See paragraph 8. Cost Analysis for further details.
   - **c.** The unit costs include all overhead markups, profit and any escalation if required. These unit costs were developed by experience, historical data, current working estimates, and/or cost estimating data bases such as M2, Cost Works, or Means. A 0% markup was included to allow for E&D, S&A, and contingencies.

Alternative No.: E	Page 4 of 5
Title: (Big Island) Concrete Lined Channel with Steeper Side Slopes	

8. Cost Analysis:

VE Alternative for Big Island Seepage Remediation, Mud Slough DD No. 1, Greene County, AR, Memphis District

Concrete Lined Channel with Steeper Side Slopes	ALT #	SHEET
	E	1

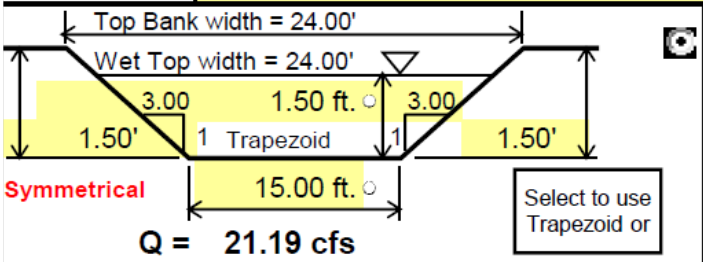
Cost Analysis		Original Concept			Alternative Concept		
Description	Unit	Quantity	Unit Cost	Total	Quantity	Unit Cost	Total
Soil Excavation	CY	24,459	$3.50	$85,608	6,472	$3.50	$22,651
6" Thick Cast in place concrete channel	CY				2,217	$560.00	$1,241,640
9" - Course Aggregate, Size #1	TN	7,610	$32.00	$243,520			
6" - Course Aggregate, Size #57	TN	5,545	$32.00	$177,440			
Geotextile, Non-Woven	SY	22,919	$2.50	$57,298			
Right-of-Way Savings (95% OF $7,250)	AC	3.14	$6,888	$21,624			
Clearing and Grubbing	AC	3.14	$350	$1,099			
Establishment of Turf	AC	2.01	$1,600	$3,223			
Sub-Total				$589,811			$1,264,291
Project Mark-ups							
Total (Rounded Nearest $1,000)				$590,000			$1,264,000
						No Savings - Added Cost	($674,000)

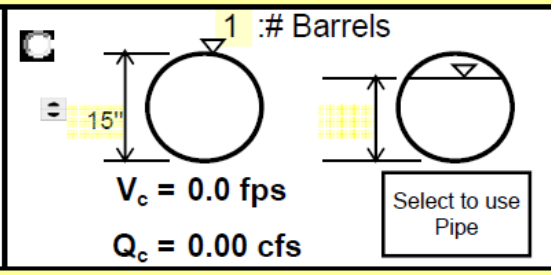
Alternative No.: E	Page 5 of 5
Title: (Big Island) Concrete Lined Channel with Steeper Side Slopes	

9. Calculations and Assumptions:

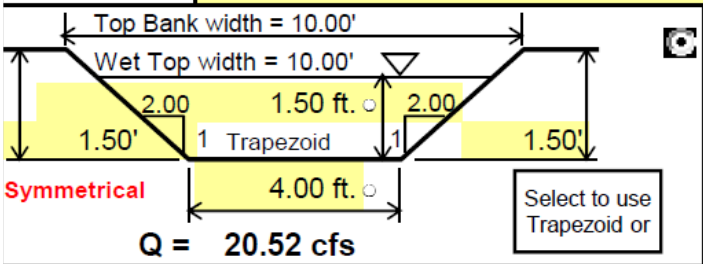
Channel Flow

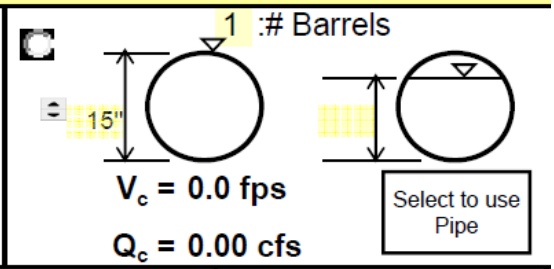
Segment ID	1	2
Section 1	Original Design	





Section 2	Concrete	





12. Cross sectional flow area, a ····· ft^2	29.25	10.50
13. Wetted perimeter, p_w ····· ft	24.49	10.71
14. Hydraulic radius, $r = a/p_w$ ····· ft	1.19	0.98
15. Channel slope, S ····· ft/ft	0.00030	0.00030
16. Mannings coefficient, n (Table 5A-1) ·····	Vegetation	Concrete: Trowel Finish
Mannings coefficient, n (Table 5A-1) ·····	0.040	0.013
17. Velocity $V=1.49\ r^{2/3}\ S^{1/2} / n$ ····· ft/s	0.72	1.95
18. Flow length, L ····· ft	13579.00	13579.00
19. $t_t = L / (3600V)$ Compute $t_{t(channel)}$ ····· hr	5.207	1.930

10. Assessment of Performance Measures /Attributes:

a. Operations and Maintenance (OM):

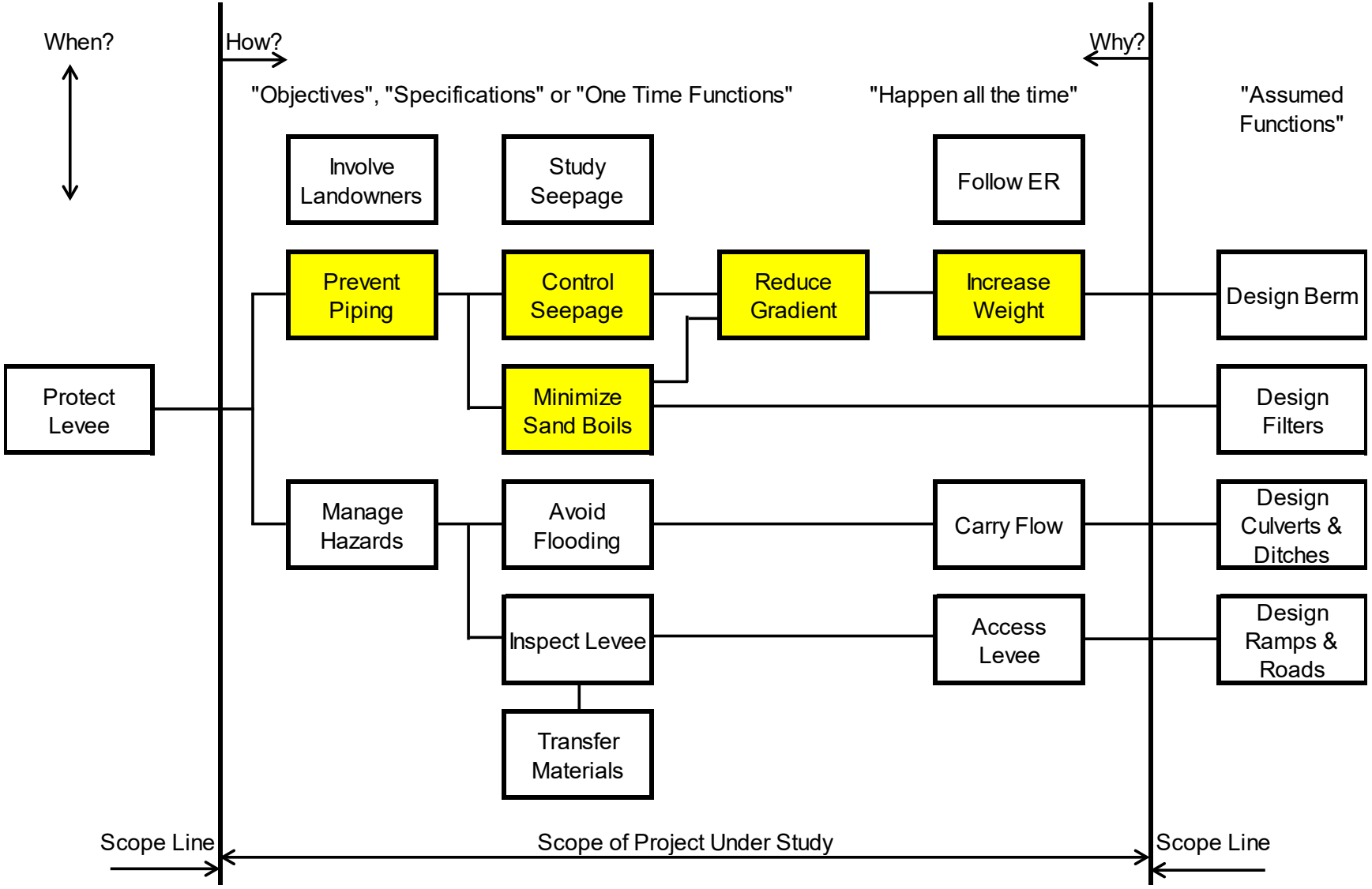
i. N/A

b. Reliability and Functionality (RF):

i. N/A

Appendix A: Function Analysis System Technique (Fast) Diagram

Function Analysis Systems Technique (FAST) Diagram
Big Island Seepage Remediation, Mud Slough Ditch DD No. 1, Greene County, AR, Memphis District



Appendix B: Speculation List

Code	No.	Big Island and Below Piggott Seepage Remediation Projects List of Speculations	Comments
X	1	HDPE pipe in lieu of CMP and cover ends with headwall concrete.	Current USACE policy hasn't addressed the acceptance of HDPE but is currently being used by small communities and some farmers.
X	2	HDPE pipe in lieu of CMP and concrete SOG ends.	Current USACE policy hasn't addressed the acceptance of HDPE but is currently being used by small communities and some farmers.
X	3	Use buried RCP to carry the flow on the northern property.	This would require catch basins to collect runoff and to allow for removal of any sediment that may accumulate.
C	4	Use rounded berms for the potato berm and locate the ditch to allow the farmer to farm over the berm to the toe the levee or berm.	Possibly push the ditch out far enough to eliminate to eliminate the inverted filter blanket, allow the farmer to farm between the toe of the berm and the ditch as well as farm over the top of the rounded berm.
X	5	Re-orient the culvert under Hwy 412 to parallel the levee to minimize the land use.	It's easier to move the ditch than to relocate a pipe.
P	6	Design the potato berm to be a potato berm and not access road (ie - reduce the 12' crown to 2').	
C	7	Establish the proper distance of the minimum berm. Piggott uses 150' from the toe of the levee to the toe of the berm while Big Island from toe of the levee to the crown of the end of the berm.	The seepage berm should be measured from the toe of the levee to the toe of the berm.
C	8	Strip the top soil of under the berms and stockpile, build the berms, and then place top soil to encourage grass growth.	It's uncertain what the borrow materials will be but using already vegetated soil would help with turfing.
X	9	Re-align the ditch to parallel Hwy 412 to Locus Creek.	Recommendation was dismissed because the ditch would flow through local landowners property and would have to be designed to ARDOT's standards.
X	10	Use Riprap for the berms in lieu of soil.	Idea was dismissed because of cost, is not easily maintained and would not stop seepage.
X	11	Use water berms in lieu of soil berm.	Recommendation dismissed because you must have seep water to fill in water berm. In addition this idea requires seepage in order for this idea to work.
X	12	Flatten the slopes coming off the levee.	This would add weight but you would still need to carry it to 150'; adding to the dirt quantity.
X	13	Embed a impervious liner in the berm and reduce the 5' fill requirement similar to a landfill.	This wouldn't allow any seepage relief, therefore there would be concentrated higher gradient at the ditch.
X	14	Put riprap on the riverside of the levee.	Not allowed to fill in to floodway.
X	15	Fill the riverside borrow pits to push the X1 distance further from the levee toe.	Riverside is considered as pristine environment.
X	16	Put an impervious liner on the riverside to the bank of the river to push the X1 factor all the way.	Riverside is considered as pristine environment.
PC	17	Steepen the slope of the ditch to 2.5 on 1 in lieu of 3 on 1.	
X	18	Straighten the ditch on the northern portion of the project in lieu of a curved design.	This would provide better hydraulic efficiency but would require more real estate.
X	19	Use a pipe in lieu of the inverted filter in the ditch.	This would require catch basins to collect runoff and to allow for removal of any sediment that may accumulate.

X	**19**	Use a pipe in lieu of the inverted filter in the ditch.	This would require catch basins to collect runoff and to allow for removal of any sediment that may accumulate.
C	**20**	Use NRCS outlet structures in lieu of just culverts in the potato berms.	This might reduce the need for CMP.
C	**21**	Use a flapgate in lieu of just culverts in the potato berms.	This would allow the farmer to control flows into the ditch.
C	**22**	Use ditches and NRCS outlet and eliminate culverts.	Same as 20.
P	**23**	Line the ditches to make the water flow faster to allow for a shallower ditch. (Concrete to clay)	
X	**24**	Consider using less than 10' minimum for the toe of the berm and the ditch.	The 15' minimum allows for easier maintenance.
X	**25**	Reduce the number of CMP and regrade farmland to drain to the fewer number of culverts.	Would require additional real estate and additional costs.
X	**26**	Install an environmental forest/bushes/grass barrier on the farmerside of the ditch to prevent soil from entering the ditch.	Upon further investigation, this recommendation did not yield viable alternatives when compared with meeting the design intentions of the potato berm it was to replace. Not only would the environmental barrier not be as efficencent in preventing sedimentation from entering the ditch as the berm would, but also it would negate from the purposed of serving as a field road per the land owners request in the project.
X	**27**	Use gravel at ramps on the existing grade in lieu of building a ramp.	This would deneuter the levee.
C	**28**	Consider combining Highway 90 project with Piggott to eliminate double handling and as a borrow source.	The Highway 90 project would provide 2/3 of the borrow required for this project from the EME and the remainder of the borrow required could come from the channel excavation. This would reduce the risk of the Below Piggott contractor waiting on the Below Highway 90 contractor to provide the materials. This would reduce the risk for two contractors impacting each other.
C	**29**	Consider a larger stockpile than 13 AC as this appears to not be enough for the amount of borrow required.	Currently the stockpile only holds 150,000 CY with a maximum of 10' height requiring filling it almost 5 times.
X	**30**	Use borrow pit 1 (not allowed to use) in lieu of borrow pit 2 as it is currently underwater. Borrow pit 2 has a high risk factor that could delay the project.	
C	**31**	Establish a standard depth of the berm at the toe of the levee. Piggott uses 5' at the toe while Big Island uses 3.7 to 4.4 feet at the toe.	Recommend using standards between project plans to avoid confusion for contractor to bid the projects.
P	**32**	Consider using 15' bottom width of ditch uniformly in lieu of varing from 15' to 40'.	
C	**33**	Consider using a wider shallow ditch to provide more borrow materials for the berm.	Would provide more borrow materials but may require more real estate.
X	**34**	Set the crown of levee berm to a minimum depth of 2 feet and slope to the levee.	It may require excessive fill and typically the design is based on the gradient at the toe of the levee and goes from there to the berm.

C	35	Consider using borrow from the location where there is a fair amount of clay as shown on the borings.	It's unknown where these borings were taken but appears to be on the riverside of the levee. Considering using these locations for borrow.
X	36	Provide relief to the southern levee by allowing water to go through the northern levee in the middle of the sleeve levees.	This would not relieve the pressure on the levee.
C	37	Recommend adding scour protection where existing ditches intersect new ditches.	It's uncertain if scour protection is needed but would assume that some may be needed especially when flow goes into existing ditches.
C	38	The current design of the inverted filter appears to not be constructable. Recommend keeping the perpendicular distance the same on the slopes of the ditches. (Make sure quantities reflect this in lieu of the current design).	
C	39	Recommend excavating 15" in lieu of overexcavate 15" at the ditches.	Design clarification
C	40	Make sure the excavation quantity is included in the ditch quantity or clarify it's incendintal to the placement of stone in the inverted filter blanket.	Design clarification.
X	41	Hold water in the riverside in detention ponds to reduce pressure against the levees.	Would excavation in the pristine environment.
C	42	Recommend not placing the potato berms over the inverted filter blanket.	Design consideration.
PC	43	Use 2.5 on 1 for the potato berm in lieu of 3 on 1.	

43	Total	**Recap Codes**
3	Total	**"P" Develop as a Proposal**
2	Total	**"PC" Combined With Another Proposal**
22	Total	**"X" Do Not Develop**
16	Total	**"C" Develop as a Comment**
0	Total	**"BD" Already Being Done**

Appendix C: Contact Directory

Contact Directory

Name/Registrations/Titles/Office/Represented Skill Set	Phone
Caroline (Mckenzie) Gabaldon, EC-H (MVM Hydraulic Engineer)	901-544-0909
John R. Holloway, EC-C (MVM Civil Engineer – Construction)	901-544-0759
Cody M. Isbell, FE, EC-G (MVM Geotechnical Engineer)	901-544-3463
Benjamin (Ben) A. Mowers P.E., EC-D (MVM Civil Engineer)	901-544-0727
Neal E. Newman, CCC, VEO, EC-D (MVM Value Engineer)	901-544-0890
Conrad R. Stacks, CCC, EC-D (MVM Cost Engineer)	901-544-0657

Appendix D: Presentation to PMC and PDT Members

Big Island Seepage Remediation, Mud Slough DD No. 1, Greene County, AR, MVM
VE Study Workshop Presentation to PDT
Friday, April 19, 2019
Sign In Sheet

	Printed Name	Signature	Office	Phone
1	Caroline (Mckenzie) Gabaldon		MVM-EC-H	901- 544-0909
2	John R. Holloway		MVM-EC-C	901-544-0759
3	Cody M. Isbell, FE		MVM-EC-G	901-544-3463
4	Benjamin (Ben) A. Mowers P.E.		MVM-EC-D	901-544-0727
5	Neal E. Newman, CCC, VMA		MVM-EC-D	901-544-0890
6	Conrad R. Stacks, CCC		MVM-EC-D	901-544-0657
7	Jeff Glass, PE		MVM-EC-D	901-544-3433
8	Jeff Gafford, PE		MVM-EC-D	0663
9	Ashley Evans		MVM EC-H	
10	Holly Euler		MVM-EC-H	x0664
11	Jamie Evans		EC-G	3921
12				3235
13	Chip Newman		EC-G	3815
14				
15				
16				

Below Piggott Seepage Remediation, DD Clay & Green County, Clay & Green Counties, AR, MVM
VE Study Workshop Presentation to PDT
Friday, April 19, 2019
Sign In Sheet

	Printed Name	Signature	Office	Phone
1	Caroline (Mckenzie) Gabaldon		MVM-EC-H	901- 544-0909
2	John R. Holloway		MVM-EC-C	901-544-0759
3	Cody M. Isbell, FE		MVM-EC-G	901-544-3463
4	Benjamin (Ben) A. Mowers P.E.		MVM-EC-D	901-544-0727
5	Neal E. Newman, CCC, VMA		MVM-EC-D	901-544-0890
6	Conrad R. Stacks, CCC		MVM-EC-D	901-544-0657
7	Jeff Glass, PE		MVM-EC-D	901-544-3433
8	Jeff Gafford, PE		MVM-EC-D	0663
9	Holly Enlow		MVM-EC-H	0664
10	Ashley Evans		MVM-EC-H	
11	Jamie Evans		ES-G	3921
12			EC-D	3236
13			EC-G	3815
14				
15				
16				

Appendix D

MVM-EC-G
31July2019
Below Piggott Seepage & Below Hwy 90 Cleanout
DQC Review Certification

As the Tech Lead for the above referenced project, I certify the design calculations and P&S developed for the DQC review were reviewed by the below listed individuals and that their comments were evaluated and resolved.

Name	Title	Office Symbol	Signature
James Evans, PE	RTS	MVM-EC-G	

I have performed review of the design calculations and P&S developed for the DQC review. I certify that all of my comments were acceptably addressed and incorporated into the documents.

Name	Title	Office Symbol	Signature
Robert Gambill, PE	Sup Civil Engineer	MVM-EC-H	
Ben Mowers, PE	Civil Engineer	MVM-EC-D	
Ben Tatum, PE	Civil Engineer	MVM-EC-G	