DTE ELECTRIC COMPANY

BELLE RIVER BOTTOM ASH IMPOUNDMENT NOTIFICATION OF COMPLETION OF RETROFIT

CCR RULE COMPLIANCE

PROJECT NO. 153316

REVISION 0

NOVEMBER 29, 2023

CONTENTS

FIGURES

List of Abbreviations

Abbreviation	Term/Phrase/Name
Belle River	Belle River Power Plant
BMC	Barton Malow Company
Burns & McDonnell	Burns & McDonnell Michigan, Inc.
CCR	Coal Combustion Residual
CFR	Code of Federal Regulations
Chesapeake	Chesapeake Containment Systems, Inc.
cm	centimeter
CQA	Construction quality assurance
CQC	Construction quality control
DTE	DTE Electric Company
EGLE	Michigan Department of Environment, Great Lakes, and Energy
ft	feet
GCL	geosynthetic clay liner
HDPE	high-density polyethylene
lb	pound(s)
MDOT	Michigan Department of Transportation
oz	ounce
sec	second
Weaver	Weaver Consultants Group
yd	yard

Index and Certification

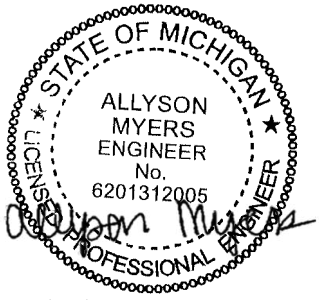
DTE Electric Company
Belle River Bottom Ash Impoundment Notification of Completion of Retrofit
Project No. 153316

Report Index

Certification

I hereby certify, as a Professional Engineer in the state of Michigan, that the information in this document was assembled under my direct personal charge. This report is not intended or represented to be suitable for reuse by the DTE Electric Company or others without specific verification or adaptation by the Engineer.

As required by 40 CFR § 257.102(k)(4), I hereby certify that removal of CCR from the Bottom Ash Impoundment at Belle River Power Plant and retrofit construction was completed in accordance with the written retrofit plan outlined in §257.102(k)(2) and the requirements of 257.102(k)(1). Additionally, I certify that the alternative composite liner meets the requirements of §257.72 and subsequently §257.70(c).



11/29/2023

Allyson Myers

Allyson Myers, P.E.
(Michigan License No. 6201312005)

Date: 11/29/2023

1.0 Background and Retrofit Design

DTE Electric Company (DTE) owns and operates the Belle River Power Plant (Belle River) located near East China, Michigan. Belle River produces coal combustion residuals (CCR) that must be managed by the requirements of 40 CFR § Part 257, Subpart D, Standards for Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments (CCR Rule). This Notification of Completion of Retrofit outlines the construction activities completed to retrofit the existing CCR Surface Impoundment, known as the Bottom Ash Impoundment, per the criteria outlined in the written retrofit plan prepared in accordance with §257.102(k)(2).

1.1 Site Information

Belle River is a two unit, 1,396-megawatt coal-fired facility located in China Township, Michigan. The Bottom Ash Impoundment, which includes the North and South Bottom Ash Basins, is located north of the generating units and is approximately 1.75 acres (see Figure 1-1 for site plan). A clay layer underlies the Bottom Ash Impoundment to a minimum depth of 82 feet. The impoundment receives CCR and non-CCR waste streams for treatment prior to being discharged to the Diversion Basin and ultimately through NDPES Outfall 001B to the St. Clair River.

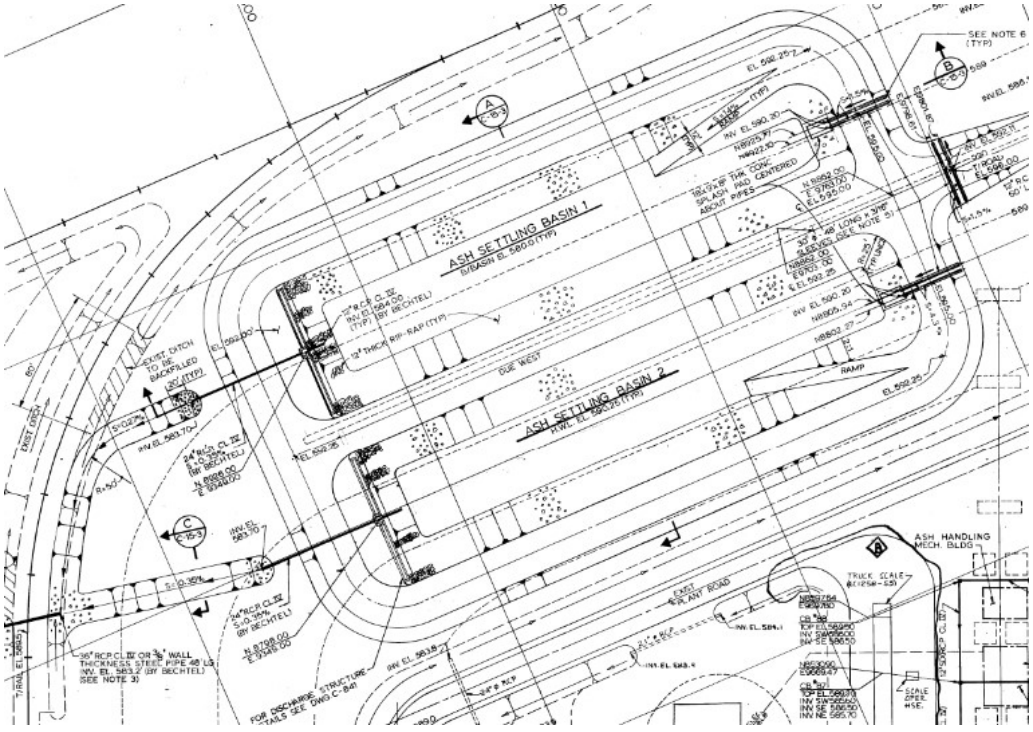


Figure 1-1: Site Plan

The Bottom Ash Impoundment was retrofitted with an alternative composite liner system that complies with §257.72 (and subsequently §257.70(c)). The North and South Basins were retrofitted sequentially so that one basin could be retrofitted while the other remained in

service. Details of closure and retrofit construction are provided in Sections 2.0 and 3.0, respectively.

1.2 Alternative Composite Liner System

The alternative composite liner system for the Belle River Bottom Ash Impoundment consisted of the following components (listed in order from the bottom layer):

- Compacted subgrade
- Geosynthetic clay liner (GCL)
  - Solmax Bentoliner CAR 0.75 lb/ft^2, NW, Peel 60
- 60-mil high-density polyethylene (HDPE) geomembrane liner
- Cushion geotextile
- 12 inches of protective cover soil
- 12 inches of crushed rock surfacing on the basin floor
- 12 inches of riprap on the basin slopes

Figure 1-2 provides a typical cross section of this liner system. The liner system materials provide adequate properties and meet the equivalency criteria in §257.70(b) and §257.70(c)(2), respectively.

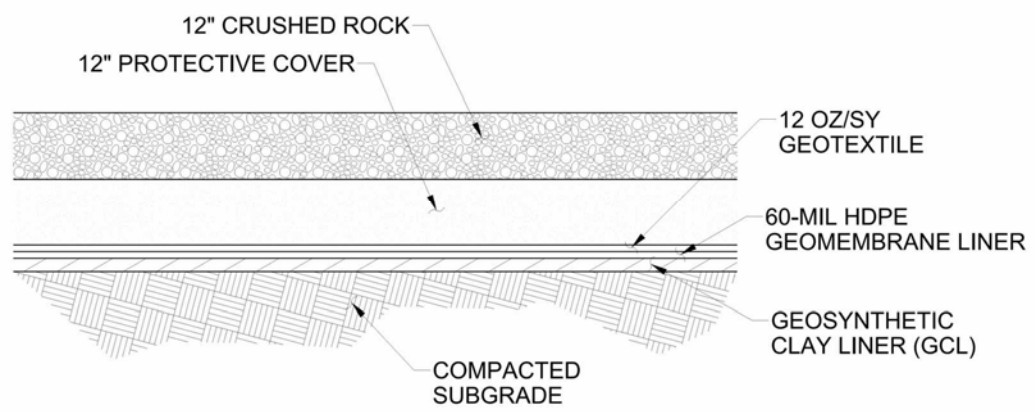


Figure 1-2: Typical Alternative Composite Liner Cross Section

The GCL component of the liner system was used in lieu of two feet of compacted soil with a hydraulic conductivity of no more than 1 x 10^{-7} cm/sec. The flow rate per unit area of the GCL was computed using Equation 1 as noted in section §257.70(c)(2).

(Eq. 1):

$$\frac{Q}{A} = q = k\left(\frac{h}{t} + 1\right)$$

Where:

Q = flow rate (cubic centimeters/second);
A = surface area of the liner (squared centimeters);

q = flow rate per unit area (cubic centimeters/second/squared centimeter);
k = hydraulic conductivity of the liner (centimeters/second);
h = hydraulic head above the liner (centimeters); and
t = thickness of the liner (centimeters).

The equivalency calculation was completed using the material data for the GCL and is included in Appendix A. As indicated by the calculation, the liquid flow rate through the GCL (i.e., the lower component of the alternative composite liner) is less than the liquid flow rate through two feet of compacted soil with a hydraulic conductivity of 1×10^{-7} cm/sec.

2.0 Bottom Ash Impoundment Closure

DTE retained Barton Malow Company (BMC) to remove ponded CCR waste from the Bottom Ash Impoundment and retained Burns & McDonnell to certify that ponded CCR waste in the Impoundment has been removed in accordance with Section 2.2 of the *Belle River Power Plant Retrofit Plan for Bottom Ash Impoundment (*February 10, 2023), referred to herein as the "Retrofit Plan". Details of the CCR removal are provided in the following subsections.

2.1 South Basin Closure Construction

CCR removal was planned within the limits of the South Basin, indicated as Ash Settling Basin 2 in Drawing C-15-1 (see Figure 1-1 and Appendix B), which represents the known extents of the South Basin. Figure No. 1 in Appendix C indicates the pre-construction surface contours (top of CCR) as surveyed by BMC. The excavation of CCR material was completed down to underlying clay. Figure No. 2 indicates the contours and the location of the top of clay/bottom of CCR excavation as surveyed by BMC and as observed and certified by Burns & McDonnell. The South Basin was surveyed on 4/4/2023, following an onsite inspection by Burns & McDonnell on 3/28/2023 and 4/3/2023. Burns & McDonnell completed another inspection on 4/11/2023 to review areas that were hand dug around the inlet and outlet structures.

Following CCR removal, the basin subgrade was over excavated to remove potentially impacted subgrade material and prepare for installation of the composite liner system in accordance with Section 2.1 of the Retrofit Plan. A total of 30 inches of additional material was over excavated from the basin floor to allow for the installation of subgrade improvements and liner components. The basin over excavation grade was surveyed by BMC as indicated in Figure No. 3. Approximately 4,400 cubic yards of material were removed from the basin in total.

2.2 North Basin Closure Construction

CCR removal at the North Basin was planned within the area indicated as Ash Settling Basin 1 in Drawing C-15-1 (see Figure 1-1 and Appendix B), which represents the known extents of the North Basin. Figure No. 1 in Appendix D indicates the pre-construction surface contours (top of CCR) as surveyed by BMC. Excavation of CCR material was completed to underlying clay as observed and certified by Burns & McDonnell. Figure No. 2 indicates the contours and the location of the top of clay/bottom of CCR excavation as surveyed by BMC on 7/31/2023. Following CCR removal, the basin subgrade was over excavated to remove potentially impacted subgrade material and prepare for installation of the composite liner system. Like the South Basin, the North Basin floor was over excavated up to 30 inches to allow for the installation of subgrade improvements and liner components. The basin over excavation grade was surveyed by BMC as indicated in Figure No. 3. Approximately 8,000 cubic yards of material were removed from the basin in total.

3.0 Bottom Ash Impoundment Retrofit

Following CCR removal activities, BMC completed retrofit construction for the Bottom Ash Impoundment. DTE retained Burns & McDonnell to certify that retrofit activities were completed in accordance with the Retrofit Plan and the requirements of §257.102(k).

3.1 South Basin Retrofit Construction

Following removal of CCR materials, the bottom of the basin was stabilized to allow for grading and preparation of the liner system subgrade. Subgrade improvements consisted of placing a 12-inch concrete mudmat which was overlain with a minimum of 6" of Michigan Department of Transportation (MDOT) Class II sand fill to restore the subgrade to 24" below the original design grade.

Prior to installation of the composite liner system materials, BMC submitted relevant quality control documents to Burns & McDonnell for approval. The liner materials were installed in accordance with the design documents. During construction, geosynthetics construction quality assurance (CQA) was performed by Weaver Consultants Group (Weaver) and construction quality control (CQC) was performed by Chesapeake Containment Systems, Inc. (Chesapeake), the Geosynthetics Installer. Burns & McDonnell provided general oversight during construction. The protective cover was installed following installation of the geosynthetic materials. Protective cover material consisted of suitable cohesionless material. The material was installed using low-ground pressure equipment such that approximately 12 inches was maintained between the tracked equipment and the geotextile layer. Finally, 12 inches of crushed rock surfacing and riprap were placed on the basin floor and slopes, respectively, to finish grade. At the completion of construction, Burns & McDonnell prepared a CQA Report what was submitted to the Michigan Department of Environment, Great Lakes, and Energy (EGLE) on 6/9/2023 and approved on 6/30/2023.

3.2 North Basin Retrofit Construction

Following removal of CCR materials, the bottom of the basin was stabilized to allow for grading and preparation of the liner system subgrade. As was the case for the South Basin, subgrade improvements consisted of placing a 12-inch concrete mudmat, which was overlain with a minimum of 6 inches of MDOT Class II sand. The Class II sand was used to restore the subgrade to 24 inches below the original design grade.

BMC submitted quality control documents for additional materials required to complete North Basin construction to Burns & McDonnell for approval. The composite liner materials were installed in accordance with the design documents. CQA for the geosynthetics materials was performed by Weaver and CQC was performed by Chesapeake. Burns & McDonnell provided general oversight during construction. The protective cover was installed following installation of the geosynthetic materials. Like the South Basin, protective cover material consisted of suitable cohesionless material which was installed using low-ground pressure equipment. This was followed with placement of 12 inches of crushed rock surfacing and riprap on the basin floor and slopes, respectively. At the completion of construction, Burns & McDonnell prepared a CQA Report what was submitted to EGLE on 11/3/2023.

APPENDIX A – LINER EQUIVALENCY CALCUATION

WORKSHEET TITLE:	Liner Equivalency Calculation	**CALCULATION NO.:**	C-001
ISSUED DATE:	4/5/2023	**REVISION:**	A
PERFORMED BY:	A. Myers	**REVIEWED BY:**	J. Eichenberger

OBJECTIVE: Confirm liner equivalency criteria is met per CCR Rule requirements

40 CFR 257.70(c)(2) requires comparison per (Eq. 1):

$$\frac{Q}{A} = q = k\left(\frac{h}{t} + 1\right)$$

Q = flow rate (cubic centimeters/second);
A = surface area of the liner (squared centimeters);
q = flow rate per unit area (cubic centimeters/second/squared centimeter);
k = hydraulic conductivity of the liner (centimeters/second);
h = hydraulic head above the liner (centimeters); and
t = thickness of the liner (centimeters).

EPA composite liner (soil component)

q	6.125E-07	
k	1.00E-07	
h	10.25	feet
h	312.42	cm
t	2	feet
t	60.96	cm

> OK

Proposed GCL

q	1.65533E-07	
k	3.17E-10	see Attachment 1*
h	10.25	feet
h	312.42	cm
t	0.236	inches, see Attachment 1*
t	0.59944	cm

*As indicated in Attachment 1, the proposed GCL material was originally to be used for the Winyah Generating Station Landfill but was re-allocated to the Belle River retrofit project.

CONCLUSION: Flow rate of proposed GCL is less than flow rate of prescribed compacted soil component.

Attachment 1

TECHNICAL DATA SHEET

Bentoliner CAR, 0.75 lbs/ft² - 3.66 kg/m², NW, Peel 60

PROPERTY(1)	TEST METHOD	FREQUENCY	UNIT Imperial	1100904-25257-5
SPECIFICATIONS				
GEOTEXTILE PROPERTY		-		
Cap Layer	-			Nonwoven
Cap Mass per Unit area	ASTM D5261	1/200,000 ft²	oz/yd²	6
Carrier Layer	-			Scrim Nonwoven
Carrier Mass/Unit area	ASTM D5261	1/200,000 ft²	oz/yd²	6
BENTONITE PROPERTY		-		
Swell Index (min.)	ASTM D5890	1 / 100,000 lb	ml/2 g	24
Moisture Content (max.)	ASTM D4643	1 / 100,000 lb	%	12
Fluid Loss (max.)	ASTM D5891	1 / 100,000 lb	ml	18
FINISHED GCL PROPERTY		-		
Bentonite Mass (0% moisture)	ASTM D5993	1/40,000 ft²	lbs/ft²	0.75
Tensile Strength MD (min. avg.)	ASTM D6768	1/40,000 ft²	lbf/in	50
Peel Strength (min.avg.)	ASTM D6496	1/40,000 ft²	lbf/in	12
Peel Strength (min.avg.)	ASTM D4632	1/40,000 ft²	lbf	60
Hydraulic Conductivity (max.)	ASTM D5887	1/200,000 ft²	cm/s	$5x10^{-9}$
Index Flux	ASTM D5887	1/200,000 ft²	m³/m²/sec	$1x10^{-8}$
Effective Confining Stress (max.)			lbs/in²	10
Internal Shear Strength	ASTM D6243	Periodically	lbs/ft²	500
Normal Stress			lbs/ft²	200
SUPPLY SPECIFICATIONS(Roll dimensions may vary ±1%)				
Roll Dimension - Width	-		ft	15.5
Roll Dimension - Length	-		ft	150
Area (Surface/Roll)	-		ft²	2325

NOTES

* The information contained herein is provided for reference purposes only and is not intended as a warranty or guarantee. Final determination of suitability for use contemplated is the sole responsibility of the user. SOLMAX assumes no liability in connection with the use of this information.

Solmax is not a design professional and has not performed any design services to determine if Solmax's goods comply with any project plans or specifications, or with the application or use of Solmax's goods to any particular system, project, purpose, installation or specification.

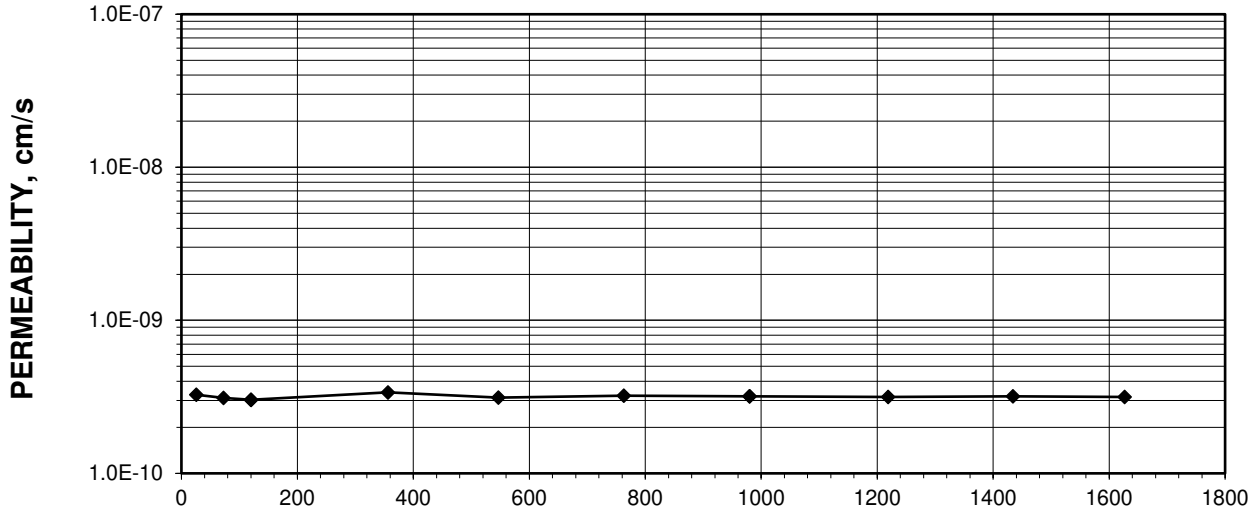
GCL INDEX FLUX & PERMEABILITY TEST

ASTM D 6766
(SOP-G109)

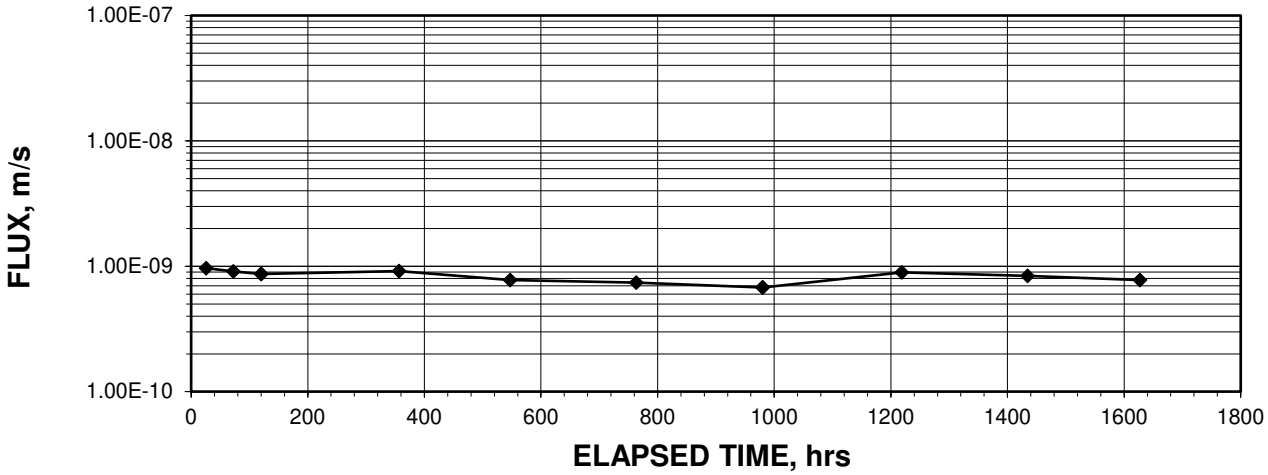
Lab ID No.	L21-006-001-003	Material	Solmax NWL CAR GCL
Client	Chesapeake Containment Systems, Inc.	Roll I.D.:	135084838
Client Project	Winyah Landfill	Lot No.:	NA
Project No.	L20-006-001	Sample No.	NA

AVERAGE FLUX = 8.36E-10 m/s
AVERAGE PERMEABILITY = 3.17E-10 cm/s @ 20°C

PERMEABILITY VS. ELAPSED TIME



FLUX VS. ELAPSED TIME



Checked By: JPK Date: 4/6/2021

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GCL INDEX FLUX & PERMEABILITY TEST

ASTM D 6766
(SOP-G109)

Lab ID No.	L21-006-001-003	Tested by: JO	Date: 1/15/2021
Client	Chesapeake Containment Systems, Inc.		
Client Project	Winyah Landfill	Checked by: JPK	Date: 4/6/2021
Project No.	L20-006-001		
Material	Solmax NWL CAR GCL		
Roll I.D.:	135084838		
Lot No.:	NA		
Sample No.	NA		

Hydration Liquid: De-ionized, De-aired Water Permeant: SC WGS SWLF Leachate

MOISTURE CONTENT:	**BEFORE TEST**	**AFTER TEST**
Tare Number	66	70
Wt. of Tare & GCL[2] (gm.)	29.90	99.18
Wt. of Tare & Dry GCL [2] (gm.)	28.81	46.36
Wt. of Tare (gm.)	11.05	11.13
Wt. of Water (gm.)	1.09	52.82
Wt. of Dry GCL (gm.) [2]	17.76	35.23
GCL Moisture Content (%)	**6.1**	**149.9**

SPECIMEN:	**BEFORE TEST**	**AFTER TEST**
Wt. of GCL (gm.) [2]	41.97	98.83 (Calculated)
Clay Component Thickness 1 (in.) [1]	0.131	0.238
Clay Component Thickness 2 (in.) [1]	0.127	0.236
Clay Component Thickness 3 (in.) [1]	0.124	0.233
Average Clay Component Thickness (in.)	na	0.236
Average Clay Component Thickness (mm)	na	**5.986**
Specimen Dia. (in)	4.000	4.000
Specimen Area (in.^{2})	12.57	12.57
Specimen Area (m^2)	0.00811	0.00811
Mass/Unit Area of GCL(gm./m^2) [2]	5,175	12,186
Mass/Unit Area of GCL(psf) [2]	1.06	2.49
Mass/Unit Area of Dry GCL(gm./m^2) [2]	4,876	
Mass/Unit Area of Dry GCL(psf) [2]	1.00	

*NOTES: 1) Direct visual measurement of exposed clay at specimen perimeter.
2) Includes weight of the textile carriers.

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GCL INDEX FLUX & PERMEABILITY TEST

ASTM D 6766
(SOP-G109)

Lab ID No.	L21-006-001-003
Client	Chesapeake Containment Systems, Inc.
Client Project	Winyah Landfill
Project No.	L20-006-001
Material	Solmax NWL CAR GCL
Roll I.D.:	135084838
Sample No.	NA

Pressure Heads (Constant)

Top Cap (psi)	75.0
Bottom Cap (psi)	77.0
Cell (psi)	86.0
Total Head (cm)	140.6

Final Sample Dimensions

Sample Length (cm), L	0.599
Sample Diameter (cm)	10.16
Sample Area (cm^2), A	**78.50**
Inflow Burette Area (cm^2), a-in	0.825
Outflow Burette Area (cm^2), a-out	0.965

Pore Volume (cm^3)	33.8	(calculated)
Bentonite Spec. Gravity	2.6	(assumed)

AVERAGE FLUX = 8.36E-10 m/s

AVERAGE PERMEABILITY = 3.17E-10 cm/s @ 20oC

DATE	ELAPSED TIME t	TOTAL INFLOW	TOTAL OUTFLOW	RATIO $\frac{\Delta IN}{\Delta OUT}$	TOTAL HEAD h	TEMP.	INCREMENTAL FLUX @ 20°C	INCREMENTAL PERMEABILITY @ 20°C
(m-d-y)	(hr)	(cm^3)	(cm^3)	(3 readings)	(cm)	(°C)	(m/sec)	(cm/sec)
1/22/2021	0.0	0.0	0.0	NA	168.2	21.2	NA	NA
1/23/2021	25.7	0.7	0.7	NA	166.7	21.3	9.66E-10	3.27E-10
1/25/2021	72.4	1.9	1.9	1.00	164.0	21.4	9.09E-10	3.11E-10
1/27/2021	120.2	3.1	3.1	1.02	161.4	21.4	8.70E-10	3.03E-10
1/28/2021	120.2	3.1	3.1	1.04	158.8	21.3	NA	NA
2/7/2021	356.4	8.8	9.6	0.88	145.4	21.4	9.14E-10	3.38E-10
2/15/2021	546.9	13.2	13.5	0.97	136.2	21.3	7.76E-10	3.13E-10
2/24/2021	763.0	18.0	17.8	1.11	126.3	21.2	7.41E-10	3.22E-10
3/5/2021	980.1	22.3	21.8	1.10	117.1	21.0	6.77E-10	3.18E-10
3/5/2021	980.1	22.3	21.8	1.10	168.2	21.0	NA	NA
3/15/2021	1218.7	28.6	27.6	1.08	154.9	21.1	8.93E-10	3.16E-10
3/24/2021	1434.3	33.9	32.5	1.08	143.7	21.2	8.37E-10	3.19E-10
4/1/2021	1626.9	38.3	36.5	1.10	134.4	21.5	7.77E-10	3.16E-10

Checked By: JPK Date: 4/6/2021

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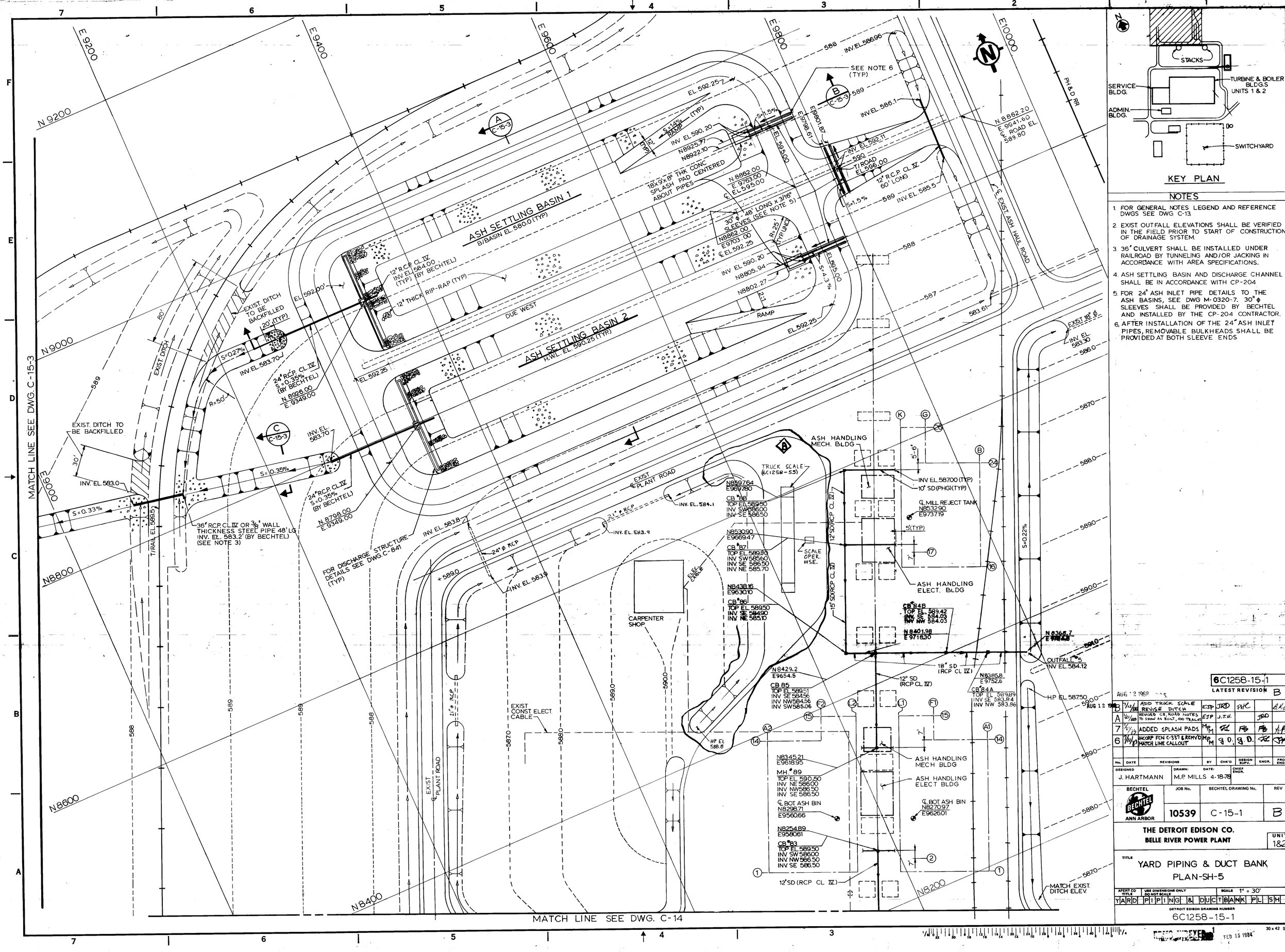
APPENDIX B – EXISTING DRAWINGS



KEY PLAN

NOTES

1. FOR GENERAL NOTES LEGEND AND REFERENCE DWGS SEE DWG C-13.
2. EXIST OUTFALL ELEVATIONS SHALL BE VERIFIED IN THE FIELD PRIOR TO START OF CONSTRUCTION OF DRAINAGE SYSTEM.
3. 36" CULVERT SHALL BE INSTALLED UNDER RAILROAD BY TUNNELING AND/OR JACKING IN ACCORDANCE WITH AREA SPECIFICATIONS.
4. ASH SETTLING BASIN AND DISCHARGE CHANNEL SHALL BE IN ACCORDANCE WITH CP-204
5. FOR 24" ASH INLET PIPE DETAILS TO THE ASH BASINS, SEE DWG M-0320-7. 30" ϕ SLEEVES SHALL BE PROVIDED BY BECHTEL AND INSTALLED BY THE CP-204 CONTRACTOR.
6. AFTER INSTALLATION OF THE 24" ASH INLET PIPES, REMOVABLE BULKHEADS SHALL BE PROVIDED AT BOTH SLEEVE ENDS

6C1258-15-1
LATEST REVISION B

AUG 12 1988

No.	DATE	REVISIONS	BY	CHK'D	DESIGN SUPV.	ENGR.	PROJ. ENGR.
B	7/14/88	ADD TRUCK SCALE REVISE DITCH	EJP	JRD	PHC		BHX
A	4/21/88	REVISED CB, ROAD NOTES TO SHOW AS BUILT, AND TRACKS	EJP	J.T.H.		JRD	
7	7/12/83	ADDED SPLASH PADS	MPM	JH	FB	FB	JA
6	7/11/83	INCORP FCN C-337 & REMVD MATCH LINE CALLOUT	MPM	G.D.	G.D.	JH	JAS

DESIGNED: J. HARTMANN
DRAWN: M.P. MILLS 4-18-78
DATE:
CHIEF ENGR.

BECHTEL ANN ARBOR
JOB No. 10539
BECHTEL DRAWING No. C-15-1
REV B

THE DETROIT EDISON CO.
BELLE RIVER POWER PLANT
UNIT 1&2

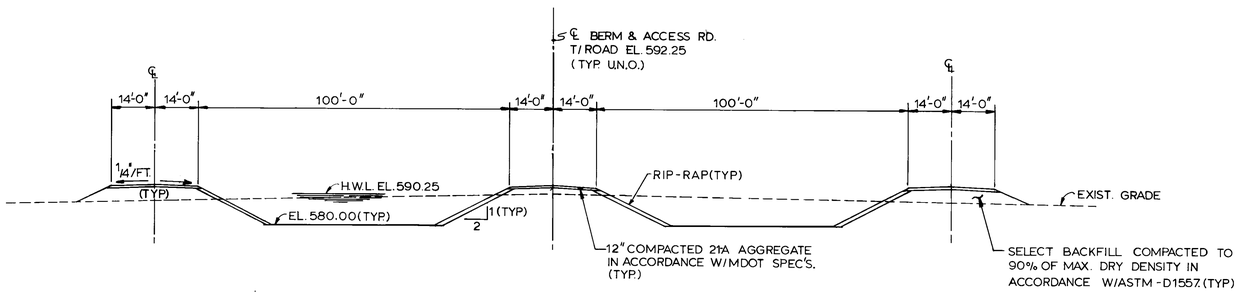
TITLE
YARD PIPING & DUCT BANK PLAN-SH-5

APERT CD TITLE: YARD PIPING & DUCT BANK PL SH 5
USE DIMENSIONS ONLY DO NOT SCALE
SCALE 1" = 30'

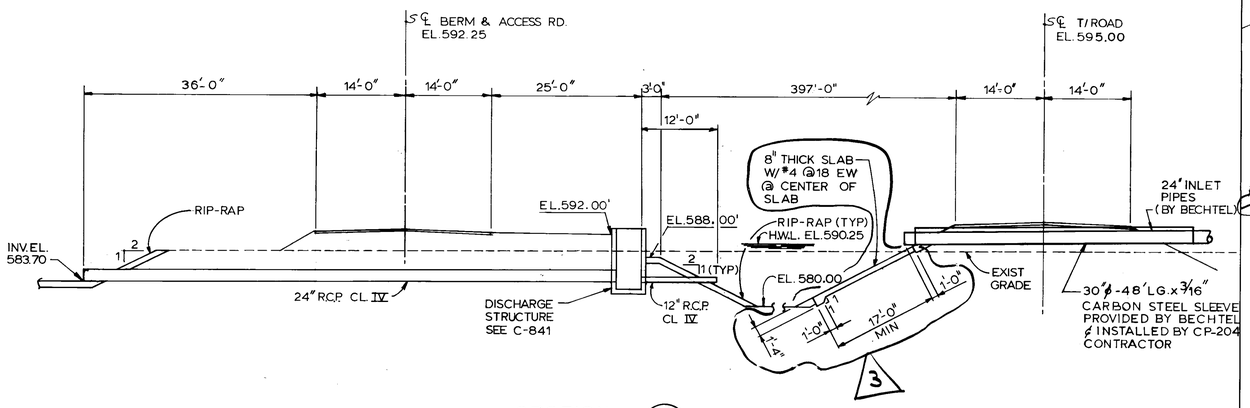
DETROIT EDISON DRAWING NUMBER
6C1258-15-1

30 x 42 SIZE

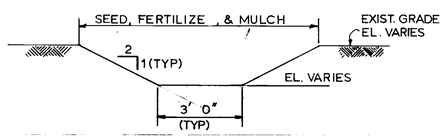
FEB 15 1984



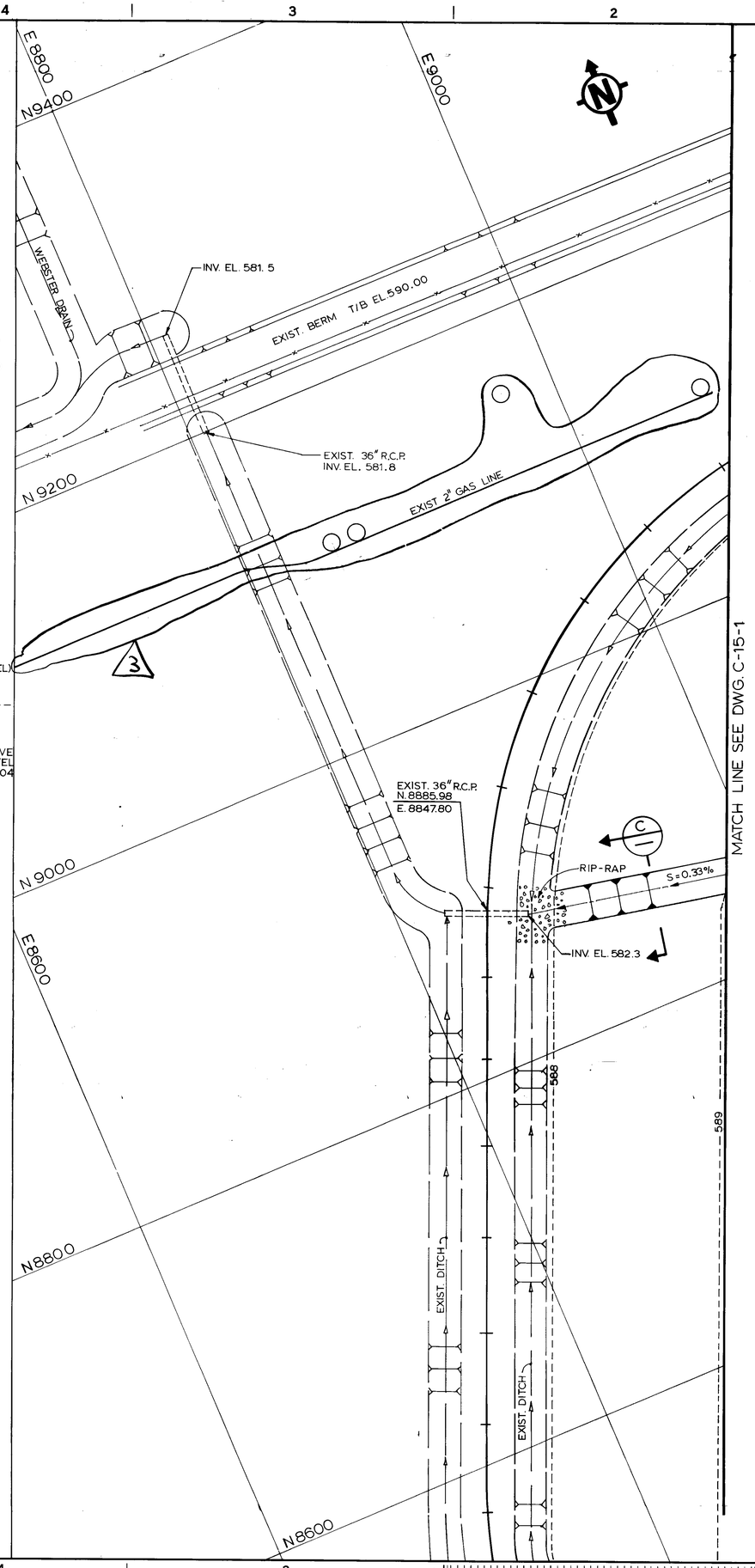
SECTION A (C-15-3) SEE DWG. C-15-1
1"=20'

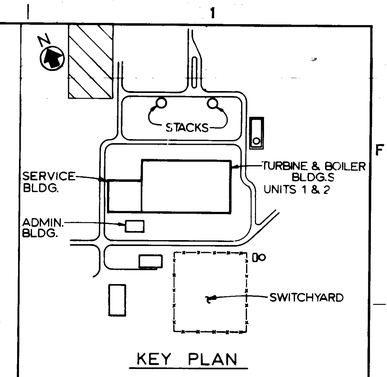


SECTION B (C-15-3) SEE DWG. C-15-1
1"-10'



SECTION C (C-15-3) SEE DWG'S C-15-1





KEY PLAN

NOTES

1. FOR GENERAL NOTES & REFERENCE DRAWINGS SEE DWG. C-13 & C-15-1
2. RIP-RAP STONE SHALL BE SOUND, DURABLE ROCK, FREE FROM CRACKS, SEAMS AND ORGANIC MATERIAL. THE STONE SHALL HAVE A MINIMUM SPECIFIC GRAVITY OF 2.6

GRADATION AS FOLLOWS:

SIEVE SIZE	9"	8"	7"	5"	3"
% PASSING	100	80-100	50-90	20-50	5-10

6C1258-15-3
LATEST REVISION 3

No.	DATE	REVISIONS	BY	CHK'D	DESIGN SUPV.	ENGR.	PROJ. ENGR.
3	1/14/82	ADDED SPLASH PAD & GAS LINE	MPM	JR	FB	FB	AA
2	2/4/82	UNDER. DRAIN & ADDED 30"ϕ SLEEVE	LKC	MPM	G.D.	FB	JMS
1	12/4/81	ISSUED FOR CONST	MPM	RLS	G.D.	AA	AA
0	12/4/81	ISSUED FOR BIDS FOR CP-204	LEK	RLS	G.D.	FB	AA

DESIGNED	DRAWN	DATE	CHIEF ENGR.
G. DEUKMAJI	L. KRANICK	10-20-81	

BECHTEL	JOB No.	BECHTEL DRAWING No.	REV
ANN ARBOR	10539	C-15-3	3

THE DETROIT EDISON CO.
BELLE RIVER POWER PLANT
UNIT 1&2

TITLE
ASH SETTLING SYSTEM PLAN SECTIONS & DETAILS

APERT CD TITLE: ASH SETT SYST PLN SECT & DETLS
USE DIMENSIONS ONLY — DO NOT SCALE
SCALE 1" = 30'

DETROIT EDISON DRAWING NUMBER
6C1258-15-3

30x42 SIZE

APPENDIX C – SOUTH BASIN CONSTRUCTION FIGURES

NOTES:

1. SURVEY AND AERIAL IMAGERY BY BARTON MALOW CONSTRUCTION CONDUCTED ON 03/14/23.

2. HORIZONTAL DATUM IS MICHIGAN SOUTH STATE PLANE NAD83 IN FT. VERTICAL DATUM IS NAVD88 (-0.965 FT FROM PLANT VERTICAL DATUM).

BURNS McDONNELL

date 4/10/23

designed A. MYERS

DTE ENERGY

BELLE RIVER POWER PLANT
PRE-CONSTRUCTION GRADES
SOUTH BASIN

project 153316

contract -

dwg **FIGURE 1**

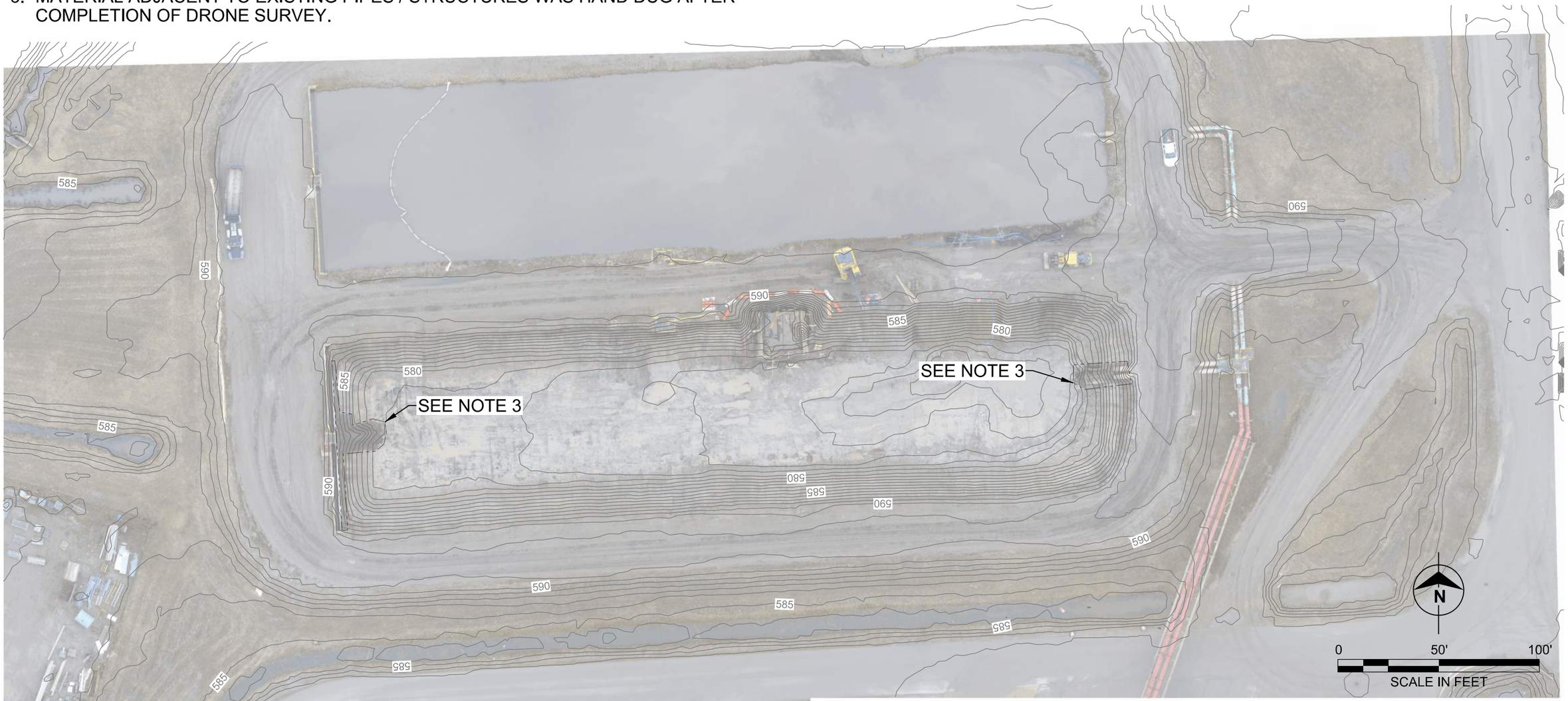
rev **A**

NOTES:

1. SURVEY AND AERIAL IMAGERY BY BARTON MALOW CONSTRUCTION CONDUCTED ON 04/04/23.

2. HORIZONTAL DATUM IS MICHIGAN SOUTH STATE PLANE NAD83 IN FT. VERTICAL DATUM IS NAVD88 (-0.965 FT FROM PLANT VERTICAL DATUM).

3. MATERIAL ADJACENT TO EXISTING PIPES / STRUCTURES WAS HAND DUG AFTER COMPLETION OF DRONE SURVEY.



BURNS McDONNELL

date 4/10/23

designed A. MYERS

DTE ENERGY

BELLE RIVER POWER PLANT
CCR EXCAVATION GRADES
SOUTH BASIN

project 153316

contract -

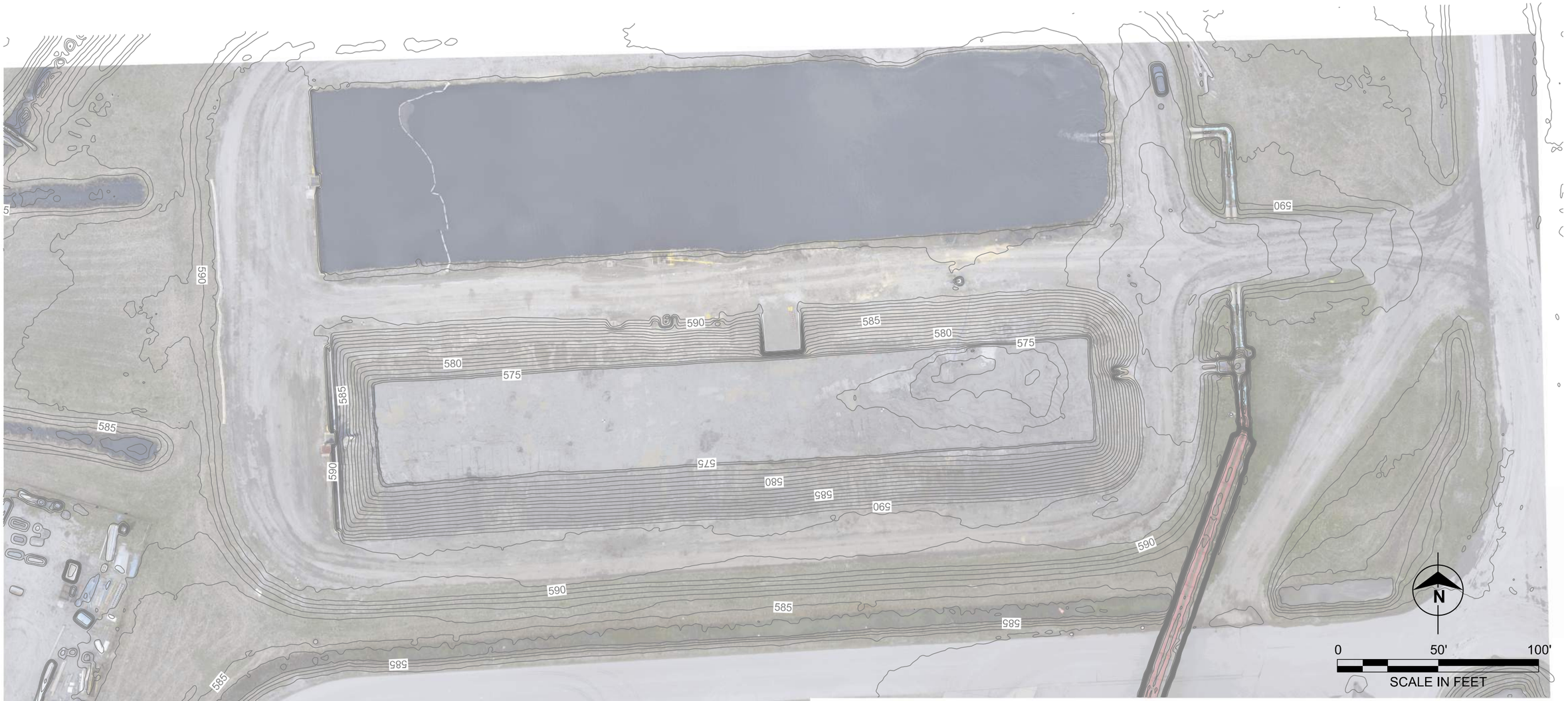
dwg **FIGURE 2**

rev **A**

NOTES:

1. SURVEY AND AERIAL IMAGERY BY BARTON MALOW CONSTRUCTION CONDUCTED ON 04/20/23.

2. HORIZONTAL DATUM IS MICHIGAN SOUTH STATE PLANE NAD83 IN FT. VERTICAL DATUM IS NAVD88 (-0.965 FT FROM PLANT VERTICAL DATUM).



BURNS McDONNELL

date 5/16/23

designed A. MYERS

DTE ENERGY

BELLE RIVER POWER PLANT
OVEREXCAVATION GRADES
SOUTH BASIN

project 153316

contract -

dwg **FIGURE 3**

rev **A**

NOTES:

1. SURVEY AND AERIAL IMAGERY BY BARTON MALOW CONSTRUCTION CONDUCTED ON 05/05/23.

2. HORIZONTAL DATUM IS MICHIGAN SOUTH STATE PLANE NAD83 IN FT. VERTICAL DATUM IS NAVD88 (-0.965 FT FROM PLANT VERTICAL DATUM).

BURNS McDONNELL

date 5/16/23

designed A. MYERS

DTE ENERGY

BELLE RIVER POWER PLANT
LINER SUBGRADE
SOUTH BASIN

project 153316

contract -

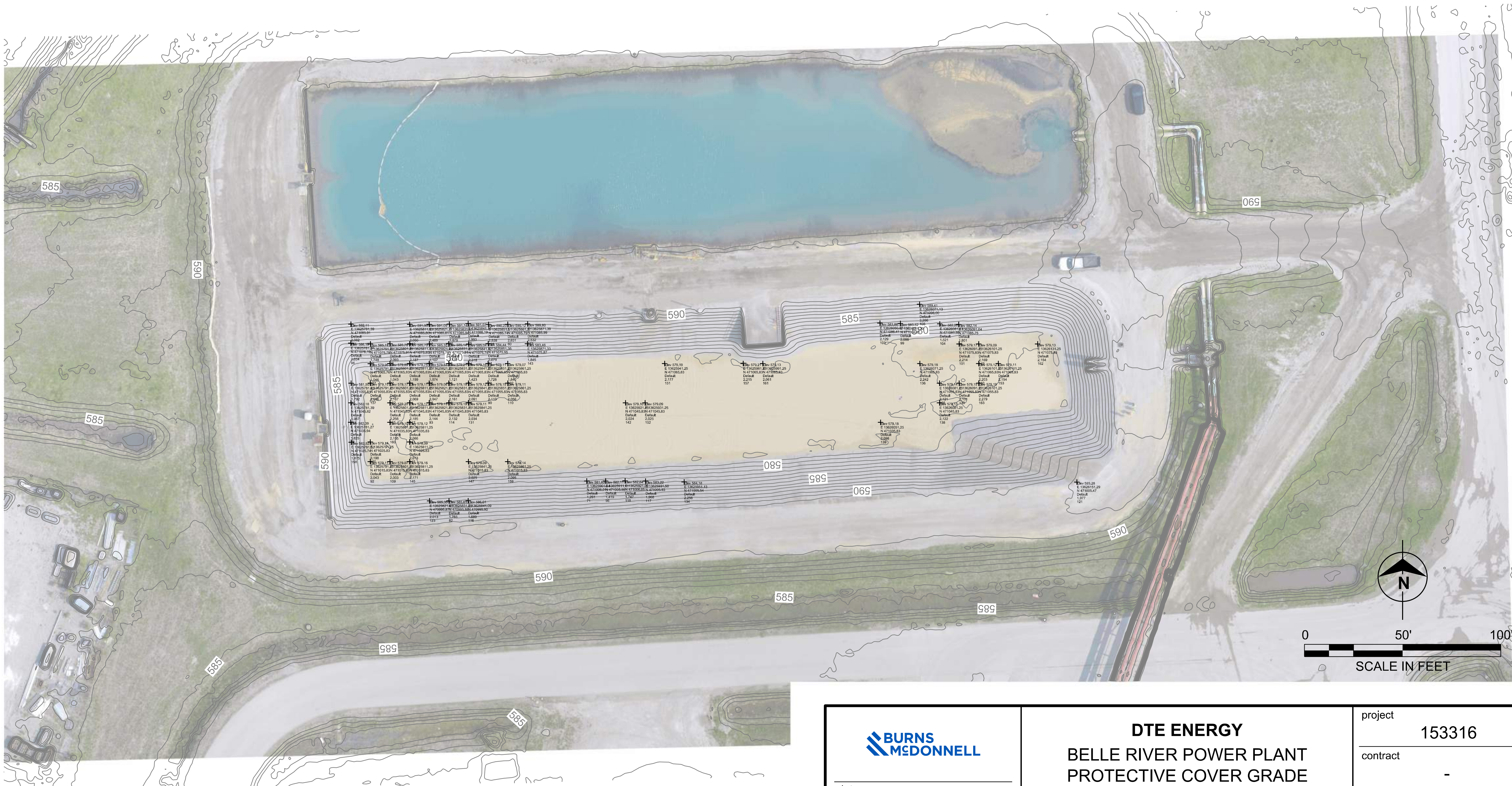
dwg **FIGURE 4**

rev **A**

NOTES:

1. SURVEY AND AERIAL IMAGERY BY BARTON MALOW CONSTRUCTION CONDUCTED ON 05/24/23. POINT CHECKS WERE CONDUCTED ON 06/06/23 TO CONFIRM ADEQUATE THICKNESS WAS ACHIEVED.

2. HORIZONTAL DATUM IS MICHIGAN SOUTH STATE PLANE NAD83 IN FT. VERTICAL DATUM IS NAVD88 (-0.965 FT FROM PLANT VERTICAL DATUM).

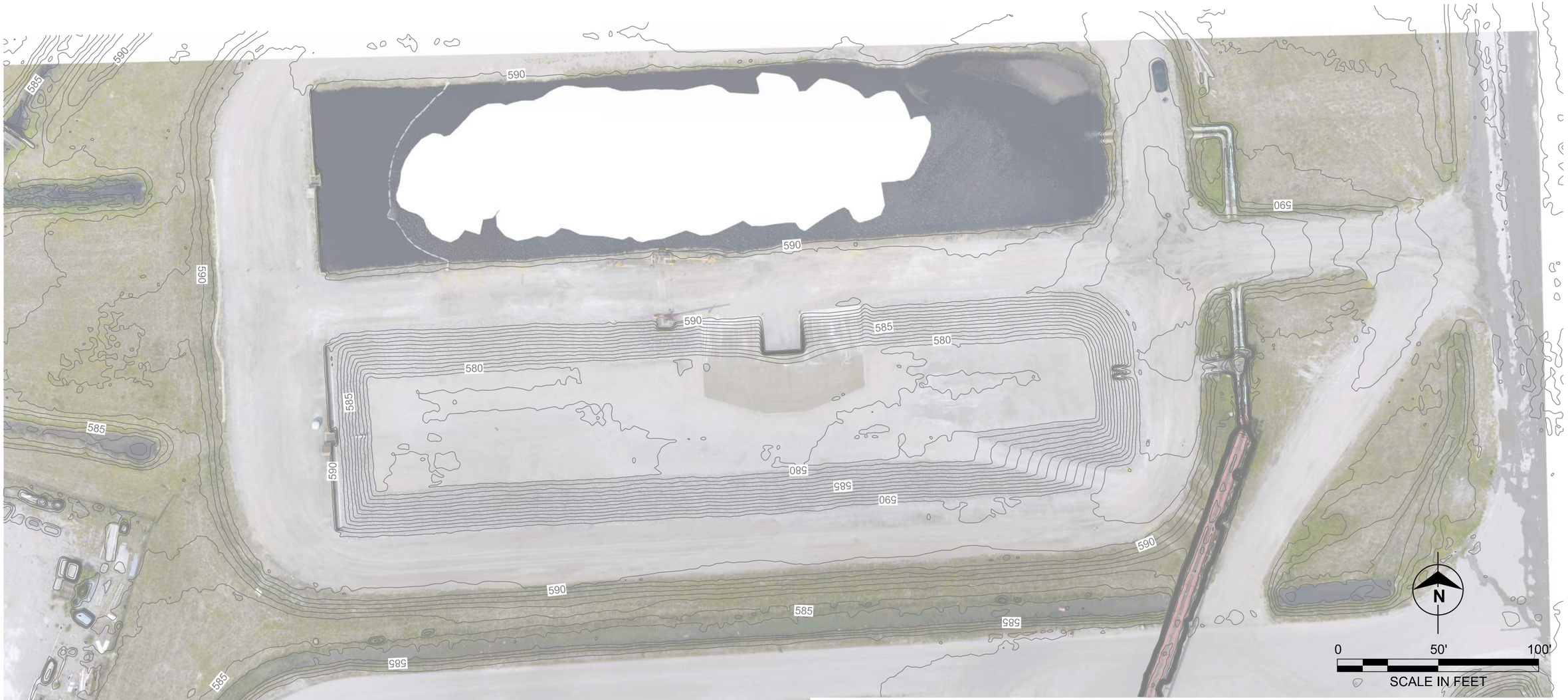


BURNS McDONNELL date 6/6/2023 designed A. MYERS	**DTE ENERGY** BELLE RIVER POWER PLANT PROTECTIVE COVER GRADE SOUTH BASIN	project 153316 contract - dwg **FIGURE 5** rev **A**

NOTES:

1. SURVEY AND AERIAL IMAGERY BY BARTON MALOW CONSTRUCTION CONDUCTED ON 06/06/23.

2. HORIZONTAL DATUM IS MICHIGAN SOUTH STATE PLANE NAD83 IN FT. VERTICAL DATUM IS NAVD88 (-0.965 FT FROM PLANT VERTICAL DATUM).



BURNS McDONNELL

date 6/6/2023

designed A. MYERS

DTE ENERGY

BELLE RIVER POWER PLANT
FINISH GRADE
SOUTH BASIN

project 153316

contract -

dwg **FIGURE 6**

rev **A**

APPENDIX D – NORTH BASIN CONSTRUCTION FIGURES

NOTES:

1. SURVEY AND AERIAL IMAGERY BY BARTON MALOW CONSTRUCTION CONDUCTED ON 07/11/23.

2. HORIZONTAL DATUM IS MICHIGAN SOUTH STATE PLANE NAD83 IN FT. VERTICAL DATUM IS NAVD88 (-0.965 FT FROM PLANT VERTICAL DATUM).

BURNS McDONNELL

date 10/16/2023

designed A. MYERS

DTE ENERGY

BELLE RIVER POWER PLANT
PRE-CONSTRUCTION GRADES
NORTH BASIN

project 153316

contract -

dwg **FIGURE 1**

rev **A**

10/16/2023

\\bmcd.burnsmcd.com\dfs\Clients\ENR\DTEEnr\153316_BRBACCRMod-OE\2_Design\Civil\Dwgs\Sketches\BAB-North\Figure 1.dgn

NOTES:

1. SURVEY AND AERIAL IMAGERY BY BARTON MALOW CONSTRUCTION CONDUCTED ON 07/31/23.

2. HORIZONTAL DATUM IS MICHIGAN SOUTH STATE PLANE NAD83 IN FT. VERTICAL DATUM IS NAVD88 (-0.965 FT FROM PLANT VERTICAL DATUM).

BURNS McDONNELL

date 10/16/2023

designed A. MYERS

DTE ENERGY

BELLE RIVER POWER PLANT
CCR EXCAVATION GRADES
NORTH BASIN

project 153316

contract -

dwg **FIGURE 2**

rev **A**

NOTES:

1. SURVEY AND AERIAL IMAGERY BY BARTON MALOW CONSTRUCTION CONDUCTED ON 08/08/23.

2. HORIZONTAL DATUM IS MICHIGAN SOUTH STATE PLANE NAD83 IN FT. VERTICAL DATUM IS NAVD88 (-0.965 FT FROM PLANT VERTICAL DATUM).

BURNS McDONNELL

date 10/16/2023

designed A. MYERS

DTE ENERGY

BELLE RIVER POWER PLANT
OVEREXCAVATION GRADES
NORTH BASIN

project 153316

contract -

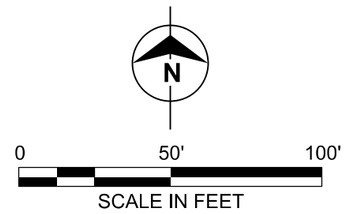
dwg **FIGURE 3**

rev **A**

NOTES:

1. SURVEY AND AERIAL IMAGERY BY BARTON MALOW CONSTRUCTION CONDUCTED ON 08/21/23.

2. HORIZONTAL DATUM IS MICHIGAN SOUTH STATE PLANE NAD83 IN FT. VERTICAL DATUM IS NAVD88 (-0.965 FT FROM PLANT VERTICAL DATUM).



BURNS McDONNELL date 10/16/2023 designed A. MYERS	**DTE ENERGY** BELLE RIVER POWER PLANT LINER SUBGRADE NORTH BASIN	project 153316 contract - dwg **FIGURE 4** rev **A**

NOTES:

1. SURVEY AND AERIAL IMAGERY BY BARTON MALOW CONSTRUCTION CONDUCTED ON 09/27/23. POINT CHECKS WERE CONDUCTED ON 09/30/23, 10/03/23, AND 10/05/23 TO CONFIRM ADEQUATE THICKNESS WAS ACHIEVED.

2. HORIZONTAL DATUM IS MICHIGAN SOUTH STATE PLANE NAD83 IN FT. VERTICAL DATUM IS NAVD88 (-0.965 FT FROM PLANT VERTICAL DATUM).

N

0 50' 100'

SCALE IN FEET

BURNS McDONNELL date 10/16/2023 designed A. MYERS	**DTE ENERGY** BELLE RIVER POWER PLANT PROTECTIVE COVER GRADE NORTH BASIN	project 153316 contract - dwg **FIGURE 5** rev **A**

NOTES:

1. SURVEY AND AERIAL IMAGERY BY BARTON MALOW CONSTRUCTION CONDUCTED ON 10/09/23.

2. HORIZONTAL DATUM IS MICHIGAN SOUTH STATE PLANE NAD83 IN FT. VERTICAL DATUM IS NAVD88 (-0.965 FT FROM PLANT VERTICAL DATUM).

BURNS McDONNELL date 10/16/2023 designed A. MYERS	**DTE ENERGY** BELLE RIVER POWER PLANT FINISH GRADE NORTH BASIN	project 153316 contract - dwg **FIGURE 6** rev **A**


BURNS McDONNELL