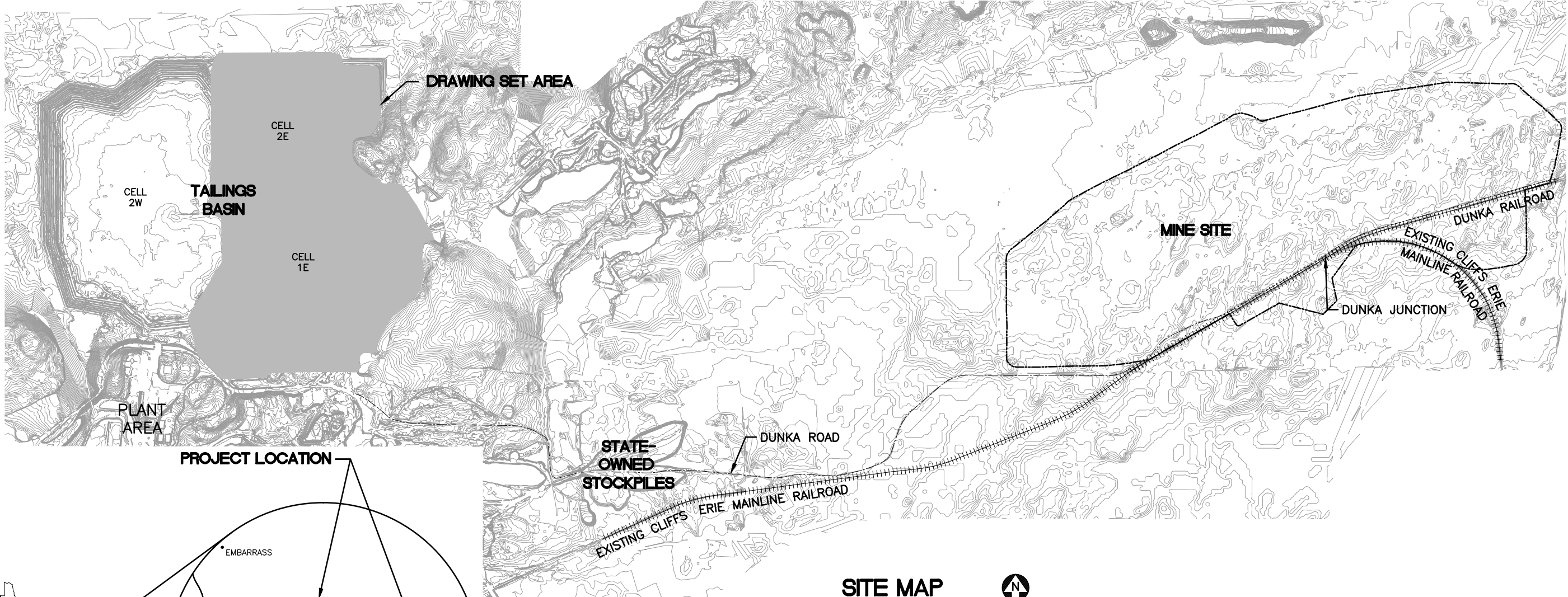


## **Appendix 6**

### **Flotation Tailings Basin and FTB Seepage Containment and Stream Augmentation Systems Permit Application Support Drawings**

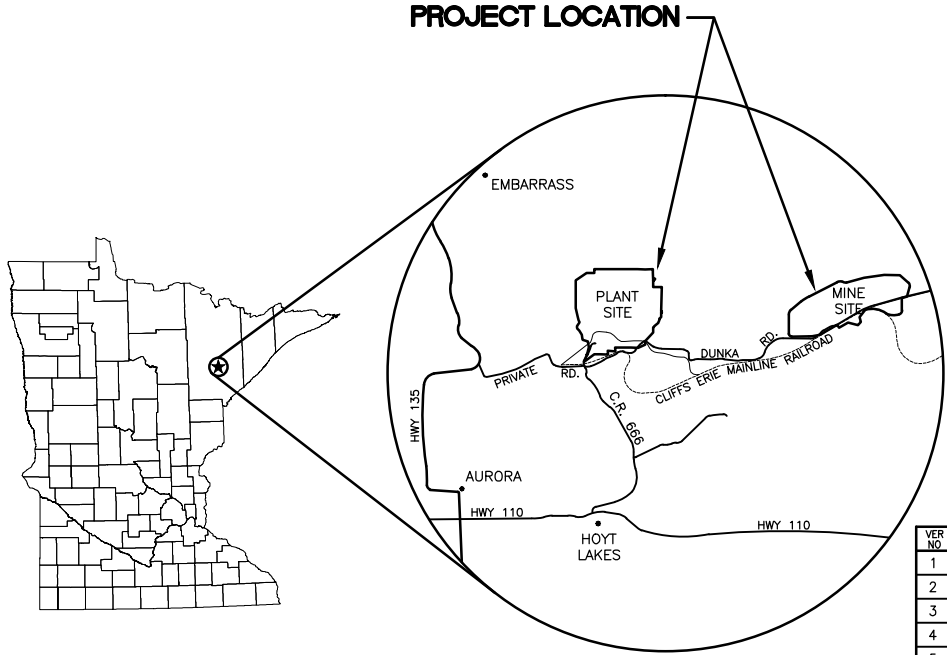
POLY MET MINING, INC. NORTHMET PROJECT  
PERMIT APPLICATION SUPPORT DRAWINGS  
FLOTATION TAILINGS BASIN  
HOYT LAKES, MINNESOTA



SITE MAP



0 2000 4000  
SCALE IN FEET



LOCATION MAP  
NOT TO SCALE



VICINITY MAP  
NOT TO SCALE

VER NO	DATE	DESCRIPTION	ISSUE STATUS		
1	10/14/11	FLOTATION TAILINGS MANAGEMENT PLAN – VERSION 1 – ATTACHMENT A	ISSUED	VERSION	DATE
2	12/07/12	FLOTATION TAILINGS MANAGEMENT PLAN – VERSION 2 – ATTACHMENT A	FOR PERMITTING	7	5/12/17
3	04/12/13	FLOTATION TAILINGS MANAGEMENT PLAN – VERSION 3 – ATTACHMENT A			
4	11/25/14	FLOTATION TAILINGS MANAGEMENT PLAN – VERSION 4 – ATTACHMENT A			
5	03/03/15	FLOTATION TAILINGS MANAGEMENT PLAN – VERSION 5 – ATTACHMENT A			
6	05/20/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS	FOR CONSTRUCTION	–	–
7	05/12/17	PERMIT APPLICATION UPDATES			
			NOT APPROVED FOR CONSTRUCTION.		

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINTED NAME THOMAS J. RADUE  
SIGNATURE Thomas J. Radue  
DATE 5/12/17 LICENSE# 20951

DRAWN: CAD  
CHECKED: TJR  
BARR PROJECT NO.: 23/69-0C29  
SCALE: AS SHOWN

PLANT DRAWING NUMBER:

FLOTATION TAILINGS BASIN  
LOCATION MAP AND SITE MAP

**POLYMET**  
MINING

POLY MET MINING, INC.  
NORTHMET PROJECT  
HOYT LAKES, MINNESOTA

**BARR**  
ENGINEERING CO.  
4300 MARKETPOINTE DRIVE  
SUITE 200  
MINNEAPOLIS, MN.  
Ph: 1-800-632-2277

PLANT DRAWING NUMBER:  
FTB-001

REV  
A



CADD USER: Cristian A. Diaz FILE: K:\DESIGN\23690C29.10\PERMIT\_NMT-02-CS-002.DWG PLOT SCALE: 1:2 PLOT DATE: 5/15/2017 3:03 PM

INCHES

1

2

GENERAL LEGEND

	EXISTING CONTOUR – MAJOR
	EXISTING CONTOUR – MINOR
	PROPOSED CONTOUR – MAJOR
	PROPOSED CONTOUR – MINOR
	EXISTING POWER POLE
	EXISTING RAILROAD
	EXISTING ROAD
	EXISTING TRAIL
	EXISTING STRUCTURES
	TREE LINE
	WETLAND BOUNDARY
	EXISTING CULVERT
	EXISTING PIPELINE
	OVERHEAD ELECTRIC
	PROPOSED DAMS
	PROPOSED DEWATERING PIPE
	PROPOSED DISCHARGE PIPELINE
	PROPOSED RETURN PIPELINE
	PROPOSED CULVERT (NON-MINE WATER)
	PROPOSED BORROW AREA
	PROPOSED ACCESS ROADS
	BUTTRESS

ABBREVIATIONS

APPROX.	–	APPROXIMATE
CMP	–	CORRUGATED METAL PIPE
CPEP	–	CORRUGATED POLYETHYLENE PIPE
CY	–	CUBIC YARD
DR	–	DIMENSION RATIO
DWG	–	DRAWING
EL.	–	ELEVATION
F	–	DIAMETER
FTB	–	FLOTATION TAILINGS BASIN
GCL	–	GEOSYNTHETIC CLAY LINER
HDPE	–	HIGH DENSITY POLYETHYLENE
HRF	–	HYDROMETALLURGICAL RESIDUE FACILITY
LDPE	–	LOW DENSITY POLYETHYLENE
LF	–	LINEAR FEET
LTVSMC	–	LTV STEEL MINING COMPANY
MCY	–	MILLION CUBIC YARDS
mil	–	ONE THOUSANDTH OF AN INCH
MIN	–	MINIMUM
MSL	–	MEAN SEA LEVEL
NTS	–	NOT TO SCALE
SCH.	–	SCHEDULE
SDR	–	STANDARD DIMENSION RATIO
TYP.	–	TYPICAL

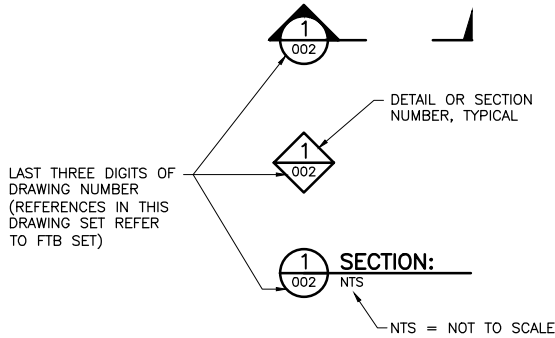
SHEET INDEX

SHEET NO. TITLE

GENERAL DRAWINGS

FTB-001	LOCATION MAP AND SITE MAP
FTB-002	LEGEND AND SHEET INDEX
FTB-003	EXISTING CONDITIONS
FTB-004	LAYOUT MINE YEAR 20
FTB-005	LAYOUT MINE YEAR 1
FTB-006	LAYOUT MINE YEAR 5
FTB-007	LAYOUT MINE YEAR 7
FTB-008	NORTH DAM – MINE YEAR 20 LAYOUT
FTB-009	NORTH DAM – TYPICAL CROSS SECTION
FTB-010	NORTH DAM – STAGED CONSTRUCTION
FTB-011	EAST AND WEST DAMS – MINE YEAR 20 LAYOUT
FTB-012	EAST AND WEST DAMS – TYPICAL CROSS SECTIONS AND DRAINAGE SWALE
FTB-013	SOUTH DAM – MINE YEAR 20 LAYOUT
FTB-014	SOUTH DAM – TYPICAL CROSS SECTION
FTB-015	EMERGENCY OVERFLOW CHANNEL – LAYOUT
FTB-016	EMERGENCY OVERFLOW CHANNEL – SECTIONS
FTB-017	EMERGENCY OVERFLOW CHANNEL – DETAILS
FTB-018	EMERGENCY OVERFLOW CHANNEL – SEQUENCING
FTB-019	PIPING LAYOUT CELL 2E
FTB-020	PIPING LAYOUT CELL 1/2E
FTB-021	DETAILS
FTB-022	TRANSFER PUMP RAFT
FTB-023	TAILINGS DISPOSAL DIFFUSER RAFT
FTB-024	CLOSURE PLAN



DRAWING NUMBERING



NOTES

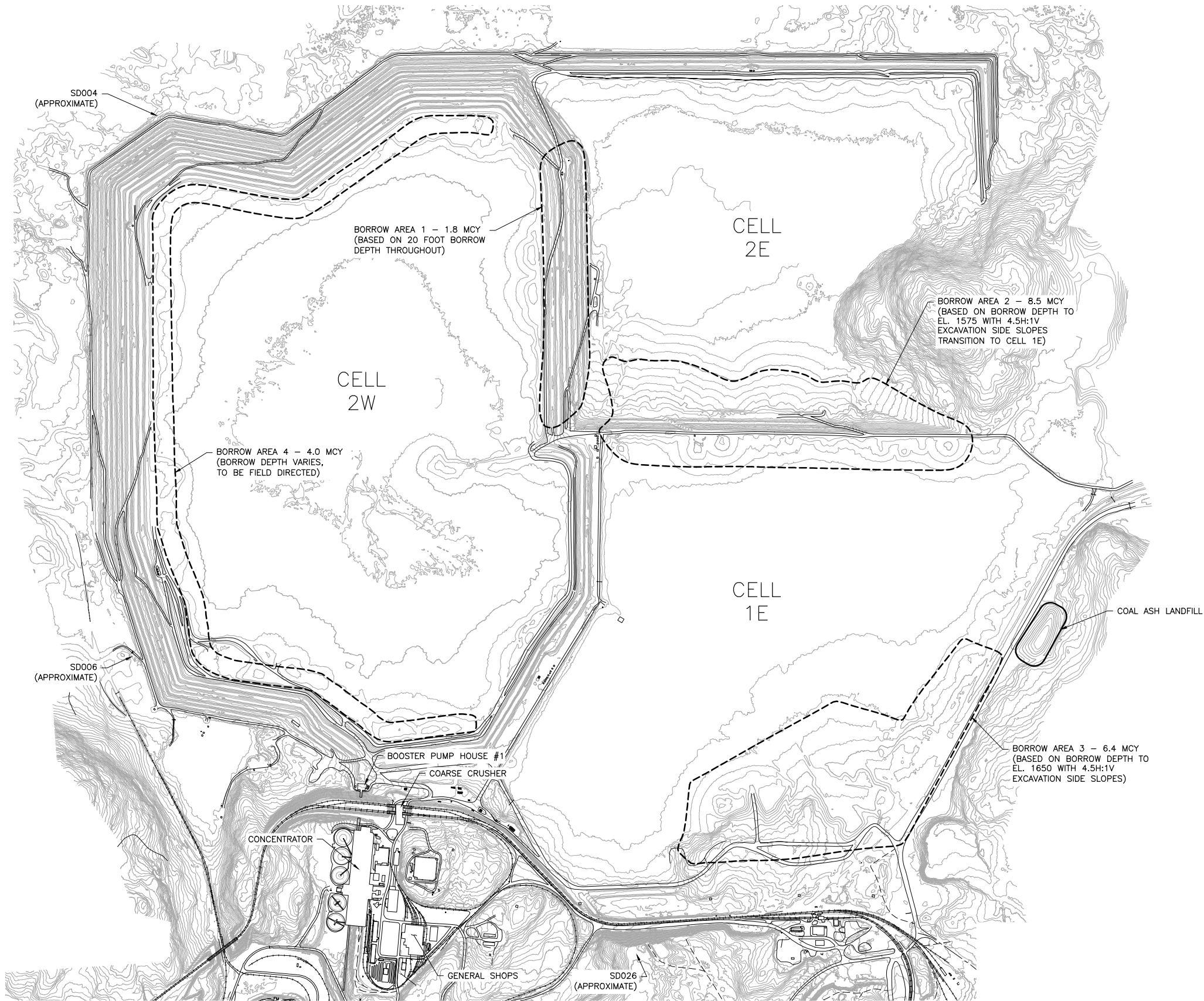
- COORDINATE SYSTEM IS MINNESOTA STATE PLANE NORTH ZONE, NAD83.
- ELEVATIONS ARE MEAN SEA LEVEL (MSL), NAVD88.
- EXISTING TOPOGRAPHIC INFORMATION SHOWN ON THE DRAWINGS WAS PREPARED BY AEROMETRIC, INC. FROM LIDAR DATA COLLECTED ON MARCH 17, 2010.
- EXISTING TOPOGRAPHIC INFORMATION WAS UPDATED FOR AREAS SOUTH EAST OF COAL ASH LANDFILL AND EAST OF OUTCROP BETWEEN CELLS 1E AND 2E USING CONTOURS FROM DATA COLLECTED IN 1999.
- FLOTATION TAILINGS BASIN DESIGN WAS BASED ON CONTOURS FROM DATA COLLECTED IN 1999. PROPOSED DAM LAYOUTS MAY NOT EXACTLY MATCH THE EXISTING TOPOGRAPHY FROM 2010 LIDAR.

VER NO	DATE	DESCRIPTION	ISSUE STATUS		
1	10/14/11	FLOTATION TAILINGS MANAGEMENT PLAN – VERSION 1 – ATTACHMENT A	FOR PERMITTING	7	5/12/17
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3	04/12/13	FLOTATION TAILINGS MANAGEMENT PLAN – VERSION 3 – ATTACHMENT A			
4	11/25/14	FLOTATION TAILINGS MANAGEMENT PLAN – VERSION 4 – ATTACHMENT A			
5	03/03/15	FLOTATION TAILINGS MANAGEMENT PLAN – VERSION 5 – ATTACHMENT A	FOR CONSTRUCTION	–	–
6	05/20/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS			
7	05/12/17	PERMIT APPLICATION UPDATES			
			NOT APPROVED FOR CONSTRUCTION		

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	DRAWN: CAD		 <b>BARR</b>		BARR ENGINEERING CO. 4300 MARKETPOINTE DRIVE SUITE 200 MINNEAPOLIS, MN. Ph: 1-800-632-2277	
	CHECKED: TJR					
	BARR PROJECT NO.: 23/69-0C29					
SCALE: AS SHOWN		DWG. NO. FTB-002		REV A		

CADD USER: Cristian A. Diaz FILE: K:\DESIGN\23690029.10\PERMIT\_NMT-02-CS-003.DWG PLOT SCALE: 1:2 PLOT DATE: 5/12/2017 10:04 AM

INCHES  
1  
2



- NOTES:**
1. CONTOURS DO NOT REFLECT BORROW REMOVAL.
  2. THE GENERAL BORROW SEQUENCING WILL BE:
    - AREAS THAT WILL BE INUNDATED BY OPERATIONS
    - AREAS NEAREST THE POINT OF USE
    - REMAINING BORROW AREAS
  3. COAL ASH LANDFILL TO BE RELOCATED TO HYDROMET RESIDUE FACILITY OR ALTERNATE PERMITTED FACILITY PRIOR TO TAILINGS DEPOSITION IN CELL 1E.

1 PLAN: EXISTING CONDITIONS  
0 800 1600  
SCALE IN FEET





VER NO	DATE	DESCRIPTION	ISSUE STATUS		
			ISSUED	VERSION	DATE
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3	04/12/13	FLOTATION TAILINGS MANAGEMENT PLAN - VERSION 3 - ATTACHMENT A			
4	11/25/14	FLOTATION TAILINGS MANAGEMENT PLAN - VERSION 4 - ATTACHMENT A	FOR PERMITTING	7	5/12/17
5	03/03/15	FLOTATION TAILINGS MANAGEMENT PLAN - VERSION 5 - ATTACHMENT A			
6	05/20/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS	FOR CONSTRUCTION	-	-
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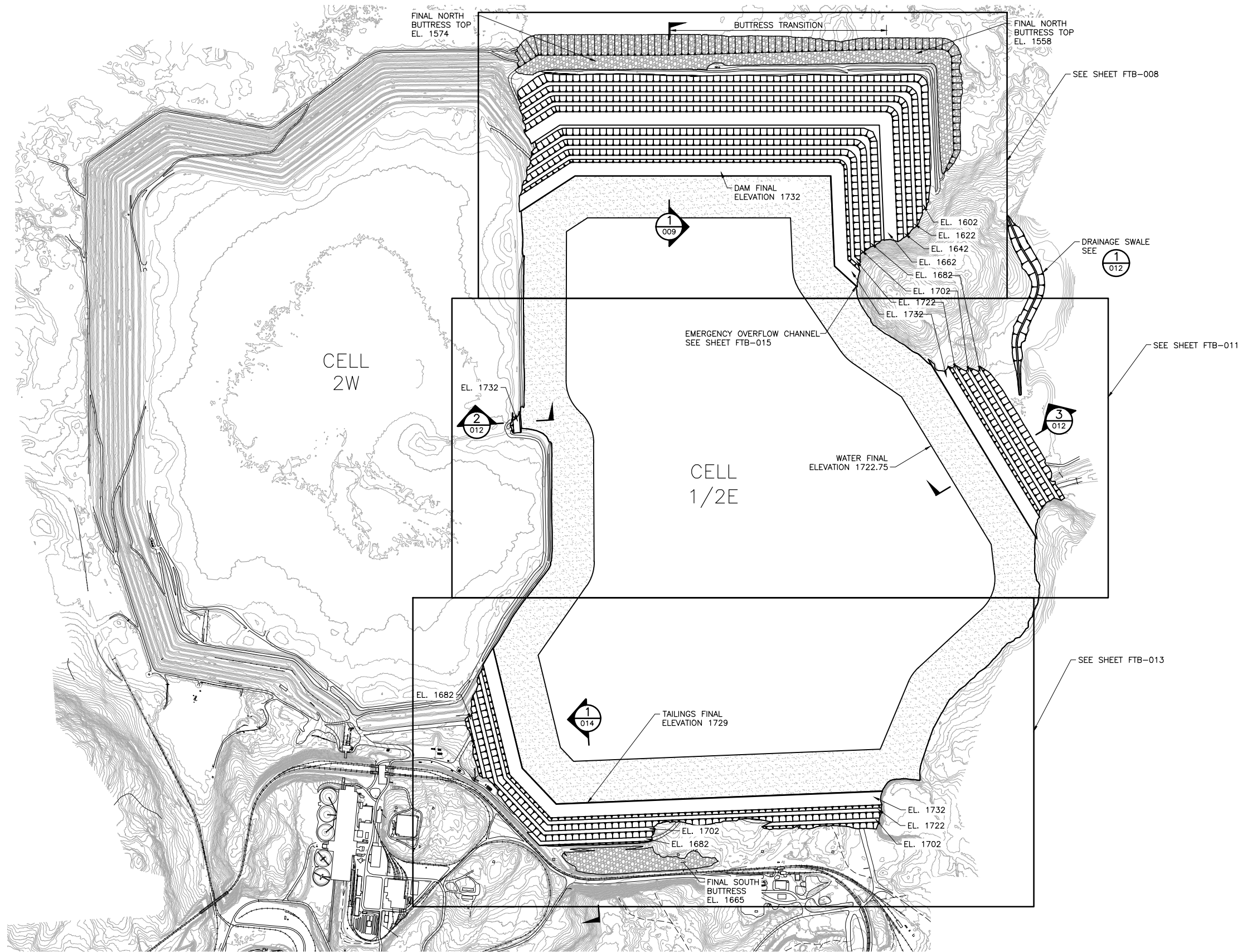
PRINTED NAME THOMAS J. RADUE  
SIGNATURE Thomas J. Radue  
DATE 5/12/17 LICENSE# 20951

DRAWN: CAD  
CHECKED: TJR  
BARR PROJECT NO.: 23/69-0C29  
SCALE: AS SHOWN

PLANT DRAWING NUMBER:	
FLOTATION TAILINGS BASIN EXISTING CONDITIONS	
	POLY MET MINING, INC. NORTHMET PROJECT HOYT LAKES, MINNESOTA
	BARR ENGINEERING CO. 4300 MARKETPOINTE DRIVE SUITE 200 MINNEAPOLIS, MN. Ph: 1-800-632-2277
DWG. NO. FTB-003	REV A

CADD USER: Cristian A. Diaz FILE: K:\DESIGN\23690229.10\PERMIT\_NMT-02-CS-004.DWG PLOT SCALE: 1:2 PLOT DATE: 5/12/2017 8:45 AM

INCHES  
1  
2





1 PLAN: FLOTATION TAILINGS BASIN LAYOUT MINE YEAR 20

VER NO	DATE	DESCRIPTION	ISSUE STATUS		
1	10/14/11	FLOTATION TAILINGS MANAGEMENT PLAN – VERSION 1 – ATTACHMENT A	FOR PERMITTING	7	5/12/17
2	12/07/12	FLOTATION TAILINGS MANAGEMENT PLAN – VERSION 2 – ATTACHMENT A			
3	04/12/13	FLOTATION TAILINGS MANAGEMENT PLAN – VERSION 3 – ATTACHMENT A			
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5	03/03/15	FLOTATION TAILINGS MANAGEMENT PLAN – VERSION 5 – ATTACHMENT A	FOR CONSTRUCTION	–	–
6	05/20/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS			
7	05/12/17	PERMIT APPLICATION UPDATES			
			NOT APPROVED FOR CONSTRUCTION		

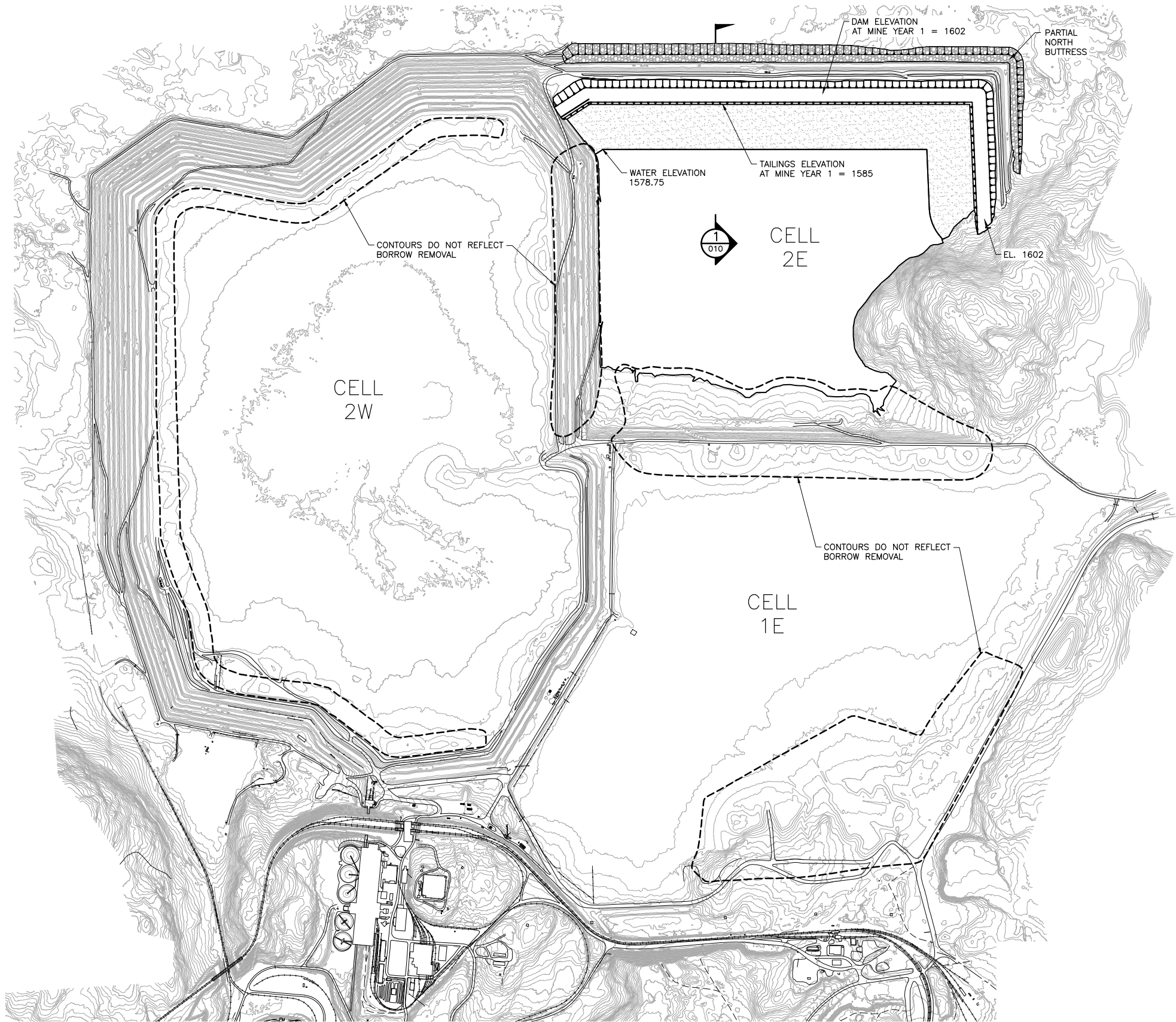
I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINTED NAME THOMAS J. RADUE  
SIGNATURE *Thomas J. Radue*  
DATE 5/12/17 LICENSE# 20951

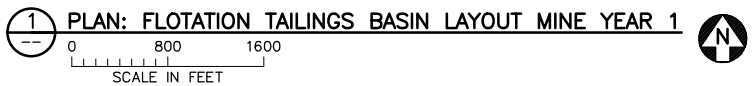
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CHECKED: TJR  
BARR PROJECT NO.: 23/69-0C29  
SCALE: AS SHOWN

PLANT DRAWING NUMBER:	
FLOTATION TAILINGS BASIN LAYOUT MINE YEAR 20	
 <b>POLYMET</b> MINING	<b>POLY MET MINING, INC.</b> NORTHMET PROJECT HOYT LAKES, MINNESOTA
 <b>BARR</b>	BARR ENGINEERING CO. 4300 MARKETPOINTE DRIVE SUITE 200 MINNEAPOLIS, MN. Ph: 1-800-632-2277
DWG. NO. <b>FTB-004</b>	REV <b>A</b>

CADD USER: Cristian A. Diaz FILE: K:\DESIGN\23690029.10\PERMIT\_NMT-02-CS-005.DWG PLOT SCALE: 1:2 PLOT DATE: 5/12/2017 8:50 AM



- NOTES:**
1. SEE SHEET FTB-015 FOR OPERATIONS-PHASE EMERGENCY OVERFLOW CHANNEL.
  2. CONSTRUCT NORTH BUTTRESS FOLLOWING THE SCHEDULE AND ELEVATIONS SPECIFIED IN THE FLOTATION TAILINGS MANAGEMENT PLAN.





VER NO	DATE	DESCRIPTION	ISSUE STATUS		
1	10/14/11	FLOTATION TAILINGS MANAGEMENT PLAN – VERSION 1 – ATTACHMENT A	FOR PERMITTING	7	5/12/17
2	12/07/12	FLOTATION TAILINGS MANAGEMENT PLAN – VERSION 2 – ATTACHMENT A			
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SIGNATURE *Thomas J. Radue*  
DATE 5/12/17 LICENSE# 20951

DRAWN: CAD  
CHECKED: TJR  
BARR PROJECT NO.: 23/69-0C29  
SCALE: AS SHOWN

PLANT DRAWING NUMBER:	
FLOTATION TAILINGS BASIN LAYOUT MINE YEAR 1	
 <b>POLYMET</b> MINING	<b>POLY MET MINING, INC.</b> NORTHMET PROJECT HOYT LAKES, MINNESOTA
 <b>BARR</b>	BARR ENGINEERING CO. 4300 MARKETPOINTE DRIVE SUITE 200 MINNEAPOLIS, MN. Ph: 1-800-632-2277
DWG. NO. FTB-005	REV A

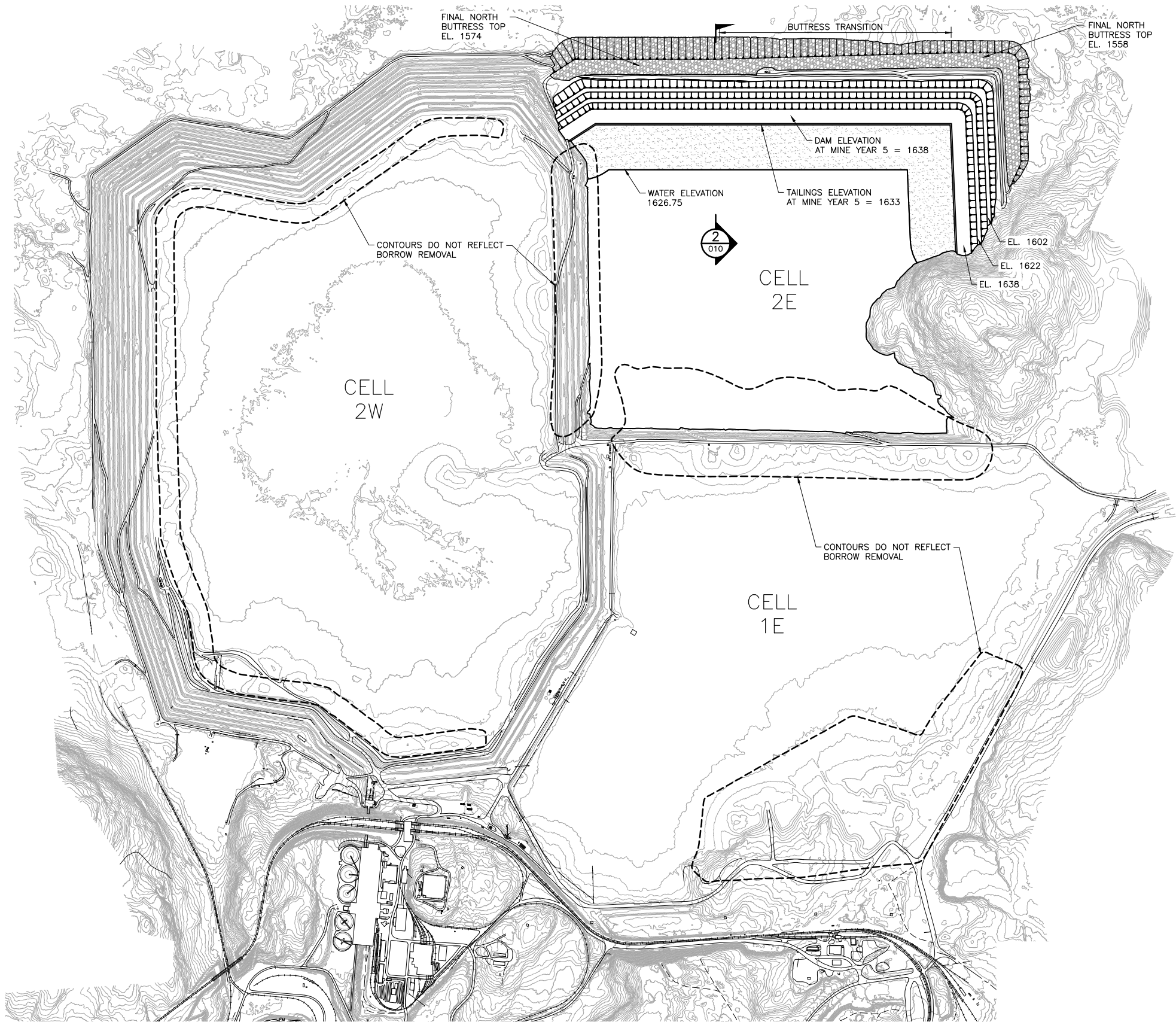


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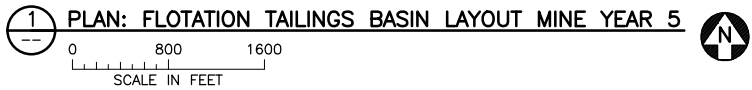
2

1

INCHES



**NOTES:**  
1. SEE SHEET FTB-015 FOR OPERATIONS-PHASE EMERGENCY OVERFLOW CHANNEL.



VER NO	DATE	DESCRIPTION	ISSUE STATUS		
			ISSUED	VERSION	DATE
1	10/14/11	FLOTATION TAILINGS MANAGEMENT PLAN - VERSION 1 - ATTACHMENT A			
2	12/07/12	FLOTATION TAILINGS MANAGEMENT PLAN - VERSION 2 - ATTACHMENT A			
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5	03/03/15	FLOTATION TAILINGS MANAGEMENT PLAN - VERSION 5 - ATTACHMENT A			
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PRINTED NAME THOMAS J. RADUE  
SIGNATURE *Thomas J. Radue*  
DATE 5/12/17 LICENSE# 20951


DRAWN: CAD  
CHECKED: TJR  
BARR PROJECT NO.: 23/69-0C29  
SCALE: AS SHOWN

PLANT DRAWING NUMBER:

FLOTATION TAILINGS BASIN  
LAYOUT MINE YEAR 5



POLY MET MINING, INC.  
NORTHMET PROJECT  
HOYT LAKES, MINNESOTA



BARR ENGINEERING CO.  
4300 MARKETPOINTE DRIVE  
SUITE 200  
MINNEAPOLIS, MN.  
Ph: 1-800-632-2277

DWG. NO. FTB-006

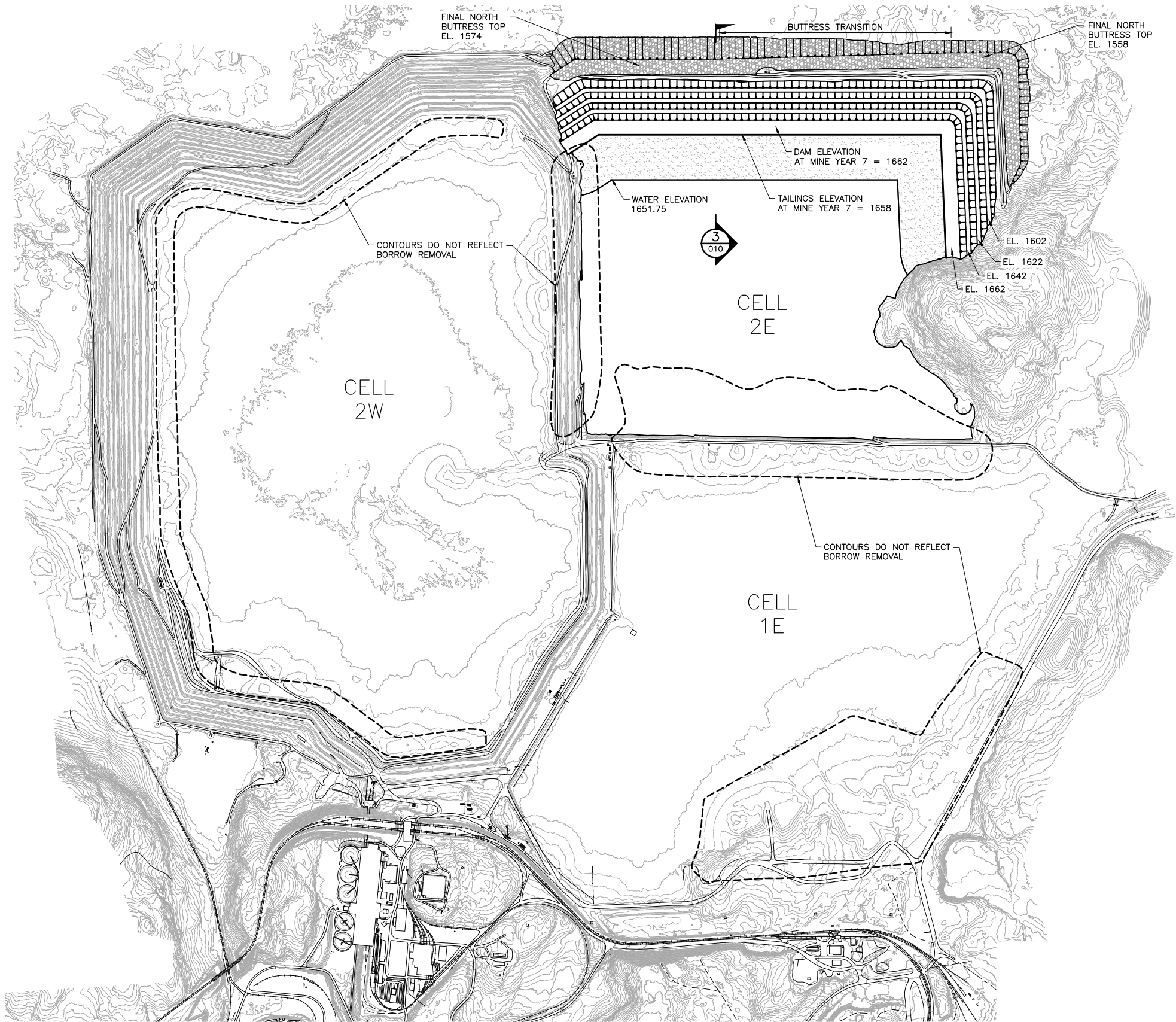
REV A

CADD USER: Cristian A. Diaz FILE: K:\DESIGN\23690029.10\PERMIT\_MNT-02-CS-007.DWG PLOT SCALE: 1:2 PLOT DATE: 5/12/2017 8:59 AM

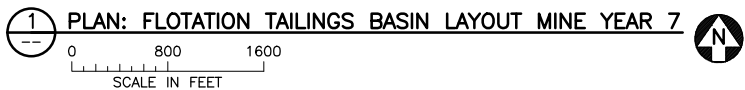
2

1

INCHES



- NOTES:**
- 1. LAST YEAR BEFORE COMBINING CELLS 2E AND 1E FOR TAILINGS.
  - 2. SEE SHEET FTB-015 FOR OPERATIONS-PHASE EMERGENCY OVERFLOW CHANNEL.





VER NO	DATE	DESCRIPTION	ISSUE STATUS		
1	10/14/11	FLOTATION TAILINGS MANAGEMENT PLAN – VERSION 1 – ATTACHMENT A	FOR PERMITTING	7	5/12/17
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3	04/12/13	FLOTATION TAILINGS MANAGEMENT PLAN – VERSION 3 – ATTACHMENT A			
4	11/25/14	FLOTATION TAILINGS MANAGEMENT PLAN – VERSION 4 – ATTACHMENT A			
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DATE 5/12/17 LICENSE# 20951

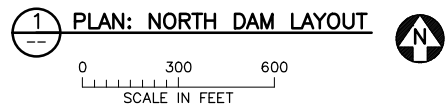
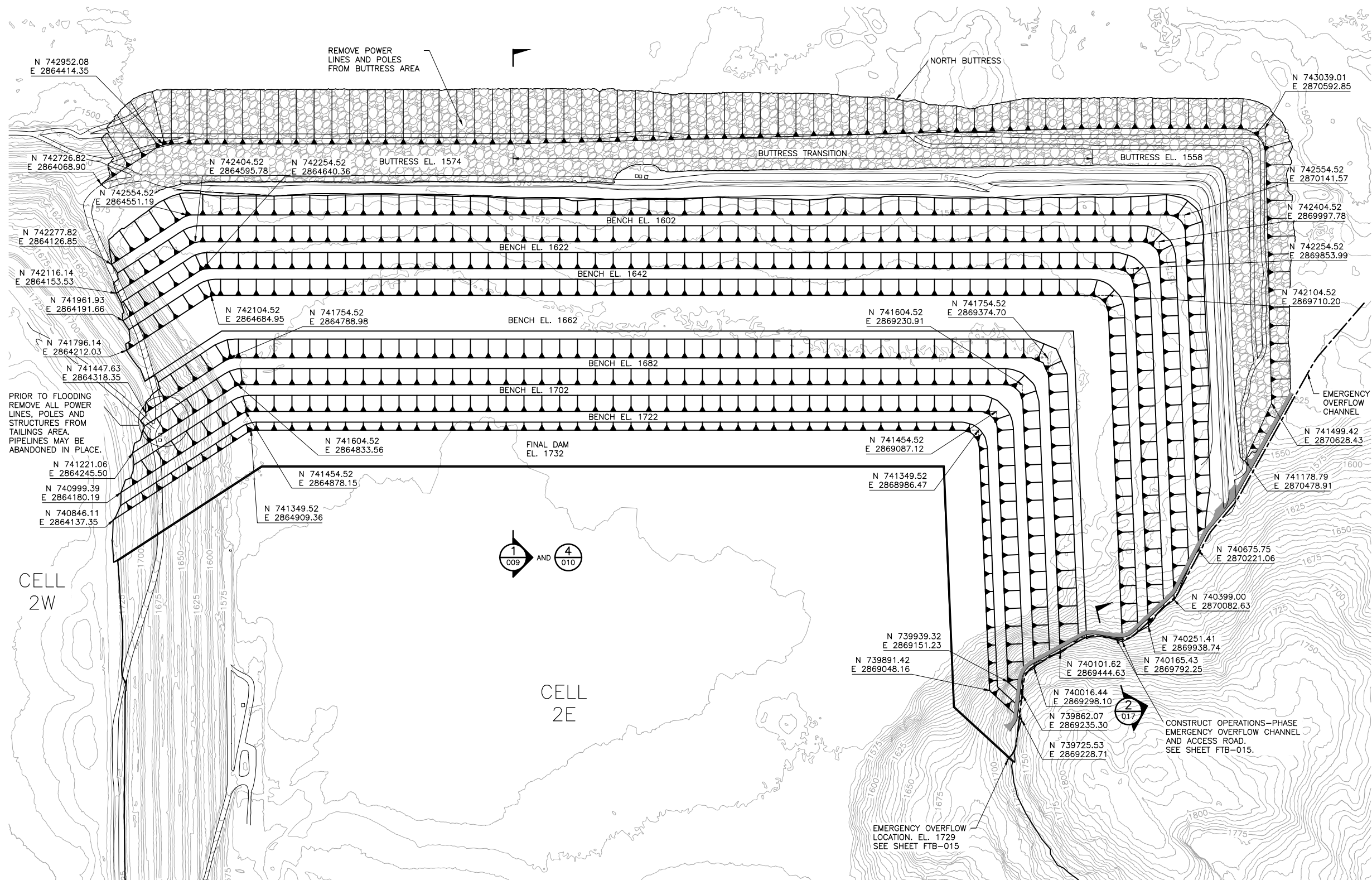
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CHECKED: TJR  
BARR PROJECT NO.: 23/69-0C29  
SCALE: AS SHOWN

PLANT DRAWING NUMBER:	
FLOTATION TAILINGS BASIN LAYOUT MINE YEAR 7	
 <b>POLYMET</b> MINING	POLY MET MINING, INC. NORTHMET PROJECT HOYT LAKES, MINNESOTA
 <b>BARR</b>	BARR ENGINEERING CO. 4300 MARKETPOINTE DRIVE SUITE 200 MINNEAPOLIS, MN. Ph: 1-800-632-2277
DWG. NO. <b>FTB-007</b>	REV <b>A</b>





CADD USER: Cristian A. Diaz FILE: K:\DESIGN\2369029.10\PERMIT\_MNT-02-CS-008.DWG PLOT SCALE: 1:2 PLOT DATE: 5/12/2017 9:03 AM

2  
1  
INCHES



**NOTES:**

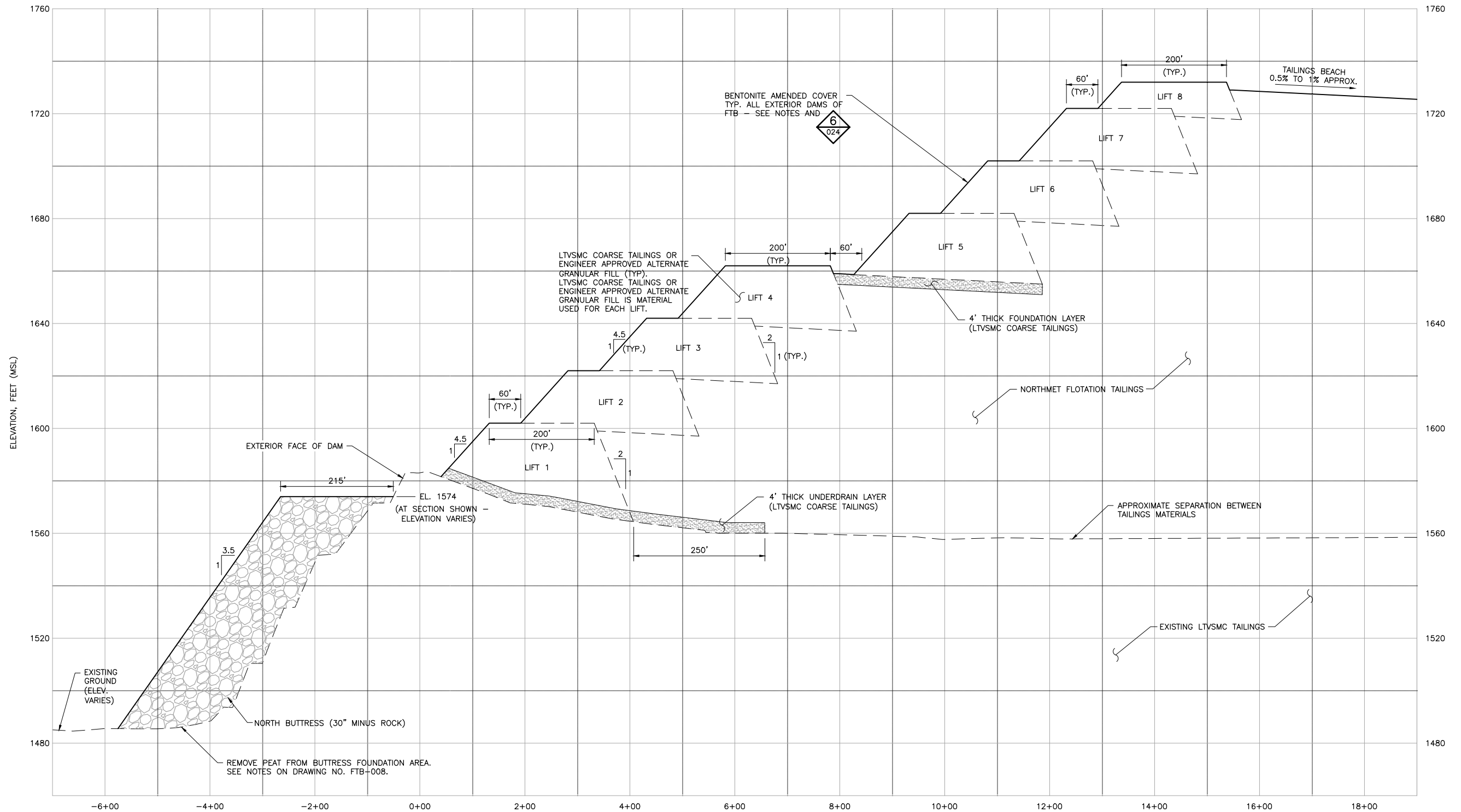
- DAM ACCESS ROAD LOCATION IS APPROXIMATE. FIELD LOCATE TO PROVIDE PREFERRED SLOPE AND DRAINAGE.
- EXTEND ACCESS ROAD TO AREA 5 STOCKPILES AND TO PLANT (NOT SHOWN).
- PEAT TO BE REMOVED FROM BUTTRESS FOUNDATION AREA UNDER THE DIRECTION OF A GEOTECHNICAL ENGINEER.

PLANT DRAWING NUMBER:	
FLOTATION TAILINGS BASIN NORTH DAM MINE YEAR 20 LAYOUT	
 POLYMET MINING POLY MET MINING, INC. NORTHMET PROJECT HOYT LAKES, MINNESOTA	
 BARR ENGINEERING CO. 4300 MARKETPOINTE DRIVE SUITE 200 MINNEAPOLIS, MN. Ph: 1-800-632-2277	
DRAWN: CAD	REV A
CHECKED: TJR	
BARR PROJECT NO.: 23/69-0C29	
SCALE: AS SHOWN	
DWG. NO. FTB-008	

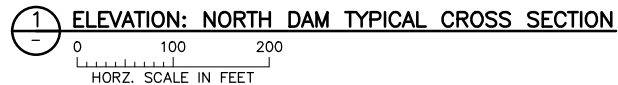
VER NO	DATE	DESCRIPTION	ISSUE STATUS		
			ISSUED	VERSION	DATE
1	10/14/11	FLOTATION TAILINGS MANAGEMENT PLAN - VERSION 1 - ATTACHMENT A			
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PRINTED NAME THOMAS J. RADUE  
SIGNATURE *Thomas J. Radue*  
DATE 5/12/17 LICENSE# 20951



**NOTES:**  
1. DAMS AND BUTTRESS DIMENSIONS MAY CHANGE WITH EVALUATION OF FUTURE DAM STABILITY PERFORMANCE DATA.



VER NO	DATE	DESCRIPTION	ISSUE STATUS		
1	10/14/11	FLOTATION TAILINGS MANAGEMENT PLAN – VERSION 1 – ATTACHMENT A	ISSUED	VERSION	DATE
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3	04/12/13	FLOTATION TAILINGS MANAGEMENT PLAN – VERSION 3 – ATTACHMENT A			
4	11/25/14	FLOTATION TAILINGS MANAGEMENT PLAN – VERSION 4 – ATTACHMENT A			
5	03/03/15	FLOTATION TAILINGS MANAGEMENT PLAN – VERSION 5 – ATTACHMENT A	FOR CONSTRUCTION	–	–
6	05/20/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS			
7	05/12/17	PERMIT APPLICATION UPDATES			
			NOT APPROVED FOR CONSTRUCTION		


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PRINTED NAME **THOMAS J. RADUE**  
SIGNATURE *Thomas J. Radue*  
DATE **5/12/17** LICENSE# **20951**

DRAWN: CAD  
CHECKED: TJR  
BARR PROJECT NO.: 23/69-0C29  
SCALE: AS SHOWN

PLANT DRAWING NUMBER:

FLOTATION TAILINGS BASIN  
NORTH DAM  
TYPICAL CROSS SECTION

**POLYMET MINING, INC.**  
NORTHMET PROJECT  
HOYT LAKES, MINNESOTA

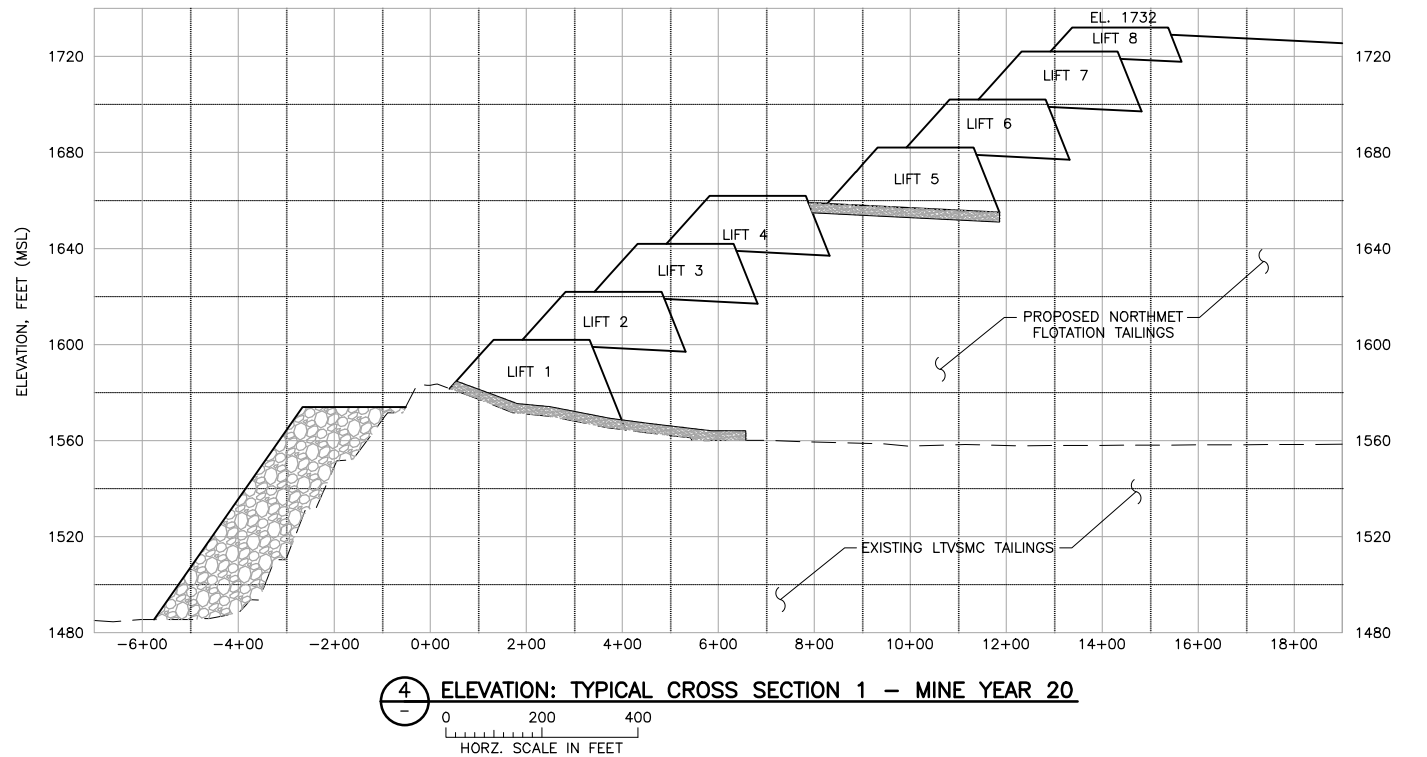
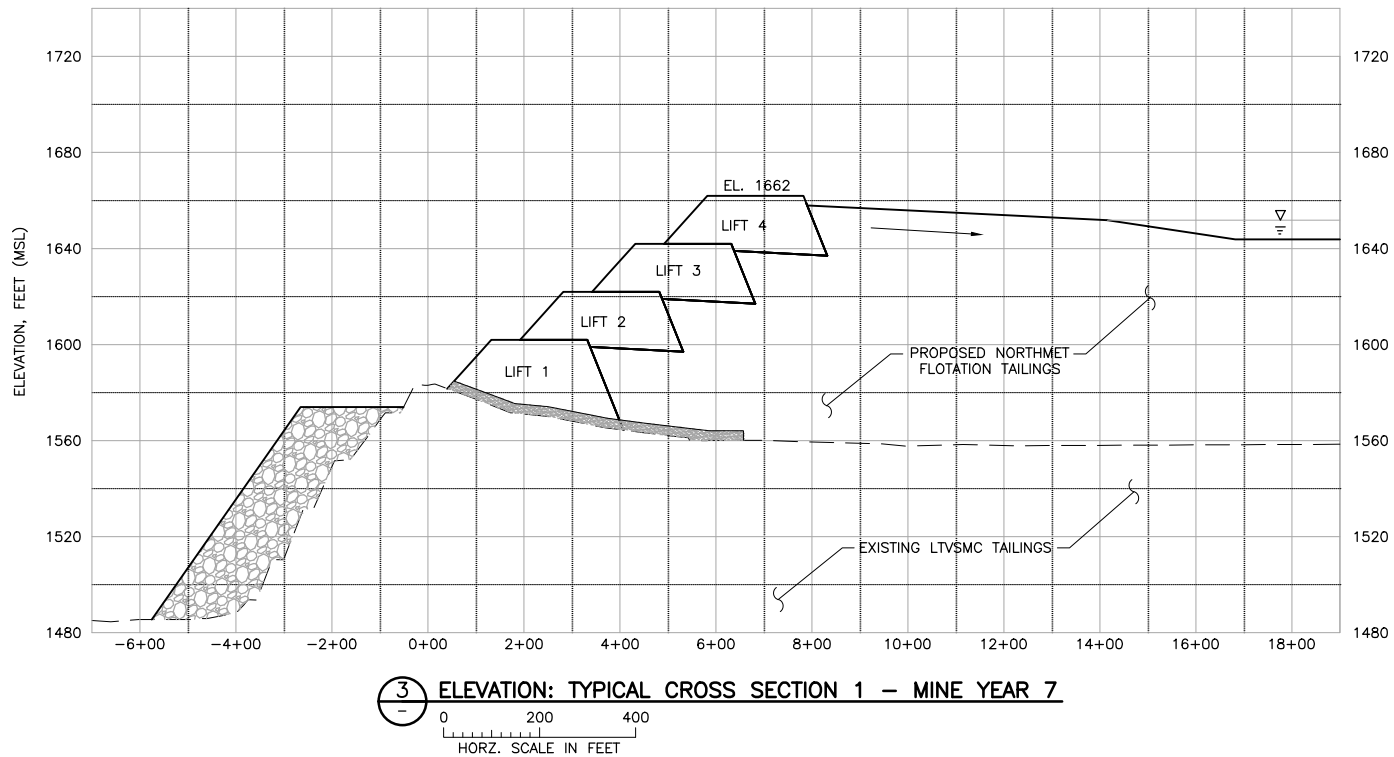
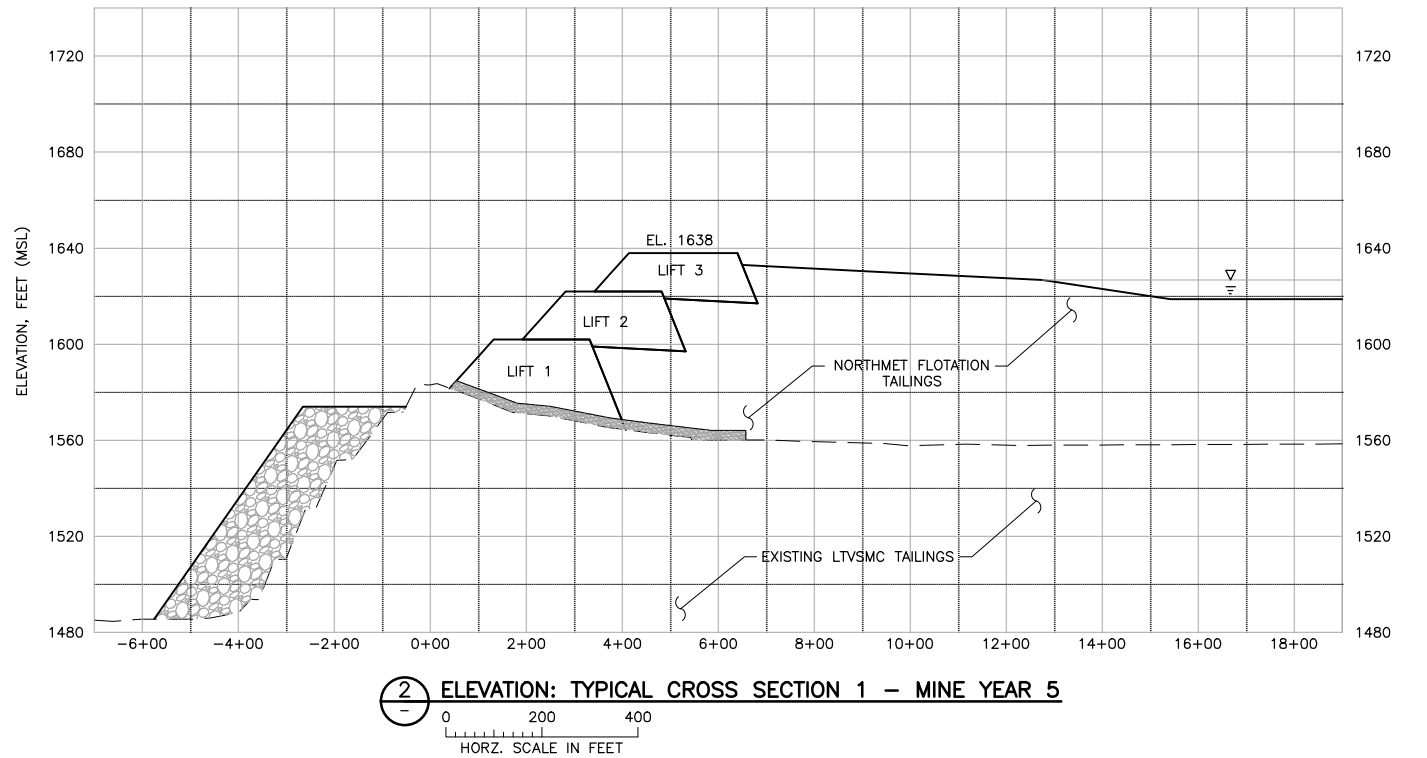
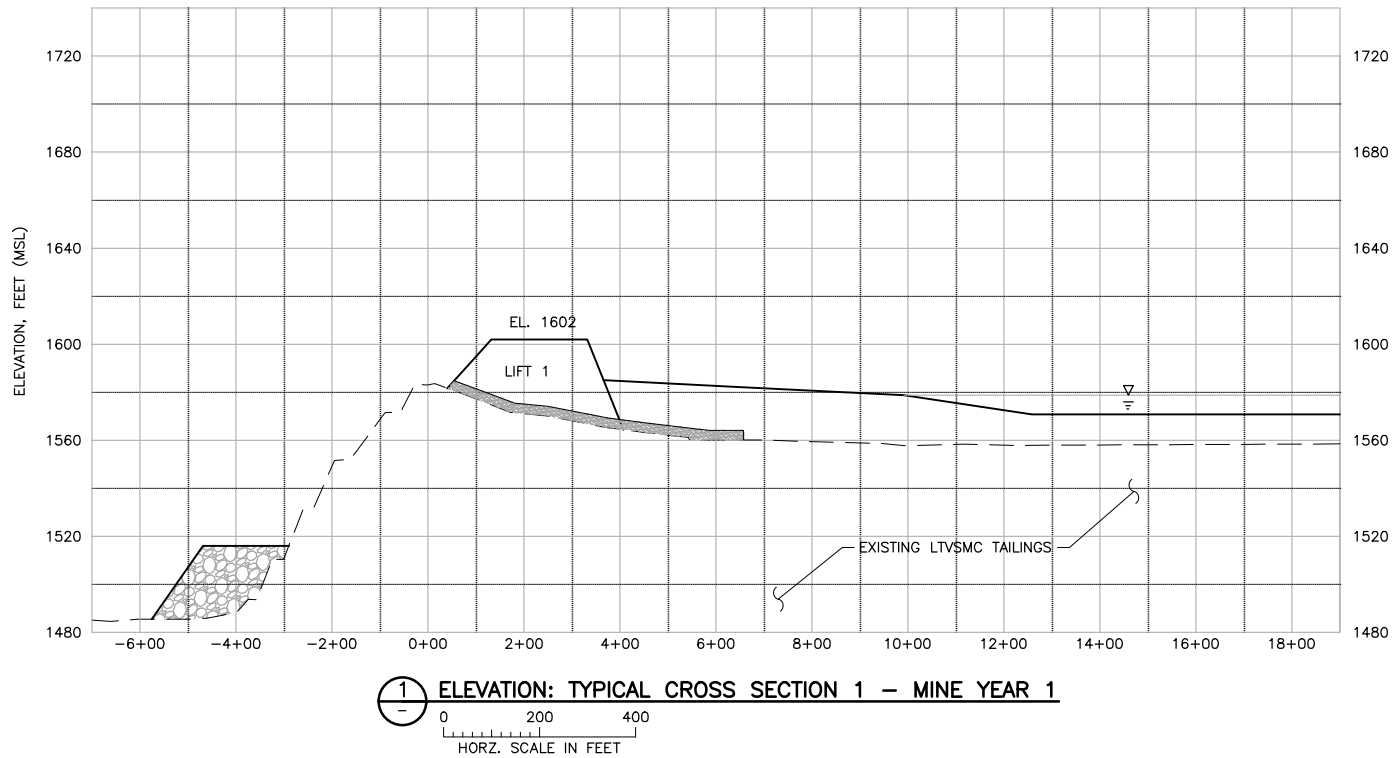
**BARR** ENGINEERING CO.  
4300 MARKETPOINTE DRIVE  
SUITE 200  
MINNEAPOLIS, MN.  
Ph: 1-800-632-2277

DWG. NO. **FTB-009**

REV **A**

CADD USER: Cristian A. Diaz FILE: K:\DESIGN\2369028\10\PERMIT\_NMT-02-CS-010.DWG PLOT SCALE: 1:2 PLOT DATE: 5/12/2017 9:09 AM

2  
1  
INCHES



**NOTE:**



1. DAM AND BUTTRESS DIMENSIONS MAY CHANGE WITH EVALUATION OF FUTURE DAM STABILITY PERFORMANCE DATA.
2. PLACE BENTONITE AMENDED SOIL COVER ON OUTSIDE FACE OF NEW DAMS.
3. CONSTRUCT NORTH BUTTRESS FOLLOWING THE SCHEDULE AND ELEVATIONS TO BE SPECIFIED AT TIME OF CONSTRUCTION.

VER NO	DATE	DESCRIPTION	ISSUE STATUS		
1	10/14/11	FLOTATION TAILINGS MANAGEMENT PLAN – VERSION 1 – ATTACHMENT A	ISSUED	VERSION	DATE
2	12/07/12	FLOTATION TAILINGS MANAGEMENT PLAN – VERSION 2 – ATTACHMENT A	FOR PERMITTING	7	5/12/17
3	04/12/13	FLOTATION TAILINGS MANAGEMENT PLAN – VERSION 3 – ATTACHMENT A			
4	11/25/14	FLOTATION TAILINGS MANAGEMENT PLAN – VERSION 4 – ATTACHMENT A			
5	03/03/15	FLOTATION TAILINGS MANAGEMENT PLAN – VERSION 5 – ATTACHMENT A			
6	05/20/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS	FOR CONSTRUCTION	–	–
7	05/12/17	PERMIT APPLICATION UPDATES			
			NOT APPROVED FOR CONSTRUCTION		

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PRINTED NAME THOMAS J. RADUE  
SIGNATURE Thomas J. Radue  
DATE 5/12/17 LICENSE# 20951

DRAWN: CAD  
CHECKED: TJR  
BARR PROJECT NO.: 23/69-0C29  
SCALE: AS SHOWN

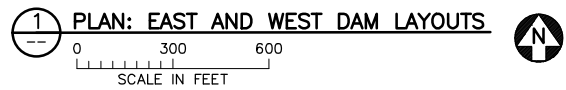
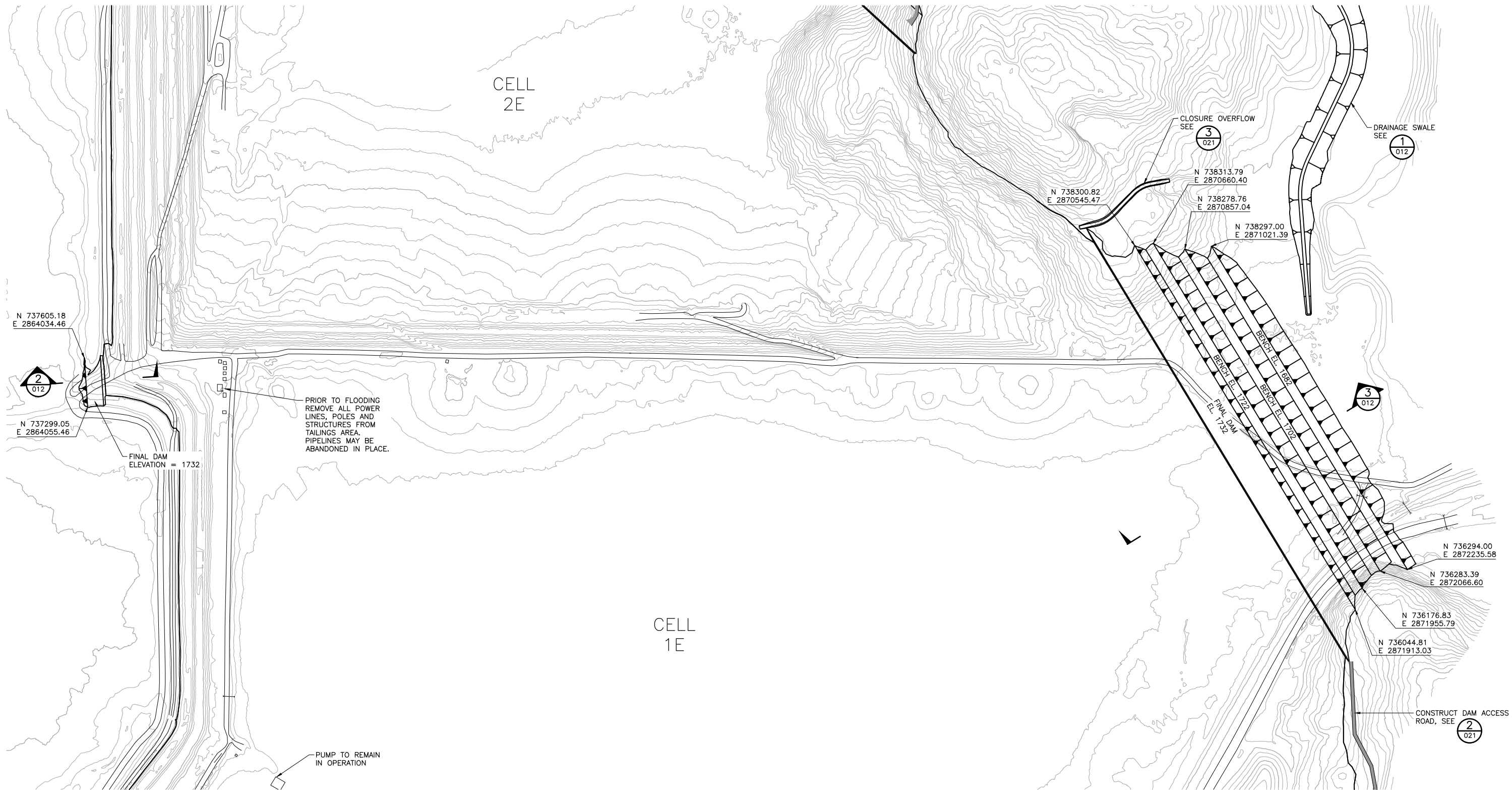
PLANT DRAWING NUMBER:	
FLOTATION TAILINGS BASIN NORTH DAM STAGED CONSTRUCTION	
 POLY MET MINING, INC. NORTHMET PROJECT HOYT LAKES, MINNESOTA	
 BARR ENGINEERING CO. 4300 MARKETPOINTE DRIVE SUITE 200 MINNEAPOLIS, MN. Ph: 1-800-632-2277	
DWG. NO. FTB-010	REV A

CADD USER: Cristian A. Diaz FILE: K:\DESIGN\23690229.10\PERMIT\_NMT-02-CS-011.DWG PLOT SCALE: 1:2 PLOT DATE: 5/12/2017 9:13 AM

2

1

INCHES





VER NO	DATE	DESCRIPTION	ISSUE STATUS		
1	10/14/11	FLOTATION TAILINGS MANAGEMENT PLAN – VERSION 1 – ATTACHMENT A	ISSUED	VERSION	DATE
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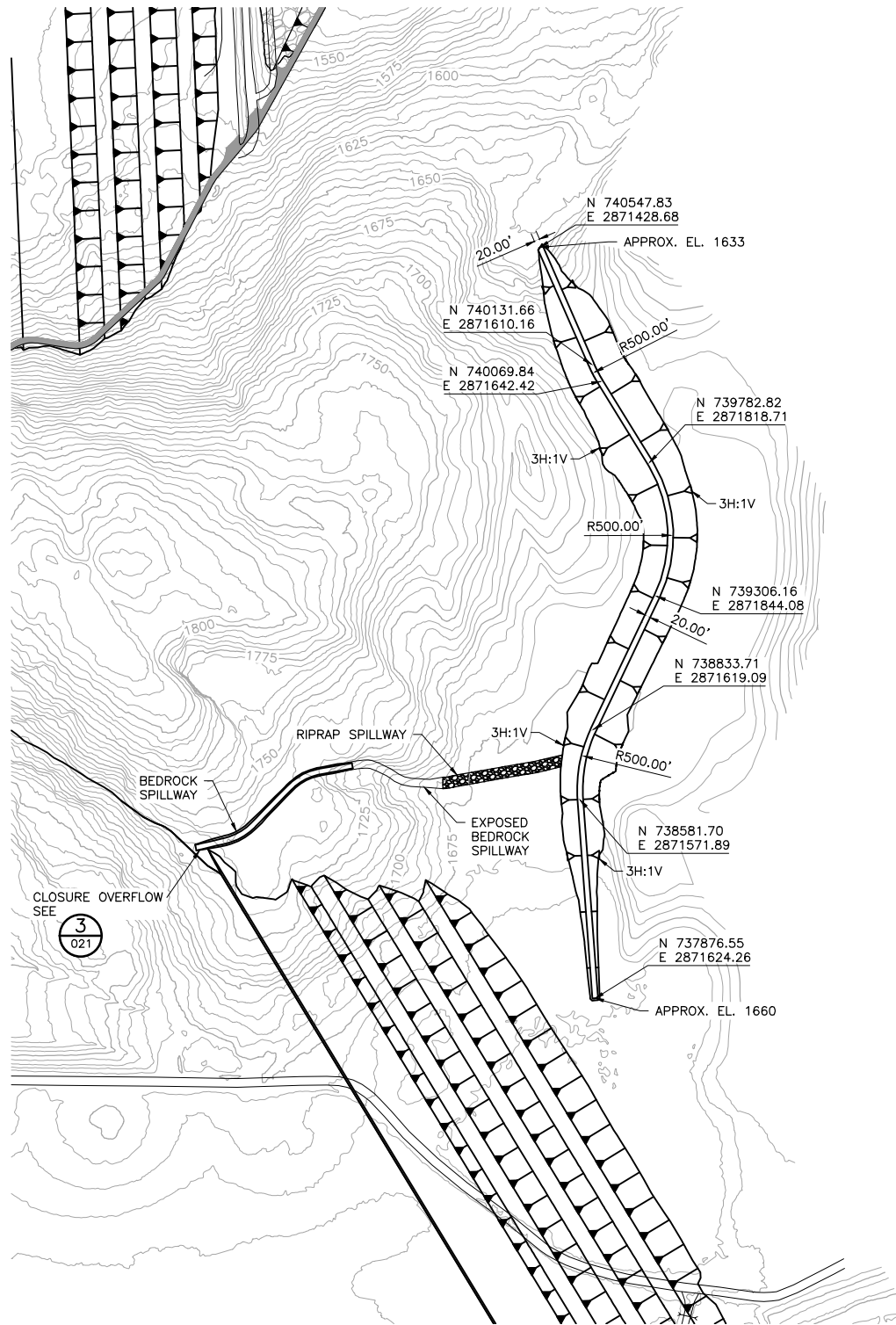
PRINTED NAME THOMAS J. RADUE  
SIGNATURE Thomas J. Radue  
DATE 5/12/17 LICENSE# 20951

DRAWN: CAD  
CHECKED: TJR  
BARR PROJECT NO.: 23/69-0C29  
SCALE: AS SHOWN

PLANT DRAWING NUMBER:	
FLOTATION TAILINGS BASIN EAST AND WEST DAMS MINE YEAR 20 LAYOUT	
 <b>POLYMET</b> MINING	<b>POLY MET MINING, INC.</b> <b>NORTHMET PROJECT</b> <b>HOYT LAKES, MINNESOTA</b>
 <b>BARR</b>	BARR ENGINEERING CO. 4300 MARKETPOINTE DRIVE SUITE 200 MINNEAPOLIS, MN. Ph: 1-800-632-2277
DWG. NO. <b>FTB-011</b>	REV <b>A</b>

CADD USER: Cristian A. Diaz FILE: K:\DESIGN\2369029.10\PERMIT\_NMT-02-CS-012.DWG PLOT SCALE: 1:2 PLOT DATE: 5/12/2017 9:18 AM

2  
1  
INCHES



**1 PLAN: DRAINAGE SWALE LAYOUT**

0 300 600  
SCALE IN FEET

**NOTES:**



1. CLOSURE OVERFLOW IS FOR EMERGENCY OVERFLOW ONLY UNTIL POND WATER QUALITY MEETS DISCHARGE WATER QUALITY REQUIREMENTS.
2. DAM DIMENSIONS MAY CHANGE WITH EVALUATION OF FUTURE DAM STABILITY PERFORMANCE DATA.

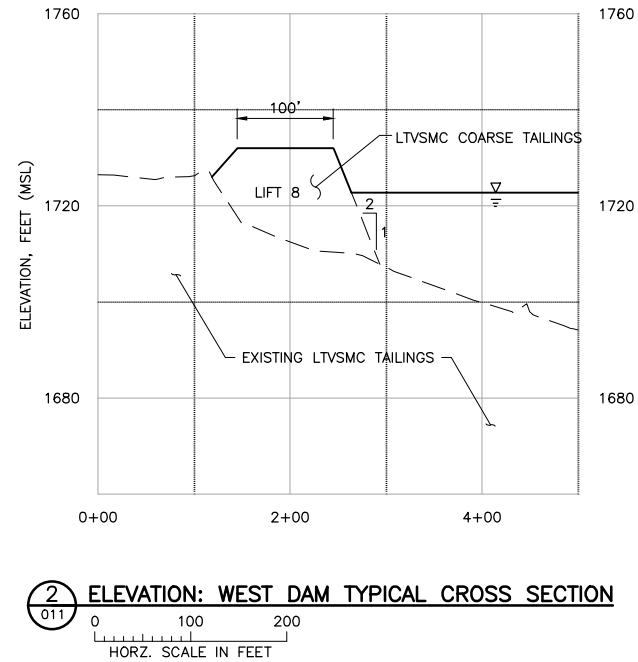
VER NO	DATE	DESCRIPTION	ISSUE STATUS		
1	10/14/11	FLOTATION TAILINGS MANAGEMENT PLAN – VERSION 1 – ATTACHMENT A	FOR PERMITTING	7	5/12/17
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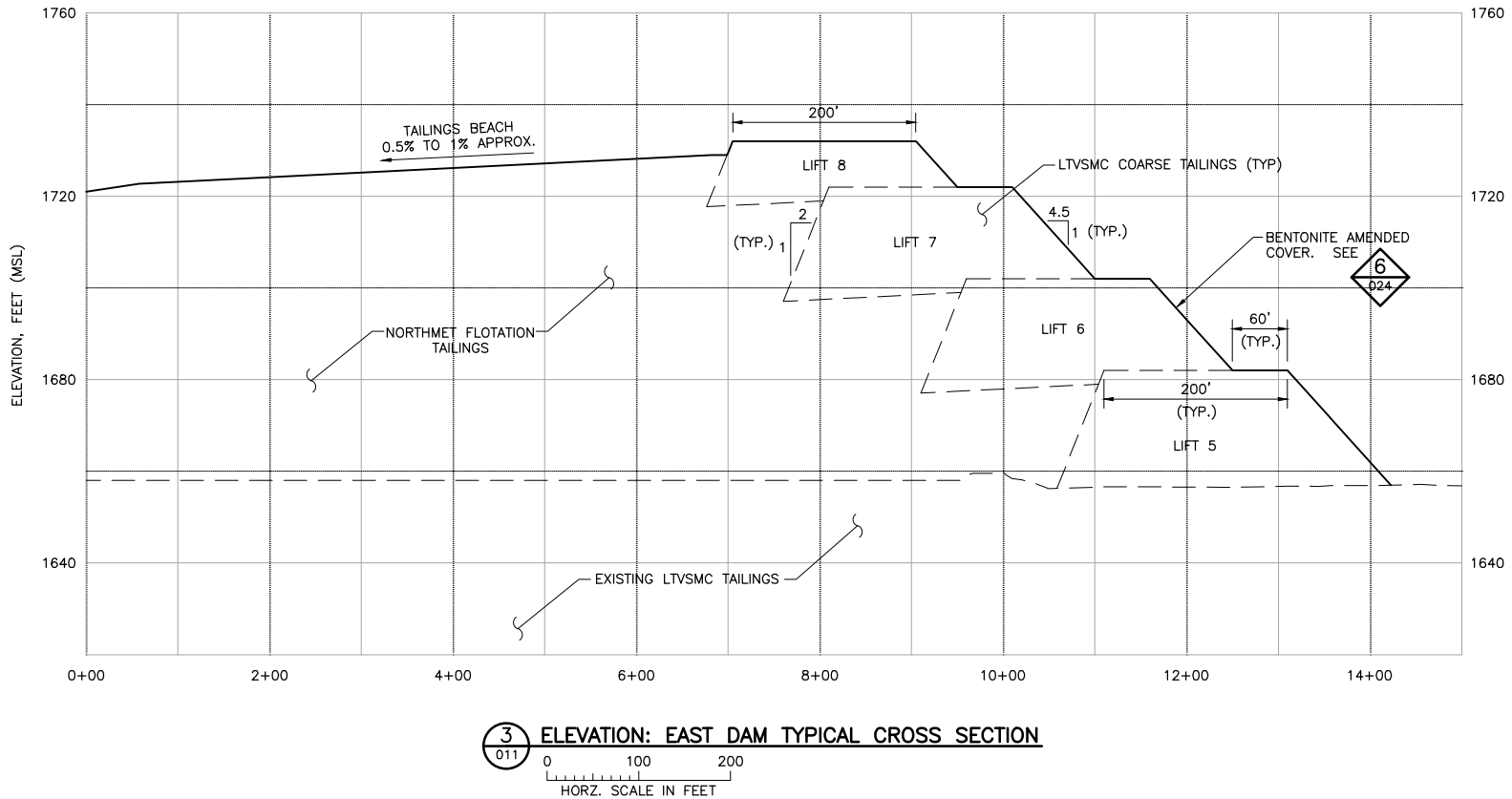
PRINTED NAME THOMAS J. RADUE  
SIGNATURE Thomas J. Radue  
DATE 5/12/17 LICENSE# 20951

DRAWN: CAD  
CHECKED: TJR  
BARR PROJECT NO.: 23/69-0C29  
SCALE: AS SHOWN

PLANT DRAWING NUMBER:	
FLOTATION TAILINGS BASIN EAST AND WEST DAMS TYPICAL CROSS SECTIONS AND DRAINAGE SWALE	
	POLY MET MINING, INC. NORTHMET PROJECT HOYT LAKES, MINNESOTA
	BARR ENGINEERING CO. 4300 MARKETPOINTE DRIVE SUITE 200 MINNEAPOLIS, MN. Ph: 1-800-632-2277
DWG. NO. <b>FTB-012</b>	REV <b>A</b>



**2 ELEVATION: WEST DAM TYPICAL CROSS SECTION**



**3 ELEVATION: EAST DAM TYPICAL CROSS SECTION**

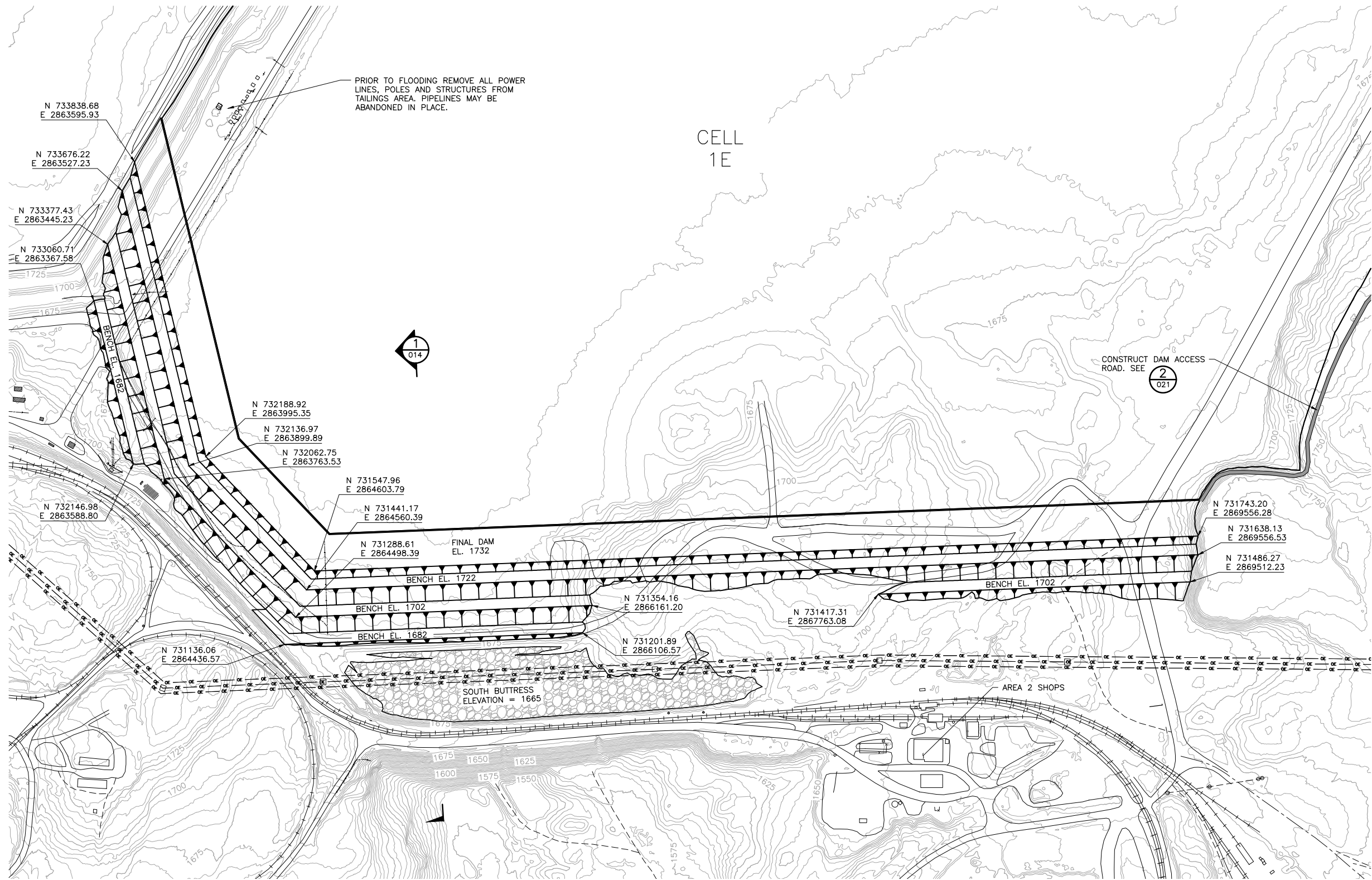


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2

1

INCHES



1 PLAN: SOUTH DAM LAYOUT  
0 300 600  
SCALE IN FEET





VER NO	DATE	DESCRIPTION	ISSUE STATUS		
			ISSUED	VERSION	DATE
1	10/14/11	FLOTATION TAILINGS MANAGEMENT PLAN - VERSION 1 - ATTACHMENT A			
2	12/07/12	FLOTATION TAILINGS MANAGEMENT PLAN - VERSION 2 - ATTACHMENT A			
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4	11/25/14	FLOTATION TAILINGS MANAGEMENT PLAN - VERSION 4 - ATTACHMENT A			
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7	05/12/17	PERMIT APPLICATION UPDATES			
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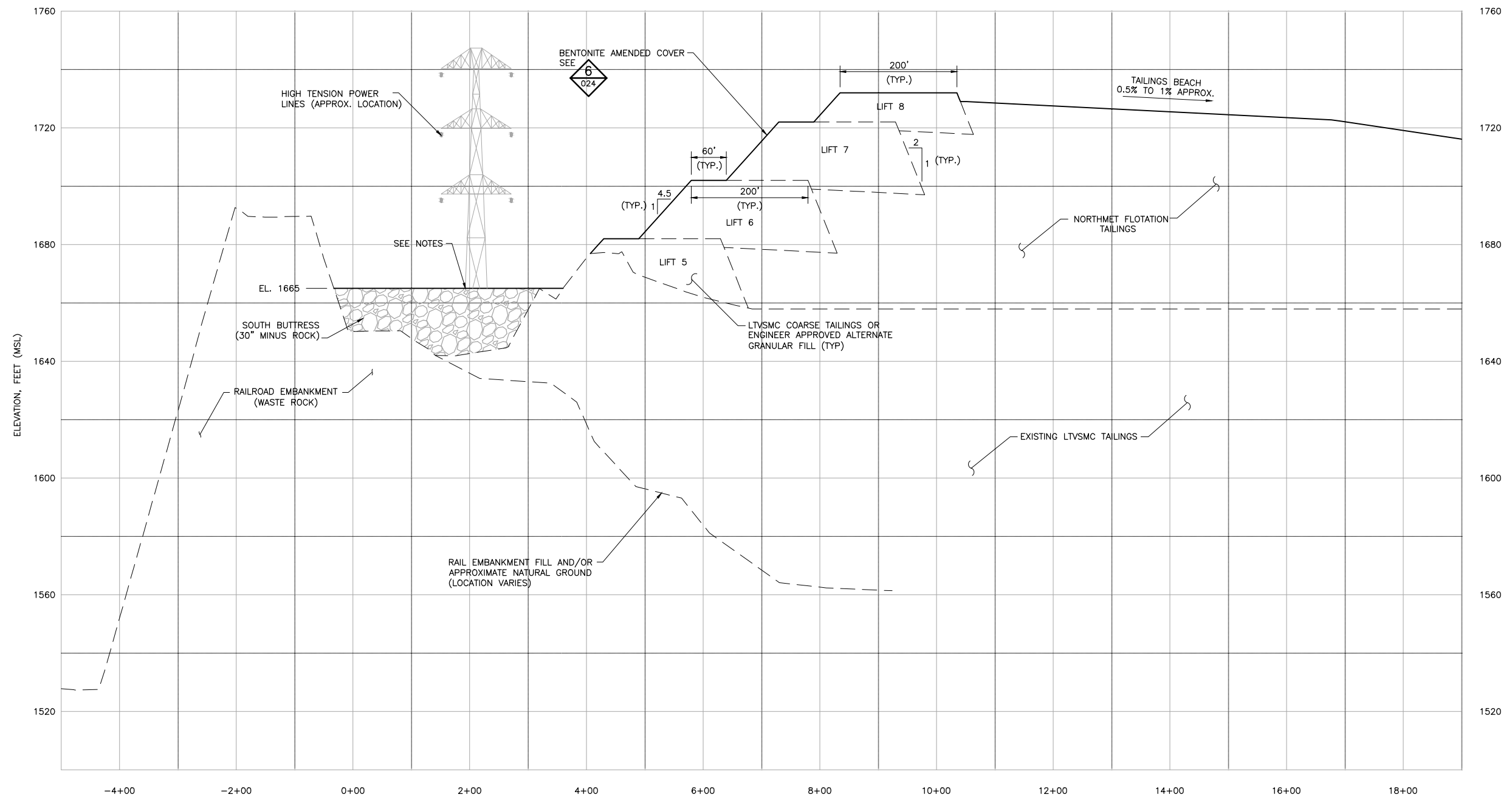
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DATE 5/12/17 LICENSE# 20951

DRAWN: CAD  
CHECKED: TJR  
BARR PROJECT NO.: 23/69-0C29  
SCALE: AS SHOWN

PLANT DRAWING NUMBER:	
FLOTATION TAILINGS BASIN SOUTH DAM YEAR 20 LAYOUT	
	POLY MET MINING, INC. NORTHMET PROJECT HOYT LAKES, MINNESOTA
	BARR ENGINEERING CO. 4300 MARKETPOINTE DRIVE SUITE 200 MINNEAPOLIS, MN. Ph: 1-800-632-2277
DWG. NO. FTB-013	REV A





1 ELEVATION: SOUTH DAM TYPICAL CROSS SECTION

0 100 200  
HORZ. SCALE IN FEET

NOTES:

1. DAM DIMENSIONS MAY CHANGE WITH EVALUATION OF FUTURE PERFORMANCE DATA.
2. HIGH TENSION POWER LINES SHOWN FOR REFERENCE. TOWER FOUNDATIONS ARE LOCATED OUTSIDE OF THE AREA COVERED BY THE BUTTRESS.

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DRAWN: CAD  
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BARR PROJECT NO.: 23/69-0C29  
SCALE: AS SHOWN

PLANT DRAWING NUMBER:

FLOTATION TAILINGS BASIN  
SOUTH DAM  
TYPICAL CROSS SECTIONS



POLY MET MINING, INC.  
NORTHMET PROJECT  
HOYT LAKES, MINNESOTA

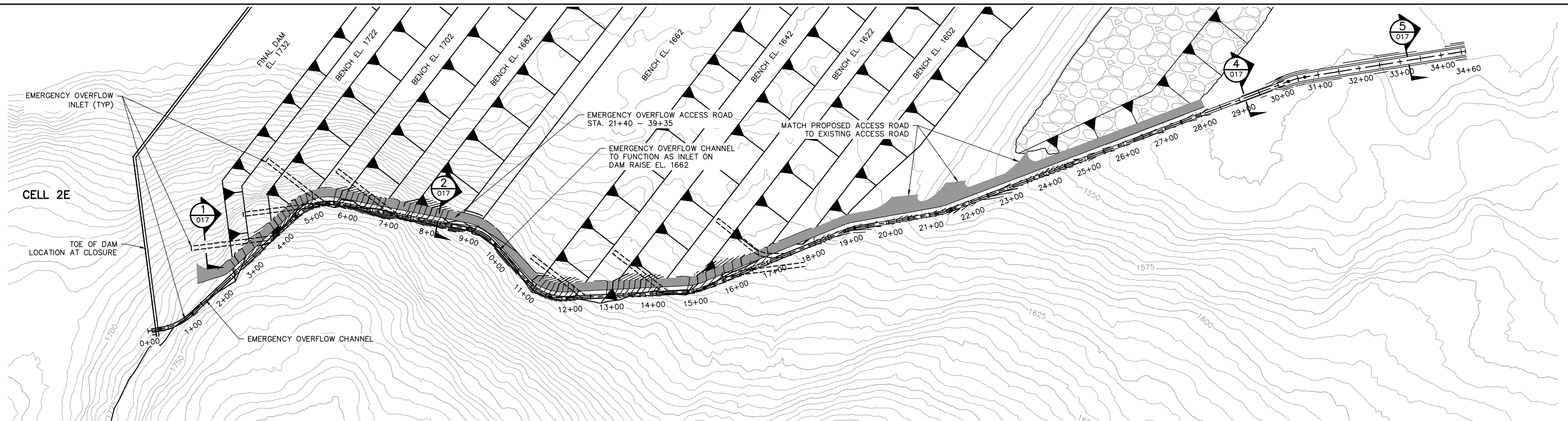


BARR ENGINEERING CO.  
4300 MARKETPOINTE DRIVE  
SUITE 200  
MINNEAPOLIS, MN.  
Ph: 1-800-632-2277

DWG. NO. FTB-014  
REV A

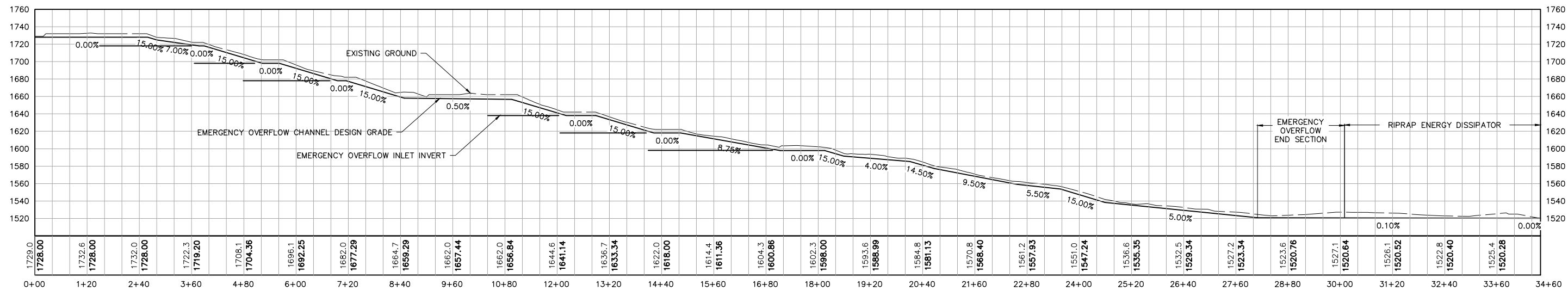
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2  
1  
INCHES



1 PLAN: EMERGENCY OVERFLOW CHANNEL (OPERATIONS-PHASE)

0 120 240  
SCALE IN FEET



2 PROFILE: EMERGENCY OVERFLOW CHANNEL (OPERATIONS-PHASE)

0 120 240  
HORIZONTAL SCALE IN FEET



0 60 120  
VERTICAL SCALE IN FEET

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BARR PROJECT NO.: 23/69-0C29  
SCALE: AS SHOWN

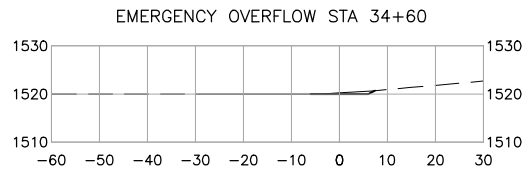
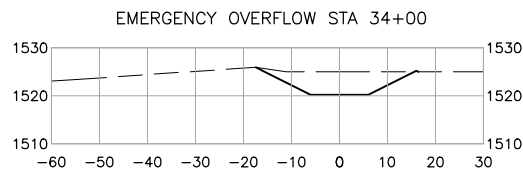
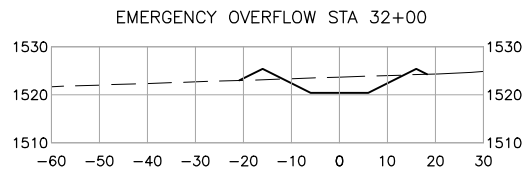
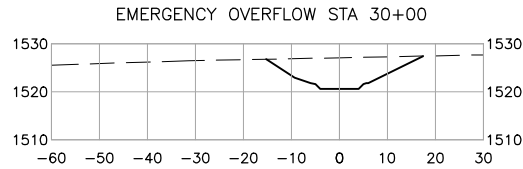
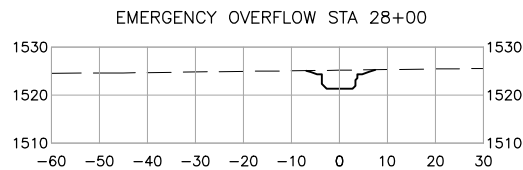
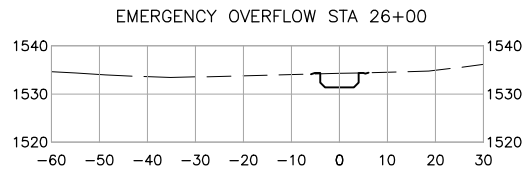
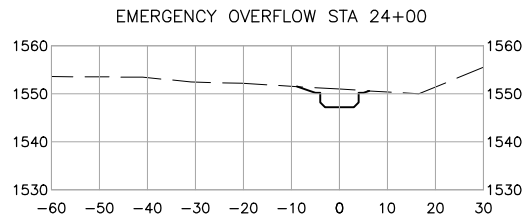
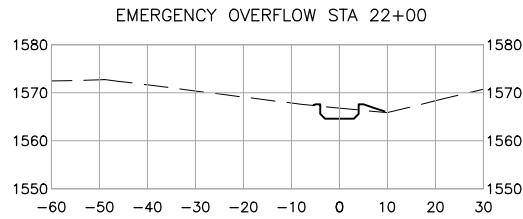
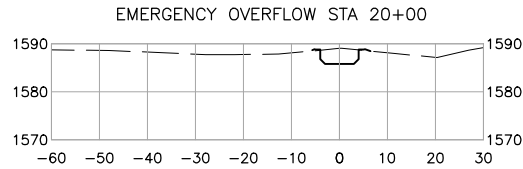
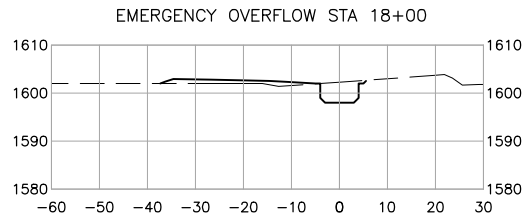
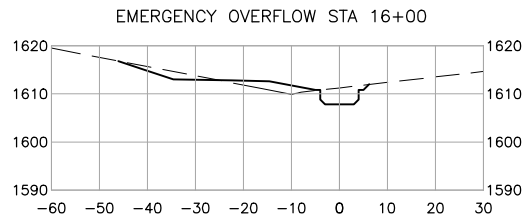
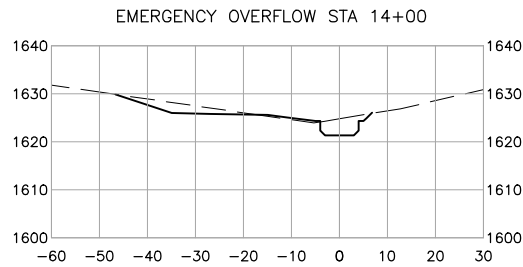
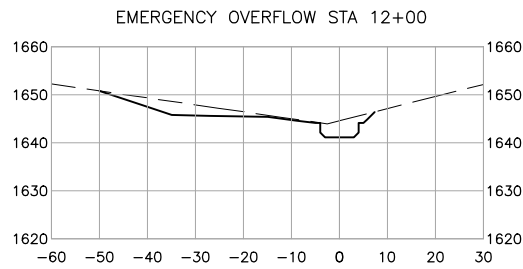
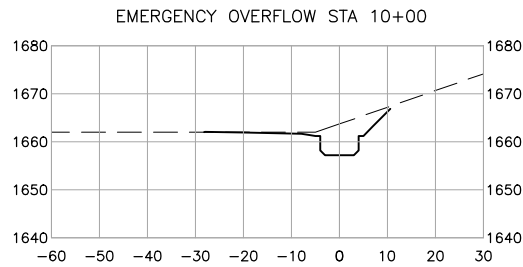
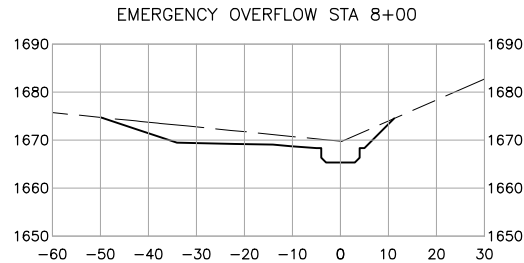
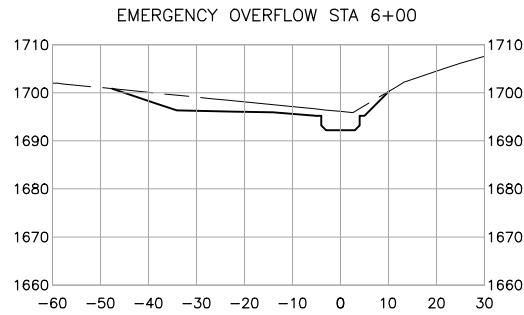
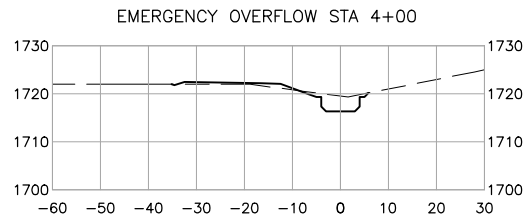
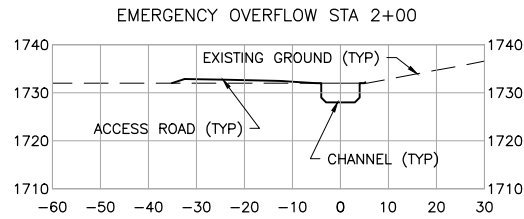
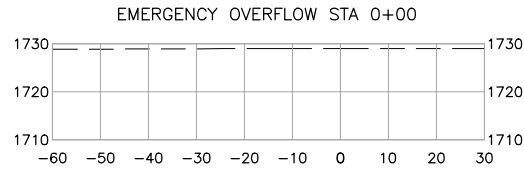
PLANT DRAWING NUMBER:	
FLOTATION TAILINGS BASIN EMERGENCY OVERFLOW CHANNEL LAYOUT	
	POLY MET MINING, INC. NORTHMET PROJECT HOYT LAKES, MINNESOTA
	BARR ENGINEERING CO. 4300 MARKETPOINTE DRIVE SUITE 200 MINNEAPOLIS, MN. Ph: 1-800-632-2277
DWG. NO. FTB-015	REV A

CADD USER: Cristian A. Diaz FILE: K:\DESIGN\23690229.10\PERMIT\_NMT-02-CS-016.DWG PLOT SCALE: 1:2 PLOT DATE: 5/12/2017 9:30 AM

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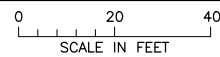
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INCHES



1  
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SECTIONS: EMERGENCY OVERFLOW CHANNEL



VER NO	DATE	DESCRIPTION	ISSUE STATUS		
1	10/14/11	FLOTATION TAILINGS MANAGEMENT PLAN – VERSION 1 – ATTACHMENT A	FOR PERMITTING	7	5/12/17
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PRINTED NAME THOMAS J. RADUE  
SIGNATURE *Thomas J. Radue*  
DATE 5/12/17 LICENSE# 20951

DRAWN: CAD

CHECKED: TJR

BARR PROJECT NO.: 23/69-0C29

SCALE: AS SHOWN

PLANT DRAWING NUMBER:

FLOTATION TAILINGS BASIN  
EMERGENCY OVERFLOW CHANNEL  
SECTIONS



POLY MET MINING, INC.  
NORTHMET PROJECT  
HOYT LAKES, MINNESOTA

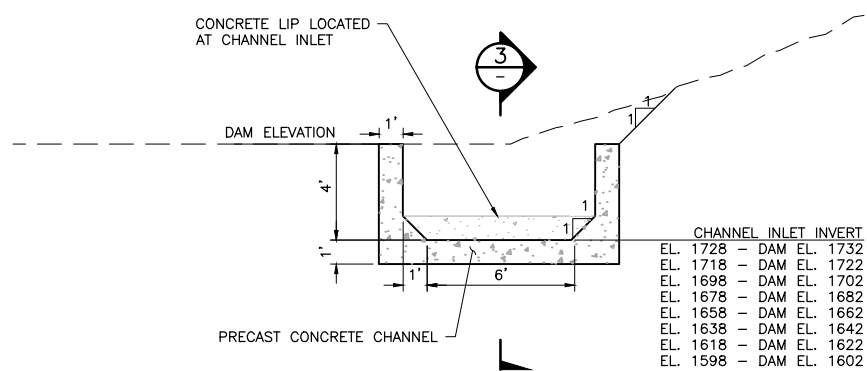


BARR ENGINEERING CO.  
4300 MARKETPOINTE DRIVE  
SUITE 200  
MINNEAPOLIS, MN.  
Ph: 1-800-632-2277

DWG. NO. FTB-016

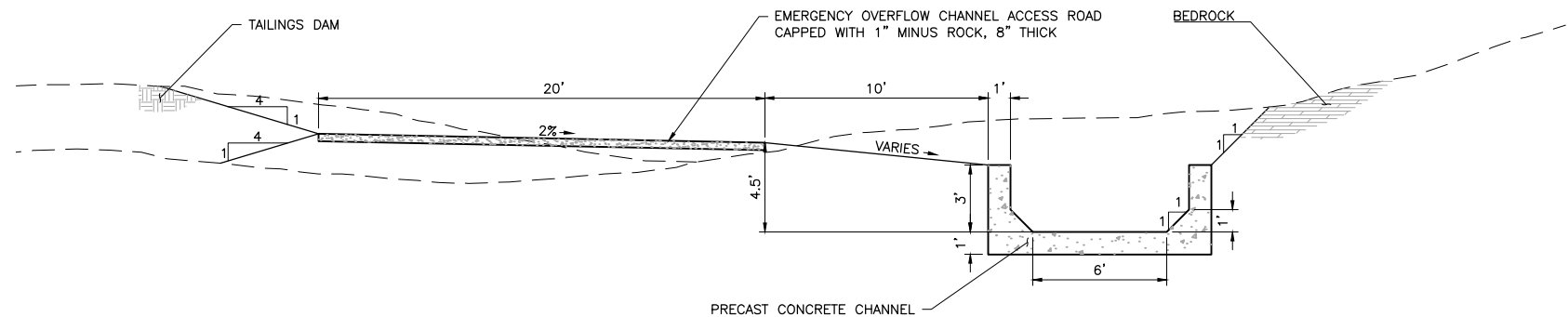
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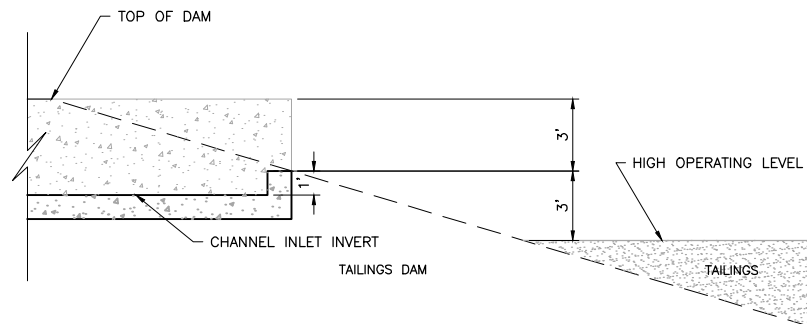
**1** SECTION: TYPICAL EMERGENCY OVERFLOW CHANNEL INLET  
015 NTS

**NOTE:**  
PROTECT SOILS AT CHANNEL INLET WITH NEEDLE-PUNCHED NON-WOVEN HEAVY DUTY GEOTEXTILE AND RIPRAP. FIELD FIT (NOT SHOWN ON DRAWINGS).

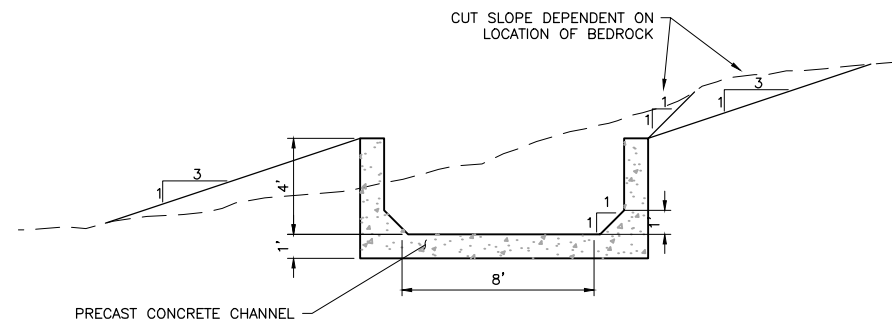


**2** SECTION: EMERGENCY OVERFLOW CHANNEL  
015 NTS

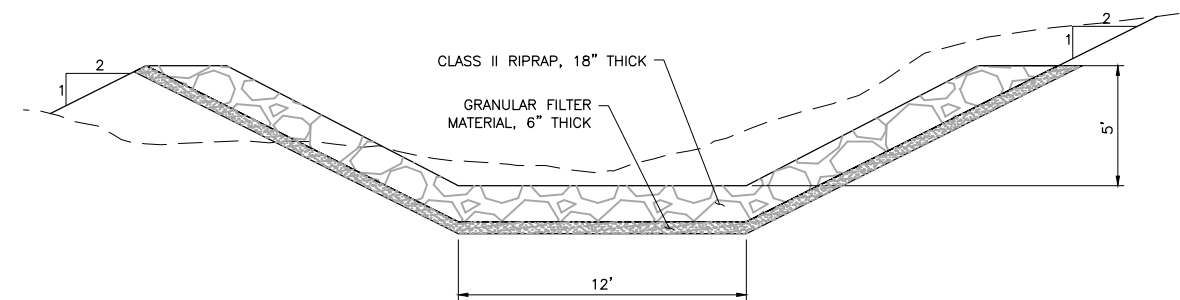
**NOTE:**  
INCREASE EMERGENCY OVERFLOW CHANNEL DEPTH TO 4' WHEN CHANNEL SLOPE IS 0%





**3** DETAIL: EMERGENCY OVERFLOW CHANNEL INLET  
015 NTS



**4** SECTION: EMERGENCY OVERFLOW CHANNEL END SECTION - STA. 28+10 - 30+10  
015 NTS



**5** SECTION: RIPRAP OVERFLOW CHANNEL ENERGY DISSIPATOR - STA. 30+10 - 34+60  
015 NTS

PLANT DRAWING NUMBER:	
FLOTATION TAILINGS BASIN EMERGENCY OVERFLOW CHANNEL DETAILS	
 POLYMET MINING, INC. NORTHMET PROJECT HOYT LAKES, MINNESOTA	
 BARR ENGINEERING CO. 4300 MARKETPOINTE DRIVE SUITE 200 MINNEAPOLIS, MN. Ph: 1-800-632-2277	
DRAWN: CAD	REV A
CHECKED: TJR	
BARR PROJECT NO.: 23/69-0C29	
SCALE: AS SHOWN	
DWG. NO. FTB-017	

VER NO	DATE	DESCRIPTION	ISSUE STATUS		
1	10/14/11	FLOTATION TAILINGS MANAGEMENT PLAN – VERSION 1 – ATTACHMENT A	ISSUED	VERSION	DATE
2	12/07/12	FLOTATION TAILINGS MANAGEMENT PLAN – VERSION 2 – ATTACHMENT A	FOR PERMITTING	7	5/12/17
3	04/12/13	FLOTATION TAILINGS MANAGEMENT PLAN – VERSION 3 – ATTACHMENT A			
4	11/25/14	FLOTATION TAILINGS MANAGEMENT PLAN – VERSION 4 – ATTACHMENT A			
5	03/03/15	FLOTATION TAILINGS MANAGEMENT PLAN – VERSION 5 – ATTACHMENT A	FOR CONSTRUCTION	–	–
6	05/20/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS			
7	05/12/17	PERMIT APPLICATION UPDATES			
			NOT APPROVED FOR CONSTRUCTION		

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINTED NAME THOMAS J. RADUE  
SIGNATURE *Thomas J. Radue*  
DATE 5/12/17 LICENSE# 20951

DRAWN:  
CAD

CHECKED:  
TJR

BARR PROJECT NO.:  
23/69-0C29

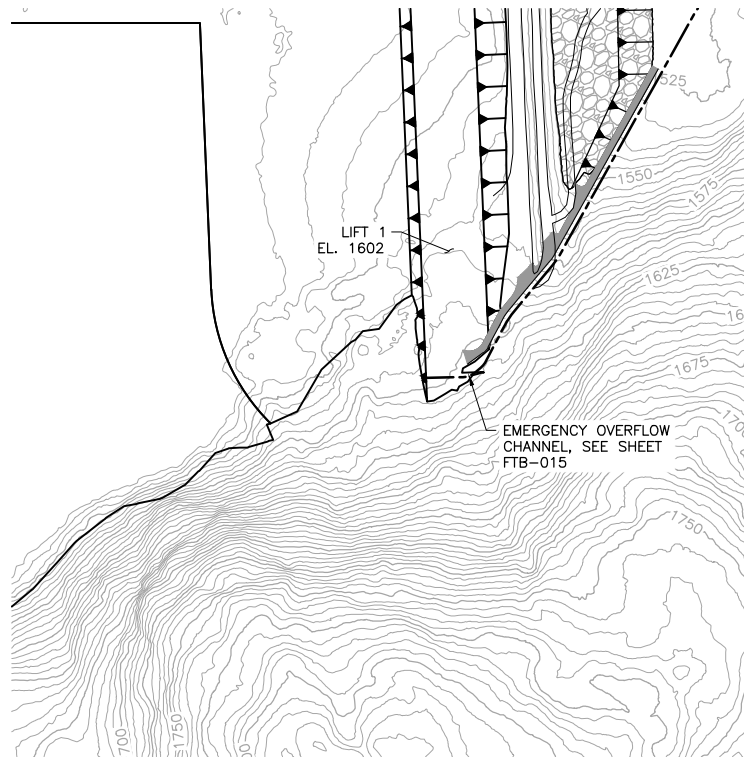
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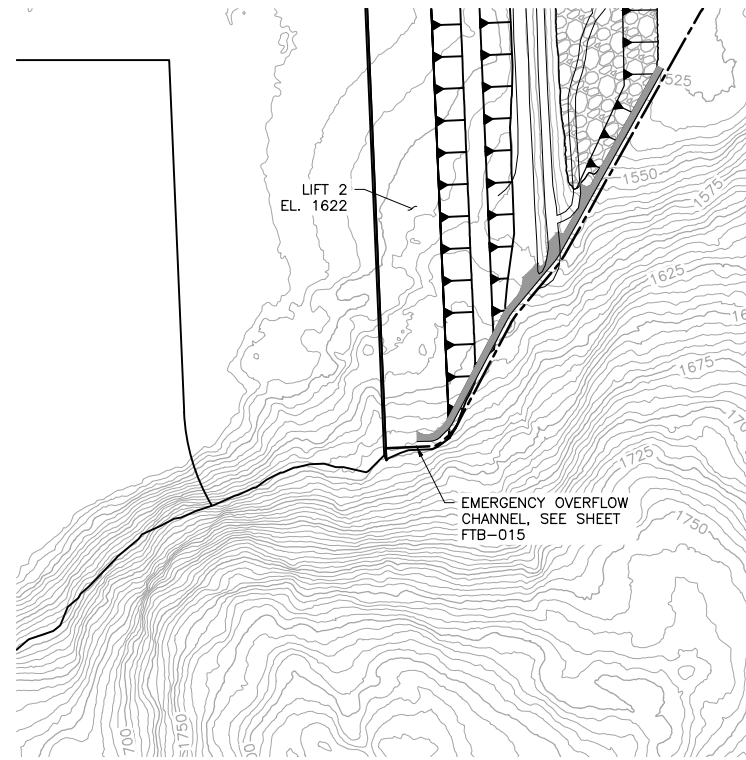
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2

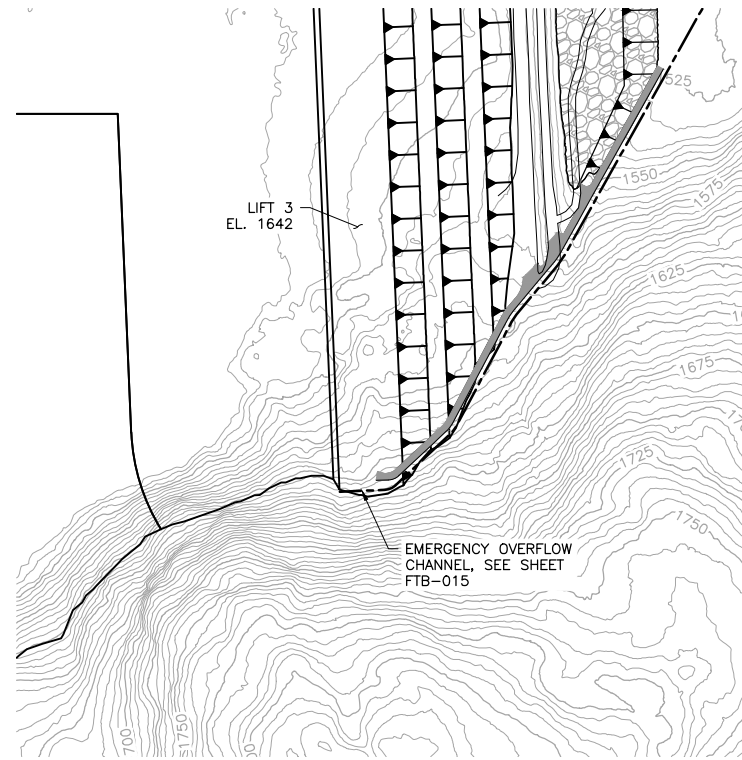
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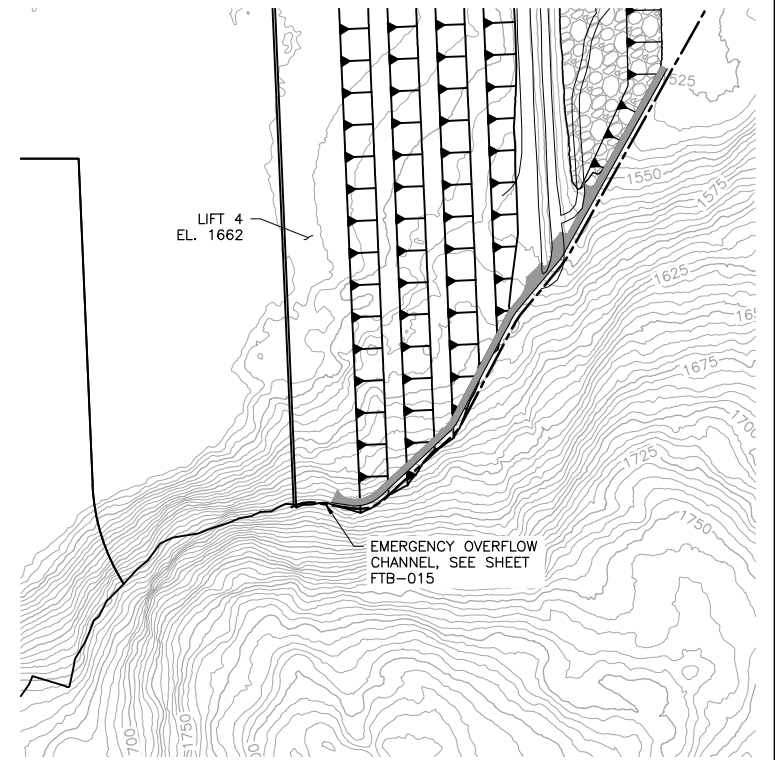
1 PLAN: EMERGENCY OVERFLOW CHANNEL - LIFT 1



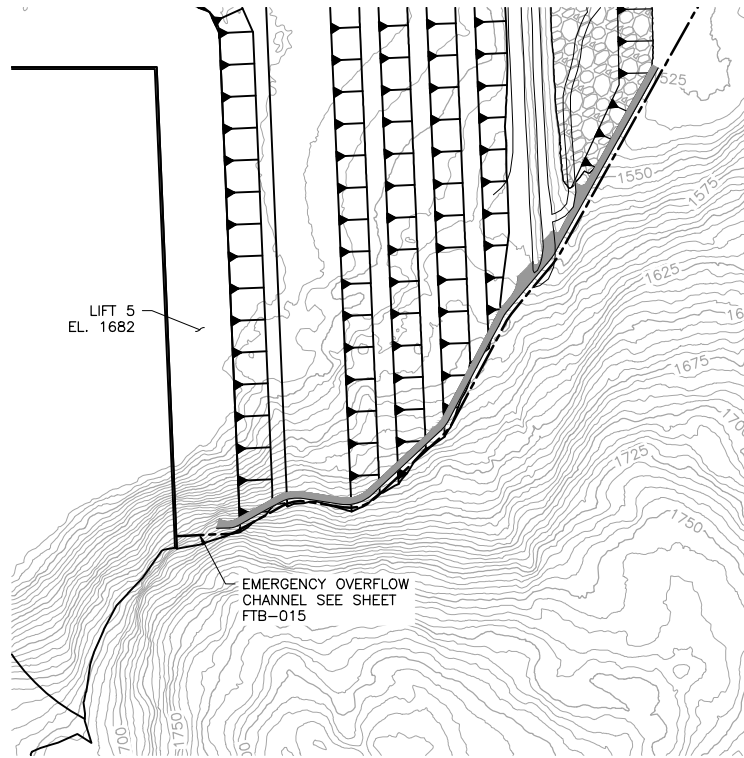
2 PLAN: EMERGENCY OVERFLOW CHANNEL - LIFT 2



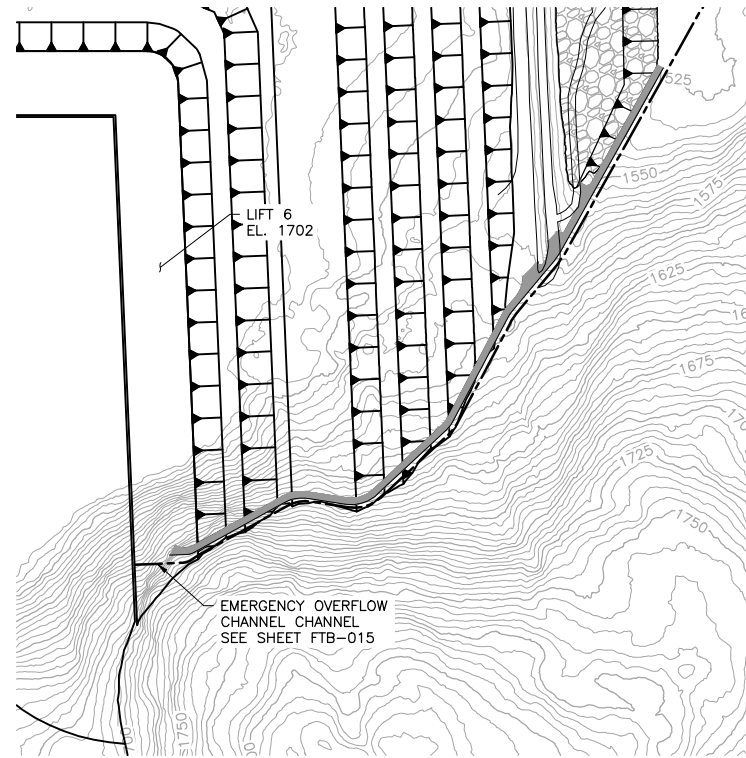
3 PLAN: EMERGENCY OVERFLOW CHANNEL - LIFT 3



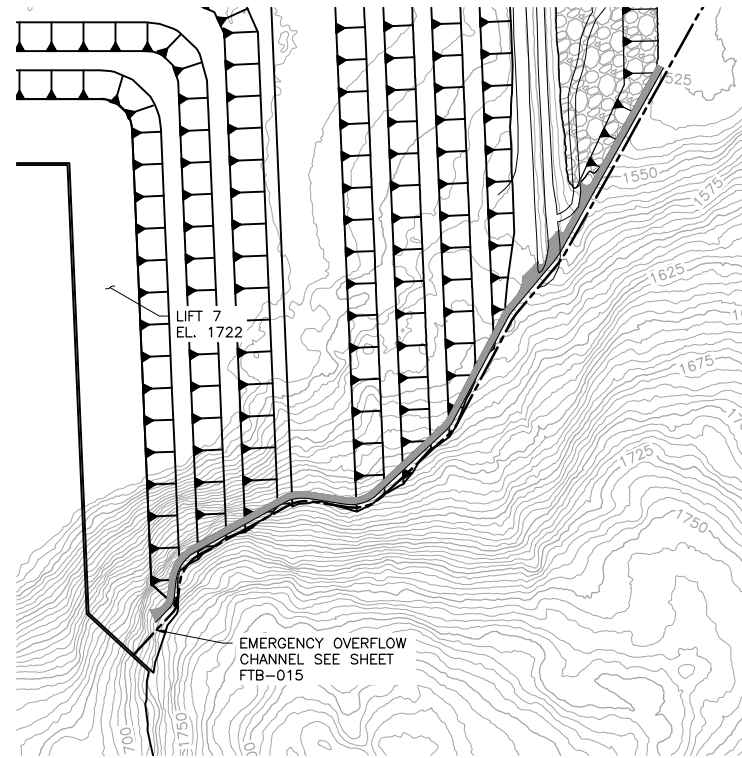
4 PLAN: EMERGENCY OVERFLOW CHANNEL - LIFT 4



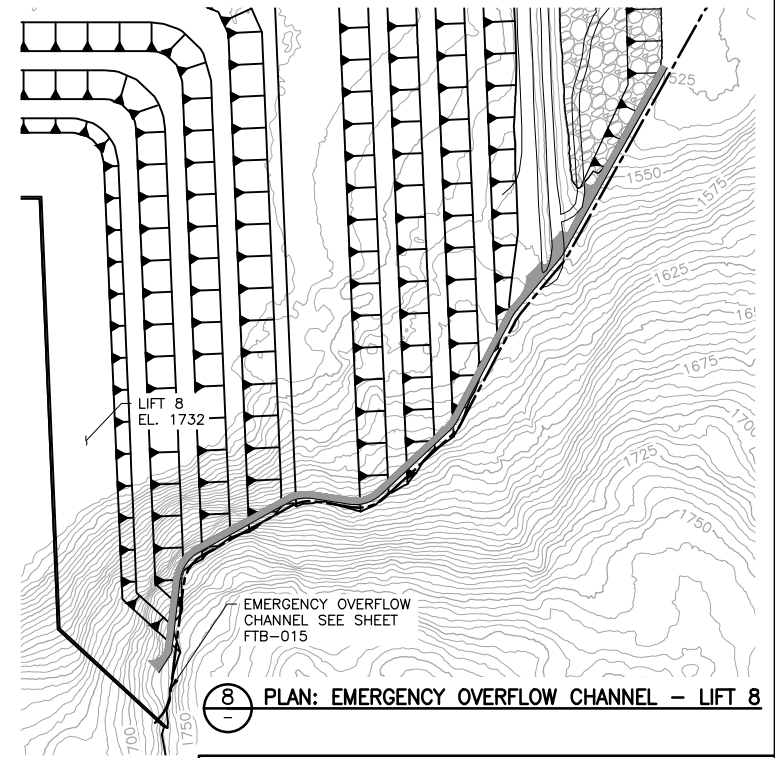
5 PLAN: EMERGENCY OVERFLOW CHANNEL - LIFT 5



6 PLAN: EMERGENCY OVERFLOW CHANNEL - LIFT 6



7 PLAN: EMERGENCY OVERFLOW CHANNEL - LIFT 7



8 PLAN: EMERGENCY OVERFLOW CHANNEL - LIFT 8

NOTES:

1. EMERGENCY OVERFLOW CHANNEL PLAN VIEW NOT SHOWN, SEE SHEET FTB-015 FOR REFERENCE.





0 300 600  
SCALE IN FEET

VER NO	DATE	DESCRIPTION	ISSUE STATUS		
			ISSUED	VERSION	DATE
1	10/14/11	FLOTATION TAILINGS MANAGEMENT PLAN - VERSION 1 - ATTACHMENT A			
2	12/07/12	FLOTATION TAILINGS MANAGEMENT PLAN - VERSION 2 - ATTACHMENT A			
3	04/12/13	FLOTATION TAILINGS MANAGEMENT PLAN - VERSION 3 - ATTACHMENT A	FOR PERMITTING	7	5/12/17
4	11/25/14	FLOTATION TAILINGS MANAGEMENT PLAN - VERSION 4 - ATTACHMENT A			
5	03/03/15	FLOTATION TAILINGS MANAGEMENT PLAN - VERSION 5 - ATTACHMENT A			
6	05/20/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS	FOR CONSTRUCTION	-	-
7	05/12/17	PERMIT APPLICATION UPDATES	NOT APPROVED FOR CONSTRUCTION		

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PRINTED NAME **THOMAS J. RADUE**  
SIGNATURE *Thomas J. Radue*  
DATE 5/12/17 LICENSE# 20951

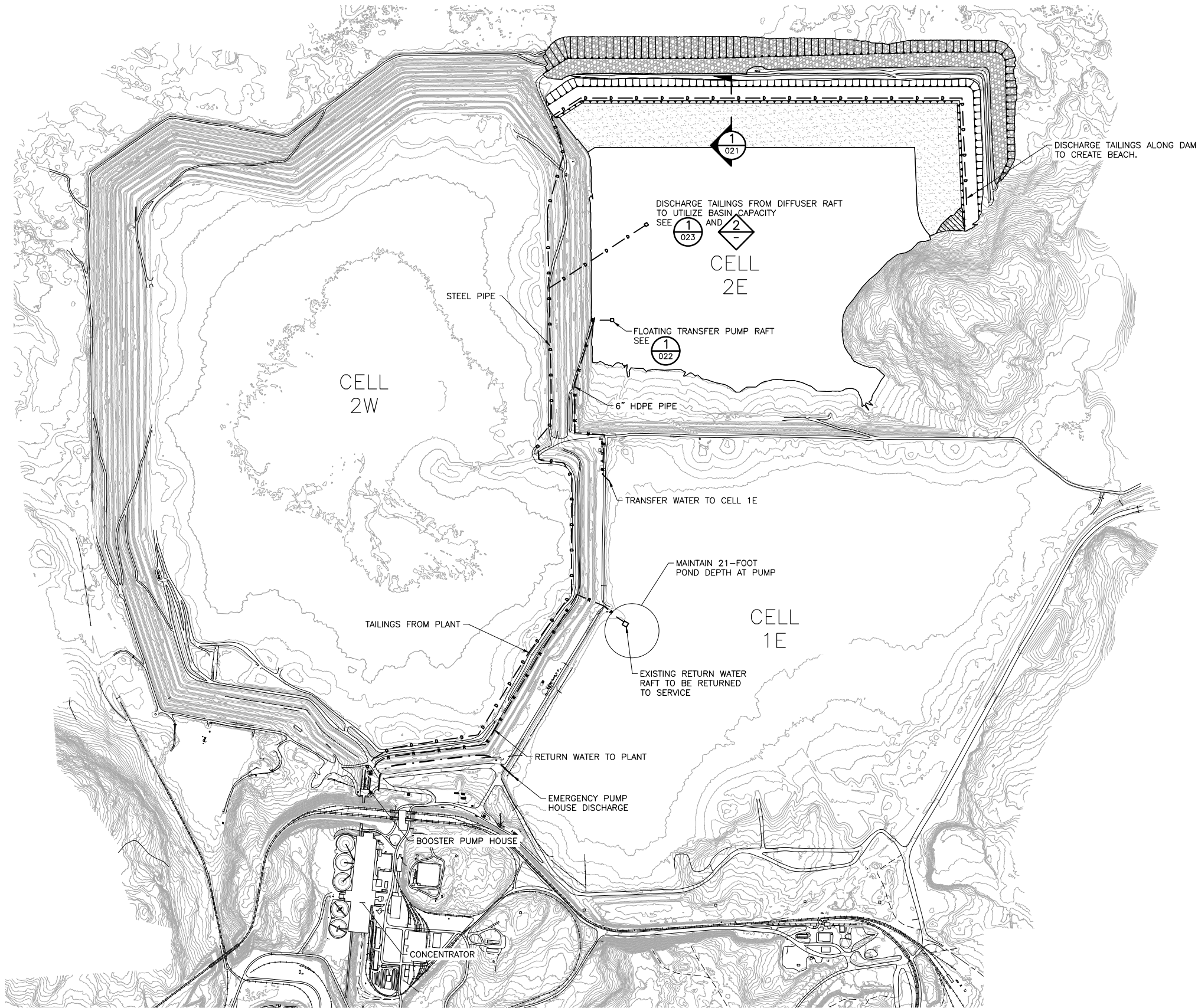
DRAWN: CAD  
CHECKED: TJR  
BARR PROJECT NO.: 23/69-0C29  
SCALE: AS SHOWN

PLANT DRAWING NUMBER:	
FLOTATION TAILINGS BASIN EMERGENCY OVERFLOW CHANNEL SEQUENCING	
 <b>POLYMET</b> MINING	<b>POLY MET MINING, INC.</b> NORTHMET PROJECT HOYT LAKES, MINNESOTA
 <b>BARR</b>	BARR ENGINEERING CO. 4300 MARKETPOINTE DRIVE SUITE 200 MINNEAPOLIS, MN. Ph: 1-800-632-2277
DWG. NO. <b>FTB-018</b>	REV <b>A</b>



CADD USER: Cristian A. Diaz FILE: K:\DESIGN\23690029.10\PERMIT\_MNT-02-CS-019.DWG PLOT SCALE: 1:2 PLOT DATE: 5/12/2017 9:42 AM

INCHES  
1  
2



1 PLAN: PIPING LAYOUT CELL 2E  
0 800 1600  
SCALE IN FEET





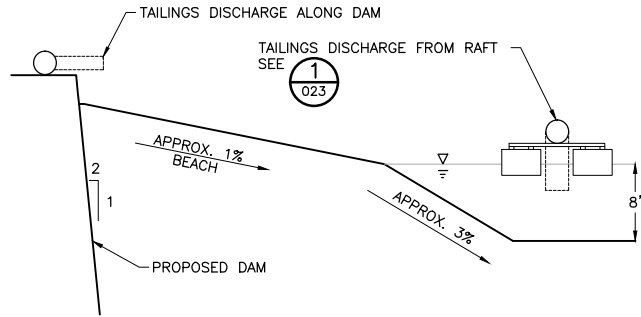
VER NO	DATE	DESCRIPTION	ISSUE STATUS		
			ISSUED	VERSION	DATE
1	10/14/11	FLOTATION TAILINGS MANAGEMENT PLAN - VERSION 1 - ATTACHMENT A			
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4	11/25/14	FLOTATION TAILINGS MANAGEMENT PLAN - VERSION 4 - ATTACHMENT A			
5	03/03/15	FLOTATION TAILINGS MANAGEMENT PLAN - VERSION 5 - ATTACHMENT A			
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			NOT APPROVED FOR CONSTRUCTION		

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SIGNATURE Thomas J. Radue  
DATE 5/12/17 LICENSE# 20951

DRAWN: CAD  
CHECKED: TJR  
BARR PROJECT NO.: 23/69-0C29  
SCALE: AS SHOWN

PLANT DRAWING NUMBER:	
FLOTATION TAILINGS BASIN PIPING LAYOUT CELL 2E	
	POLY MET MINING, INC. NORTHMET PROJECT HOYT LAKES, MINNESOTA
	BARR ENGINEERING CO. 4300 MARKETPOINTE DRIVE SUITE 200 MINNEAPOLIS, MN. Ph: 1-800-632-2277
DWG. NO. FTB-019	REV A



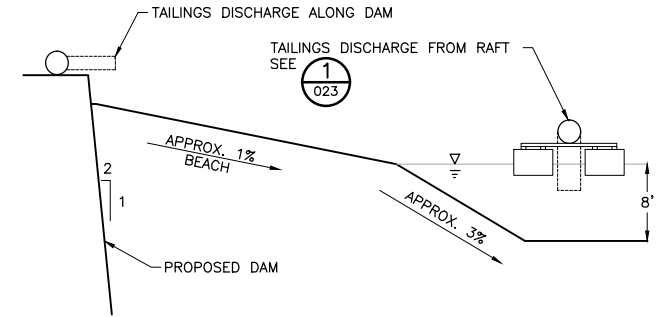
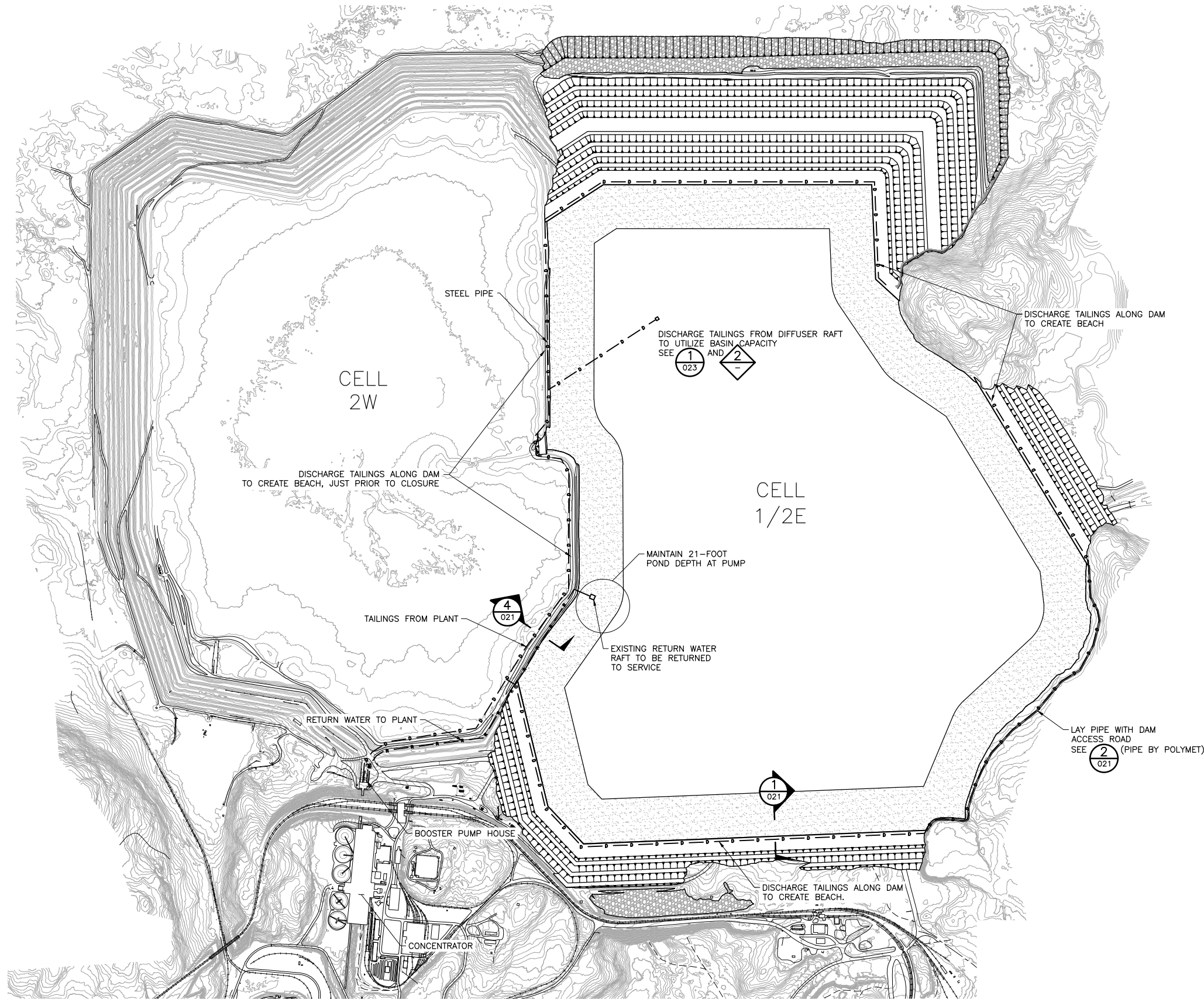
2 DETAIL: TAILINGS DISCHARGE ALONG DAM  
NTS

- NOTES:
1. CONTOURS DO NOT REFLECT BORROW REMOVAL.
  2. PIPELINE LOCATIONS ARE PRELIMINARY.

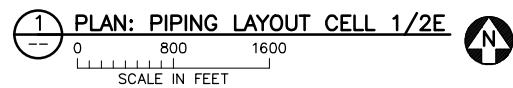


CADD USER: Cristian A. Diaz FILE: K:\DESIGN\23690229.10\PERMIT\_NMT-02-CS-020.DWG PLOT SCALE: 1:2 PLOT DATE: 5/12/2017 9:46 AM

INCHES  
1  
2



NOTES:  
1. PIPELINE LOCATIONS ARE PRELIMINARY.





VER NO	DATE	DESCRIPTION	ISSUE STATUS		
			ISSUED	VERSION	DATE
1	10/14/11	FLOTATION TAILINGS MANAGEMENT PLAN - VERSION 1 - ATTACHMENT A			
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7	05/12/17	PERMIT APPLICATION UPDATES			
			NOT APPROVED FOR CONSTRUCTION		

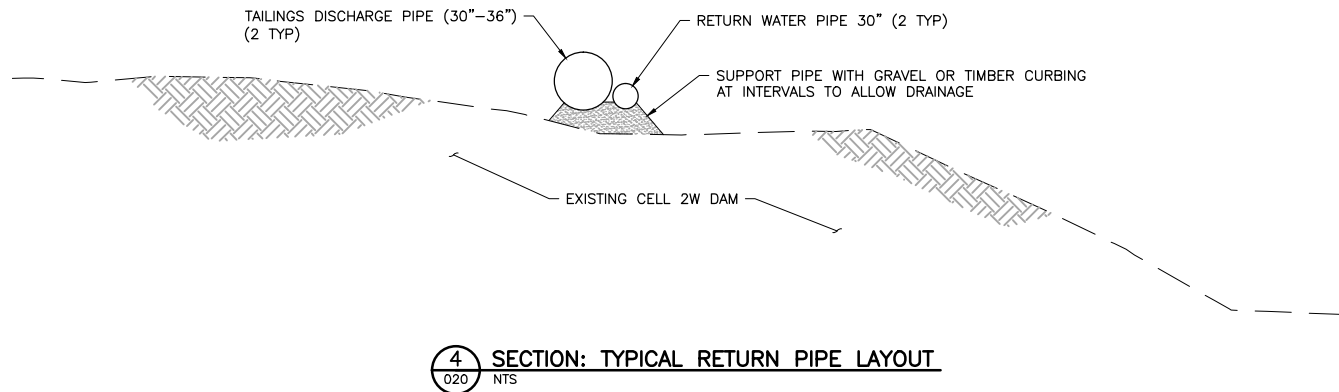
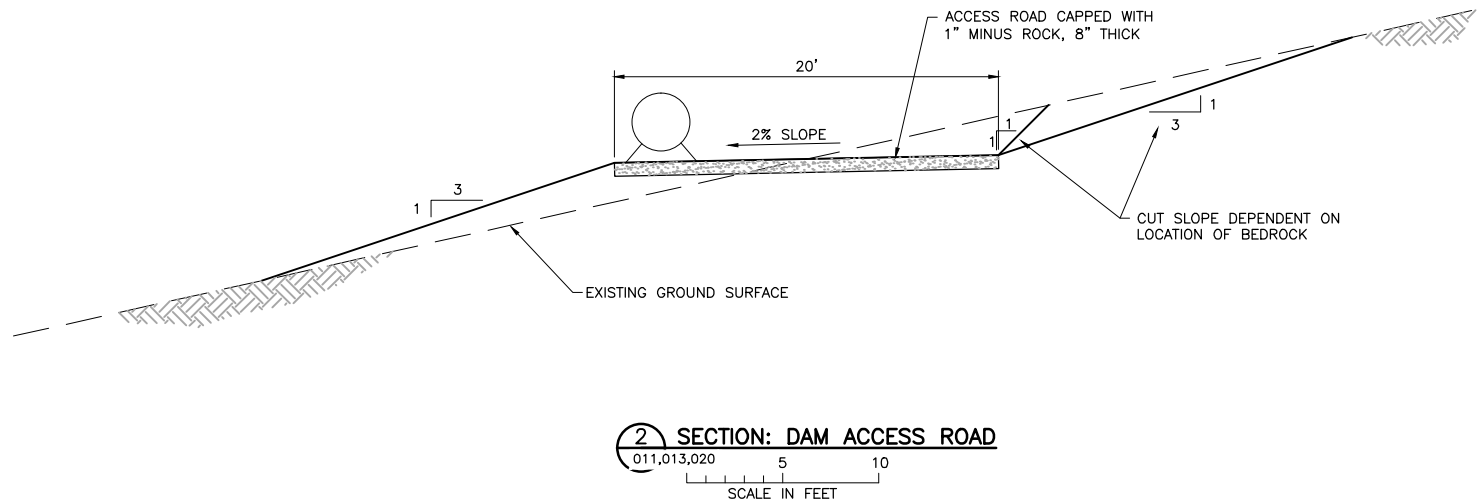
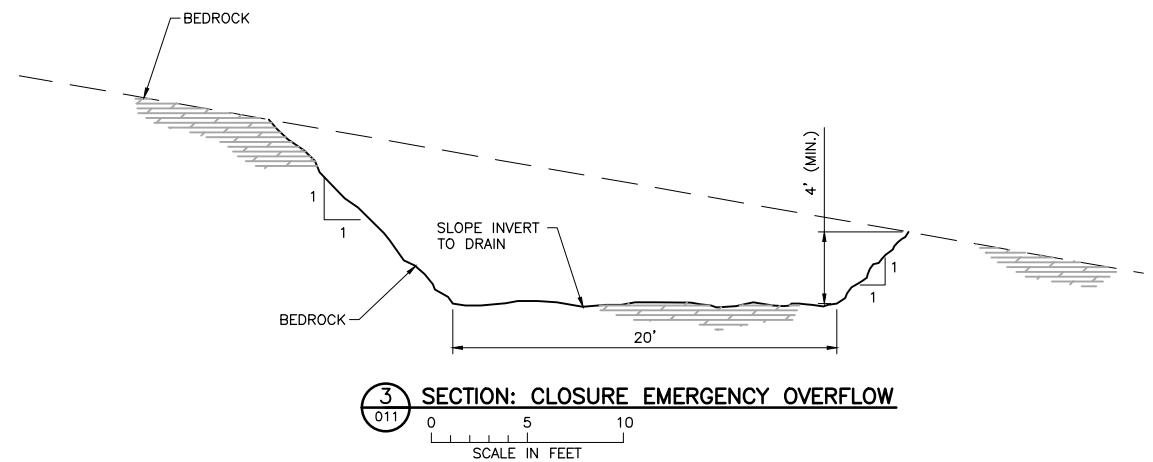
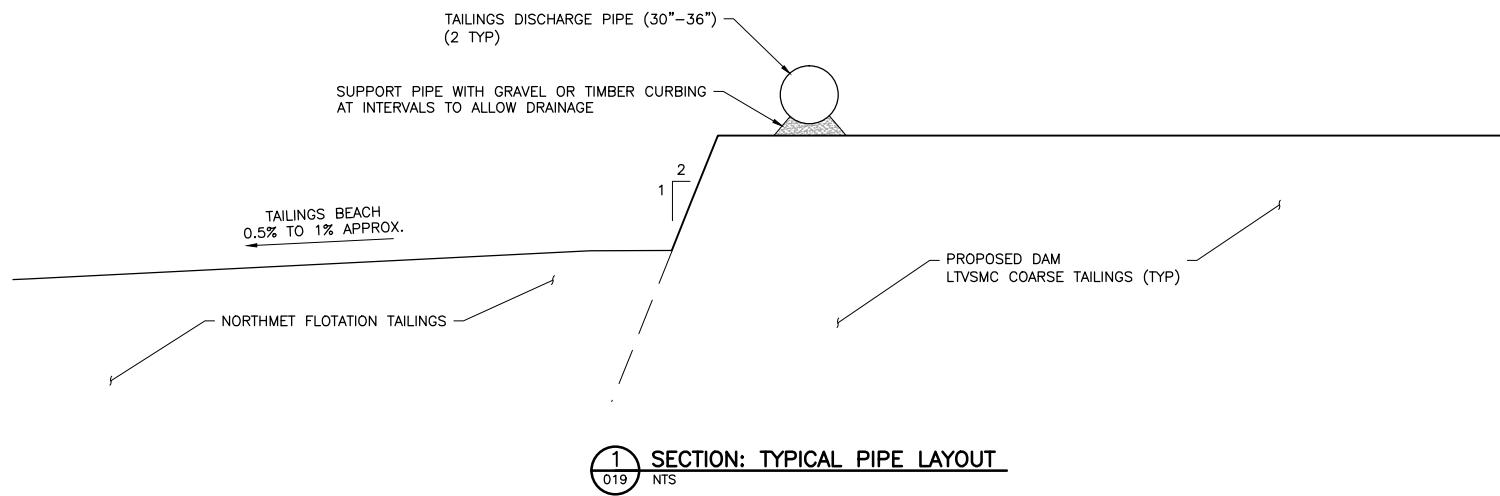
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PRINTED NAME THOMAS J. RADUE  
SIGNATURE Thomas J. Radue  
DATE 5/12/17 LICENSE# 20951

DRAWN: CAD  
CHECKED: TJR  
BARR PROJECT NO.: 23/69-0C29  
SCALE: AS SHOWN

PLANT DRAWING NUMBER:	
FLOTATION TAILINGS BASIN PIPING LAYOUT CELL 1/2E	
	POLY MET MINING, INC. NORTHMET PROJECT HOYT LAKES, MINNESOTA
	BARR ENGINEERING CO. 4300 MARKETPOINTE DRIVE SUITE 200 MINNEAPOLIS, MN. Ph: 1-800-632-2277
DWG. NO. FTB-020	REV A

CADD USER: Cristian A. Diaz FILE: K:\DESIGN\23690029.10\PERMIT\_NMT-02-CS-021.DWG PLOT SCALE: 1:2 PLOT DATE: 5/12/2017 9:48 AM



**NOTES:**



1. EMERGENCY OVERFLOW SIZING AND CONFIGURATION IS PRELIMINARY.
2. PIPELINE INFORMATION IS PRELIMINARY.
3. CONSTRUCT CLOSURE EMERGENCY OVERFLOW AT CLOSURE. OPERATIONS-PHASE EMERGENCY OVERFLOW TO BE MAINTAINED OR REMOVED AT OWNER'S DETERMINATION.
4. ALL PIPE SIZES SHOWN ARE PRELIMINARY.

VER NO	DATE	DESCRIPTION	ISSUE STATUS		
1	10/14/11	FLOTATION TAILINGS MANAGEMENT PLAN – VERSION 1 – ATTACHMENT A	ISSUED	VERSION	DATE
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PRINTED NAME THOMAS J. RADUE  
SIGNATURE Thomas J. Radue  
DATE 5/12/17 LICENSE# 20951

DRAWN: CAD  
CHECKED: TJR  
BARR PROJECT NO.: 23/69-0C29  
SCALE: AS SHOWN

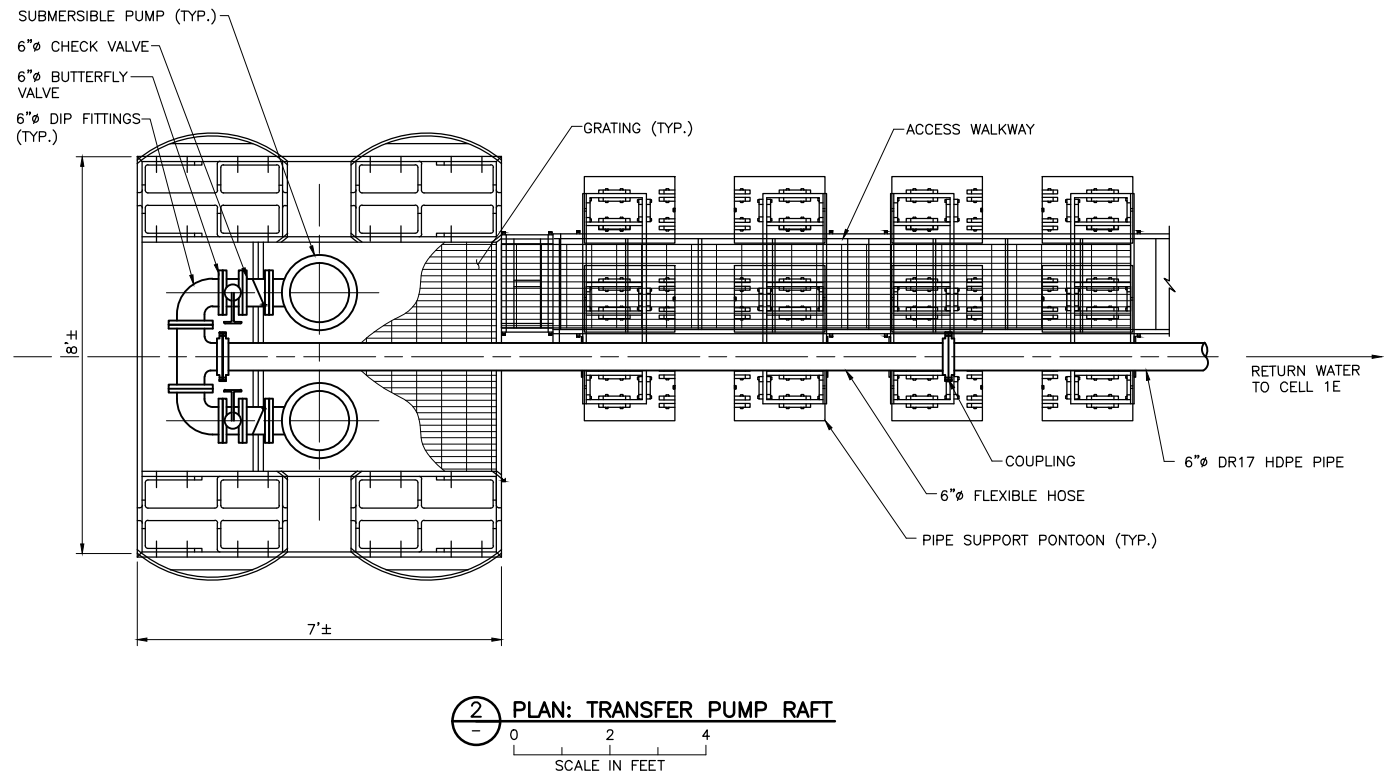
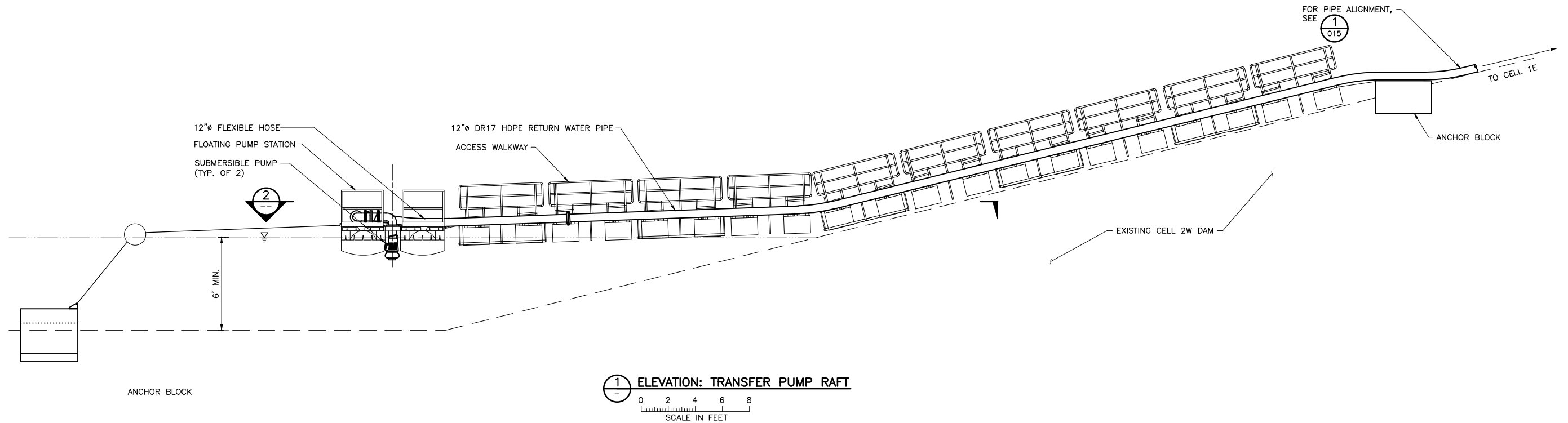
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	POLY MET MINING, INC. NORTHMET PROJECT HOYT LAKES, MINNESOTA
	BARR ENGINEERING CO. 4300 MARKETPOINTE DRIVE SUITE 200 MINNEAPOLIS, MN. Ph: 1-800-632-2277
DWG. NO. FTB-021	REV A

CADD USER: Cristian A. Diaz FILE: K:\DESIGN\23690C29.10\PERMIT\_NMT-02-CS-022.DWG PLOT SCALE: 1:2 PLOT DATE: 5/12/2017 11:14 AM

2

1

INCHES





NOTES:

1. ALL PIPE SIZES SHOWN ARE PRELIMINARY.

VER NO	DATE	DESCRIPTION	ISSUE STATUS		
1	10/14/11	FLOTATION TAILINGS MANAGEMENT PLAN – VERSION 1 – ATTACHMENT A	ISSUED	VERSION	DATE
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7	05/12/17	PERMIT APPLICATION UPDATES			
			NOT APPROVED FOR CONSTRUCTION		

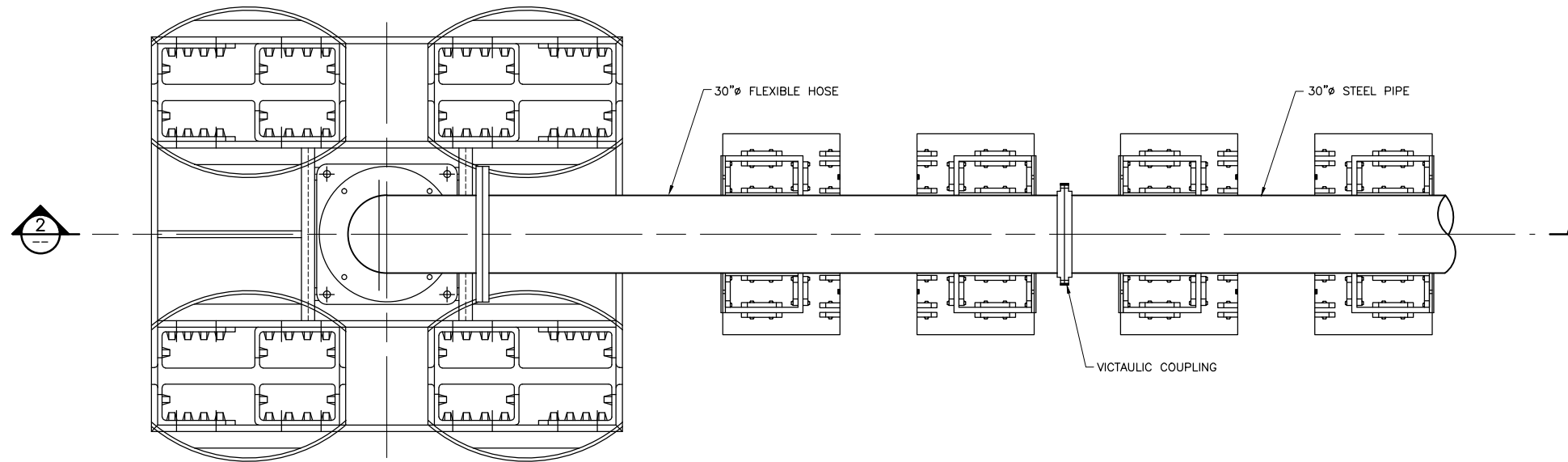
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PRINTED NAME THOMAS J. RADUE  
SIGNATURE *Thomas J. Radue*  
DATE 5/12/17 LICENSE# 20951

DRAWN: CAD  
CHECKED: TJR  
BARR PROJECT NO.: 23/69-0C29  
SCALE: AS SHOWN

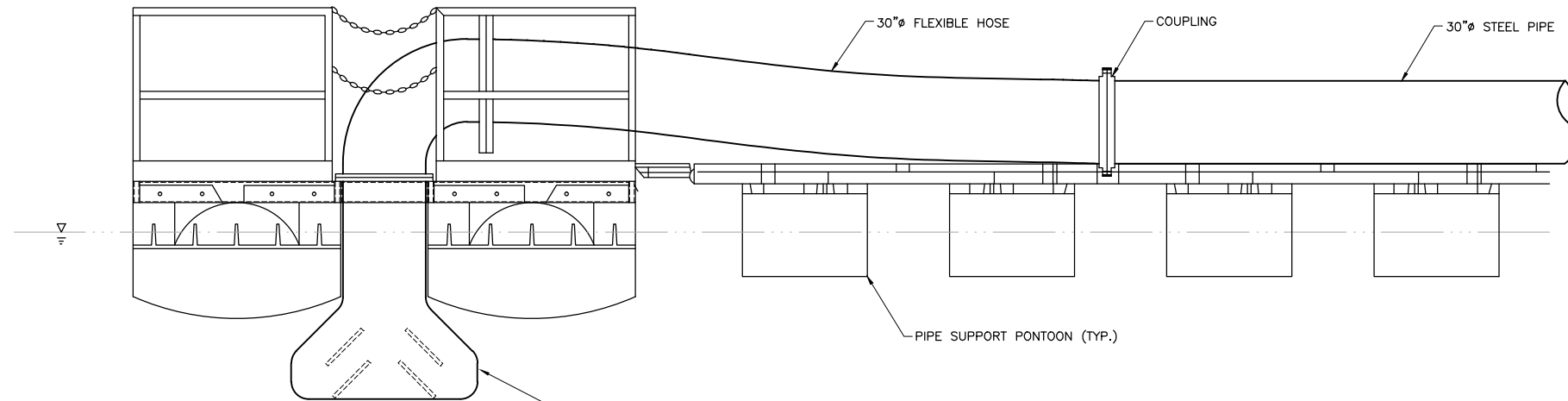
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FLOTATION TAILINGS BASIN TRANSFER PUMP RAFT	
	POLY MET MINING, INC. NORTHMET PROJECT HOYT LAKES, MINNESOTA
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DWG. NO. FTB-022	REV A

CADD USER: Cristian A. Diaz FILE: K:\DESIGN\23690229.10\PERMIT\_NMT-02-CS-023.DWG PLOT SCALE: 1:2 PLOT DATE: 5/12/2017 9:51 AM

INCHES  
1  
2

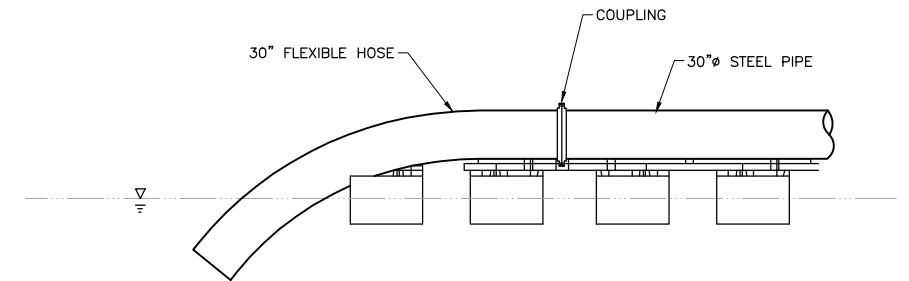


1 PLAN: TAILINGS DISPOSAL DIFFUSER RAFT  
NTS



DIFFUSER  
SEE  
3  
FOR OPTIONAL CONFIGURATION

2 ELEVATION: TAILINGS DISPOSAL DIFFUSER RAFT  
NTS



3 ELEVATION: PIPE OPEN END OPTION  
NTS

NOTES:



1. ALL PIPE SIZES SHOWN ARE PRELIMINARY.

VER NO	DATE	DESCRIPTION	ISSUE STATUS		
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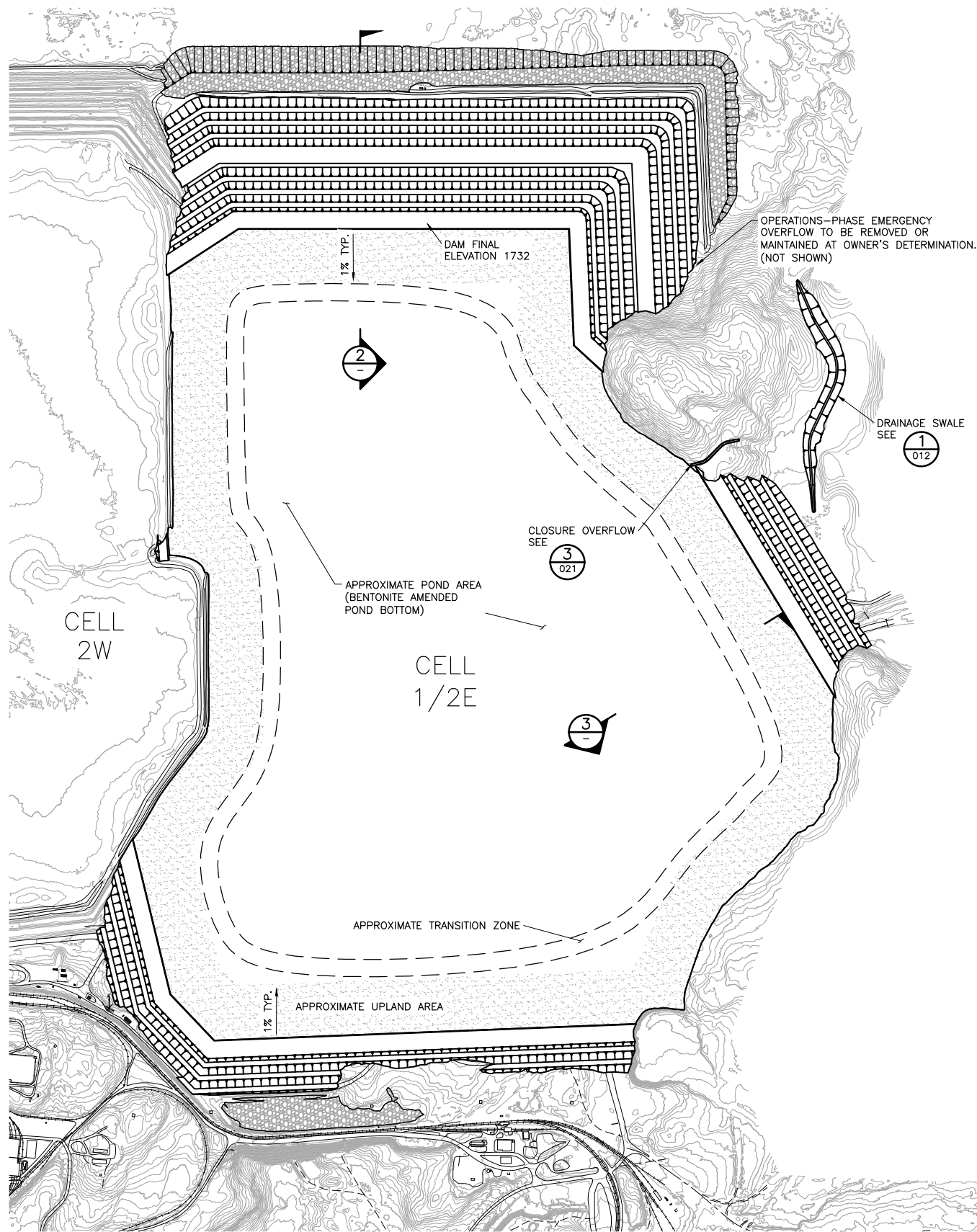
PRINTED NAME THOMAS J. RADUE  
SIGNATURE *Thomas J. Radue*  
DATE 5/12/17 LICENSE# 20951

DRAWN: CAD  
CHECKED: TJR  
BARR PROJECT NO.: 23/69-0C29  
SCALE: AS SHOWN

PLANT DRAWING NUMBER:	
FLOTATION TAILINGS BASIN TAILINGS DISPOSAL DIFFUSER RAFT	
	POLY MET MINING, INC. NORTHMET PROJECT HOYT LAKES, MINNESOTA
	BARR ENGINEERING CO. 4300 MARKETPOINTE DRIVE SUITE 200 MINNEAPOLIS, MN. Ph: 1-800-632-2277
DWG. NO. FTB-023	REV A

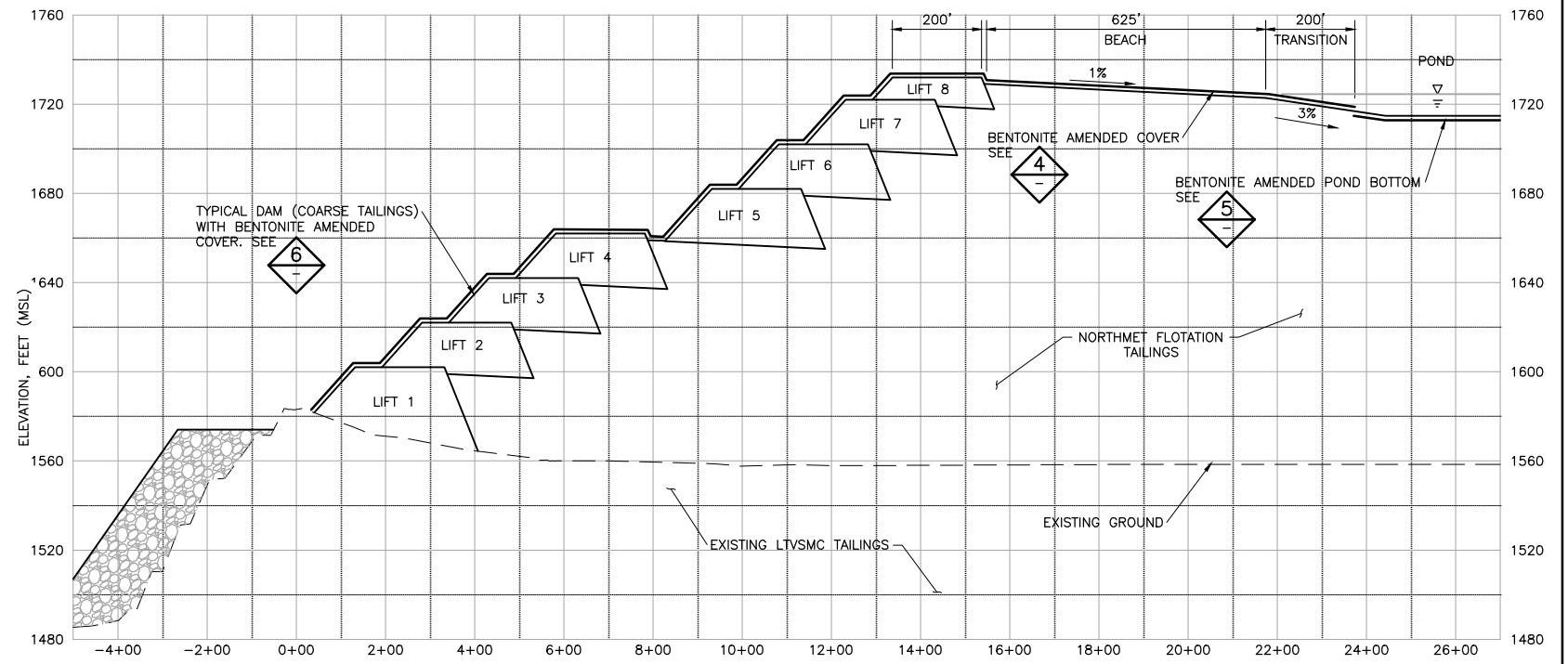
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2  
1  
INCHES

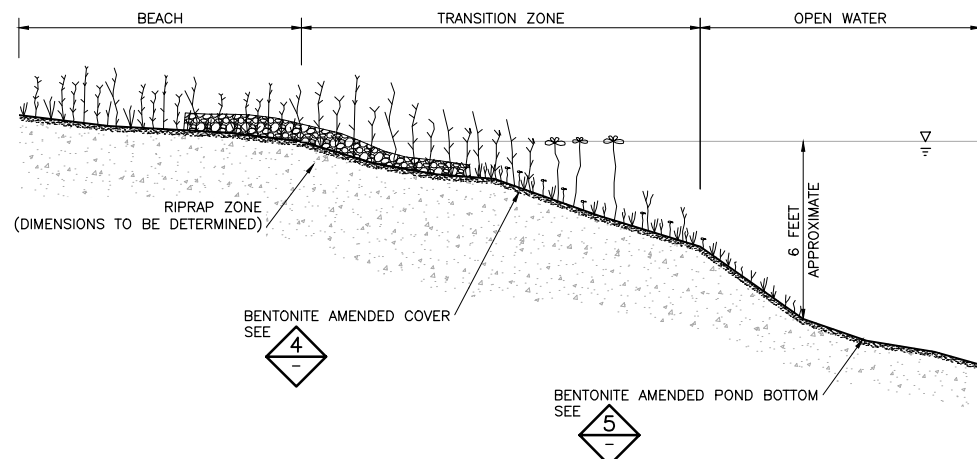


1 PLAN: PROPOSED CLOSURE PLAN

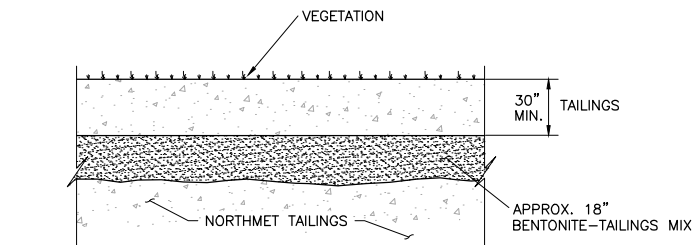
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2	12/07/12	FLOTATION TAILINGS MANAGEMENT PLAN – VERSION 2 – ATTACHMENT A
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6	05/20/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS
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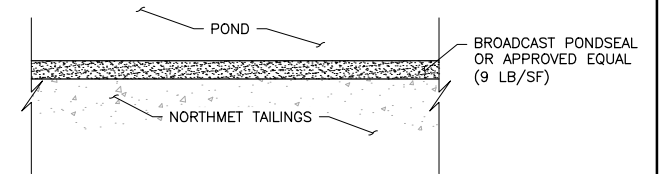
2 SECTION: CELL 2E TAILINGS BASIN CLOSURE TYPICAL SECTION



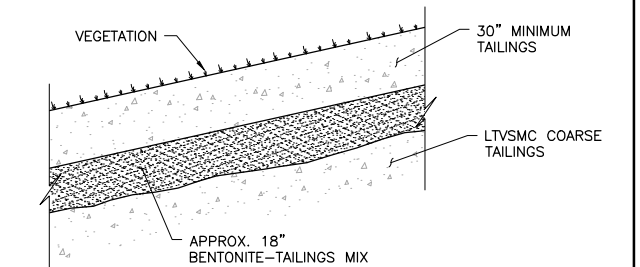
3 SECTION: SCHEMATIC TAILINGS BASIN CLOSURE SURFACE





4 DETAIL: BENTONITE AMENDED BEACH COVER



5 DETAIL: BENTONITE AMENDED POND BOTTOM



6 DETAIL: DAM SLOPE BENTONITE AMENDED COVER

PLANT DRAWING NUMBER:	
FLOTATION TAILINGS BASIN CLOSURE PLAN	
 POLY MET MINING, INC. NORTHMET PROJECT HOYT LAKES, MINNESOTA	
 BARR ENGINEERING CO. 4300 MARKETPOINTE DRIVE SUITE 200 MINNEAPOLIS, MN. Ph: 1-800-632-2277	
DRAWN: CAD	REV A
CHECKED: TJR	
BARR PROJECT NO.: 23/69-0C29	
SCALE: AS SHOWN	
DWG. NO. FTB-024	

## Errata Sheet

### Poly Met Mining, Inc. NorthMet Project

### Permit Application Support Drawings: FTB Seepage Containment and Stream Augmentation Systems

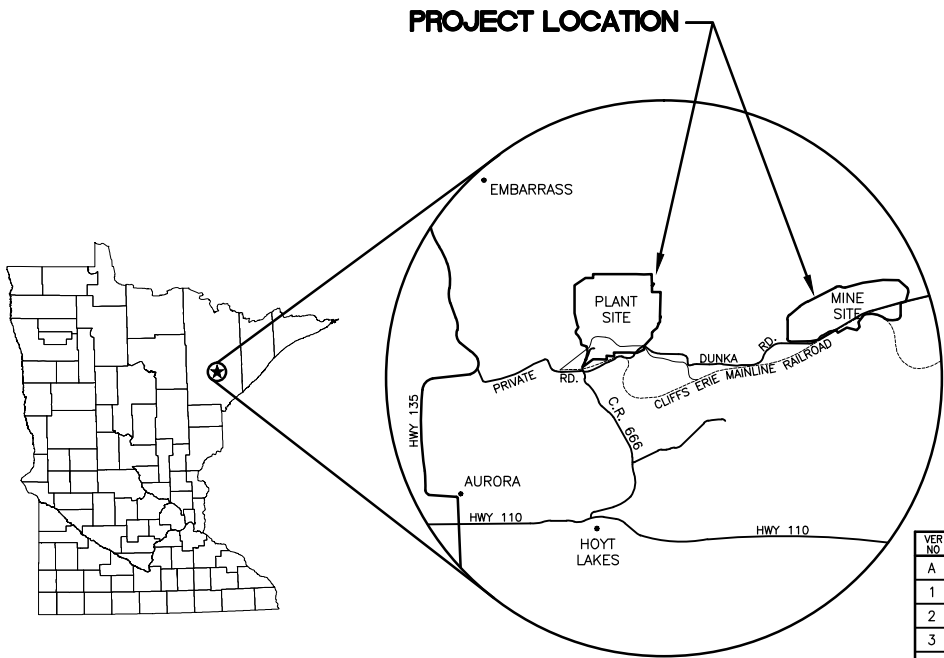
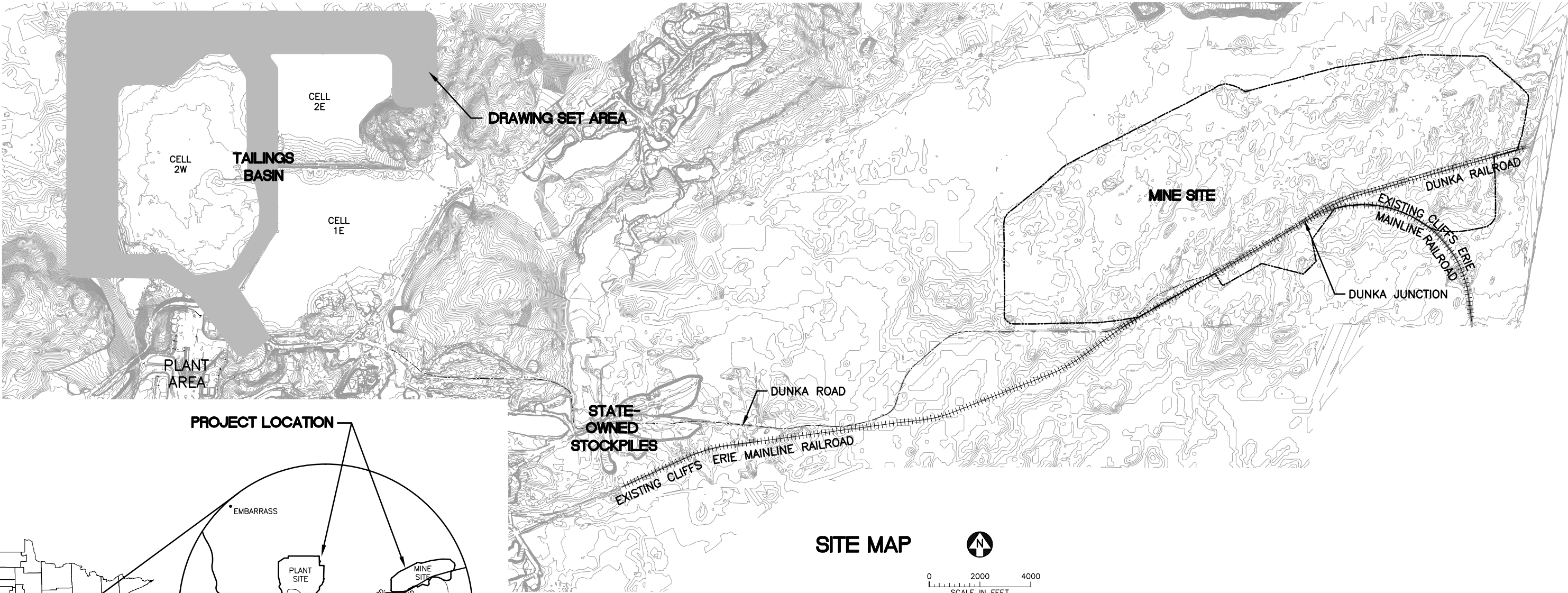
#### July 2016 (version 2)

Engineering design is currently in progress. The table below lists changes that have been identified to-date and have not yet been incorporated in the attached permit application support drawings within this set. Final design will incorporate these changes along with additional site-specific information (e.g., supplementary geotechnical data); therefore, additional adjustments may be made during final design that will be incorporated into the final design drawing set.

Drawing Sheet(s)	Change
FTBCA-002	A note 5 will be added to say: The term "stream augmentation" in this drawing set is synonymous with "surface water discharge"; these terms are used in the Water Appropriations Consolidated Permit Application and the NPDES/SDS Permit Application, respectively.
FTBCA-013, FTBCA-015	The cross slope on the perimeter access road surface will be revised so that it slopes entirely towards the FTB, instead of being crowned in the center.
FTBCA-013, FTBCA-015	To eliminate additional fill in wetlands, the monitoring wells located outside of the perimeter access road will be moved to within the road embankment.
FTBCA-004 through FTBCA-010	The final location and number of discharge locations to Unnamed Creek and Trimble Creek will be determined in permitting and final design.



POLY MET MINING, INC. NORTHMET PROJECT  
PERMIT APPLICATION SUPPORT DRAWINGS  
FTB SEEPAGE CONTAINMENT AND STREAM AUGMENTATION SYSTEMS  
HOYT LAKES, MINNESOTA



**LOCATION MAP**  
NOT TO SCALE



**VICINITY MAP**  
NOT TO SCALE

VER NO	DATE	DESCRIPTION	ISSUE STATUS		
			ISSUED	VERSION	DATE
A	09/28/12	WATER MANAGEMENT PLAN - PLANT- VERSION 2 - ATTACHEMENT B	ISSUED		
1	09/09/14	WATER MANAGEMENT PLAN - PLANT- VERSION 3 - ATTACHEMENT B	FOR PERMITTING	4	5/15/17
2	12/31/14	WATER MANAGEMENT PLAN - PLANT- VERSION 3,4 - ATTACHEMENT B			
3	05/28/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS			
4	05/15/17	PERMIT APPLICATION UPDATES			
			FOR CONSTRUCTION	-	-
			NOT APPROVED FOR CONSTRUCTION.		

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PRINTED NAME THOMAS J. RADUE  
SIGNATURE Thomas J. Radue  
DATE 5/15/17 LICENSE# 20951

DRAWN: BDP  
CHECKED: DVS/AMP  
BARR PROJECT NO.: 23/69-0C29  
SCALE: AS SHOWN

PLANT DRAWING NUMBER:

FTB SEEPAGE CONTAINMENT  
AND STREAM AUGMENTATION SYSTEMS  
LOCATION MAP AND SITE MAP

**POLYMET** MINING  
POLY MET MINING, INC.  
NORTHMET PROJECT  
HOYT LAKES, MINNESOTA

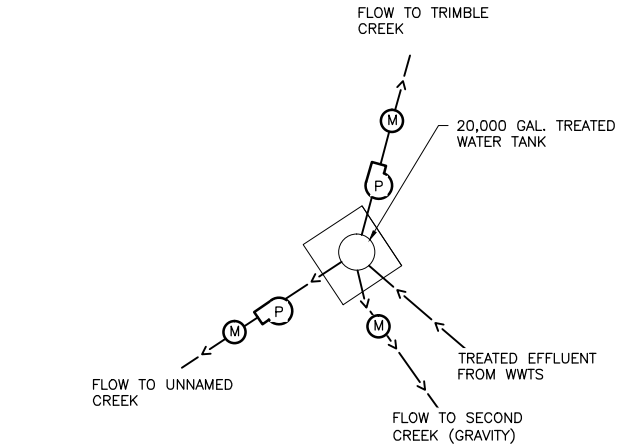
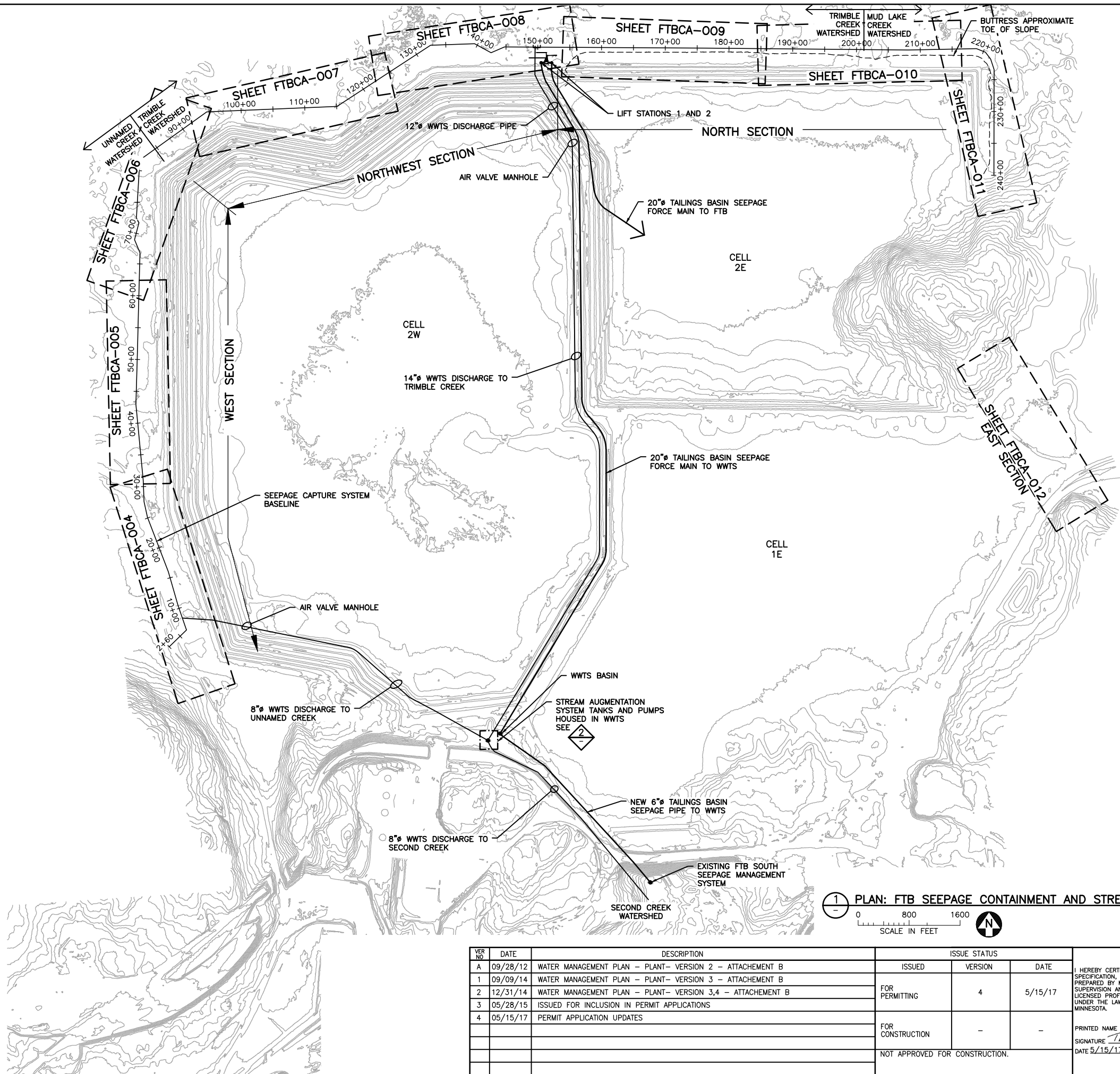
**BARR** ENGINEERING CO.  
4300 MARKETPOINTE DRIVE  
SUITE 200  
MINNEAPOLIS, MN.  
Ph: 1-800-632-2277

DWG. NO. FTBCA-001  
REV A



CADD USER: Cristian A. Diaz FILE: K:\DESIGN\23690C29.10\PERMIT\_NMT-10-CU-003.DWG PLOT SCALE: 1:2 PLOT DATE: 5/15/2017 3:10 PM

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INCHES



2  
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DETAIL: CONCEPTUAL STREAM AUGMENTATION SYSTEM SUPPLY  
NOT TO SCALE

- NOTES
1. SEEPAGE CAPTURE SYSTEMS INCLUDE THE FTB CONTAINMENT SYSTEM ALONG THE WEST, NORTH AND EAST SIDES OF THE FTB, THE SOUTH SEEPAGE MANAGEMENT SYSTEM ON THE SOUTH SIDE OF THE FTB AND CONVEYANCE TO THE WWTS BASIN.
  2. STREAM AUGMENTATION SYSTEM INCLUDES TREATED WATER CONVEYANCE AND DISCHARGE TO UNNAMED CREEK, TRIMBLE CREEK, AND SECOND CREEK WATERSHEDS.
  3. FTB SEEPAGE CONTAINMENT AND STREAM AUGMENTATION SYSTEMS DESIGN REFERENCE BASELINE SHOWN ON THIS SHEET. SEE SUBSEQUENT SHEETS FOR PROPOSED LAYOUT OF SYSTEMS ALONG BASELINE.

1  
-  
PLAN: FTB SEEPAGE CONTAINMENT AND STREAM AUGMENTATION LAYOUT  
0 800 1600  
SCALE IN FEET

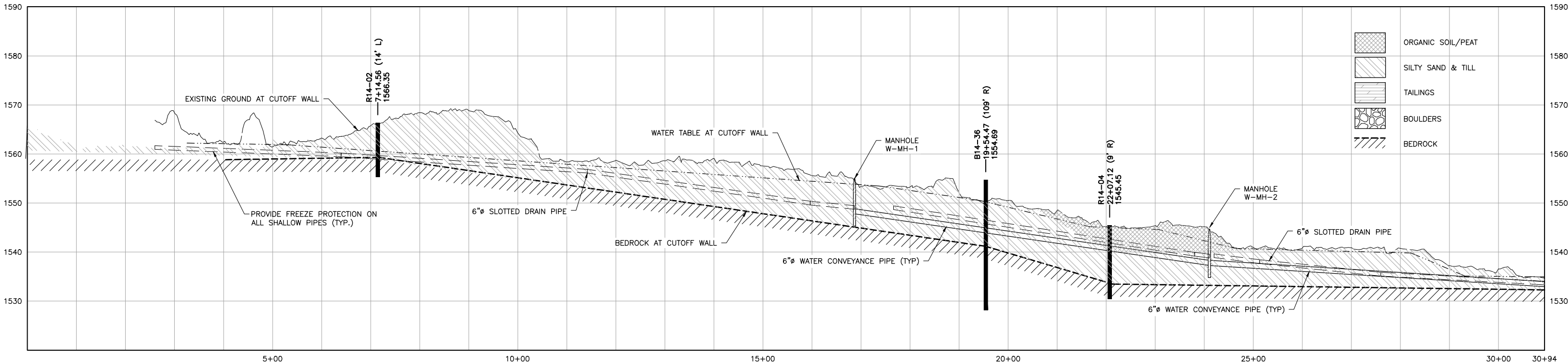
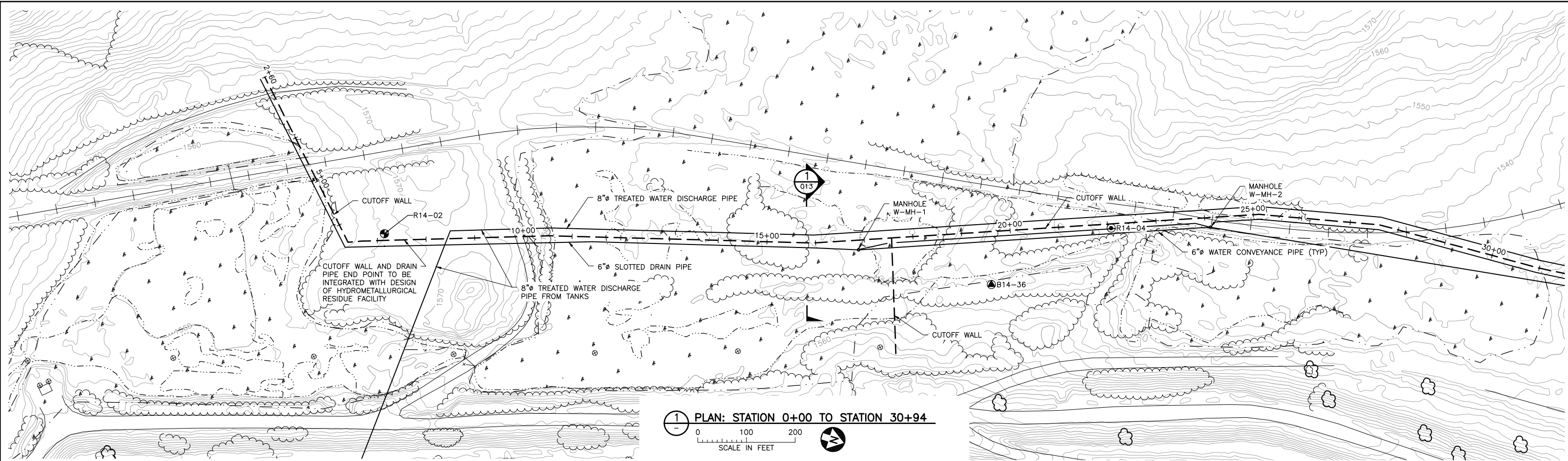
VER NO	DATE	DESCRIPTION	ISSUE STATUS		
			ISSUED	VERSION	DATE
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DATE 5/15/17 LICENSE# 20951

DRAWN: BDP  
CHECKED: DVS  
BARR PROJECT NO.: 23/69-0C29  
SCALE: AS SHOWN

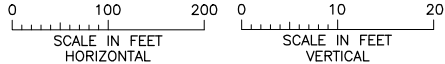
PLANT DRAWING NUMBER:	
FTB SEEPAGE CONTAINMENT AND STREAM AUGMENTATION SYSTEMS PLAN SHEET LAYOUT	
	POLY MET MINING, INC. NORTHMET PROJECT HOYT LAKES, MINNESOTA
	BARR ENGINEERING CO. 4300 MARKETPOINTE DRIVE SUITE 200 MINNEAPOLIS, MN. Ph: 1-800-632-2277
DWG. NO. FTBCA-003	REV A



NOTES:

1. HORIZONTAL LOCATION OF FORCE MAIN, SEEPAGE CONVEYANCE PIPES AND STREAM AUGMENTATION PIPES/DISCHARGE POINTS ON THIS SHEET AND SUBSEQUENT SHEETS SHOWN FOR CLARITY. ACTUAL LOCATION TO BE DETERMINED DURING FINAL DESIGN.
2. MANHOLE LOCATIONS ON THIS SHEET AND SUBSEQUENT SHEETS ARE PRELIMINARY.
3. ACCESS ROAD NOT SHOWN ON THIS SHEET AND SUBSEQUENT SHEETS.
4. TREATED WATER DISCHARGE PIPES NOT SHOWN IN PROFILE ON THIS SHEET AND SUBSEQUENT SHEETS.
5. WATER TABLE ELEVATIONS ARE ESTIMATED BASED ON PIEZOMETERS, BORING LOGS, SOIL TYPES AND AERIAL PHOTOGRAPHY.
6. GROUND SURFACE ELEVATIONS ARE BASED ON 2010 LIDAR DATA (NAVD88). BORING ELEVATIONS SHOWN ARE BASED ON 2010 LIDAR DATA (NAVC88) ADJUSTED AFTER GEOTECHNICAL EXPLORATION (03-11-2014 THRU 05-20-2014). STRATIGRAPHY AND WATER TABLES ARE BASED ON THE 2014 FIELD INVESTIGATION LOGS.
7. BORING LOCATION OFFSETS FROM PROPOSED CUTOFF WALL ALIGNMENT ARE SHOWN. SUBSURFACE CONDITIONS ON WALL ALIGNMENT WILL DIFFER FROM THOSE SHOWN.
8. AREAS OF COBBLES AND BOULDERS BETWEEN BORING LOCATIONS AND ADJACENT BORING LOCATIONS SHOULD BE ASSUMED TO EXIST.

2 PROFILE: STATION 0+00 TO STATION 30+94



VER NO	DATE	DESCRIPTION	ISSUE STATUS		
A	09/28/12	WATER MANAGEMENT PLAN – PLANT– VERSION 2 – ATTACHEMENT B	ISSUED	VERSION	DATE
1	09/09/14	WATER MANAGEMENT PLAN – PLANT– VERSION 3 – ATTACHEMENT B	FOR PERMITTING	4	5/15/17
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4	05/15/17	PERMIT APPLICATION UPDATES			
			NOT APPROVED FOR CONSTRUCTION.		

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SIGNATURE *Thomas J. Radue*  
DATE 5/15/17 LICENSE# 20951

DRAWN: BJH  
CHECKED: DVS/AMP  
BARR PROJECT NO.: 23/69-0C29  
SCALE: AS SHOWN

PLANT DRAWING NUMBER:

FTB SEEPAGE CONTAINMENT  
AND STREAM AUGMENTATION SYSTEMS  
PLAN & PROFILE STATION 0+00 TO 30+94



POLY MET MINING, INC.  
NORTHMET PROJECT  
HOYT LAKES, MINNESOTA



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4300 MARKETPOINTE DRIVE  
SUITE 200  
MINNEAPOLIS, MN.  
Ph: 1-800-632-2277

DWG. NO.

FTBCA-004

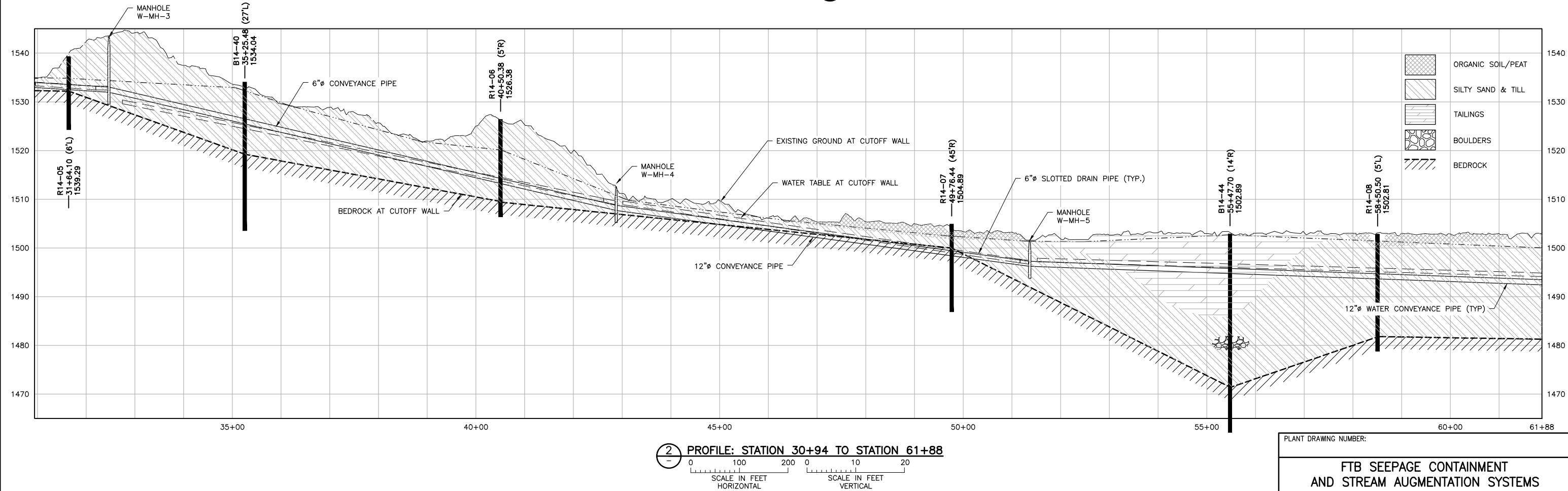
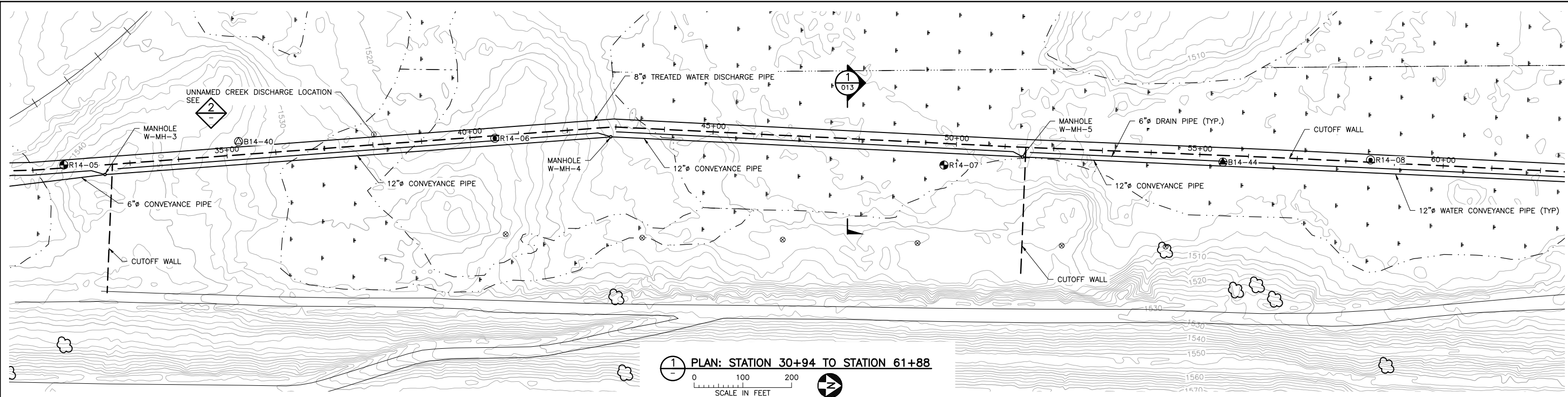
REV

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INCHES



VER NO	DATE	DESCRIPTION	ISSUE STATUS		
A	09/28/12	WATER MANAGEMENT PLAN - PLANT- VERSION 2 - ATTACHEMENT B	ISSUED	VERSION	DATE
1	09/09/14	WATER MANAGEMENT PLAN - PLANT- VERSION 3 - ATTACHEMENT B	FOR PERMITTING	4	5/15/17
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DRAWN: BJH  
CHECKED: DVS/AMP  
BARR PROJECT NO.: 23/69-0C29  
SCALE: AS SHOWN

PLANT DRAWING NUMBER:

FTB SEEPAGE CONTAINMENT  
AND STREAM AUGMENTATION SYSTEMS  
PLAN & PROFILE STATION 30+94 TO 61+88

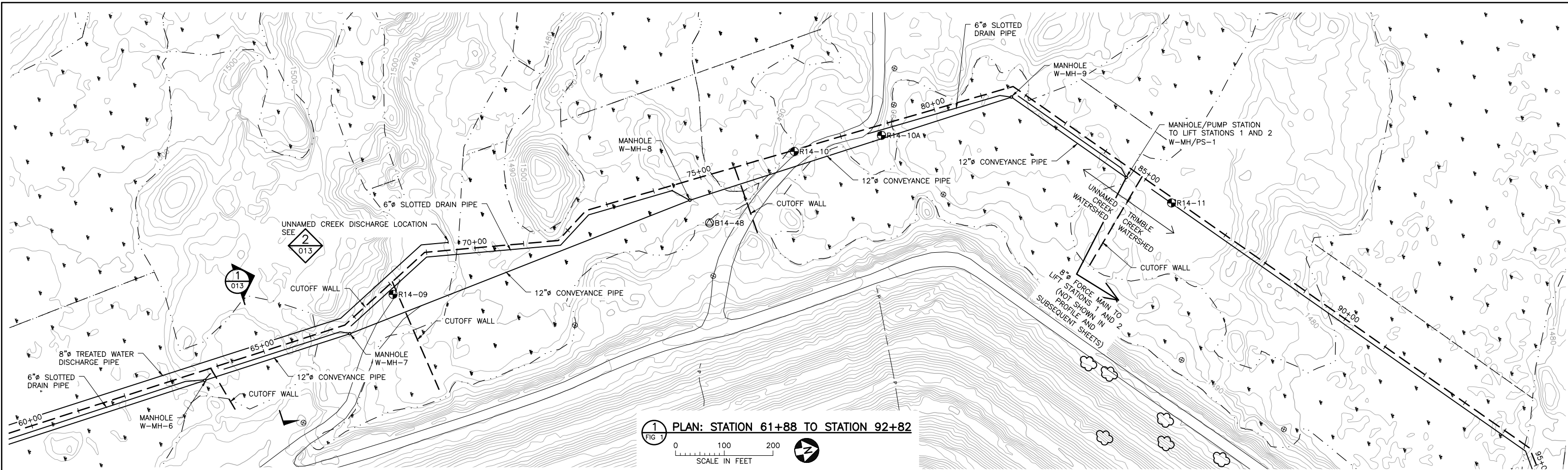
**POLYMET MINING**  
POLY MET MINING, INC.  
NORTHMET PROJECT  
HOYT LAKES, MINNESOTA

**BARR**  
BARR ENGINEERING CO.  
4300 MARKETPOINTE DRIVE  
SUITE 200  
MINNEAPOLIS, MN.  
Ph: 1-800-632-2277

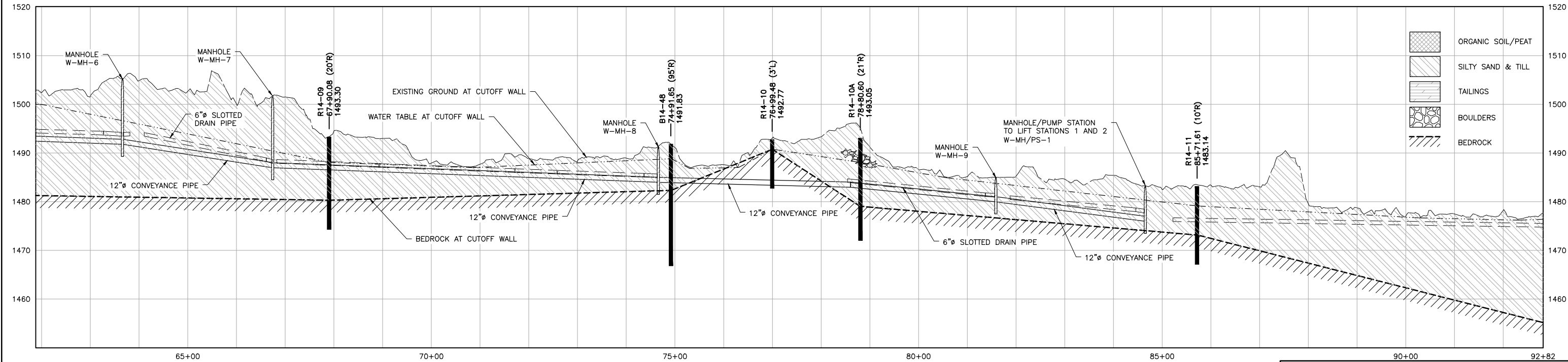
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REV A

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INCHES



1 PLAN: STATION 61+88 TO STATION 92+82



2 PROFILE: STATION 61+88 TO STATION 92+82

VER NO	DATE	DESCRIPTION	ISSUE STATUS		
A	09/28/12	WATER MANAGEMENT PLAN - PLANT- VERSION 2 - ATTACHEMENT B	ISSUED	VERSION	DATE
1	09/09/14	WATER MANAGEMENT PLAN - PLANT- VERSION 3 - ATTACHEMENT B	FOR PERMITTING	4	5/15/17
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DATE 5/15/17 LICENSE# 20951

DRAWN: BJH  
CHECKED: DVS/AMP  
BARR PROJECT NO.: 23/69-0C29  
SCALE: AS SHOWN

PLANT DRAWING NUMBER:

FTB SEEPAGE CONTAINMENT  
AND STREAM AUGMENTATION SYSTEMS  
PLAN & PROFILE STATION 61+88 TO 92+82

**POLYMET** MINING  
POLY MET MINING, INC.  
NORTHMET PROJECT  
HOYT LAKES, MINNESOTA

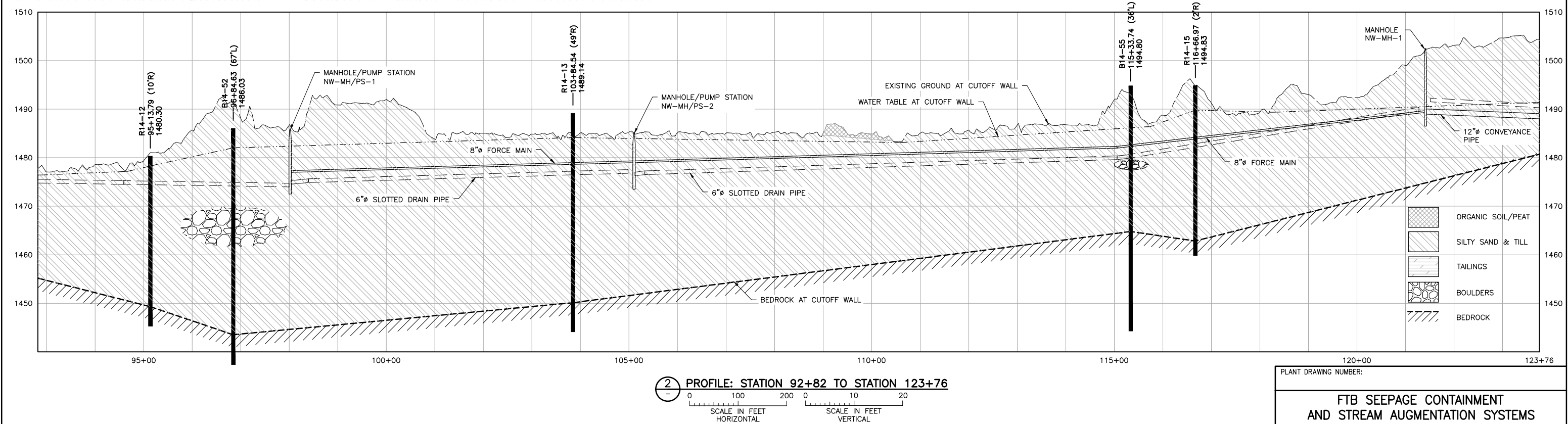
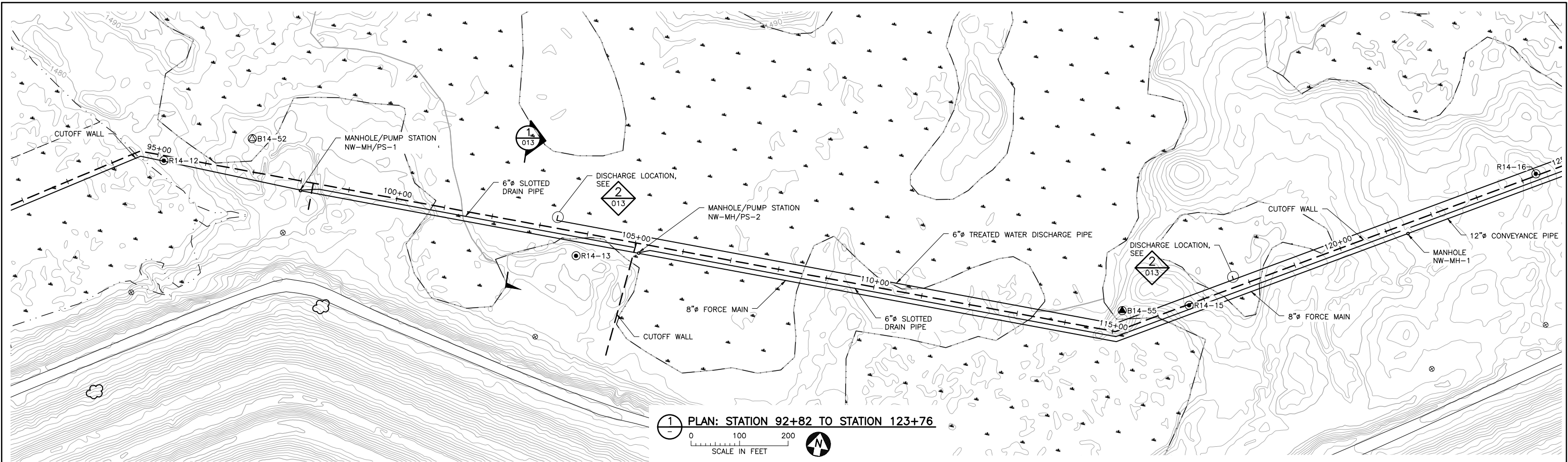
**BARR** ENGINEERING CO.  
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SUITE 200  
MINNEAPOLIS, MN.  
Ph: 1-800-632-2277

DWG. NO. FTBCA-006  
REV A



CADD USER: Cristian A. Diaz FILE: K:\DESIGN\23690C29.10\PERMIT\_NMT-10-CU-007.DWG PLOT SCALE: 1:2 PLOT DATE: 5/15/2017 3:43 PM

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INCHES



VER NO	DATE	DESCRIPTION	ISSUE STATUS		
A	09/28/12	WATER MANAGEMENT PLAN – PLANT– VERSION 2 – ATTACHEMENT B	ISSUED	VERSION	DATE
1	09/09/14	WATER MANAGEMENT PLAN – PLANT– VERSION 3 – ATTACHEMENT B			
2	12/31/14	WATER MANAGEMENT PLAN – PLANT– VERSION 3,4 – ATTACHEMENT B			
3	05/28/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS	FOR PERMITTING	4	5/15/17
4	05/15/17	PERMIT APPLICATION UPDATES			
			FOR CONSTRUCTION	–	–
			NOT APPROVED FOR CONSTRUCTION.		

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DRAWN: BJH  
CHECKED: DVS/AMP  
BARR PROJECT NO.: 23/69-0C29  
SCALE: AS SHOWN

PLANT DRAWING NUMBER:

FTB SEEPAGE CONTAINMENT  
AND STREAM AUGMENTATION SYSTEMS  
PLAN & PROFILE STATION 92+82 TO 123+76

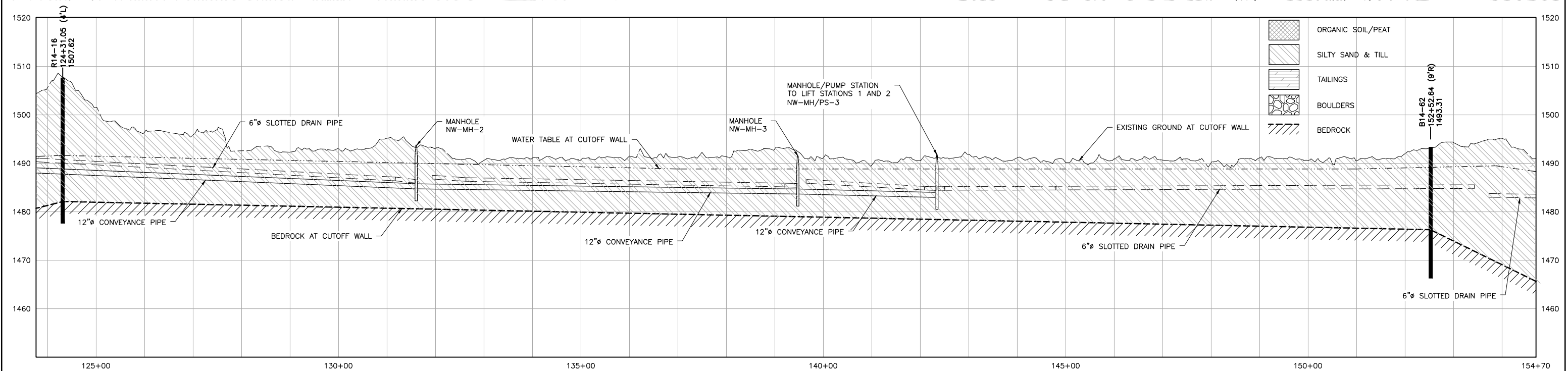
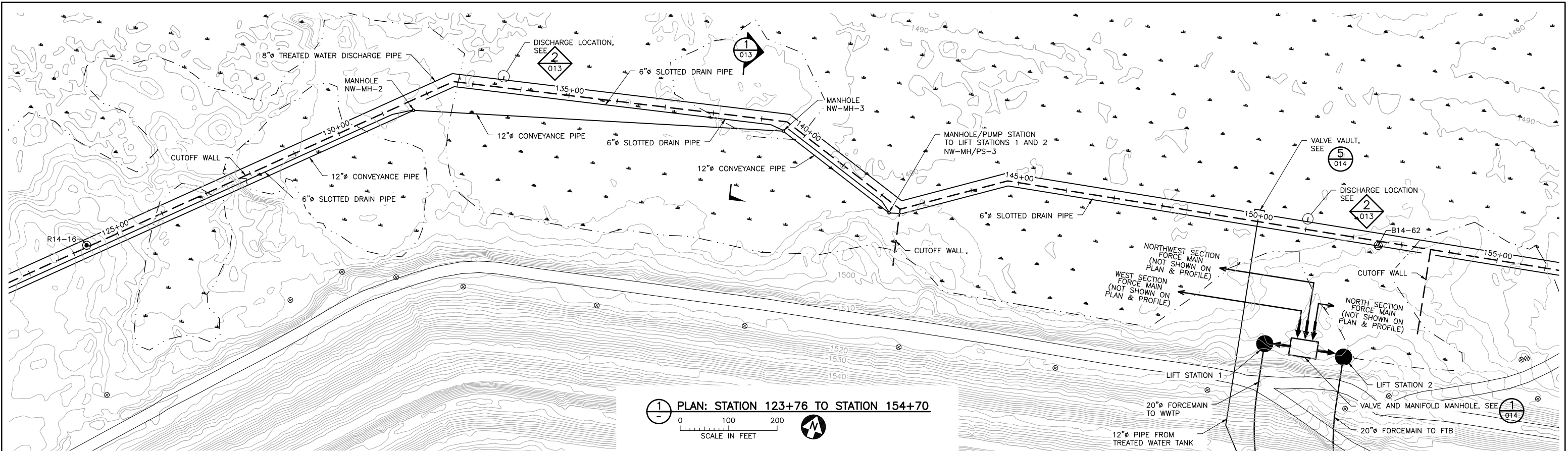
**POLYMET MINING**  
POLY MET MINING, INC.  
NORTHMET PROJECT  
HOYT LAKES, MINNESOTA

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BARR ENGINEERING CO.  
4300 MARKETPOINTE DRIVE  
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DWG. NO. FTBCA-007  
REV A

CADD USER: Cristian A. Diaz FILE: K:\DESIGN\23690029.10\PERMIT\_MNT-10-CU-008.DWG PLOT SCALE: 1:2 PLOT DATE: 5/15/2017 3:52 PM

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INCHES



2 PROFILE: STATION 123+76 TO STATION 154+70

VER NO	DATE	DESCRIPTION	ISSUE STATUS		
A	09/28/12	WATER MANAGEMENT PLAN – PLANT– VERSION 2 – ATTACHEMENT B	ISSUED	VERSION	DATE
1	09/09/14	WATER MANAGEMENT PLAN – PLANT– VERSION 3 – ATTACHEMENT B	FOR PERMITTING	4	5/15/17
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DRAWN: BJH  
CHECKED: DVS/AMP  
BARR PROJECT NO.: 23/69-0C29  
SCALE: AS SHOWN

PLANT DRAWING NUMBER:

FTB SEEPAGE CONTAINMENT  
AND STREAM AUGMENTATION SYSTEMS  
PLAN & PROFILE STATION 123+76 TO 154+70

POLYMET MINING

POLY MET MINING, INC.  
NORTHMET PROJECT  
HOYT LAKES, MINNESOTA

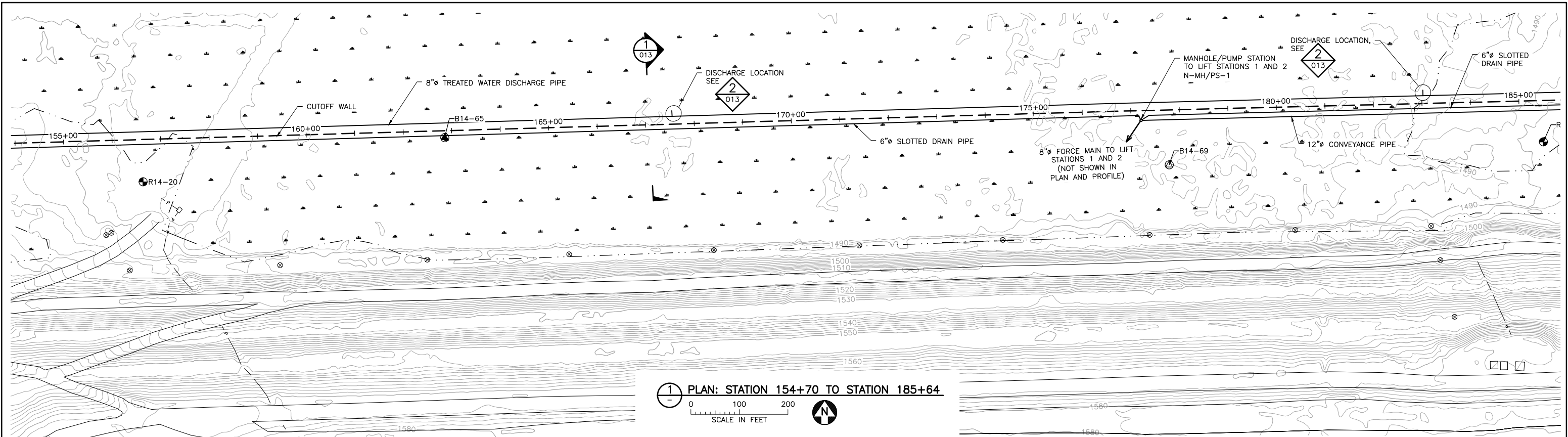
BARR ENGINEERING CO.  
4300 MARKETPOINTE DRIVE  
SUITE 200  
MINNEAPOLIS, MN.  
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DWG. NO. FTBCA-008

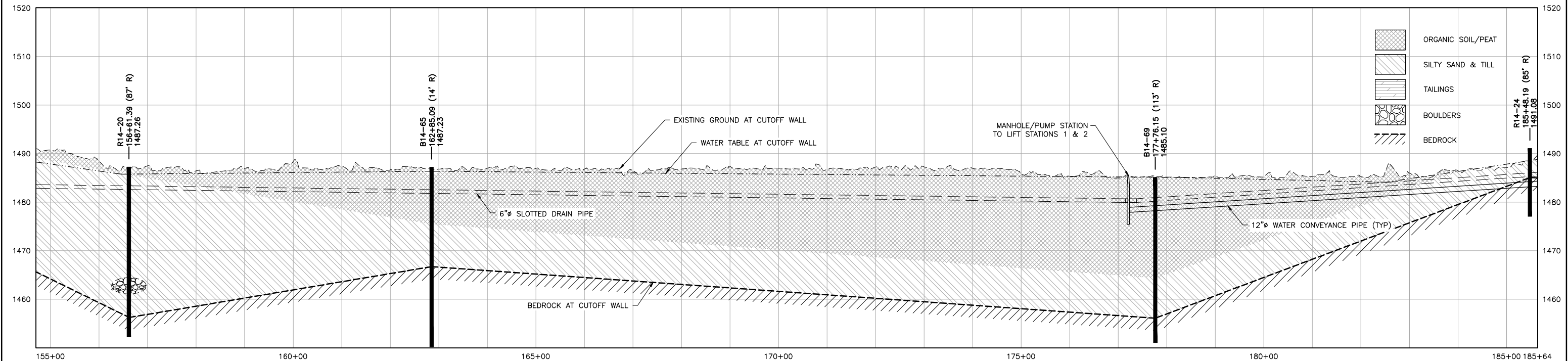
REV A

CADD USER: Cristian A. Diaz FILE: K:\DESIGN\2369029.10\PERMIT\_NMT-10-CU-009.DWG PLOT SCALE: 1:2 PLOT DATE: 5/15/2017 4:44 PM



2  
1  
INCHES



1 PLAN: STATION 154+70 TO STATION 185+64



2 PROFILE: STATION 154+70 TO STATION 185+64

PLANT DRAWING NUMBER:	
FTB SEEPAGE CONTAINMENT AND STREAM AUGMENTATION SYSTEMS PLAN & PROFILE STATION 154+70 TO 185+64	
 POLY MET MINING, INC. NORTHMET PROJECT HOYT LAKES, MINNESOTA	
 BARR ENGINEERING CO. 4300 MARKETPOINTE DRIVE SUITE 200 MINNEAPOLIS, MN. Ph: 1-800-632-2277	
DRAWN: BJH	REV A
CHECKED: DVS/AMP	
BARR PROJECT NO.: 23/69-OC29	
SCALE: AS SHOWN	
DWG. NO. FTBCA-009	

VER NO	DATE	DESCRIPTION	ISSUE STATUS		
A	09/28/12	WATER MANAGEMENT PLAN - PLANT- VERSION 2 - ATTACHEMENT B	ISSUED	VERSION	DATE
1	09/09/14	WATER MANAGEMENT PLAN - PLANT- VERSION 3 - ATTACHEMENT B	FOR PERMITTING	4	5/15/17
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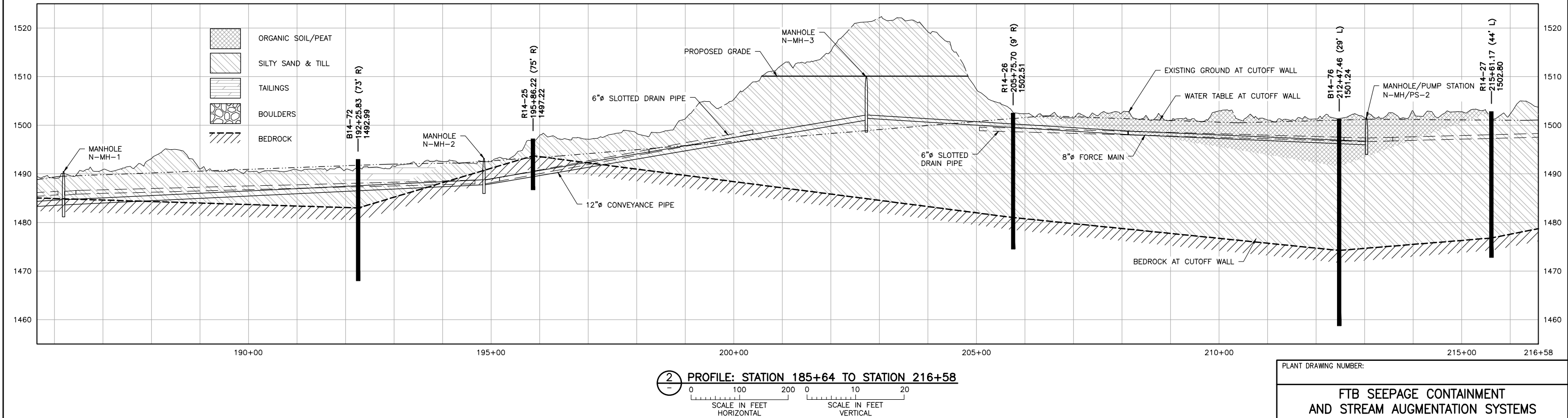
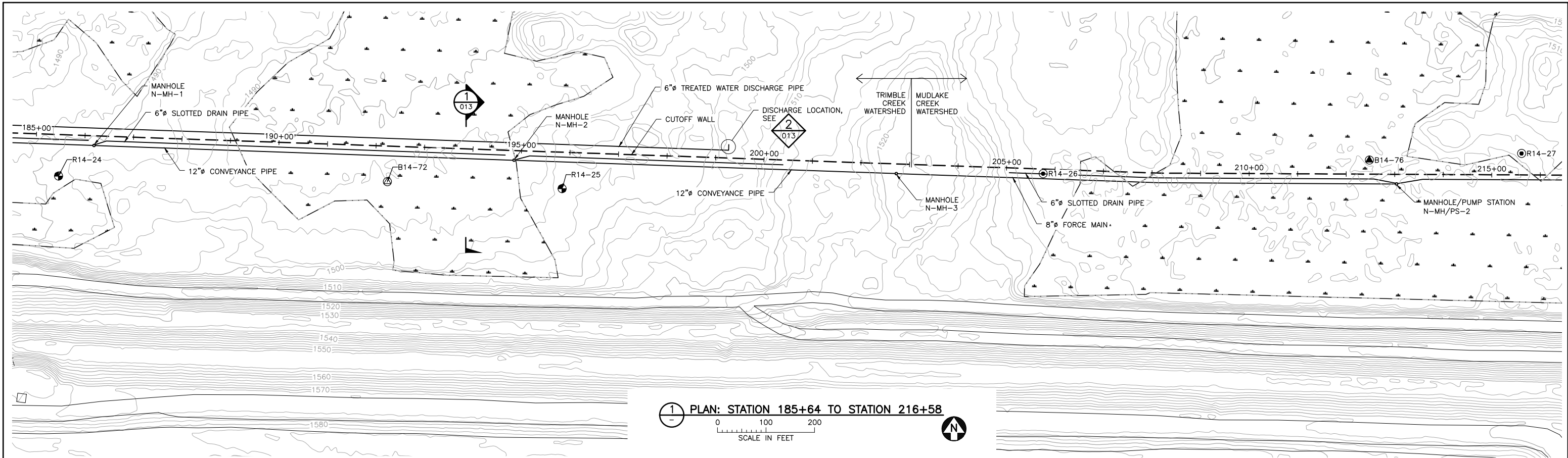
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PRINTED NAME THOMAS J. RADUE  
SIGNATURE *Thomas J. Radue*  
DATE 5/15/17 LICENSE# 20951

SCALE: AS SHOWN

CADD USER: Cristian A. Diaz FILE: K:\DESIGN\23690C29.10\PERMIT\_NMT-10-CU-010.DWG PLOT SCALE: 1:2 PLOT DATE: 5/15/2017 4:10 PM

2  
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INCHES



VER NO	DATE	DESCRIPTION	ISSUE STATUS		
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SIGNATURE Thomas J. Radue  
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DRAWN: BJH  
CHECKED: DVS/AMP  
BARR PROJECT NO.: 23/69-OC29  
SCALE: AS SHOWN

PLANT DRAWING NUMBER:

FTB SEEPAGE CONTAINMENT  
AND STREAM AUGMENTATION SYSTEMS  
PLAN & PROFILE STATION 185+64 TO 216+58

**POLYMET** MINING  
POLY MET MINING, INC.  
NORTHMET PROJECT  
HOYT LAKES, MINNESOTA

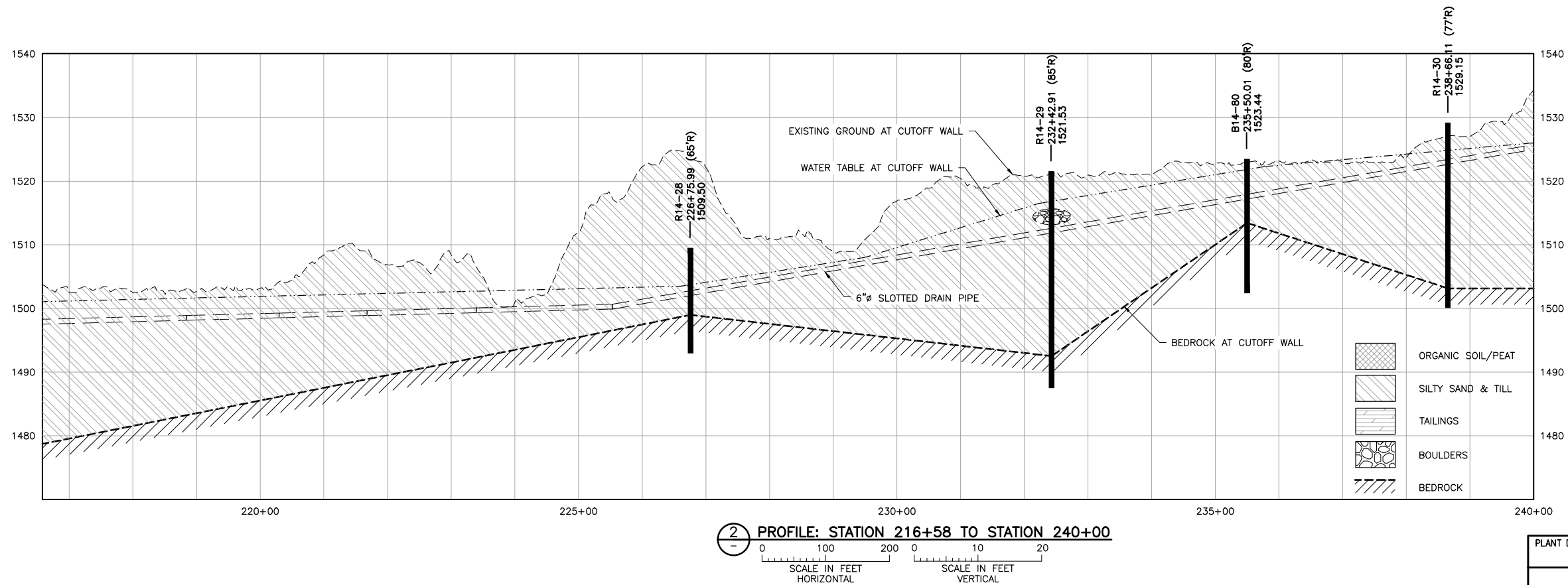
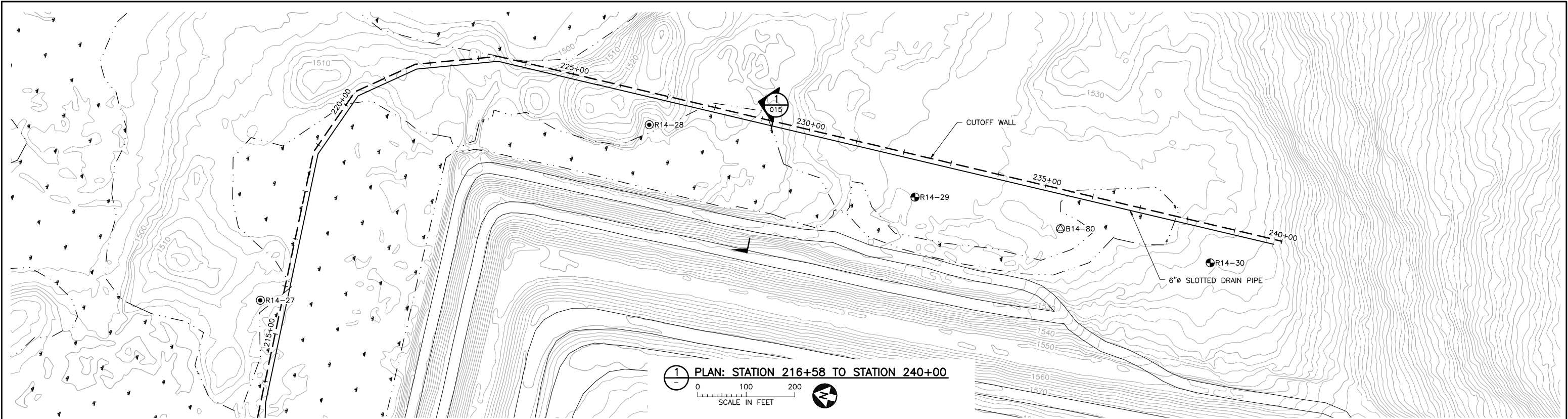
**BARR** ENGINEERING CO.  
4300 MARKETPOINTE DRIVE  
SUITE 200  
MINNEAPOLIS, MN.  
Ph: 1-800-632-2277



DWG. NO. FTBCA-010  
REV A



CADD USER: Cristian A. Diaz FILE: K:\DESIGN\23690C29.10\PERMIT\_NMT-10-CU-011.DWG PLOT SCALE: 1:2 PLOT DATE: 5/15/2017 4:19 PM

INCHES  
1  
2



PLANT DRAWING NUMBER:	
FTB SEEPAGE CONTAINMENT AND STREAM AUGMENTATION SYSTEMS PLAN & PROFILE STATION 216+58 TO 240+00	
 POLY MET MINING, INC. NORTHMET PROJECT HOYT LAKES, MINNESOTA	
 BARR ENGINEERING CO. 4300 MARKETPOINTE DRIVE SUITE 200 MINNEAPOLIS, MN. Ph: 1-800-632-2277	
DRAWN: BJH	REV A
CHECKED: DVS/AMP	
BARR PROJECT NO.: 23/69-0C29	
SCALE: AS SHOWN	
DWG. NO. FTBCA-011	

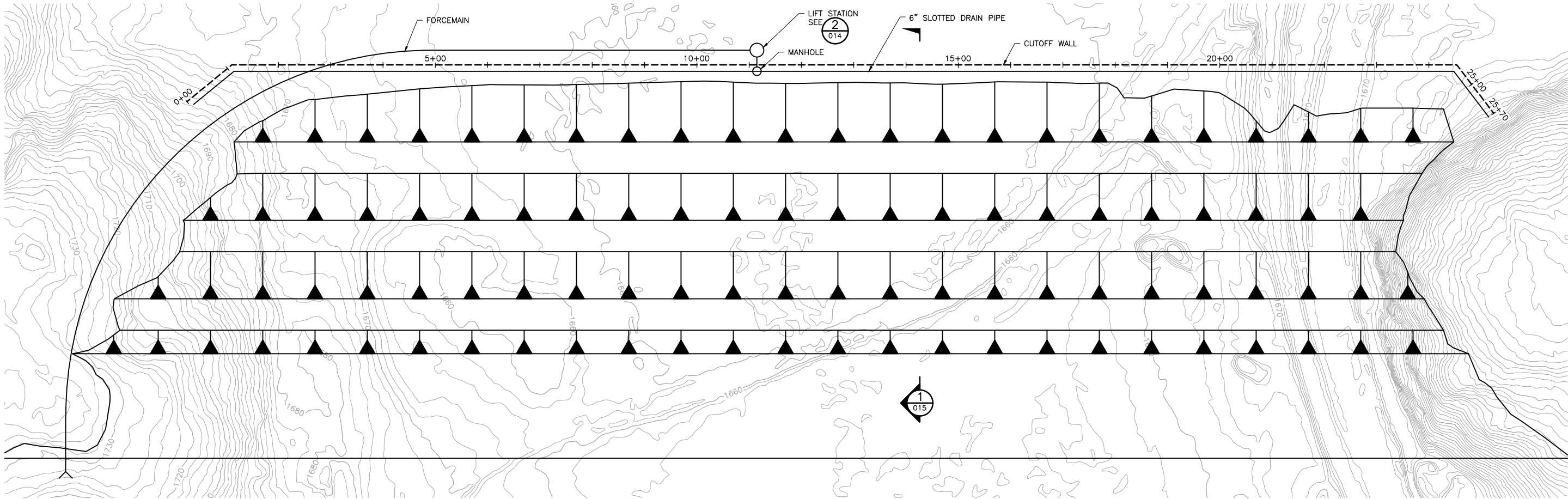
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A	09/28/12	WATER MANAGEMENT PLAN - PLANT- VERSION 2 - ATTACHEMENT B	ISSUED	VERSION	DATE
1	09/09/14	WATER MANAGEMENT PLAN - PLANT- VERSION 3 - ATTACHEMENT B	FOR PERMITTING	4	5/15/17
2	12/31/14	WATER MANAGEMENT PLAN - PLANT- VERSION 3,4 - ATTACHEMENT B			
3	05/28/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS			
4	05/15/17	PERMIT APPLICATION UPDATES	FOR CONSTRUCTION	-	-
			NOT APPROVED FOR CONSTRUCTION.		

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

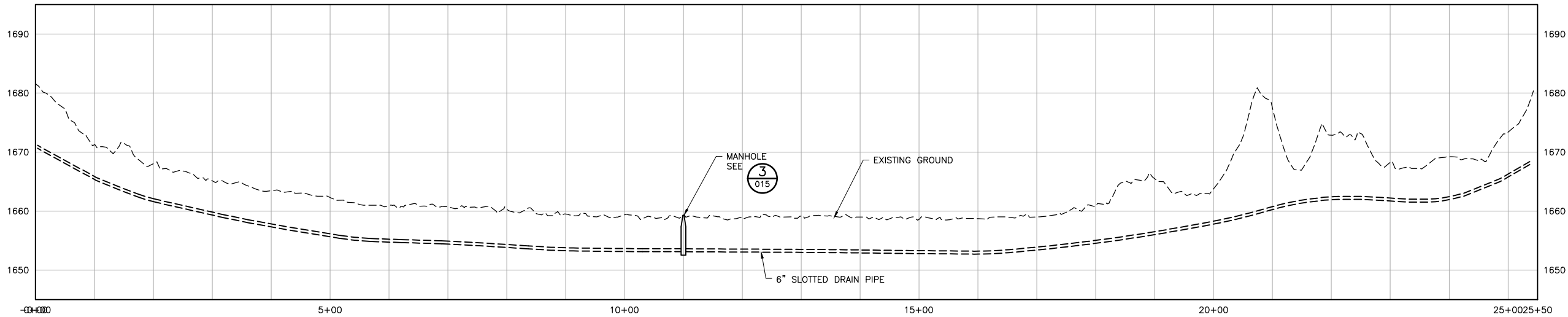
PRINTED NAME THOMAS J. RADUE  
SIGNATURE *Thomas J. Radue*  
DATE 5/15/17 LICENSE# 20951

CADD USER: Cristian A. Diaz FILE: K:\DESIGN\23690C29.10\PERMIT\_NMT-10-CU-012.DWG PLOT SCALE: 1:2 PLOT DATE: 5/15/2017 4:23 PM

INCHES  
1  
2



1 PLAN: STATION 0+00 TO STATION 23+33  
0 100 200  
SCALE IN FEET



1 PLAN: STATION 0+00 TO STATION 23+33  
0 100 200 0 10 20  
SCALE IN FEET HORIZONTAL VERTICAL

VER NO	DATE	DESCRIPTION	ISSUE STATUS		
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PRINTED NAME THOMAS J. RADUE  
SIGNATURE Thomas J. Radue  
DATE 5/15/17 LICENSE# 20951


DRAWN: BDP  
CHECKED: DVS/AMP  
BARR PROJECT NO.: 23/69-0C29  
SCALE: AS SHOWN

PLANT DRAWING NUMBER:

FTB SEEPAGE CONTAINMENT  
AND STREAM AUGMENTATION SYSTEMS  
PLAN & PROFILE STATION 0+00 TO 25+43



POLYMET MINING



BARR

POLY MET MINING, INC.  
NORTHMET PROJECT  
HOYT LAKES, MINNESOTA

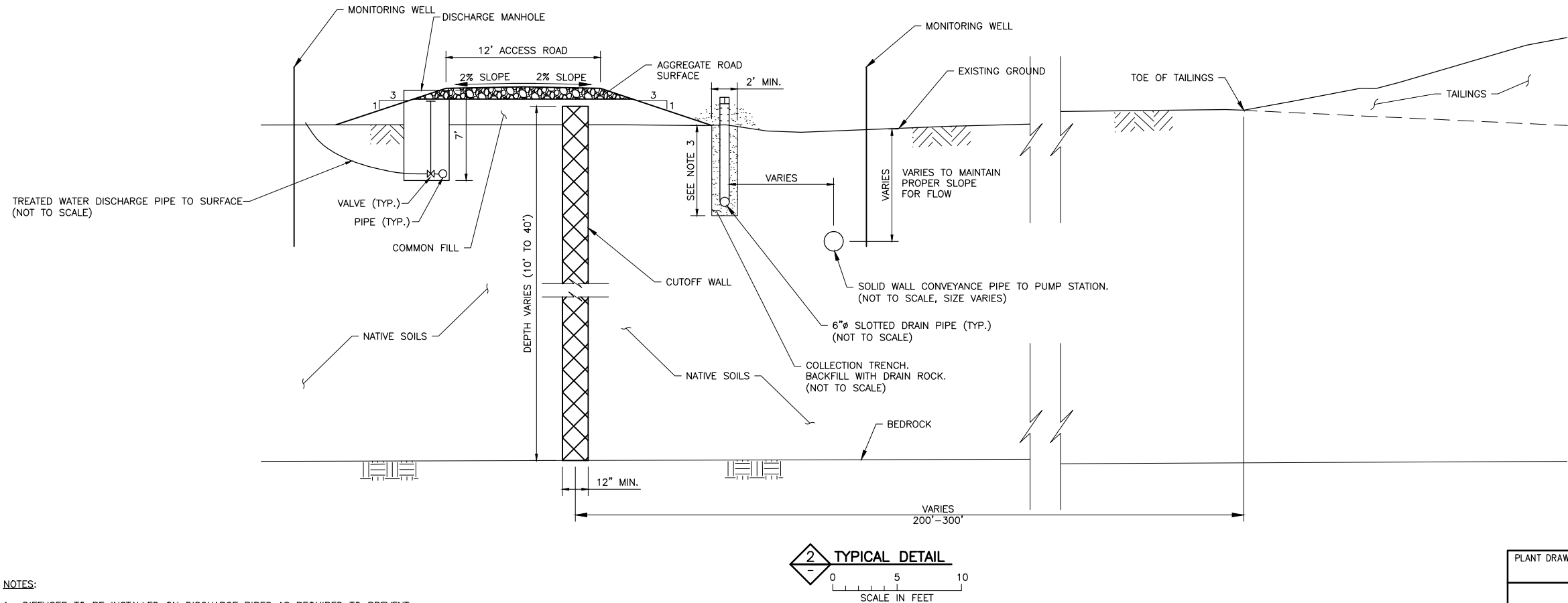
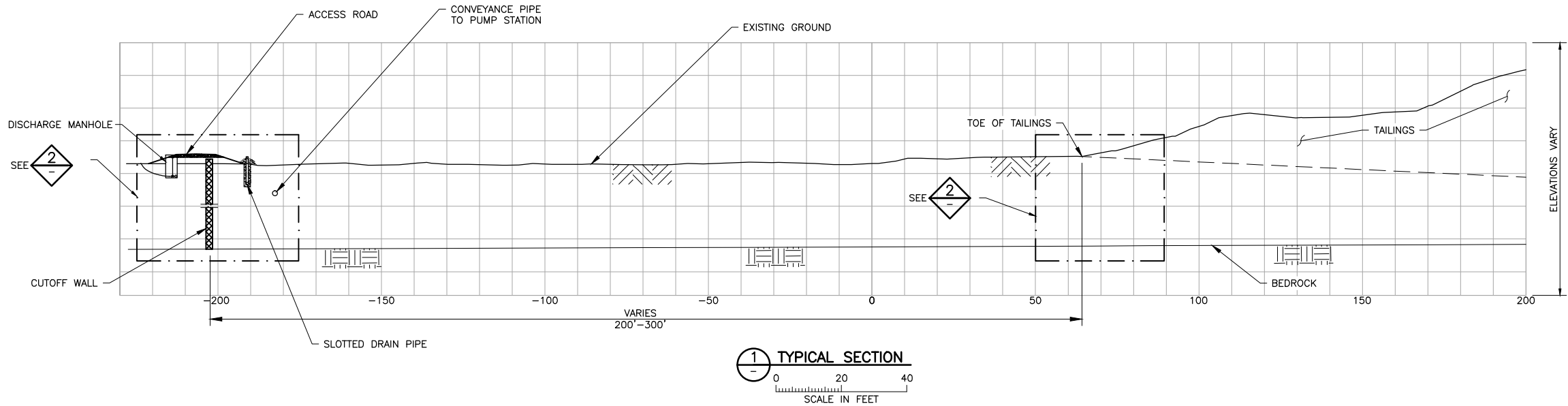
BARR ENGINEERING CO.  
4300 MARKETPOINTE DRIVE  
SUITE 200  
MINNEAPOLIS, MN.  
Ph: 1-800-632-2277

DWG. NO. FTBCA-012

REV A



CADD USER: Cristian A. Diaz FILE: K:\DESIGN\23690029.10\PERMIT\_NMT-10-CU-013.DWG PLOT SCALE: 1:2 PLOT DATE: 5/15/2017 4:25 PM



NOTES:



1. DIFFUSER TO BE INSTALLED ON DISCHARGE PIPES AS REQUIRED TO PREVENT EROSION.
2. CUTOFF WALL MAXIMUM DESIGN HYDRAULIC CONDUCTIVITY =  $1 \times 10^{-6}$  CM/SEC
3. 7' TYPICAL BUT MAY BE LESS IN AREAS WITH SHALLOW BEDROCK

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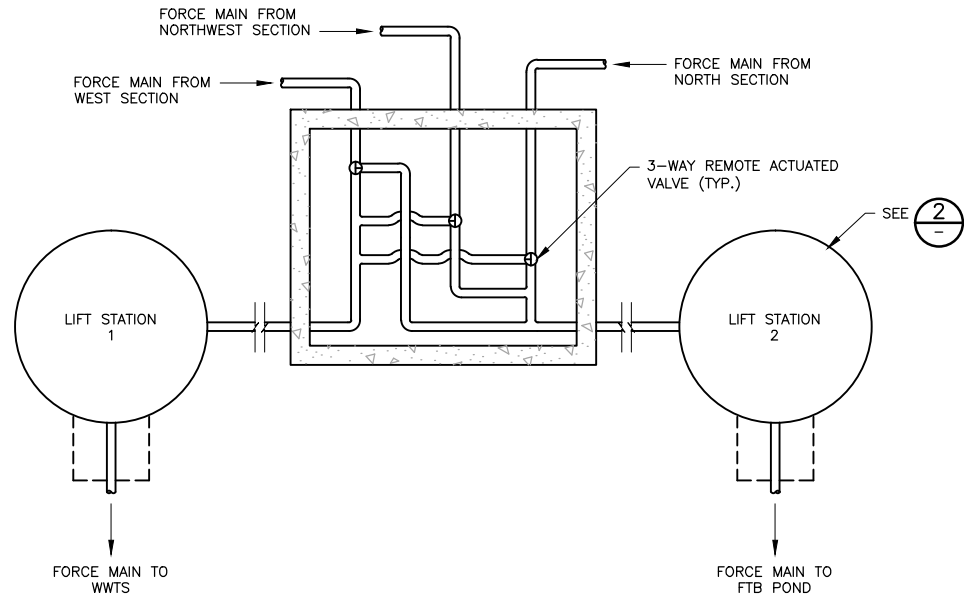
PRINTED NAME THOMAS J. RADUE  
SIGNATURE *Thomas J. Radue*  
DATE 5/15/17 LICENSE# 20951

DRAWN: BDP  
CHECKED: DVS/AMP  
BARR PROJECT NO.: 23/69-0C29  
SCALE: AS SHOWN

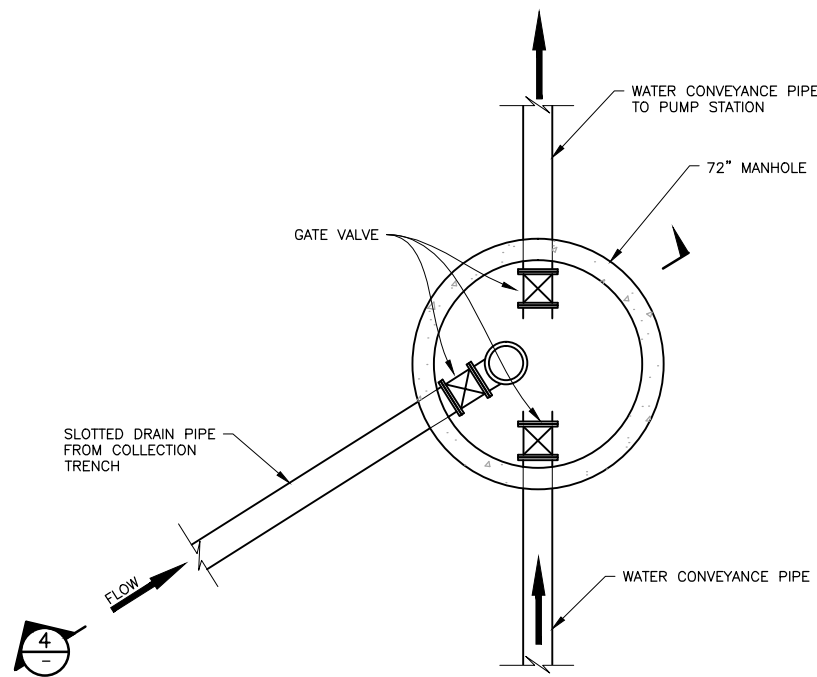
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FTB SEEPAGE CONTAINMENT AND STREAM AUGMENTATION SYSTEMS DETAILS	
 POLY MET MINING, INC. NORTHMET PROJECT HOYT LAKES, MINNESOTA	
 BARR ENGINEERING CO. 4300 MARKETPOINTE DRIVE SUITE 200 MINNEAPOLIS, MN. Ph: 1-800-632-2277	
DWG. NO. FTBCA-013	REV A

CADD USER: Cristian A. Diaz FILE: K:\DESIGN\23690029.10\PERMIT\_NMT-10-CU-014.DWG PLOT SCALE: 1:2 PLOT DATE: 5/15/2017 5:00 PM

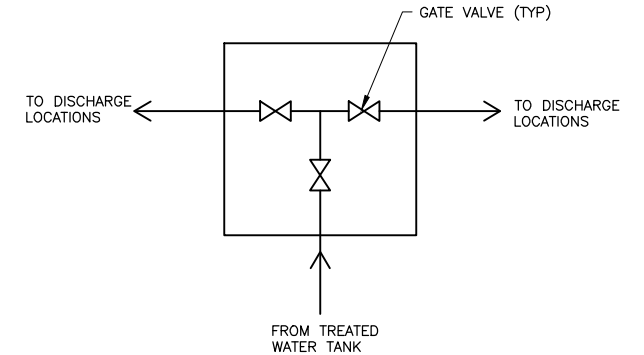
2  
1  
INCHES



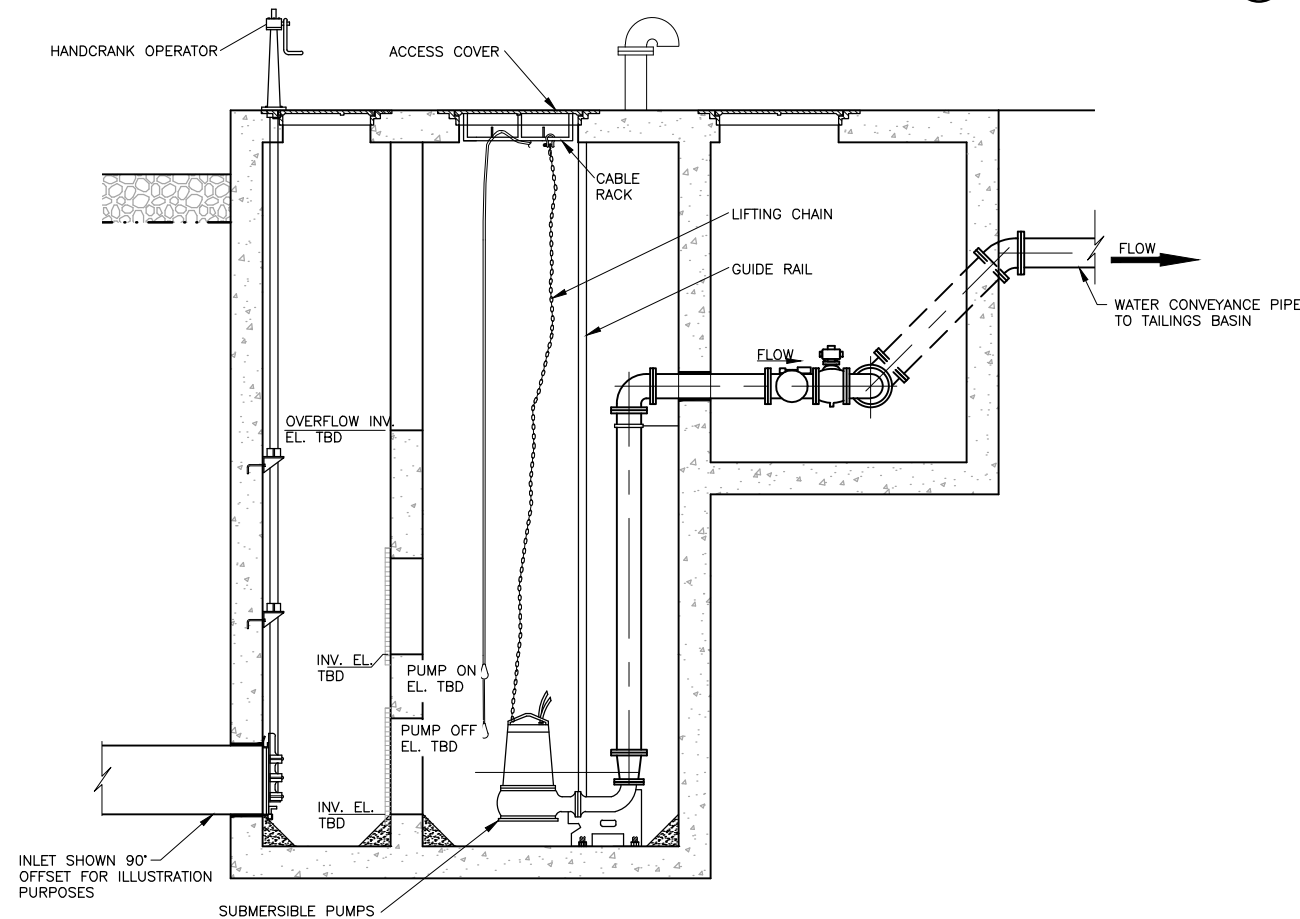
1 PLAN: VALVE AND MANIFOLD MANHOLE  
008 NOT TO SCALE



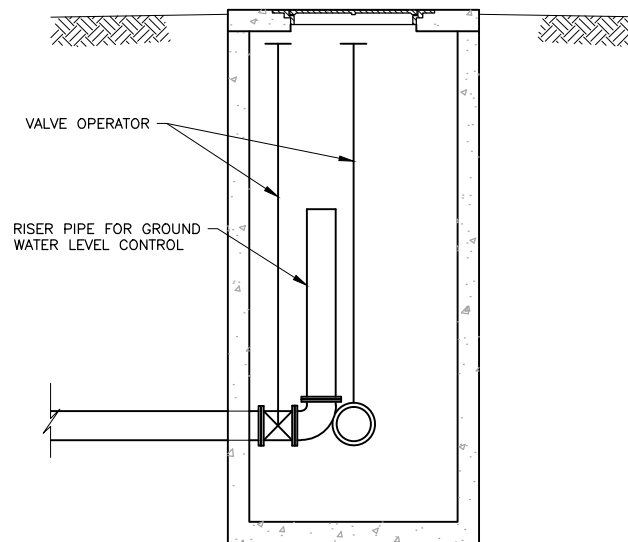
3 PLAN: MANHOLE (TYP.)  
NOT TO SCALE



5 PLAN: VALVE VAULT  
008 NOT TO SCALE



2 SECTION: LIFT STATION (TYP.)  
NOT TO SCALE



4 SECTION: MANHOLE (TYP.)  
NOT TO SCALE

NOTES:



1. LIFT STATION, MANHOLE AND VAULT CONFIGURATIONS SHOWN ON THIS SHEET ARE INTENDED TO BE REPRESENTATIVE OF TYPICAL FACILITIES NEEDED FOR OPERATION OF THE SEEPAGE CONTAINMENT AND STREAM AUGMENTATION SYSTEMS. THE ACTUAL DESIGN FOR EACH LIFT STATION, PUMP STATION, MANHOLE, AND VAULT WILL BE DEVELOPED DURING DETAILED DESIGN TO REFLECT THE SPECIFIC EQUIPMENT REQUIREMENTS FOR EACH LOCATION.
2. PUMP STATIONS WILL BE SIMILAR TO MANHOLE SHOWN IN 3 WITH SMALL SUBMERSIBLE PUMP.
3. FLOW METERS WILL BE PROVIDED FOR DISCHARGE FROM ALL LIFT AND PUMP STATIONS AND AT OTHER LOCATIONS AS REQUIRED FOR OPERATIONS.

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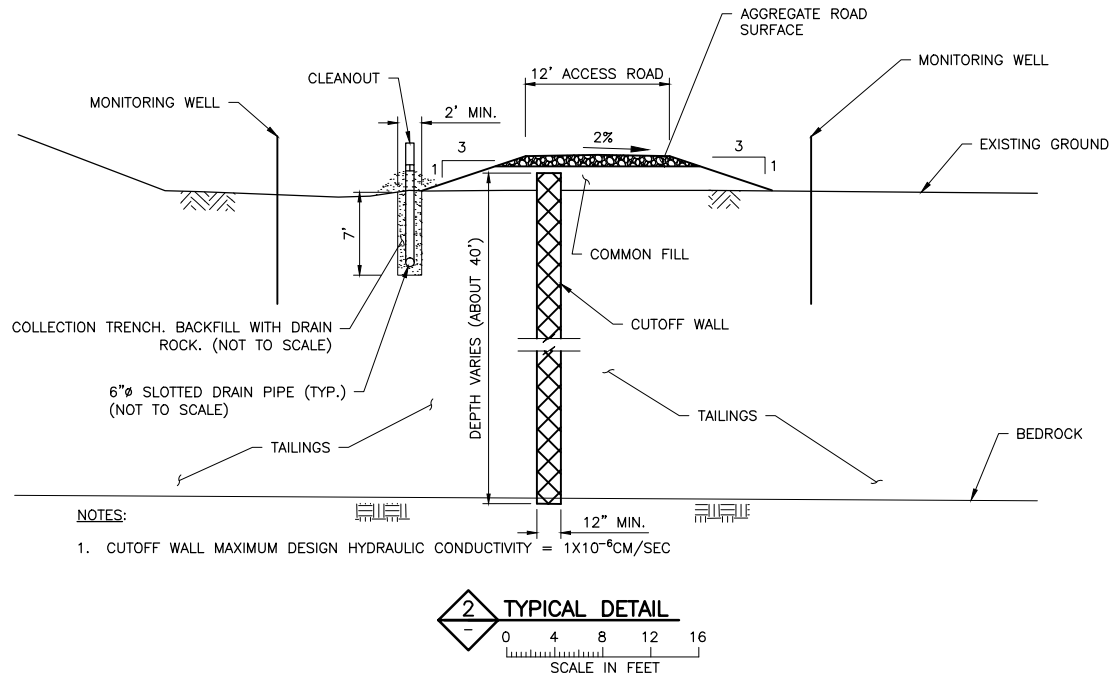
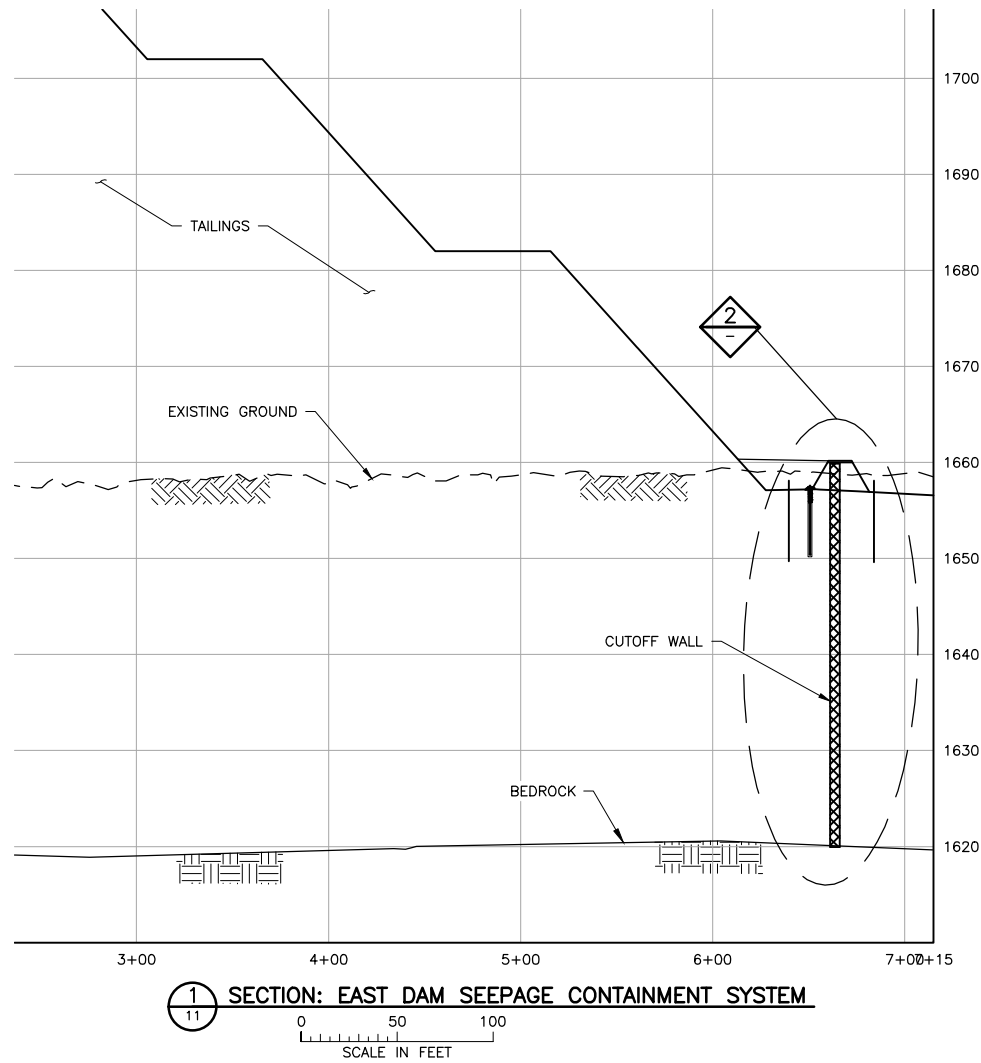
PRINTED NAME THOMAS J. RADUE  
SIGNATURE *Thomas J. Radue*  
DATE 5/15/17 LICENSE# 20951

DRAWN: BDP  
CHECKED: DVS/AMP  
BARR PROJECT NO.: 23/69-0C29  
SCALE: AS SHOWN

PLANT DRAWING NUMBER:	
FTB SEEPAGE CONTAINMENT AND STREAM AUGMENTATION SYSTEMS DETAILS	
	POLY MET MINING, INC. NORTHMET PROJECT HOYT LAKES, MINNESOTA
	BARR ENGINEERING CO. 4300 MARKETPOINTE DRIVE SUITE 200 MINNEAPOLIS, MN. Ph: 1-800-632-2277
DWG. NO. FTBCA-014	REV A

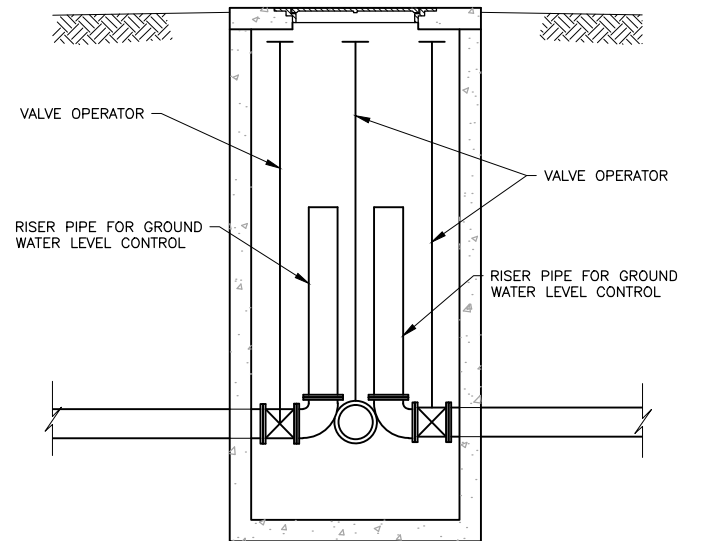
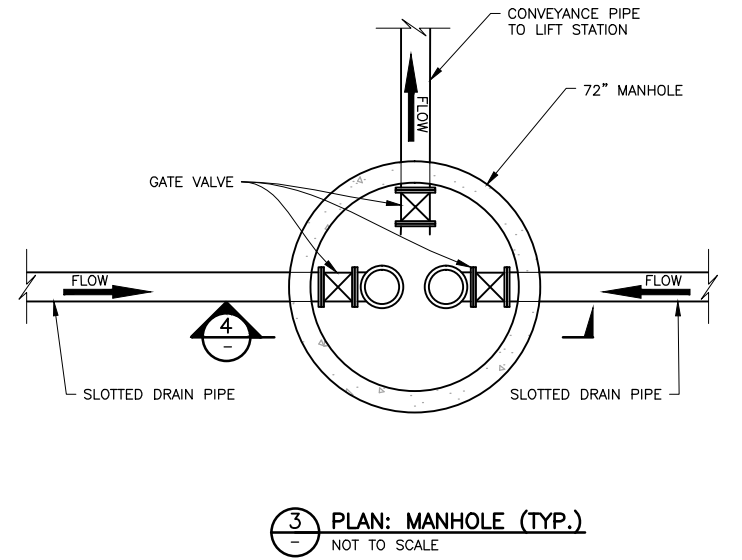
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INCHES  
1  
2



NOTES:

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- FLOW METERS WILL BE PROVIDED FOR DISCHARGE FROM ALL LIFT AND PUMP STATIONS AND AT OTHER LOCATIONS AS REQUIRED FOR OPERATIONS.



4 SECTION: MANHOLE (TYP.)  
NOT TO SCALE

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PLANT DRAWING NUMBER:

FTB SEEPAGE CONTAINMENT AND STREAM AUGMENTATION SYSTEMS DETAILS



POLYMET MINING

POLY MET MINING, INC.  
NORTHMET PROJECT  
HOYT LAKES, MINNESOTA



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Ph: 1-800-632-2277

DWG. NO. FTBCA-015

REV A