

**Appendix 4 Categories 1, 2/3, and 4 Stockpiles and Ore Surge Pile Design and
Category 1 Stockpile Groundwater Containment System Permit
Application Support Drawings**

Errata Sheet

Poly Met Mining, Inc. NorthMet Project

Permit Application Support Drawings: Categories 1, 2/3, and 4 Stockpiles and Ore Surge Pile Design

July 2016 (version 2)

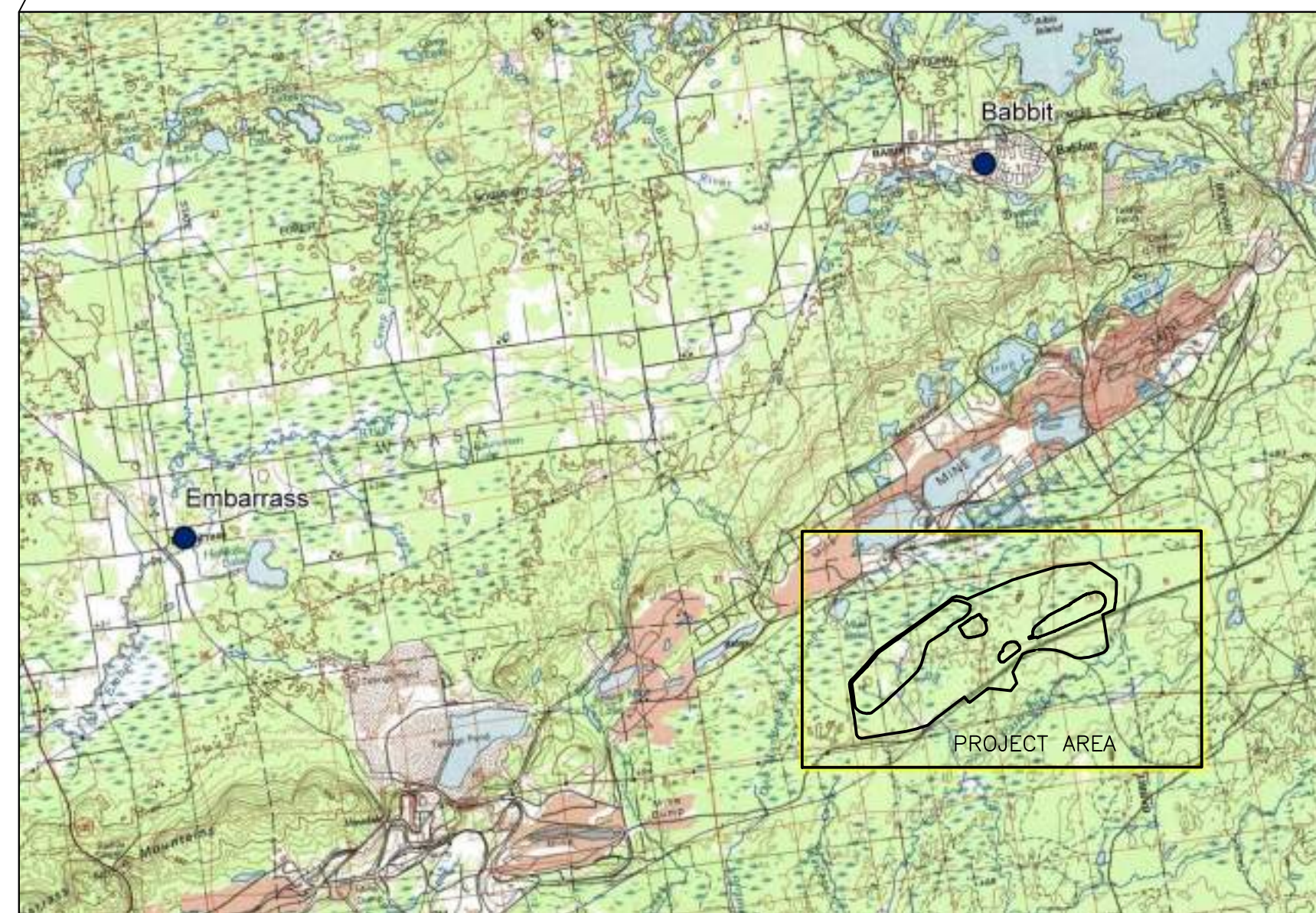
Engineering design is currently in progress. The table below lists changes that have been identified to-date and have not yet been incorporated in the attached permit application support drawings within this set. Final design will incorporate these changes along with additional site-specific information (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
Global change to all sheets, as needed	The terminology "mine drainage" as noted in these drawings will be changed to "mine water".

POLY MET MINING, INC. NORTHMET PROJECT
PERMIT APPLICATION SUPPORT DRAWINGS
CATEGORIES 1, 2/3, AND 4 STOCKPILES
AND ORE SURGE PILE DESIGN
HOYT LAKES, MINNESOTA






PROJECT LOCATION MAP



SITE LOCATION

DRAWING LIST	
SHEET NUMBER	SHEET TITLE
SKP-001	TITLE SHEET AND LOCATION MAP
SKP-002	LEGEND, GENERAL NOTES AND SPECIFICATIONS
SKP-003	STOCKPILE LAYOUTS – MINE YEAR 1 LIMITS
SKP-004	STOCKPILE LAYOUTS – MINE YEAR 2 LIMITS
SKP-005	STOCKPILE LAYOUTS – MINE YEAR 11 LIMITS
SKP-006	STOCKPILE LAYOUTS – MINE YEAR 21 LIMITS CLOSURE CONFIGURATION
SKP-007	EXISTING SITE CONDITIONS
SKP-008	SITE LAYOUT AND LOCATION OF FIELD INVESTIGATIONS
SKP-009	DEPTH TO BEDROCK ISOPACH MAP
SKP-010	CATEGORY 1 STOCKPILE SUBGRADE EXCAVATION PLAN
SKP-011	CATEGORY 1 STOCKPILE MINE YEAR 1 CONTINGENCY CLOSURE CONFIGURATION
SKP-012	CATEGORY 1 STOCKPILE FINAL GRADES AND SUB-BASIN DELINEATION
SKP-013	CATEGORY 1 STOCKPILE DESIGN SECTIONS
SKP-014	CATEGORY 2/3 STOCKPILE SUBGRADE EXCAVATION PLAN
SKP-015	CATEGORY 2/3 STOCKPILE FOUNDATION GRADING PLAN – MINE YEAR 1 AND MAXIMUM
SKP-016	CATEGORY 2/3 STOCKPILE UNDERDRAIN PIPING PLAN – MINE YEAR 1 AND MAXIMUM
SKP-017	CATEGORY 2/3 STOCKPILE OVERLINER DRAINAGE PIPING PLAN – MINE YEAR 1 AND MAXIMUM
SKP-018	CATEGORY 2/3 STOCKPILE MAXIMUM CAPACITY CONFIGURATION
SKP-019	CATEGORY 2/3 STOCKPILE DESIGN SECTIONS
SKP-020	CATEGORY 4 STOCKPILE SUBGRADE EXCAVATION PLAN
SKP-021	CATEGORY 4 STOCKPILE FOUNDATION GRADING PLAN – MINE YEAR 1 AND MAXIMUM
SKP-022	CATEGORY 4 STOCKPILE UNDERDRAIN PIPING PLAN – MINE YEAR 1 AND MAXIMUM
SKP-023	CATEGORY 4 STOCKPILE OVERLINER DRAINAGE PIPING PLAN – MINE YEAR 1 AND MAXIMUM
SKP-024	CATEGORY 4 STOCKPILE MAXIMUM CAPACITY CONFIGURATION
SKP-025	CATEGORY 4 STOCKPILE DESIGN SECTIONS
SKP-026	ORE SURGE PILE SUBGRADE EXCAVATION PLAN
SKP-027	ORE SURGE PILE FOUNDATION GRADING PLAN
SKP-028	ORE SURGE PILE UNDERDRAIN PIPING PLAN
SKP-029	ORE SURGE PILE OVERLINER DRAINAGE PIPING PLAN
SKP-030	ORE SURGE PILE TYPICAL CONFIGURATION
SKP-031	ORE SURGE PILE DESIGN SECTIONS
SKP-032	CATEGORY 1 STOCKPILE RECLAMATION AND OPERATIONS SURFACE WATER – MANAGEMENT DETAILS – SHEET 1 OF 2
SKP-033	CATEGORY 1 STOCKPILE RECLAMATION AND OPERATIONS SURFACE WATER – MANAGEMENT DETAILS – SHEET 2 OF 2
SKP-034	CATEGORY 1 STOCKPILE PHASED COVER DESIGN
SKP-035	CONSTRUCTION DETAILS

VER NO	DATE	DESCRIPTION	ISSUE STATUS							
A	12/02/11	ISSUED FOR REVIEW FOR INCLUSION IN ROCK AND OVERBURDEN MANAGEMENT PLAN (ROMP)	ISSUED	VERSION	DATE	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. SIGNATURE  PRINTED NAME BRENT R. BRONSON DATE 5/22/15 LICENSE # 46492	DRAWN:	POLY MET MINING, INC.		
B	2/15/13	ISSUED FOR REVIEW FOR INCLUSION IN ROMP	FOR PERMITTING	F	5-22-15		MTM	NORTHMET PROJECT		
C	5/29/13	ISSUED FOR REVIEW FOR INCLUSION IN ROMP						HOYT LAKES, MINNESOTA		
D	1/14/14	ISSUED FOR AGENCY REVIEW						GOLDER PROJECT NO. : 113-2209	 GOLDER ASSOCIATES INC. 44 UNION BOULEVARD, SUITE 300 LAKEWOOD, CO USA 80233 Ph: (303) 980-0540 Fax: (303) 985-2080 www.golder.com	
E	4/10/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS	SCALE:	DWG. NO.						
F	5/22/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS			AS SHOWN		SKP-001			
						NOT APPROVED FOR CONSTRUCTION.				

LEGEND

MAJOR FEATURE

EXISTING GROUND TOPOGRAPHY (SEE NOTE 2)

PROPOSED FINISHED GRADE TOPOGRAPHY

SLOPE DIRECTION

CROSS SECTION IDENTIFIER

SHEET WHERE SECTION IS LOCATED

SLOPE

HAUL ROADS

MINE SITE BOUNDARY

PIT BOUNDARY

MINE YEAR 1 ORE, WASTE ROCK STOCKPILE LIMITS

MAXIMUM ORE, WASTE ROCK STOCKPILE LIMITS

GEOMEMBRANE BARRIER LAYER

PREPARED SUBGRADE

SOIL LINER 1

SOIL LINER 2

WASTE ROCK OR ORE

STRUCTURAL FILL

GRANULAR DRAINAGE MATERIAL 1

COMMON FILL 1

DRAIN ROCK

RIPRAP

RANDOM FILL

OVERBURDEN MATERIAL

VERTICAL PERCOLATION LAYER (USCS - ML)

LATERAL DRAINAGE LAYER (USCS - SP OR SM)

TERTIARY COLLECTION PIPING

4-INCH

PRIMARY AND SECONDARY COLLECTION PIPING

4-INCH

6-INCH

8-INCH

10-INCH

12-INCH

GATP-06-7

GOLDER ASSOC. TEST PIT (2006)

SB-05-01

BARR ENGINEERING BOREHOLES (2005)

RS-11

BARR ENGINEERING BOREHOLES (2008)

J003

AMERICAN ENGINEERING TESTING, INC. BOREHOLES (2010)

SHALLOW MARSH

CONIFEROUS SWAMP

HARDWOOD SWAMP

SHRUB SWAMP

CONIFEROUS BOG

OPEN BOG

SEDGE MEADOW

LIST OF ABBREVIATIONS

AMSL	ABOVE MEAN SEA LEVEL
CY	CUBIC YARD
DIA.	DIAMETER
EL.	ELEVATION
ET	EVAPOTRANSPIRATION
FT.	FEET
HDPE	HIGH DENSITY POLYETHYLENE
ID	INSIDE DIAMETER
IN.	INCH
LLDPE	LINEAR LOW DENSITY POLYETHYLENE
LCRS	LEAK COLLECTION AND RECOVERY SYSTEM
MAX.	MAXIMUM
MIN.	MINIMUM
N.T.S.	NOT TO SCALE
OD	OUTSIDE DIAMETER
SY	SQUARE YARD
TYP.	TYPICAL
ROMP	ROCK AND OVERBURDEN MANAGEMENT PLAN
USCS	UNIFIED SOIL CLASSIFICATION SYSTEM
CPEP	PERFORATED CORRUGATED POLYETHYLENE

GENERAL NOTES:

- THIS DRAWING SET REPRESENTS THE DESIGN FOR PERMITTING FOR CATEGORY 1 STOCKPILE, CATEGORY 2/3 STOCKPILE, CATEGORY 4 STOCKPILE AND ORE SURGE PILE FOR THE POLYMET NORTHMET PROJECT IN HOYT LAKES, MINNESOTA, PREPARED IN SUPPORT OF A PERMIT TO MINE. THE DRAWING SET ONLY INCLUDES INFRASTRUCTURE ASSOCIATED WITH THE MOVEMENT OF ROCK (STOCKPILES, PITS, HAUL ROADS, AND RAIL TRANSFER HOPPER) AND NOT OTHER SUPPORT FACILITIES.
- BASE TOPOGRAPHY PROVIDED BY BARR ENGINEERING IN AUGUST 2011.
- GOLDER ASSOCIATES INC. (GOLDER) IS RESPONSIBLE FOR STOCKPILE DESIGNS WITH BATTERY LIMITS DEFINED BY THE PERIMETER/LINER BERMS AND THE UNDERDRAIN SUMPS.
- AT THE BASIC ENGINEERING LEVEL, LIMITED GEOTECHNICAL DATA EXISTS, PARTICULARLY IN LOWLAND AREAS. ADDITIONAL DATA WILL BE OBTAINED FROM THESE AREAS AFTER THE PERMIT TO MINE IS APPROVED. SUBGRADE EXCAVATION PLANS WERE DEVELOPED USING AVAILABLE INFORMATION, AND WILL BE UPDATED FOR FINAL DESIGN BASED ON RESULTS OF PHASE II GEOTECHNICAL INVESTIGATION.
- EARTHWORK QUANTITIES BASED ON NEAT LINE (I.E., NET CUT/ FILL SHRINKAGE FACTOR = 1.0).
- PREPARED SUBGRADE, AS DEFINED ON THE DRAWINGS, INCLUDES CLEARING, GRUBBING, TOPSOIL REMOVAL, REMOVAL OF GEOTECHNICALLY-UNSUITABLE MATERIALS, MOISTURE CONDITIONING, AND SUBGRADE COMPACTION AS DEFINED IN THE SPECIFICATIONS.
- FOUNDATION PREPARATION ASSUMES THE FOLLOWING GENERAL CONSTRUCTION SEQUENCE: (I) EXCAVATE TO BEDROCK WITHIN LOWLAND AREAS ASSUMING A MAXIMUM DEPTH OF OVER-EXCAVATION OF 20 FEET, OR UNTIL REACHING GEOTECHNICALLY-SUITABLE FOUNDATION SOILS AS DETERMINED BY THE PHASE II GEOTECHNICAL INVESTIGATION. STOCKPILE ORGANIC SOILS AND TILL MATERIAL SEPARATELY FOR FUTURE USE AS RECLAMATION SOILS AND STRUCTURAL FILL; (II) PLACE STRUCTURAL FILL AS REQUIRED TO MEET THE FOUNDATION GRADE REQUIREMENTS WITH GRANULAR SOILS, E.G., CATEGORY 1 WASTE ROCK MATERIAL; (III) ESTABLISH FOUNDATION DRAINAGE AS REQUIRED TO PREVENT EXCESS PORE PRESSURES DURING OPERATION; AND (IV) CONSTRUCT LINER SYSTEM DEPENDENT UPON THE REACTIVITY CATEGORY OF THE STOCKPILE MATERIAL.
- AREAS WITH UNSUITABLE SOILS (LOWLAND AREAS) ARE ASSUMED TO COINCIDE WITH THE PREVIOUSLY IDENTIFIED WETLAND AREAS. HORIZONTAL AND VERTICAL EXTENTS OF LOWLAND AREAS ARE EXPECTED TO BE REVISED BASED ON RESULTS OF PHASE II GEOTECHNICAL INVESTIGATION.
- POST-CONSOLIDATION STOCKPILE SETTLEMENTS WERE ESTIMATED BASED ON LIMITED INFORMATION ON THE CONSOLIDATION PROPERTIES OF SUBGRADE MATERIALS. HENCE, FOUNDATION EXCAVATION AND GRADING PLANS ARE ANTICIPATED TO UNDERGO MINOR MODIFICATIONS BASED ON THE RESULTS OF THE PHASE II GEOTECHNICAL INVESTIGATION TO ENSURE SUFFICIENT DRAINAGE.
- CATEGORY 1 WASTE ROCK STOCKPILE WILL BE RECLAIMED BY PLACEMENT OF A GEOMEMBRANE COVER AT CLOSURE. PRIOR TO CLOSURE, WASTE ROCK CATEGORY 2, 3 AND 4 WILL BE USED TO BACKFILL EAST PIT.
- LIMITS OF DISTURBANCE (I.E., CLEARING LIMITS) ASSUMED TO BE 40 FEET FROM THE FACILITY LIMITS.

SPECIFICATIONS:

- FOR EARTHWORKS COMPONENTS OF THE STOCKPILE DESIGN, REFER TO SECTION 2300 OF THE PROJECT SPECIFICATIONS.
- FOR GEOSYNTHETIC AND PIPING COMPONENTS OF THE STOCKPILE DESIGN, REFER TO SECTION 2272 FOR GEOTEXTILE, 2273 FOR POLYETHYLENE GEOMEMBRANE LINERS, AND SECTION 2610 FOR PIPING.
- QUALITY ASSURANCE REQUIREMENTS FOR STOCKPILE CONSTRUCTION ARE DEFINED IN THE CONSTRUCTION QUALITY ASSURANCE PLAN.
- SPECIFICATION SECTION NUMBERING IS PRELIMINARY.

PLANT DRAWING NUMBER:

LEGEND, GENERAL NOTES AND SPECIFICATIONS


POLY MET MINING, INC.
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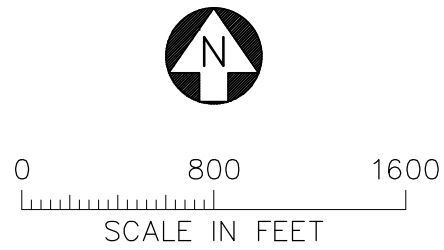
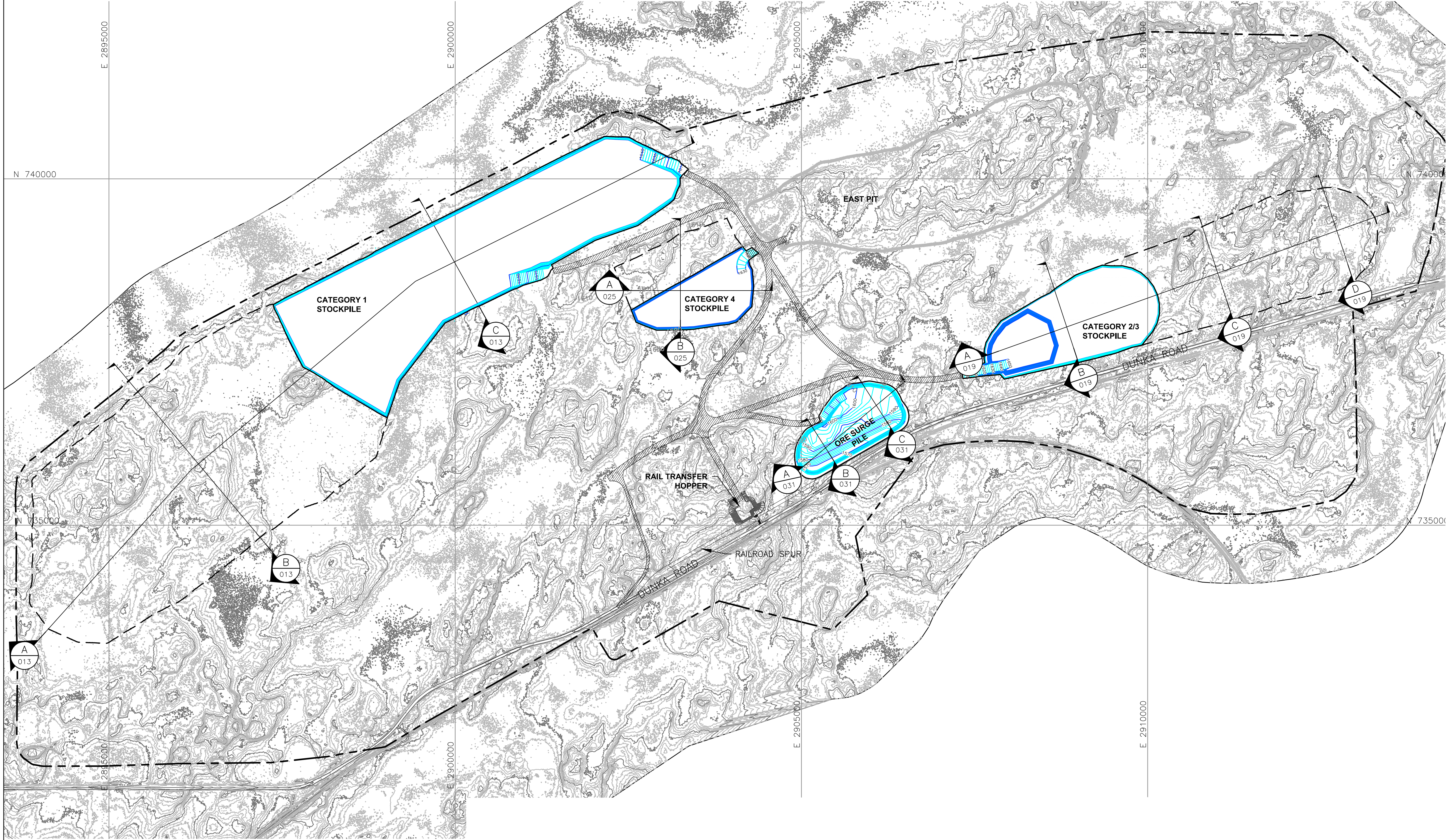
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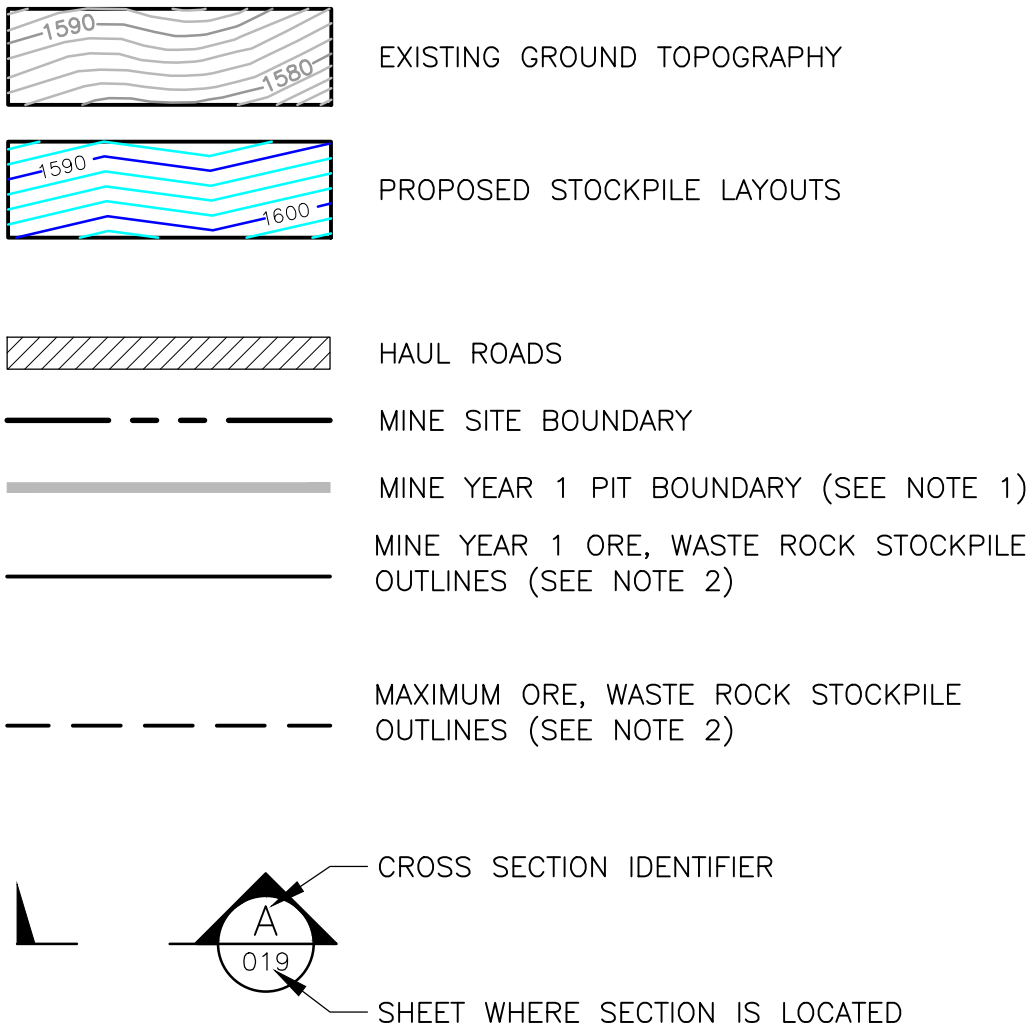
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INCHES
1
2



LEGEND



NOTES

1. OPEN PIT AND HAUL ROAD LAYOUTS PROVIDED BY BARR ENGINEERING IN OCTOBER 2011.
2. STOCKPILE LAYOUTS PROVIDED BY BARR ENGINEERING IN APRIL 2011 AND MODIFIED BY GOLDER.
3. SEE GENERAL NOTES AND LEGEND ON DRAWING 002.
4. CATEGORY 2/3 AND CATEGORY 4 STOCKPILES SHOWN BASED ON WASTE ROCK SCHEDULE ONLY, I.E. WITHOUT OVERBURDEN. SEE DRAWINGS 018 AND 024 SHOWING MAXIMUM CAPACITY LAYOUTS FOR THESE STOCKPILES.

REFERENCES

1. EXISTING GROUND TOPOGRAPHY PROVIDED BY BARR ENGINEERING, AUGUST 2011.
2. COORDINATE SYSTEM REFERENCE IS NAD83 MINNESOTA STATE PLANE NORTH.
3. VERTICAL DATUM REFERENCE IS FEET ABOVE MEAN SEA LEVEL (AMSL).

PLANT DRAWING NUMBER:

STOCKPILE LAYOUTS – MINE YEAR 1 LIMITS



POLY MET MINING, INC.
NORTHMET PROJECT
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DATE 5/22/15 LICENSE # 46492

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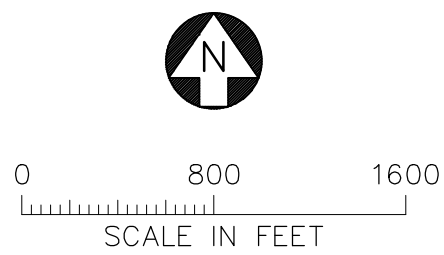
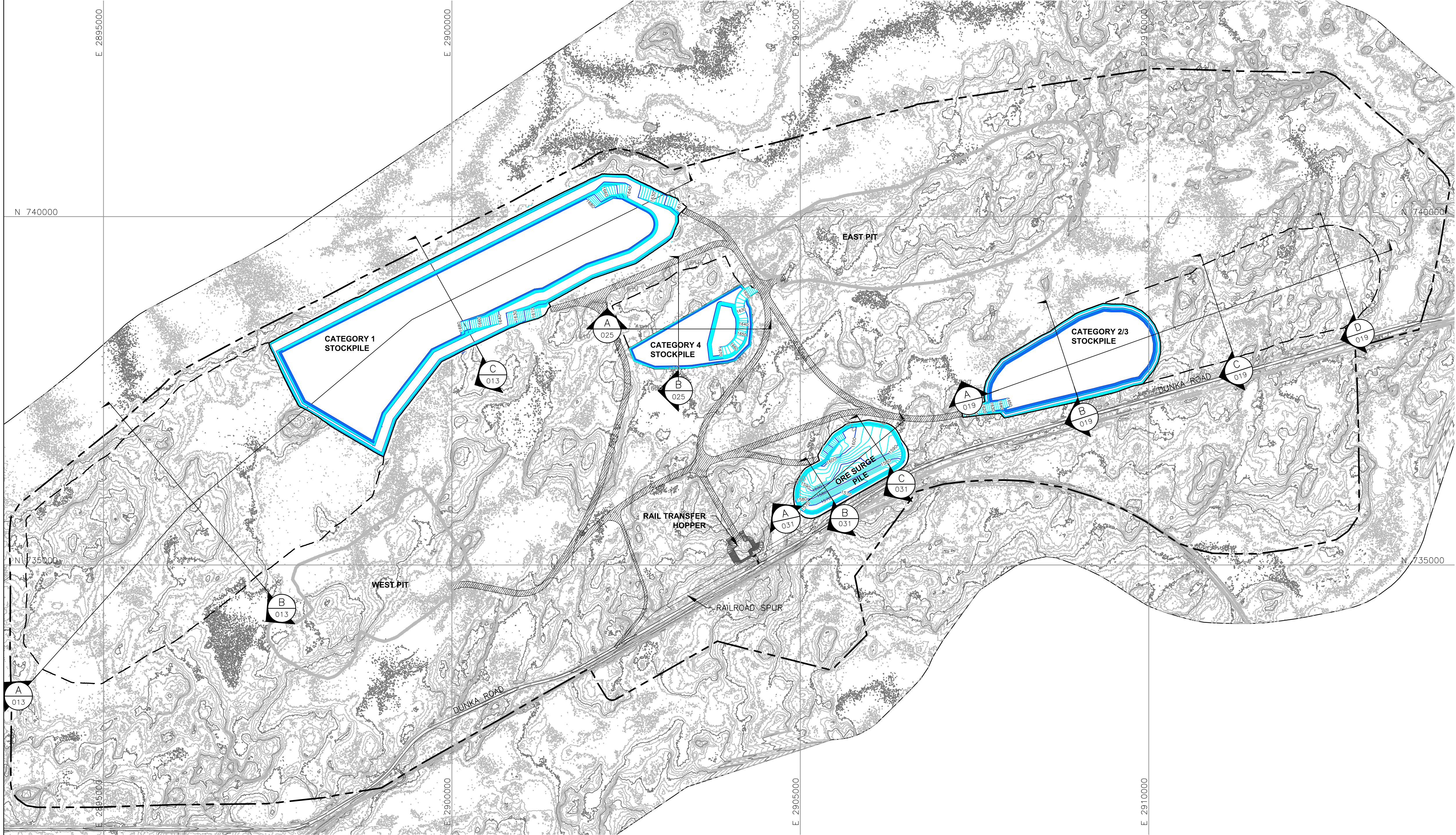
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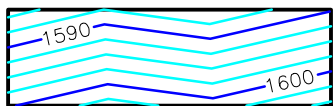
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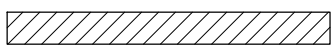
LEGEND



EXISTING GROUND TOPOGRAPHY



PROPOSED GRADING TOPOGRAPHY



HAUL ROADS



MINE SITE BOUNDARY



PIT BOUNDARIES AT MINE YEAR 2 (SEE NOTE 1)



MINE YEAR 1 AND 2 ORE, WASTE ROCK STOCKPILE OUTLINES (SEE NOTE 2)



MAXIMUM ORE, WASTE ROCK STOCKPILE OUTLINES (SEE NOTE 2)



CROSS SECTION IDENTIFIER



SHEET WHERE SECTION IS LOCATED

NOTES

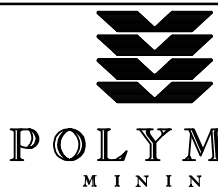
1. OPEN PIT AND HAUL ROAD LAYOUTS PROVIDED BY BARR ENGINEERING IN OCTOBER 2011.
2. STOCKPILE LAYOUTS PROVIDED BY BARR ENGINEERING IN APRIL 2011 AND MODIFIED BY GOLDER.
3. SEE GENERAL NOTES AND LEGEND ON DRAWING 002.
4. CATEGORY 2/3 AND CATEGORY 4 STOCKPILES SHOWN BASED ON WASTE ROCK SCHEDULE ONLY, I.E. WITHOUT OVERBURDEN. SEE DRAWINGS 018 AND 024 SHOWING MAXIMUM CAPACITY LAYOUTS FOR THESE STOCKPILES.

REFERENCES

1. EXISTING GROUND TOPOGRAPHY PROVIDED BY BARR ENGINEERING, AUGUST 2011.
2. COORDINATE SYSTEM REFERENCE IS NAD83 MINNESOTA STATE PLANE NORTH.
3. VERTICAL DATUM REFERENCE IS FEET ABOVE MEAN SEA LEVEL (AMSL).

PLANT DRAWING NUMBER:

STOCKPILE LAYOUTS – MINE YEAR 2 LIMITS



POLY MET MINING, INC.
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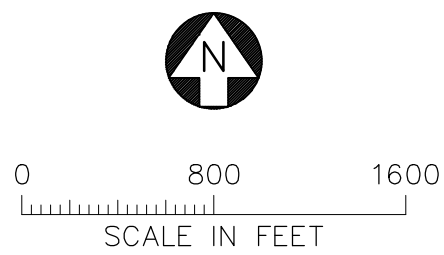
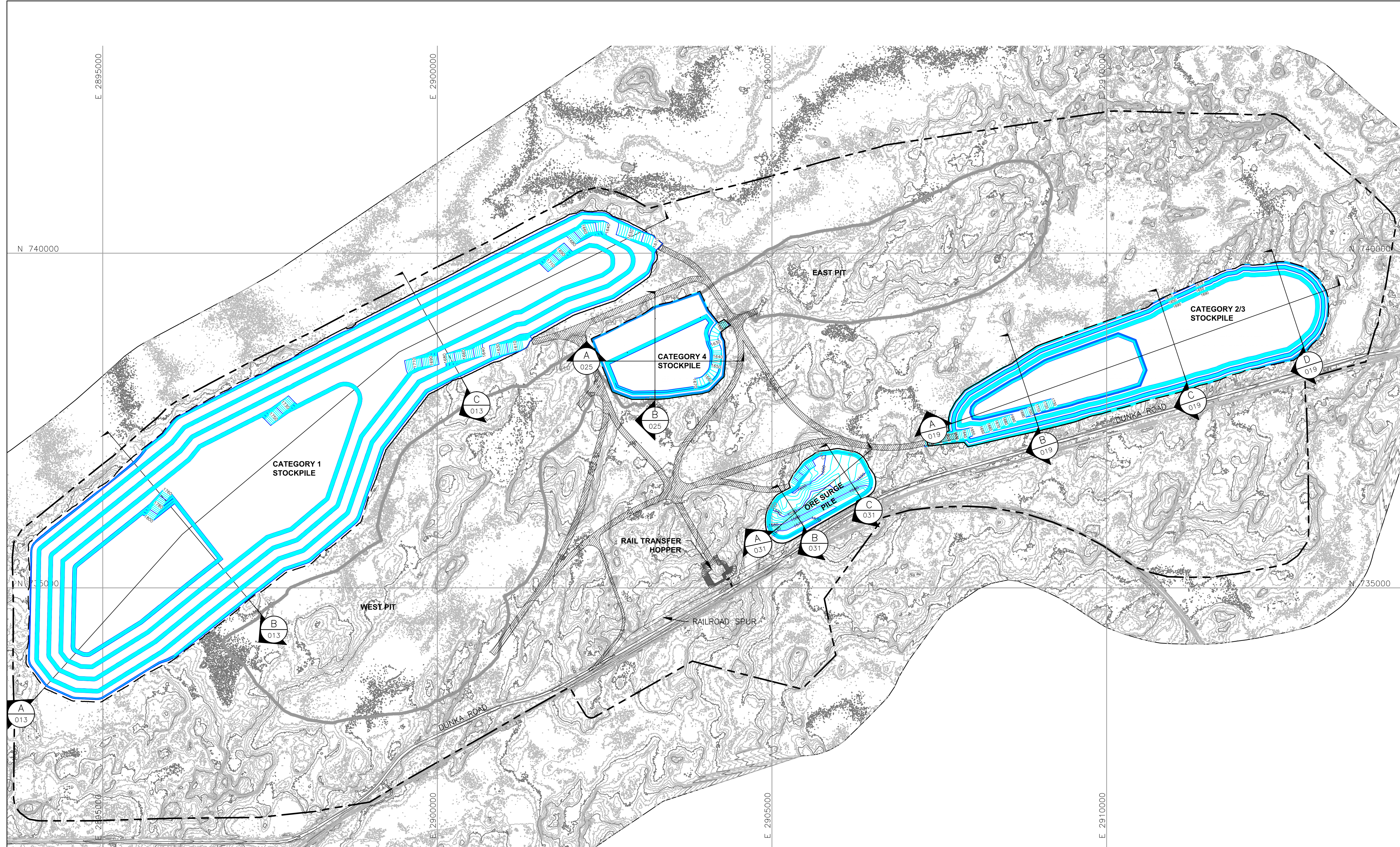
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INCHES

2

1



LEGEND



- EXISTING GROUND TOPOGRAPHY
- PROPOSED LAYOUTS
- HAUL ROADS
- MINE SITE BOUNDARY
- PIT BOUNDARIES AT MINE YEAR 11 (SEE NOTE 1)
- MINE YEAR 1 ORE, WASTE ROCK STOCKPILE OUTLINES (SEE NOTE 2)
- MAXIMUM ORE, WASTE ROCK STOCKPILE OUTLINES (SEE NOTE 2)
- CROSS SECTION IDENTIFIER
- SHEET WHERE SECTION IS LOCATED

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STOCKPILE LAYOUTS – MINE YEAR 11 LIMITS	
 POLYMET MINING	POLY MET MINING, INC. NORTHMET PROJECT HOYT LAKES, MINNESOTA
	GOLDER ASSOCIATES INC. 44 UNION BOULEVARD, SUITE 300 LAKEWOOD, CO USA 80233 Ph: (303) 980-0540 Fax: (303) 985-2080 www.golder.com
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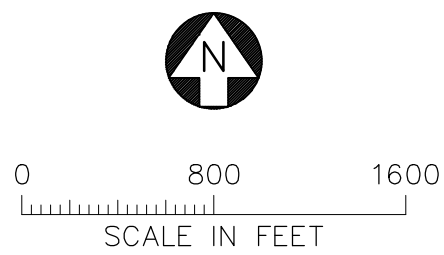
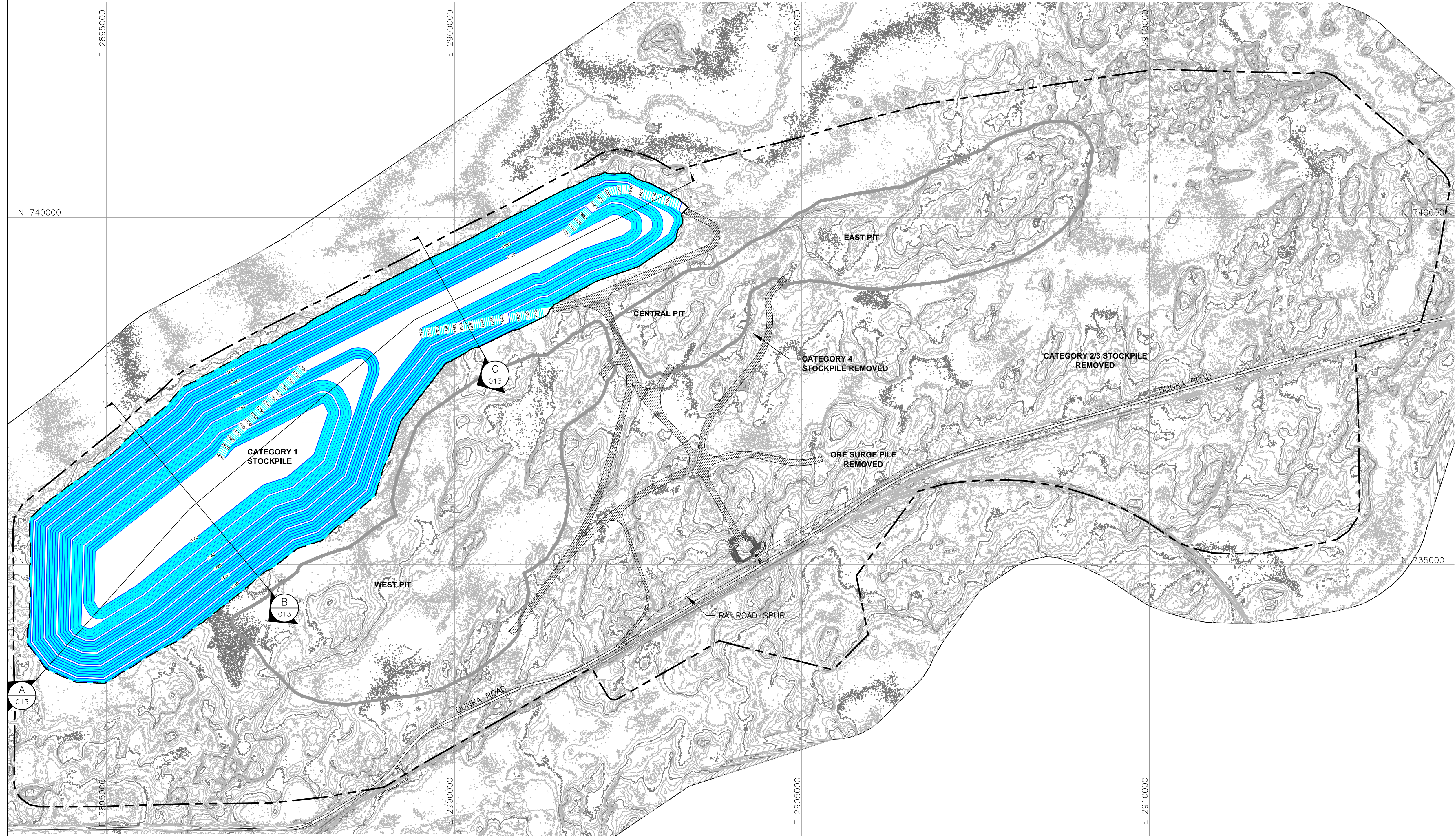
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2

1



LEGEND

- EXISTING GROUND TOPOGRAPHY
- PROPOSED LAYOUT CONTOURS
- HAUL ROADS
- MINE SITE BOUNDARY
- ULTIMATE PIT BOUNDARIES (SEE NOTE 1)
- MINE YEAR 1 ORE, WASTE ROCK STOCKPILE OUTLINES (SEE NOTE 2)
- MAXIMUM ORE, WASTE ROCK STOCKPILE OUTLINES (SEE NOTE 2)
- CROSS SECTION IDENTIFIER
- SHEET WHERE SECTION IS LOCATED

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- EXISTING GROUND TOPOGRAPHY PROVIDED BY BARR ENGINEERING, AUGUST 2011.
- COORDINATE SYSTEM REFERENCE IS NAD83 MINNESOTA STATE PLANE NORTH.
- VERTICAL DATUM REFERENCE IS FEET ABOVE MEAN SEA LEVEL (AMSL).

PLANT DRAWING NUMBER:

STOCKPILE LAYOUTS
MINE YEAR 21 LIMITS
CLOSURE CONFIGURATION



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



GOLDER ASSOCIATES INC.
44 UNION BOULEVARD, SUITE 300
LAKEWOOD, CO USA 80233
Ph: (303) 980-0540
Fax: (303) 985-2080
www.golder.com

VER NO	DATE	DESCRIPTION	ISSUE STATUS		
A	12/02/11	ISSUED FOR REVIEW FOR INCLUSION IN ROCK AND OVERBURDEN MANAGEMENT PLAN (ROMP)	FOR PERMITTING	F	5-22-15
B	2/15/13	ISSUED FOR REVIEW FOR INCLUSION IN ROMP			
C	5/29/13	ISSUED FOR REVIEW FOR INCLUSION IN ROMP			
D	1/14/14	ISSUED FOR AGENCY REVIEW			
E	4/10/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS	FOR CONSTRUCTION		
F	5/22/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS			
			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.

SIGNATURE

PRINTED NAME BRENT R. BRONSON

DATE 5/22/15 LICENSE # 46492

DRAWN: MTM

CHECKED:

GOLDER PROJECT NO.: 113-2209

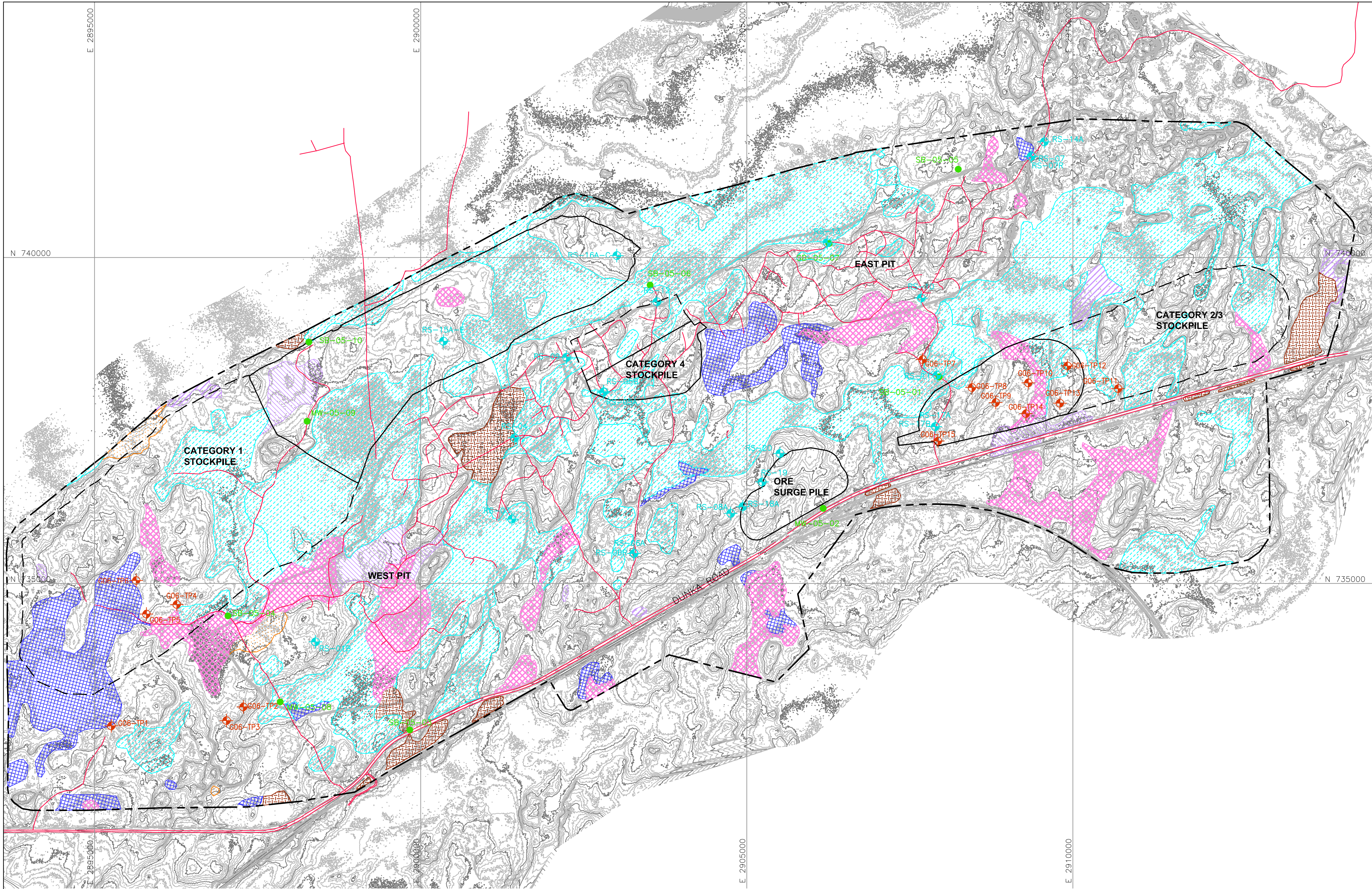
SCALE: AS SHOWN

DWG. NO. SKP-006

REV

CADD USER: Brewer, Keith FILE: X:_DENVER\113-2209\1132209H022.DWG PLOT SCALE: 1:1 PLOT DATE: 5/27/2015 11:55 AM

INCHES
1
2



LEGEND

- EXISTING GROUND TOPOGRAPHY (SEE REFERENCE 1)
- MINE SITE BOUNDARY
- G06-TP11
 SB-05-01
 RS-11
GOLDER ASSOC. TEST PIT (2006)
BARR ENGINEERING BOREHOLES (2005)
BARR ENGINEERING BOREHOLES (2008)
- SHALLOW MARSH
- SHRUB SWAMP
- CONIFEROUS SWAMP
- HARDWOOD SWAMP
- SEDGE MEADOW
- CONIFEROUS BOG
- OPEN BOG
- EXISTING TRAIL OR ROAD
- MINE YEAR 11 PIT BOUNDARIES (SEE NOTE 2)
- MINE YEAR 1 ORE, WASTE ROCK STOCKPILE OUTLINES (SEE NOTE 3)
- MAXIMUM ORE, WASTE ROCK STOCKPILE OUTLINES (SEE NOTE 3)

NOTES

1. WETLAND DELINEATION CHARACTERIZATION PROVIDED BY BARR ENGINEERING IN OCTOBER 2011.
2. OPEN PIT LAYOUTS PROVIDED BY BARR ENGINEERING IN OCTOBER 2011.
3. STOCKPILE LAYOUTS PROVIDED BY BARR ENGINEERING IN APRIL 2011 AND MODIFIED BY GOLDER.
4. SEE GENERAL NOTES AND LEGEND ON DRAWING 002.

REFERENCES

1. EXISTING GROUND TOPOGRAPHY PROVIDED BY BARR ENGINEERING, AUGUST 2011.
2. COORDINATE SYSTEM REFERENCE IS NAD83 MINNESOTA STATE PLANE NORTH,
3. VERTICAL DATUM REFERENCE IS FEET ABOVE MEAN SEA LEVEL (AMSL).

PLANT DRAWING NUMBER:

EXISTING SITE CONDITIONS



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

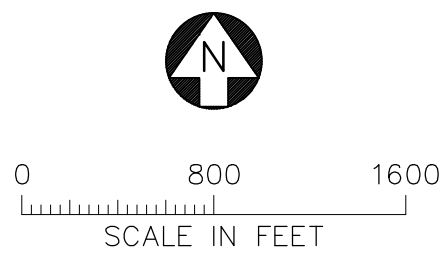


GOLDER ASSOCIATES INC.
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LAKEWOOD, CO USA 80233
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DWG. NO. SKP-007

REV

VER NO	DATE	DESCRIPTION	ISSUE STATUS		
A	12/02/11	ISSUED FOR REVIEW FOR INCLUSION IN ROCK AND OVERBURDEN MANAGEMENT PLAN (ROMP)	FOR PERMITTING	F	5-22-15
B	2/15/13	ISSUED FOR REVIEW FOR INCLUSION IN ROMP			
C	5/29/13	ISSUED FOR REVIEW FOR INCLUSION IN ROMP			
D	1/14/14	ISSUED FOR AGENCY REVIEW			
E	4/10/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS	FOR CONSTRUCTION		
F	5/22/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS			
			NOT APPROVED FOR CONSTRUCTION.		

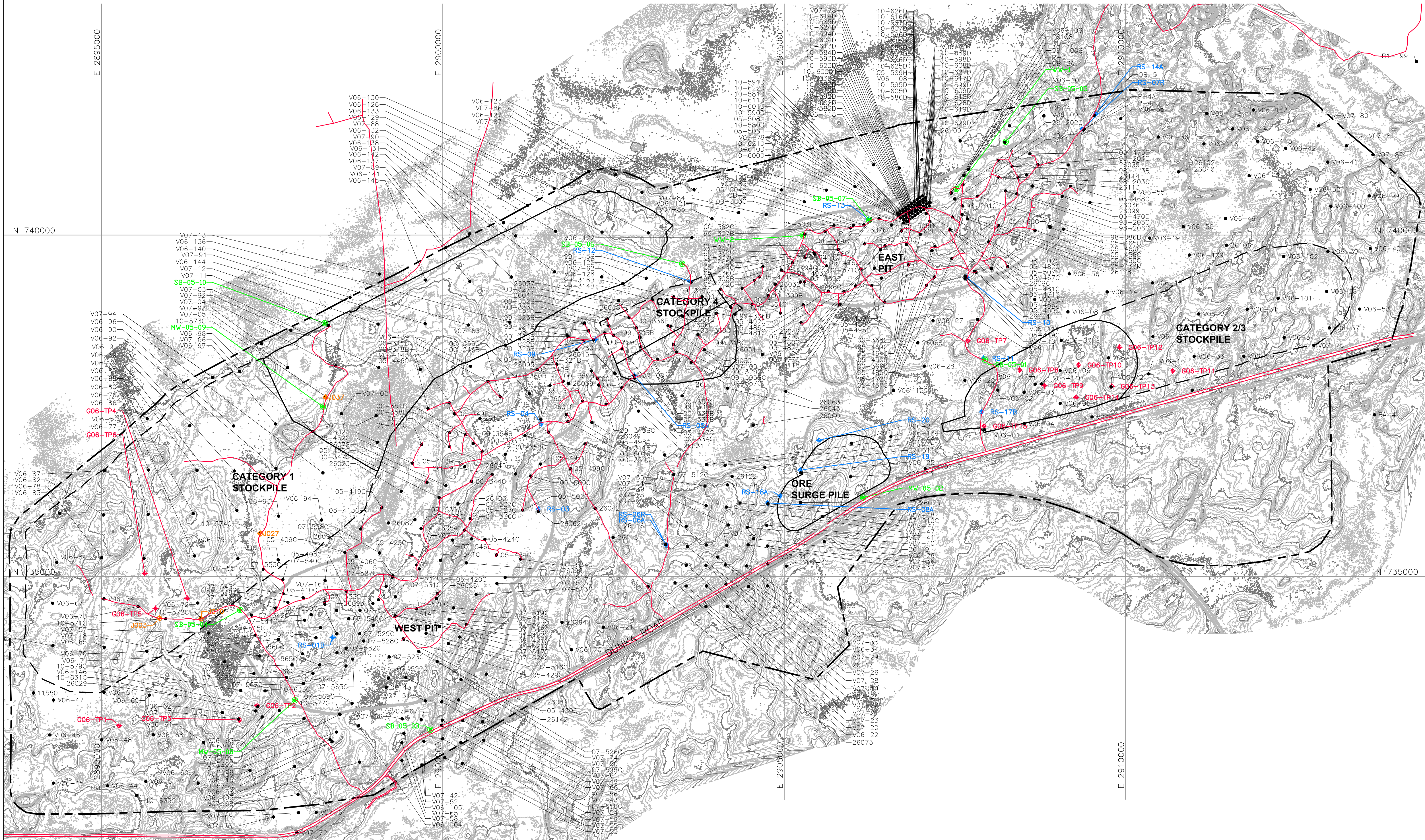


CADD USER: Brewer, Keith FILE: X:\DENVER\113-2209\113-2209\132209\023.DWG PLOT SCALE: 1:1 PLOT DATE: 5/27/2015 11:56 AM

INCHES

2

1



LEGEND

- EXISTING GROUND TOPOGRAPHY
- MINE SITE BOUNDARY
- MINE YEAR 11 PIT BOUNDARIES (SEE NOTE 1)
- MINE YEAR 1 ORE, AND WASTE ROCK STOCKPILE OUTLINES (SEE NOTE 2)
- MAXIMUM ORE, AND WASTE ROCK STOCKPILE OUTLINES (SEE NOTE 2)
- GOLDER ASSOC. TEST PIT (2006)
- BARR ENGINEERING BOREHOLES (2005)
- BARR ENGINEERING BOREHOLES (2008)
- BORING OR GEOPHYSICAL SURVEY LOCATION
- AMERICAN ENGINEERING TESTING, INC. BOREHOLES (2010)

NOTES

- OPEN PIT LAYOUTS PROVIDED BY BARR ENGINEERING IN OCTOBER 2011.
- STOCKPILE LAYOUTS PROVIDED BY BARR ENGINEERING IN APRIL 2011 AND MODIFIED BY GOLDER.
- SEE GENERAL NOTES AND LEGEND ON DRAWING 002.
- SEE GEOTECHNICAL DATA PACKAGE VOLUME 3 FOR DETAILS ON TEST PITS, BOREHOLES AND GEOPHYSICAL SURVEYS.

REFERENCES

- EXISTING GROUND TOPOGRAPHY PROVIDED BY BARR ENGINEERING, AUGUST 2011.
- COORDINATE SYSTEM REFERENCE IS NAD83 MINNESOTA STATE PLANE NORTH
- VERTICAL DATUM REFERENCE IS FEET ABOVE MEAN SEA LEVEL (AMSL).

PLANT DRAWING NUMBER:

SITE LAYOUT AND LOCATION
OF FIELD INVESTIGATIONS



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



GOLDER ASSOCIATES INC.
44 UNION BOULEVARD, SUITE 300
LAKEWOOD, CO USA 80233
Ph: (303) 980-0540
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DWG. NO. SKP-008

REV

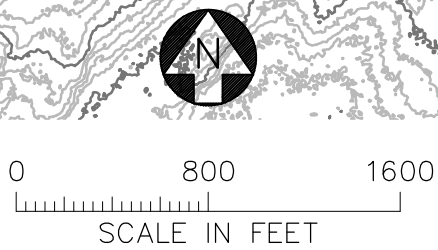
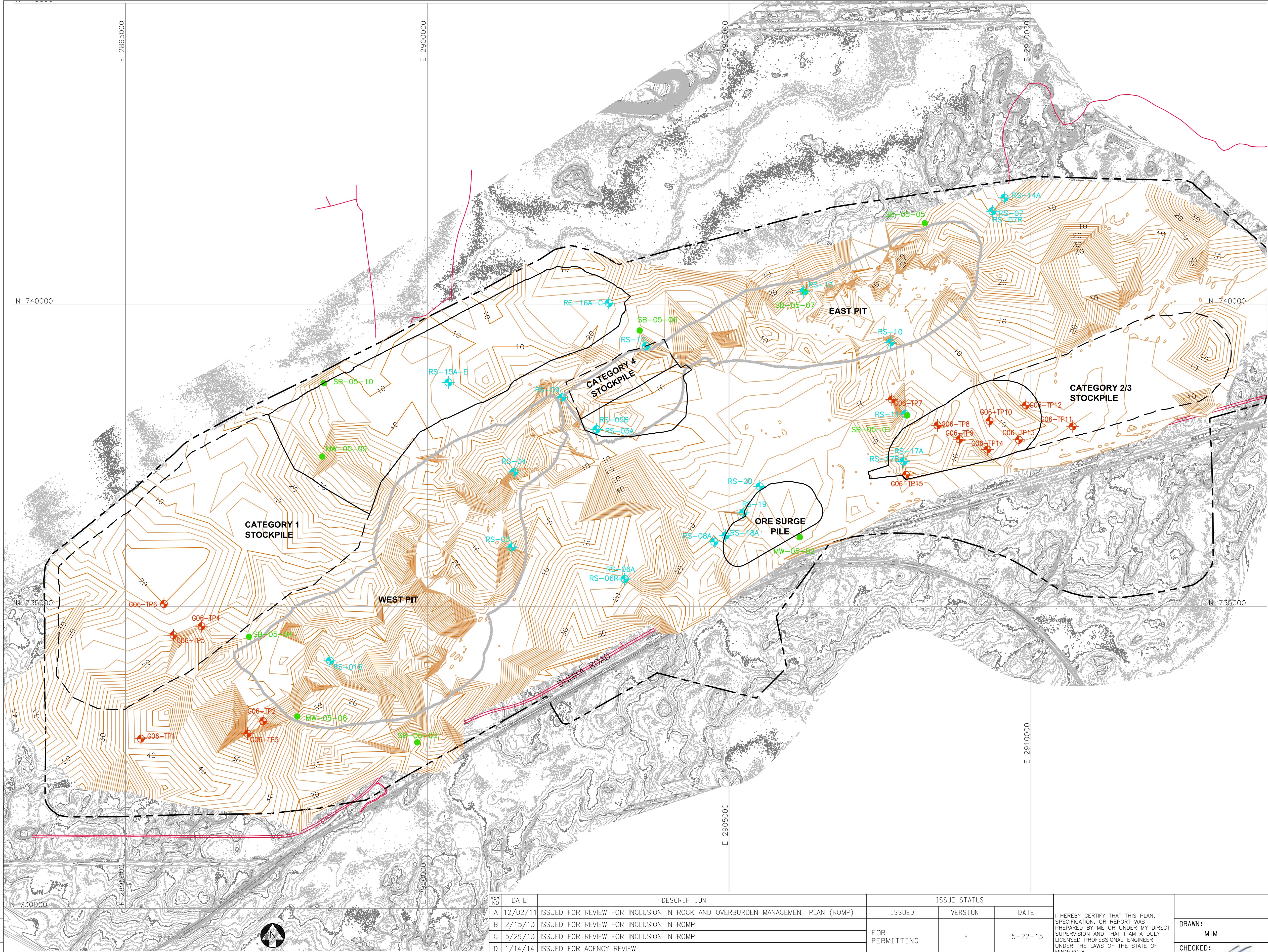
VER	NO	DATE	DESCRIPTION	ISSUE STATUS	VERSION	DATE
A	12/02/11	ISSUED FOR REVIEW FOR INCLUSION IN ROCK AND OVERBURDEN MANAGEMENT PLAN (ROMP)	ISSUED	VERSION	DATE	
B	2/15/13	ISSUED FOR REVIEW FOR INCLUSION IN ROMP	FOR PERMITTING	F	5-22-15	
C	5/29/13	ISSUED FOR REVIEW FOR INCLUSION IN ROMP	FOR PERMITTING	F	5-22-15	
D	1/14/14	ISSUED FOR AGENCY REVIEW	FOR PERMITTING	F	5-22-15	
E	4/10/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS	FOR PERMITTING	F	5-22-15	
F	5/22/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS	FOR PERMITTING	F	5-22-15	
			NOT APPROVED FOR CONSTRUCTION.			

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SIGNATURE BRENT R. BRONSON
PRINTED NAME BRENT R. BRONSON
DATE 5/22/15 LICENSE # 46492

DRAWN: MTM
CHECKED:
GOLDER PROJECT NO.: 113-2209
SCALE: AS SHOWN

CADD USER: Brewer, Keith FILE: X:_DENVER\113-2209\1322094024.DWG PLOT SCALE: 1:1 PLOT DATE: 5/27/2015 11:57 AM



LEGEND

- EXISTING GROUND TOPOGRAPHY
- MINE SITE BOUNDARY
- ESTIMATED DEPTH TO BEDROCK CONTOURS
- MINE YEAR 11 PIT BOUNDARIES (SEE NOTE 1)
- MINE YEAR 1 ORE, WASTE ROCK STOCKPILE OUTLINES (SEE NOTE 2)
- MAXIMUM ORE, WASTE ROCK STOCKPILE OUTLINES (SEE NOTE 2)
- GOLDER ASSOC. TEST PIT (2006)
- BARR ENGINEERING BOREHOLES (2005)
- BARR ENGINEERING BOREHOLES (2008)

NOTES

- OPEN PIT BOUNDARIES PROVIDED BY BARR ENGINEERING IN OCTOBER 2011.
- STOCKPILE LAYOUTS PROVIDED BY BARR ENGINEERING IN APRIL 2011 AND MODIFIED BY GOLDER.
- SEE GENERAL NOTES AND LEGEND ON DRAWING 002.

REFERENCES

- EXISTING GROUND TOPOGRAPHY PROVIDED BY BARR ENGINEERING, AUGUST 2011.
- COORDINATE SYSTEM REFERENCE IS NAD83 MINNESOTA STATE PLANE NORTH
- VERTICAL DATUM REFERENCE IS FEET ABOVE MEAN SEA LEVEL (AMSL).

PLANT DRAWING NUMBER:

DEPTH TO BEDROCK ISOPACH MAP

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

GOLDER ASSOCIATES INC.
44 UNION BOULEVARD, SUITE 300
LAKEWOOD, CO USA 80233
Ph: (303) 980-0540
Fax: (303) 985-2080
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DWG. NO. SKP-009

REV

DRAWN: MTM

CHECKED:

GOLDER PROJECT NO.: 113-2209

SCALE: AS SHOWN

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SIGNATURE PRINTED NAME BRENT R. BRONSON DATE 5/22/15 LICENSE # 46492

ISSUE STATUS

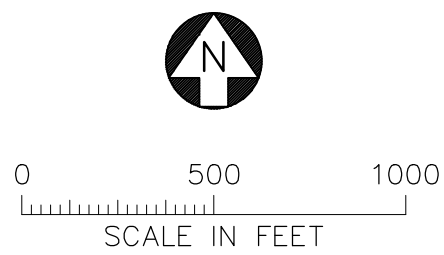
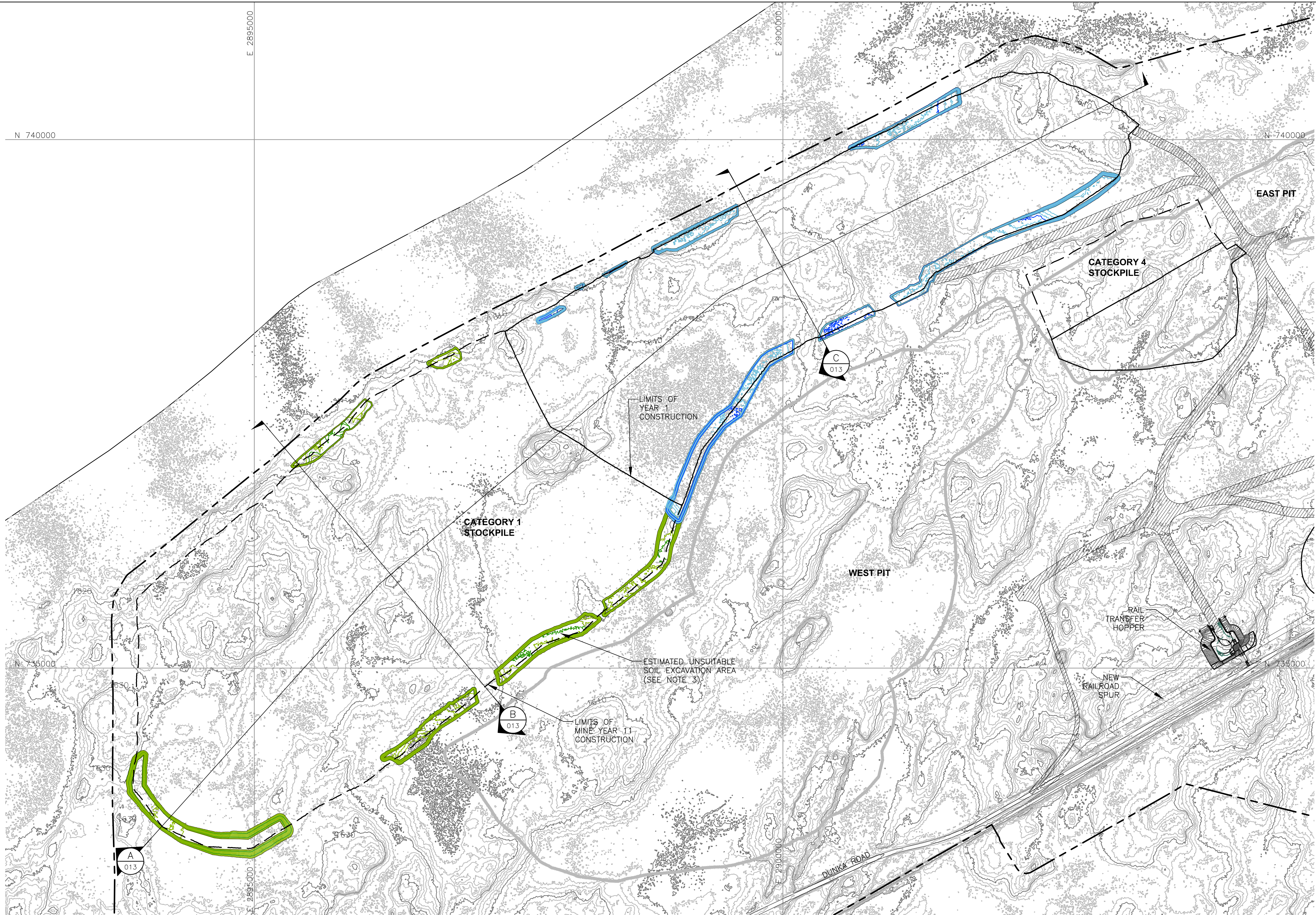
VER NO	DATE	DESCRIPTION	ISSUED	VERSION	DATE
A	12/02/11	ISSUED FOR REVIEW FOR INCLUSION IN ROCK AND OVERBURDEN MANAGEMENT PLAN (ROMP)	ISSUED		
B	2/15/13	ISSUED FOR REVIEW FOR INCLUSION IN ROMP			
C	5/29/13	ISSUED FOR REVIEW FOR INCLUSION IN ROMP	FOR PERMITTING	F	5-22-15
D	1/14/14	ISSUED FOR AGENCY REVIEW			
E	4/10/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS			
F	5/22/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS	FOR CONSTRUCTION		
			NOT APPROVED FOR CONSTRUCTION.		

CADD USER: Brewer, Keith FILE: X:_DENVER\113-2209\1322094025.DWG PLOT SCALE: 1:1 PLOT DATE: 5/27/2015 11:58 AM

INCHES

2

1



LEGEND

- EXISTING GROUND TOPOGRAPHY (SEE REFERENCE 1)
- PROPOSED MINE YEAR 1 EXCAVATION TOPOGRAPHY
- MINE YEAR 11 AND ULTIMATE EXCAVATION TOPOGRAPHY
- MINE SITE BOUNDARY
- MINE YEAR 11 PIT BOUNDARIES (SEE NOTE 1)
- MINE YEAR 1 WASTE ROCK STOCKPILE OUTLINES (SEE NOTE 2)
- MAXIMUM WASTE ROCK STOCKPILE OUTLINES (SEE NOTE 2)
- HAUL ROADS
- CROSS SECTION IDENTIFIER
- SHEET WHERE SECTION IS LOCATED

NOTES

- OPEN PIT AND HAUL ROAD LAYOUTS PROVIDED BY BARR ENGINEERING IN OCTOBER 2011.
- STOCKPILE LAYOUTS PROVIDED BY BARR ENGINEERING IN APRIL 2011 AND MODIFIED BY GOLDER.
- UNSUITABLE SOILS TO BE EXCAVATED WITHIN FIRST 100 FEET FROM THE ULTIMATE STOCKPILE BOUNDARIES. GEOTECHNICAL PROPERTIES OF THE FOUNDATION SOILS WILL BE CONFIRMED PRIOR TO FINAL DESIGN.
- SEE GENERAL NOTES AND LEGEND ON DRAWING 002.

REFERENCES

- EXISTING GROUND TOPOGRAPHY PROVIDED BY BARR ENGINEERING, AUGUST 2011.
- COORDINATE SYSTEM REFERENCE IS NAD83 MINNESOTA STATE PLANE NORTH.
- VERTICAL DATUM REFERENCE IS FEET ABOVE MEAN SEA LEVEL (AMSL).

PLANT DRAWING NUMBER:

CATEGORY 1 STOCKPILE
SUBGRADE EXCAVATION PLAN



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



GOLDER ASSOCIATES INC.
44 UNION BOULEVARD, SUITE 300
LAKEWOOD, CO USA 80233
Ph: (303) 980-0540
Fax: (303) 985-2080
www.golder.com

VER NO	DATE	DESCRIPTION	ISSUE STATUS		
A	12/02/11	ISSUED FOR REVIEW FOR INCLUSION IN ROCK AND OVERBURDEN MANAGEMENT PLAN (ROMP)	FOR PERMITTING	F	5-22-15
B	2/15/13	ISSUED FOR REVIEW FOR INCLUSION IN ROMP			
C	5/29/13	ISSUED FOR REVIEW FOR INCLUSION IN ROMP			
D	1/14/14	ISSUED FOR AGENCY REVIEW			
E	4/10/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS	FOR CONSTRUCTION		
F	5/22/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS			
			NOT APPROVED FOR CONSTRUCTION.		

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SIGNATURE *B. Bronson*
PRINTED NAME BRENT R. BRONSON
DATE 5/22/15 LICENSE # 46492

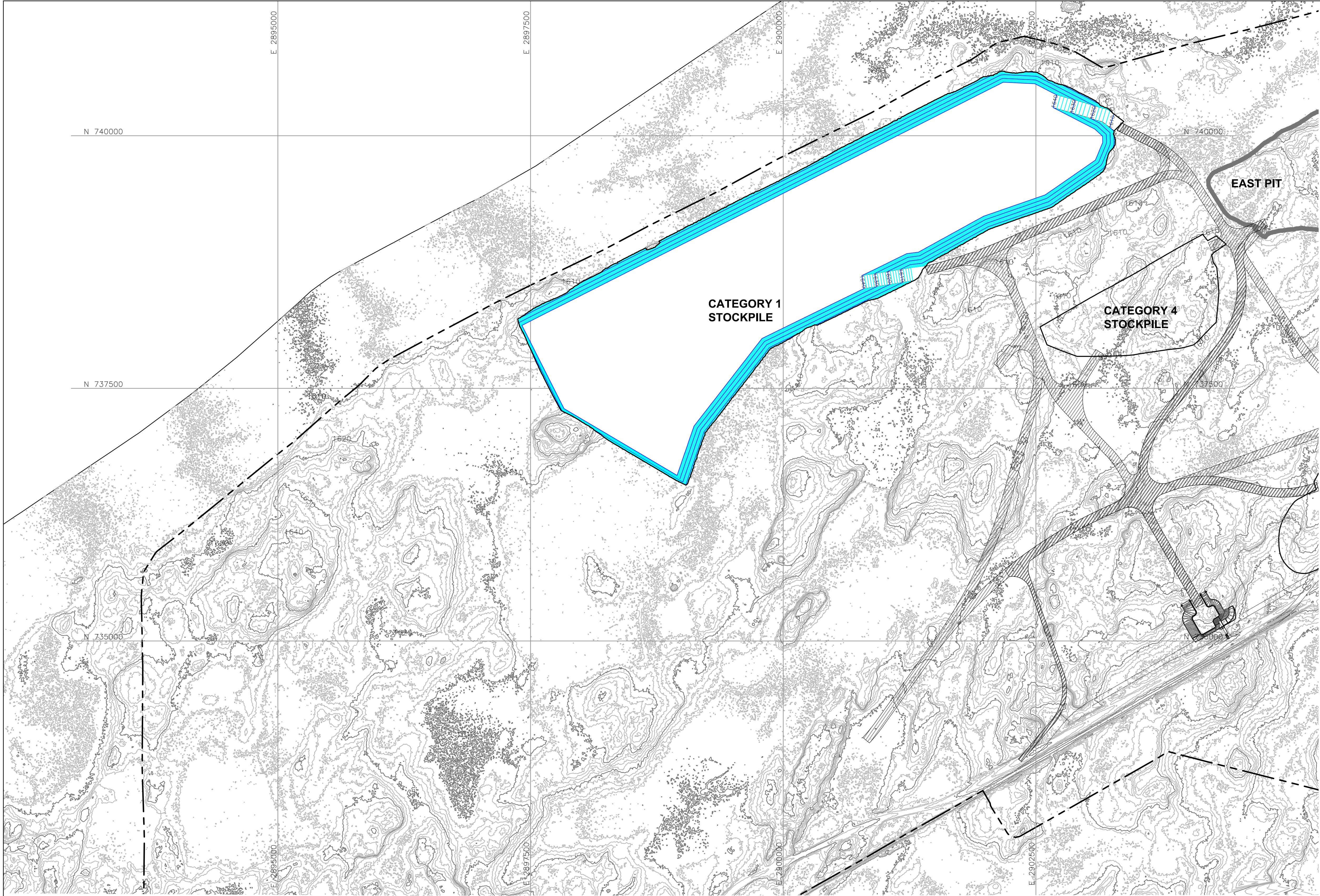
DRAWN: MTM
CHECKED: *gg*
GOLDER PROJECT NO.: 113-2209
SCALE: AS SHOWN

DWG. NO. SKP-010

REV

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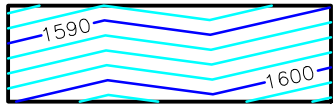
INCHES
1
2



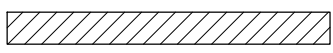
LEGEND



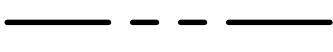
EXISTING GROUND TOPOGRAPHY



PROPOSED GRADING TOPOGRAPHY



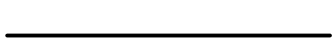
HAUL ROADS



MINE SITE BOUNDARY



PIT BOUNDARIES AT MINE YEAR 2 (SEE NOTE 1)



MINE YEAR 1 AND 2 ORE, WASTE ROCK STOCKPILE OUTLINES (SEE NOTE 2)

NOTES

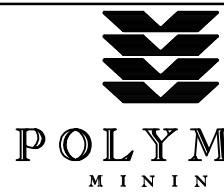
1. OPEN PIT AND HAUL ROAD LAYOUTS PROVIDED BY BARR ENGINEERING IN OCTOBER 2011.
2. STOCKPILE LAYOUTS PROVIDED BY BARR ENGINEERING IN APRIL 2011 AND MODIFIED BY GOLDER.
3. SEE GENERAL NOTES AND LEGEND ON DRAWING 002.
4. IF CLOSURE OCCURS AFTER 1 YEAR OF MINING, STOCKPILE DRAINAGE WILL BE AS SHOWN ON DRAWING 012 FOR THIS PORTION OF THE STOCKPILE.

REFERENCES

1. EXISTING GROUND TOPOGRAPHY PROVIDED BY BARR ENGINEERING, AUGUST 2011.
2. COORDINATE SYSTEM REFERENCE IS NAD83 MINNESOTA STATE PLANE NORTH.
3. VERTICAL DATUM REFERENCE IS FEET ABOVE MEAN SEA LEVEL (AMSL).

PLANT DRAWING NUMBER:

CATEGORY 1 STOCKPILE
MINE YEAR 1 CONTINGENCY
CLOSURE CONFIGURATION



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



GOLDER ASSOCIATES INC.
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Ph: (303) 980-0540
Fax: (303) 985-2080
www.golder.com

VER NO	DATE	DESCRIPTION	ISSUE STATUS		
A	12/02/11	ISSUED FOR REVIEW FOR INCLUSION IN ROCK AND OVERBURDEN MANAGEMENT PLAN (ROMP)	ISSUED	VERSION	DATE
B	2/15/13	ISSUED FOR REVIEW FOR INCLUSION IN ROMP	FOR PERMITTING	F	5-22-15
C	5/29/13	ISSUED FOR REVIEW FOR INCLUSION IN ROMP			
D	1/14/14	ISSUED FOR AGENCY REVIEW			
E	4/10/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS	FOR CONSTRUCTION		
F	5/22/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS			
			NOT APPROVED FOR CONSTRUCTION.		

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SIGNATURE *B. Bronson*
PRINTED NAME BRENT R. BRONSON
DATE 5/22/15 LICENSE # 46492

DRAWN: MTM

CHECKED: *gg*
GOLDER PROJECT NO.: 113-2209

SCALE: AS SHOWN

DWG. NO. SKP-011

REV

CADD USER: Brewer, Keith FILE: X:\DENVER\113-2209\1322094027.DWG PLOT SCALE: 1:1 PLOT DATE: 5/27/2015 12:00 PM

INCHES

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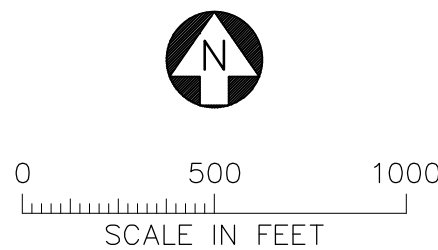
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N 740000

N 740000


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N 735000



VER NO	DATE	DESCRIPTION	ISSUE STATUS		
A	12/02/11	ISSUED FOR REVIEW FOR INCLUSION IN ROCK AND OVERBURDEN MANAGEMENT PLAN (ROMP)	FOR PERMITTING	F	5-22-15
B	2/15/13	ISSUED FOR REVIEW FOR INCLUSION IN ROMP			
C	5/29/13	ISSUED FOR REVIEW FOR INCLUSION IN ROMP			
D	1/14/14	ISSUED FOR AGENCY REVIEW			
E	4/10/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS	FOR CONSTRUCTION		
F	5/22/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS			
			NOT APPROVED FOR CONSTRUCTION.		


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SIGNATURE 

PRINTED NAME BRENT R. BRONSON


DATE 5/22/15 LICENSE # 46492

DRAWN: MTM


CHECKED: 

GOLDER PROJECT NO.: 113-2209

SCALE: AS SHOWN



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

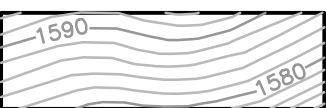


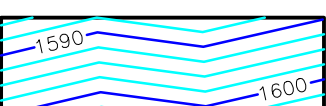
GOLDER ASSOCIATES INC.
44 UNION BOULEVARD, SUITE 300
LAKEWOOD, CO USA 80233
Ph: (303) 980-0540
Fax: (303) 985-2080
www.golder.com

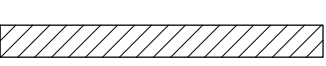
DWG. NO. SKP-012


REV


LEGEND


 EXISTING GROUND TOPOGRAPHY


 PROPOSED GRADING TOPOGRAPHY


 HAUL ROADS


 MINE SITE BOUNDARY

 PIT BOUNDARIES AT MINE YEAR 2 (SEE NOTE 1)

 MINE YEAR 1 AND 2 ORE, WASTE ROCK STOCKPILE OUTLINES (SEE NOTE 2)


 MAXIMUM WASTE ROCK STOCKPILE OUTLINES (SEE NOTE 2)


 DOWNCHUTE/DRAINAGE DIRECTION


 WATERSHED DIVIDES

C1-H1 WATERSHED ID

DC1-H DOWNCHUTE ID

 GENERAL DRAINAGE DIRECTION

 CROSS SECTION IDENTIFIER

 SHEET WHERE SECTION IS LOCATED

- NOTES**
- OPEN PIT AND HAUL ROAD LAYOUTS PROVIDED BY BARR ENGINEERING IN OCTOBER 2011.
 - STOCKPILE LAYOUTS PROVIDED BY BARR ENGINEERING IN APRIL 2011 AND MODIFIED BY GOLDER.
 - SEE GENERAL NOTES AND LEGEND ON DRAWING 002.

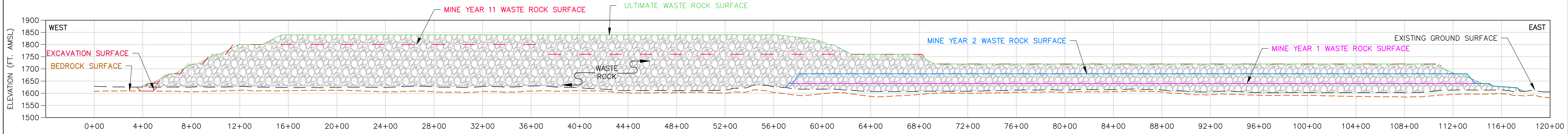
- REFERENCES**
- EXISTING GROUND TOPOGRAPHY PROVIDED BY BARR ENGINEERING, AUGUST 2011.
 - COORDINATE SYSTEM REFERENCE IS NAD83 MINNESOTA STATE PLANE NORTH.
 - VERTICAL DATUM REFERENCE IS FEET ABOVE MEAN SEA LEVEL (AMSL).

PLANT DRAWING NUMBER:

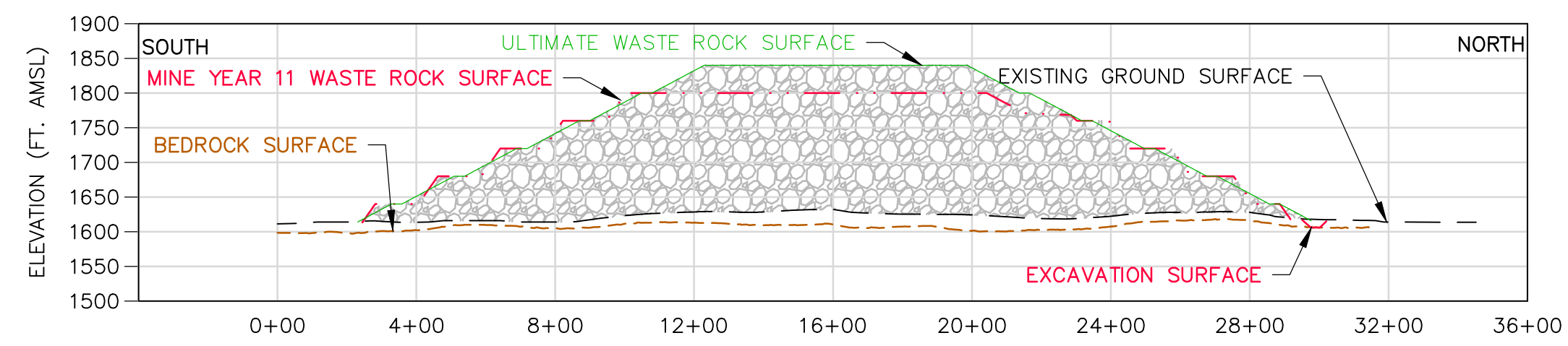
CATEGORY 1 STOCKPILE
FINAL GRADES AND SUB-BASIN DELINEATION

CADD USER: Brewer, Keith FILE: X:_DENVER\113-2209\132209r026.DWG PLOT SCALE: 1:1 PLOT DATE: 5/27/2015 12:02 PM

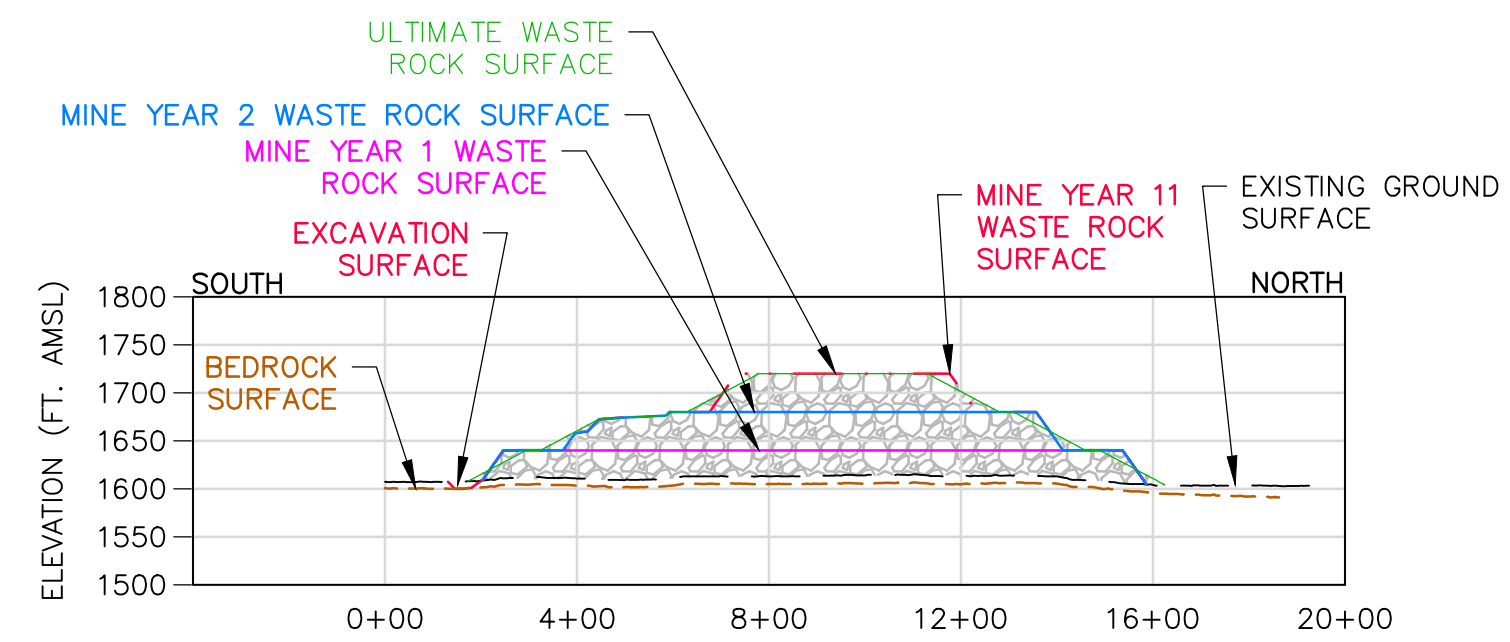
INCHES
1
2



A
SECTION
013
0 400 800
HORIZONTAL SCALE IN FEET
2X VERTICAL EXAGGERATION



B
SECTION
013
0 400 800
HORIZONTAL SCALE IN FEET
2X VERTICAL EXAGGERATION



C
SECTION
013
0 400 800
HORIZONTAL SCALE IN FEET
2X VERTICAL EXAGGERATION

LEGEND	
	MINE YEAR 1 LIMITS
	MINE YEAR 2 LIMITS
	MINE YEAR 11 LIMITS
	MINE YEAR 21, ULTIMATE LIMITS
	EXISTING GROUND SURFACE
	BEDROCK SURFACE
	EXCAVATION SURFACE

NOTE

- SEE GENERAL NOTES AND LEGEND ON DRAWING 002.
- UNSUITABLE SOILS TO BE EXCAVATED WITHIN FIRST 100 FEET FROM THE ULTIMATE STOCKPILE BOUNDARIES. GEOTECHNICAL PROPERTIES OF THE FOUNDATION SOILS WILL BE CONFIRMED PRIOR TO FINAL DESIGN.
- SEE CROSS SECTION LOCATIONS ON DRAWINGS 3, 4, 5, 6, 10, AND 12.

PLANT DRAWING NUMBER:	
CATEGORY 1 STOCKPILE DESIGN SECTIONS	
	POLY MET MINING, INC. NORTHMET PROJECT HOYT LAKES, MINNESOTA
	GOLDER ASSOCIATES INC. 44 UNION BOULEVARD, SUITE 300 LAKEWOOD, CO USA 80233 Ph: (303) 980-0540 Fax: (303) 985-2080 www.golder.com
DWG. NO. SKP-013	REV

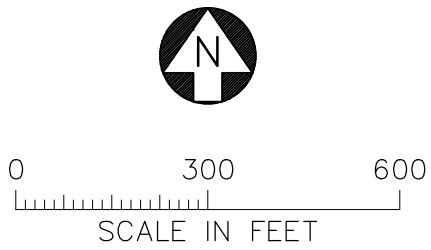
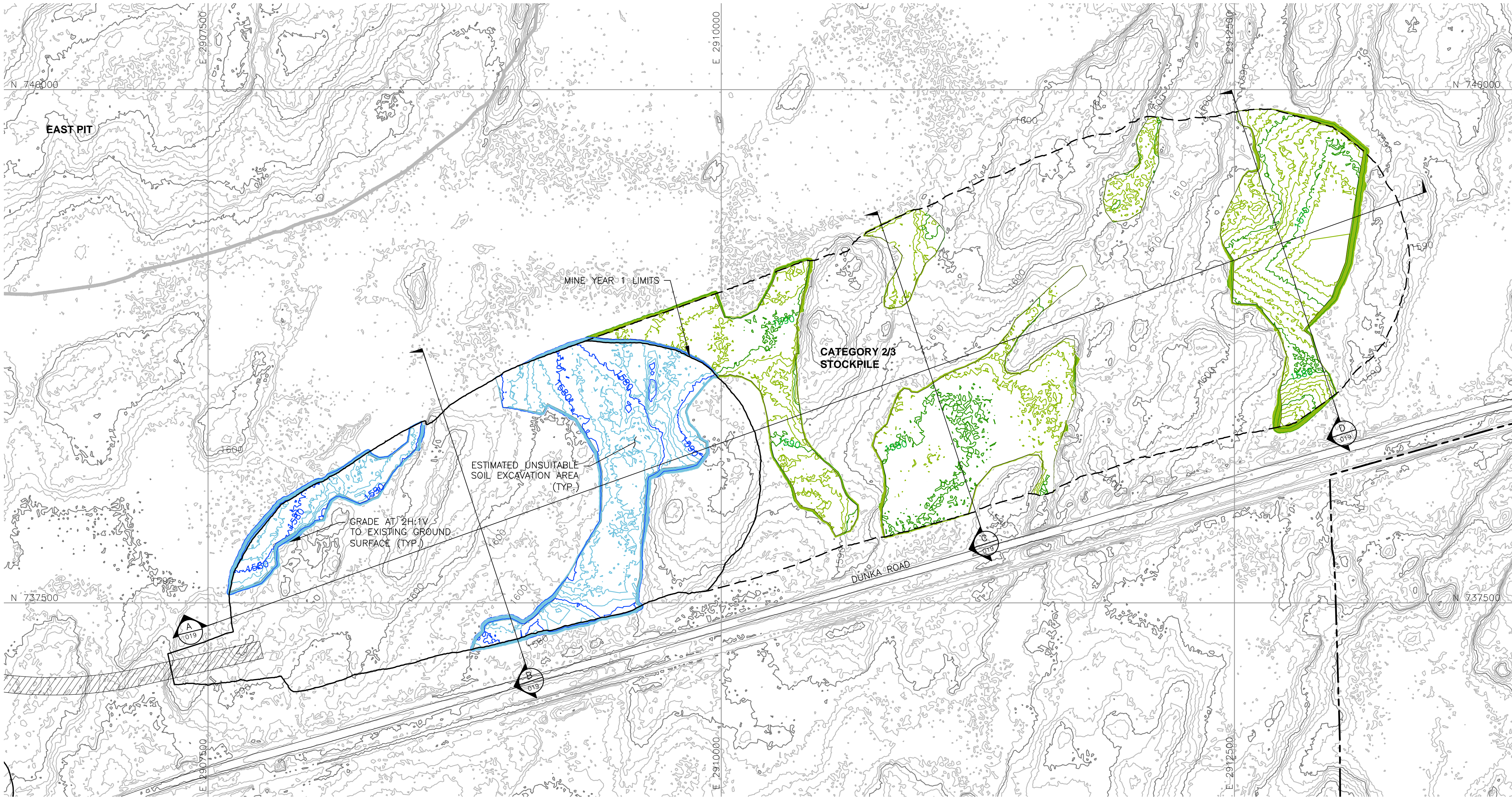
VER NO	DATE	DESCRIPTION	ISSUE STATUS		
A	12/02/11	ISSUED FOR REVIEW FOR INCLUSION IN ROCK AND OVERBURDEN MANAGEMENT PLAN (ROMP)	ISSUED	VERSION	DATE
B	2/15/13	ISSUED FOR REVIEW FOR INCLUSION IN ROMP	FOR PERMITTING	F	5-22-15
C	5/29/13	ISSUED FOR REVIEW FOR INCLUSION IN ROMP			
D	1/14/14	ISSUED FOR AGENCY REVIEW			
E	4/10/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS	FOR CONSTRUCTION		
F	5/22/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS			
			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.	
SIGNATURE	
PRINTED NAME BRENT R. BRONSON	
DATE 5/22/15 LICENSE # 46492	

DRAWN: MTM
CHECKED:
GOLDER PROJECT NO.: 113-2209
SCALE: AS SHOWN

CADD USER: Brewer, Keith FILE: X:_DENVER\113-2209\11322094034.DWG PLOT SCALE: 1:1 PLOT DATE: 5/27/2015 12:03 PM

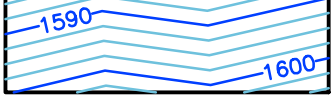
INCHES
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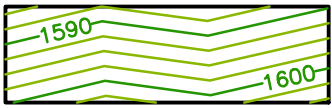
LEGEND



EXISTING GROUND TOPOGRAPHY (SEE REFERENCE 1)



PROPOSED MINE YEAR 1 EXCAVATION TOPOGRAPHY



PROPOSED MAXIMUM FOOTPRINT EXCAVATION TOPOGRAPHY



MINE SITE BOUNDARY



MINE YEAR 11 PIT BOUNDARIES (SEE NOTE 1)



MINE YEAR 1 WASTE ROCK STOCKPILE OUTLINES (SEE NOTE 2)



MAXIMUM WASTE ROCK STOCKPILE OUTLINES (SEE NOTE 2)



HAUL ROADS



CROSS SECTION IDENTIFIER

SHEET WHERE SECTION IS LOCATED

NOTES

- OPEN PIT AND HAUL ROAD LAYOUTS PROVIDED BY BARR ENGINEERING IN OCTOBER 2011.
- STOCKPILE LAYOUTS PROVIDED BY BARR ENGINEERING IN APRIL 2011 AND MODIFIED BY GOLDER.
- SEE GENERAL NOTES AND LEGEND ON DRAWING 002.

REFERENCES

- EXISTING GROUND TOPOGRAPHY PROVIDED BY BARR ENGINEERING, AUGUST 2011.
- COORDINATE SYSTEM REFERENCE IS NAD83 MINNESOTA STATE PLANE NORTH.
- VERTICAL DATUM REFERENCE IS FEET ABOVE MEAN SEA LEVEL (AMSL).

PLANT DRAWING NUMBER:

CATEGORY 2/3 STOCKPILE SUBGRADE EXCAVATION PLAN



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



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Ph: (303) 980-0540
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VER NO	DATE	DESCRIPTION	ISSUE STATUS		
A	12/02/11	ISSUED FOR REVIEW FOR INCLUSION IN ROCK AND OVERBURDEN MANAGEMENT PLAN (ROMP)	ISSUED	VERSION	DATE
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C	5/29/13	ISSUED FOR REVIEW FOR INCLUSION IN ROMP			
D	1/14/14	ISSUED FOR AGENCY REVIEW			
E	4/10/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS	FOR CONSTRUCTION		
F	5/22/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS			
			NOT APPROVED FOR CONSTRUCTION.		

DRAWN: MTM

CHECKED: *gg*

GOLDER PROJECT NO.: 113-2209

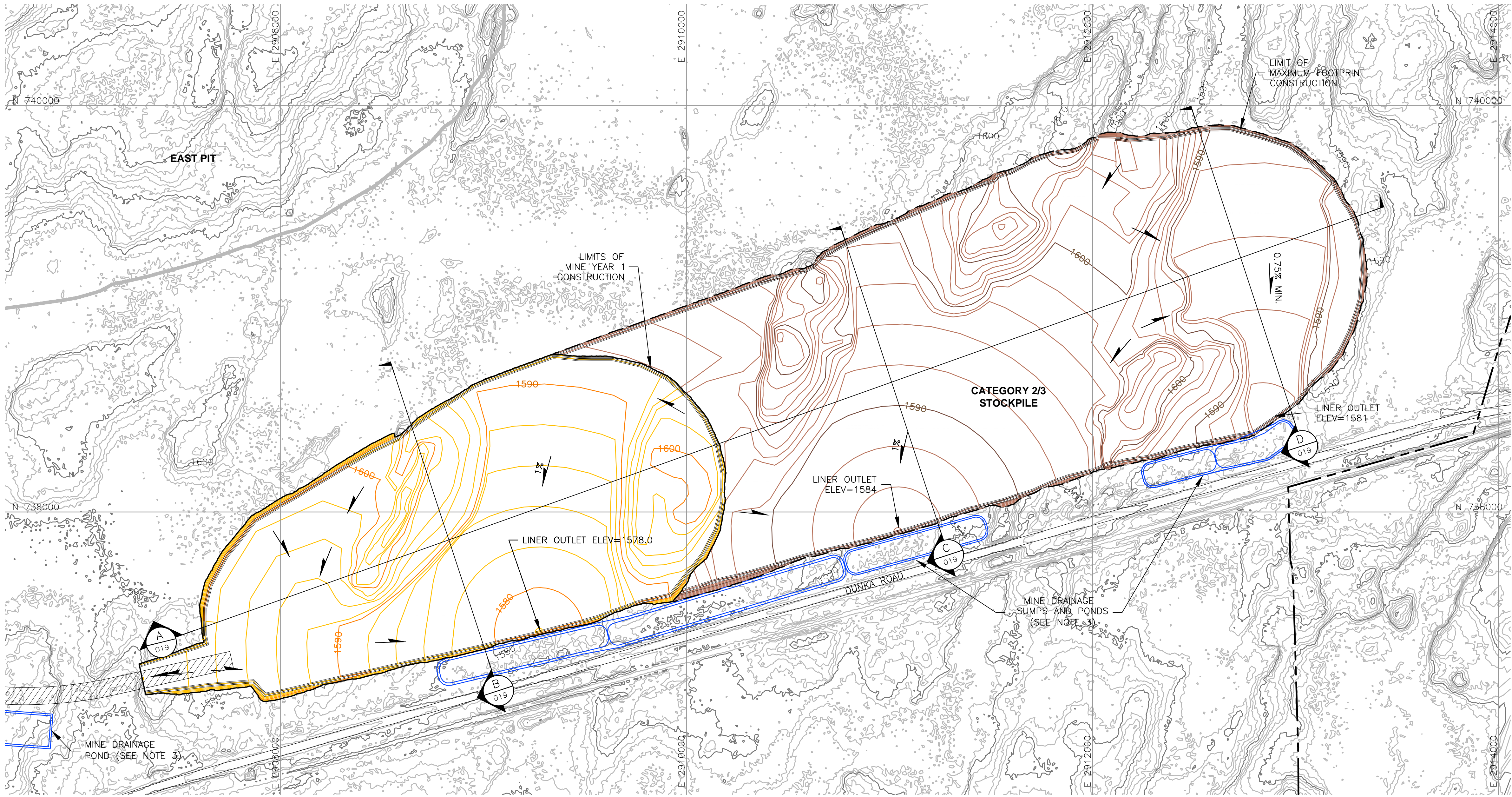
SCALE: AS SHOWN

DWG. NO. SKP-014

REV

CADD USER: Brewer, Keith FILE: X:_DENVER\113-2209\132209\035.DWG PLOT SCALE: 1:1 PLOT DATE: 5/27/2015 12:04 PM

INCHES
1
2



LEGEND

- EXISTING GROUND TOPOGRAPHY (SEE REFERENCE 1)
- PROPOSED MINE YEAR 1 GRADING TOPOGRAPHY
- PROPOSED MAXIMUM FOOTPRINT GRADING TOPOGRAPHY
- MINE SITE BOUNDARY
- CROSS SECTION IDENTIFIER
- SHEET WHERE SECTION IS LOCATED
- SLOPE
- MINE YEAR 11 PIT BOUNDARIES (SEE NOTE 1)
- MINE YEAR 1 WASTE ROCK STOCKPILE OUTLINES (SEE NOTE 2)
- MAXIMUM WASTE ROCK STOCKPILE OUTLINES (SEE NOTE 2)
- HAUL ROADS
- MINE DRAINAGE SUMP/POND (SEE NOTE 3)

NOTES

- OPEN PIT AND HAUL ROAD LAYOUTS PROVIDED BY BARR ENGINEERING IN OCTOBER 2011.
- STOCKPILE LAYOUTS PROVIDED BY BARR ENGINEERING IN APRIL 2011 AND MODIFIED BY GOLDER.
- SEE MECHANICAL INFRASTRUCTURE PERMIT SUPPORT DRAWINGS.
- SEE GENERAL NOTES AND LEGEND ON DRAWING 002.

REFERENCES

- EXISTING GROUND TOPOGRAPHY PROVIDED BY BARR ENGINEERING, AUGUST 2011.
- COORDINATE SYSTEM REFERENCE IS NAD83 MINNESOTA STATE PLANE NORTH.
- VERTICAL DATUM REFERENCE IS FEET ABOVE MEAN SEA LEVEL (AMSL).

PLANT DRAWING NUMBER:

CATEGORY 2/3 STOCKPILE
FOUNDATION GRADING PLAN
MINE YEAR 1 AND MAXIMUM



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



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SIGNATURE *B. Bronson*
PRINTED NAME BRENT R. BRONSON
DATE 5/22/15 LICENSE # 46492

DRAWN: MTM

CHECKED: *gg*

GOLDER PROJECT NO.: 113-2209

SCALE: AS SHOWN

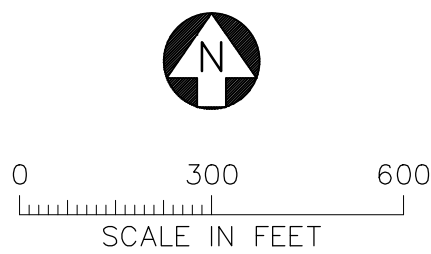
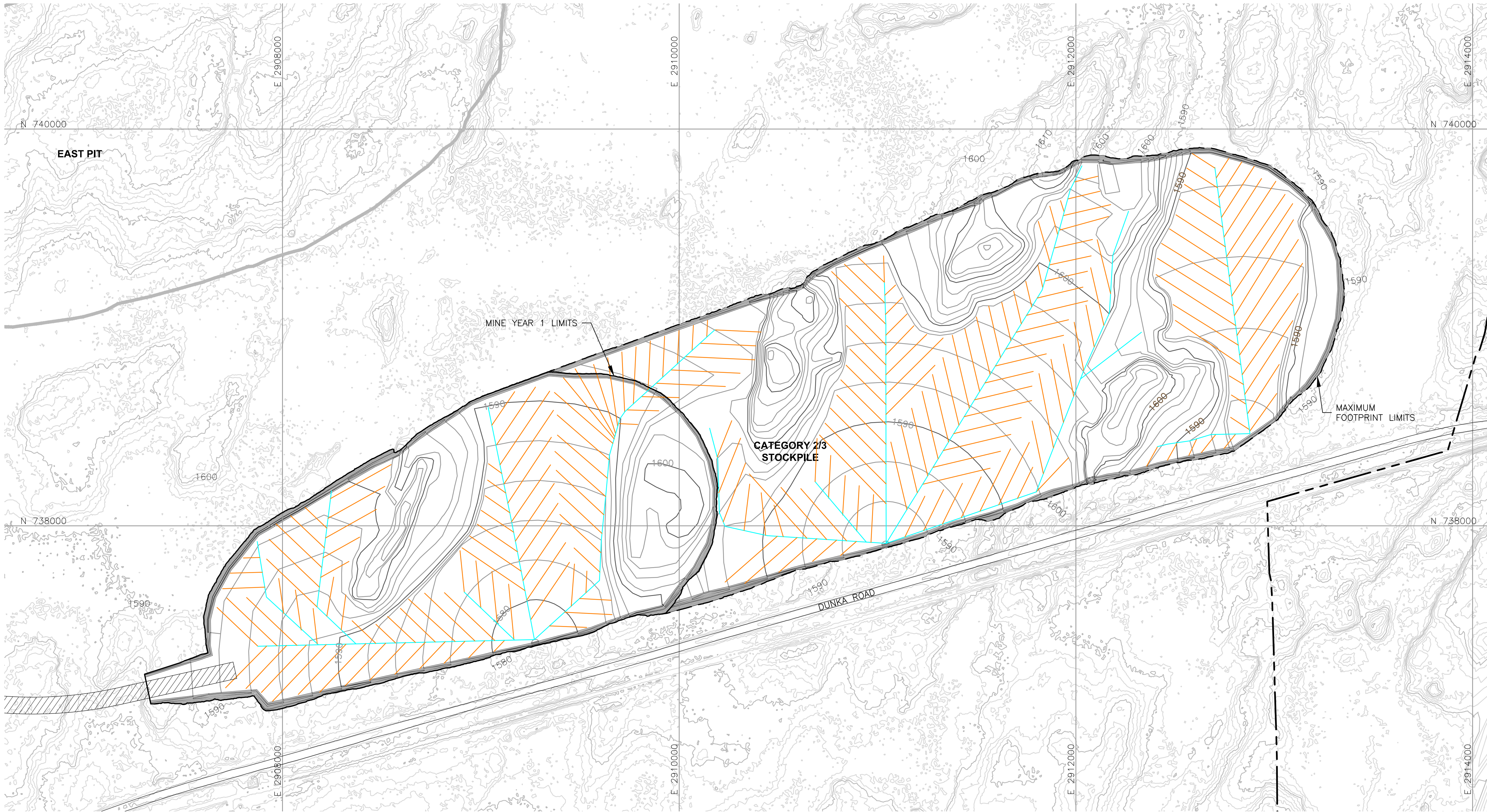
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VER NO	DATE	DESCRIPTION	ISSUE STATUS		
A	12/02/11	ISSUED FOR REVIEW FOR INCLUSION IN ROCK AND OVERBURDEN MANAGEMENT PLAN (ROMP)	FOR PERMITTING	F	5-22-15
B	2/15/13	ISSUED FOR REVIEW FOR INCLUSION IN ROMP			
C	5/29/13	ISSUED FOR REVIEW FOR INCLUSION IN ROMP			
D	1/14/14	ISSUED FOR AGENCY REVIEW			
E	4/10/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS	FOR CONSTRUCTION		
F	5/22/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS			
			NOT APPROVED FOR CONSTRUCTION.		

CADD USER: Brewer, Keith FILE: X:\DENVER\113-2209\1132209H008.DWG PLOT SCALE: 1:1 PLOT DATE: 5/27/2015 12:05 PM

INCHES
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VER NO	DATE	DESCRIPTION	ISSUE STATUS		
A	12/02/11	ISSUED FOR REVIEW FOR INCLUSION IN ROCK AND OVERBURDEN MANAGEMENT PLAN (ROMP)	FOR PERMITTING	F	5-22-15
B	2/15/13	ISSUED FOR REVIEW FOR INCLUSION IN ROMP			
C	5/29/13	ISSUED FOR REVIEW FOR INCLUSION IN ROMP			
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E	4/10/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS	FOR CONSTRUCTION		
F	5/22/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS			
			NOT APPROVED FOR CONSTRUCTION.		


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SIGNATURE *B. Bronson*
PRINTED NAME BRENT R. BRONSON
DATE 5/22/15 LICENSE # 46492

DRAWN: MTM
CHECKED: *gg*
GOLDER PROJECT NO.: 113-2209
SCALE: AS SHOWN









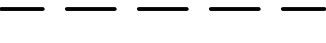
POLY MET MINING, INC.
NORTHMET PROJECT
HOYT LAKES, MINNESOTA



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DWG. NO. SKP-016
REV

LEGEND

-  EXISTING GROUND TOPOGRAPHY
-  PROPOSED GRADING TOPOGRAPHY
-  MINE SITE BOUNDARY
-  MINE YEAR 11 PIT BOUNDARIES (SEE NOTE 1)
-  MINE YEAR 1 WASTE ROCK STOCKPILE OUTLINES (SEE NOTE 2)
-  MAXIMUM WASTE ROCK STOCKPILE OUTLINES (SEE NOTE 2)
-  HAUL ROADS

TERTIARY COLLECTION PIPING (SEE NOTE 3)
4-INCH



SECONDARY COLLECTION PIPING (SEE NOTE 3)
6-INCH

NOTES

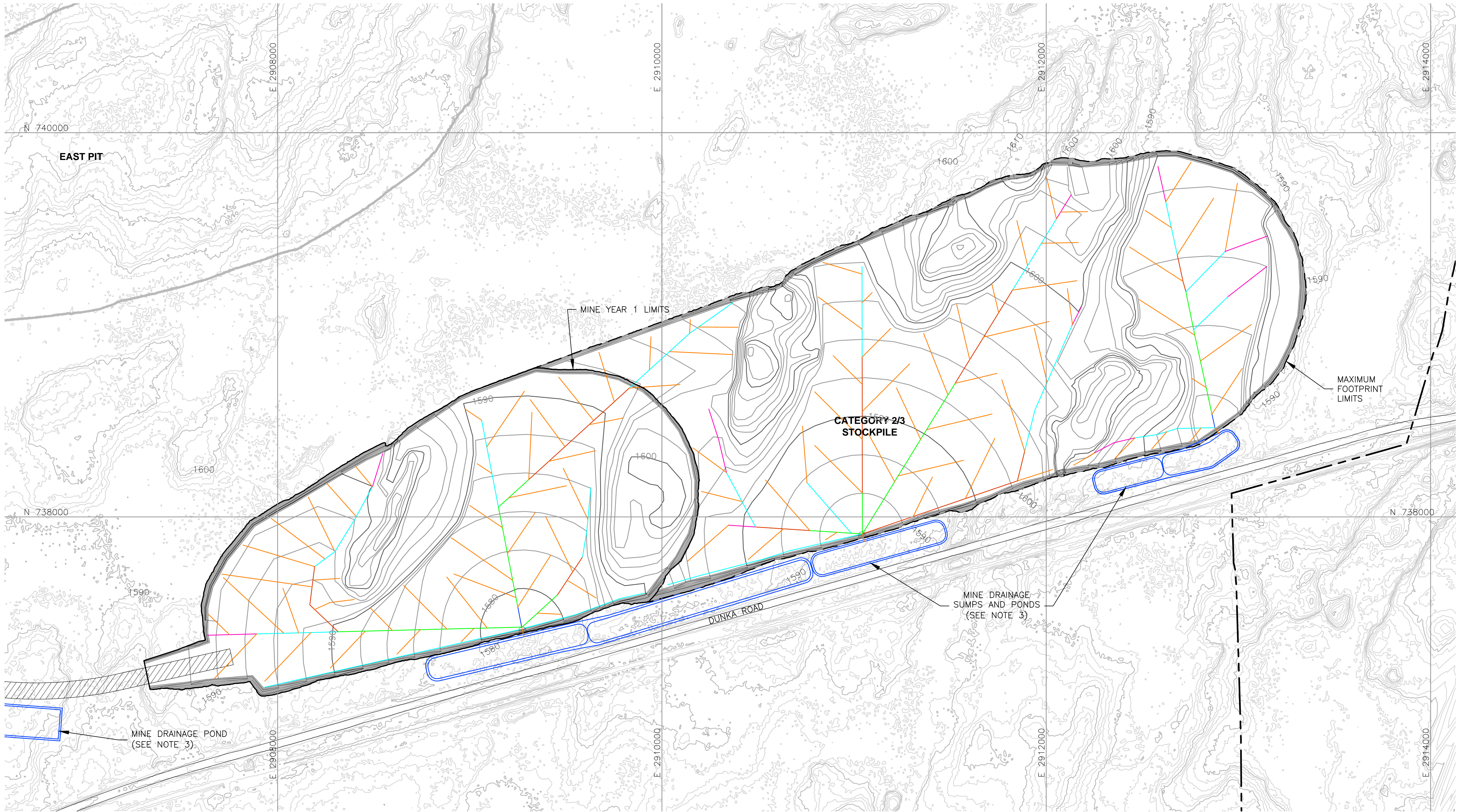
- OPEN PIT AND HAUL ROAD LAYOUTS PROVIDED BY BARR ENGINEERING IN OCTOBER 2011.
- STOCKPILE LAYOUTS PROVIDED BY BARR ENGINEERING IN APRIL 2011 AND MODIFIED BY GOLDER.
- ACTUAL NUMBER AND LOCATION OF UNDERDRAIN PIPES AND SUMPS WILL NEED TO BE DETERMINED DURING CONSTRUCTION BASED ON ENCOUNTERED FIELD CONDITIONS.
- SEE GENERAL NOTES AND LEGEND ON DRAWING 002.

REFERENCES

- EXISTING GROUND TOPOGRAPHY PROVIDED BY BARR ENGINEERING, AUGUST 2011.
- COORDINATE SYSTEM REFERENCE IS NAD83 MINNESOTA STATE PLANE NORTH.
- VERTICAL DATUM REFERENCE IS FEET ABOVE MEAN SEA LEVEL (AMSL).

PLANT DRAWING NUMBER:		
CATEGORY 2/3 STOCKPILE UNDERDRAIN PIPING PLAN MINE YEAR 1 AND MAXIMUM		
<div><p>POLY MET MINING, INC. NORTHMET PROJECT HOYT LAKES, MINNESOTA</p></div> <div><p>GOLDER ASSOCIATES INC. 44 UNION BOULEVARD, SUITE 300 LAKEWOOD, CO USA 80233 Ph: (303) 980-0540 Fax: (303) 985-2080 www.golder.com</p></div>		
DWG. NO.	SKP-016	REV

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LEGEND

- EXISTING GROUND TOPOGRAPHY
- PROPOSED GRADING TOPOGRAPHY
- MINE SITE BOUNDARY
- MINE YEAR 11 PIT BOUNDARIES (SEE NOTE 1)
- MINE YEAR 1 ORE, WASTE ROCK STOCKPILE OUTLINES (SEE NOTE 2)
- MAXIMUM ORE, WASTE ROCK STOCKPILE OUTLINES (SEE NOTE 2)
- HAUL ROADS
- MINE DRAINAGE SUMP/POND (SEE NOTE 3)

TERTIARY COLLECTION PIPING

- 4-INCH

PRIMARY AND SECONDARY COLLECTION PIPING

- 4-INCH
- 6-INCH
- 8-INCH
- 10-INCH
- 12-INCH

NOTES

- OPEN PIT AND HAUL ROAD LAYOUTS PROVIDED BY BARR ENGINEERING IN OCTOBER 2011.
- STOCKPILE LAYOUTS PROVIDED BY BARR ENGINEERING IN APRIL 2011 AND MODIFIED BY GOLDER.
- SEE MECHANICAL INFRASTRUCTURE PERMIT SUPPORT DRAWINGS.
- SEE GENERAL NOTES AND LEGEND ON DRAWING 002.

REFERENCES

- EXISTING GROUND TOPOGRAPHY PROVIDED BY BARR ENGINEERING, AUGUST 2011.
- COORDINATE SYSTEM REFERENCE IS NAD83 MINNESOTA STATE PLANE NORTH.
- VERTICAL DATUM REFERENCE IS FEET ABOVE MEAN SEA LEVEL (AMSL).

PLANT DRAWING NUMBER:

CATEGORY 2/3 STOCKPILE
OVERLINER DRAINAGE PIPING PLAN
MINE YEAR 1 AND MAXIMUM



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



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REV

VER NO	DATE	DESCRIPTION	ISSUE STATUS		
A	12/02/11	ISSUED FOR REVIEW FOR INCLUSION IN ROCK AND OVERBURDEN MANAGEMENT PLAN (ROMP)	ISSUED	VERSION	DATE
B	2/15/13	ISSUED FOR REVIEW FOR INCLUSION IN ROMP	FOR PERMITTING	F	5-22-15
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E	4/10/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS	FOR CONSTRUCTION		
F	5/22/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS			
			NOT APPROVED FOR CONSTRUCTION.		

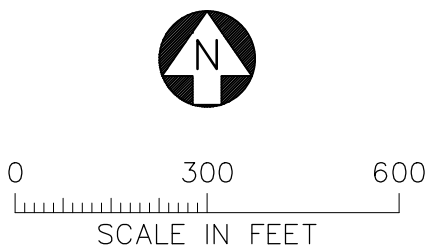
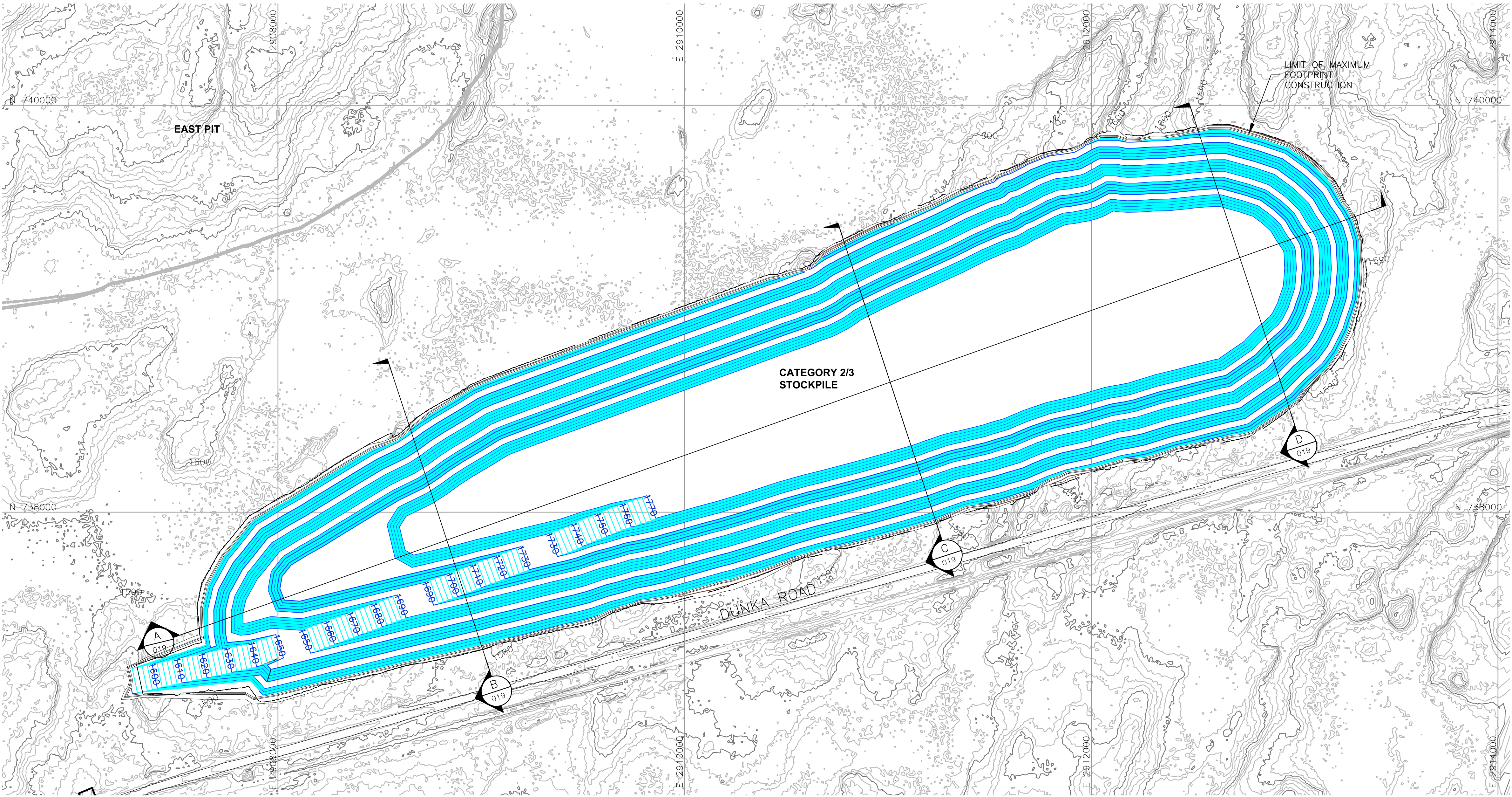
I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

SIGNATURE *B. Bronson*
PRINTED NAME BRENT R. BRONSON
DATE 5/22/15 LICENSE # 46492


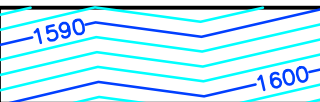
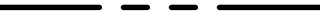






DRAWN: MTM
CHECKED: *gg*
GOLDER PROJECT NO.: 113-2209
SCALE: AS SHOWN

CADD USER: Brewer, Keith FILE: X:_DENVER\113-2209\132209H004.DWG PLOT SCALE: 1:1 PLOT DATE: 5/27/2015 12:07 PM

INCHES
1
2



LEGEND

-  EXISTING GROUND TOPOGRAPHY (SEE REFERENCE 1)
-  PROPOSED MAXIMUM GRADING TOPOGRAPHY
-  MINE SITE BOUNDARY
-  CROSS SECTION IDENTIFIER
-  SHEET WHERE SECTION IS LOCATED
-  MINE YEAR 1 WASTE ROCK STOCKPILE OUTLINES (SEE NOTE 2)
-  MAXIMUM ORE, WASTE ROCK STOCKPILE OUTLINES (SEE NOTE 2)
-  PROPOSED HAUL ROAD
-  MINE YEAR 11 PIT BOUNDARIES (SEE NOTE 1)

NOTES

1. OPEN PIT AND HAUL ROAD LAYOUTS PROVIDED BY BARR ENGINEERING IN OCTOBER 2011.
2. STOCKPILE LAYOUTS PROVIDED BY BARR ENGINEERING IN APRIL 2011 AND MODIFIED BY GOLDER.
3. SEE GENERAL NOTES AND LEGEND ON DRAWING 002.

REFERENCES

1. EXISTING GROUND TOPOGRAPHY PROVIDED BY BARR ENGINEERING, AUGUST 2011.
2. COORDINATE SYSTEM REFERENCE IS NAD83 MINNESOTA STATE PLANE NORTH.
3. VERTICAL DATUM REFERENCE IS FEET ABOVE MEAN SEA LEVEL (AMSL).

PLANT DRAWING NUMBER:

CATEGORY 2/3 STOCKPILE
MAXIMUM CAPACITY CONFIGURATION



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Ph: (303) 980-0540
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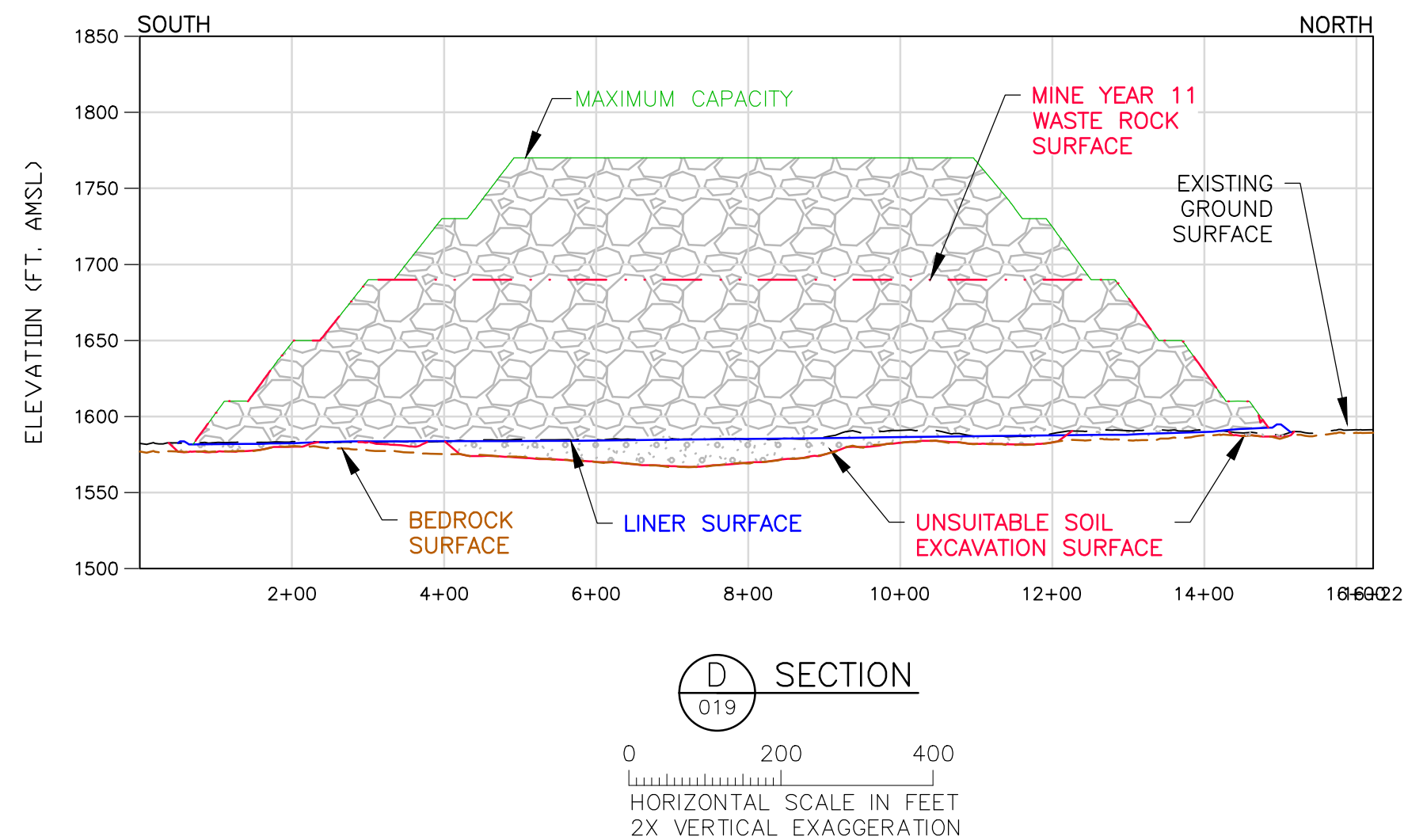
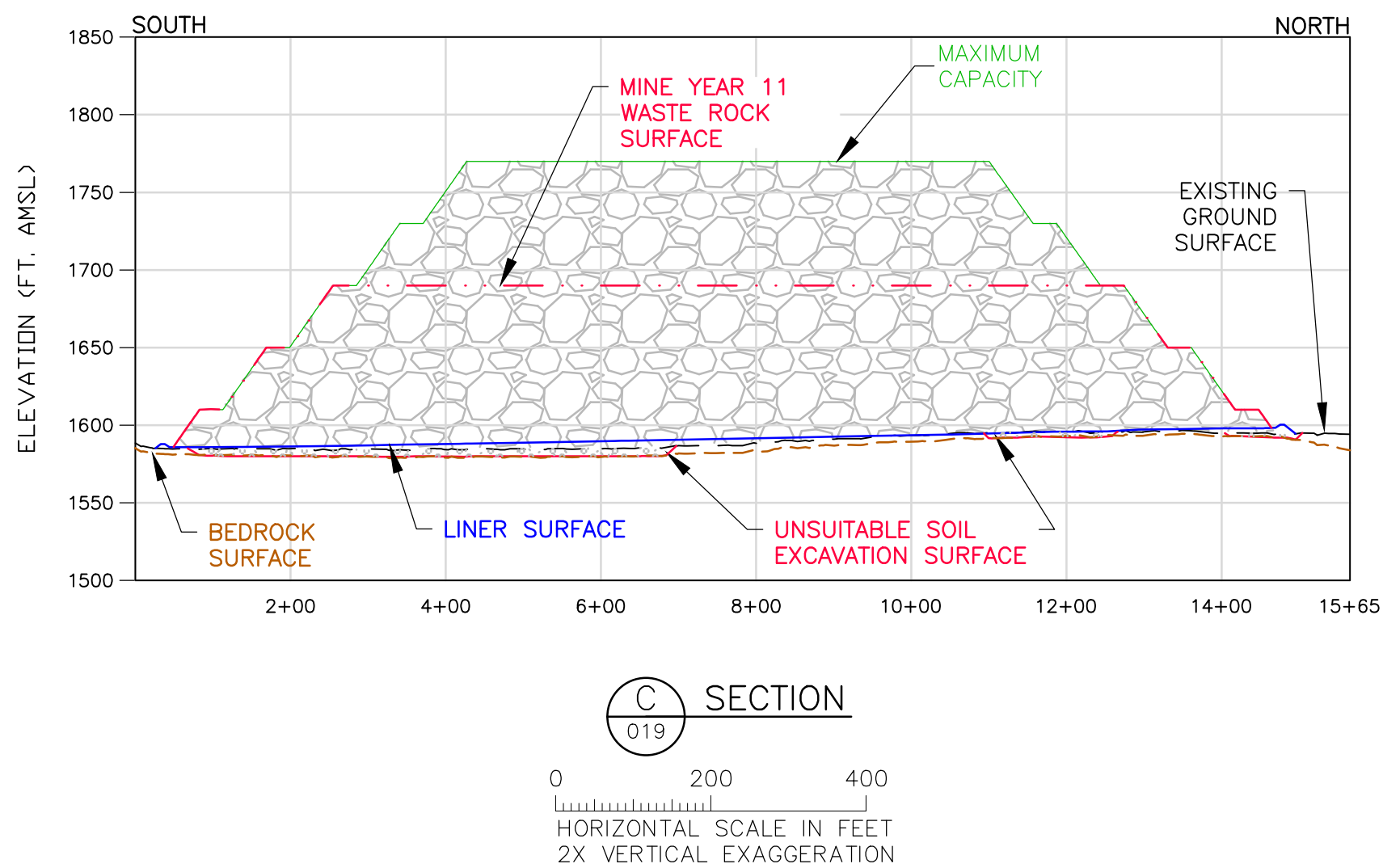
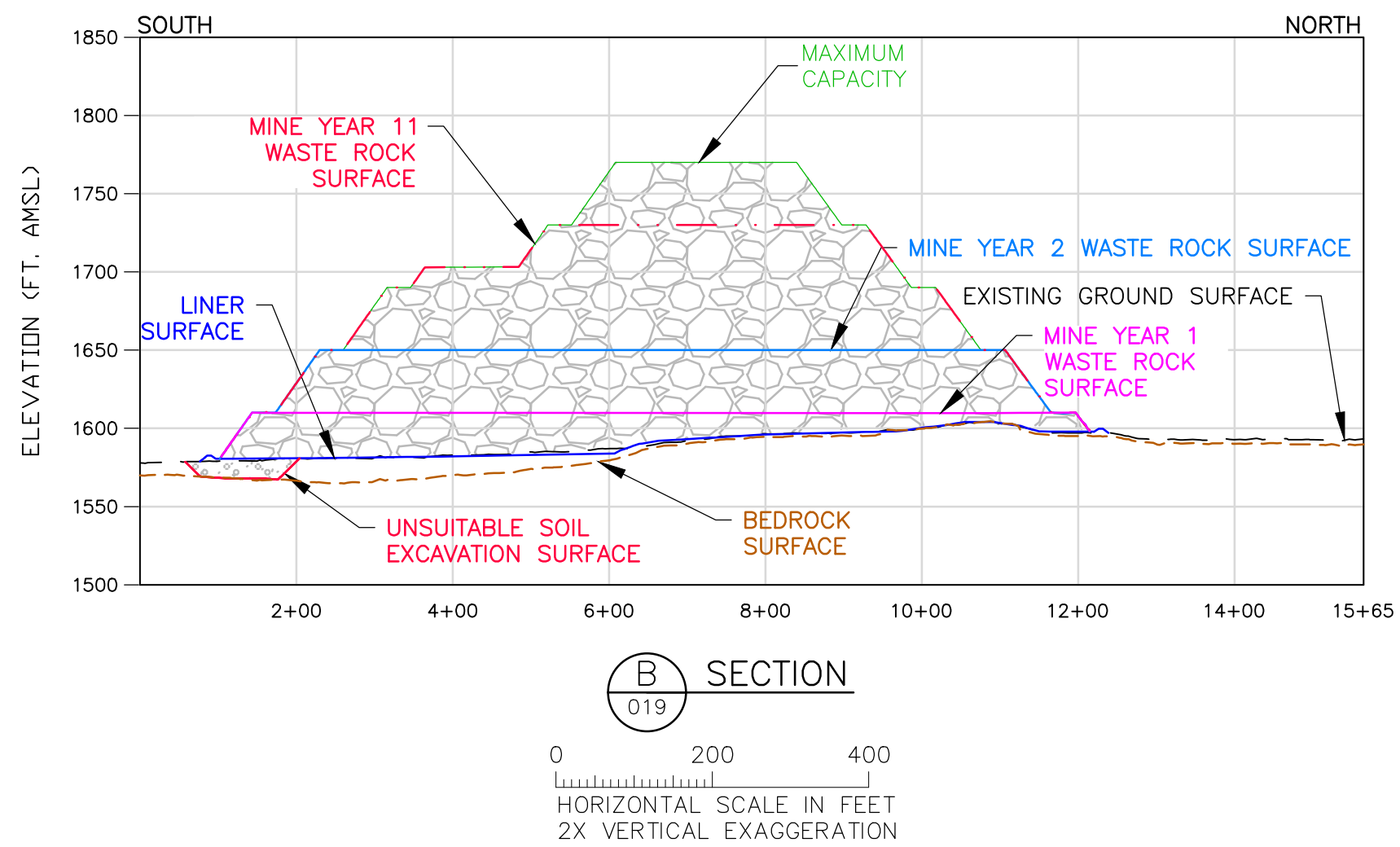
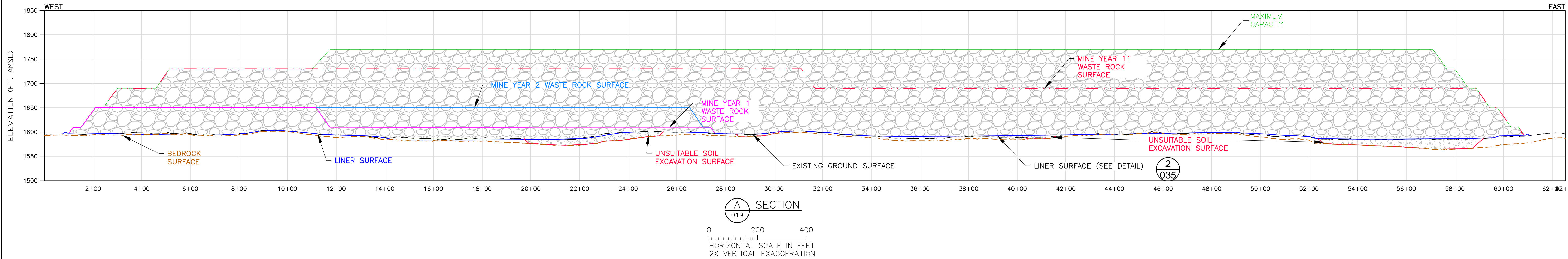
DWG. NO. SKP-018

REV

VER NO	DATE	DESCRIPTION	ISSUE STATUS			SIGNATURE PRINTED NAME BRENT R. BRONSON DATE 5/22/15 LICENSE # 46492	DRAWN: MTM CHECKED: <i>gg</i> GOLDER PROJECT NO.: 113-2209 SCALE: AS SHOWN
			ISSUED	VERSION	DATE		
A	12/02/11	ISSUED FOR REVIEW FOR INCLUSION IN ROCK AND OVERBURDEN MANAGEMENT PLAN (ROMP)	FOR PERMITTING	F	5-22-15	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.	
B	2/15/13	ISSUED FOR REVIEW FOR INCLUSION IN ROMP					
C	5/29/13	ISSUED FOR REVIEW FOR INCLUSION IN ROMP					
D	1/14/14	ISSUED FOR AGENCY REVIEW	FOR CONSTRUCTION			NOT APPROVED FOR CONSTRUCTION.	
E	4/10/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS					
F	5/22/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS					

CADD USER: Brewer, Keith FILE: X:\DENVER\113-2209\132209d011.DWG PLOT SCALE: 1:1 PLOT DATE: 5/27/2015 12:09 PM

INCHES
1
2



LEGEND

	MINE YEAR 1 LIMITS
	MINE YEAR 2 LIMITS
	MINE YEAR 11 LIMITS
	MAXIMUM CAPACITY
	LINER SURFACE
	EXISTING GROUND SURFACE
	UNSUITABLE SOIL EXCAVATION SURFACE
	BEDROCK SURFACE

NOTES

- STOCKPILE INTERBENCH SLOPES AT ANGLE OF REPOSE.
- THIS DESIGN CONSERVATIVELY ASSUMES THAT ALL LOWLAND/WETLAND SOILS ARE GEOTECHNICALLY UNSUITABLE AND WILL REQUIRE EXCAVATION AND REPLACEMENT WITH STRUCTURAL FILL TO THE DESIGN FOUNDATION BASE GRADE. GEOTECHNICAL PROPERTIES OF THE FOUNDATION SOILS WILL BE CONFIRMED PRIOR TO FINAL DESIGN.
- MAXIMUM DEPTH OF UNSUITABLE MATERIAL SUBGRADE EXCAVATION LIMITED TO 20 FEET FOR THIS DESIGN. THE ACTUAL DEPTH OF UNSUITABLE SOIL EXCAVATION WILL BE CONFIRMED BY PHASE II GEOTECHNICAL INVESTIGATION.
- SEE CROSS SECTION LOCATIONS ON DRAWINGS 3, 4, 5, 14, 15 AND 18.

PLANT DRAWING NUMBER:

CATEGORY 2/3 STOCKPILE DESIGN SECTIONS



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



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SIGNATURE

PRINTED NAME BRENT R. BRONSON

DATE 5/22/15 LICENSE # 46492

DRAWN: MTM

CHECKED:

GOLDER PROJECT NO.: 113-2209

SCALE: AS SHOWN

DWG. NO. SKP-019

REV

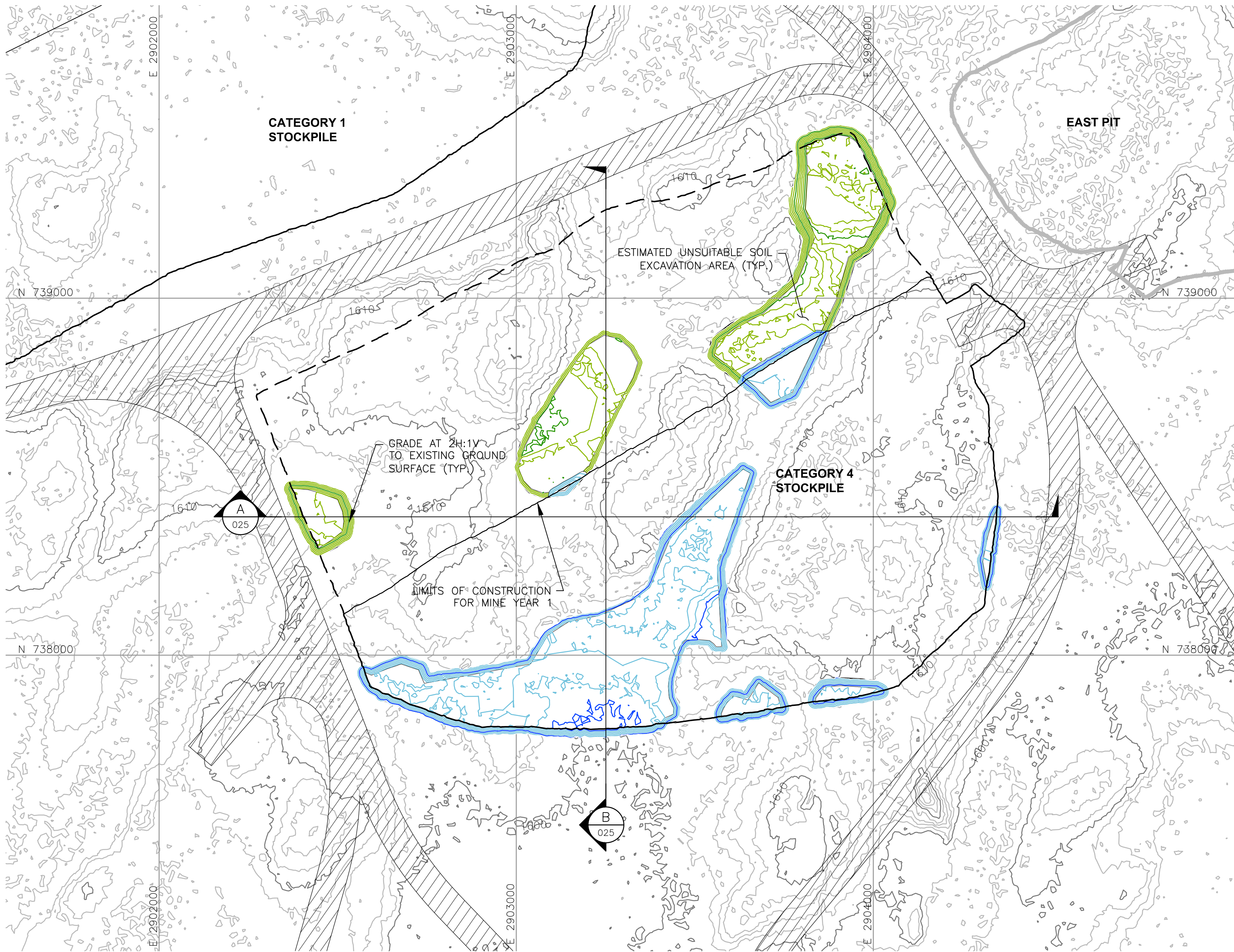
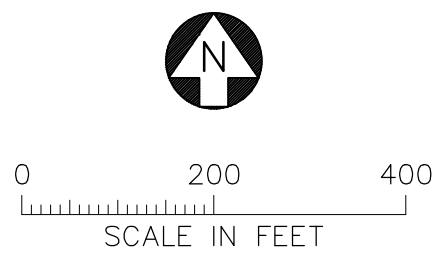
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E	4/10/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS			
F	5/22/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS			
			NOT APPROVED FOR CONSTRUCTION.		

CADD USER: Brewer, Keith FILE: X:_DENVER\113-2209\1132209.dwg PLOT SCALE: 1:1 PLOT DATE: 5/27/2015 12:10 PM

INCHES

2

1



LEGEND

- EXISTING GROUND TOPOGRAPHY (SEE REFERENCE 1)
- PROPOSED MINE YEAR 1 EXCAVATION TOPOGRAPHY
- PROPOSED MAXIMUM FOOTPRINT EXCAVATION TOPOGRAPHY
- MINE SITE BOUNDARY
- MINE YEAR 1 WASTE ROCK STOCKPILE OUTLINES (SEE NOTE 2)
- MAXIMUM WASTE ROCK STOCKPILE OUTLINES (SEE NOTE 2)
- HAUL ROADS
- MINE YEAR 2 PIT BOUNDARIES (SEE NOTE 1)
- CROSS SECTION IDENTIFIER
- SHEET WHERE SECTION IS LOCATED

NOTES


- OPEN PIT AND HAUL ROAD LAYOUTS PROVIDED BY BARR ENGINEERING IN OCTOBER 2011.
- STOCKPILE LAYOUTS PROVIDED BY BARR ENGINEERING IN APRIL 2011 AND MODIFIED BY GOLDER.
- SEE GENERAL NOTES AND LEGEND ON DRAWING 002.

REFERENCES


- EXISTING GROUND TOPOGRAPHY PROVIDED BY BARR ENGINEERING, AUGUST 2011.
- COORDINATE SYSTEM REFERENCE IS NAD83 MINNESOTA STATE PLANE NORTH.
- VERTICAL DATUM REFERENCE IS FEET ABOVE MEAN SEA LEVEL (AMSL).

PLANT DRAWING NUMBER:

CATEGORY 4 STOCKPILE
SUBGRADE EXCAVATION PLAN




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



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Ph: (303) 980-0540
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DRAWN: MTM


CHECKED: 

GOLDER PROJECT NO.: 113-2209

SCALE: AS SHOWN

DWG. NO. SKP-020

REV

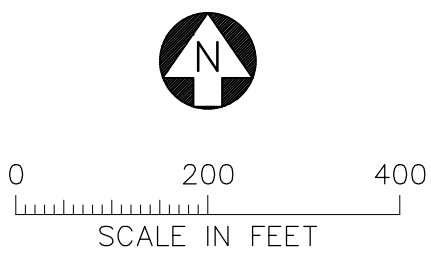
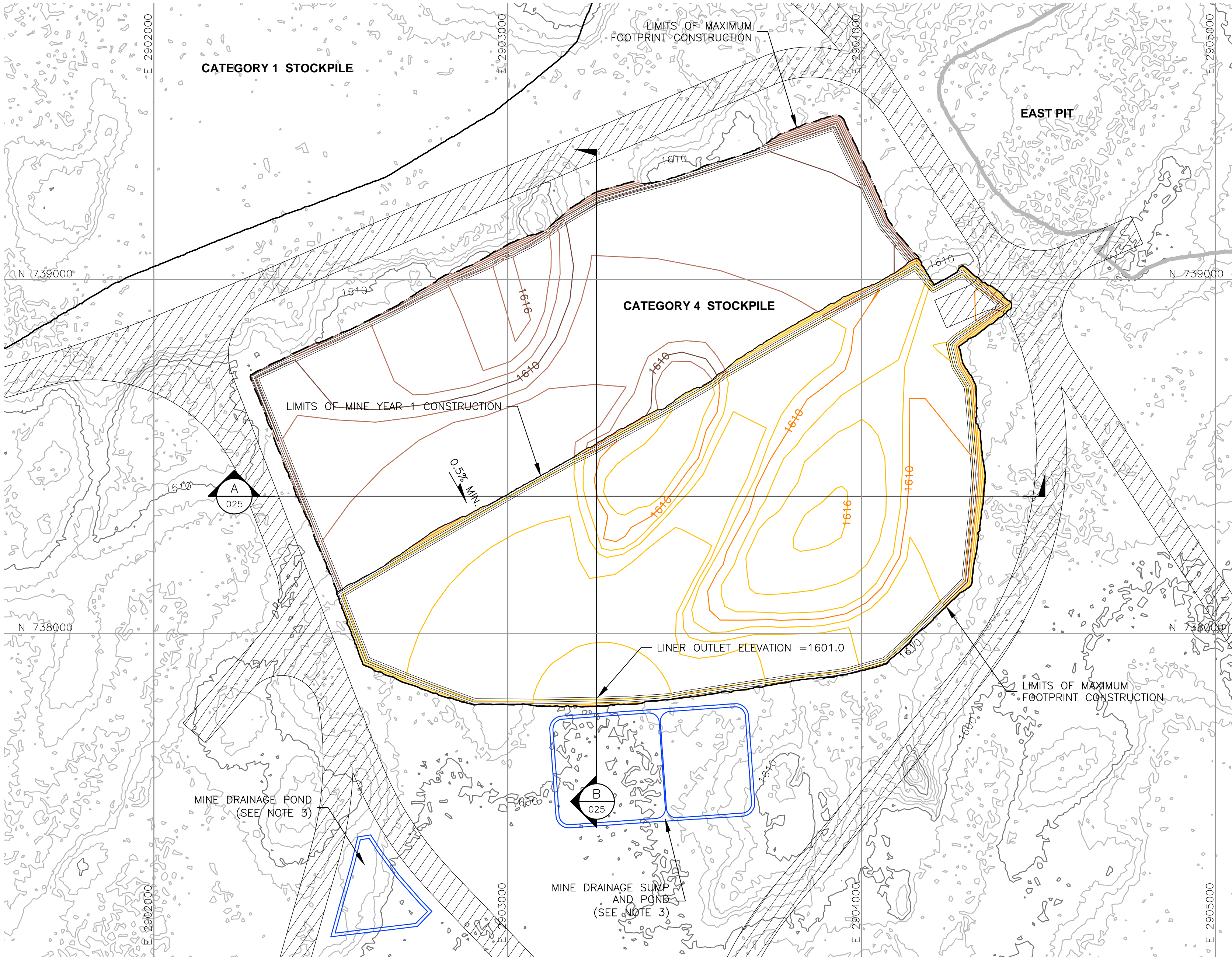
VER NO	DATE	DESCRIPTION	ISSUE STATUS			I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA. SIGNATURE  PRINTED NAME <u>BRENT R. BRONSON</u> DATE <u>5/22/15</u> LICENSE # <u>46492</u>
A	12/02/11	ISSUED FOR REVIEW FOR INCLUSION IN ROCK AND OVERBURDEN MANAGEMENT PLAN (ROMP)	ISSUED	VERSION	DATE	
B	2/15/13	ISSUED FOR REVIEW FOR INCLUSION IN ROMP	FOR PERMITTING	F	5-22-15	
C	5/29/13	ISSUED FOR REVIEW FOR INCLUSION IN ROMP				
D	1/14/14	ISSUED FOR AGENCY REVIEW	FOR CONSTRUCTION			
E	4/10/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS				
F	5/22/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS	NOT APPROVED FOR CONSTRUCTION.			

CADD USER: Brewer, Keith FILE: X:\DENVER\113-2209\11322090103.DWG PLOT SCALE: 1:1 PLOT DATE: 5/27/2015 12:11 PM

INCHES

1

2



VER NO	DATE	DESCRIPTION	ISSUE STATUS				
A	12/02/11	ISSUED FOR REVIEW FOR INCLUSION IN ROCK AND OVERBURDEN MANAGEMENT PLAN (ROMP)	ISSUED	VERSION	DATE		
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SIGNATURE *B. Bronson*

PRINTED NAME BRENT R. BRONSON

DATE 5/22/15 LICENSE # 46492

DRAWN: MTM

CHECKED: *gg*

GOLDER PROJECT NO.: 113-2209

SCALE: AS SHOWN

PLANT DRAWING NUMBER:

CATEGORY 4 STOCKPILE
FOUNDATION GRADING PLAN
MINE YEAR 1 AND MAXIMUM

POLYMET MINING

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

GOLDER ASSOCIATES INC.
44 UNION BOULEVARD, SUITE 300
LAKEWOOD, CO USA 80233
Ph: (303) 980-0540
Fax: (303) 985-2080
www.golder.com

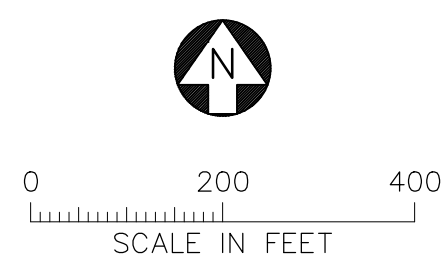
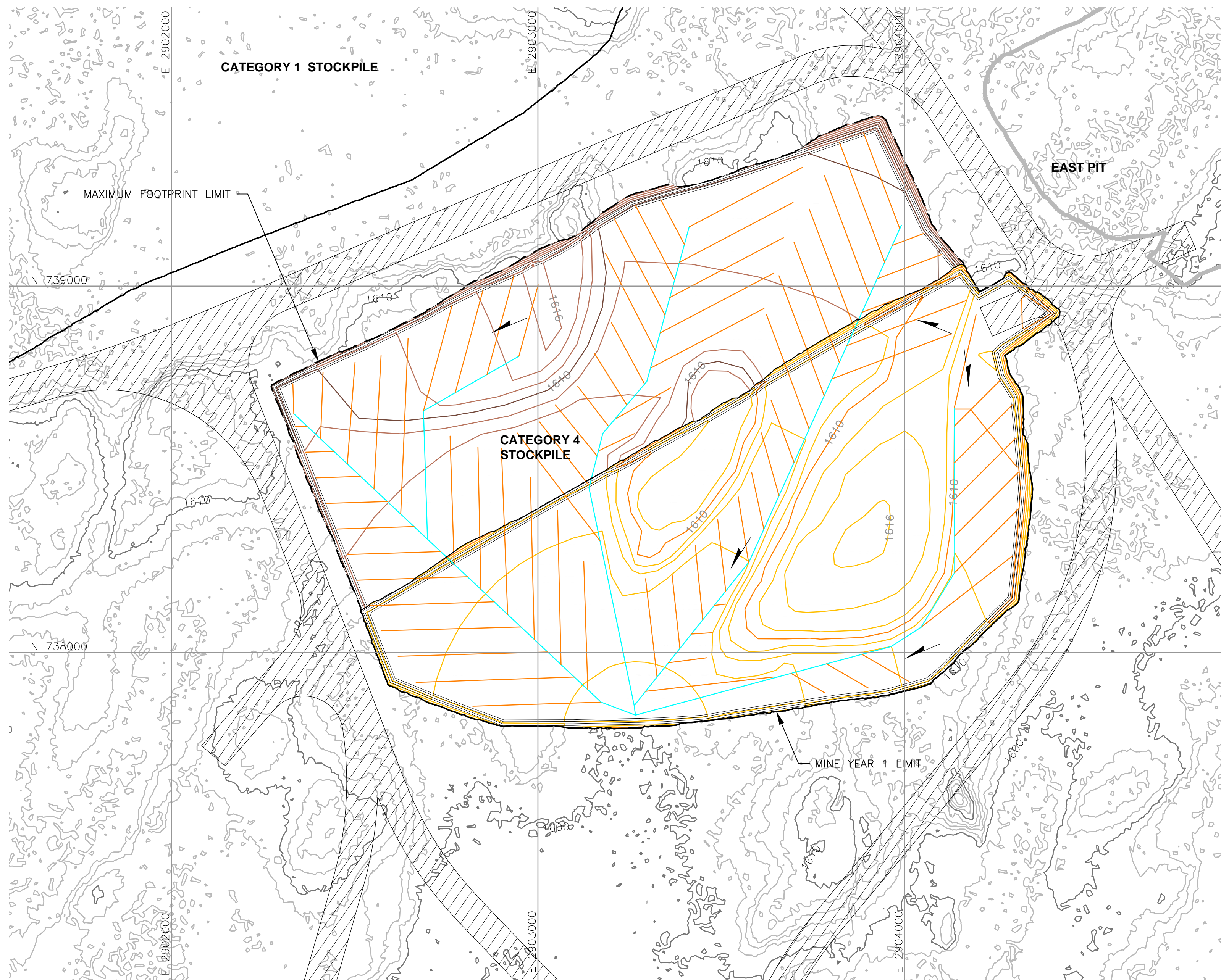
DWG. NO. SKP-021

REV

- ### LEGEND
- EXISTING GROUND TOPOGRAPHY (SEE REFERENCE 1)
 - PROPOSED MINE YEAR 1 GRADING TOPOGRAPHY
 - PROPOSED MAXIMUM FOOTPRINT GRADING TOPOGRAPHY
 - MINE SITE BOUNDARY
 - CROSS SECTION IDENTIFIER
 - SHEET WHERE SECTION IS LOCATED
 - SLOPE
 - MINE YEAR 1 WASTE ROCK STOCKPILE OUTLINES (SEE NOTE 2)
 - MAXIMUM WASTE ROCK STOCKPILE OUTLINES (SEE NOTE 2)
 - HAUL ROAD
 - MINE YEAR 2 PIT BOUNDARIES (SEE NOTE 1)
 - MINE DRAINAGE SUMP/POND (SEE NOTE 3)

- ### NOTES
- OPEN PIT AND HAUL ROAD LAYOUTS PROVIDED BY BARR ENGINEERING IN OCTOBER 2011.
 - STOCKPILE LAYOUTS PROVIDED BY BARR ENGINEERING IN APRIL 2011 AND MODIFIED BY GOLDER.
 - SEE MECHANICAL INFRASTRUCTURE PERMIT SUPPORT DRAWINGS.
 - SEE GENERAL NOTES AND LEGEND ON DRAWING 002.

- ### REFERENCES
- EXISTING GROUND TOPOGRAPHY PROVIDED BY BARR ENGINEERING, AUGUST 2011.
 - COORDINATE SYSTEM REFERENCE IS NAD83 MINNESOTA STATE PLANE NORTH.
 - VERTICAL DATUM REFERENCE IS FEET ABOVE MEAN SEA LEVEL (AMSL).



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F	5/22/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS			
			NOT APPROVED FOR CONSTRUCTION.		

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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.

SIGNATURE Brent R. Bronson
PRINTED NAME BRENT R. BRONSON
DATE 5/22/15 LICENSE # 46492

DRAWN: MTM

CHECKED: 

GOLDER PROJECT NO.:
113-2209

SCALE: AS SHOWN



POLYMET
MINING

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



GOLDER ASSOCIATES INC.
44 UNION BOULEVARD, SUITE 300
LAKEWOOD, CO USA 80233
Ph: (303) 980-0540
Fax: (303) 985-2080
www.golder.com

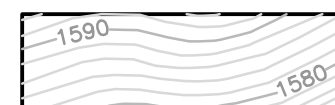
PLANT DRAWING NUMBER:

CATEGORY 4 STOCKPILE
UNDERDRAIN PIPING PLAN
MINE YEAR 1 AND MAXIMUM

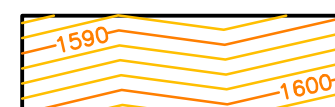
DWG. NO. SKP-022

REV

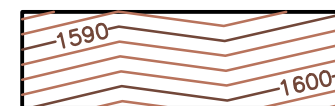
LEGEND



EXISTING GROUND TOPOGRAPHY



PROPOSED MINE YEAR 1 GRADING TOPOGRAPHY



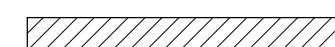
PROPOSED MAXIMUM FOOTPRINT GRADING
TOPOGRAPHY

— — — — — MINE SITE BOUNDARY

 MINE YEAR 2 PIT BOUNDARIES (SEE NOTE 1) SLOPE

_____ MINE YEAR 1 WASTE ROCK STOCKPILE
OUTLINES (SEE NOTE 2)

— — — — — MAXIMUM WASTE ROCK STOCKPILE
OUTLINES (SEE NOTE 2)



HAUL ROADS

TERTIARY COLLECTION PIPING (SEE NOTE 3)

 4-INCH

SECONDARY COLLECTION PIPING (SEE NOTE 3)

_____ 6-INCH

NOTES

1. OPEN PIT AND HAUL ROAD LAYOUTS PROVIDED BY BARR ENGINEERING IN OCTOBER 2011.
2. STOCKPILE LAYOUTS PROVIDED BY BARR ENGINEERING IN APRIL 2011 AND MODIFIED BY GOLDER.
3. ACTUAL NUMBER AND LOCATION OF UNDERDRAIN PIPES AND SUMPS WILL NEED TO BE DETERMINED DURING CONSTRUCTION BASED ON ENCOUNTERED FIELD CONDITIONS.
4. SEE GENERAL NOTES AND LEGEND ON DRAWING 002.

REFERENCES

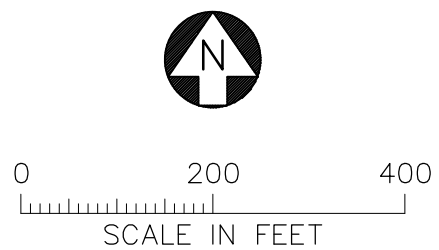
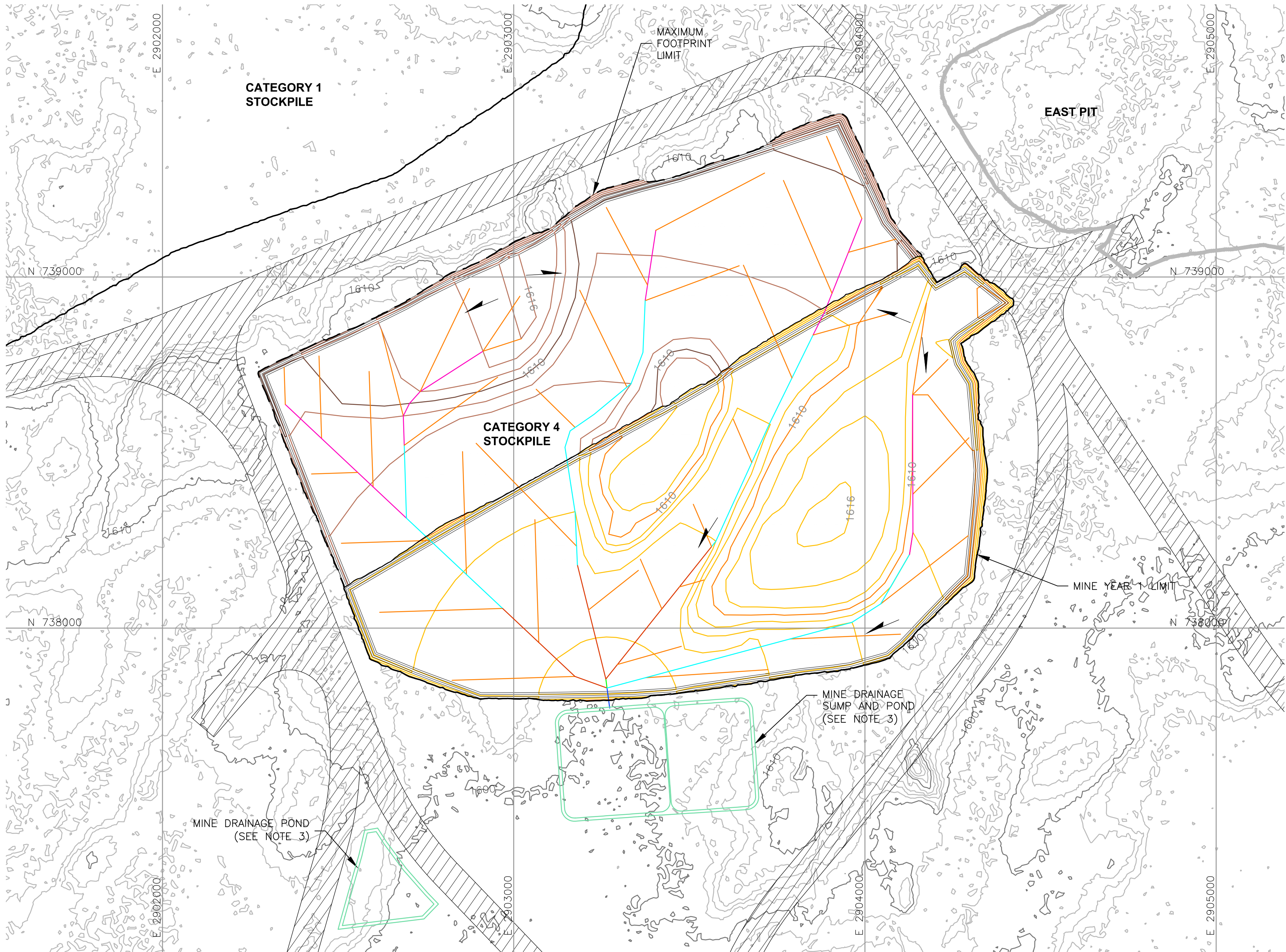
1. EXISTING GROUND TOPOGRAPHY PROVIDED BY BARR ENGINEERING, AUGUST 2011.
2. COORDINATE SYSTEM REFERENCE IS NAD83 MINNESOTA STATE PLANE NORTH.
3. VERTICAL DATUM REFERENCE IS FEET ABOVE MEAN SEA LEVEL (AMSL).

CADD USER: Brewer, Keith FILE: X:\DENVER\113-2209\1132209M015.DWG PLOT SCALE: 1:1 PLOT DATE: 5/27/2015 12:13 PM

2

1

INCHES



VER NO	DATE	DESCRIPTION	ISSUE STATUS		
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F	5/22/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS			
			NOT APPROVED FOR CONSTRUCTION.		

LEGEND

-
- EXISTING GROUND TOPOGRAPHY
-
- PROPOSED MINE YEAR 1 GRADING TOPOGRAPHY
-
- PROPOSED MAXIMUM FOOTPRINT GRADING TOPOGRAPHY
-
- MINE SITE BOUNDARY
-
- MINE YEAR 2 PIT BOUNDARIES (SEE NOTE 1)
-
- SLOPE
-
- MINE YEAR 1 WASTE ROCK STOCKPILE OUTLINES (SEE NOTE 2)
-
- MAXIMUM WASTE ROCK STOCKPILE OUTLINES (SEE NOTE 2)
-
- HAUL ROADS
-
- MINE DRAINAGE SUMP/POND (SEE NOTE 3)
- MINE YEAR 1 - TERTIARY COLLECTION PIPING
-
- 4-INCH
- MINE YEAR 1 - PRIMARY AND SECONDARY COLLECTION PIPING
-
- 4-INCH
-
- 6-INCH
-
- 8-INCH
-
- 10-INCH
-
- 12-INCH

NOTES

- OPEN PIT AND HAUL ROAD LAYOUTS PROVIDED BY BARR ENGINEERING IN OCTOBER 2011.
- STOCKPILE LAYOUTS PROVIDED BY BARR ENGINEERING IN APRIL 2011 AND MODIFIED BY GOLDER.
- SEE MECHANICAL INFRASTRUCTURE PERMIT SUPPORT DRAWINGS.
- SEE GENERAL NOTES AND LEGEND ON DRAWING 002.

REFERENCES

- EXISTING GROUND TOPOGRAPHY PROVIDED BY BARR ENGINEERING, AUGUST 2011.
- COORDINATE SYSTEM REFERENCE IS NAD83 MINNESOTA STATE PLANE NORTH.
- VERTICAL DATUM REFERENCE IS FEET ABOVE MEAN SEA LEVEL (AMSL).

PLANT DRAWING NUMBER:

CATEGORY 4 STOCKPILE
OVERLINER DRAINAGE PIPING PLAN
MINE YEAR 1 AND MAXIMUM

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

GOLDER ASSOCIATES INC.
44 UNION BOULEVARD, SUITE 300
LAKEWOOD, CO USA 80233
Ph: (303) 980-0540
Fax: (303) 985-2080
www.golder.com

DRAWN: MTM

CHECKED: *gg*

GOLDER PROJECT NO.: 113-2209

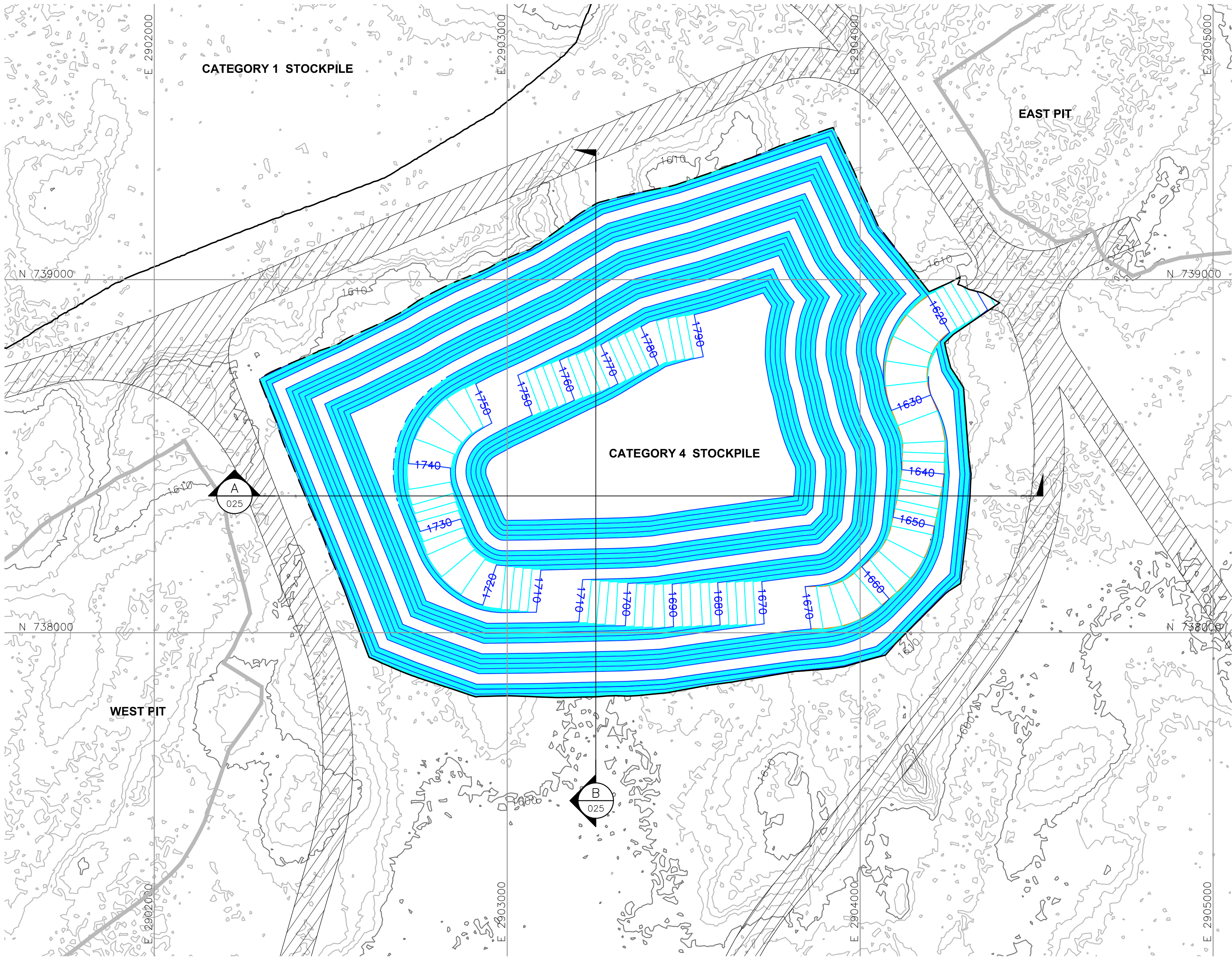
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DWG. NO. SKP-023

REV

CADD USER: Brewer, Keith FILE: X:\DENVER\113-2209\1132209\006.DWG PLOT SCALE: 1:1 PLOT DATE: 5/27/2015 12:14 PM

INCHES
1
2



LEGEND

- EXISTING GROUND TOPOGRAPHY (SEE REFERENCE 1)
- PROPOSED MAXIMUM GRADING TOPOGRAPHY
- MINE SITE BOUNDARY
- CROSS SECTION IDENTIFIER
- SHEET WHERE SECTION IS LOCATED
- MINE YEAR 1 WASTE ROCK STOCKPILE LIMIT (SEE NOTE 1)
- MAXIMUM WASTE ROCK STOCKPILE LIMIT
- PROPOSED HAUL ROAD
- MINE YEAR 11 PIT BOUNDARIES (SEE NOTE 1)

NOTES

- OPEN PIT AND HAUL ROAD LAYOUTS PROVIDED BY BARR ENGINEERING IN OCTOBER 2011.
- STOCKPILE LAYOUTS PROVIDED BY BARR ENGINEERING IN APRIL 2011 AND MODIFIED BY GOLDER.
- SEE GENERAL NOTES AND LEGEND ON DRAWING 002.

REFERENCES

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PLANT DRAWING NUMBER:

CATEGORY 4 STOCKPILE
STOCKPILE MAXIMUM CAPACITY CONFIGURATION



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



GOLDER ASSOCIATES INC.
44 UNION BOULEVARD, SUITE 300
LAKEWOOD, CO USA 80233
Ph: (303) 980-0540
Fax: (303) 985-2080
www.golder.com

VER NO	DATE	DESCRIPTION	ISSUE STATUS		
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E	4/10/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS			
F	5/22/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS	NOT APPROVED FOR CONSTRUCTION.		

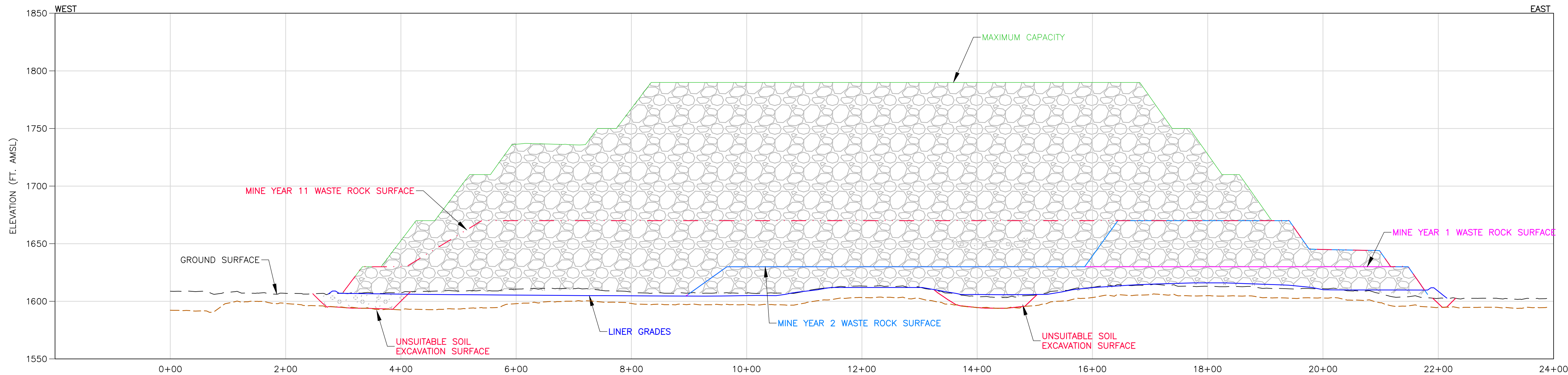
I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

SIGNATURE *B. Bronson*
PRINTED NAME BRENT R. BRONSON
DATE 5/22/15 LICENSE # 46492

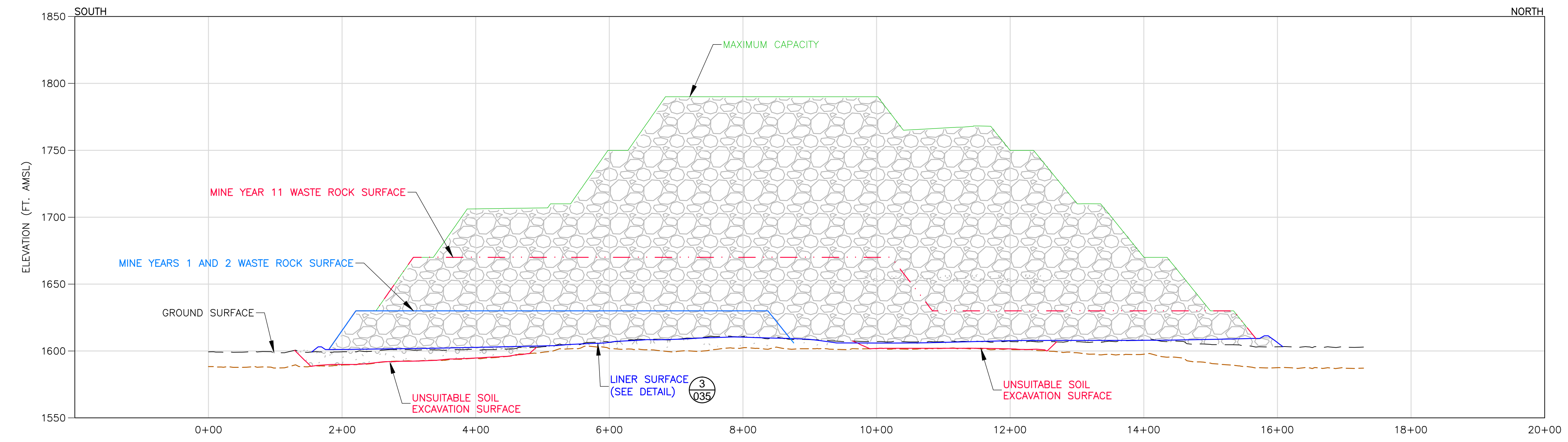
DRAWN: MTM
CHECKED: *gg*
GOLDER PROJECT NO.: 113-2209
SCALE: AS SHOWN

DWG. NO. SKP-024

REV






A SECTION
025
0 100 200
HORIZONTAL SCALE IN FEET
2X VERTICAL EXAGGERATION



B SECTION
025
0 100 200
HORIZONTAL SCALE IN FEET
2X VERTICAL EXAGGERATION

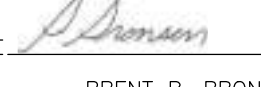
- LEGEND**
- MINE YEAR 1 LIMITS
 - MINE YEAR 2 LIMITS
 - MINE YEAR 11 LIMITS
 - MAXIMUM CAPACITY
 - LINER SURFACE
 - EXISTING GROUND SURFACE
 - UNSUITABLE SOIL EXCAVATION SURFACE
 - BEDROCK SURFACE

- NOTES**
- STOCKPILE INTERBENCH SLOPES AT ANGLE OF REPOSE.
 - THIS DESIGN CONSERVATIVELY ASSUMES THAT ALL LOWLAND/WETLAND SOILS ARE GEOTECHNICALLY UNSUITABLE AND WILL REQUIRE EXCAVATION AND REPLACEMENT WITH STRUCTURAL FILL TO THE DESIGN FOUNDATION BASE GRADE. GEOTECHNICAL PROPERTIES OF THE FOUNDATION SOILS WILL BE CONFIRMED PRIOR TO FINAL DESIGN.
 - MAXIMUM DEPTH OF UNSUITABLE MATERIAL SUBGRADE EXCAVATION LIMITED TO 20 FEET FOR THIS DESIGN. THE ACTUAL DEPTH OF UNSUITABLE SOIL EXCAVATION WILL BE CONFIRMED BY PHASE II GEOTECHNICAL INVESTIGATION.
 - SEE CROSS SECTION LOCATIONS ON DRAWINGS 3, 4, 5, 20, 21 AND 24.

PLANT DRAWING NUMBER:		
CATEGORY 4 STOCKPILE DESIGN SECTIONS		
 POLY MET MINING, INC. NORTHMET PROJECT HOYT LAKES, MINNESOTA		
 GOLDER ASSOCIATES INC. 44 UNION BOULEVARD, SUITE 300 LAKEWOOD, CO USA 80233 Ph: (303) 980-0540 Fax: (303) 985-2080 www.golder.com		
DRAWN: MTM	GOLDER PROJECT NO.: 113-2209	
CHECKED: 		
SCALE: AS SHOWN	DWG. NO. SKP-025	REV

VER NO	DATE	DESCRIPTION	ISSUE STATUS		
A	12/02/11	ISSUED FOR REVIEW FOR INCLUSION IN ROCK AND OVERBURDEN MANAGEMENT PLAN (ROMP)	ISSUED	VERSION	DATE
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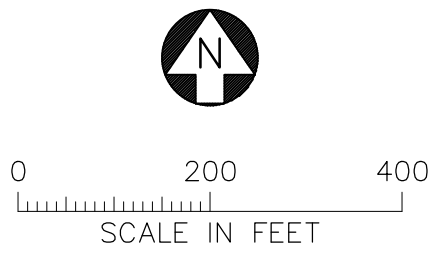
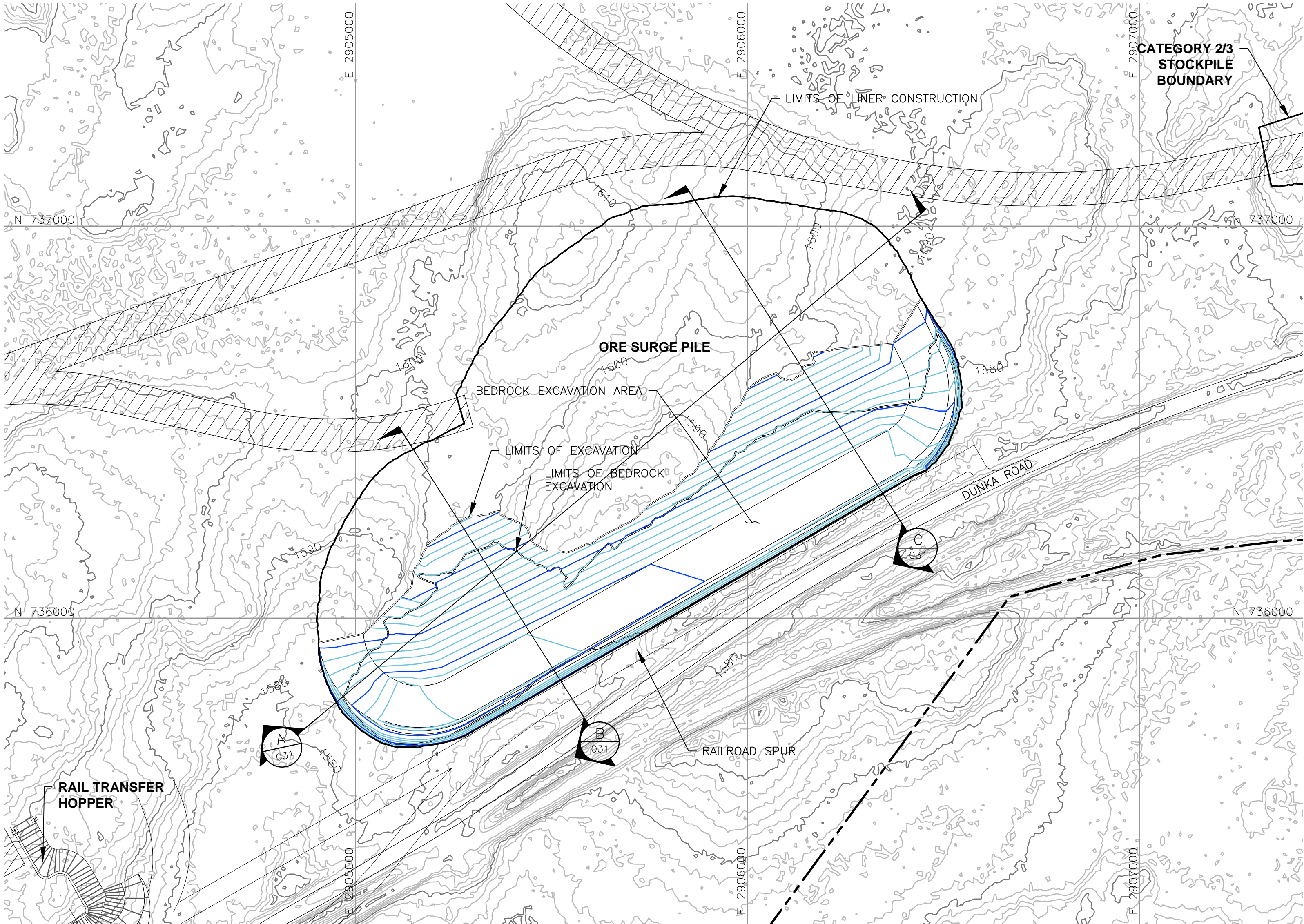
SIGNATURE 
PRINTED NAME BRENT R. BRONSON
DATE 5/22/15 LICENSE # 46492

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INCHES

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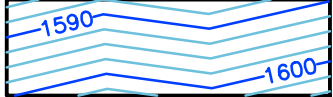
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LEGEND




EXISTING GROUND TOPOGRAPHY (SEE REFERENCE 1)




PROPOSED MINE YEAR 1 EXCAVATION TOPOGRAPHY



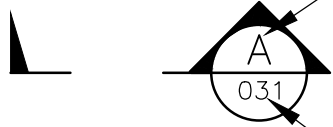
MINE SITE BOUNDARY




MINE YEAR 1 ORE STOCKPILE OUTLINES (SEE NOTE 2)



HAUL ROADS



CROSS SECTION IDENTIFIER



SHEET WHERE SECTION IS LOCATED

- NOTES
1.

OPEN PIT AND HAUL ROAD LAYOUTS PROVIDED BY BARR ENGINEERING IN OCTOBER 2011.
2.

STOCKPILE LAYOUTS PROVIDED BY BARR ENGINEERING IN APRIL 2011 AND MODIFIED BY GOLDER.
3.

SEE GENERAL NOTES AND LEGEND ON DRAWING 002.

- REFERENCES
1.


EXISTING GROUND TOPOGRAPHY PROVIDED BY BARR ENGINEERING, AUGUST 2011.
2.

COORDINATE SYSTEM REFERENCE IS NAD83 MINNESOTA STATE PLANE NORTH.
3.


VERTICAL DATUM REFERENCE IS FEET ABOVE MEAN SEA LEVEL (AMSL).

PLANT DRAWING NUMBER:

ORE SURGE PILE
SUBGRADE EXCAVATION PLAN




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



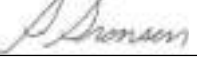
GOLDER ASSOCIATES INC.
44 UNION BOULEVARD, SUITE 300
LAKEWOOD, CO USA 80233
Ph: (303) 980-0540
Fax: (303) 985-2080
www.golder.com

DRAWN:
MTM

CHECKED:


GOLDER PROJECT NO.:
113-2209

SCALE:
AS SHOWN

SIGNATURE


PRINTED NAME BRENT R. BRONSON

DATE 5/22/15 LICENSE # 46492

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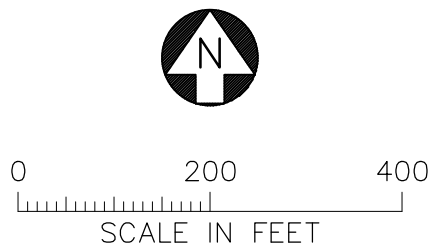
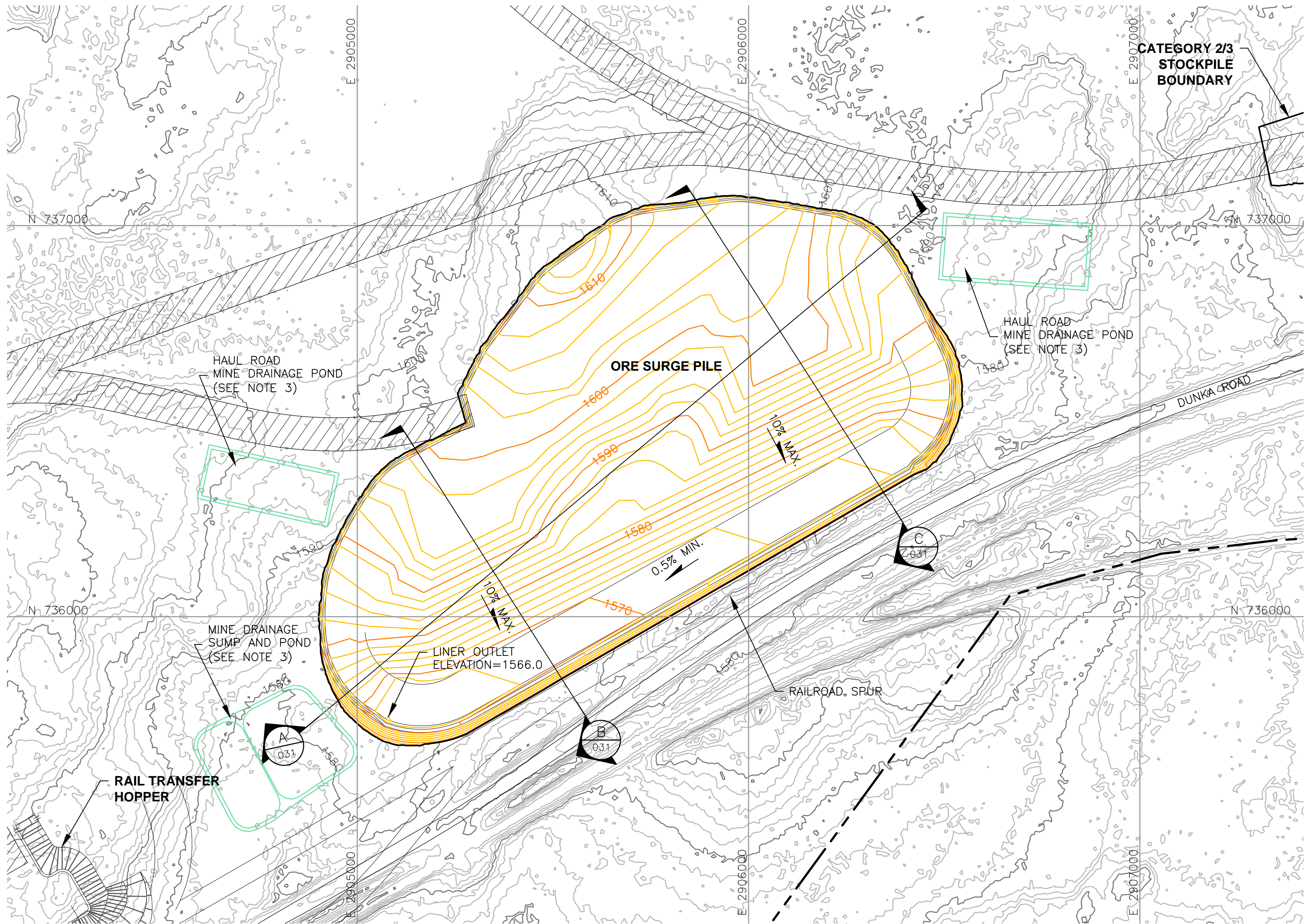
DWG. NO.
SKP-026

REV

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CADD USER: Brewer, Keith FILE: X:\DENVER\113-2209\1132209\018.DWG PLOT SCALE: 1:1 PLOT DATE: 5/27/2015 12:17 PM

INCHES
1
2



LEGEND

-
- EXISTING GROUND TOPOGRAPHY (SEE REFERENCE 1)
-
- PROPOSED MINE YEAR 1 GRADING TOPOGRAPHY
-
- MINE SITE BOUNDARY
-
- CROSS SECTION IDENTIFIER
-
- SLOPE
-
- MINE YEAR 1 ORE, WASTE ROCK STOCKPILE OUTLINES (SEE NOTE 2)
-
- HAUL ROADS
-
- MINE DRAINAGE SUMP/POND (SEE NOTE 3)

NOTES

1. OPEN PIT AND HAUL ROAD LAYOUTS PROVIDED BY BARR ENGINEERING IN OCTOBER 2011.
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3. SEE MECHANICAL INFRASTRUCTURE PERMIT SUPPORT DRAWINGS.
4. SEE GENERAL NOTES AND LEGEND ON DRAWING 002.

REFERENCES

1. EXISTING GROUND TOPOGRAPHY PROVIDED BY BARR ENGINEERING, AUGUST 2011.
2. COORDINATE SYSTEM REFERENCE IS MINNESOTA STATE PLANE.
3. VERTICAL DATUM REFERENCE IS FEET ABOVE MEAN SEA LEVEL (AMSL).

PLANT DRAWING NUMBER:

ORE SURGE PILE
FOUNDATION GRADING PLAN



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



GOLDER ASSOCIATES INC.
44 UNION BOULEVARD, SUITE 300
LAKEWOOD, CO USA 80233
Ph: (303) 980-0540
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www.golder.com

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			NOT APPROVED FOR CONSTRUCTION.		

DRAWN:
MTM

CHECKED: *gg*
GOLDER PROJECT NO.:
113-2209

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AS SHOWN

DWG. NO. SKP-027

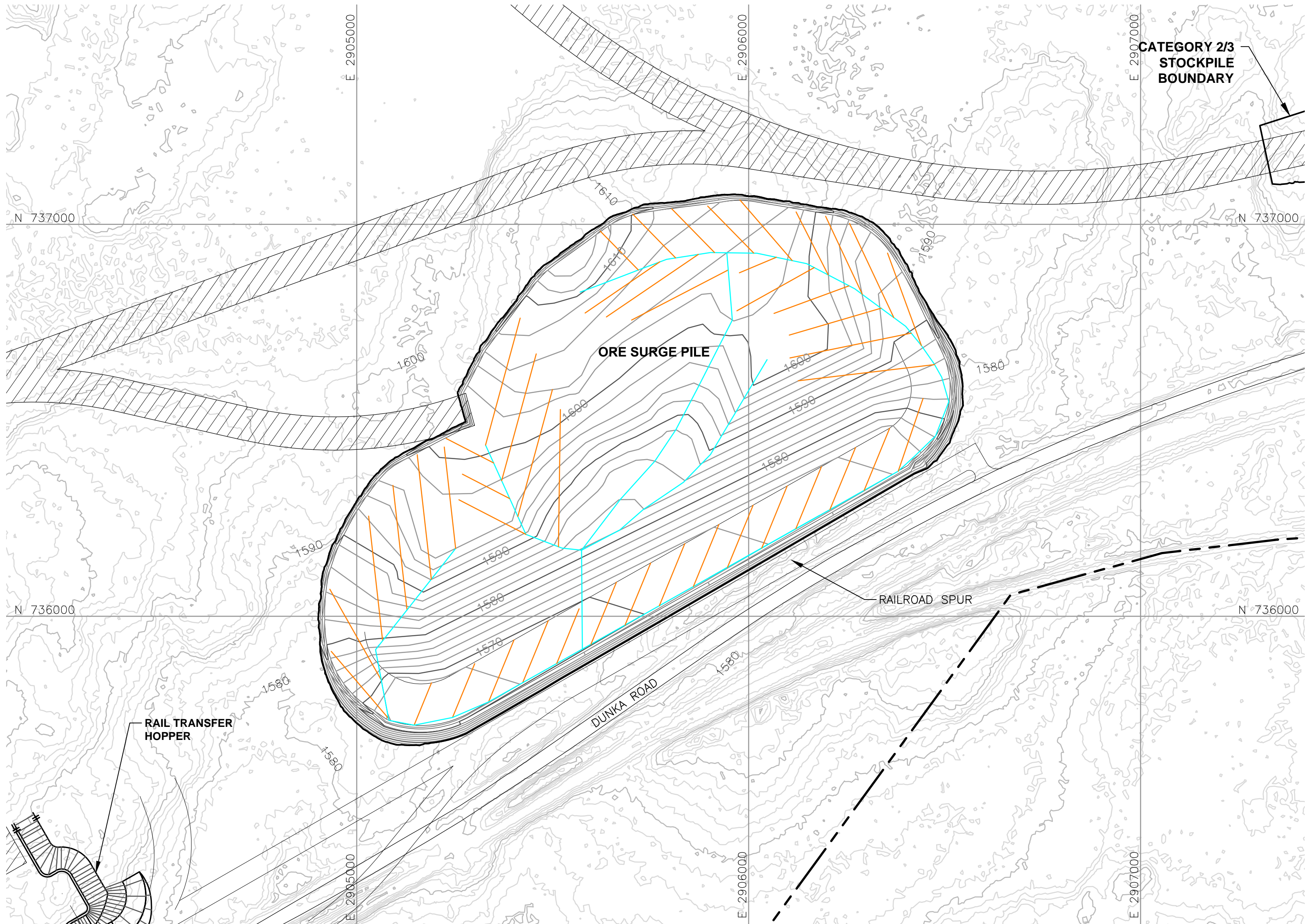
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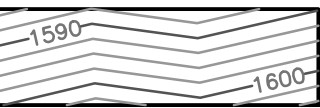
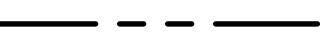

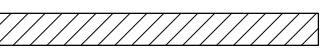
INCHES

2

1



LEGEND

-  EXISTING GROUND TOPOGRAPHY
-  PROPOSED GRADING TOPOGRAPHY
-  MINE SITE BOUNDARY
-  MINE YEAR 1 ORE, WASTE ROCK STOCKPILE OUTLINES (SEE NOTE 2)
-  HAUL ROADS

TERTIARY COLLECTION PIPING (SEE NOTE 3)

4-INCH

SECONDARY COLLECTION PIPING (SEE NOTE 3)

6-INCH

NOTES

- OPEN PIT AND HAUL ROAD LAYOUTS PROVIDED BY BARR ENGINEERING IN OCTOBER 2011.
- STOCKPILE LAYOUTS PROVIDED BY BARR ENGINEERING IN APRIL 2011 AND MODIFIED BY GOLDER.
- ACTUAL NUMBER OF UNDERDRAIN PIPES AND SUMPS WILL NEED TO BE DETERMINED DURING CONSTRUCTION BASED ON ENCOUNTERED FIELD CONDITIONS.
- SEE GENERAL NOTES AND LEGEND ON DRAWING 002.

REFERENCES

- EXISTING GROUND TOPOGRAPHY PROVIDED BY BARR ENGINEERING, AUGUST 2011.
- COORDINATE SYSTEM REFERENCE IS NAD83 MINNESOTA STATE PLANE NORTH.
- VERTICAL DATUM REFERENCE IS FEET ABOVE MEAN SEA LEVEL (AMSL).

PLANT DRAWING NUMBER:

ORE SURGE PILE
UNDERDRAIN PIPING PLAN



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



GOLDER ASSOCIATES INC.
44 UNION BOULEVARD, SUITE 300
LAKEWOOD, CO USA 80233
Ph: (303) 980-0540
Fax: (303) 985-2080
www.golder.com

VER NO	DATE	DESCRIPTION	ISSUE STATUS		
A	12/02/11	ISSUED FOR REVIEW FOR INCLUSION IN ROCK AND OVERBURDEN MANAGEMENT PLAN (ROMP)	ISSUED FOR PERMITTING	VERSION F	DATE 5-22-15
B	2/15/13	ISSUED FOR REVIEW FOR INCLUSION IN ROMP			
C	5/29/13	ISSUED FOR REVIEW FOR INCLUSION IN ROMP			
D	1/14/14	ISSUED FOR AGENCY REVIEW			
E	4/10/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS	FOR CONSTRUCTION		
F	5/22/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS			
			NOT APPROVED FOR CONSTRUCTION.		



0 200 400
SCALE IN FEET

DWG. NO. SKP-028

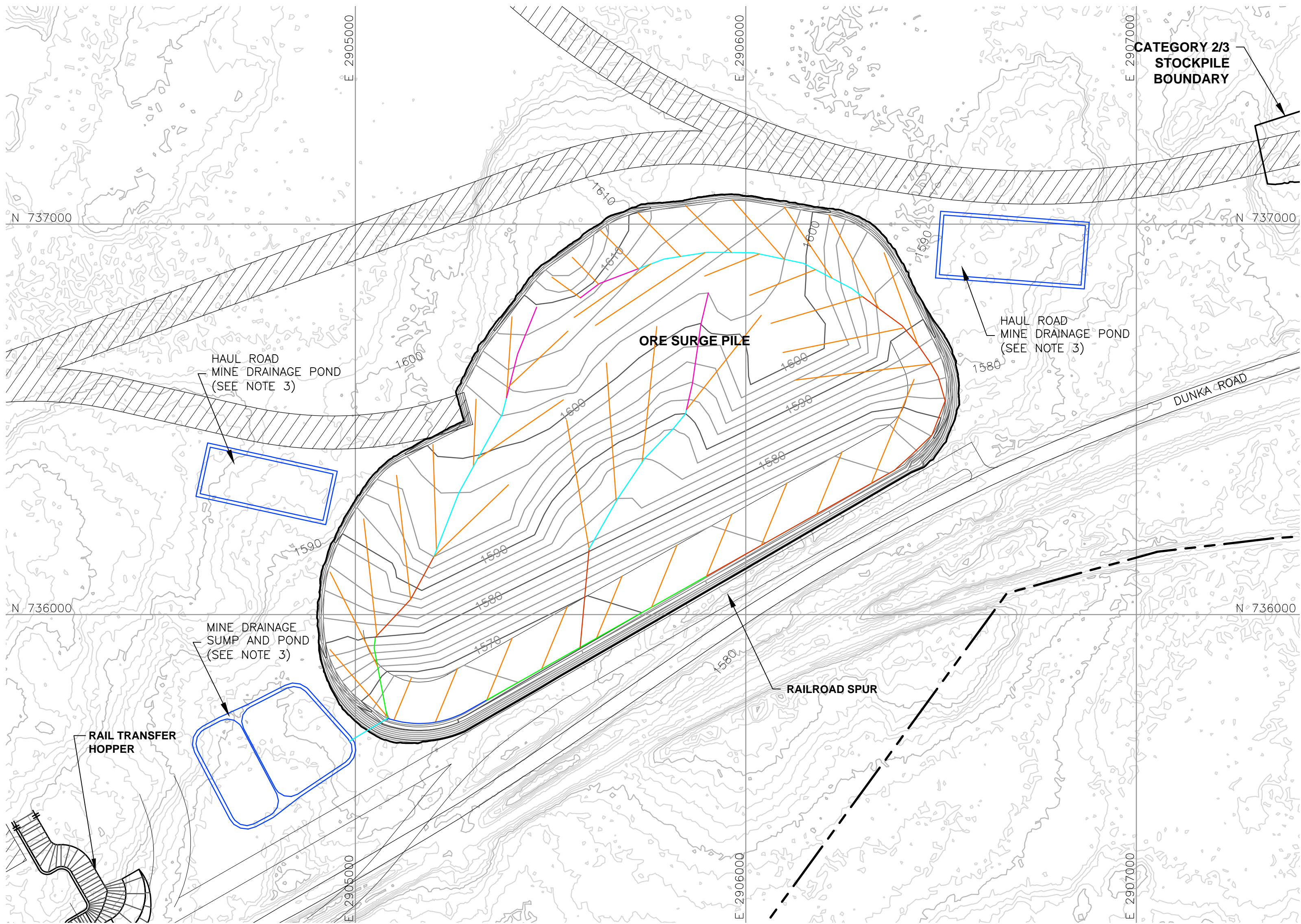
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INCHES

2

1



LEGEND

- EXISTING GROUND TOPOGRAPHY
- PROPOSED GRADING TOPOGRAPHY
- MINE SITE BOUNDARY
- MINE YEAR 1 ORE, WASTE ROCK STOCKPILE OUTLINES (SEE NOTE 2)
- HAUL ROADS
- MINE DRAINAGE SUMP/POND (SEE NOTE 3)

- MINE YEAR 1 - TERTIARY COLLECTION PIPING
- 4-INCH

- MINE YEAR 1 - PRIMARY AND SECONDARY COLLECTION PIPING
- 4-INCH
 - 6-INCH
 - 8-INCH
 - 10-INCH
 - 12-INCH

NOTES

- OPEN PIT AND HAUL ROAD LAYOUTS PROVIDED BY BARR ENGINEERING IN OCTOBER 2011.
- STOCKPILE LAYOUTS PROVIDED BY BARR ENGINEERING IN APRIL 2011 AND MODIFIED BY GOLDER.
- SEE MECHANICAL INFRASTRUCTURE PERMIT SUPPORT DRAWINGS.
- SEE GENERAL NOTES AND LEGEND ON DRAWING 002.

REFERENCES

- EXISTING GROUND TOPOGRAPHY PROVIDED BY BARR ENGINEERING, AUGUST 2011.
- COORDINATE SYSTEM REFERENCE IS NAD83 MINNESOTA STATE PLANE NORTH.
- VERTICAL DATUM REFERENCE IS FEET ABOVE MEAN SEA LEVEL (AMSL).

PLANT DRAWING NUMBER:

ORE SURGE PILE
OVERLINER DRAINAGE PIPING PLAN



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NORTHMET PROJECT
HOYT LAKES, MINNESOTA



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44 UNION BOULEVARD, SUITE 300
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Ph: (303) 980-0540
Fax: (303) 985-2080
www.golder.com

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E	4/10/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS	FOR CONSTRUCTION		
F	5/22/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS			
			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.

SIGNATURE *B. Bronson*

PRINTED NAME BRENT R. BRONSON

DATE 5/22/15 LICENSE # 46492

DRAWN: MTM

CHECKED: *gg*

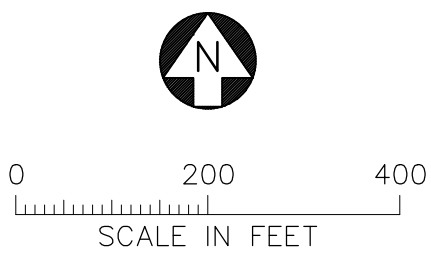
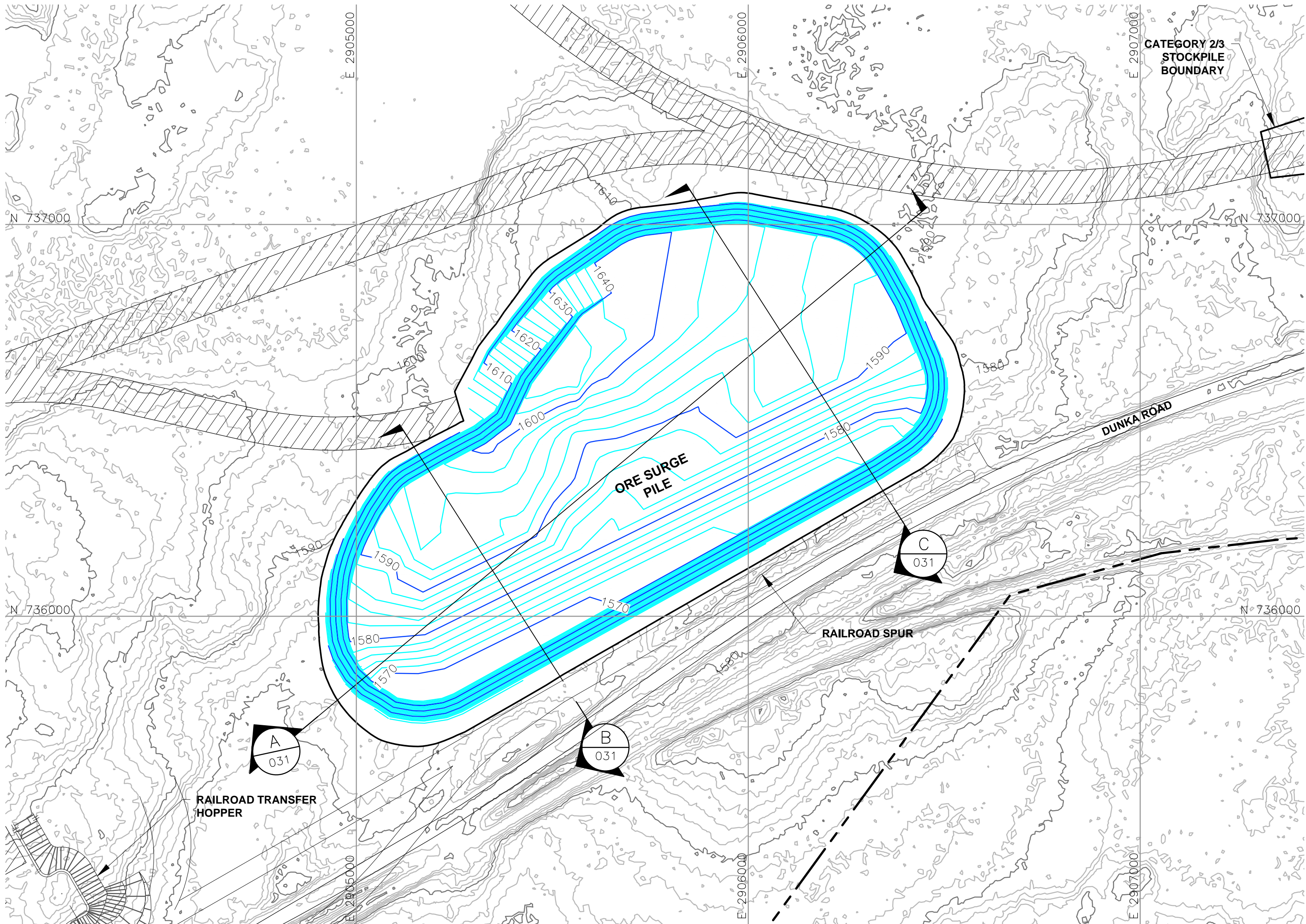
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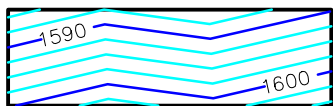
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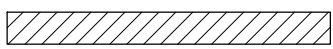
LEGEND



EXISTING GROUND TOPOGRAPHY



PROPOSED STOCKPILE LAYOUTS



HAUL ROADS



MINE SITE BOUNDARY



MINE YEAR 1 PIT BOUNDARY (SEE NOTE 1)



MINE YEAR 1 ORE, WASTE ROCK STOCKPILE OUTLINES (SEE NOTE 2)



MAXIMUM ORE, WASTE ROCK STOCKPILE OUTLINES (SEE NOTE 2)



CROSS SECTION IDENTIFIER



SHEET WHERE SECTION IS LOCATED

NOTES

1. OPEN PIT AND HAUL ROAD LAYOUTS PROVIDED BY BARR ENGINEERING IN OCTOBER 2011.
2. STOCKPILE LAYOUTS PROVIDED BY BARR ENGINEERING IN APRIL 2011 AND MODIFIED BY GOLDER.
3. SEE GENERAL NOTES AND LEGEND ON DRAWING 002.

REFERENCES

1. EXISTING GROUND TOPOGRAPHY PROVIDED BY BARR ENGINEERING, AUGUST 2011.
2. COORDINATE SYSTEM REFERENCE IS NAD83 MINNESOTA STATE PLANE NORTH.
3. VERTICAL DATUM REFERENCE IS FEET ABOVE MEAN SEA LEVEL (AMSL).

PLANT DRAWING NUMBER:

ORE SURGE PILE
TYPICAL CONFIGURATION



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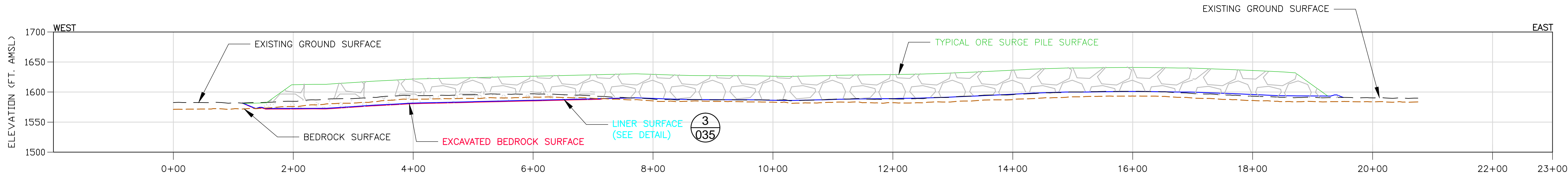
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F	5/22/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS			
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DWG. NO. SKP-030

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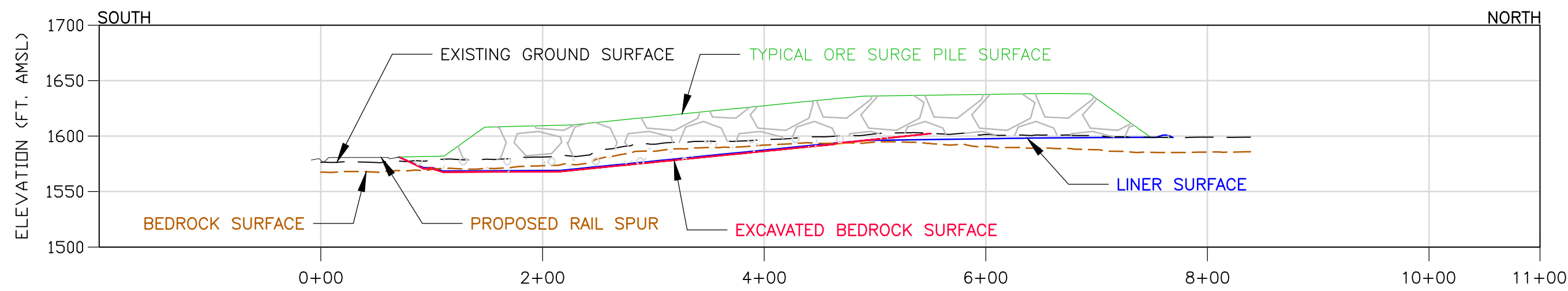
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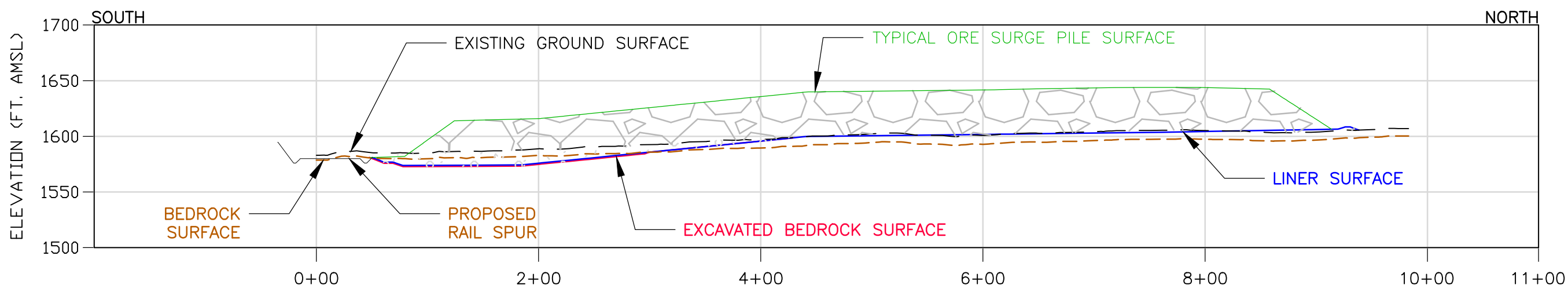
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031

0 100 200
HORIZONTAL SCALE IN FEET
2X VERTICAL EXAGGERATION



B SECTION
031

0 100 200
HORIZONTAL SCALE IN FEET
2X VERTICAL EXAGGERATION



C SECTION
031

0 100 200
HORIZONTAL SCALE IN FEET
2X VERTICAL EXAGGERATION

LEGEND

- ORE LIMITS AT TYPICAL CAPACITY
- LINER SURFACE
- EXISTING GROUND SURFACE
- OVERBURDEN SOIL AND BEDROCK EXCAVATION SURFACE
- BEDROCK SURFACE

NOTES

- STOCKPILE SIDE SLOPES AT ANGLE OF REPOSE.
- SEE GENERAL NOTES AND LEGEND ON DRAWING 002.
- SEE CROSS SECTION LOCATIONS ON DRAWINGS 3, 4, 5, 26, AND 27

PLANT DRAWING NUMBER:

ORE SURGE PILE
DESIGN SECTIONS



POLY MET MINING, INC.
NORTHMET PROJECT
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Fax: (303) 985-2080
www.golder.com

I HEREBY CERTIFY THAT THIS PLAN,
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LICENSED PROFESSIONAL ENGINEER
UNDER THE LAWS OF THE STATE OF
MINNESOTA.

SIGNATURE *B. Bronson*
PRINTED NAME BRENT R. BRONSON
DATE 5/22/15 LICENSE # 46492

DRAWN:
MTM

CHECKED:

GOLDER PROJECT NO.:
113-2209

SCALE:
AS SHOWN

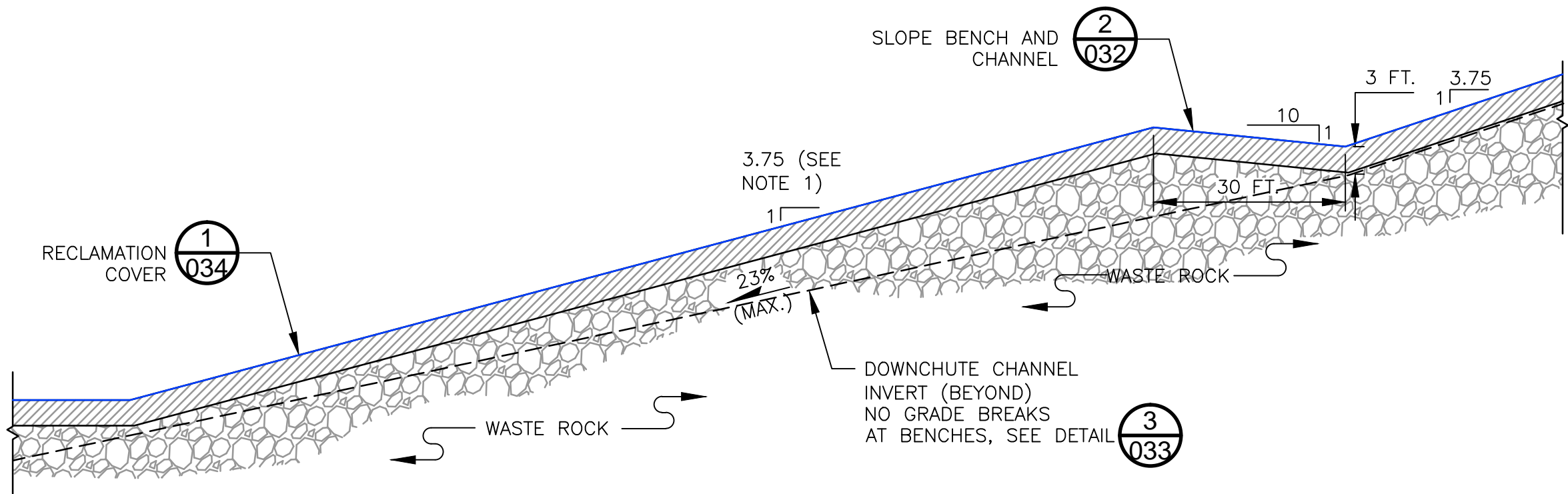
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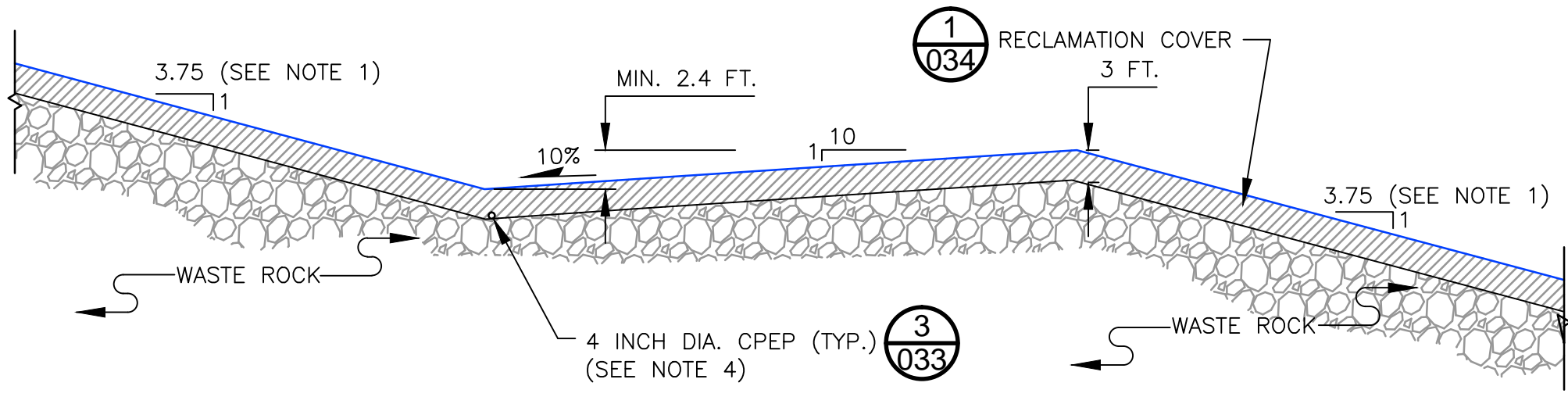
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			NOT APPROVED FOR CONSTRUCTION.				

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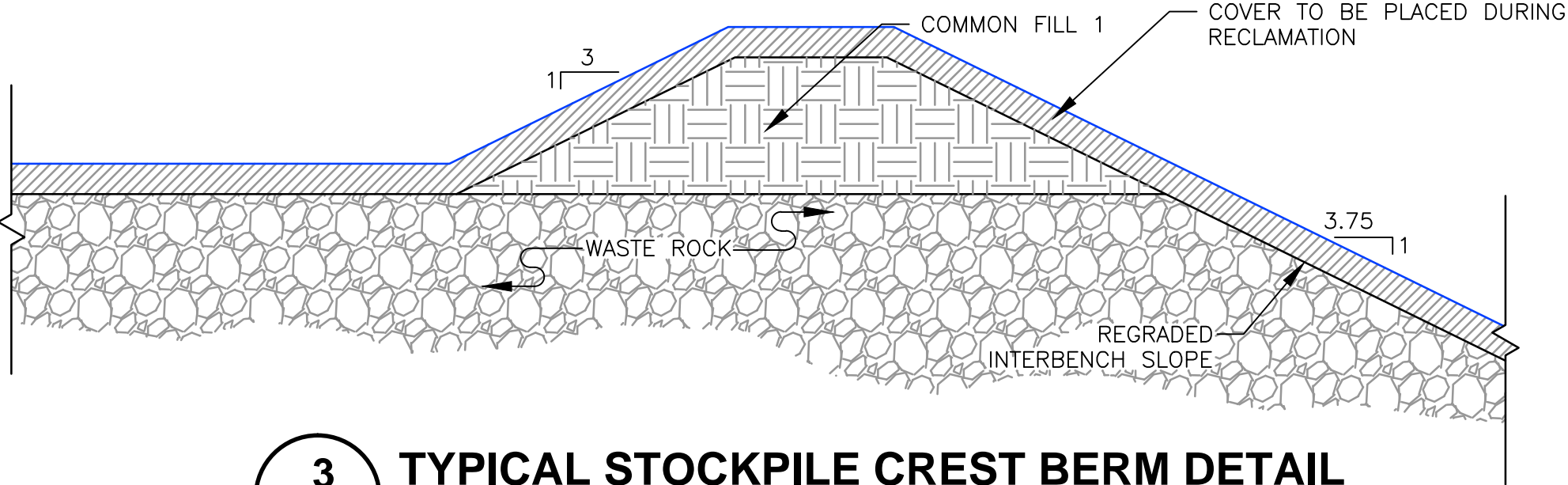
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INCHES



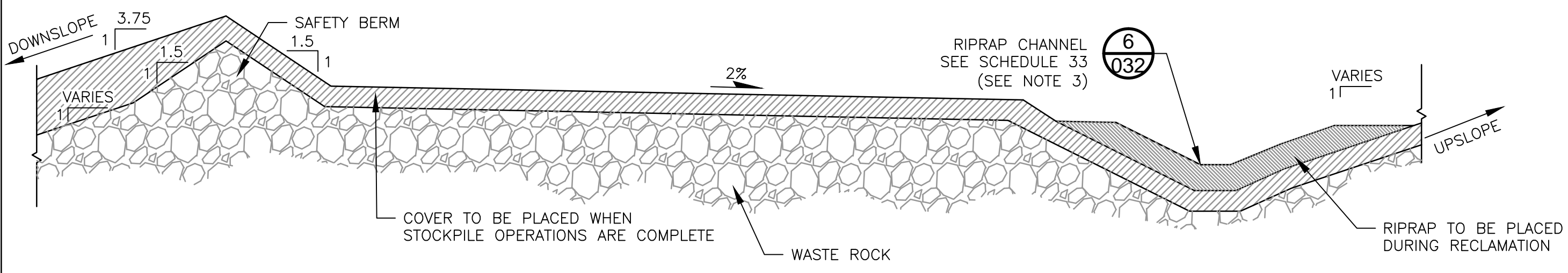
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032 **TYPICAL SLOPE AND DOWNCHUTE GRADING DETAIL**
N.T.S.



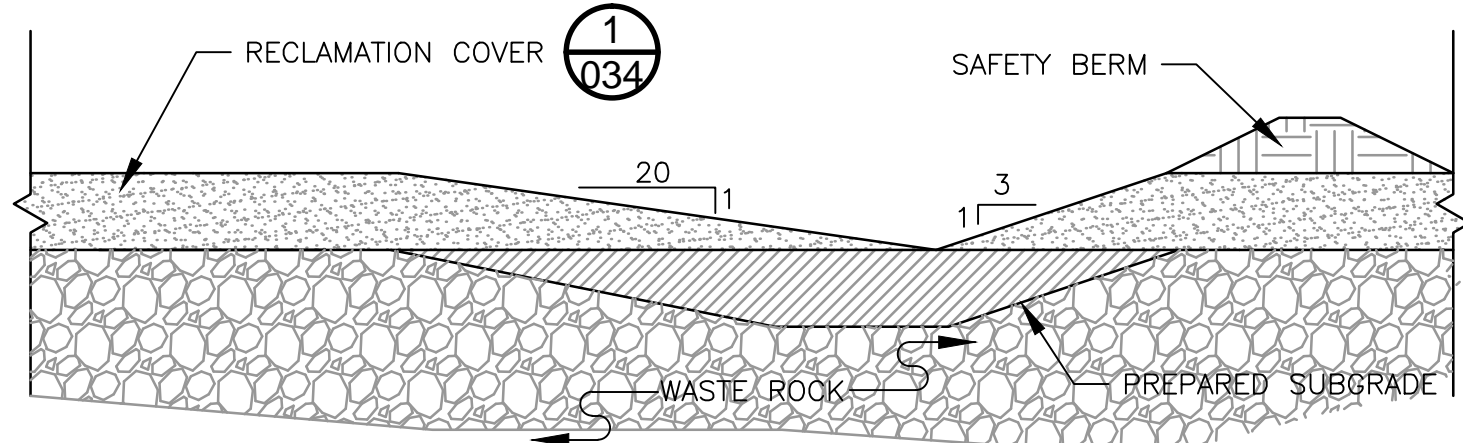
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032 **TYPICAL SLOPE BENCH AND CHANNEL RECLAMATION DETAIL**
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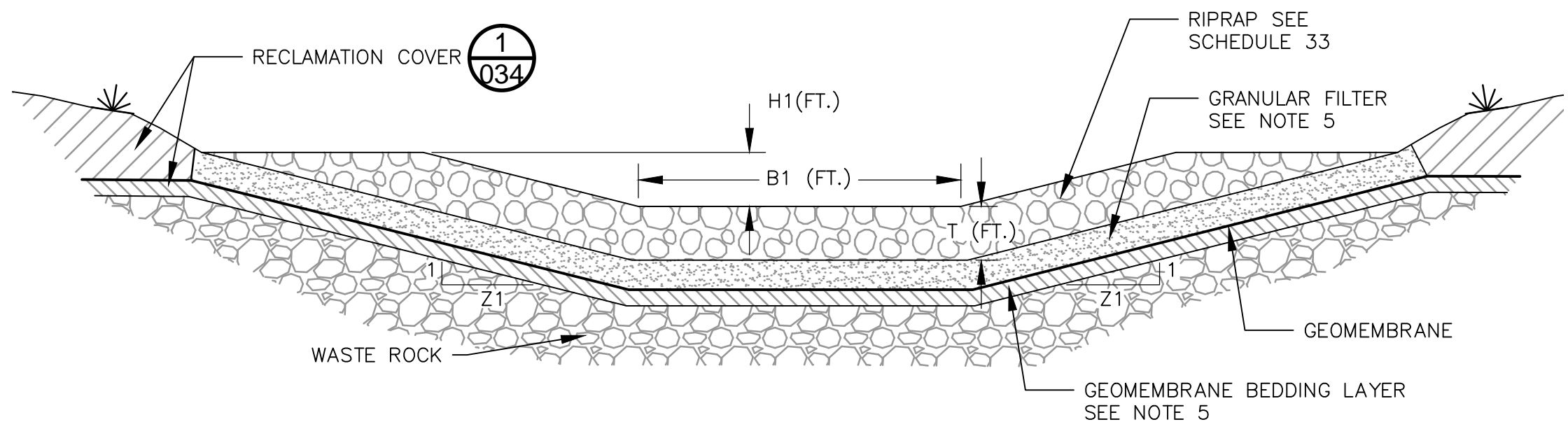
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032 **TYPICAL STOCKPILE CREST BERM DETAIL**
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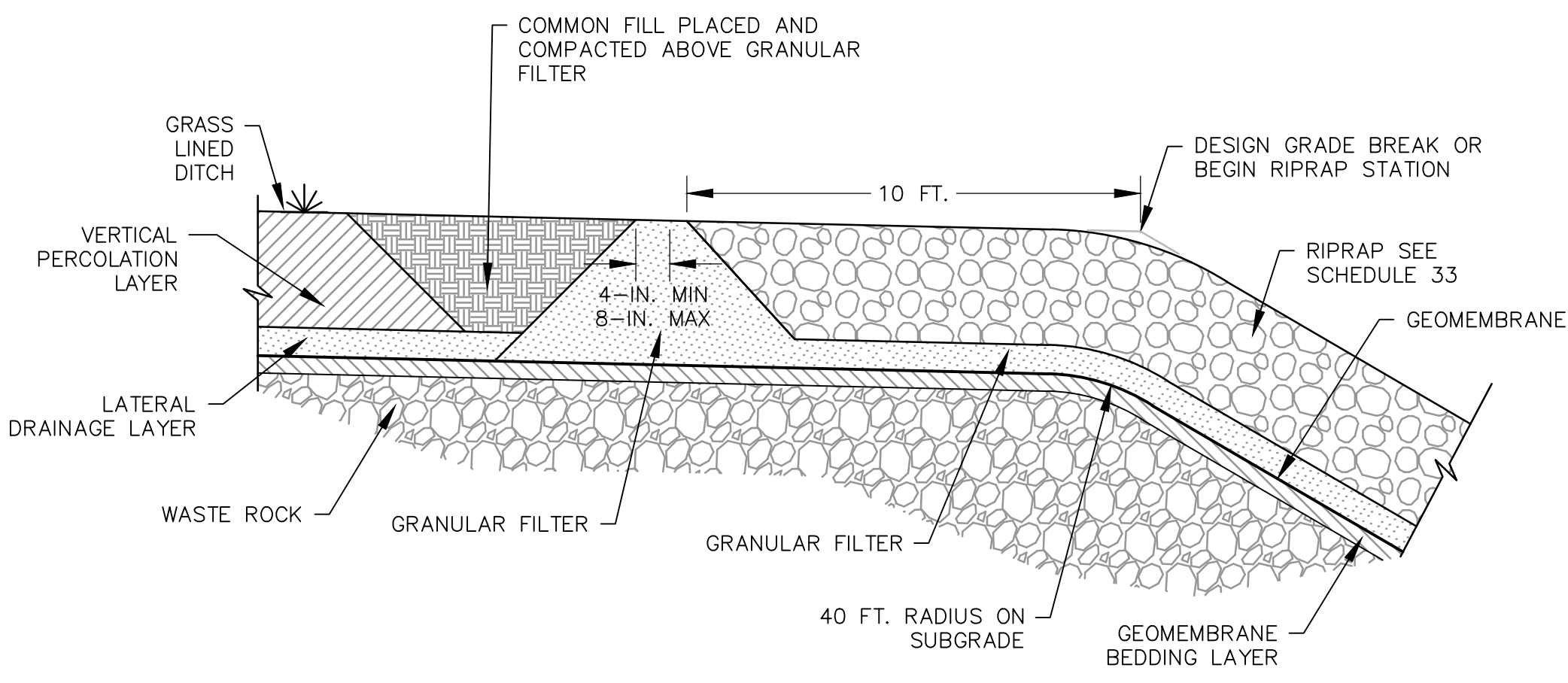
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032 **STOCKPILE RAMP TYPICAL DETAIL**
N.T.S.



5
032 **TYPICAL TOP SURFACE CHANNEL SECTION**
N.T.S.



6
032 **TYPICAL RIPRAP-LINED CHANNEL AND DOWNCHUTE**
N.T.S. (SEE SCHEDULE 33 FOR DIMENSIONS - SKP-033)



7
032 **UPSTREAM END OF RIPRAP CHANNEL**
N.T.S.

NOTES

1. THE MAXIMUM SLOPE GRADES ARE 3.75H:1V FOR RECLAIMED STOCKPILE AREAS.
2. ASSUME 1.4H:1V INTERBENCH SLOPES FOR ACTIVE AREAS (EQUAL TO NOMINAL ANGLE OF REPOSE FOR WASTE ROCK MATERIAL). REGRADE PRIOR TO PLACEMENT OF RECLAMATION COVER.
3. SEE SCHEDULE 33 ON DRAWING SKP-033.
4. AT BASE OF COVER SYSTEM GRANULAR DRAINAGE LAYER PLACE DRAIN PIPE AT SLOPE-BENCH INTERSECTION. PIPE TO BE CONTINUOUS ALONG BENCHES BETWEEN DOWNCHUTE CHANNELS.
5. RIPRAP-LINED CHANNEL AND DOWNCHUTE DETAILS REPRESENT PRELIMINARY DESIGNS. DETAILED DIMENSIONS AND TECHNICAL SPECIFICATIONS TO BE PROVIDED PRIOR TO CONSTRUCTION, I.E. AS A PART OF FINAL DESIGN.
6. SEE GENERAL NOTES AND LEGEND ON DRAWING 002.

PLANT DRAWING NUMBER:

CATEGORY 1 STOCKPILE RECLAMATION
AND OPERATIONS SURFACE WATER
MANAGEMENT DETAILS - SHEET 1 OF 2



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



GOLDER ASSOCIATES INC.
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Ph: (303) 980-0540
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I HEREBY CERTIFY THAT THIS PLAN,
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LICENSED PROFESSIONAL ENGINEER
UNDER THE LAWS OF THE STATE OF
MINNESOTA.

SIGNATURE *Brent R. Bronson*
PRINTED NAME BRENT R. BRONSON
DATE 5/22/15 LICENSE # 46492

DRAWN: MTM

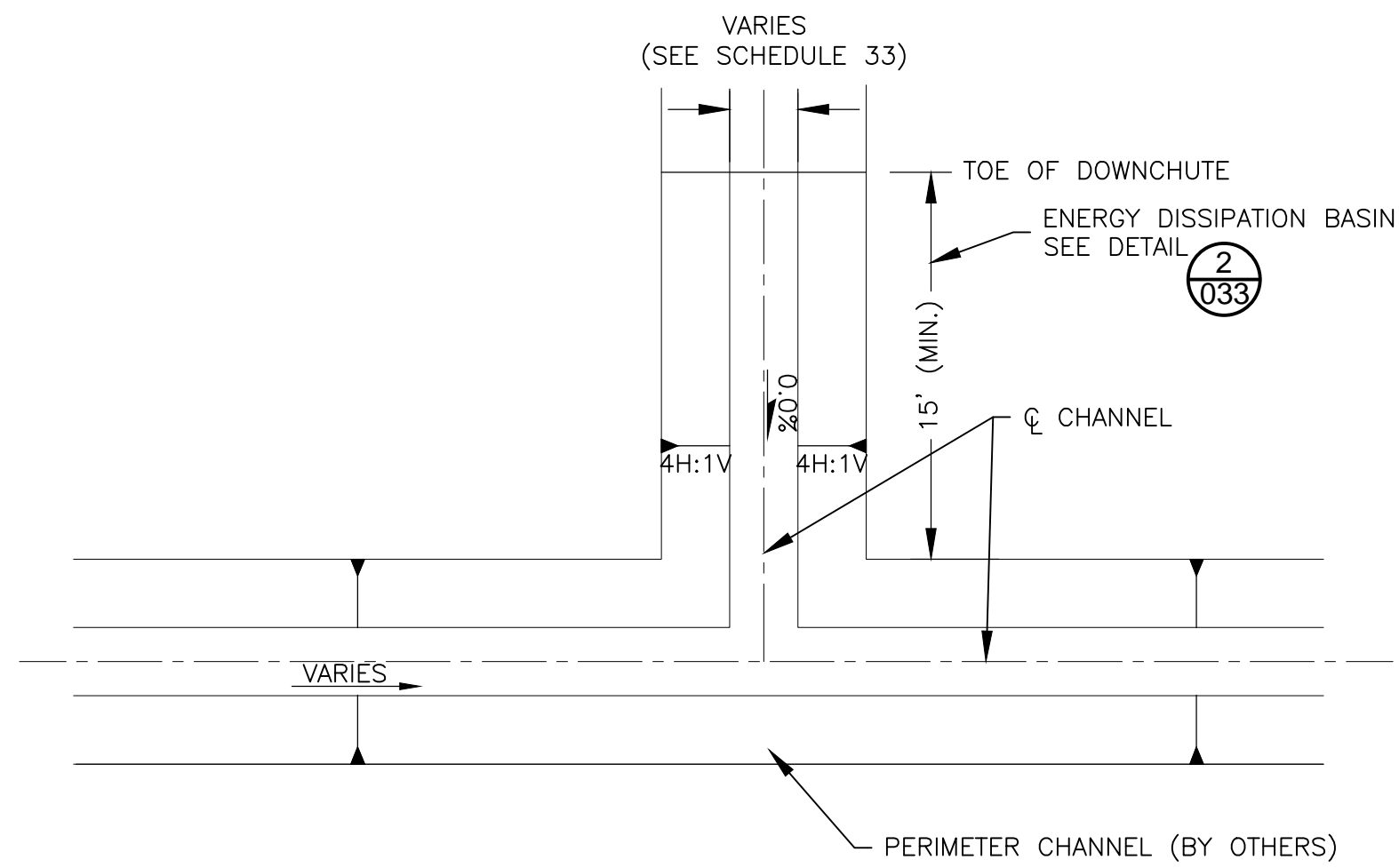
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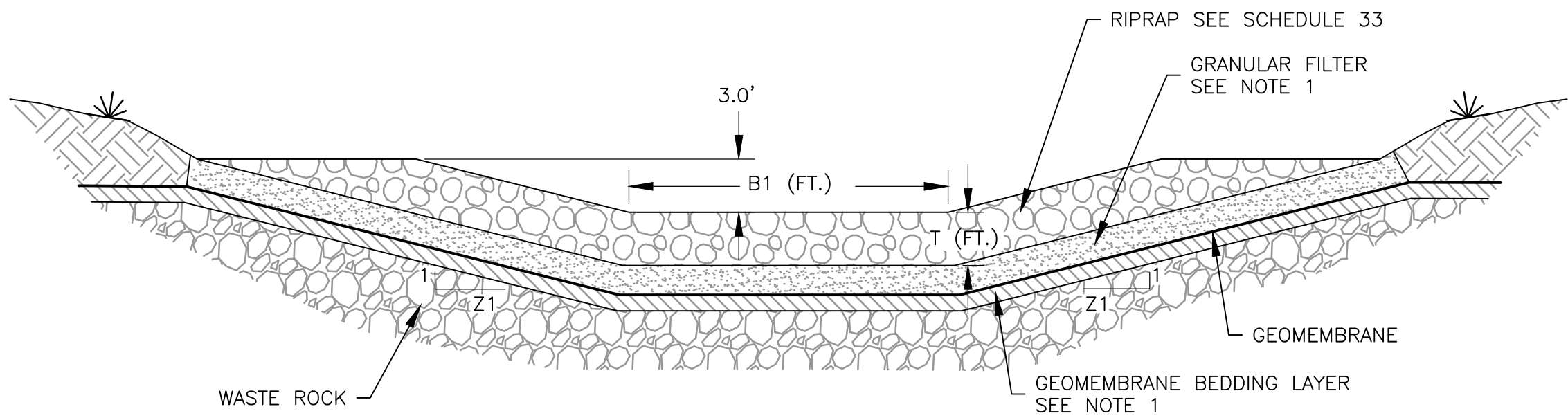
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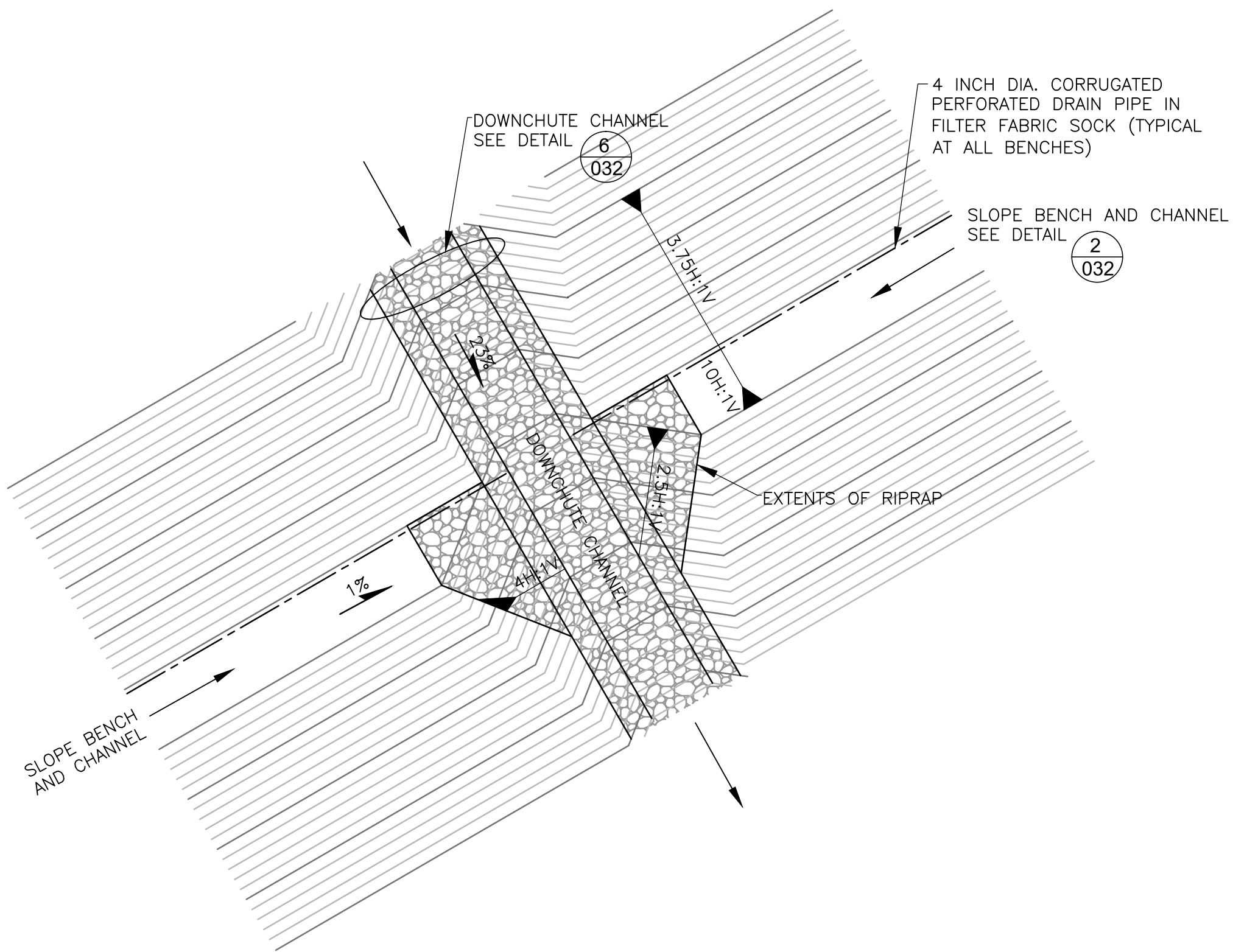
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			NOT APPROVED FOR CONSTRUCTION.			



1
033 **DOWNCHUTE CHANNEL CONFLUENCE DETAIL**
N.T.S.



2
033 **TYPICAL ENERGY DISSIPATION BASIN**
(SEE SCHEDULE 33 FOR DIMENSIONS)
N.T.S.





3
033 **SLOPE BENCH AND CHANNEL TO DOWNCHUTE TRANSITION**
N.T.S.


SCHEDULE 33: RIPRAP-LINED CHANNEL DIMENSIONS

CHANNEL ID	BOTTOM WIDTH, B1 (FT)	SIDE SLOPE, Z1 (H:1V)	MIN. DEPTH, H1 (FT)	RIPRAP SIZE, D50 (IN)	RIPRAP LAYER THICKNESS, T (FT)	MAX SLOPE, (FT/FT)
DC1-A	20	4	3	12	2	0.23
DC1-B	20	4	3	12	2	0.23
DC1-C	25	4	3	12	2	0.23
DC1-D	20	4	3	12	2	0.23
DC1-E	25	4	3	12	2	0.23
DC1-F	20	4	3	9	1.5	0.23
DC1-G	20	4	3	12	2	0.23
DC1-HRE	8	4	3	9	1.5	0.06
DC1-H	20	4	3	9	1.5	0.23
DC1-HRS	8	4	3	9	1.5	0.06
DC1-HRU	8	4	3	9	1.5	0.07
DC1-I	20	4	3	12	2	0.23
DC1-J	20	4	3	18	3	0.23
DC1-K	25	4	3	12	2	0.23
DC1-L	25	4	3	12	2	0.23

NOTES

- ENERGY DISSIPATION BASIN DETAIL REPRESENTS PRELIMINARY DESIGN. DETAILED DIMENSIONS AND TECHNICAL SPECIFICATIONS TO BE PROVIDED PRIOR TO CONSTRUCTION, I.E. AS A PART OF FINAL DESIGN.
- SEE GENERAL NOTES AND LEGEND ON DRAWING 002.

PLANT DRAWING NUMBER:	
CATEGORY 1 STOCKPILE RECLAMATION AND OPERATIONS SURFACE WATER MANAGEMENT DETAILS – SHEET 2 OF 2	
 POLYMET MINING	POLY MET MINING, INC. NORTHMET PROJECT HOYT LAKES, MINNESOTA
 Golder Associates	GOLDER ASSOCIATES INC. 44 UNION BOULEVARD, SUITE 300 LAKEWOOD, CO USA 80233 Ph: (303) 980-0540 Fax: (303) 985-2080 www.golder.com
DWG. NO. SKP-033	REV

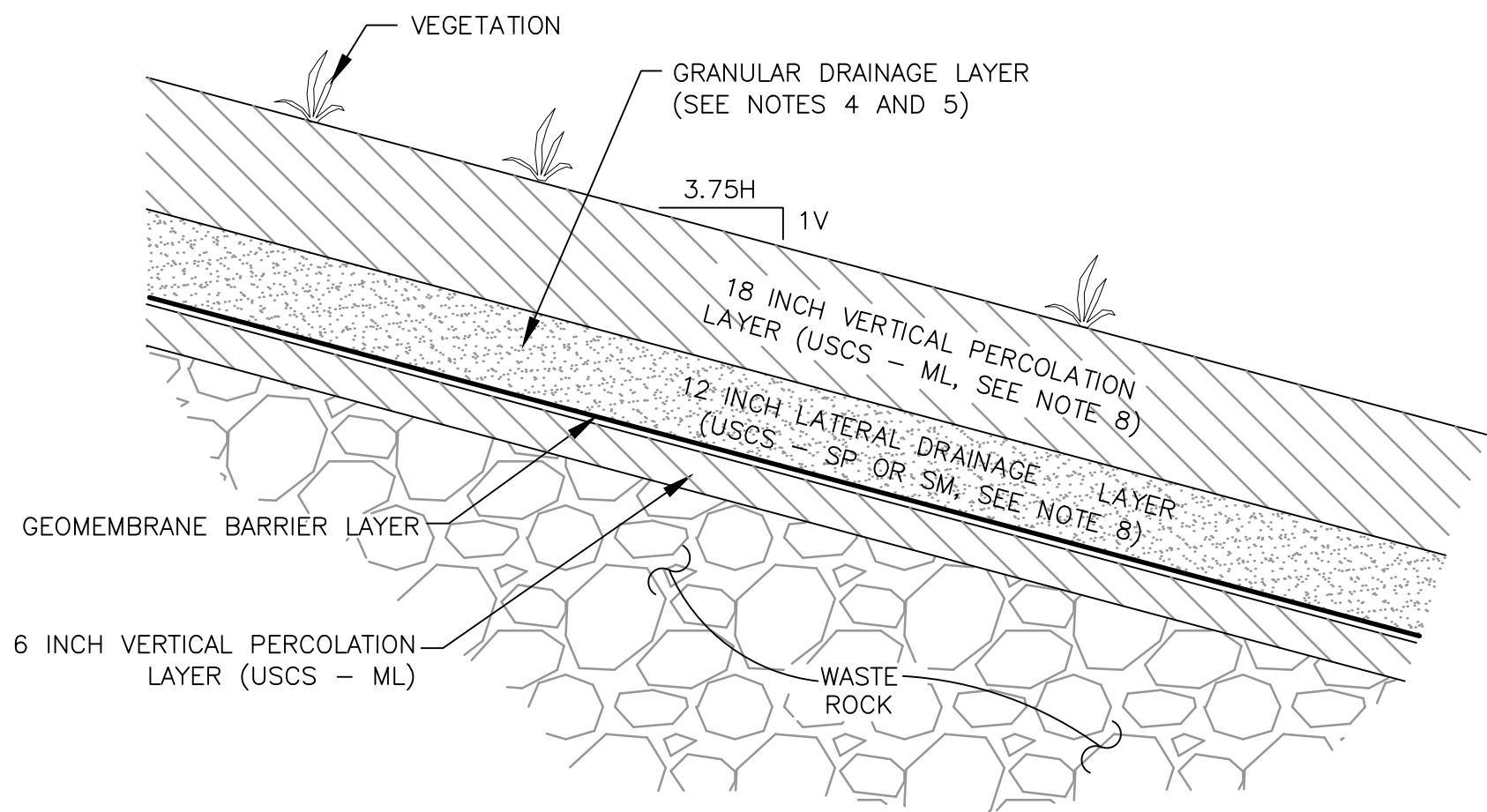
VER NO	DATE	DESCRIPTION	ISSUE STATUS			I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA. SIGNATURE  PRINTED NAME <u>BRENT R. BRONSON</u> DATE <u>5/22/15</u> LICENSE # <u>46492</u>
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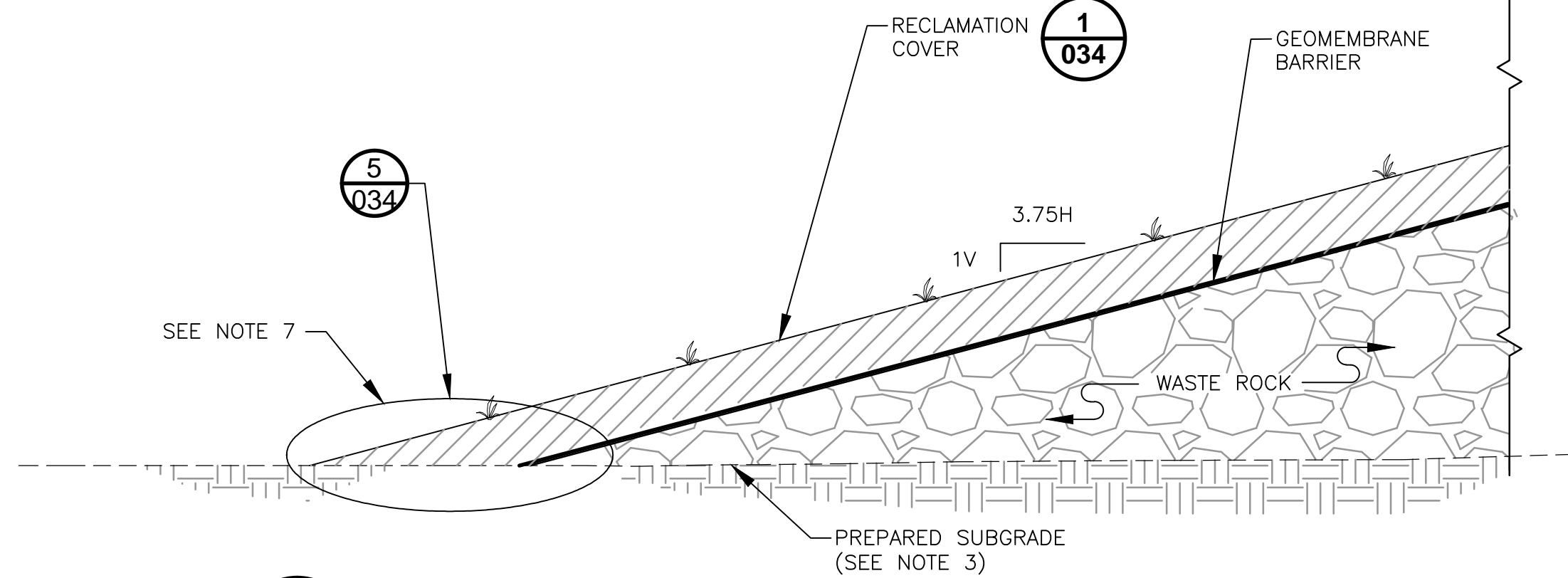
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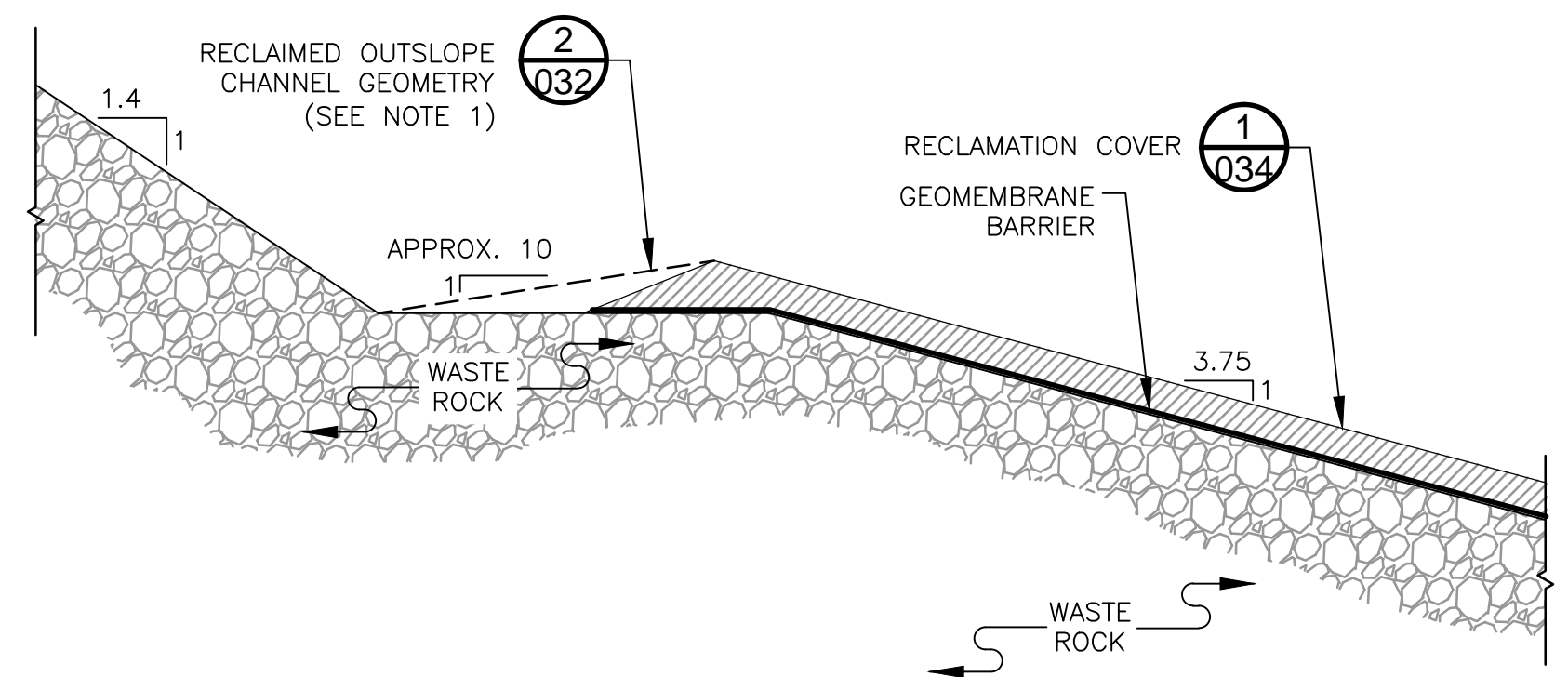
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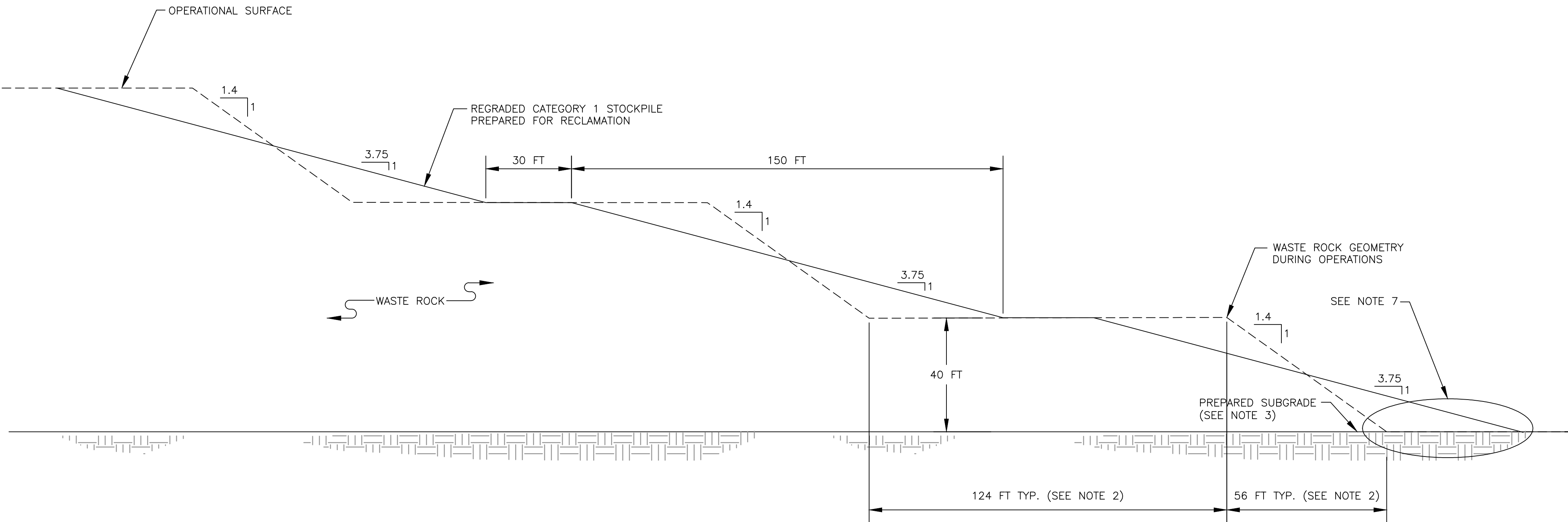
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034 TYPICAL CATEGORY 1 RECLAMATION COVER DETAIL
N.T.S.



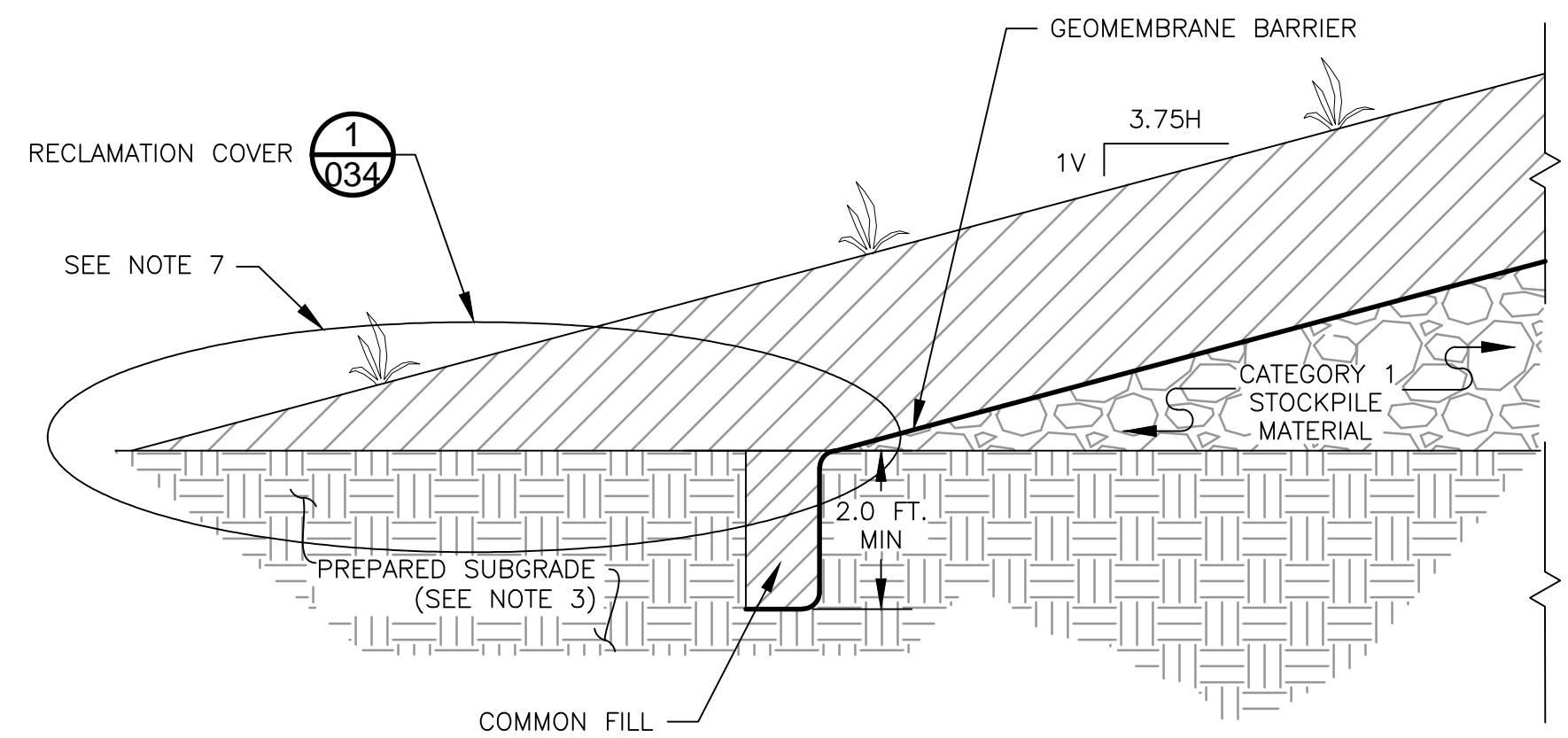
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034 CATEGORY 1 RECLAMATION COVER DESIGN SECTION
N.T.S.



3
034 RECLAMATION TO OPERATIONAL AREA TIE IN DETAIL
N.T.S.



4
034 CATEGORY 1 STOCKPILE TYPICAL GEOMETRY DURING OPERATIONS AND REGRADED FOR RECLAMATION
N.T.S.



5
034 GEOMEMBRANE COVER ANCHOR TRENCH DETAIL
N.T.S.

NOTES

- TEMPORARY SLOPE BENCH CHANNEL SHOULD BE CONSTRUCTED WITH MINIMUM DEPTH OF 2.4 FT. ON THE BENCHES BY GRADING CHANNEL SIDE SLOPES TO 10H:1V ON 30 FT. WIDE BENCHES.
- STOCKPILE GEOMETRY DURING OPERATIONS BASED ON ASSUMED WASTE ROCK ANGLE OF REPOSE OF 35.5 DEGREES (1.4H:1V).
- GEOTECHNICALLY UNSUITABLE SOILS TO BE REMOVED AND REPLACED WITH COMPACTED STRUCTURAL FILL WITHIN 100 FT. OF CATEGORY 1 STOCKPILE PERIMETER LIMITS.
- ON TOP OF STOCKPILE ON 1% SLOPE AREAS, PLACE 4 INCH DIAMETER PERFORATED CORRUGATED POLYETHYLENE PIPE (CPEP) WITH FILTER FABRIC SOCK AT 75 FOOT SPACING TO FACILITATE DRAINAGE OF GRANULAR DRAINAGE LAYER TO TOP SURFACE CHANNEL. PIPE LOCATION TO BE FIELD FIT.
- AT STOCKPILE BENCHES, PLACE 4 INCH PERFORATED CPEP DRAIN PIPE WITH FILTER FABRIC SOCK AT BASE OF COVER SYSTEM GRANULAR DRAINAGE LAYER AT SLOPE-BENCH INTERSECTION WITH OUTFLOW DIRECTED TO DOWNCHUTE CHANNELS.
- SEE GENERAL NOTES AND LEGEND ON DRAWING 002.
- EDGE OF LINER TO TIE IN TO CATEGORY 1 STOCKPILE GROUNDWATER CONTAINMENT SYSTEM.
- REFER TO UNIFIED SOIL CLASSIFICATION SYSTEM FOR COVER SOIL DESCRIPTION.

PLANT DRAWING NUMBER:

CATEGORY 1 STOCKPILE
PHASED COVER DESIGN



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



GOLDER ASSOCIATES INC.
44 UNION BOULEVARD, SUITE 300
LAKEWOOD, CO USA 80233
Ph: (303) 980-0540
Fax: (303) 985-2080
www.golder.com

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SIGNATURE *B. Bronson*
PRINTED NAME BRENT R. BRONSON
DATE 5/22/15 LICENSE # 46492

DRAWN: MTM
CHECKED: *gg*
GOLDER PROJECT NO.: 113-2209
SCALE: AS SHOWN

DWG. NO. SKP-034

REV

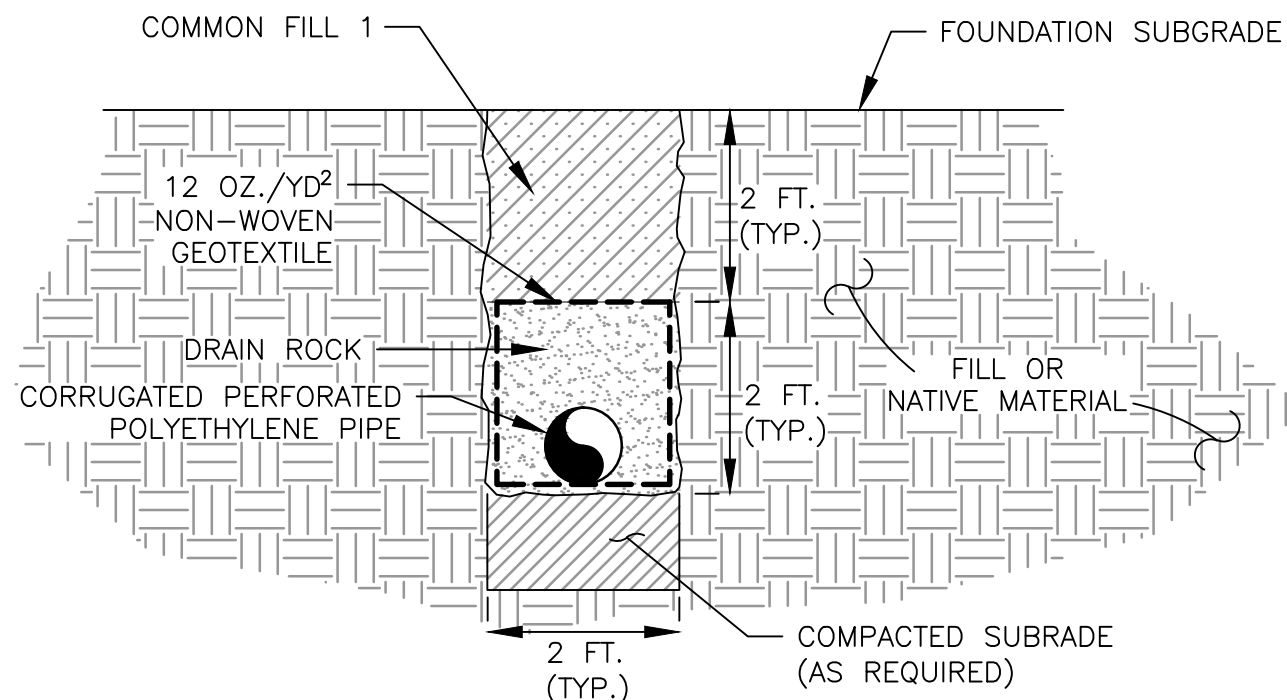
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B	2/15/13	ISSUED FOR REVIEW FOR INCLUSION IN ROMP	FOR PERMITTING	F	5-22-15
C	5/29/13	ISSUED FOR REVIEW FOR INCLUSION IN ROMP			
D	1/14/14	ISSUED FOR AGENCY REVIEW			
E	4/10/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS	FOR CONSTRUCTION		
F	5/22/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS			
			NOT APPROVED FOR CONSTRUCTION.		

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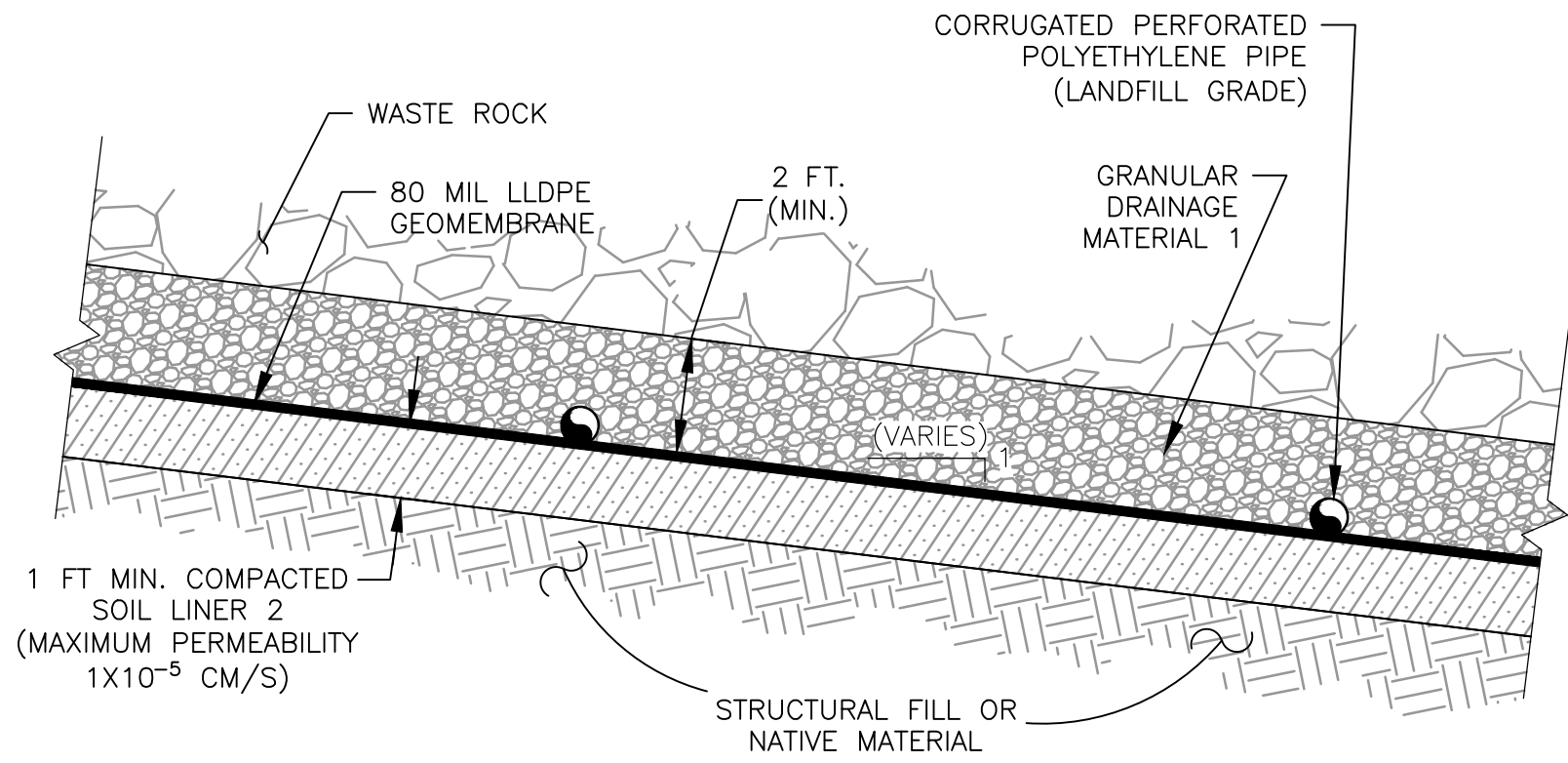
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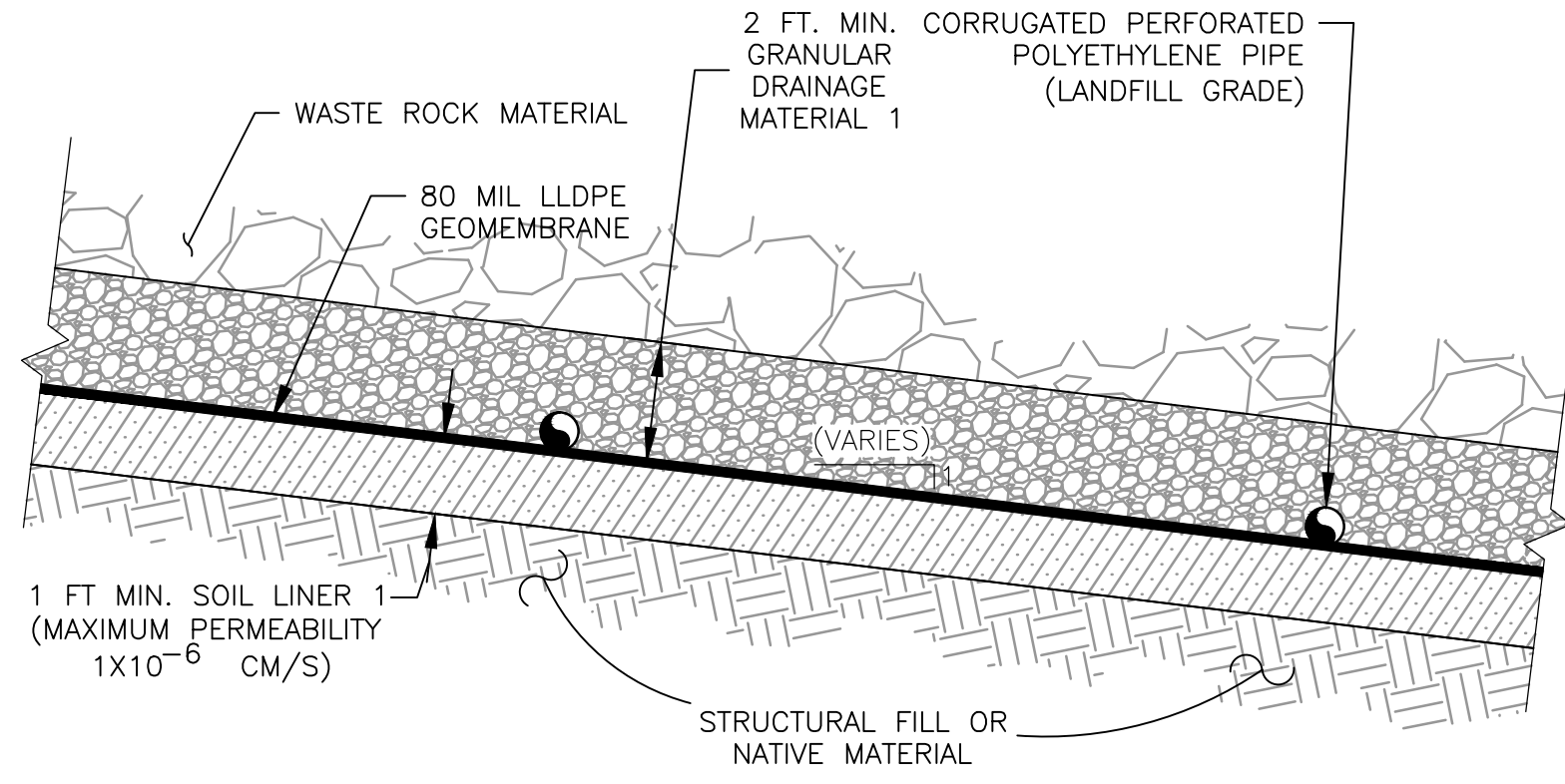
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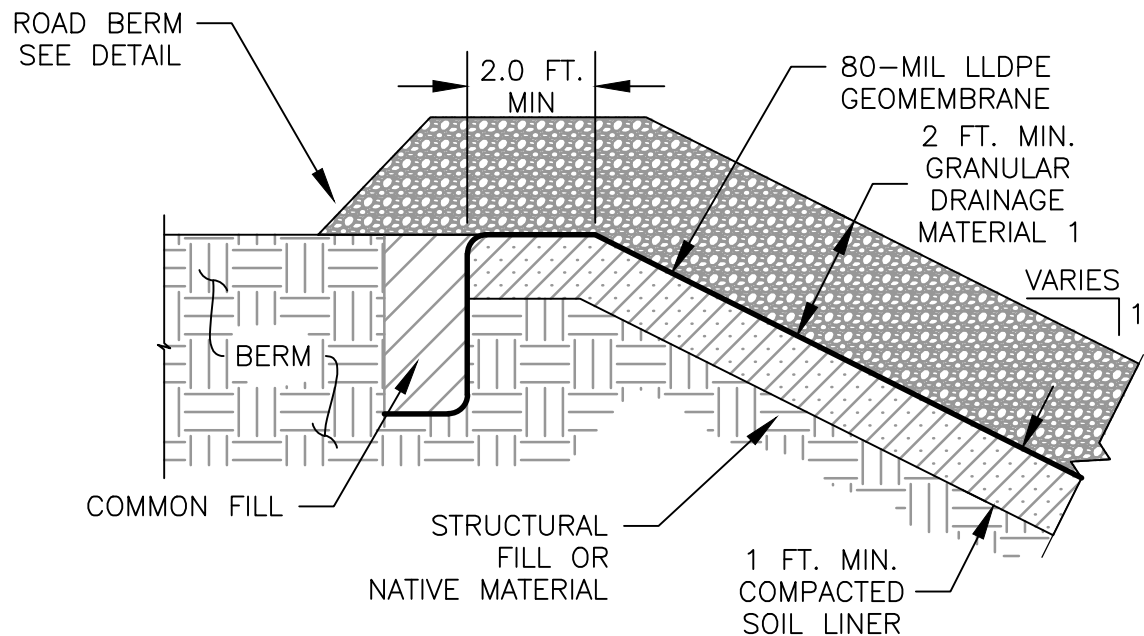
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035 **TYPICAL FOUNDATION UNDERDRAIN**
N.T.S.



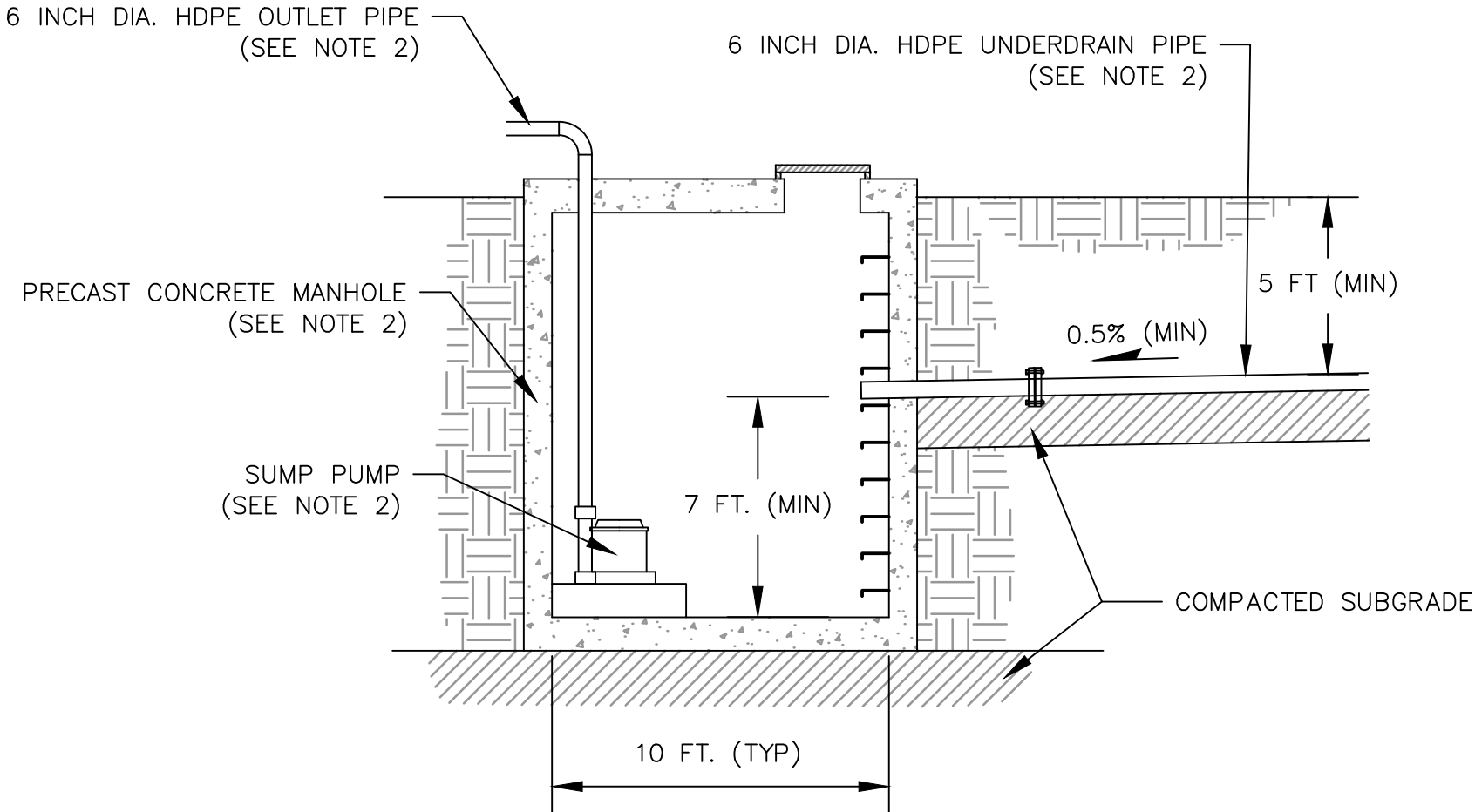
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035 **CATEGORY 2/3 STOCKPILE LINER**
N.T.S.



3
035 **CATEGORY 4 STOCKPILE AND ORE SURGE PILE LINER**
N.T.S.



4
035 **GEOMEMBRANE LINER ANCHOR TRENCH DETAIL**
N.T.S.



5
035 **UNDERDRAIN SUMP MANHOLE**
N.T.S.

NOTES

1. SEE GENERAL NOTES AND LEGEND ON DRAWING 002.
2. UNDERDRAIN SUMP MANHOLE DIMENSIONS, SUMP PUMP CAPACITY AND PIPE DIMENSIONS ARE PRELIMINARY AND WILL BE SIZED BASED ON ENCOUNTERED FIELD CONDITIONS.

PLANT DRAWING NUMBER:

CONSTRUCTION DETAILS



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



GOLDER ASSOCIATES INC.
44 UNION BOULEVARD, SUITE 300
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			NOT APPROVED FOR CONSTRUCTION.		

DRAWN: MTM

CHECKED: *gg*

GOLDER PROJECT NO.: 113-2209

SCALE: AS SHOWN

DWG. NO. SKP-035

REV

Errata Sheet

Poly Met Mining, Inc. NorthMet Project

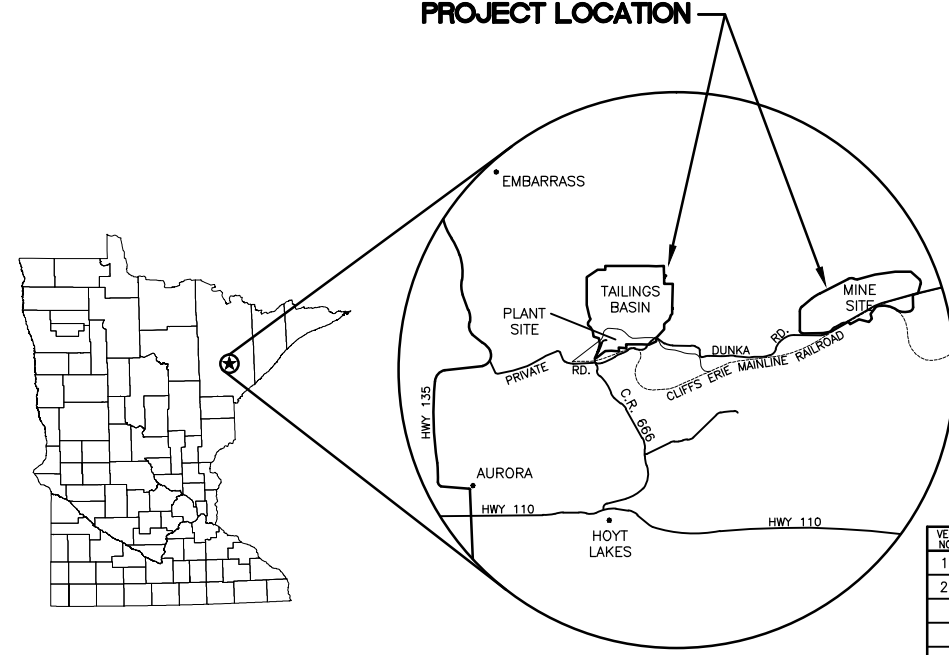
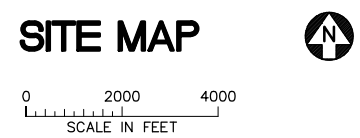
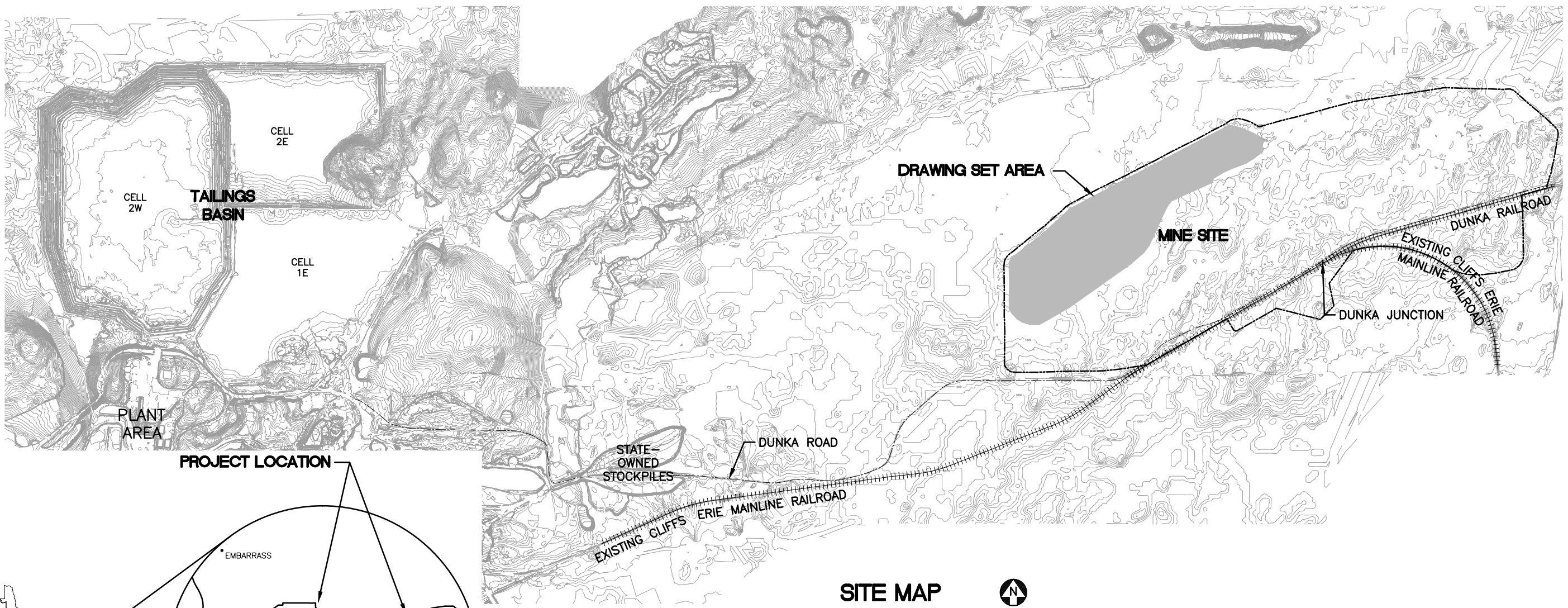
Permit Application Support Drawings: Category 1 Stockpile Groundwater Containment System

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
Global change to all sheets, as needed	The terminology "mine drainage" as noted in these drawings will be changed to "mine water".
GCS-003	To meet construction stormwater requirements, a temporary berm will be added on the west side of the Mine Year 0 Category 1 Stockpile footprint to control mine water runoff as the stockpile is built out.

POLY MET MINING, INC. NORTHMET PROJECT
PERMIT APPLICATION SUPPORT DRAWINGS
CATEGORY 1 STOCKPILE GROUNDWATER CONTAINMENT SYSTEM
HOYT LAKES, MINNESOTA



LOCATION MAP
NOT TO SCALE

VER. NO.	DATE	DESCRIPTION	ISSUE STATUS		
			ISSUED	VERSION	DATE
1	10/18/11	ROCK AND OVERBURDEN MANAGEMENT PLAN -- VERSIONS 5, 6, 7 -- ATTACHMENT C	ISSUED		
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PRINTED NAME THOMAS J. RADUE
SIGNATURE Thomas J. Radue
DATE 5/28/15 LICENSE# 20951

DRAWN: CAD
CHECKED: CMK2
BARR PROJECT NO.: 23/69-0C29
SCALE: AS SHOWN

PLANT DRAWING NUMBER:

CATEGORY 1 STOCKPILE GROUNDWATER CONTAINMENT SYSTEM LOCATION MAP AND SITE MAP

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

BARR BARR ENGINEERING COMPANY 4700 WEST 77TH STREET MINNEAPOLIS, MN. Ph: 1-800-632-2277

DWG. NO. **GCS-001** REV

CADD USER: Terri J. Toms FILE: K:\DESIGN\23690C29\10\PERMIT_NMM-21-CS-002.DWG PLOT SCALE: 1:2 PLOT DATE: 5/28/2015 1:30 PM

INCHES

1

2

GENERAL LEGEND

	EXISTING CONTOUR - MAJOR
	EXISTING CONTOUR - MINOR
	MINE SITE BOUNDARY
	PROPOSED SUMP OVERFLOW PIPE
	PROPOSED MINE DRAINAGE PIPE (PUMPED FLOW)
	PROPOSED MINE DRAINAGE PIPE (GRAVITY FLOW)
	PROPOSED SUMP MANHOLE
	PROPOSED ACCESS ROADS
	HAUL ROAD

ABBREVIATIONS

CAT	-	CATEGORY
DWG	-	DRAWING
EL	-	ELEVATION
GCS	-	GROUNDWATER CONTAINMENT SYSTEM
MH	-	MANHOLE
NTS	-	NOT TO SCALE
PVI	-	PROFILE VERTICAL INTERSECTION
STA	-	STATION
WWTF	-	WASTE WATER TREATMENT FACILITY

SHEET INDEX

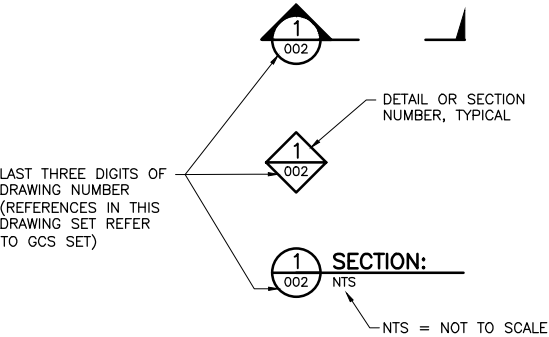
SHEET NO. TITLE



GENERAL DRAWINGS	
GCS-001	LOCATION MAP AND SITE MAP
GCS-002	LEGEND AND SHEET INDEX
GCS-003	MINE YEAR 0 LAYOUT
GCS-004	MINE YEAR 2 LAYOUT
GCS-005	MINE YEAR 3 LAYOUT
GCS-006	MINE YEAR 5 LAYOUT
GCS-007	MINE YEAR 6 LAYOUT
GCS-008	MINE YEAR 20 LAYOUT
GCS-009	CLOSURE CONFIGURATION
GCS-010	TYPICAL CROSS SECTIONS
GCS-011	TYPICAL CROSS SECTIONS
GCS-012	NORTH PROFILES
GCS-013	SOUTH PROFILES
GCS-014	DISCHARGE PROFILES

NOTES

1. COORDINATE SYSTEM IS MINNESOTA STATE PLANE NORTH ZONE, NAD83.
2. ELEVATIONS ARE MEAN SEA LEVEL (MSL), NAVD88.
3. EXISTING TOPOGRAPHIC INFORMATION SHOWN ON THE DRAWINGS WAS PREPARED BY AEROMETRIC, INC. FROM LIDAR DATA COLLECTED ON MARCH 17, 2010.

DRAWING NUMBERING



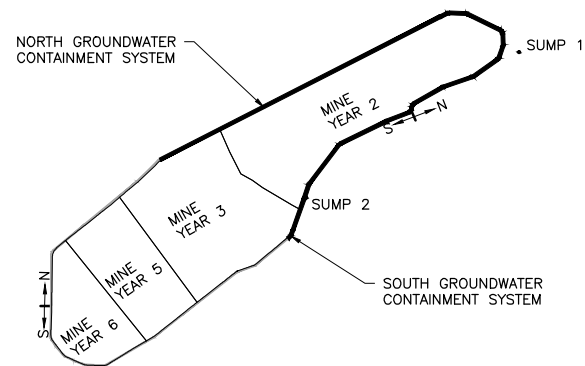
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1		10/18/11	ROCK AND OVERBURDEN MANAGEMENT PLAN – VERSIONS 5, 6, 7 – ATTACHMENT C	ISSUED	VERSION	DATE	I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA. PRINTED NAME <u>THOMAS J. RADUE</u> SIGNATURE <u>Thomas J. Radue</u> DATE <u>5/28/15</u> LICENSE# <u>20951</u>	DRAWN:	CAD	  BARR ENGINEERING COMPANY 4700 WEST 77TH STREET MINNEAPOLIS, MN. Ph: 1–800–632–2277
2		5/28/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS	FOR PERMITTING	2	5/28/15		CHECKED:	CMK2	
				FOR CONSTRUCTION				BARR PROJECT NO.:	23/69–0C29	
								SCALE:	AS SHOWN	
				NOT APPROVED FOR CONSTRUCTION.				DWG. NO.	GCS–002	
										REV

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PRINTED NAME THOMAS J. RADUE
SIGNATURE
DATE 5/28/15 LICENSE# 20951

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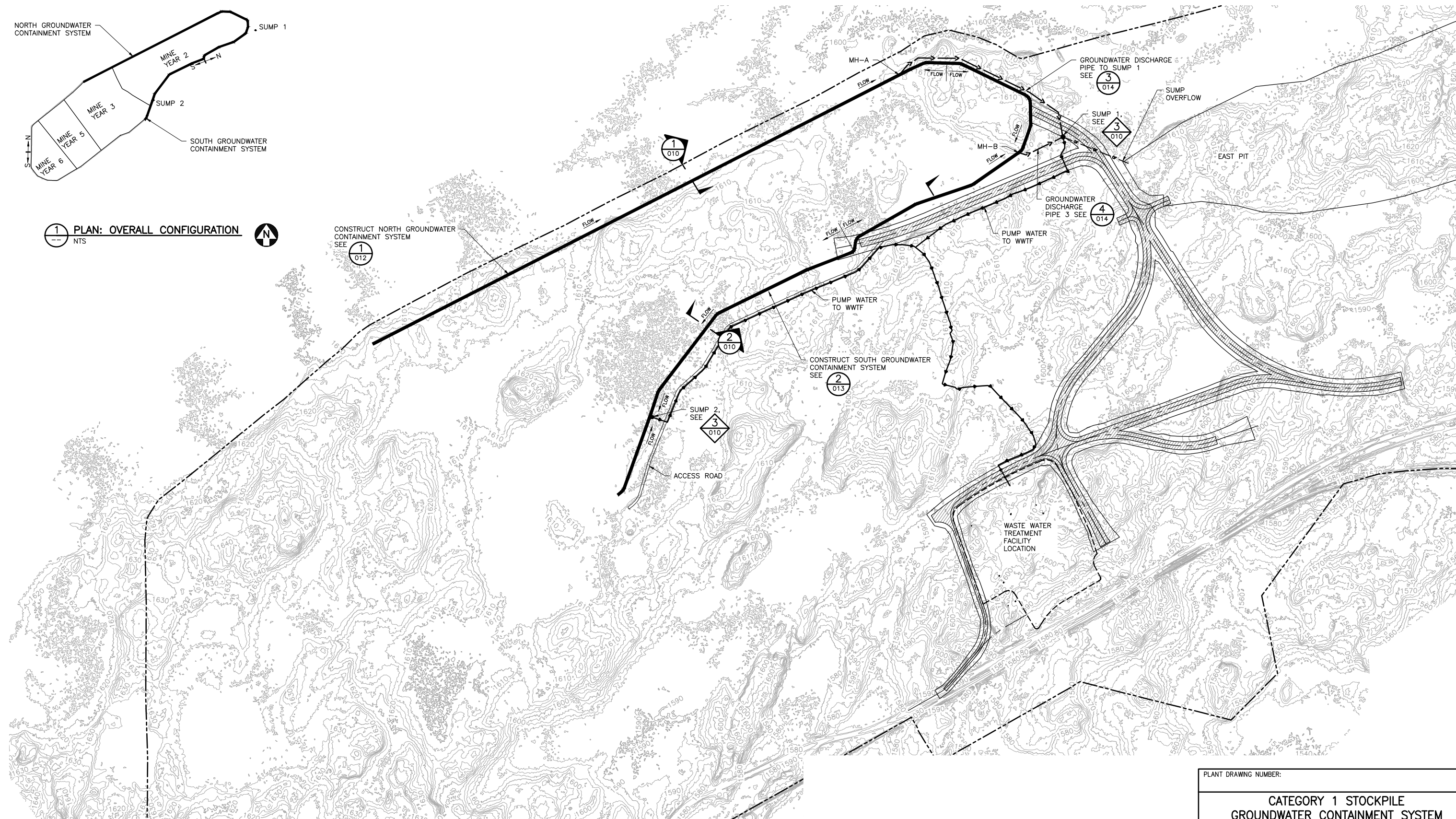
INCHES
1
2



1 PLAN: OVERALL CONFIGURATION
NTS



CONSTRUCT NORTH GROUNDWATER
CONTAINMENT SYSTEM
SEE 1
012



2 PLAN: GCS - MINE YEAR 0 LAYOUT

0 500 1000
SCALE IN FEET



VER NO	DATE	DESCRIPTION	ISSUE STATUS		
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DATE 5/28/15 LICENSE# 20951

DRAWN: CAD
CHECKED: CMK2
BARR PROJECT NO.: 23/69-0C29
SCALE: AS SHOWN

PLANT DRAWING NUMBER:

CATEGORY 1 STOCKPILE
GROUNDWATER CONTAINMENT SYSTEM
MINE YEAR 0 LAYOUT



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



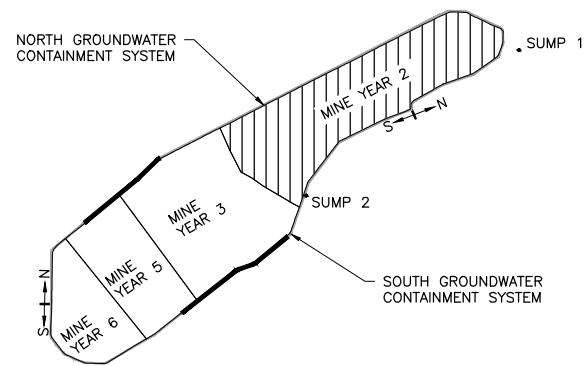
BARR ENGINEERING COMPANY
4700 WEST 77TH STREET
MINNEAPOLIS, MN.
Ph: 1-800-632-2277

DWG. NO. GCS-003

REV

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INCHES
1
2



1 PLAN: OVERALL CONFIGURATION
NTS



EXTEND NORTH GROUNDWATER
CONTAINMENT SYSTEM
SEE

1
012

MINE YEAR 2 CATEGORY
1 STOCKPILE FOOTPRINT

1
010

EXTEND SOUTH GROUNDWATER
CONTAINMENT SYSTEM
SEE

2
013

ACCESS ROAD

SUMP OVERFLOW SEE

3
010

WEST PIT

WASTE WATER
TREATMENT
FACILITY
LOCATION

SUMP
OVERFLOW

EAST PIT

2 PLAN: GCS - MINE YEAR 2 LAYOUT

0 500 1000
SCALE IN FEET





VER NO	DATE	DESCRIPTION	ISSUE STATUS		
			ISSUED	VERSION	DATE
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UNDER THE LAWS OF THE STATE OF
MINNESOTA.

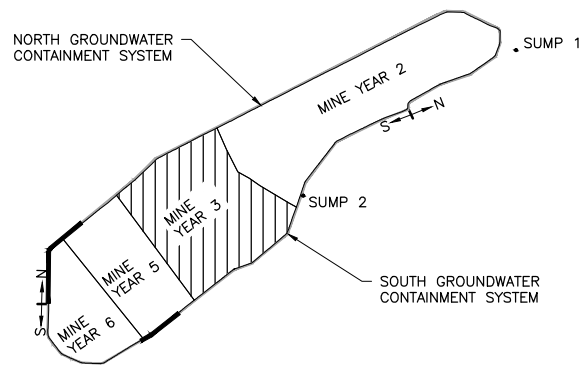
PRINTED NAME THOMAS J. RADUE
SIGNATURE *Thomas J. Radue*
DATE 5/28/15 LICENSE# 20951

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

PLANT DRAWING NUMBER:	
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	POLY MET MINING, INC. NORTHMET PROJECT HOYT LAKES, MINNESOTA
	BARR ENGINEERING COMPANY 4700 WEST 77TH STREET MINNEAPOLIS, MN. Ph: 1-800-632-2277
DWG. NO. GCS-004	REV

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INCHES
1
2



1 PLAN: OVERALL CONFIGURATION
NTS



2 PLAN: GCS - MINE YEAR 3 LAYOUT

0 500 1000
SCALE IN FEET



VER NO	DATE	DESCRIPTION	ISSUE STATUS		
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SIGNATURE *Thomas J. Radue*
DATE 5/28/15 LICENSE# 20951

DRAWN: CAD
CHECKED: CMK2
BARR PROJECT NO.: 23/69-0C29
SCALE: AS SHOWN

PLANT DRAWING NUMBER:

CATEGORY 1 STOCKPILE
GROUNDWATER CONTAINMENT SYSTEM
MINE YEAR 3 LAYOUT

POLYMET MINING

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

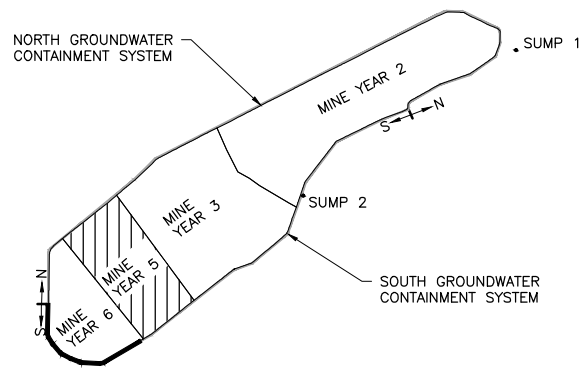
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4700 WEST 77TH STREET
MINNEAPOLIS, MN.
Ph: 1-800-632-2277

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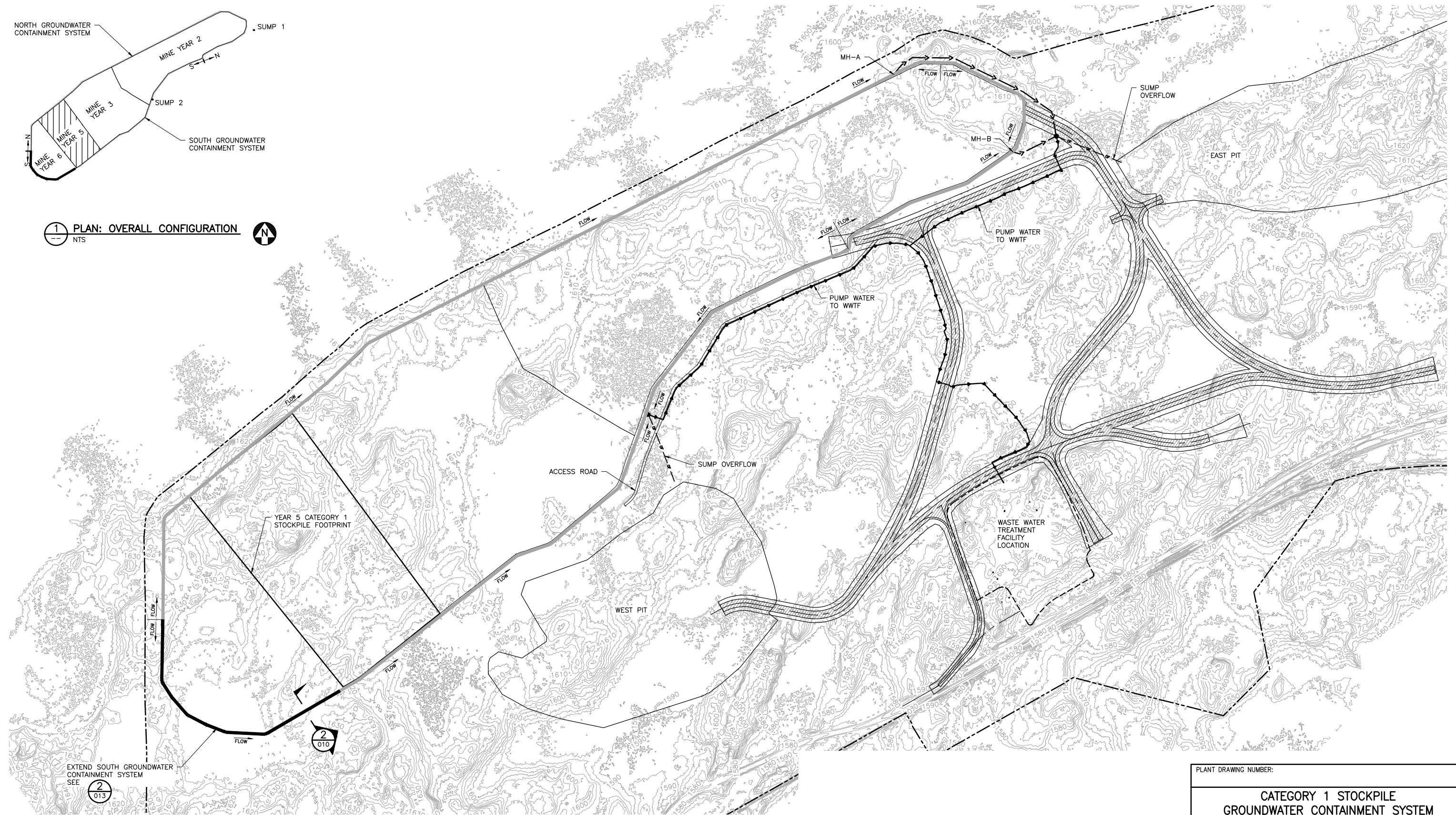
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INCHES
1
2



1 PLAN: OVERALL CONFIGURATION
NTS



2 PLAN: GCS - MINE YEAR 5 LAYOUT





0 500 1000
SCALE IN FEET

VER NO	DATE	DESCRIPTION	ISSUE STATUS		
1	10/18/11	ROCK AND OVERBURDEN MANAGEMENT PLAN - VERSIONS 5, 6, 7 - ATTACHMENT C	ISSUED	VERSION	DATE
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SIGNATURE *Thomas J. Radue*
DATE 5/28/15 LICENSE# 20951

DRAWN: CAD
CHECKED: CMK2
BARR PROJECT NO.: 23/69-0C29
SCALE: AS SHOWN

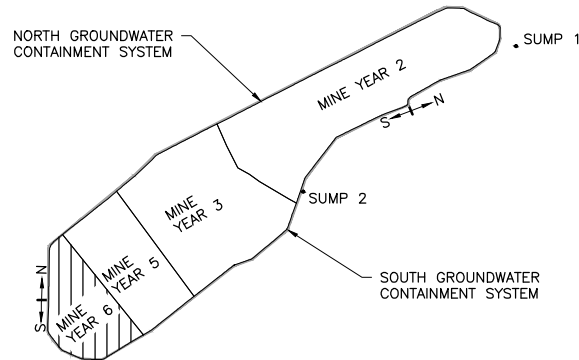
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CATEGORY 1 STOCKPILE GROUNDWATER CONTAINMENT SYSTEM MINE YEAR 5 LAYOUT	
	POLY MET MINING, INC. NORTHMET PROJECT HOYT LAKES, MINNESOTA
	BARR ENGINEERING COMPANY 4700 WEST 77TH STREET MINNEAPOLIS, MN. Ph: 1-800-632-2277
DWG. NO. GCS-006	REV

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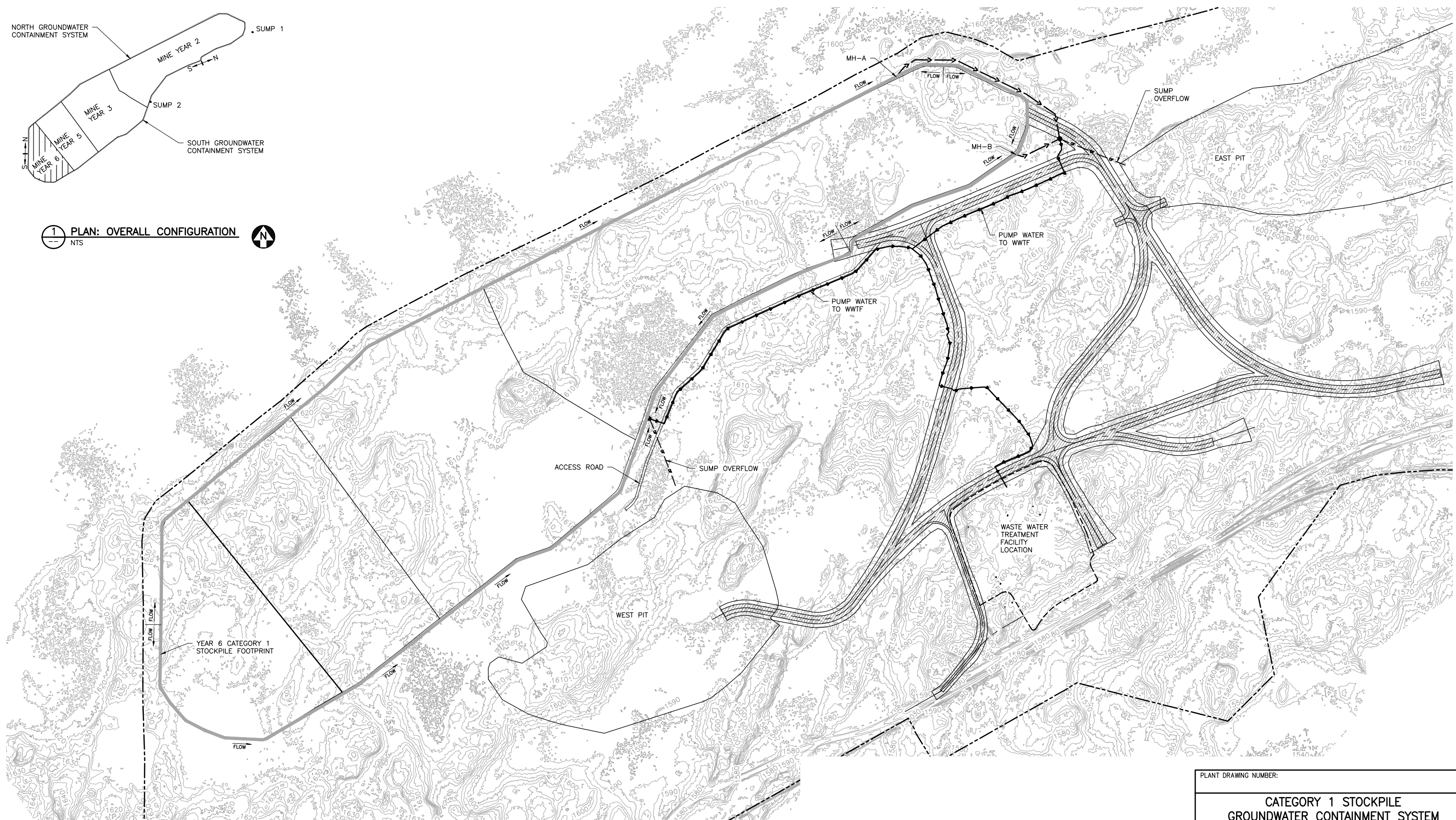
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INCHES



1 PLAN: OVERALL CONFIGURATION
NTS



2 PLAN: GCS - MINE YEAR 6 LAYOUT

0 500 1000
SCALE IN FEET

VER NO	DATE	DESCRIPTION	ISSUE STATUS		
			ISSUED	VERSION	DATE
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SIGNATURE *Thomas J. Radue*
DATE 5/28/15 LICENSE# 20951

DRAWN: CAD
CHECKED: CMK2
BARR PROJECT NO.: 23/69-0C29
SCALE: AS SHOWN

PLANT DRAWING NUMBER:

CATEGORY 1 STOCKPILE
GROUNDWATER CONTAINMENT SYSTEM
YEAR 6 LAYOUT

POLYMET MINING

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

BARR

BARR ENGINEERING COMPANY
4700 WEST 77TH STREET
MINNEAPOLIS, MN.
Ph: 1-800-632-2277

DWG. NO. GCS-007

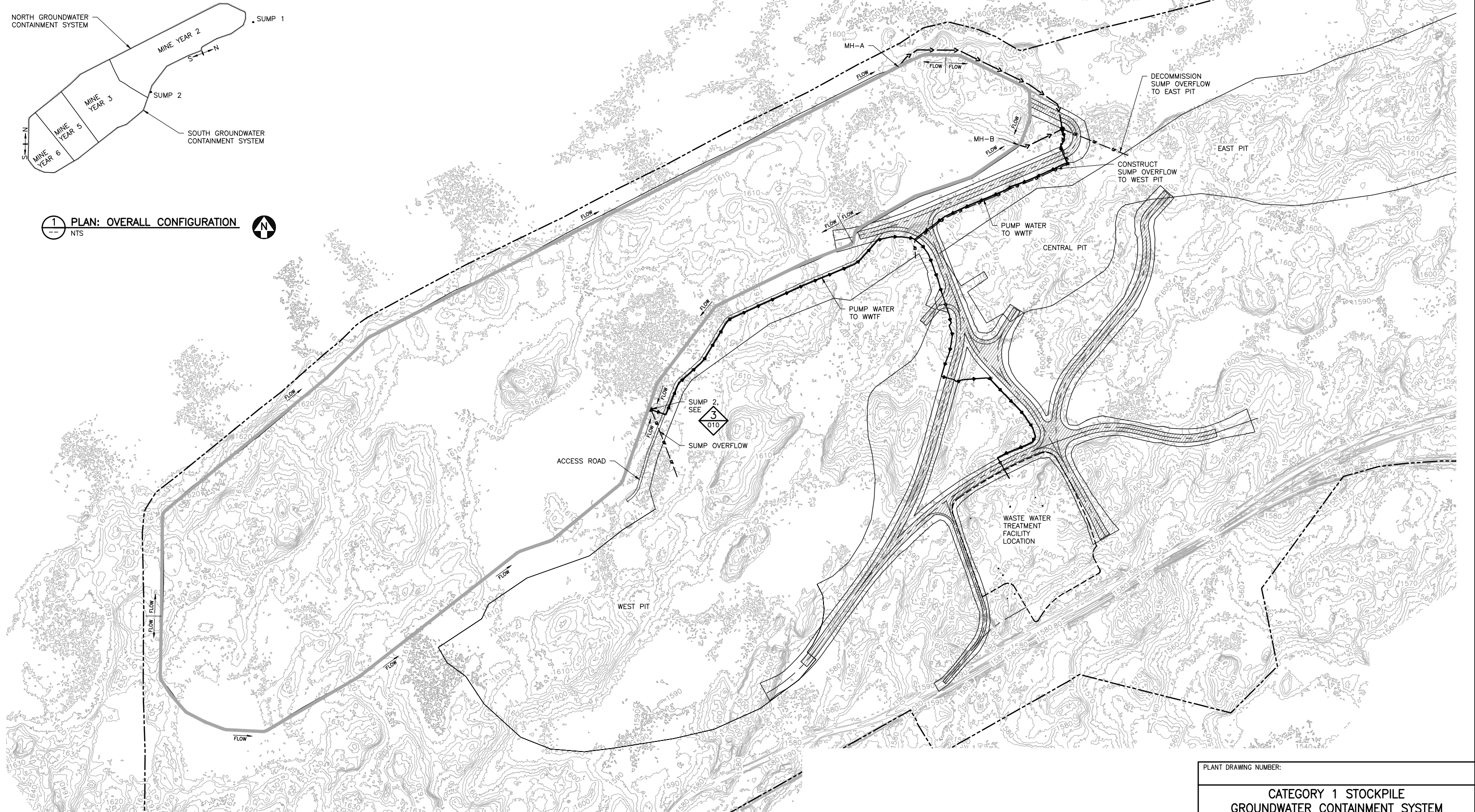
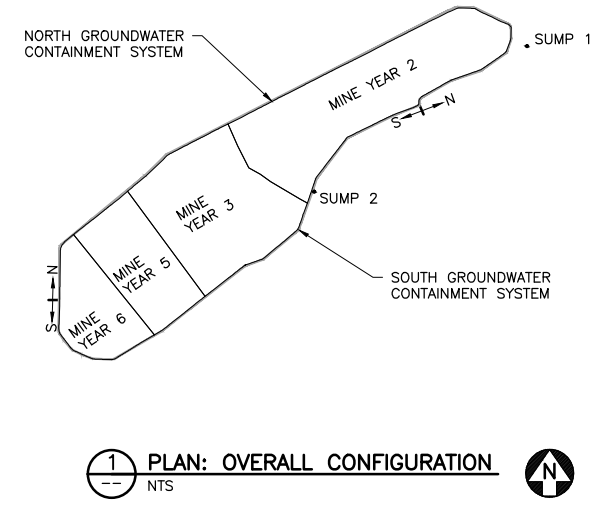
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2

1

INCHES

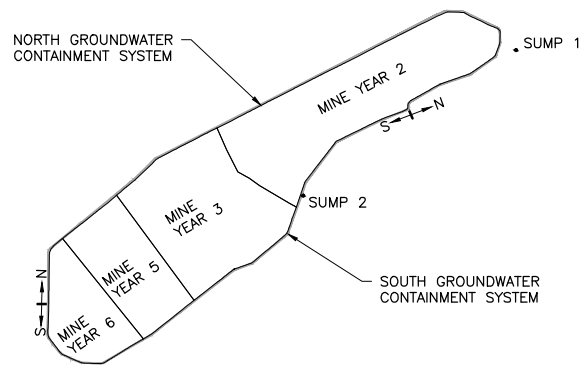


2 PLAN: GCS - MINE YEAR 20 LAYOUT

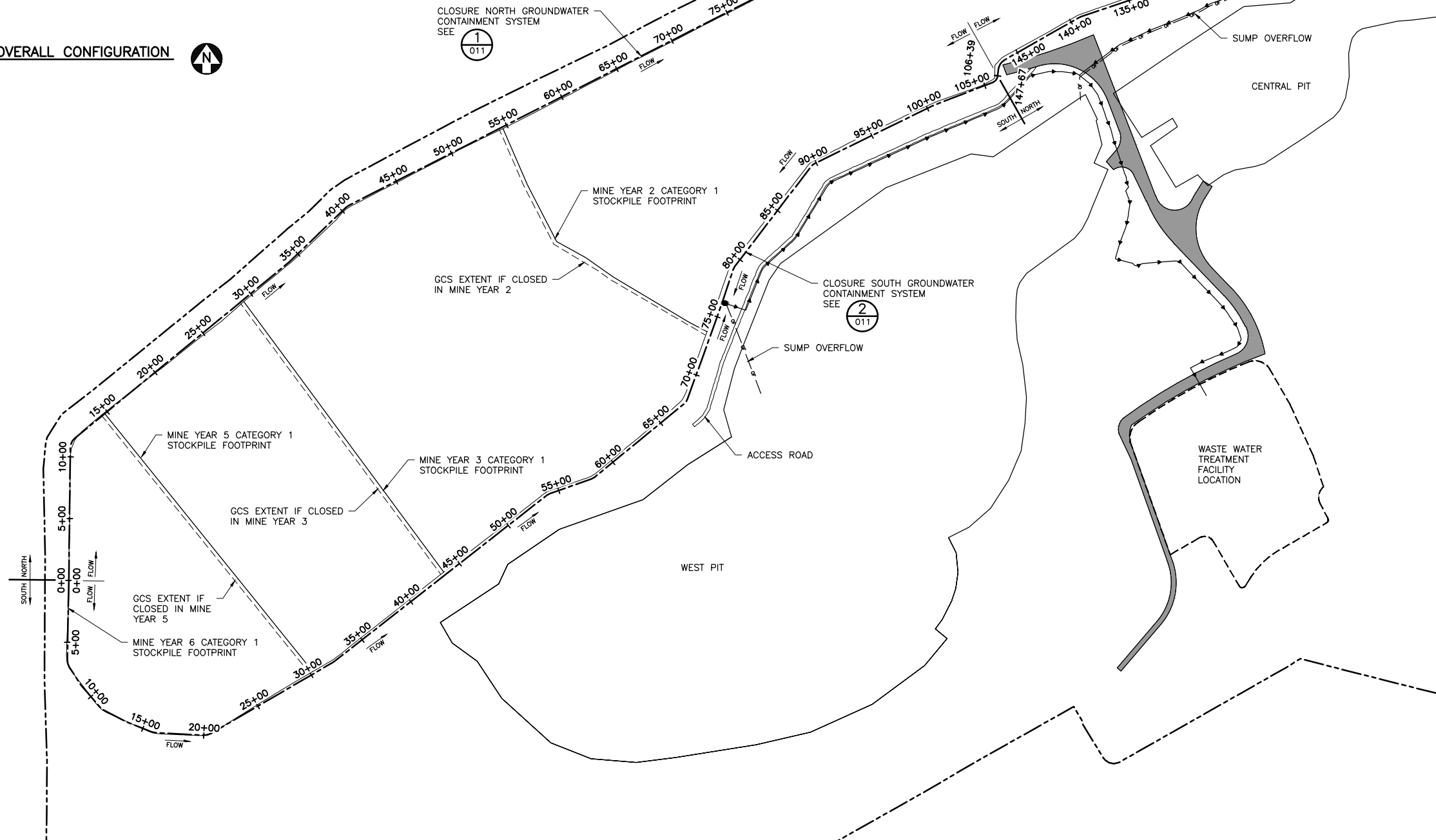
VER NO	DATE	DESCRIPTION	ISSUE STATUS			<div>I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.</div> <div>PRINTED NAME <u>THOMAS J. RADUE</u></div> <div>SIGNATURE <u></u></div> <div>DATE <u>5/28/15</u> LICENSE# <u>20951</u></div>			<div><div>POLYMET MINING</div><div>POLY MET MINING, INC. NORTHMET PROJECT HOYT LAKES, MINNESOTA</div></div> <div><div>BARR</div><div>BARR ENGINEERING COMPANY 4700 WEST 77TH STREET MINNEAPOLIS, MN. Ph: 1-800-632-2277</div></div>	DWG. NO.	REV
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			FOR CONSTRUCTION				BARR PROJECT NO.:	23/69-0C29			
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INCHES
1
2



1 PLAN: OVERALL CONFIGURATION
NTS



2 PLAN: CLOSURE CONFIGURATION

0 500 1000
SCALE IN FEET





VER NO	DATE	DESCRIPTION	ISSUE STATUS		
1	10/18/11	ROCK AND OVERBURDEN MANAGEMENT PLAN - VERSIONS 5, 6, 7 - ATTACHMENT C	ISSUED	VERSION	DATE
2	5/28/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS	FOR PERMITTING	2	5/28/15
			FOR CONSTRUCTION		
			NOT APPROVED FOR CONSTRUCTION.		

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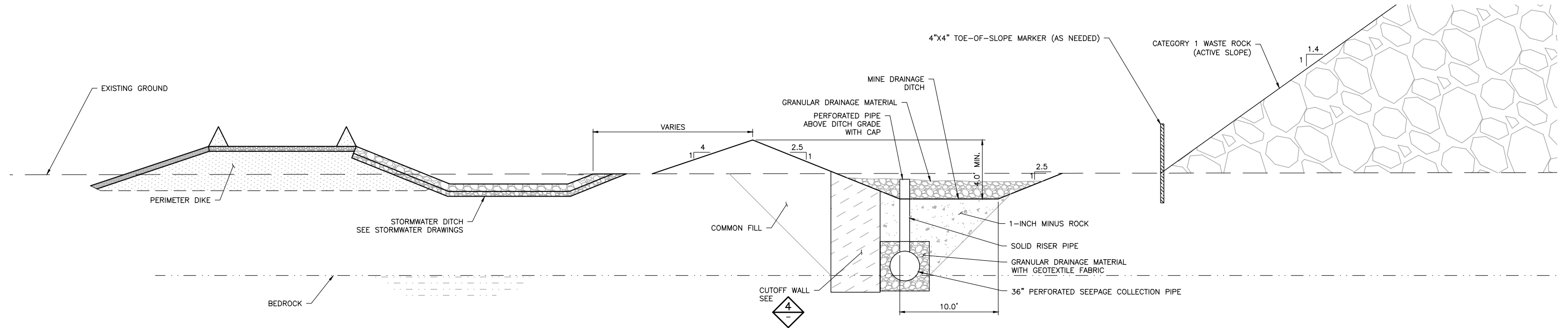
PRINTED NAME THOMAS J. RADUE
SIGNATURE *Thomas J. Radue*
DATE 5/28/15 LICENSE# 20951

DRAWN: CAD
CHECKED: CMK2
BARR PROJECT NO.: 23/69-OC29
SCALE: AS SHOWN

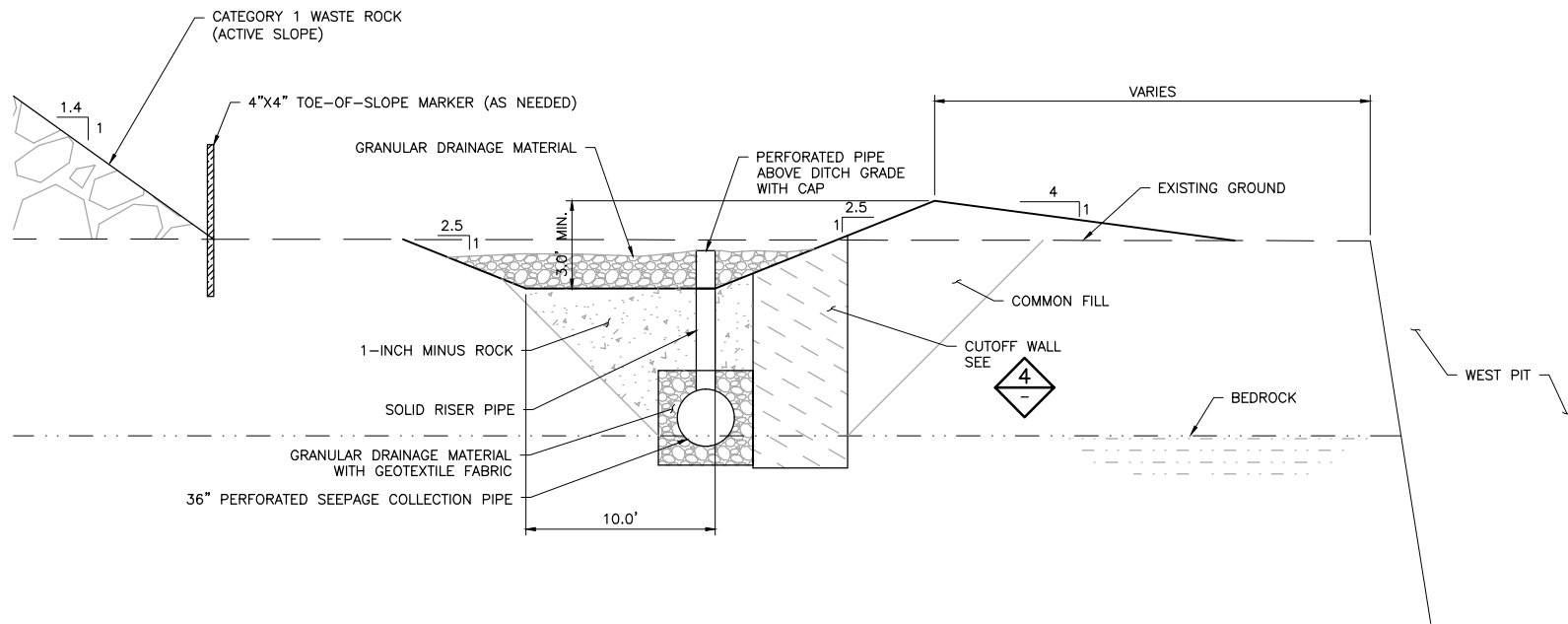
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 POLYMET MINING, INC. NORTHMET PROJECT HOYT LAKES, MINNESOTA		
 BARR ENGINEERING COMPANY 4700 WEST 77TH STREET MINNEAPOLIS, MN. Ph: 1-800-632-2277		
DWG. NO.	GCS-009	REV

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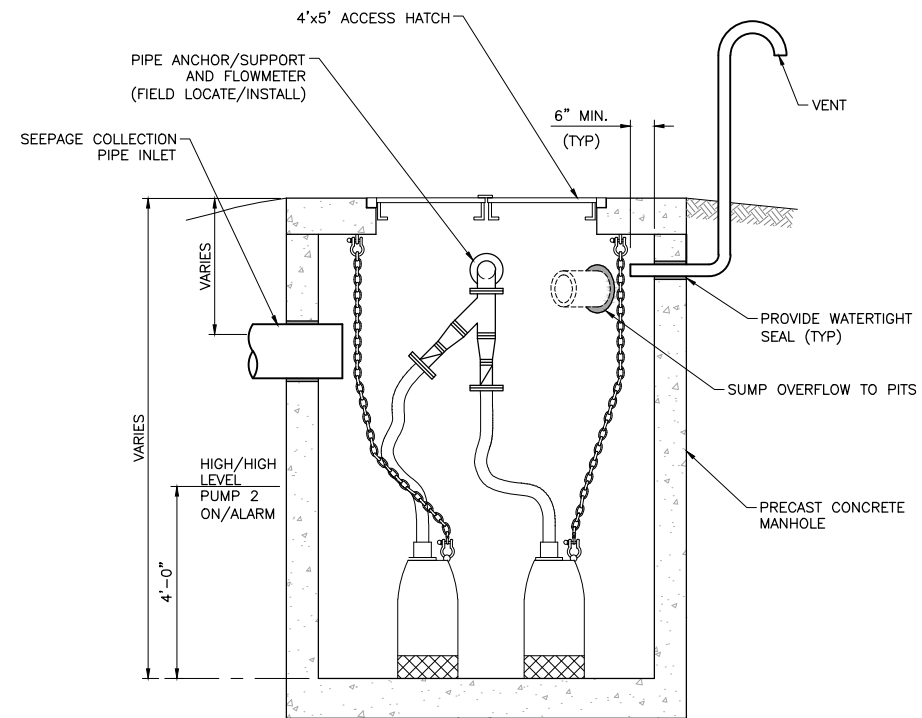
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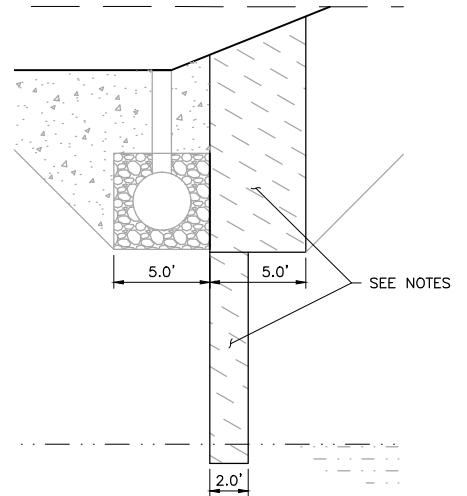
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0 5 10
SCALE IN FEET



2 SECTION: SOUTH GROUNDWATER CONTAINMENT SYSTEM TYPICAL SECTION - ADJACENT TO ACTIVE STOCKPILE
0 5 10
SCALE IN FEET



3 SECTION: TYPICAL SUMP
NTS



4 SECTION: TYPICAL CUTOFF WALL
0 5 10
SCALE IN FEET



- NOTES:
1. CUTOFF WALL WILL BE A HYDRAULIC BARRIER CONSTRUCTED OF COMPACTED SOIL, GEOSYNTHETIC CLAY, OR APPROVED ALTERNATE.
 2. USE TRENCHLESS TECHNOLOGY TO CONSTRUCT 2' WIDE TRENCH DOWN TO COMPETENT BEDROCK IN AREAS WHERE COLLECTION PIPE IS LOCATED ABOVE BEDROCK. SEE

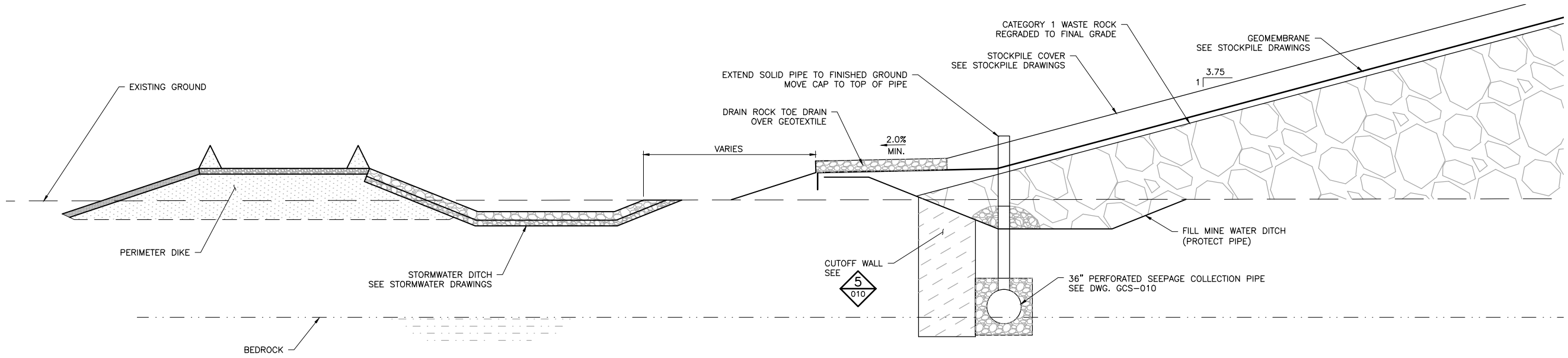
VER NO	DATE	DESCRIPTION	ISSUE STATUS		
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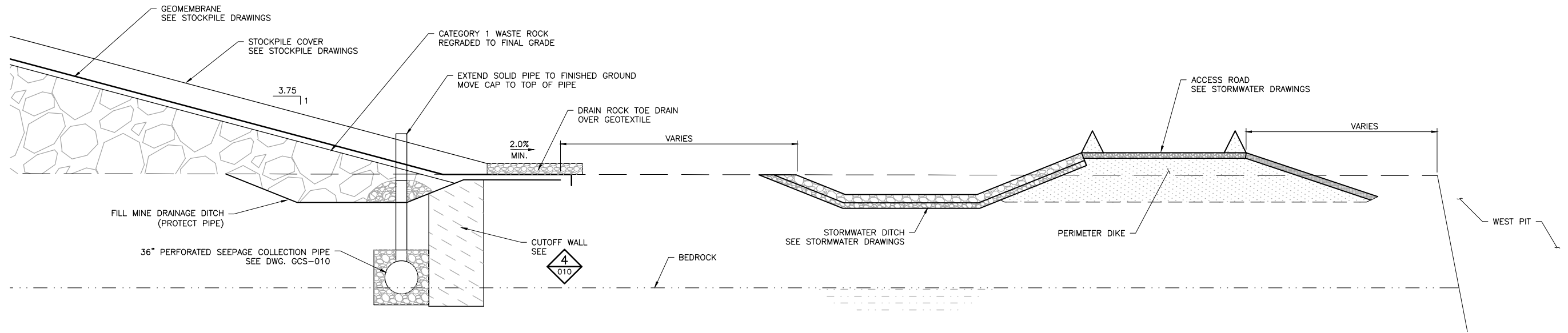
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BARR PROJECT NO.: 23/69-0C29
SCALE: AS SHOWN

PLANT DRAWING NUMBER:	
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 POLYMET MINING POLY MET MINING, INC. NORTHMET PROJECT HOYT LAKES, MINNESOTA	
 BARR BARR ENGINEERING COMPANY 4700 WEST 77TH STREET MINNEAPOLIS, MN. Ph: 1-800-632-2277	
DWG. NO. GCS-010	REV



1 SECTION: CLOSURE NORTH GROUNDWATER CONTAINMENT SYSTEM TYPICAL SECTION – ADJACENT TO RECLAIMED STOCKPILE

0 5 10
SCALE IN FEET



2 SECTION: CLOSURE SOUTH AND GROUNDWATER CONTAINMENT SYSTEM TYPICAL SECTION – ADJACENT TO RECLAIMED STOCKPILE

0 5 10
SCALE IN FEET

CADD USER: Terril J. Toms FILE: K:\DESIGN\23690C29\10\PERMIT_NMM-21-CS-01.DWG PLOT SCALE: 1:2 PLOT DATE: 5/28/2015 1:57 PM

2

1



INCHES

VER NO	DATE	DESCRIPTION	ISSUE STATUS		
			ISSUED	VERSION	DATE
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CHECKED: CMK2
BARR PROJECT NO.: 23/69-OC29
SCALE: AS SHOWN

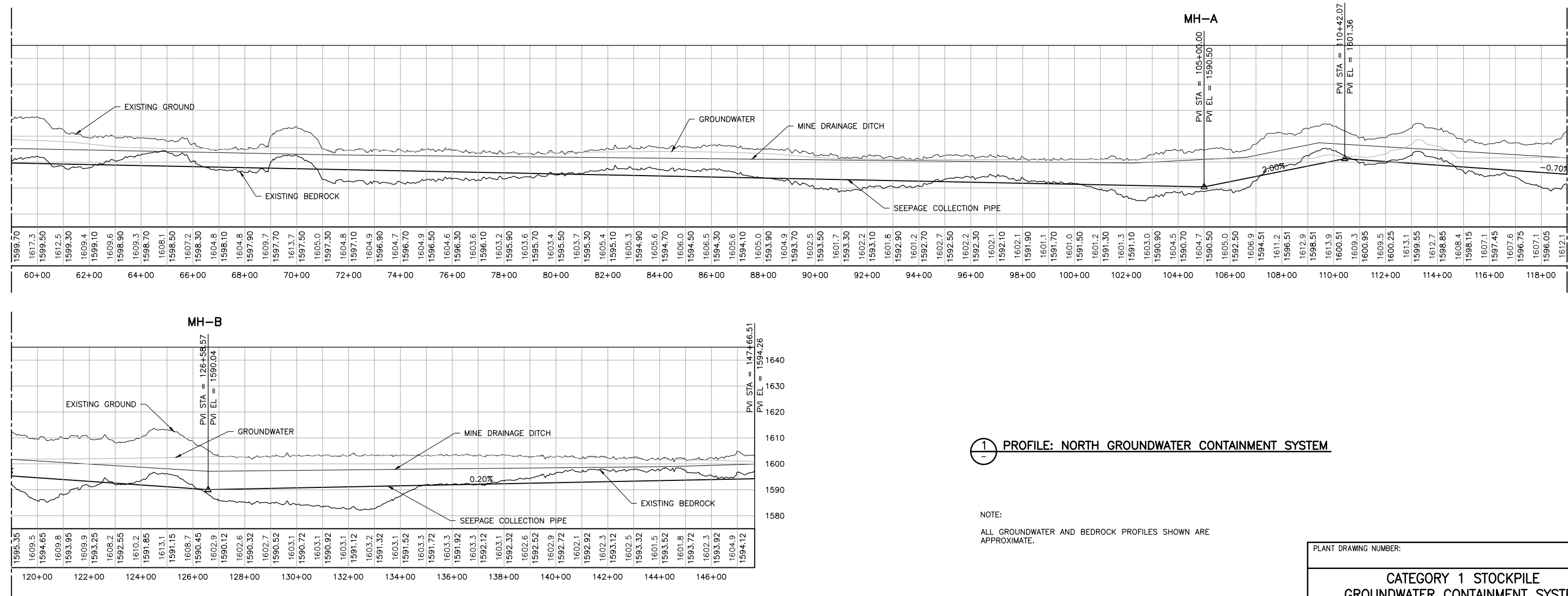
PLANT DRAWING NUMBER:	
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	POLY MET MINING, INC. NORTHMET PROJECT HOYT LAKES, MINNESOTA
	BARR ENGINEERING COMPANY 4700 WEST 77TH STREET MINNEAPOLIS, MN. Ph: 1-800-632-2277
DWG. NO. GCS-011	REV

MATCHLINE - SEE ABOVE

MATCHLINE - SEE ABOVE

MATCHLINE - SEE BELOW

MATCHLINE - SEE BELOW



1 PROFILE: NORTH GROUNDWATER CONTAINMENT SYSTEM

NOTE:

ALL GROUNDWATER AND BEDROCK PROFILES SHOWN ARE APPROXIMATE.

VER NO	DATE	DESCRIPTION	ISSUE STATUS		
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DRAWN: CAD
CHECKED: CMK2
BARR PROJECT NO.: 23/69-0C29
SCALE: AS SHOWN

PLANT DRAWING NUMBER:

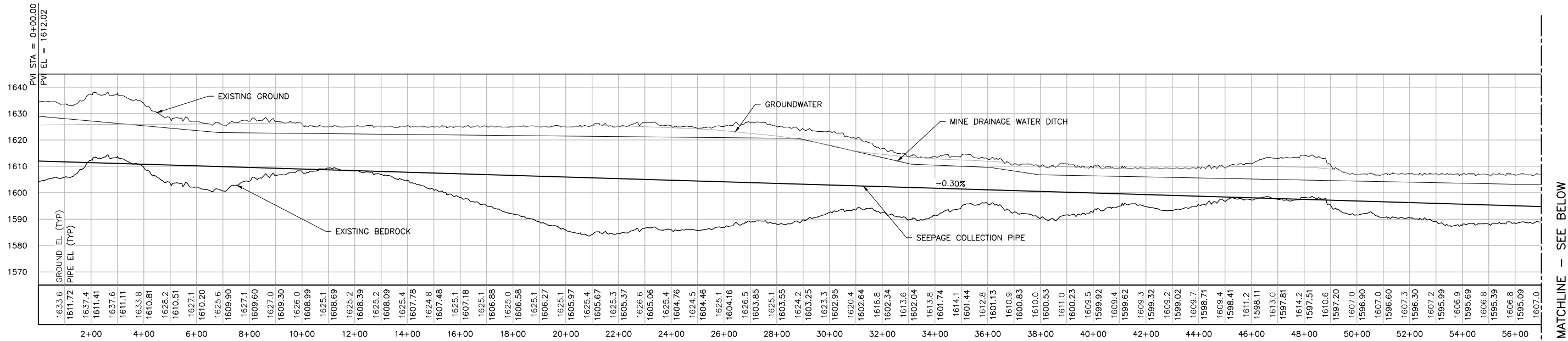
CATEGORY 1 STOCKPILE
GROUNDWATER CONTAINMENT SYSTEM
NORTH PROFILES

POLYMET
MINING

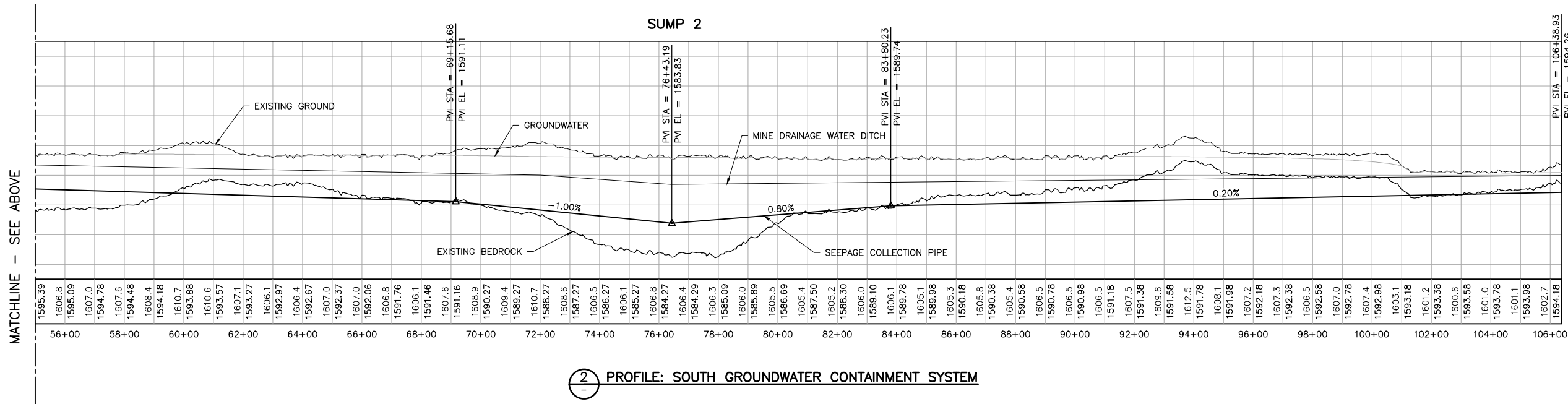
BARR
ENGINEERING COMPANY
4700 WEST 77TH STREET
MINNEAPOLIS, MN.
Ph: 1-800-632-2277

DWG. NO. GCS-012

REV



MATCHLINE - SEE BELOW



2 PROFILE: SOUTH GROUNDWATER CONTAINMENT SYSTEM

NOTE:

ALL GROUNDWATER AND BEDROCK PROFILES SHOWN ARE APPROXIMATE.

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DRAWN: CAD
CHECKED: CMK2
BARR PROJECT NO.: 23/69-0C29
SCALE: AS SHOWN

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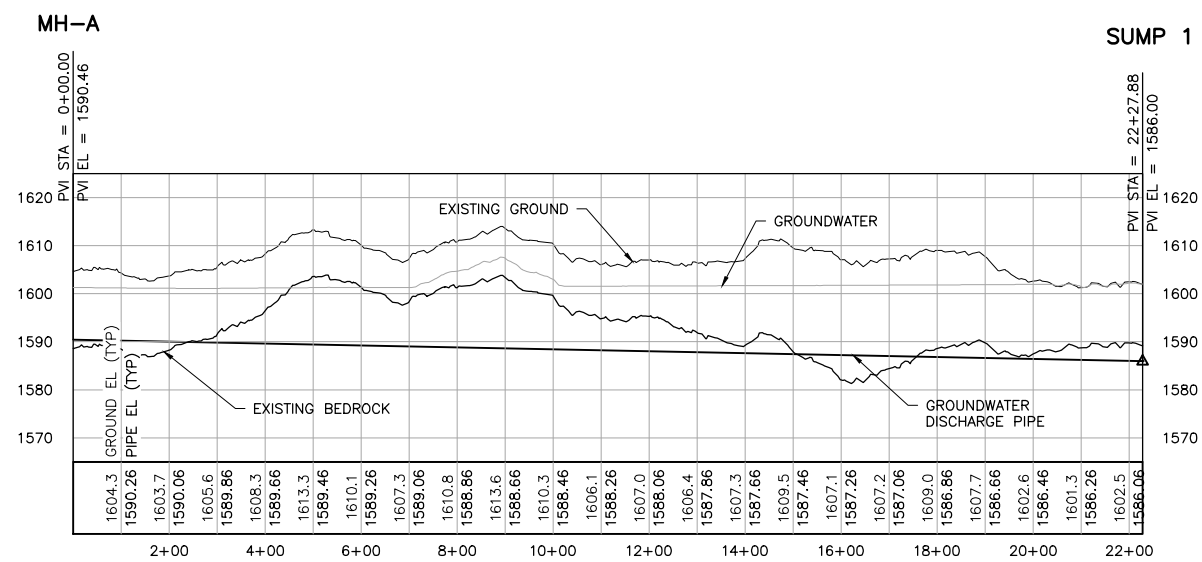
CATEGORY 1 STOCKPILE
GROUNDWATER CONTAINMENT SYSTEM
SOUTH PROFILES

**POLYMET**
MINING

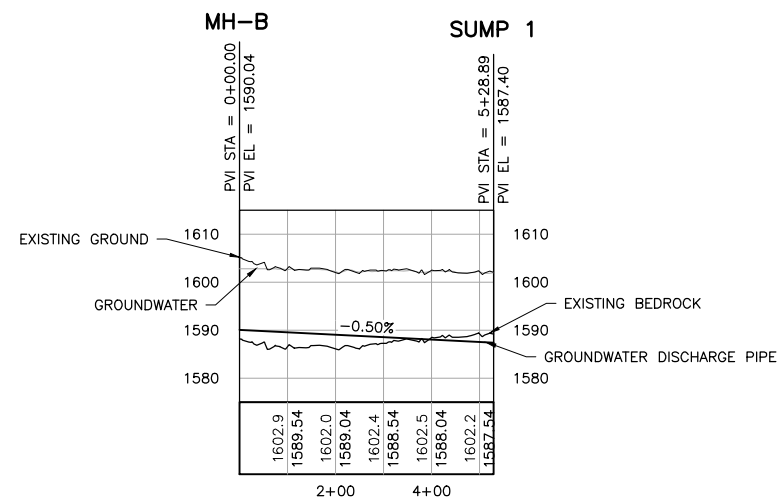
**BARR**
ENGINEERING COMPANY
4700 WEST 77TH STREET
MINNEAPOLIS, MN.
Ph: 1-800-632-2277

DWG. NO. GCS-013

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3 PROFILE: MANHOLE A GROUNDWATER DISCHARGE PIPE TO SUMP 1



NOTE:

ALL GROUNDWATER AND BEDROCK PROFILES SHOWN ARE APPROXIMATE.

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1	10/18/11	ROCK AND OVERBURDEN MANAGEMENT PLAN — VERSIONS 5, 6, 7 — ATTACHMENT C	ISSUED	VERSION	DATE		DRAWN: CAD	 POLY MET MINING, INC. NORTHMET PROJECT HOYT LAKES, MINNESOTA	
2	5/28/15	ISSUED FOR INCLUSION IN PERMIT APPLICATIONS	FOR PERMITTING	2	5/28/15				CHECKED: CMK2
			FOR CONSTRUCTION				BARR PROJECT NO.: 23/69-0C29	 BARR ENGINEERING COMPANY 4700 WEST 77TH STREET MINNEAPOLIS, MN. Ph: 1-800-632-2277	
			NOT APPROVED FOR CONSTRUCTION.				SCALE: AS SHOWN		DWG. NO. GCS-014
									REV