08 March 2013

AMEC File: VM00560A

VIA Email

Mount Polley Mining Corporation

Attention: Luke Moger, Project Engineer

RE: Stage 9 Tailings Storage Facility Construction Drawings and Stability Analyses for Embankment Raise to El. 970 m

Mt. Polley Mining Corporation (MPMC) has requested AMEC Environment and Infrastructure (AMEC) to provide a design package for the Mt. Polley tailings impoundment embankment raise to El. 970.0 m (Stage 9). The updated design incorporates raising the embankment from the current crest El. 963.5 to El. 970.0 m, to be carried out over the 2013 construction season. The design package includes construction drawings as well as stability analysis for the embankment crest El. 970.0 m. The raise is projected to provide additional storage and freeboard capacity until the end of 2015.

The raise to El. 970.0 m incorporates the recent design change switching from the modified centerline (upstream) as designed by the previous dam design, to a fully centerline method.

It is understood that this package will be used in support of MPMC's application to the British Columbia Ministry of Energy and Mines (MEM) for authorization to build to El. 970 m.

Sincerely,

AMEC Environment & Infrastructure
A division of AMEC Americas Limited

Reviewed by:

Laura Wiebe, P.Eng.
Geotechnical Engineer

Steve Rice, P.Eng.
Principal Engineer

Attachments:
- Issued for Construction Drawings 2012.A.01 through 2012.A.08 (12 sheets)
- Stage 9 (970 m) Expansion Stability Analyses

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Canada V5C 0E4
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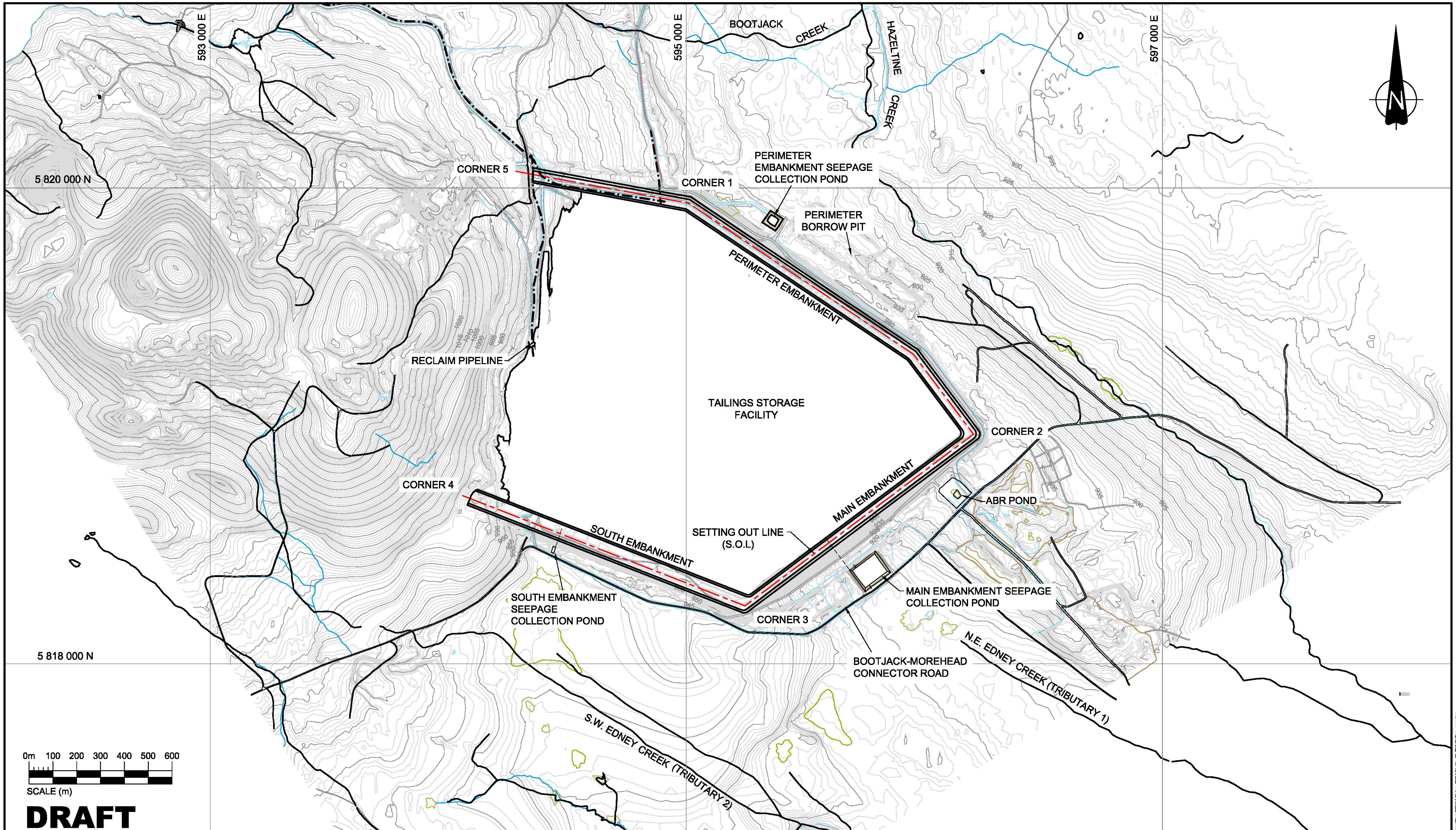
DRAWINGS



NOTES:

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH THE STAGE 9 CONSTRUCTION MONITORING MANUAL, DATED MARCH 2013.
2. TOPOGRAPHY BASED ON OCT 2012 FLYOVER DATA PROVIDED BY MPMC.

REV	D	M	Y	ISSUE/REVISION DESCRIPTION	ENG.	APPR.
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Client Logo: Imperial Metals

Client: MOUNT POLLEY MINING CORPORATION

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DATUM:	NAD 83
PROJECTION:	UTM ZONE 10
DRAWN BY:	YC
REVIEWED BY:	SR
ORIGINAL SCALE:	AS SHOWN

PROJECT: MOUNT POLLEY MINE TAILINGS STORAGE FACILITY

TITLE: STAGE 9 TAILINGS EMBANKMENT GENERAL SITE PLAN

PROJECT NO.:	VM00560A
REVISION NO.	0
DATE:	MARCH 2013
DRAWING NO.:	2012.A.01
SHEET NO.:	1 of 1

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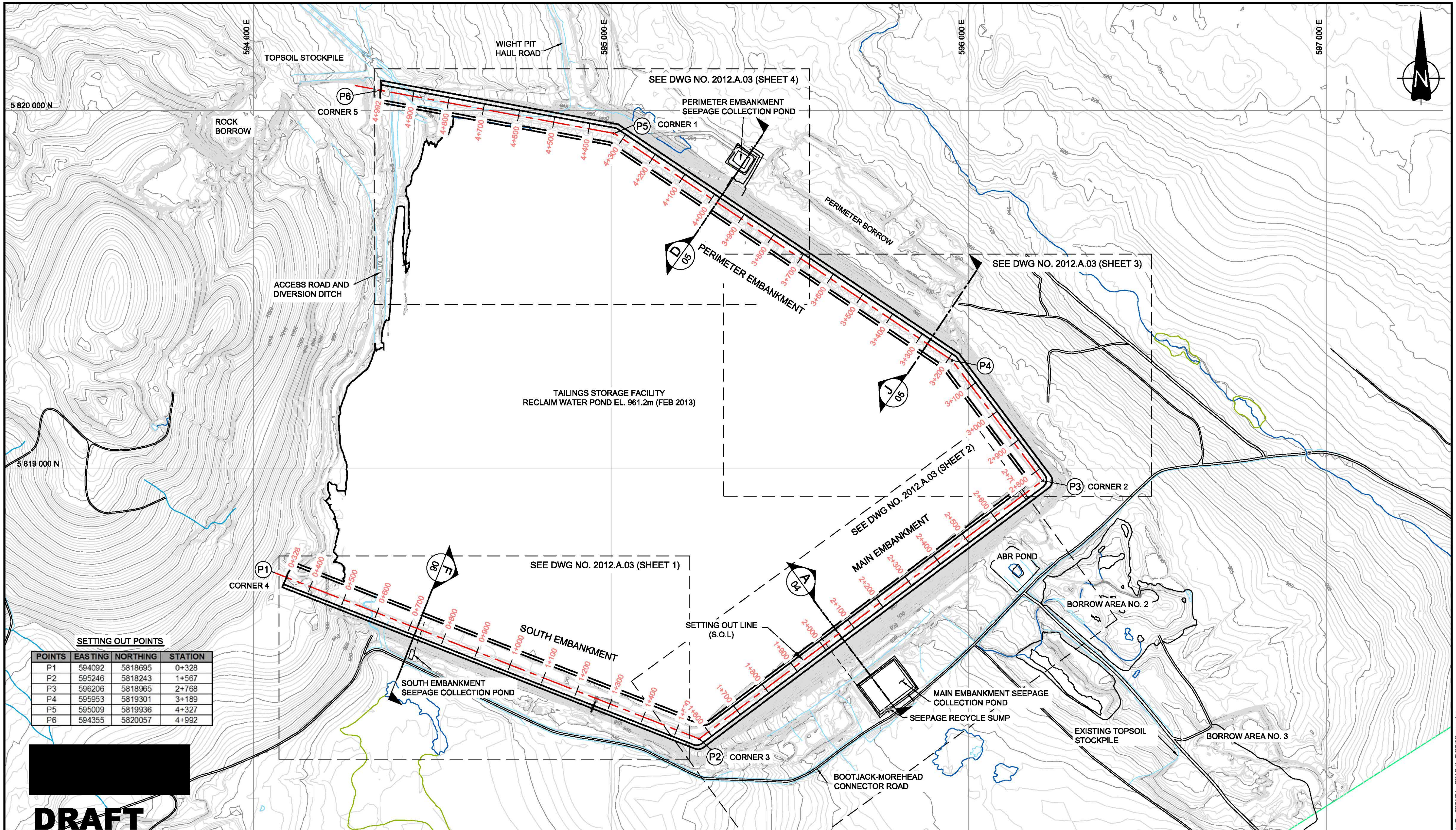

SETTING OUT POINTS

POINTS	EASTING	NORTHING	STATION
P1	594092	5818695	0+328
P2	595246	5818243	1+567
P3	596206	5818965	2+768
P4	595953	5819301	3+189
P5	595009	5819936	4+327
P6	594355	5820057	4+992

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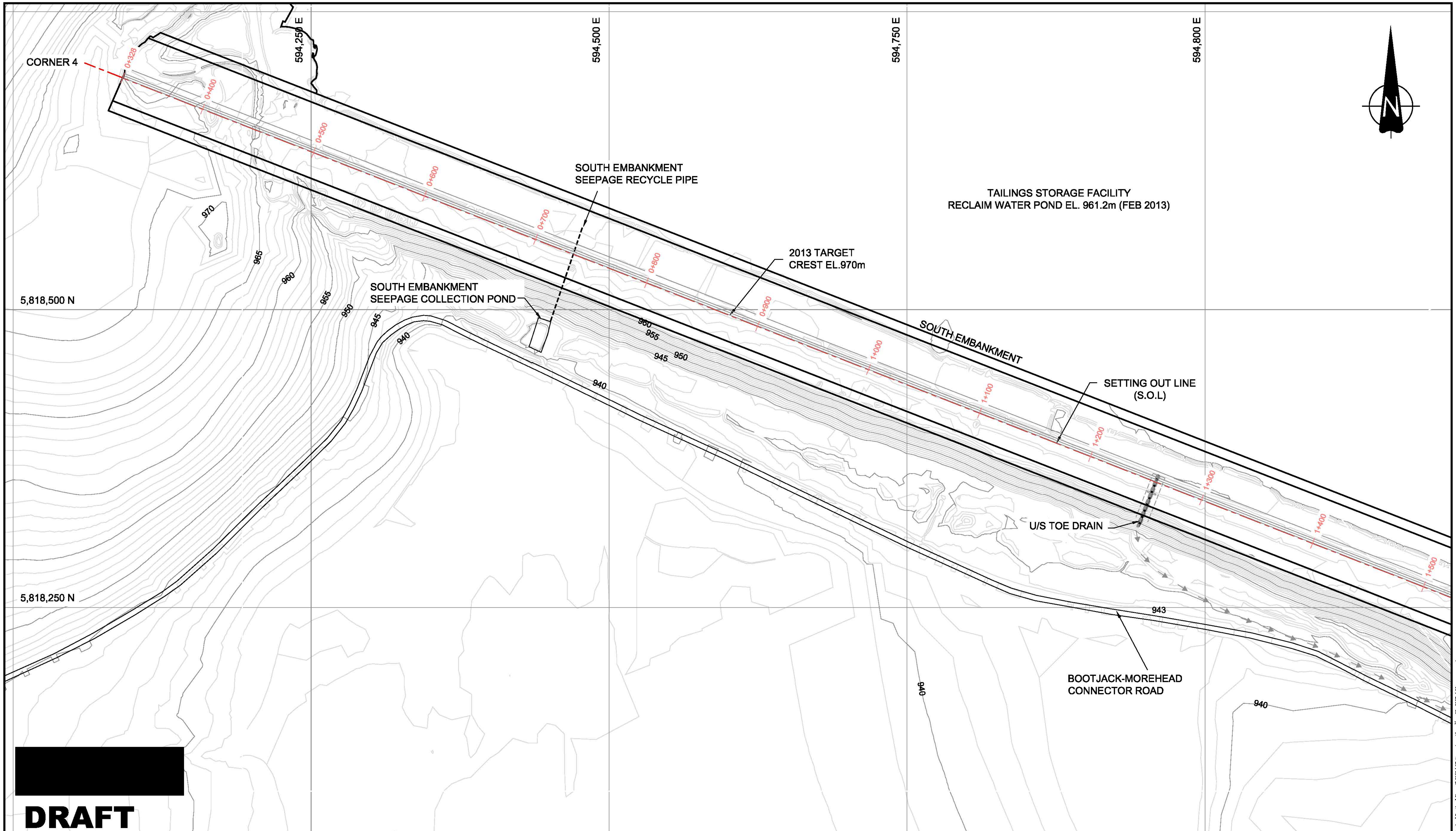
DATUM: NAD 83
PROJECTION: UTM ZONE 10
DRAWN BY: YC
REVIEWED BY: SR
ORIGINAL SCALE: AS SHOWN

PROJECT: MOUNT POLLEY MINE TAILINGS STORAGE FACILITY

TITLE: STAGE 9 TAILINGS EMBANKMENT CREST EL. 970m PLAN VIEW

PROJECT NO.: VM00560A
REVISION NO.: 0
DATE: MARCH 2013
DRAWING NO.: 2012.A.02
SHEET NO.: 1 of 1



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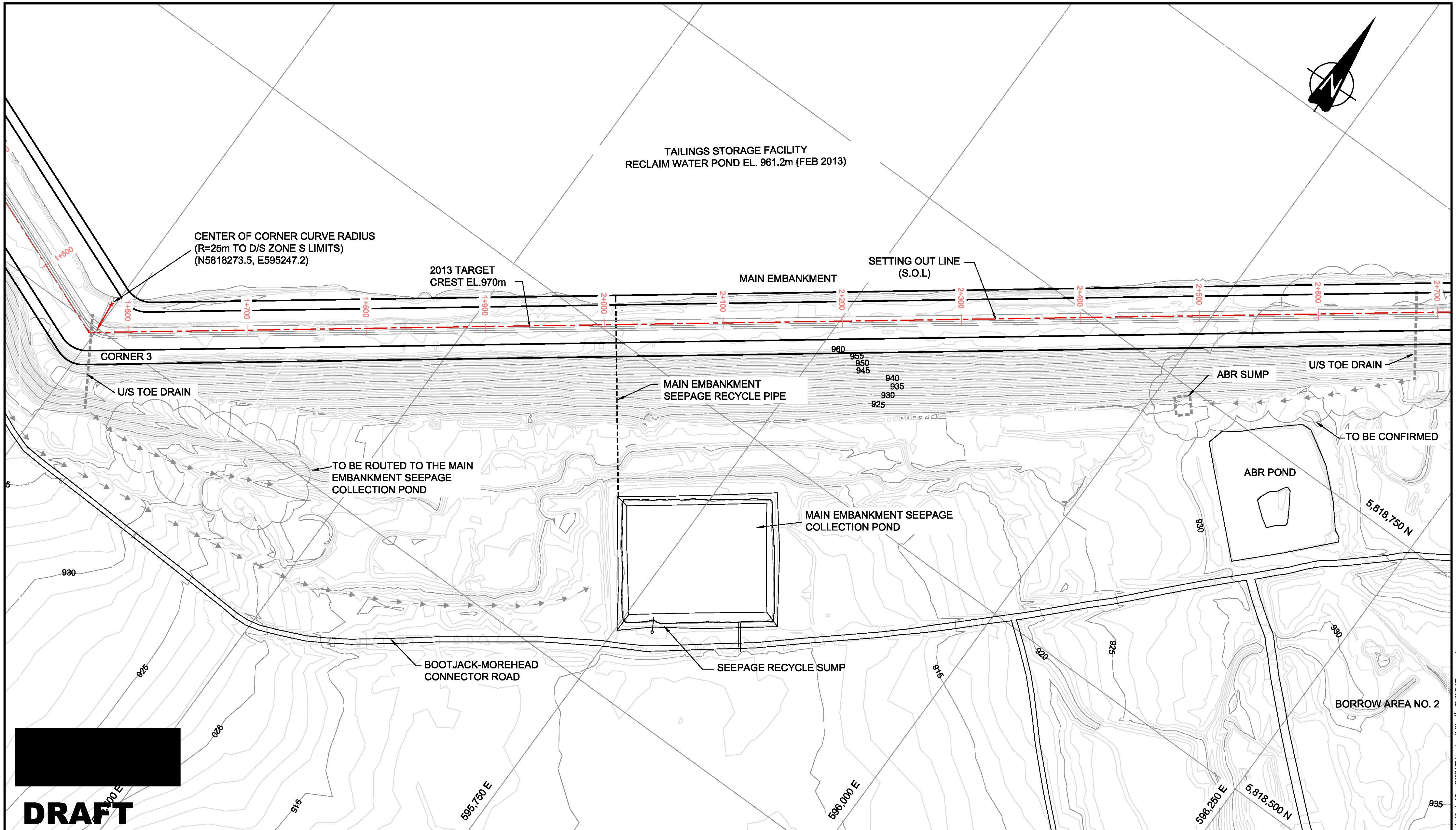
DATUM:	NAD 83
PROJECTION:	UTM ZONE 10
DRAWN BY:	YC
REVIEWED BY:	SR
ORIGINAL SCALE:	AS SHOWN

PROJECT: MOUNT POLLEY MINE TAILINGS STORAGE FACILITY

TITLE: STAGE 9 TAILINGS EMBANKMENT CREST EL. 970m PLAN VIEW SHEET 1 OF 4

PROJECT NO.:	VM00560A
REVISION NO.	0
DATE:	MARCH 2013
DRAWING NO.:	2012.A.03
SHEET NO.:	1 of 4



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DATUM: NAD 83
PROJECTION: UTM ZONE 10
DRAWN BY: YC
REVIEWED BY: SR
ORIGINAL SCALE: AS SHOWN

PROJECT: MOUNT POLLEY MINE TAILINGS STORAGE FACILITY

TITLE: STAGE 8A TAILINGS EMBANKMENT CREST EL. 970m PLAN VIEW SHEET 2 OF 4

PROJECT NO.: VM00560A
REVISION NO. 0
DATE: MARCH 2013
DRAWING NO.: 2012.A.03
SHEET NO.: 2 of 4

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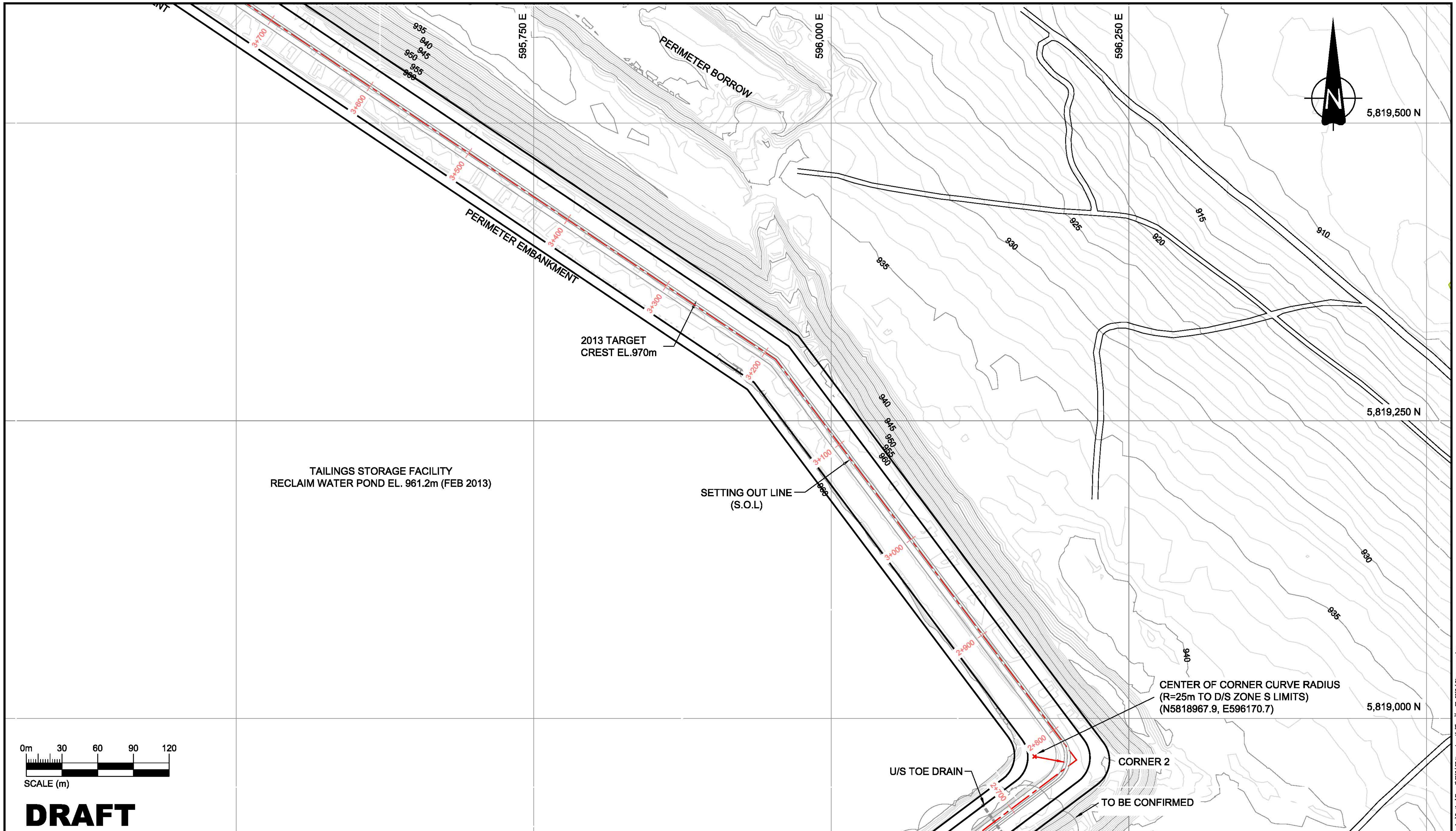

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DRAWN BY:	YC
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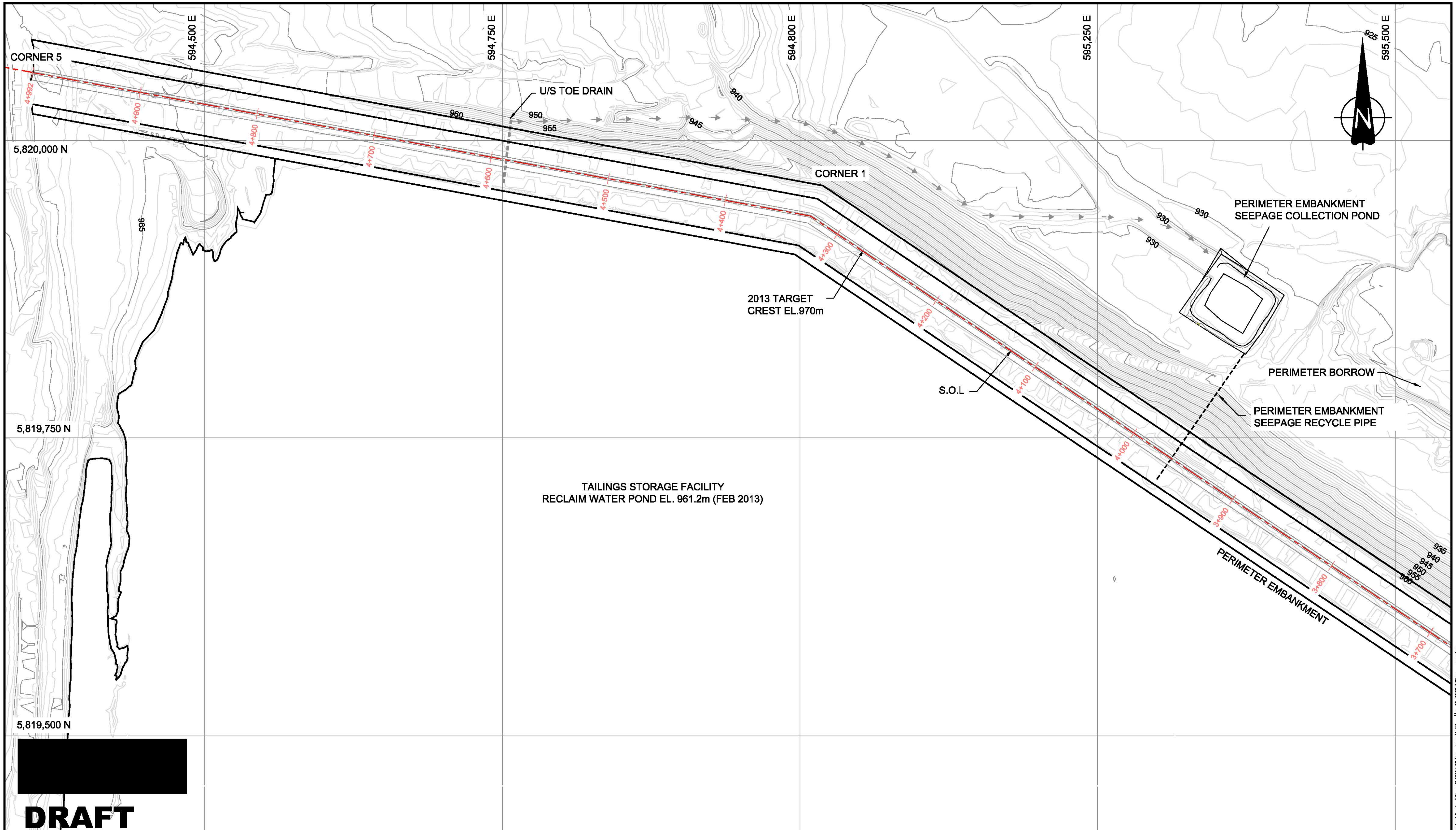
ORIGINAL SCALE:	AS SHOWN

PROJECT: MOUNT POLLEY MINE TAILINGS STORAGE FACILITY

TITLE: STAGE 9 TAILINGS EMBANKMENT CREST EL. 970m PLAN VIEW SHEET 3 OF 4

PROJECT NO.:	VM00560A
REVISION NO.	0
DATE:	MARCH 2013
DRAWING NO.:	2012.03
SHEET NO.:	3 of 4



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DATUM:	NAD 83
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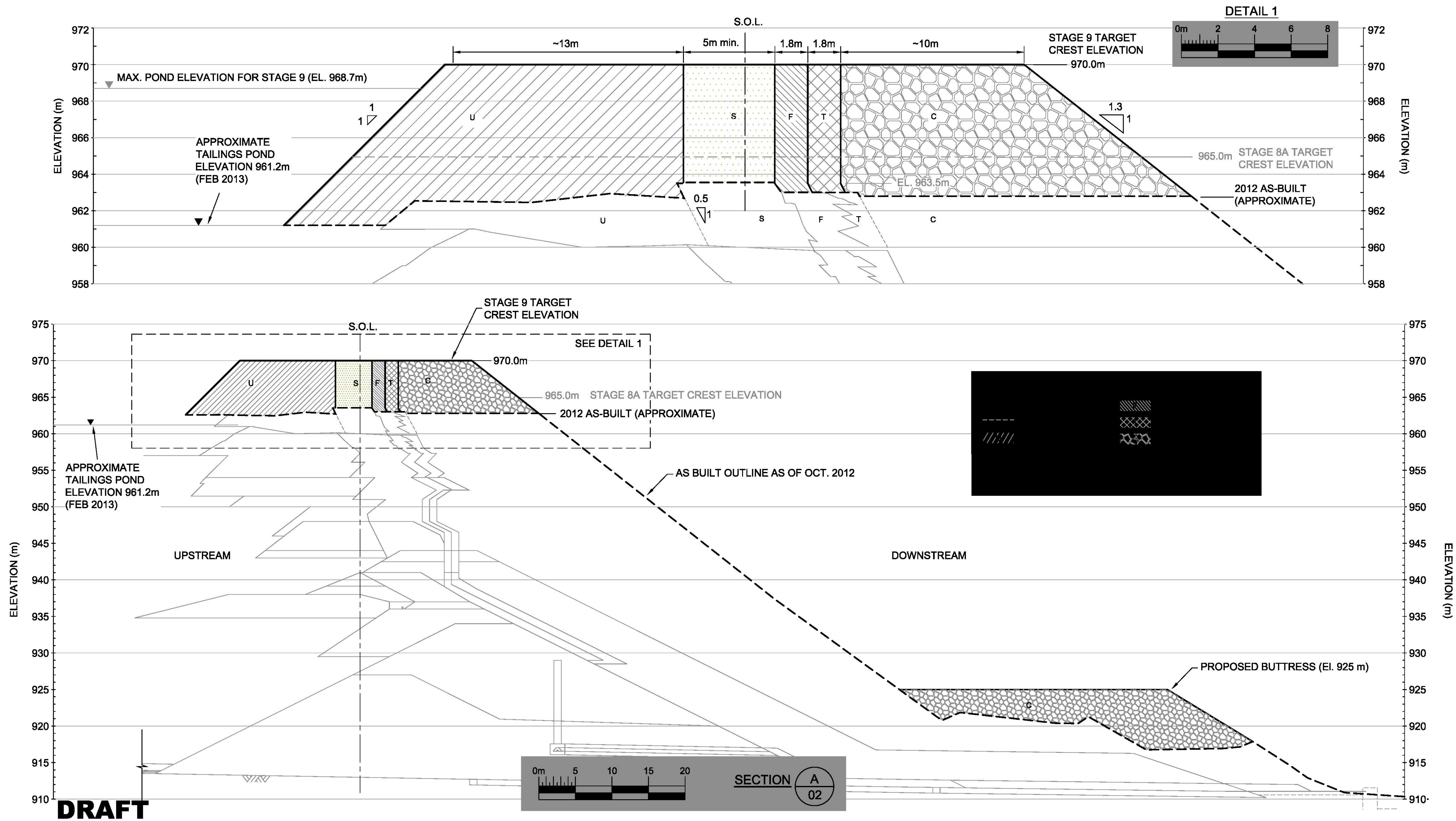
PROJECT: MOUNT POLLEY MINE TAILINGS STORAGE FACILITY

TITLE: STAGE 9 TAILINGS EMBANKMENT CREST EL. 970m PLAN VIEW SHEET 4 OF 4

PROJECT NO.:	VM00560A
REVISION NO.	0
DATE:	MARCH 2013
DRAWING NO.:	2012.A.03
SHEET NO.:	4 of 4



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3. FOR NOTES AND SPECIFICATIONS SEE DWG. NO. 2012.A.08.

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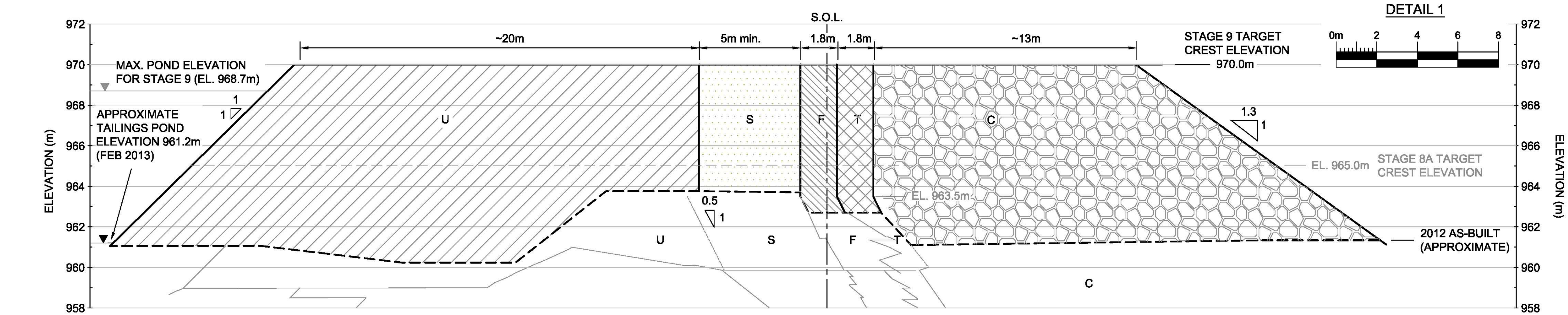
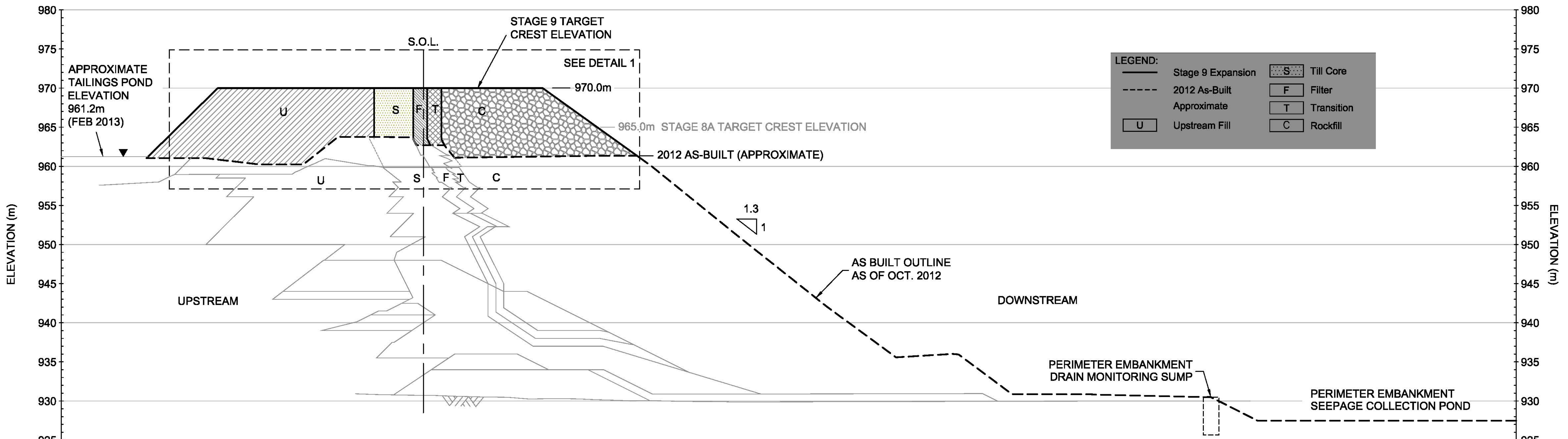
ORIGINAL SCALE:	AS SHOWN
PROJECT:	MOUNT POLLEY MINE TAILINGS STORAGE FACILITY
TITLE:	STAGE 9 MAIN EMBANKMENT RAISE SECTION A (20+60)
PROJECT NO.:	VM00560A
REVISION NO.	0
DATE:	MARCH 2013
DRAWING NO.:	2012.A.04
SHEET NO.:	1 of 1





SECTION D / 02

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ORIGINAL SCALE: AS SHOWN

PROJECT: MOUNT POLLEY MINE TAILINGS STORAGE FACILITY

TITLE: STAGE 9 PERIMETER EMBANKMENT SECTION D (39+90)

PROJECT NO.: VM00560A
REVISION NO.: 0
DATE: MARCH 2013
DRAWING NO.: 2012.A.05.1
SHEET NO.: 1 of 1

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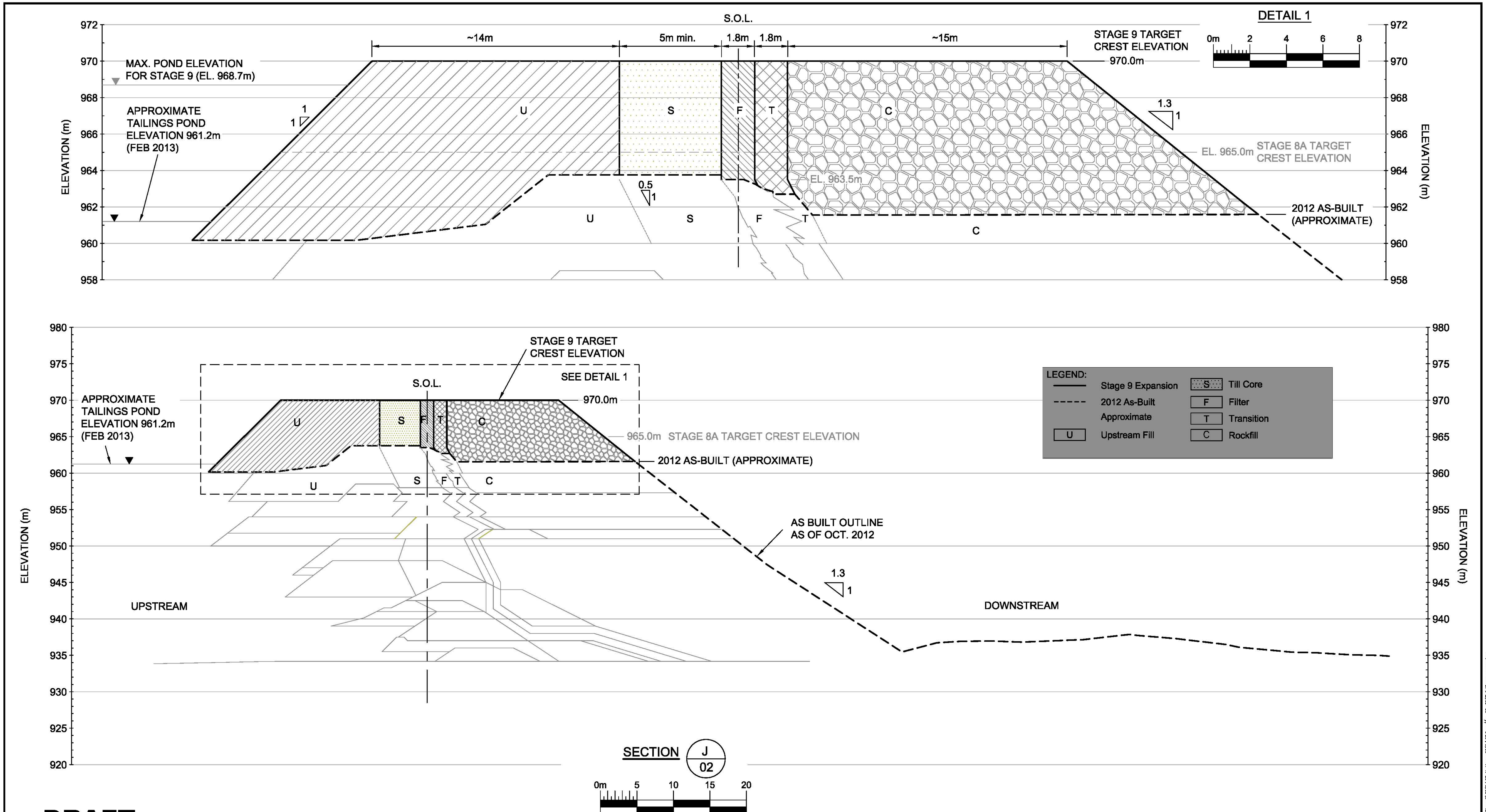

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DATUM: NAD 83
PROJECTION: UTM ZONE 10
DRAWN BY: YC
REVIEWED BY: SR
ORIGINAL SCALE: AS SHOWN

PROJECT: MOUNT POLLEY MINE TAILINGS STORAGE FACILITY

TITLE: STAGE 9 PERIMETER EMBANKMENT SECTION J (32+80)

PROJECT NO.: VM00560A
REVISION NO. 0
DATE: MARCH 2013
DRAWING NO.: 2012.A.05.2
SHEET NO.: 2 of 2

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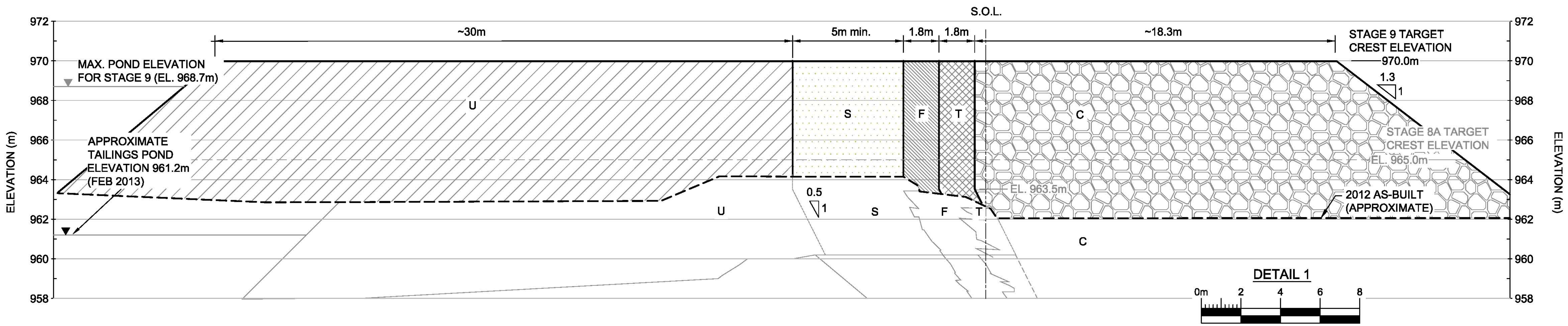

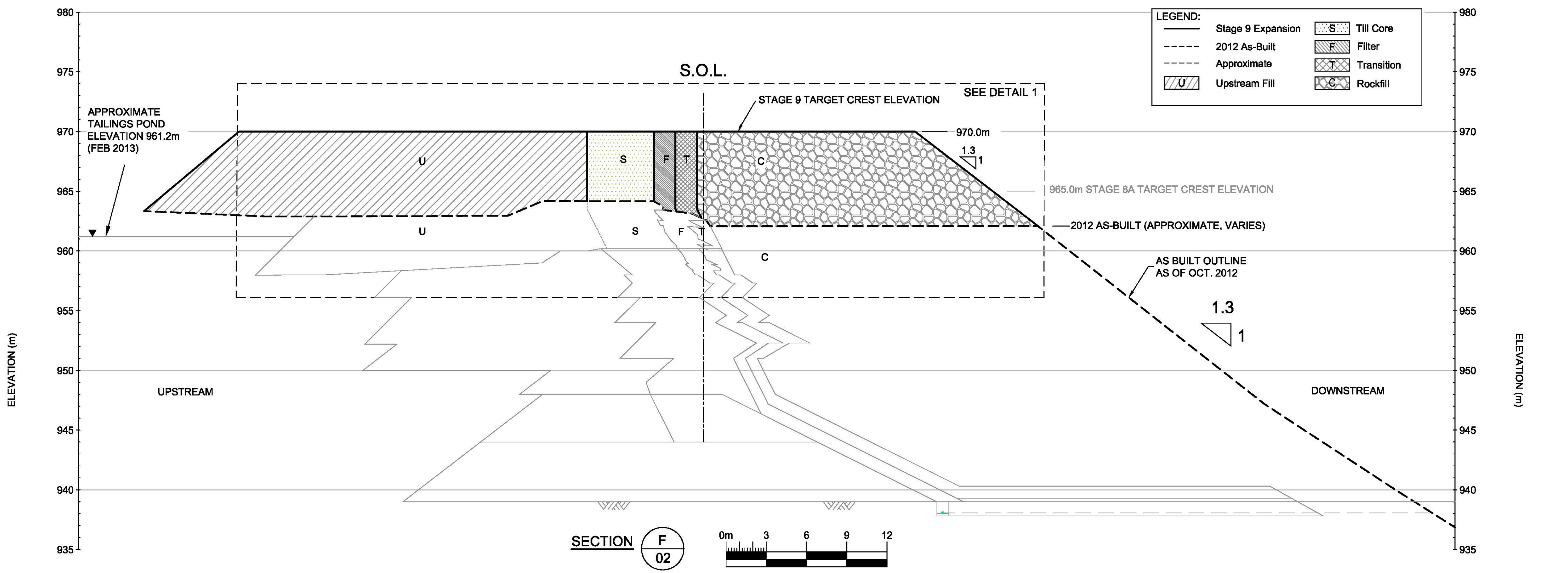

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DATUM: NAD 83
PROJECTION: UTM ZONE 10
DRAWN BY: YC
REVIEWED BY: SR
ORIGINAL SCALE: AS SHOWN

PROJECT: MOUNT POLLEY MINE TAILINGS STORAGE FACILITY

TITLE: STAGE 9 SOUTH EMBANKMENT SECTION F (7+20)

PROJECT NO.: VM00560A
REVISION NO.: 0
DATE: MARCH 2013
DRAWING NO.: 2012.A.06
SHEET NO.: 1 of 1

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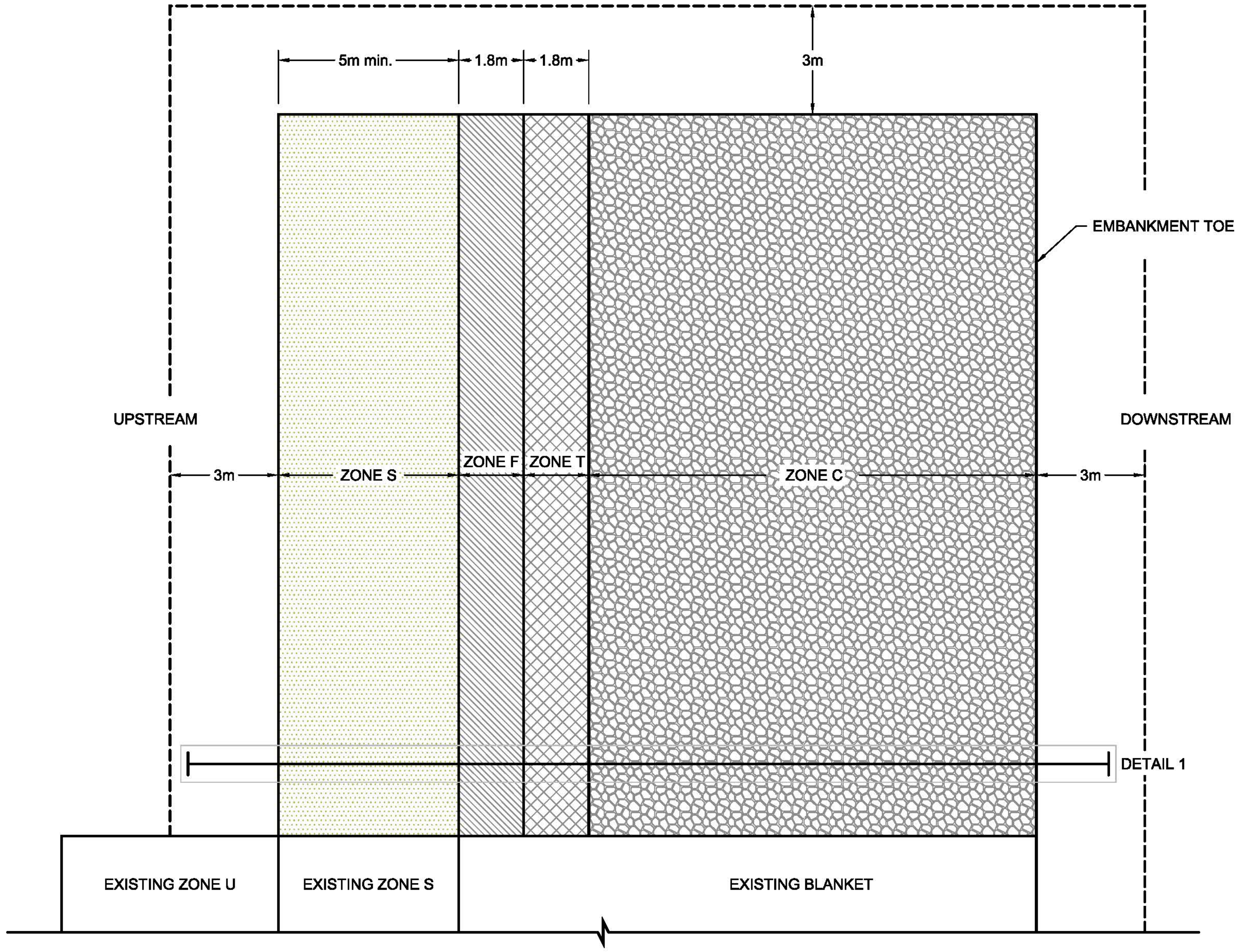
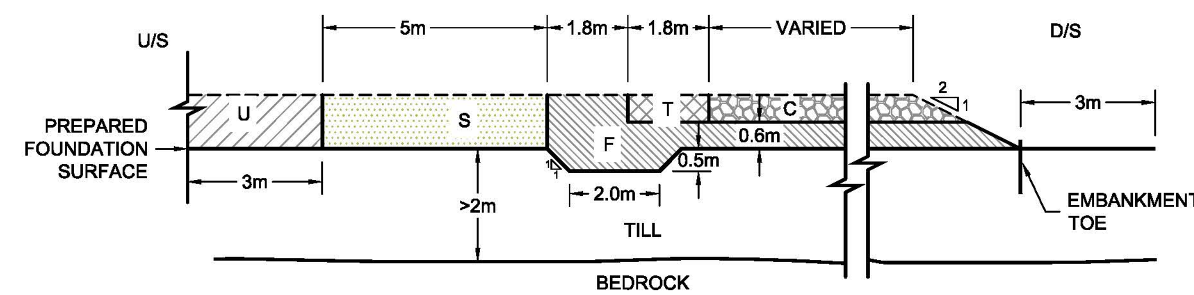
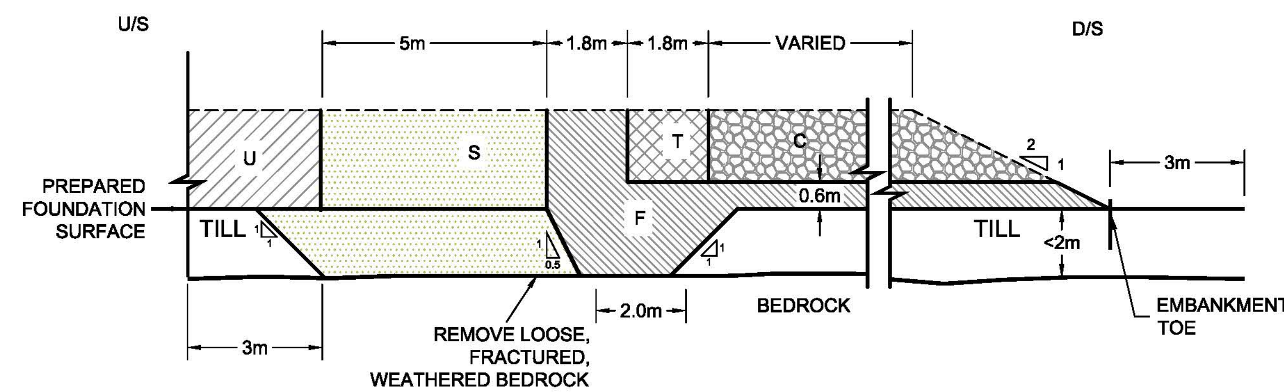


PLAN VIEW

DETAIL 1A: CUT OFF TRENCH TO TILL



DETAIL 1B: CUT OFF TRENCH TO BEDROCK



LEGEND:

U	Upstream Fill
S	Till Core
F	Filter
T	Transition
C	Rock Fill

NOTE:

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DRAWN BY:	YC
REVIEWED BY:	SR
ORIGINAL SCALE:	AS SHOWN

PROJECT: MOUNT POLLEY MINE TAILINGS STORAGE FACILITY

TITLE: STAGE 9 TAILINGS EMBANKMENT TYPICAL ABUTMENT DETAIL ABOVE 963.5m

PROJECT NO.:	VM00560A
REVISION NO.	0
DATE:	MARCH 2013
DRAWING NO.:	2012.A.07
SHEET NO.:	1 of 1

AMEC010624_0013

EMBANKMENT ZONE MATERIAL GRADATION AND PLACEMENT SPECIFICATIONS

EMBANKMENT ZONE	DESCRIPTION	MATERIAL TYPE	SPECIFICATIONS	SUBGRADE BASE PREPARATION	PLACEMENT AND COMPACTION	ON-SITE TESTING	OFF-SITE TESTING	SAMPLE COLLECTION SCHEDULE	SAMPLE SIZE
S	TILL CORE	GLACIAL TILL	Well graded till moisture content at ±1% of optimum. (See Gradation Envelope below)	Strip all topsoil and organic material. Excavate cutoff trench as per detail. (see VM0560.2012.07) Strip all frost softened and weakened soils, proof roll then scarify base soils.	Place, moisture condition and spread in maximum 300mm loose lifts. Vibratory compaction to 95% of standard proctor maximum utilizing a 10 ton smooth drum. Density tested once (1) per 100 linear m per lift per day.	Source Classification: Visual inspection of borrow material. In-Place Testing: Visual inspection of zone dimension, and material. ND Density Testing (D6938-10) MDI Density Testing (D680-05) Moisture Content (D4318-10)	Source Classification and In-Place Testing: Proctor (D698-07 / D4718-07) Atterberg (D421-07 / D4318-10) Hydrometer Gradation (D421-07 / D422-07) Sieve Gradation (D6913-09)	Source Classification : One (1) per biweekly per source or one (1) per 10,000 m^3 per source In-Place Testing: One (1) per offset biweekly per source or one (1) per 6,500 linear meters per source Moisture Content: One (1) per 1000 linear meters per lift per day	Source Classification: Two (2) three-quarter (3/4) full five (5) gallon bucket, void of oversized rocks In-Place Testing: Two (2) three-quarter (3/4) full five (5) gallon bucket, void of oversized rocks Moisture Content: Minimum sample 700g
F	FILTER	SAND AND GRAVEL	Sand and gravel sized material. (See Gradation Envelope below)	Strip all frost softened and weakened soils. Expose previously placed material.	Place, and spread in maximum 600mm loose lifts. Vibratory compaction minimum of 4 passes utilizing a 10 ton smooth drum compactor.	During Production/Transportation: Wash Sieve Gradation (C117-04 / C136-06) During Placement: Visual inspection of material size, compaction, preparation, and zone dimension. Wash Sieve Gradation (C117-04 / C136-06)	During Production/Transportation: Wash Sieve Gradation (C117-04 / C136-06) In-Place Testing: Wash Sieve Gradation (C117-04 / C136-06)	During Production/Transportation: One (1) per 5,000 m^3 per stockpile A duplicate sample for off-site testing one (1) per stockpile In-Place Testing: One (1) per placement event or one (1) per 2,500 linear meters A duplicate sample for off-site testing one (1) per 4,500 linear meters	During Production/Transportation: One (1) three-quarter (3/4) full five (5) gallon bucket, void of oversized rocks In-Place Testing: One (1) three-quarter (3/4) full five (5) gallon bucket, void of oversized rocks
T	TRANSITION	FINE ROCKFILL (NAG)	Cobble and gravel sized material. (See Gradation Envelope below)	Strip all frost softened and weakened soils. Expose previously placed material.	Place, and spread in maximum 600mm loose lifts. Vibratory compaction minimum of 4 passes utilizing a 10 ton smooth drum compactor.	In-Place Testing: Wash Sieve Gradation (C117-04 / C136-06) Confirmation of waste rock inertness, as required. Visual inspection of material size, compaction, preparation, and zone dimension.	In-Place Testing: Wash Sieve Gradation (C117-04 / C136-06)	In-Place Testing: One (1) per 5,000 m^3 material placed. A duplicate sample for off-site testing one (1) per 10,000 m^3	In-Place Testing: Three (3) three-quarter (3/4) full five (5) gallon bucket
C	ROCKFILL	GENERAL ROCKFILL (NAG)	Nominal 1m maximum particle size.	Strip all frost softened and weakened soils. Scarify previously placed material.	Placed and spread in maximum 2000mm loose lifts. Boulder-rich rockfill not to be placed adjacent to fine rock transition zone.	Confirmation of waste rock inertness, as required. Visual in-place inspection of material size, preparation, and placement.	Not Applicable	Not Applicable	Not Applicable
U	UPSTREAM FILL	SELECT FILL	Cell construction is to be utilized. Constant reworking of the tailings is needed to ensure proper distribution within the cell.	Not Applicable	Placement and compaction requirements to be determined based on material selection.	Not Applicable	Not Applicable	Not Applicable	Not Applicable

CONSTRUCTION NOTES

1. SITE PREPARATION

i) The site preparation work shall be performed by experienced earthworks personnel, and shall be inspected by and completed to the approval of the field engineer. Proposed changes in the site preparation plan shall be discussed and agreed upon by the owner, contractor, field engineer, and AMEC's senior geotechnical engineer prior to being undertaken.

ii) All topsoil, organic material, and other unsuitable materials are to be removed from the foundation area, to expose the native foundation subgrade of dense glacial till, or bedrock. The subgrade shall be further excavated or proofrolled where deemed necessary by the field engineer.

iii) Surface water shall be directed away from the foundation area of the dam prior to surficial soil stripping, to reduce the potential for water softening and weakening of the foundation materials by construction activity.

2. CUTOFF TRENCH CONSTRUCTION (SEE DWG. NO. 2012.A.07)

i) The cutoff trench shall extend a minimum of 500 mm into the native glacial till, where the foundation (subgrade) glacial till is at least 1000 mm thick. Confirmation of the minimum 500 mm basal till thickness below the base of the cutoff trench shall be conducted by soil probing, to the approval of AMEC's field engineer. Where the foundation basal till is less than 1000 mm thick, the cutoff trench shall extend to sound bedrock. Removal of highly fractured and/or weathered bedrock overlying the sound bedrock shall be conducted to the approval of the AMEC field engineer.

ii) The cutoff trench shall have a minimum width of 2 m at its base, in the glacial till or in the sound bedrock. Where bedrock is encountered, the AMEC field engineer may direct that overburden be removed for the full 5 m width of the Zone S core.

iii) The cutoff trench walls shall slope up from the base elevation to the adjacent dam foundation level at a maximum slope of 1 H : 1 V (1 horizontal : 1 vertical) in the overlying foundation soils or weathered bedrock.

iv) Shallow groundwater seepage into the cutoff trench shall be controlled by temporary pumping or other measures, as required.

v) The cutoff trenches for the Stage 9 dam extensions shall be keyed into the trench at the abutments of the Stage 8A dams to ensure that the cutoff is continuous and free of gaps.

vi) Where bedrock is encountered on steep abutment slopes, special considerations exist and special bedrock treatment measures may be required. At a minimum this will include removal of all residual soil to fully expose bedrock, excavation of relatively loose, diggable bedrock, and cleaning of the rock surface via high air and/or water pressure jetting. Subsequent to such preparation, the engineer may designate placement of bentonite, shotcrete and/or dental concrete prior to till fill placement against the approved abutment surface.

3. BORROW MATERIAL SPECIFICATIONS, PLACEMENT, AND COMPACTION

i) The cutoff trench key and Zone S shall be constructed of compacted, organic-free, well graded till.

ii) The till borrow material shall fall within the design grain size distribution envelope, and shall be placed at a moisture content between 1% dry of and 1% wet of Standard Proctor compaction optimum moisture content for the material.

iii) Stockpiled borrow material that is moisture-sensitive should be protected from excessive wetting by smoothrolling the borrow pile surface to enhance water runoff. In situ borrow material should not be excavated or worked during periods of heavy rainfall or snowfall. Overly wet material shall be set aside or placed in a general fill dump area, and shall not be used in its overwet condition for construction.

iv) The glacial till structural fill shall be compacted by a 10-ton vibratory smooth drum compactor to a minimum dry density of 95% of the Standard Proctor maximum dry density. Construction compaction densities shall be determined in the field by MPMC construction monitors, and must be reviewed and approved by the AMEC senior geotechnical engineer as part of overall approval of the dam construction.

v) The maximum allowable loose lift thickness for the glacial till fill shall be established by the field engineers from the results of the field density testing. In any case, the maximum allowable loose lift thickness shall not exceed 300 mm.

vi) The surface of the existing, compacted till lifts shall be scarified to make rough, immediately prior to placement and compaction of the next lift of glacial till structural fill. Scarification should only be carried out for the areas that will be immediately covered. Moisture conditioning may be required for areas of the scarified surface that have dried out.

vii) A granular wearing surface may be placed on the dam crest. Any such material placed on the dam crest shall be removed, and wasted over the upstream crest of the dam, and any underlying frost-softened and/or overwet till removed, prior to subsequent dam raises. Area to be inspected by AMEC field engineer prior to placement of additional till lifts.

4. MATERIALS AND CONSTRUCTION TESTING

i) Borrow materials testing shall be carried out by the AMEC field engineers and/or the AMEC soils laboratory in Prince George. Atypical or abnormal test results shall be reassessed by retesting of similar material (soil from the same general borrow soil source location).

ii) The intent of the borrow materials testing is to confirm that the proposed borrow soil is within the design material specifications for construction of the dam. Where the testing program identifies a zone or stockpile of proposed borrow soil that falls outside of one or more design specifications, that identified material shall not be used for construction of the dam without further review and approval by the AMEC senior geotechnical engineer.

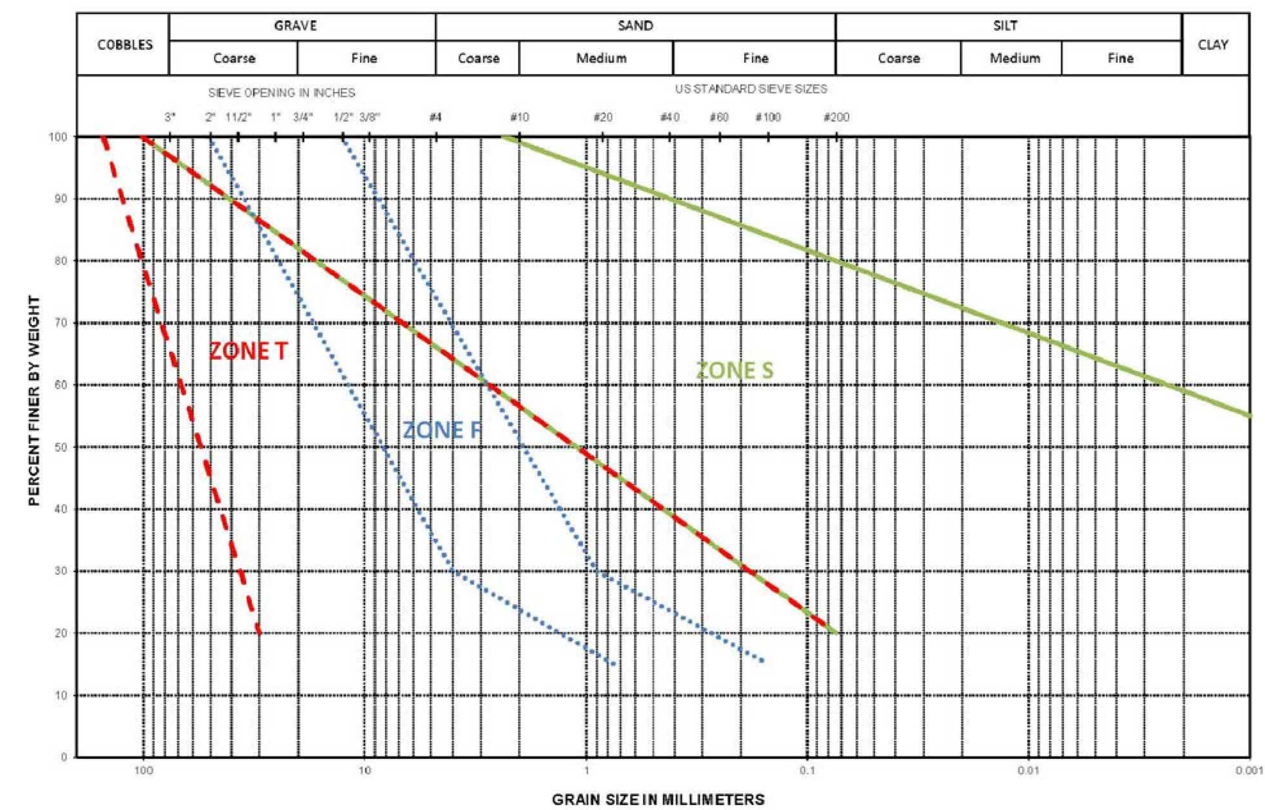
ii) The glacial till borrow material shall be tested for natural moisture content, and grain size at minimum frequency of one test suite per 10,000 m^3 of soil.

iv) Moisture-density (Standard Proctor) reference tests shall be performed at a minimum frequency of 1 test per biweekly for glacial till borrow soil.

v) Compacted field density tests shall be performed on Zone S fill at a minimum frequency of 1 test per 100 linear m per compacted lift per day, throughout the thickness of the compacted lift being tested.

vi) Grain size analyses on sand and gravel filter material (Zone F) shall be conducted on samples obtained from the Zone F stockpile and from samples placed on the embankments. On-site Zone F testing shall include grain size and suitability of rock hardness and shall be performed at a minimum frequency of 1 test per placement event or 1 test per 2,500 linear meter of placed material. Off-site Zone F testing of this material shall consist of grain size at a frequency of 1 test per 5,000 linear meters of placed material.

EMBANKMENT ZONE MATERIAL GRADATION LIMITS



NOTE:

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH THE STAGE 9 CONSTRUCTION MONITORING MANUAL, DATED MARCH 2013.

REV	D	M	Y	ISSUE/REVISION DESCRIPTION	ENG.	APPR.
6						
5						
4						
3						
2						
1						
0	08	03	2013	ISSUED FOR CLIENT REVIEW	LW	SR

Client Logo: Imperial Metals

Client: MOUNT POLLEY MINING CORPORATION

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DRAWN BY:	YC
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Mount Polley Mine
Tailing Storage Facility
Stage 9 (970m) Expansion Stability Analyses

Submitted to:

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Vancouver, BC

Submitted by:

AMEC Environment & Infrastructure,
a Division of AMEC Americas Limited
Burnaby, BC

08 March 2013

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1.0 STABILITY ANALYSIS

1.1 Analysis Parameters and Methodology

Two-dimensional limit equilibrium stability analyses were carried out for representative sections of the proposed configuration of the Mt. Polley tailings dam, raised to a target crest elevation of 970 m, 6.5 m higher than the 2012 as-built dam configuration (Approx. El. 963.5 m - Zone S).

In order to perform these analyses, the three embankments were modelled at the following four locations; Main - Ch. 20+60 and 18+50, Perimeter – Ch. 39+90 and South – Ch. 7+20. The four dam sections were selected as representative for stability analyses based on their downstream rockfill shell configurations, range of dam heights, and foundation soil conditions.

The compacted till core is supported by the downstream rockfill shell and filter sequence, and does not significantly contribute to the stability of the embankments from a slope stability perspective. The centerline raise geometry of the dam is such that stability is not significantly affected by the shear strength assigned to the upstream impounded tailings.

The analyses were conducted using the computer code SLOPE/W (GeoStudio, 2007), incorporating the Morgenstern-Price method of slices solution. There are seven main materials incorporated into the analyzed sections, Zone S (compacted till fill), Zone C (rockfill), tailings, foundation tills (ablation, basal), glaciolacustrine and glaciofluvial sediments, and bedrock. The material properties used for the analyses are based on previously established parameters assumed by KP (2005) with minor modifications deemed appropriate by AMEC in more recent analyses and on the basis of recent geotechnical site investigations. The parameters used in the stability analyses presented herein are summarized in Table 1.1.

1.2 Material Parameters

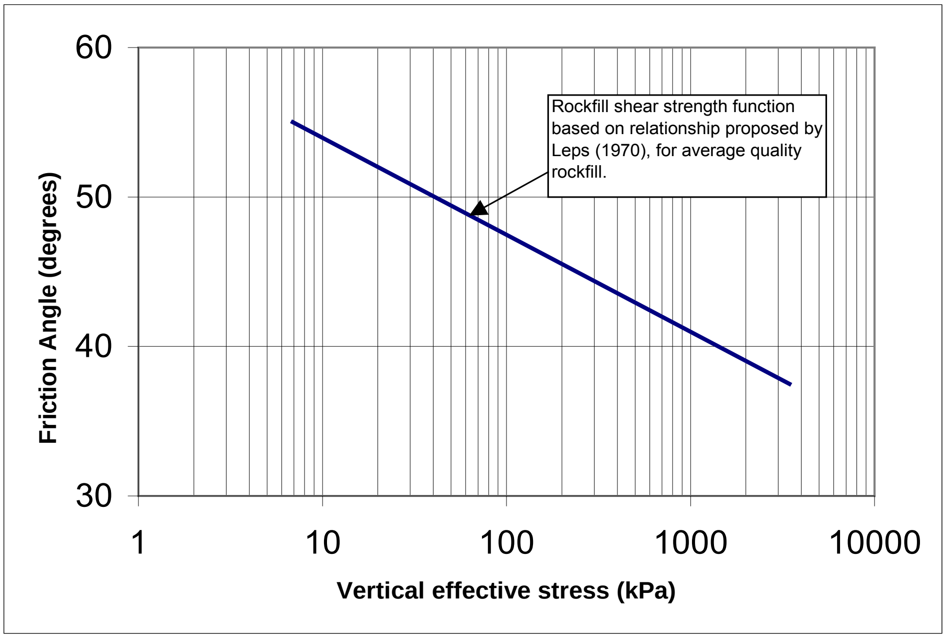
Material properties for the glaciolacustrine/glaciofluvial unit used in this analysis are consistent with those presented in the report, 2012 Stage 8a Expansion Stability Analyses (AMEC 2012-4). The shear strength assigned to this unit comprised an effective cohesion (c') of zero, and an effective friction angle (ϕ') of 28°.

The rockfill shear strength is taken as stress-level dependent as per Leps (1970), as illustrated in Figure 1.1. It is anticipated that the rockfill used for construction of the Stage 9 expansion will be comparable to that used for the previous dam raises and:

- is strong and durable with high compressive strength;
- is well-graded, and comprised of highly angular rock; and
- is placed with moderate compactive effort.

Therefore, the Leps (1970) trend for average quality rockfill was selected for the analysis.

Figure 1.1: Shear Strength Relationship Used for Rockfill



Based on field density test results during the 2012 construction season, AMEC determined the bulk unit weight of the till to average about 20.5 kN/m^3. This average value has been adopted for the purposes of the stability analyses presented herein.

The material strength parameters used in the stability analyses are as summarized in Table 1.1.

Table 1.1: Material Strength Parameters

Material	Bulk Unit Weight γ_b (kN/m^3)	Friction Angle ϕ' (degrees)	Cohesion c' (kPa)
Rockfill (Zone C)	22	Defined by Lep's (1970) shear normal function for average quality rockfill (Note 1)	0
Compacted Till Fill (Zone S)	20.5	35	0
Glaciolacustrine/Glaciofluvial	20	28	0
Basal Till	21	33	0
Tailings	18	30 (drained) S_u/σ_v' = 0.1 (undrained)	0

Note 1: The shear normal function used for the rockfill accounts for the stress-level dependency of the normalized shear strength as expressed by the effective friction angle (ϕ') – see Figure 1.1.

1.3 Pore Pressure Assumptions

The current phreatic surfaces used for the stability analysis sections were inferred on the basis of data from vibrating wire piezometers installed in the embankment or into the embankment foundations. For those analysis sections lacking in piezometric data, the phreatic surface was estimated based on trends on monitored sections, interpolation of piezometer data, observed piezometric trends over the years at this facility, and experience from other tailings dams of similar design with similar foundation conditions.

The phreatic surface for the Stage 9 raise (crest El. 970 m) was estimated by increasing the phreatic surface on the upstream side to an elevation of 970 m, equivalent to the maximum Stage 9 raise, while maintaining the phreatic surface downstream of the core as indicated by interpolation of piezometric data. The historical piezometer data shows essentially zero foundation piezometer response to the rising tailings pond elevation or in response to increased embankment loading associated with the construction of the annual stage raises.

The rockfill was assigned zero pore pressure except where located below the inferred phreatic surface, below which pore pressures at any given point were assumed hydrostatic.

1.4 Minimum Factor of Safety Criteria

The minimum factor of safety criteria for design is 1.3 for short-term (during construction) and 1.5 for long-term (closure) steady state conditions. Currently, “during construction” conditions are applicable.

2.0 STABILITY ANALYSES RESULTS

2.1 Stability Results

The stability analyses of the Stage 9 expansion were carried out for four representative cross sections of the embankment (Main, Perimeter and South). Three of these are similar to those sections analysed in previous reports. To analyse the stability of the embankment two shear strength cases were considered for each cross section: one considering drained shear strength within the tailings, and the other considering residual undrained shear strength (i.e. post-liquefaction conditions) within the tailings.

The stability analyses results for the most critical (lowest factor of safety) slip surface geometries are illustrated on Figure 2.1 to 2.4. A summary of the factors of safety obtained for Stage 9 are shown below in Table 2.1, alongside stability results from the 2012 Stage 8a analyses for the dam at crest El. 965 m (AMEC 2012-4).

Table 2.1: Factor of Safety Summary

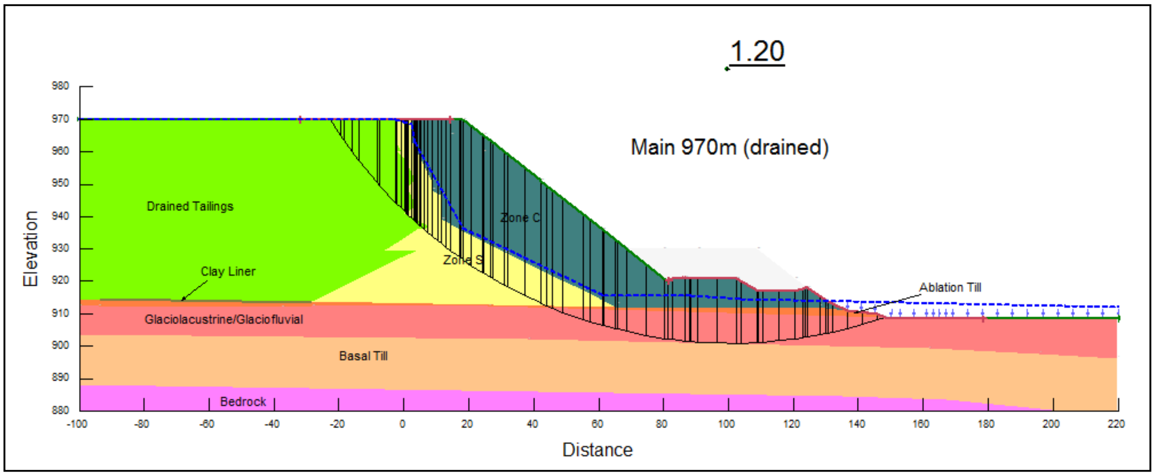
Embankment	Stage 8a (El. 965 m)	Stage 9 (El. 970 m)
Tailings shear strength: **Drained (c' = 0, σ' = 30°)*		
Main - Section A (Ch. 20+60)	1.31	1.2
Main - Section C (Ch. 18+50)	-	1.32
Perimeter (Ch. 39+90)	1.81	1.63
South (Ch. 7+20)	1.95	1.7
Tailings shear strength: **Undrained (Su/σ_v' = 0.1)*		
Main - Section A (Ch. 20+60)	1.27	1.16
Main - Section C (Ch. 18+50)	-	1.28
Perimeter (Ch. 39+90)	1.77	1.58
South (Ch. 7+20)	1.92	1.68

*Note: Minimum acceptable Factors of Safety for:
Drained = 1.3 (for "construction conditions")
Undrained = 1.1

The critical section (i.e. yielding the lowest factor of safety) for the Stage 9 expansion remains the main embankment. With the resulting factor of safety less than 1.3 at Ch. 20+60, the construction of a NAG waste rock toe buttress is recommended prior to any crest raising above El. 965 m. Stability analysis considering a buttress constructed on the main embankment is presented in the following subsection.

Both Stage 8a and 9 analyses incorporate the embankment design change from modified centerline raising to centerline raising, beginning from El. 963.5 m.

Figure 2.1: Main Embankment Stability Analysis (*Section A – Ch. 20+60*)



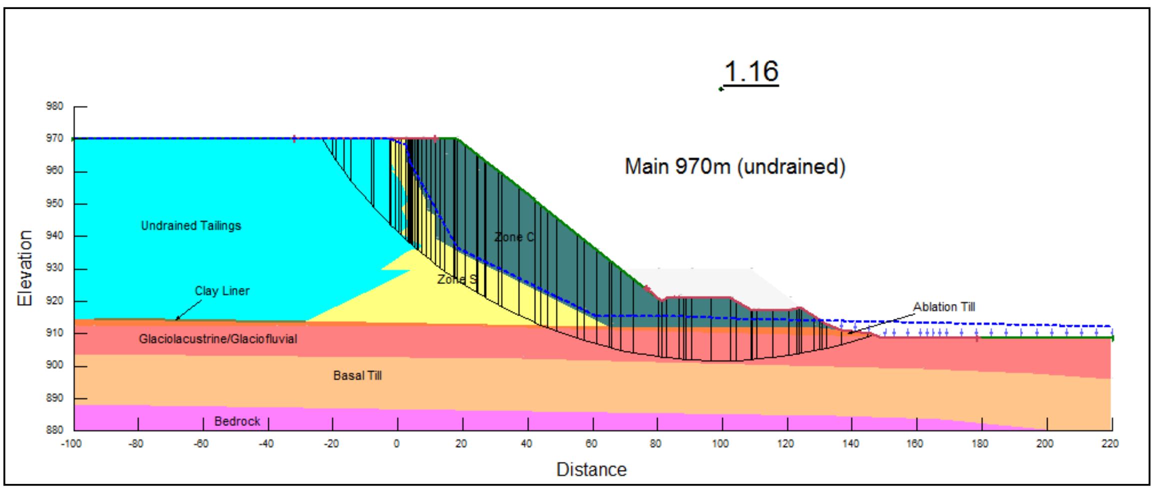
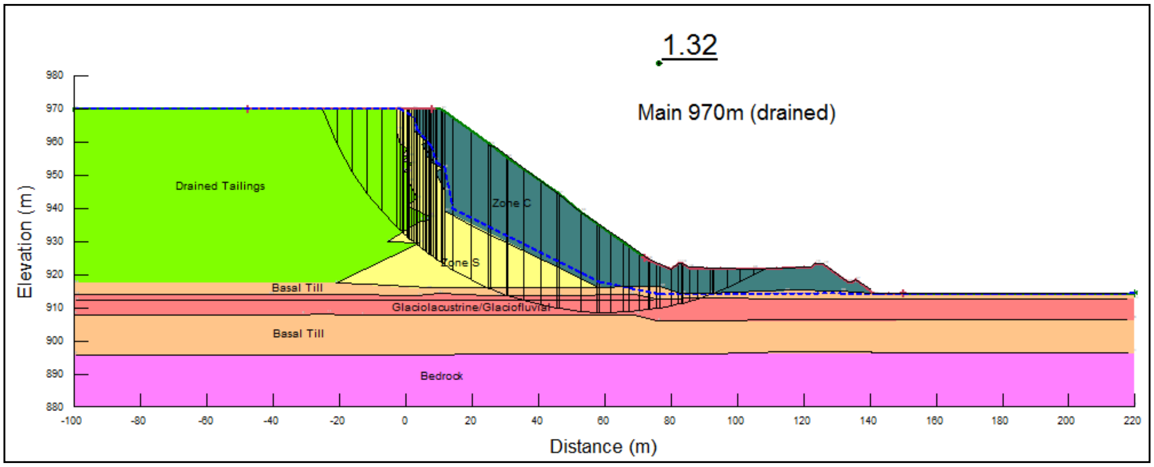


Figure 2.2: Main Embankment Stability Analysis (*Section C - Ch. 18+50*)



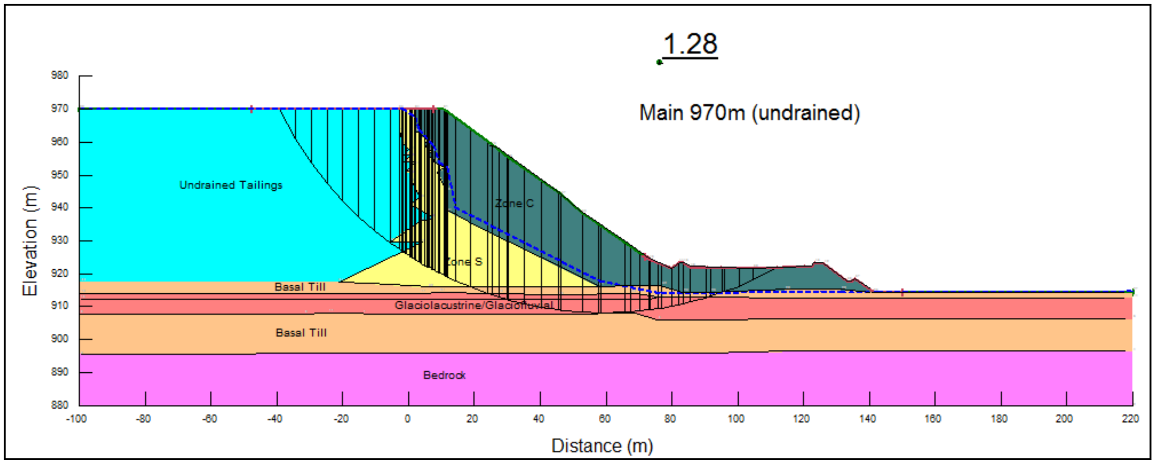
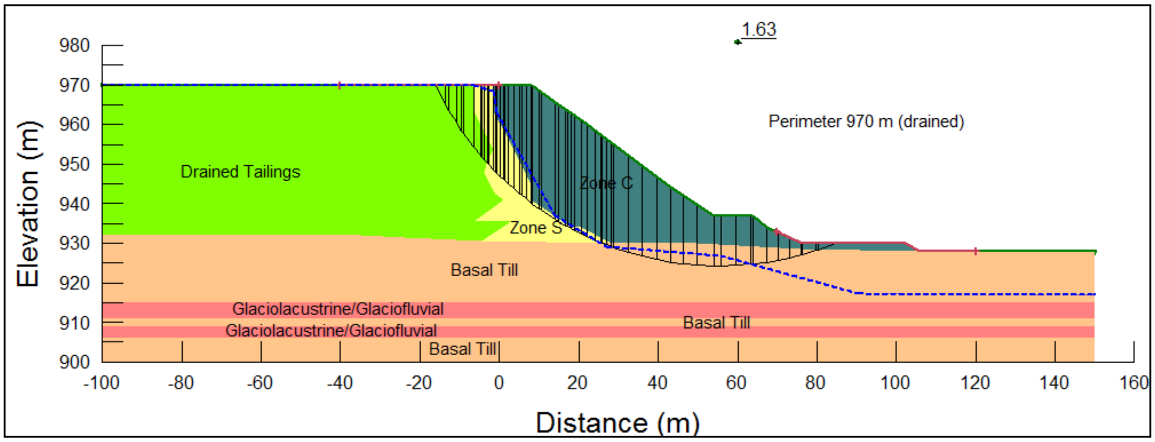


Figure 2.3: Perimeter Embankment Stability Analysis



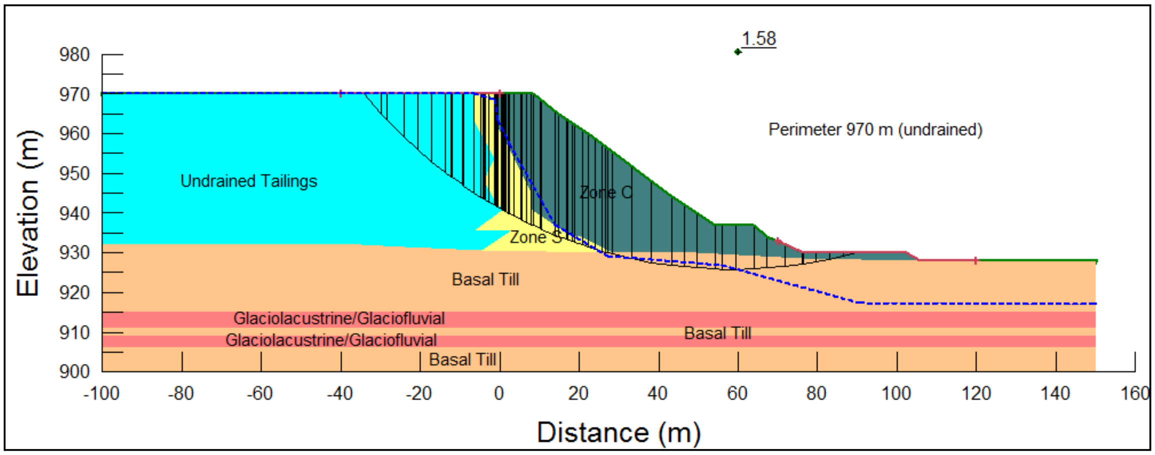
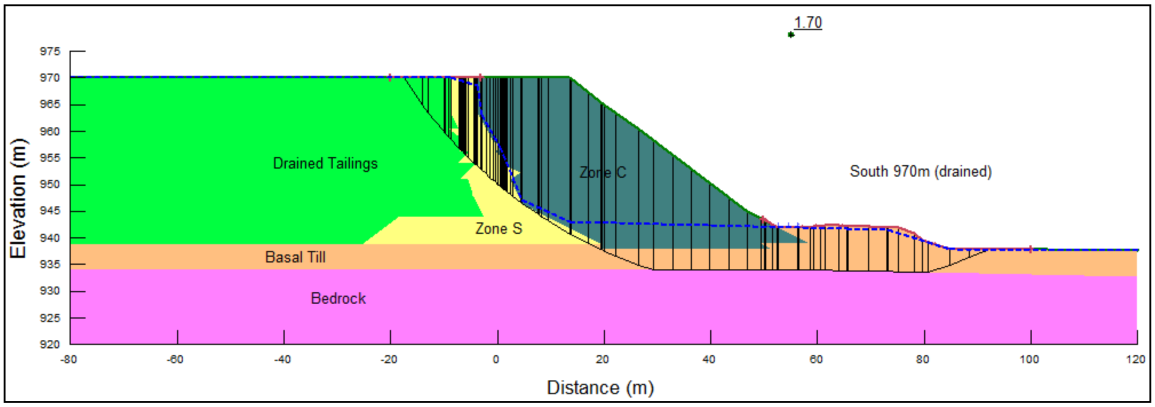
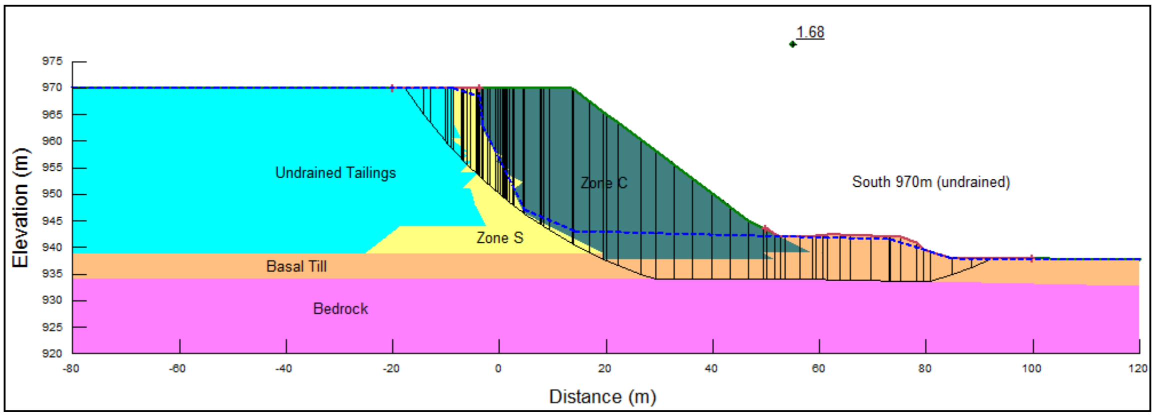


Figure 2.4: South Embankment Stability Analysis

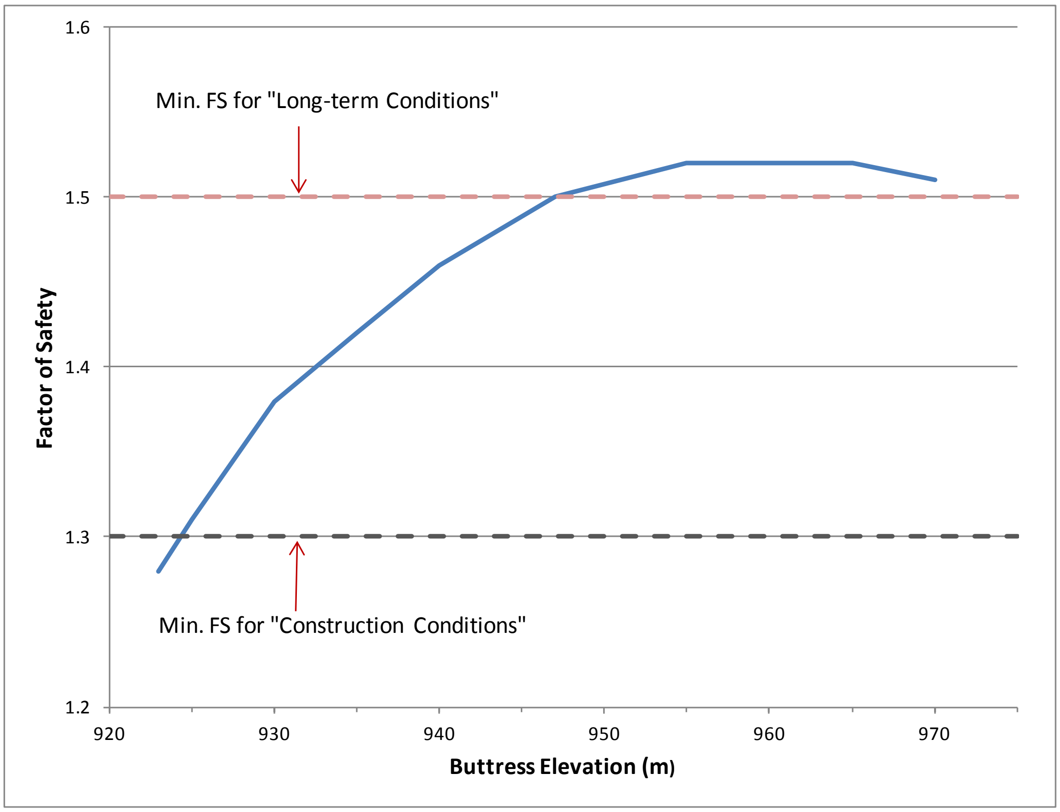




2.2 Buttress Stability Results

Based on the results noted above, the construction of a NAG waste rock toe buttress is recommended for the main embankment. The buttress should be constructed along the toe of the main embankment, directly above the existing buttress, currently at a maximum elevation of about 921.0 m. The buttress option was considered on the most critical section (Ch. 20+60) under drained tailings conditions, varying the buttress crest elevation from a minimum El. 923 m to a maximum El. 970 m. Results of the stability analysis are illustrated in Figures 2.5 and 2.6.

Figure 2.5: Stability Results with Buttress - Main Embankment (Ch. 20+60) (Drained Tailings Condition)



The results of the stability analyses show that the construction of a NAG rockfill buttress to a minimum El. 925 m provides the main embankment the minimum required factor of safety to satisfy construction conditions as well as post-liquefaction conditions (residual shear strength assigned to the tailings) up to embankment crest El. 970 m.

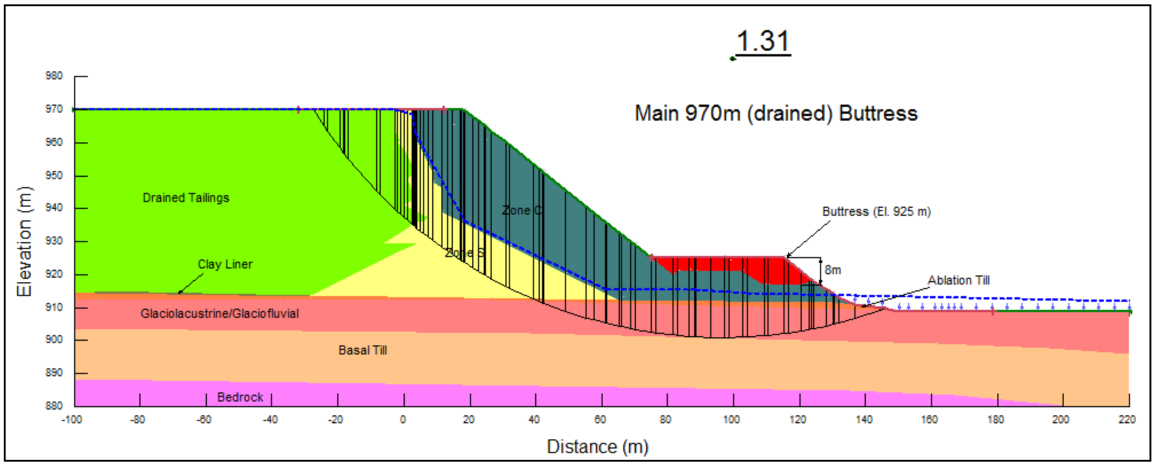
For verification, the analysis with a buttress to El. 925 m was completed for section C of the main embankment, the results shown below in Table 2.2 and Figure 2.7

Table 2.2: Factor of Safety Summary (El. 925 m Buttress)

Embankment	Stage 9 (El. 970 m) *With Buttress to El. 925 m*
Tailings shear strength: *Drained (c' = 0, σ' = 30°)*	
Main - Section A (Ch. 20+60)	1.31
Main - Section C (Ch. 18+50)	1.43
Tailings shear strength: *Undrained (Su/σ_v' = 0.1)*	
Main - Section A (Ch. 20+60)	1.27
Main - Section C (Ch. 18+50)	1.36

*Note: Minimum acceptable Factors of safety for: Drained = 1.3, Undrained = 1.1

Figure 2.6: Main Embankment Stability Analysis with El. 925 m Buttress
(Section A – Ch. 20+60)



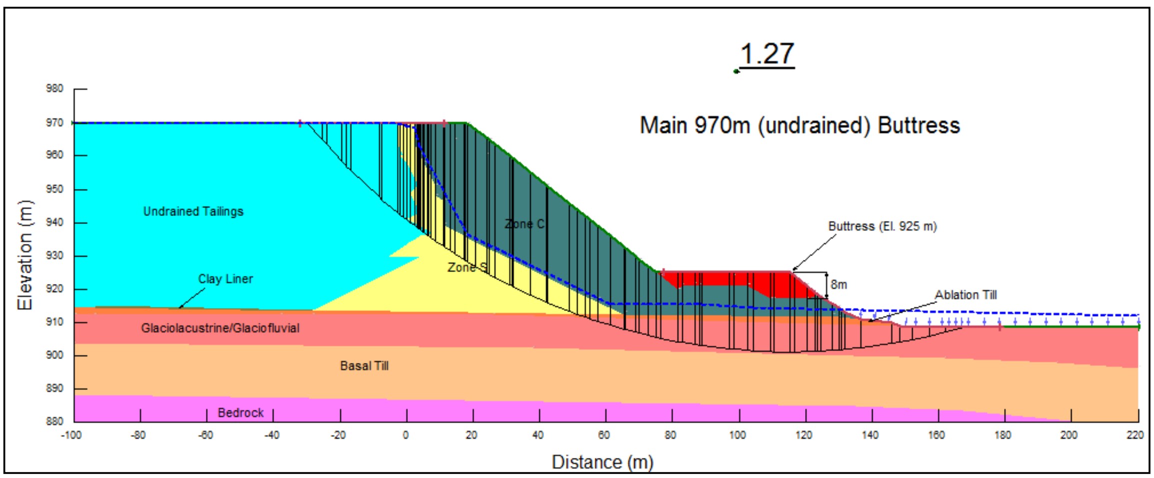
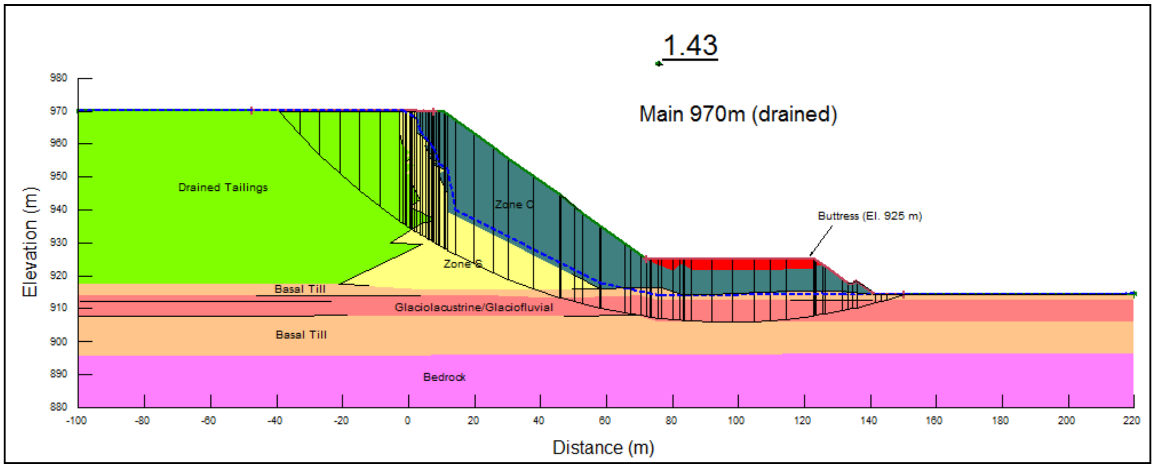
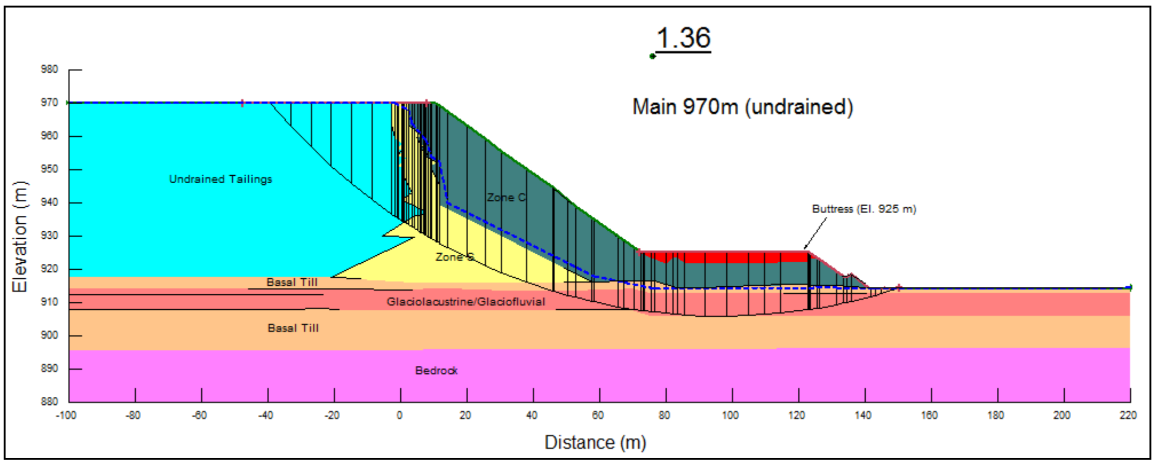


Figure 2.7: Main Embankment Stability Analysis with El. 925 m Buttress
(Section C – Ch. 18+50)





2.3 Pore Pressure Alert Levels

Pore pressure alert levels are a useful means of relating monitored piezometer data to the stability analyses and the achieved factors of safety, and triggering a pre-determined response if those levels are exceeded.

To determine the pore pressure alert levels in the foundation piezometers additional stability analyses were performed. As the main embankment cross section was determined to be the critical section, as stated above, this cross section and the pore pressures associated with this section were utilized to assess and assign alert levels. A red, yellow, green “stoplight” approach was utilized and the alert conditions are defined as follows:

- Red (factor of safety at or below 1.1) – If the foundation piezometers indicate a red condition, crest raising is to cease. AMEC’s Senior Technical Engineer is to be informed immediately, and a corrective course of action will be implemented as per direction of the AMEC’s Senior Technical Engineer, including intensified monitoring, and placement of a stabilization buttress to flatten the overall slope in the embankment area of concern.
- Yellow (factor of safety above 1.1 and below 1.3) – If the foundation piezometers indicate a yellow condition, work should be temporarily suspended in and around the embankment, AMEC’s Senior Technical Engineer is to be informed, and a corrective action will be implemented as per direction of the AMEC’s Senior Technical Engineer. Access to the embankment should be limited to essential personnel.
- Green (factor of safety at or above 1.3) – If the foundation piezometers indicate a green condition, work in and around the embankment is to continue as needed.

It should be noted that a yellow or red condition is not automatically triggered by a single piezometer on a given instrumentation section yielding a reading of concern. Such conditions will only be triggered if most or all foundation piezometers on a given section reach the requisite alert levels. If individual piezometers on a section approach or reach threshold levels while the remainder do not, additional and/or intensified monitoring may be specified, but the threshold levels described above will not be deemed as having been triggered.

Besides the specified alert levels, piezometric trends (i.e. change over time) are to be closely monitored in the foundation piezometers. Small variations in the piezometric readings are expected, however if a spike occurs in any of the foundation piezometers, and/or an unexpected a consistent trend of increasing pore pressure is noted, AMEC’s Senior Technical Engineer is to be informed immediately to assess the situation.

The results of the pore pressure alert level stability analyses are presented in Figure 2.8 and Figure 2.9, and are summarized in Table 2.3 and Table 2.4 below, which applies only for the main and perimeter embankment piezometers. Factor of safety values for the south embankment are sufficiently high that monitoring of piezometric trends, without defined alert levels, is deemed sufficient at the present time.

Table 2.3: Foundation Piezometer Alert Levels (Main Embankment)

Condition	Modeled Pore Pressure Elevation Head (m)	Above Original Ground Elevation (912m) (m)
RED	Above 933	>21
YELLOW	Between 916 and 933	4 to 21
GREEN	Less than 916	<4

Table 2.4: Foundation Piezometer Alert Levels (Perimeter Embankment)

Condition	Modeled Pore Pressure Elevation Head (m)	Above Original Ground Elevation (928m) (m)
RED	Above 939	>11
YELLOW	Between 935 and 939	7 to 11
GREEN	Less than 935	<7

Figure 2.8: Pore Pressure Alert Levels Stability Analysis
(Main Embankment – Section A, Ch. 20+60)

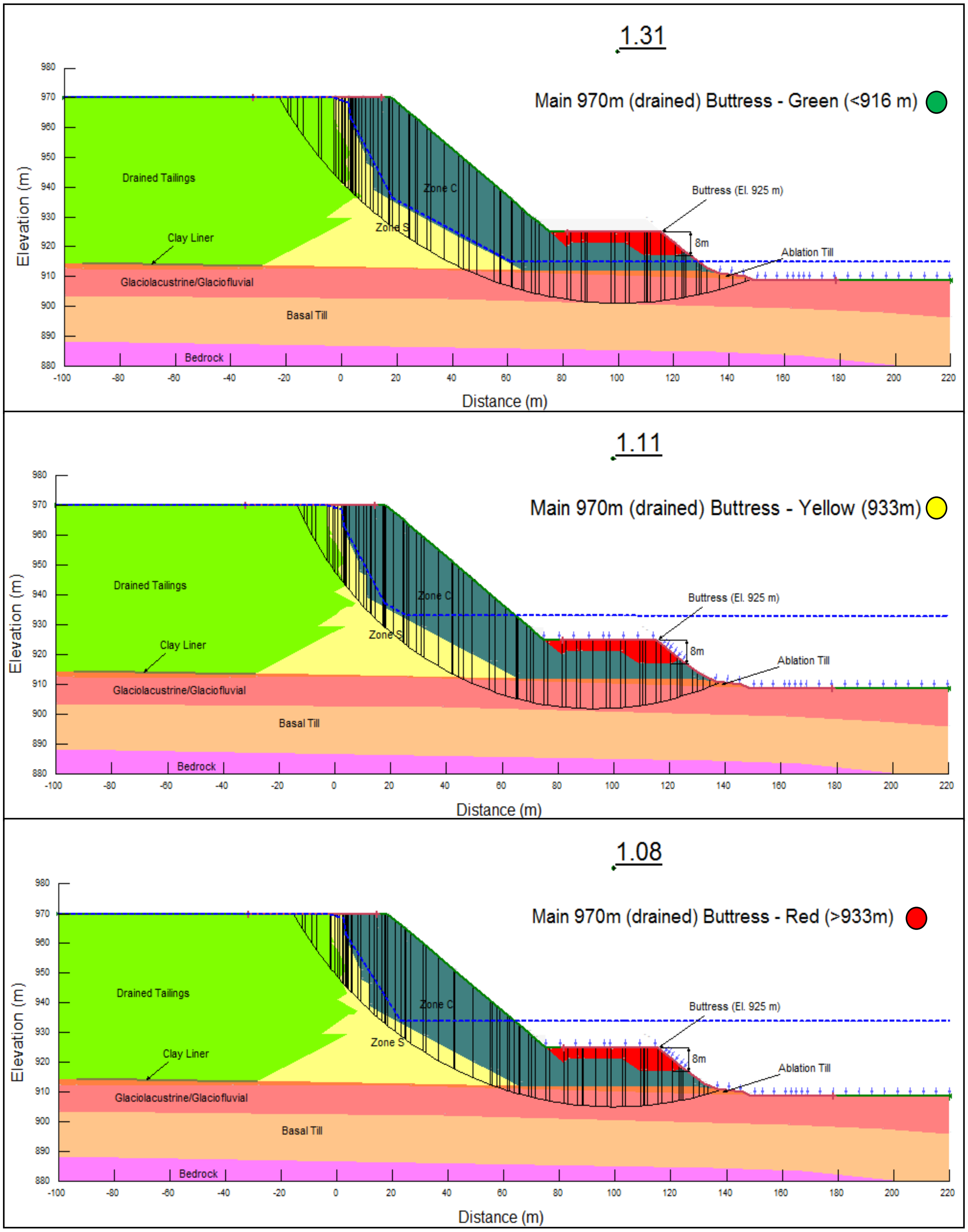
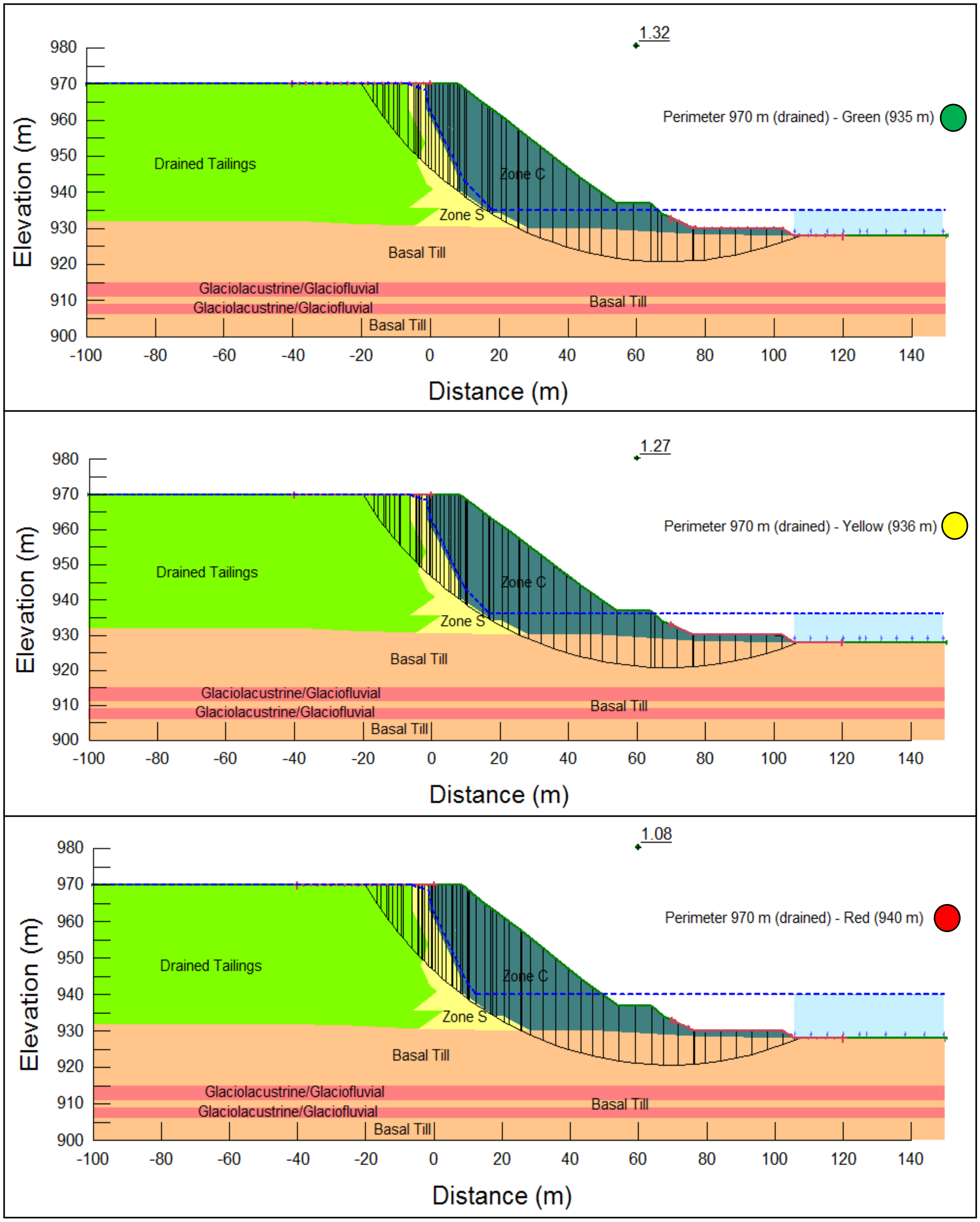


Figure 2.9: Pore Pressure Alert Levels Stability Analysis (Perimeter Embankment)



Please note that phreatic surface indicated is applied for the tailings, the till core, and the foundation soils only. Rockfill shell is assumed fully drained.

3.0 LIMITATIONS AND CLOSURE

This report has been prepared for the use of Mount Polley Mining Corporation. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibility of such third parties. AMEC accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report. It has been prepared in accordance with generally accepted geology and geotechnical engineering practices. No other warranty, expressed or implied, is made.

Respectfully submitted,

AMEC Environment & Infrastructure, **a division of AMEC Americas Limited**	*Reviewed by:*
Laura Wiebe, P.Eng. Geotechnical Engineer	Steve Rice, P.Eng, Principal Engineer

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