Stantec

Technical Memorandum

To:	Karyn Lewis, Project Manager Lupin Project Mandalay Resources Corporation, Suite 330, 76 Richmond Street Toronto, ON M5C 1P1	From:	Alvin Tong. P.Eng. Stantec Consulting Ltd., 1100 – 111 Dunsmuir Street Vancouver, BC V6B 6A3
File:	Lupin Gold Project - 129500081	Date:	June 8, 2020

Reference: 2 AM-LUP2032 Technical Memorandum on Additional Geotechnical Details on TCA Dam K and Dam M Cross Sections

Lupin Mine Incorporated (LMI), a wholly owned subsidiary of Mandalay Resources Corporation, was issued a Type "A" Water License (No: 2AM-LUP2032 (License)) in support of the Closure and Reclamation of the Lupin Mine (Lupin) by the Nunavut Water Board (NWB or Board) on April 9th, 2020. Stantec Consulting Ltd. (Stantec) was retained by LMI to support the execution of certain Licence commitments, including the response to Licence Part E Item 26. Licence Part E Item 26 states:

> *The Licensee shall, within sixty (60) days following the approval of the Licence, submit to the Board for review, a Technical Memorandum that provides additional geotechnical details on TCA Dam K and Dam M cross sections, including but not limited to the following:*
>
> *a. Magnified image that clearly identifies the materials used for the re-sloping, the distance that the re-sloping materials will extend from the crest of these Dams (including a break line with minimums and maximums noted), and the distances to the closure water mark;*
>
> *b. Perpendicular/longitudinal cross section of the outflow structures for Cell 5 and Cell 3, with invert elevations from the cover to the ponds, and a note to clarify the storm return period that will be used for designing the features.*

All the technical information and geotechnical details pertain to construction material and methods are listed in the technical specification listed on the attached Drawing 001. Distances, sections, elevation, and design storm event and follow rate are included in the appropriate attached drawings (Drawing 002 through 0015). Below are specific details provided in direct response to the License.

LICENCE PART E ITEM 26a RESPONSE

Please see attached detailed design drawings for the Tailings Containment Area (TCA) Dam M and Dam K re-sloping activities. These detailed design drawings include the requested materials to be used for re-sloping and the distance from the crest of the dams, as well as the distance to the closure elevations.

The Dam M detailed design drawings are listed below:

- Drawing 010 - M DAM - Plan View_RevA_20200513
- Drawing 011 - M DAM - Sections1_RevA_20200513
- Drawing 012 - M DAM - Sections2_RevA_20200513

The Dam K detailed design drawings are listed below:

Reference: **2 AM-LUP2032 Technical Memorandum on Additional Geotechnical Details on TCA Dam K and Dam M Cross Sections**

- Drawing 013 - K DAM - Plan View_RevA_20200522
- Drawing 014 - K DAM - Sections1_RevA_20200522
- Drawing 015 - K DAM - Sections2_RevA_20200522

LICENCE PART E ITEM 26b RESPONSE

Please see attached detailed design drawings for the Tailings Containment Area (TCA) Cell 5 and Cell 3 outflow structures. These detailed design drawings include the requested cross sections. To clarify, as it is not shown in Drawing 005 for Cell 5 as it is shown in Drawing 009 for Cell 3, the storm return period used to design the design features in both cells is the 1-in-100-year, 24-hour storm event.

Technical specifications for all TCA closure work:

- Drawing 001 -Specification_RevB_20200515

The Cell 5 detailed design drawings are listed below:

- Drawing 002 - Plan View_RevB_20200504
- Drawing 003 - Profile_RevA_20200415
- Drawing 004 - Cross section_RevA_20200415
- Drawing 005 - Outflow Channel_RevA_20200415

The Cell 3 detailed design drawings are listed below:

- Drawing 006 - Cell 3 - Plan View_RevA_20200427
- Drawing 007 - Cell 3 - Profile_RevA_20200429
- Drawing 008 - Cell 3 -Section_RevB_20200508
- Drawing 009 - Cell 3 -Outflow_RevA_20200508

Stantec Consulting Ltd.

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Senior Geotechnical Engineer
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Reference: **2 AM-LUP2032 Technical Memorandum on Additional Geotechnical Details on TCA Dam K and Dam M Cross Sections**

Attachments:

- Drawing 001 -Specification_RevB_20200515
- Drawing 002 - Plan View_RevB_20200504
- Drawing 003 - Profile_RevA_20200415
- Drawing 004 - Cross section_RevA_20200415
- Drawing 005 - Outflow Channel_RevA_20200415
- Drawing 006 - Cell 3 - Plan View_RevA_20200427
- Drawing 007 - Cell 3 - Profile_RevA_20200429
- Drawing 008 - Cell 3 -Section_RevB_20200508
- Drawing 009 - Cell 3 -Outflow_RevA_20200508
- Drawing 010 - M DAM - Plan View_RevA_20200513
- Drawing 011 - M DAM - Sections1_RevA_20200513
- Drawing 012 - M DAM - Sections2_RevA_20200513
- Drawing 013 - K DAM - Plan View_RevA_20200522
- Drawing 014 - K DAM - Sections1_RevA_20200522
- Drawing 015 - K DAM - Sections2_RevA_20200522

TABLE 1. FOUNDATION PREPARATION SPECIFICATIONS

FOUNDATION	
GENERAL	• FOUNDATION SURFACES THAT WILL BE RECEIVING COVER FILL SHALL BE CLEARED OF SNOW, ICE, AND OTHER DETERIORATIVE MATERIAL. THE FOUNDATION SHALL BE INSPECTED BY THE CONTRACTOR'S FOREMAN AND OWNERS SITE ENGINEER (WHEN THEY ARE ON SITE) AND DOCUMENTED USING GPS REFERENCED PHOTOS TO CONFIRM ADHERENCE WITH FOUNDATION PREPARATION SPECIFICATIONS. • WRITTEN FOUNDATION APPROVAL BY AREA SHALL BE PROVIDED BY THE OWNERS SITE ENGINEER (WHEN THEY ARE ON SITE) OR THE ENGINEER OF RECORD (REMOTELY WHEN THE OWNERS SITE ENGINEER IS NOT ON SITE) PRIOR TO PLACEMENT. WHEN THE OWNERS SITE ENGINEER IS NOT ON SITE THE GPS REFERENCED PHOTO DOCUMENTATION SHALL BE PROVIDED TO THE ENGINEER 72HRS PRIOR TO PLANNED PLACEMENT TO ALLOW FOR SUFFICIENT TIME FOR REVIEW AND APPROVAL. THE PHOTO DOCUMENTATION PROVIDED SHALL CAPTURE DIRECTIONS IN SUCH A WAY THAT ALL LIMITS OF THE CONSTRUCTION AREA WILL BE DOCUMENTED FOR REVIEW. • SITE DRAINAGE AND DEWATERING MEASURES ARE THE RESPONSIBILITY OF THE EARTHWORKS CONTRACTOR. TEMPORARY AND FINAL CONSTRUCTION SURFACES SHOULD BE GRADED TOWARD THE DITCHES AND/OR AWAY FROM THE DAM CREST TO ENSURE THERE IS NO PONDING OF WATER NEAR THE DAM TO PREVENT OVERFLOW OR OVERTOPPING. • DEVIATIONS FROM THE SPECIFICATIONS MUST BE APPROVED BY THE TAILINGS CONTAINMENT AREA (TCA) ENGINEER OF RECORD. • CONTRACTOR SHALL PRESERVE SURVEY CONTROL STAKES FOR PROGRESSION AS LONG AS POSSIBLE BETWEEN SURVEY PERIODS, OR BE RESPONSIBLE TO REPLACE THEM AS NEEDED. ONCE THE CONTROL STAKE IS REMOVED, THE CONTRACTOR MUST MOVE CONSTRUCTION ACTIVITIES TO AN AREA WITH SUFFICIENT SURVEY CONTROL. THE CONTRACTOR MUST PROVIDE THE OWNER 1 WEEKS' NOTICE IN ADVANCE OF WHEN THEY REQUIRE THE DAMAGED SURVEY CONTROL POINTS REPAIRED. • THE CONTRACTOR IS RESPONSIBLE TO MANAGE SURROUNDING SURFACE RUN–ON TO TAILINGS COVER TO MINIMIZE THE AMOUNT OF IMPACTED WATER WITHIN THE COVER PLACEMENT AREA.
COVER FOUNDATION PREPARATION SPECIFICATIONS	• THE FOUNDATION SHALL BE CAPABLE OF SUPPORTING COVER FILL AND CONSTRUCTION EQUIPMENT TO THE SATISFACTION OF THE CONTRACTOR, SUBJECTED TO ENGINEER'S APPROVAL. • PRIOR TO AND DURING FILL PLACEMENT, APPROVED FOUNDATION SURFACES SHALL BE CLEARED OF ALL ICE, HARDEN SNOWBANKS THICKER THAN 30 MM, LARGE BODIES OF PONDED WATER THAT ARE GREATER THAN 5M X 5M AND GREATER THAN DEPTH, AND ANY OTHER MATERIAL DEEMED UNSUITABLE BY THE OWNERS SITE ENGINEER. A THIN LAYER OF FRESH, UNCOMPACTED SNOW (<50MM) IS PERMITTED TO REMAIN IN PLACE DURING COVER CONSTRUCTION.
DAM OUTFALL CHANNEL AREA FOUNDATION	• THE FOUNDATION SHALL BE CAPABLE OF SUPPORTING FILL AND CONSTRUCTION EQUIPMENT TO THE REGULATED SAFETY STANDARDS AND TO THE SATISFACTION OF THE CONTRACTOR AND SUBJECT TO APPROVAL OF THE ENGINEER. • THE EXCAVATED SURFACE MUST BE SURVEYED TO ENSURE DESIGN IS MET PRIOR TO BACKFILL. THE CONTRACTOR IS RESPONSIBLE TO SCHEDULE THE WORK IN LINE WITH THE MONTHLY SURVEY. • 100% OF THE SURFACE OF THE FOUNDATION AND PREVIOUSLY PLACED LIFTS SHALL BE CLEAR OF ALL SNOW OR ICE PRIOR TO THE PLACEMENT OF GEOTEXTILE AND/OR RIPRAP. • THE FINAL RIPRAP SURFACE MUST BE BLENDED INTO THE TOP OF COVER TO ENSURE A SMOOTH TRANSITION. THE ENGINEER MUST INSPECT AND APPROVE THE SURVEYED EXCAVATION AND FINAL STRUCTURES.

TABLE 2. FILL PLACEMENT SPECIFICATIONS

COVER

- ALL TEMPORARY AND FINAL SLOPES SHALL BE TRACK PACKED TO LIMIT SURFACE EROSION.
- UNLESS OTHERWISE APPROVED BY THE OWNERS SITE ENGINEER, FILL MATERIALS SHALL BE PLACED, AND SPREAD, IN –HORIZONTAL LIFTS AND IN SUCH A MANNER TO PREVENT SEGREGATION AND STRATIFICATION.
- IMPACTED WATER FROM THE TAILINGS CELLS DISPLACED DURING COVER MATERIAL PLACEMENT MUST BE MANAGED AND DISCHARGE IN SUCH A WAY THAT WILL NOT IMPACT THE WATER TREATMENT IN POND 1 AND POND 2.
- FILL MATERIALS SHALL JOIN ONTO COMPETENT NATURAL, EXCAVATED, OR APPROVED FILL BY BLENDING INTO THE EXISTING TERRAIN SLOPES OR BY TERRACING OR STEPPING INTO SLOPES AS APPROVED BY THE OWNERS SITE ENGINEER.
- FINISHED COVER SURFACE SHALL BE WITHIN 50MM OF ESTABLISHED ROUGH GRADES AND CROSS SECTIONS, BUT NOT UNIFORMLY HIGH OR LOW. THE FINAL SURFACE SHALL BE FREE DRAINING TOWARDS THE DESIGN WATER MANAGEMENT STRUCTURES.
- DEVIATIONS FROM THE SPECIFICATIONS MUST BE APPROVED BY THE TAILINGS CONTAINMENT AREA (TCA) ENGINEER OF RECORD (EOR).
- THE CONTRACTOR IS RESPONSIBLE FOR ANY SHORT–TERM SETTLEMENT AND DEFORMATION ON THE COVER DURING CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE TO PLACE ADDITIONAL FILL WHERE IT IS NECESSARY TO MEET MINIMUM 1m COVER THICKNESS OR TO MEET DESIGN LINES.
- CONTRACTOR SHALL PRESERVE SURVEY CONTROL STAKES FOR PROGRESSION AS LONG AS POSSIBLE BETWEEN SURVEY PERIODS OR BE RESPONSIBLE TO REPLACE THEM AS NEEDED. ONCE THE CONTROL STAKE IS REMOVED, THE CONTRACTOR MUST MOVE CONSTRUCTION ACTIVITIES TO AN AREA WITH SUFFICIENT SURVEY CONTROL. THE CONTRACTOR MUST PROVIDE THE OWNER 1 WEEKS' NOTICE IN ADVANCE OF WHEN THEY REQUIRE THE DAMAGED SURVEY CONTROL POINTS REPAIRED.

FILL TYPE	PERMITTED MATERIALS	PLACEMENT SPECIFICATIONS
COVER FILL	• ESKER	• MAXIMUM SIZE OF MATERIAL SHALL BE 250 MM OR 50% OF THE LIFT THICKNESS, WHICHEVER IS SMALLER. • PLACEMENT OF FROZEN FILL IS RESTRICTED UNLESS APPROVED BY THE ENGINEER. SOME FROZEN COVER FILL IS PERMITTED PROVIDED THAT: •• THE DIAMETER OF THE FROZEN LUMPS IS LESS THAN 250 M IN DIAMETER OR 50% OF THE LIFT THICKNESS, WHICHEVER IS SMALLER •• THEY MAKE UP LESS THAN 5% BY VOLUME OF ANY GIVEN TRUCK LOAD •• THE FROZEN MATERIALS ARE APPROVED IN CONSULTATION WITH THE RESIDENT ENGINEER.
RIPRAP	• CLASS 1	• MATERIAL SHALL MEET OR EXCEED THE CLASS 1 GRADATION RECOMMENDATION PRESENTED IN TABLE 3. • CONTRACTOR'S QC SHALL VERIFY SIZE DISTRIBUTION IN ACCORDANCE WITH 'STANDARD METHOD OF TEST FOR DETERMINING RIPRAP GRADATION BY WOLMAN COUNT' CONSULTATION WITH THE OWNERS SITE ENGINEER. • EXTENT OF PLACEMENT SHOWN AT TOE OF CELL 5 OUTFLOW (STA 0+050 TO 0+075) MAY BE REDUCED BASED ON FIELD CONDITIONS, UPON APPROVAL BY THE TCA EOR, IF: •• LARGER DIAMETER MATERIAL IS AVAILABLE •• EXISTING GROUND AT TOE OF STRUCTURE IS DEEMED COMPETENT BY THE OWNERS SITE ENGINEER
GEOTEXTILE FILTER FABRIC	• GEOTEXTILE FILTER FABRIC	• GEOTEXTILE SHALL BE A COMPOSITE NON–WOVEN GEOTEXTILE AND EXTRUDED GEOGRID COMPOSITE PRODUCT (NILEX EASYGRID OR EQUIVALENT) AND SHALL MEET THE SPECIFICATIONS PROVIDED IN TABLE 4. • GEOTEXTILE SHALL BE INSTALLED IN OVERLAPPING CONFIGURATION WITH A MINIMUM 0.3 M OVERLAP BETWEEN PANELS AS SPECIFIED BY MANUFACTURER'S INSTALLATION GUIDANCE, OR AS APPROVED BY THE TCA EOR. • GEOTEXTILE SHALL BE STORED ON DRY, LEVEL GROUND TO PREVENT FILTRATION OF WATER AND FREEZING, AND GEOTEXTILE ROLLS SHOULD BE STACKED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS. THEY MUST BE STORED WITHIN THEIR PROTECTIVE WRAPPING TO PREVENT UV DEGRADATION. THE GEOTEXTILE ROLLS MUST BE HANDLED WITH PROPER EQUIPMENT OR SLINGS TO PREVENT DAMAGE TO THE PRODUCT. • THE CONTRACTOR MUST PROVIDE MANUFACTURERS' QA/QC DATASHEETS AND SHIPPING MANIFESTS FOR THE RESIDENT GEOTECHNICAL ENGINEER'S REVIEW PRIOR TO DEPLOYMENT.

TABLE 3. MATERIALS SIZE SPECIFICATIONS

GRADATION	RIP RAP CLASS 1	
	MASS (KG)	DIAMETER (mm) PASSING
NOMINAL	40	300
100%	130	>=450
25% TO 50%	70	350
50% TO 80%	40	300
100% GREATER THAN	10	200

• SIZES ARE EQUIVALENT SPHERICAL DIAMETERS

TABLE 4. GEOTEXTILE SPECIFICATIONS

PARAMETER	VALUE
GRAB TENSILE STRENGTH (KN/m)	DIAMETER (mm) PASSING
ELONGATION	300
PESISTANCE TO STATIC PUNCTURE (N)	2100
APPARENT OPENING SIZE (MICRONS)	350
PERMITTIVITY (SEC^{-1})	300
GRID OPENING SIZE (mm)	200

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Client: LUPIN MINES INC.

Project: LUPIN MINE CLOSURE

Title: TAILING CONTAINMENT AREA CLOSURE SPECIFICATION B

Scale:- | Drawing No. 001

SS	PK	AT	2020.05.15
Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Revision: B

Project No.: 129500081

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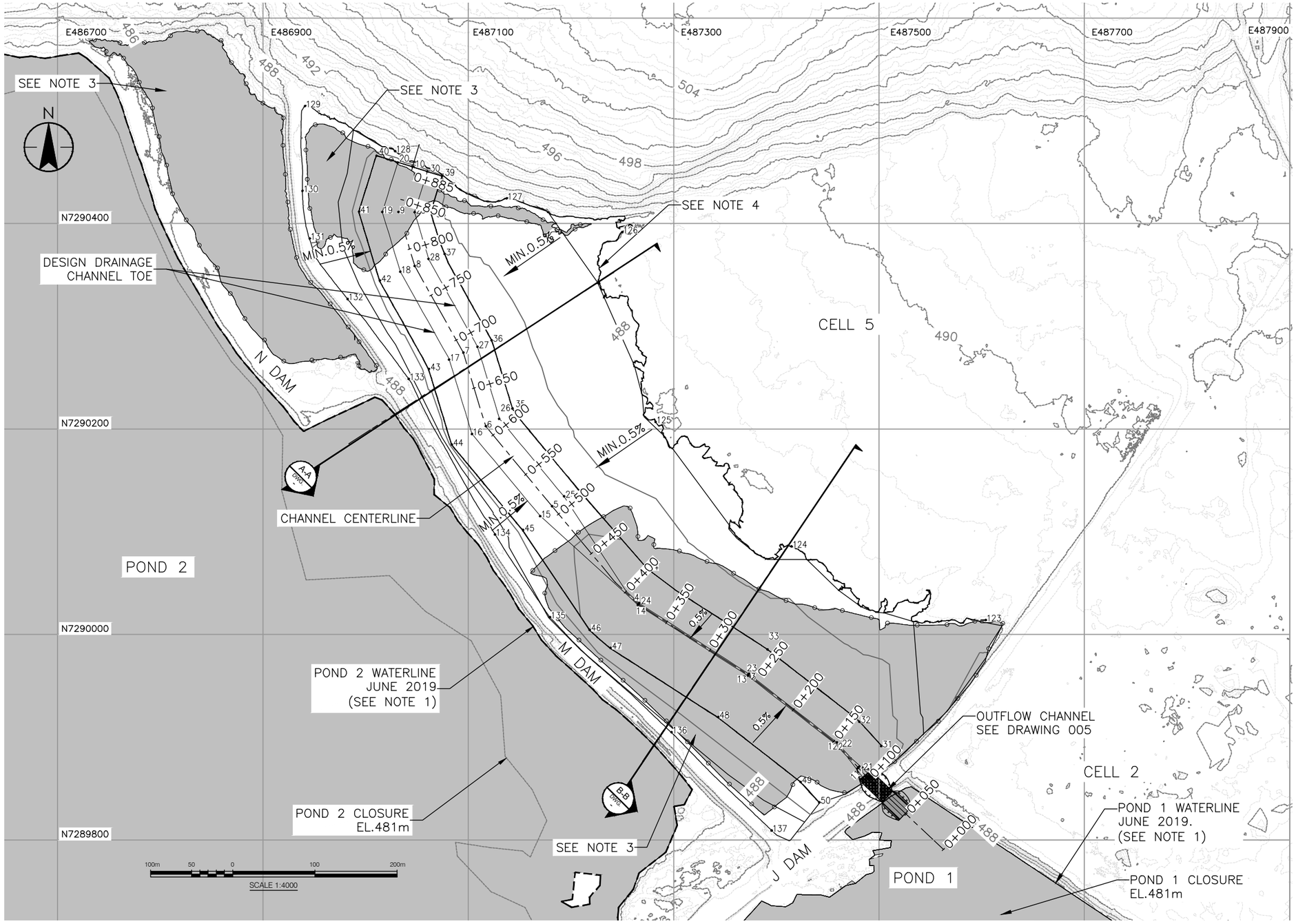

WORK POINTS DESCRIPTION

	POINT NUMBER	NORTHING	EASTING	ELEVATION
CHANNEL CENTERLINE	1	7289870	487480	486.7
	2	7289894	487458	486.7
	3	7289961	487373	486.7
	4	7290029	487266	486.7
	5	7290127	487180	487.2
	6	7290203	487117	487.2
	7	7290274	487095	487.2
	8	7290359	487048	487.2
	9	7290411	487032	487.2
	10	7290455	487046	487.2
	11	7289870	487479	486.7
CHANNEL	12	7289889	487453	486.7
	13	7289960	487372	486.7
	14	7290029	487265	486.7
	15	7290115	487170	487.2
	16	7290195	487103	487.2
	17	7290267	487081	487.2
	18	7290353	487034	487.2
	19	7290411	487016	487.2
	20	7290459	487031	487.2
	21	7289871	487481	486.7
	22	7289895	487459	486.7
	23	7289962	487373	486.7
	24	7290031	487266	486.7
	25	7290134	487194	487.2
	26	7290210	487130	487.2
	27	7290280	487109	487.2
	28	7290366	487061	487.2
	29	7290411	487048	487.2
	30	7290450	487060	487.2
	31	7289891	487502	486.8
	32	7289915	487481	486.8
	33	7289985	487391	486.8
	34	7290064	487274	486.8
	35	7290217	487144	487.3
	36	7290286	487123	487.3
	37	7290370	487075	487.3
	38	7290411	487063	487.3
	39	7290446	487073	487.3
	40	7290466	487011	487.3
	41	7290411	486993	487.3
	42	7290344	487014	487.3
	43	7290258	487062	487.3
	44	7290185	487084	487.3
	45	7290102	487153	487.3
	46	7290005	487218	486.9
	47	7289987	487238	486.9
	48	7289920	487343	486.9
	49	7289856	487424	486.9
	50	7289837	487442	486.9
COVER LIMIT	123	7290014	487604	488.0
	124	7290086	487415	488.0
	125	7290207	487282	488.0
	126	7290392	487250	488.0
	127	7290424	487137	488.0
	128	7290470	487029	488.2
	129	7290514	486941	489.4
	130	7290432	486938	489.1
	131	7290385	486945	489.1
	132	7290327	486982	488.6
	133	7290249	487042	488.5
	134	7290097	487126	488.7
	135	7290017	487180	488.2
	136	7289905	487298	488.4
	137	7289809	487395	488.9

B

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LEGEND

- 2m EXISTING GROUND CONTOURS
- 0.5m EXISTING GROUND CONTOURS
- 2m DESIGN CONTOURS
- 0.5m DESIGN CONTOURS
- CHANNEL BOUNDARY
- DESIGN COVER EXTENT. TIE TO EXISTING GROUND. CONFIRM EXISTING COVER THICKNESS ON EAST SIDE. SEE NOTE 4.
- DESIGN COVER EXTENT WEST AND NORTH SIDE
- BATHYMETRY SURVEY WATERLINE (JUNE 2019)
- NO DATA. SEE NOTE 3
- WATER COVERED AREA

NOTE

1. EXISTING TOPOGRAPHIC CONTOURS AND WATER COVERED AREAS DELINEATED FROM LIDAR SURVEY COMPLETED AUGUST 2019 AND BATHYMETRY SURVEYS COMPETED JUNE 2019.
2. COORDINATES ARE PRESENTED IN NAD83 UTM, ZONE 12.
3. TOPOGRAPHY AND BATHYMETRY SURVEYS NOT AVAILABLE FOR THESE AREAS DUE TO PONDED WATER. THE CONTRACTOR SHALL REMOVE ANY PONDED WATER PRIOR TO PLACEMENT OF COVER FILL IN THESE AREAS. THE CONTRACTOR SHALL ALSO ADJUST THE COVER FILL SURFACE ELEVATIONS AND/OR SUBEXCAVATE IN THESE AREAS TO ENSURE A MINIMUM 1.0m FILL COVER OVER TAILINGS AS DIRECTED BY THE RESIDENT GEOTHECHNICAL ENGINEER.
4. OUTLINE OF FILL COVER PLACEMENT IS APPROXIMATE BASED ON INTERPRETATION OF PREVIOUS SURVEYS AND AERIAL PHOTOGRAPHY. THE CONTRACTOR SHALL CONFIRM THE LOCATION AND MINIMUM THICKNESS OF FILL COVER ALONG THE TIE IN LIMITS.

Client
LUPIN MINES INC.

Project
LUPIN MINE CLOSURE

Title
CELL 5 CLOSURE
PLAN VIEW

Scale: 1:4000 Drawing No. 002

SS	PK	AT	2020.05.04	
Dwn.	Dsgn.	Chkd.	YYYY.MM.DD	Revision: B

Project No.: 129500081

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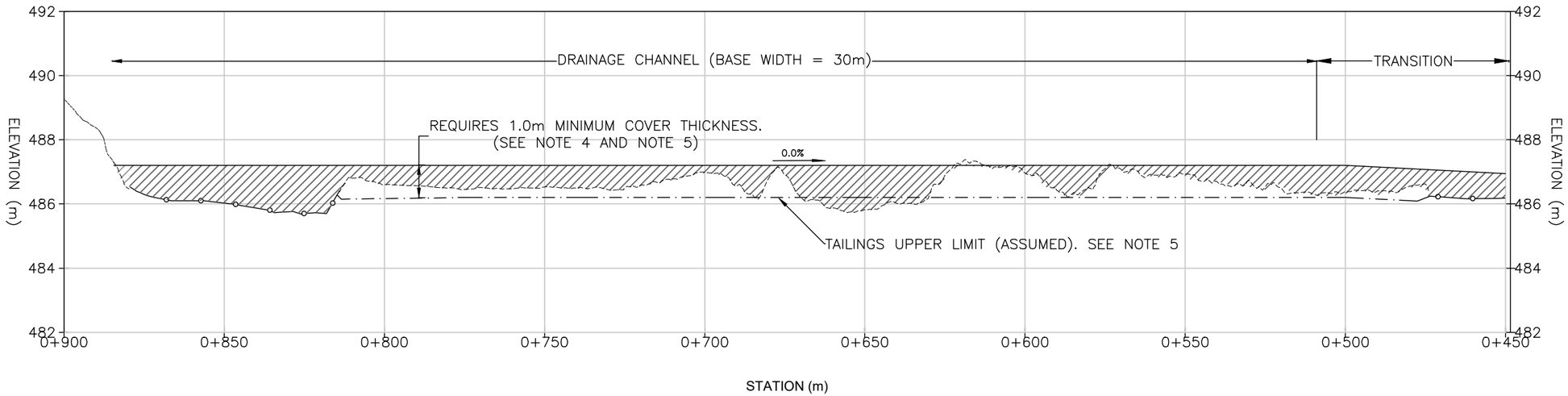
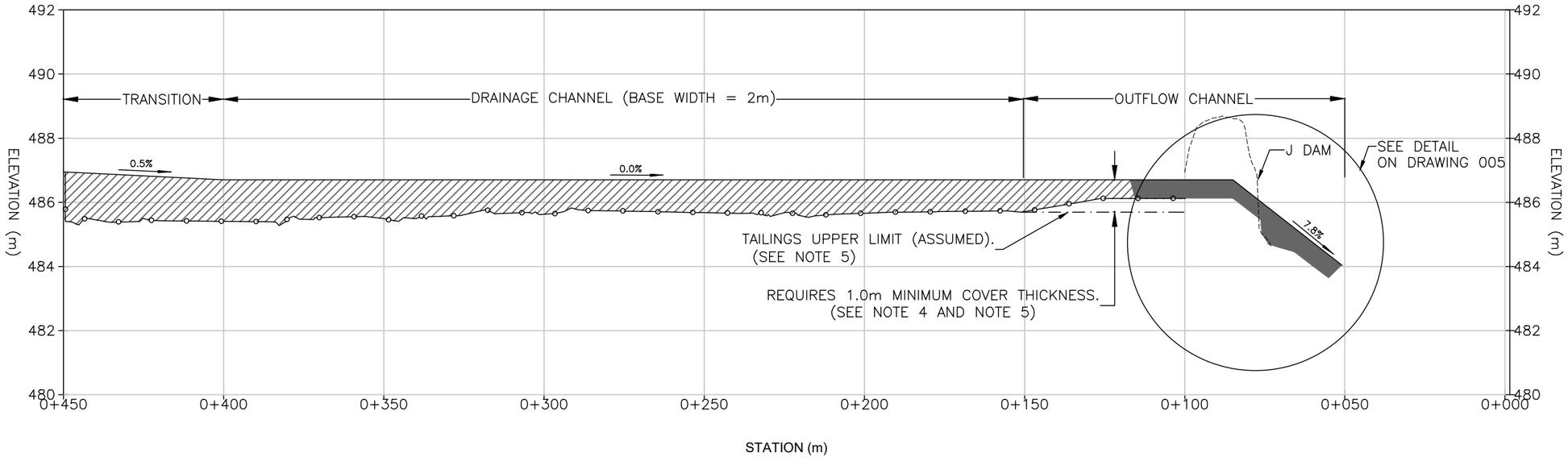


CHANNEL CENTERLINE PROFILE (STA 0+450 TO STA 0+900)

VERTICAL EXAGGERATION: 10X



CHANNEL CENTERLINE PROFILE (STA 0+00 TO STA 0+450)

VERTICA EXAGGERATION: 10X

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LEGEND

- EXISTING GROUND PROFILE
- DESIGN COVER
- NO DATA (SEE NOTE 3)
- ESKER COVER FILL MATERIAL
- OUTFLOW CHANNEL MATERIAL. SEE DRAWING 005

NOTE

1. EXISTING TOPOGRAPHIC CONTOURS AND WATER COVERED AREAS DELINEATED FROM LIDAR SURVEY COMPLETED AUGUST 2019 AND BATHYMETRY SURVEYS COMPETED JUNE 2019.
2. COORDINATES ARE PRESENTED IN NAD83 UTM, ZONE 12.
3. TOPOGRAPHY AND BATHYMETRY SURVEYS NOT AVAILABLE FOR THESE AREAS DUE TO PONDED WATER. THE CONTRACTOR SHALL REMOVE ANY PONDED WATER PRIOR TO PLACEMENT OF COVER FILL IN THESE AREAS. THE CONTRACTOR SHALL ALSO ADJUST THE COVER FILL SURFACE ELEVATIONS AND/OR SUBEXCAVATE IN THESE AREAS TO ENSURE A MINIMUM 1.0m FILL COVER OVER TAILINGS AS DIRECTED BY THE RESIDENT GEOTECHNICAL ENGINEER.
4. OUTLINE OF FILL COVER PLACEMENT IS APPROXIMATE BASED ON INTERPRETATION OF PREVIOUS SURVEYS AND AERIAL PHOTOGRAPHY. THE CONTRACTOR SHALL CONFIRM THE LOCATION AND MINIMUM THICKNESS OF FILL COVER ALONG THE TIE IN LIMITS.
5. DEPTH OF COVER BELOW EXISTING GROUND HAS NOT BEEN CONFIRMED. THE CONTRACTOR SHALL CONDUCT SUBEXACATION AND BACKFILL ACTIVITIES IN THESE AREAS AS DIRECTED BY THE RESIDENT GEOTECHNICAL ENGINEER TO ENSURE A MINIMUM 1.0m FILL COVER OVER TAILINGS.

Client
LUPIN MINES INC.

Project
LUPIN MINE CLOSURE

Title
CELL 5 CLOSURE

PROFILE ALONG CHANNEL CENTERLINE

Scale:-
Drawing No. 003

SS	PK	AW	2020.04.15
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Revision: A

Project No.: 129500081

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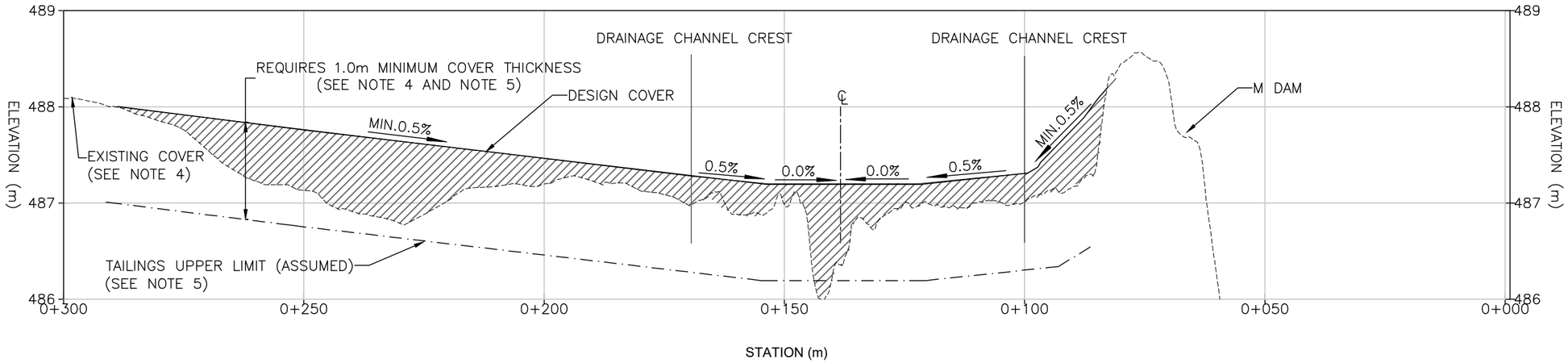
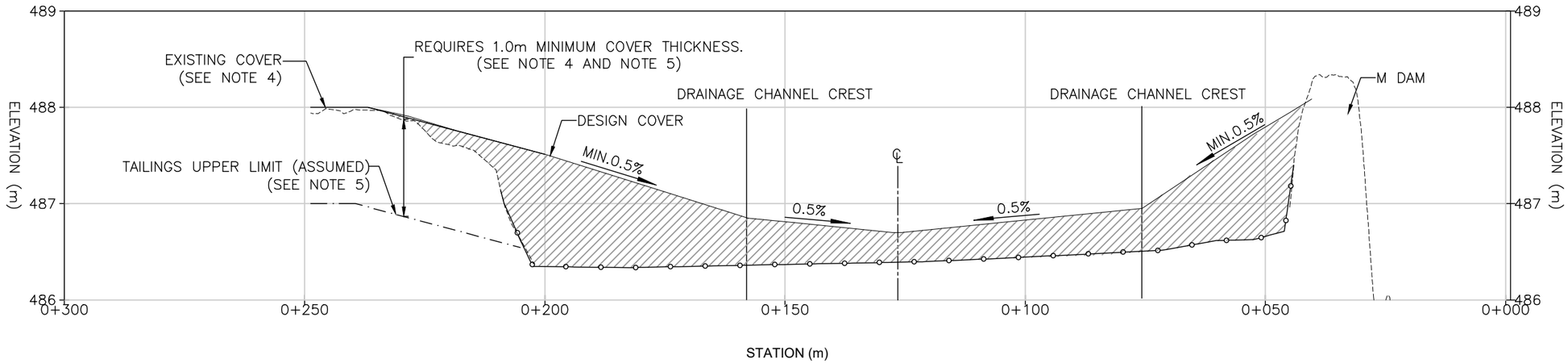


CROSS-SECTION A-A
VERTICAL EXAGGERATION: 20X



CROSS-SECTION B-B
VERTICAL EXAGGERATION: 20X

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LEGEND

- EXISTING GROUND PROFILE
- DESIGN COVER
- DRAINAGE CHANNEL CENTERLINE
- NO DATA (SEE NOTE 3)
- ESKER COVER FILL MATERIAL

NOTE

1. EXISTING TOPOGRAPHIC CONTOURS AND WATER COVERED AREAS DELINEATED FROM LIDAR SURVEY COMPLETED AUGUST 2019 AND BATHYMETRY SURVEYS COMPETED JUNE 2019.
2. COORDINATES ARE PRESENTED IN NAD83 UTM, ZONE 12.
3. TOPOGRAPHY AND BATHYMETRY SURVEYS NOT AVAILABLE FOR THESE AREAS DUE TO PONDED WATER. THE CONTRACTOR SHALL REMOVE ANY PONDED WATER PRIOR TO PLACEMENT OF COVER FILL IN THESE AREAS. THE CONTRACTOR SHALL ALSO ADJUST THE COVER FILL SURFACE ELEVATIONS AND/OR SUBEXCAVATE IN THESE AREAS TO ENSURE A MINIMUM 1.0m FILL COVER OVER TAILINGS AS DIRECTED BY THE RESIDENT GEOTHECHNICAL ENGINEER.
4. OUTLINE OF FILL COVER PLACEMENT IS APPROXIMATE BASED ON INTERPRETATION OF PREVIOUS SURVEYS AND AERIAL PHOTOGRAPHY. THE CONTRACTOR SHALL CONFIRM THE LOCATION AND MINIMUM THICKNESS OF FILL COVER ALONG THE TIE IN LIMITS.

Client
LUPIN MINES INC.

Project
LUPIN MINE CLOSURE

Title
CELL 5 CLOSURE

CROSS-SECTIONS

Scale:-
Drawing No.004

SS	PK	AW	2020.04.15
Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Revision: A

Project No.: 129500081

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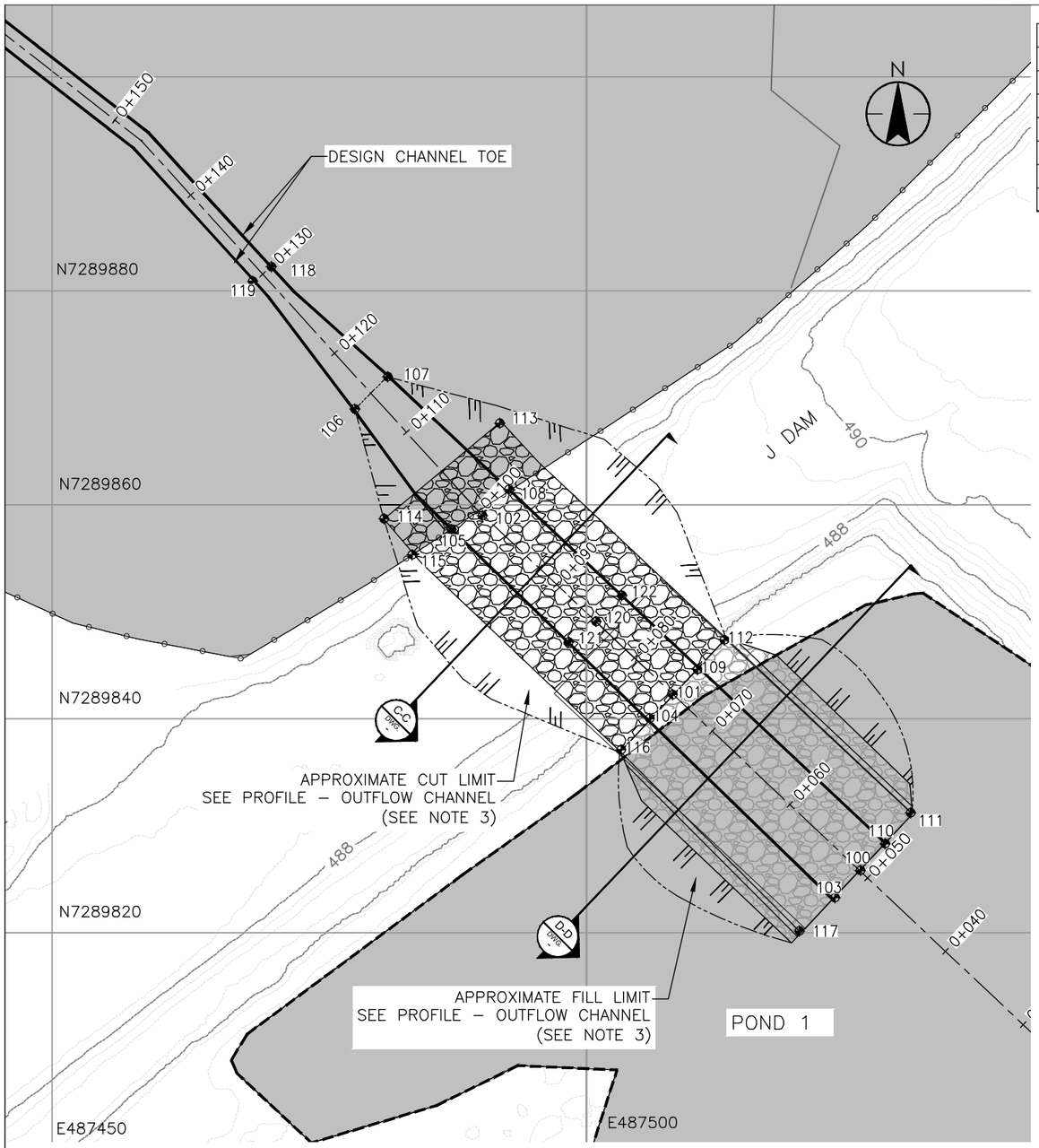


PLAN VIEW – OUTFLOW CHANNEL

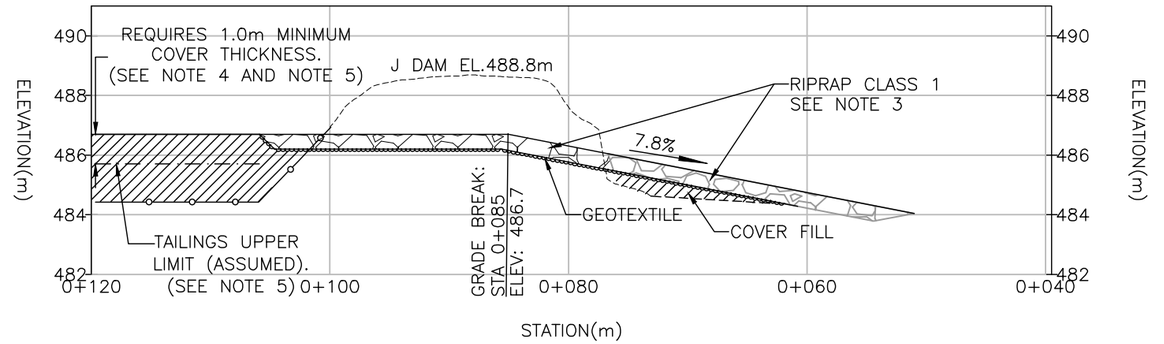
SCALE 1:500

POINT NUMBER	NORTHING	EASTING	ELEVATION
100	7289826	487526	484.1
101	7289842	487508	486.1
102	7289859	487490	486.7
103	7289823	487523	484.6
104	7289840	487506	486.1
105	7289857	487487	486.7
106	7289869	487478	486.7

POINT NUMBER	NORTHING	EASTING	ELEVATION
107	7289872	487481	486.7
108	7289861	487493	486.7
109	7289845	487510	486.1
110	7289828	487528	484.5
111	7289831	487530	484.5
112	7289847	487513	486.9
113	7289868	487492	487.5

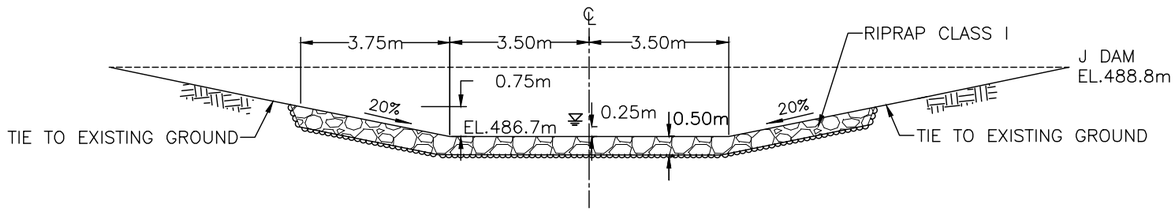
POINT NUMBER	NORTHING	EASTING	ELEVATION
114	7289859	487481	487.5
115	7289855	487483	487.5
116	7289837	487503	486.9
117	7289820	487520	484.5
118	7289882	487471	486.6
119	7289881	487469	486.6
120	7289849	487501	486.7
121	7289847	487498	486.7
122	7289851	487503	486.7

WORK POINTS DESCRIPTION



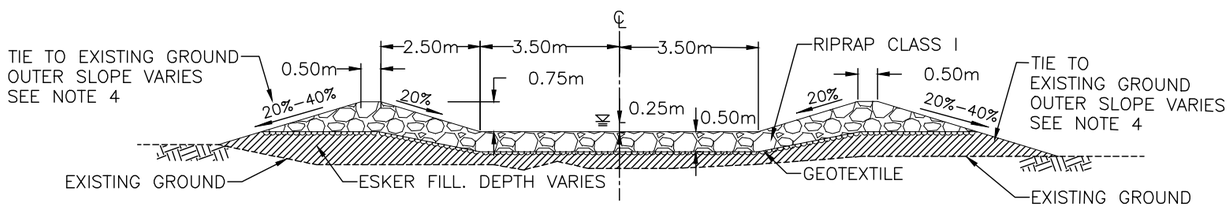
PROFILE – OUTFLOW CHANNEL

VERTIVAL EXAGGERATION: 2.5X



CROSS–SECTION C–C

N.T.S



CROSS–SECTION D–D

N.T.S

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LEGEND

- 2m EXISTING GROUND CONTOURS
- 0.5m EXISTING GROUND CONTOURS
- 2m DESIGN CONTOURS
- 0.5m DESIGN CONTOURS
- APPROXIMATE OUTFLOW CHANNEL WORKS EXTENT
- GEOTEXTILE
- NO DATA. SEE NOTE 3.
- WATERLINE
- WATER COVERED AREA
- ESKER COVER FILL MATERIAL
- RIPRAP–CLASS 1
- RIPRAP–CLASS 1 (EXTENDED PLACEMENT. SEE NOTE 3)

NOTE

1. EXISTING TOPOGRAPHIC CONTOURS AND WATER COVERED AREAS DELINEATED FROM LIDAR SURVEY COMPLETED AUGUST 2019 AND BATHYMETRY SURVEYS COMPETED JUNE 2019.
2. COORDINATES ARE PRESENTED IN NAD83 UTM, ZONE 12.
3. PLACEMENT SHOWN AT TOE OF STRUCTURE (STA 0+050 TO 0+075) MAY NOT BE REQUIRED. REFER TO CONSTRUCTION SPECIFICATIONS DRAWING 001 TABLE 2, CLASS 1 PLACEMENT SPECIFICATIONS FOR ADDITIONAL INFORMATION
4. FILL OUTER BERM SIDE SLOPE
   a. IS 40% FROM GROUND CONTACT IN POND 1 TO STA 0+055
   b. IS 20% BETWEEN STA 0+070 AND CONTACT WITH SIDE SLOPE OF J DAM.
   c. TRANSITIONS SMOOTHLY FROM 40% TO 20% BETWEEN STA 0+050 AND STA 0+070

Client
LUPIN MINES INC.

Project
LUPIN MINE CLOSURE

Title
CELL 5 CLOSURE

OUTFLOW CHANNEL

Scale: 1:4000 Drawing No.005

SS	PK	AW	2020.04.15
Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Revision: A

Project No.: 129500081

File Name: PLAN VIEW-CELL 5

2020.04.15 5:09:55 PM

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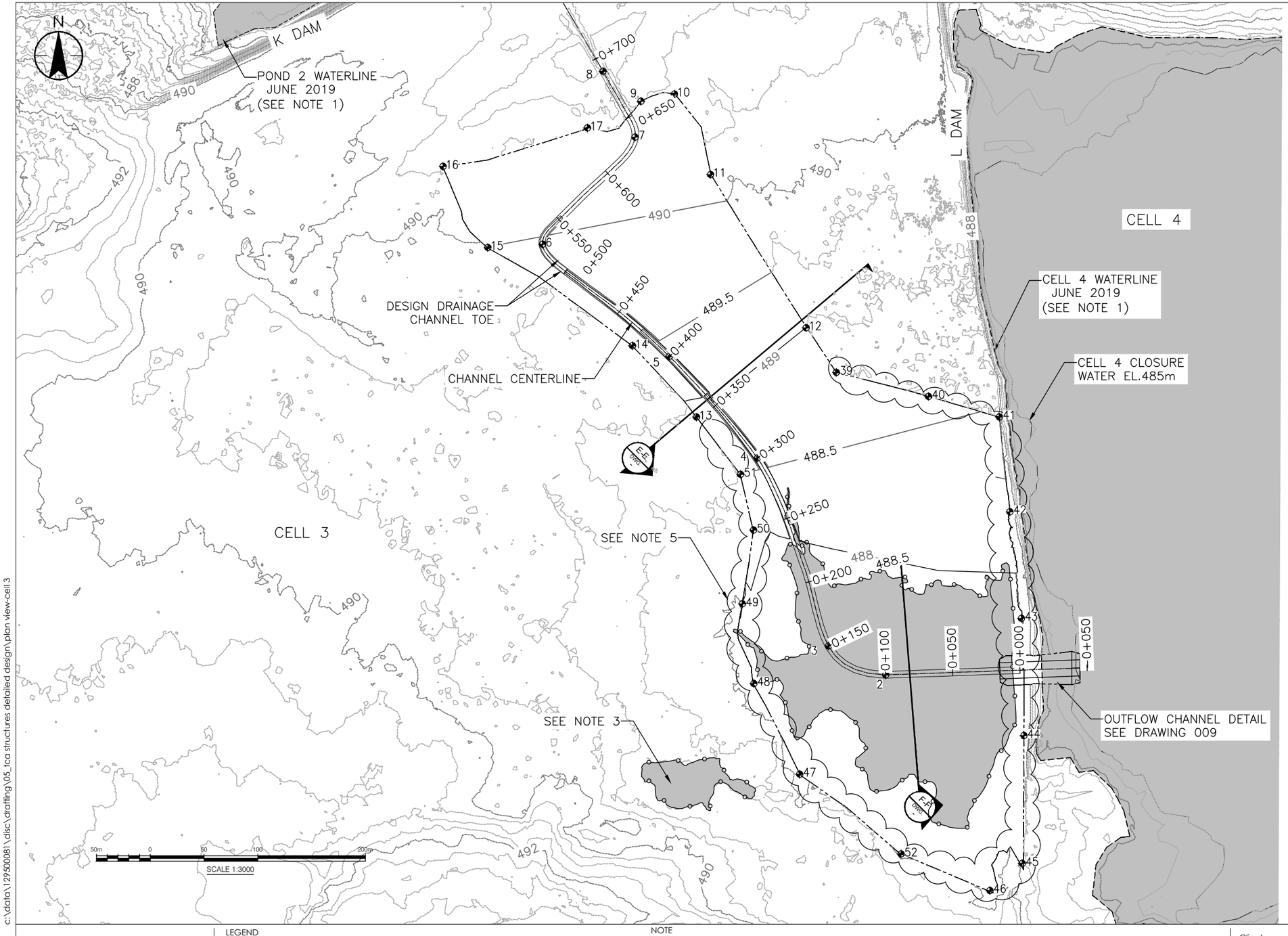
ORIGINAL SHEET - ANSI B (11 "x 17")



WORK POINTS DESCRIPTION

	POINT NUMBER	NORTHING	EASTING	ELEVATION
CHANNEL CENTERLINE	1	7288600	487305	487.0
	2	7288596	487205	487.0
	3	7288618	487163	487.1
	4	7288757	487110	487.9
	5	7288833	487044	488.8
	6	7288916	486950	489.8
	7	7288996	487019	490.8
	8	7289045	486995	491.3
COVER DESIGN	9	7289022	487023	491.0
	10	7289028	487048	490.9
	11	7288968	487075	490.2
	12	7288854	487146	489.0
	13	7288788	487064	489.0
	14	7288841	487017	489.5
	15	7288914	486909	490.0
	16	7288974	486876	490.5
	17	7289002	486983	490.5
	39	487168	7288821	488.6
	40	7288803	487237	488.5
	41	7288788	487290	488.5
	42	7288717	487298	488.3
	43	7288626	487308	487.5
	44	7288551	487308	487.6
	45	7288456	487307	487.7
	46	7288436	487283	487.8
	47	7288522	487141	487.9
	48	7288590	487107	487.8
	49	7288649	487098	487.9
	50	7288704	487107	488.3
	51	7288745	487097	488.5

B

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LEGEND

- 2m EXISTING GROUND CONTOURS
- 0.5m EXISTING GROUND CONTOURS
- 2m DESIGN CONTOURS
- 0.5m DESIGN CONTOURS
- CHANNEL BOUNDARY
- DESIGN COVER EXTENT. TIE TO EXISTING GROUND. SEE NOTE 4.
- BATHYMETRY SURVEY WATERLINE (JUNE 2019)
- NO DATA. SEE NOTE 3
- SEE NOTE 5
- WATER COVERED AREA

NOTE

1. EXISTING TOPOGRAPHIC CONTOURS AND WATER COVERED AREAS DELINEATED FROM LIDAR SURVEY COMPLETED AUGUST 2019 AND BATHYMETRY SURVEYS COMPETED JUNE 2019.
2. COORDINATES ARE PRESENTED IN NAD83 UTM, ZONE 12.
3. TOPOGRAPHY AND BATHYMETRY SURVEYS NOT AVAILABLE FOR THESE AREAS DUE TO PONDED WATER. THE CONTRACTOR SHALL REMOVE ANY PONDED WATER PRIOR TO PLACEMENT OF COVER FILL IN THESE AREAS. THE CONTRACTOR SHALL ALSO ADJUST THE COVER FILL SURFACE ELEVATIONS AND/OR SUBEXCAVATE IN THESE AREAS TO ENSURE A MINIMUM 1.0M FILL COVER OVER TAILINGS AS DIRECTED BY THE RESIDENT GEOTECHNICAL ENGINEER.
4. OUTLINE OF FILL COVER PLACEMENT IS APPROXIMATE BASED ON INTERPRETATION OF PREVIOUS SURVEYS AND AERIAL PHOTOGRAPHY. THE CONTRACTOR SHALL CONFIRM THE LOCATION AND MINIMUM THICKNESS OF FILL COVER ALONG THE TIE IN LIMITS.
5. COVER TIE IN WILL BE FIELD FITTED UNDER DIRECTION OF THE RESIDENT GEOTECHNICAL ENGINEER DEPENDING ON ACTUAL FIELD CONDITION AND TOPOGRAPHIC INFORMATION.

Client
LUPIN MINES INC.

Project
LUPIN MINE CLOSURE

Title
CELL 3 CLOSURE
PLAN VIEW

Scale: 1:3000 Drawing No. 006

SS	PK	AT	2020.05.05	
Dwn.	Dsgn.	Chkd.	YYYY.MM.DD	Revision: B

Project No.: 129500081

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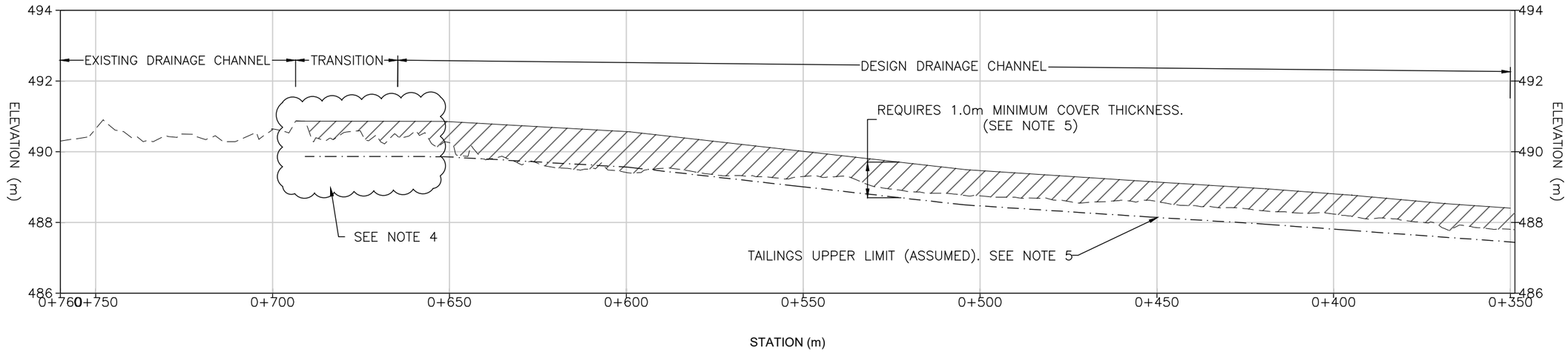
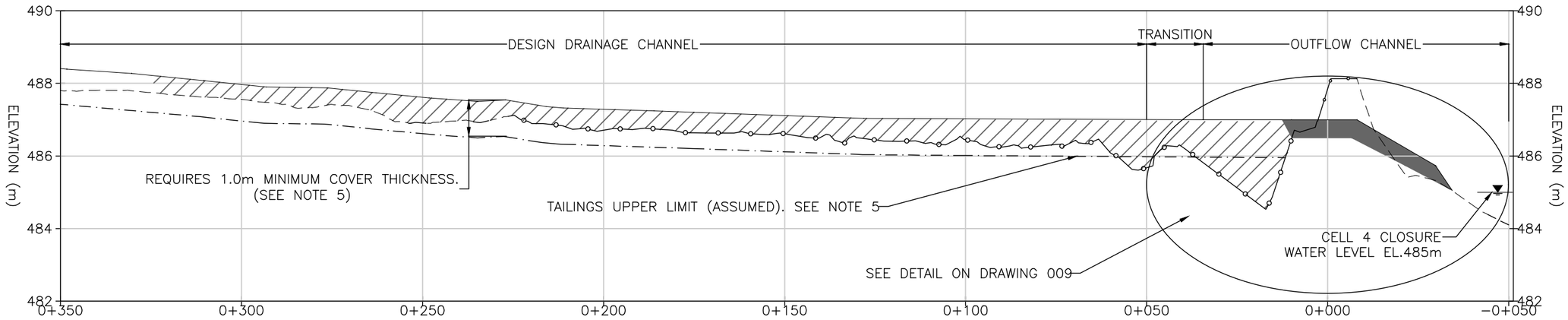
ORIGINAL SHEET - ANSI B (11"x 17")



CHANNEL CENTERLINE PROFILE (STA 0+350 TO STA 0+760)

VERTICAL EXAGGERATION: 10X



CHANNEL CENTERLINE PROFILE (STA 0+00 TO STA 0+350)

VERTICA EXAGGERATION: 10X

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LEGEND

- EXISTING GROUND PROFILE
- DESIGN COVER
- NO DATA (SEE NOTE 3)
- ESKER COVER FILL MATERIAL
- OUTFLOW CHANNEL MATERIAL. SEE DRAWING 005
- SEE NOTE 4

NOTE

1. EXISTING TOPOGRAPHIC CONTOURS AND WATER COVERED AREAS DELINEATED FROM LIDAR SURVEY COMPLETED AUGUST 2019 AND BATHYMETRY SURVEYS COMPETED JUNE 2019.
2. COORDINATES ARE PRESENTED IN NAD83 UTM, ZONE 12.
3. TOPOGRAPHY AND BATHYMETRY SURVEYS NOT AVAILABLE FOR THESE AREAS DUE TO PONDED WATER. THE CONTRACTOR SHALL REMOVE ANY PONDED WATER PRIOR TO PLACEMENT OF COVER FILL IN THESE AREAS. THE CONTRACTOR SHALL ALSO ADJUST THE COVER FILL SURFACE ELEVATIONS AND/OR SUBEXCAVATE IN THESE AREAS TO ENSURE A MINIMUM 1.0m FILL COVER OVER TAILINGS AS DIRECTED BY THE RESIDENT GEOTHECHNICAL ENGINEER.
4. OUTLINE OF FILL COVER PLACEMENT IS APPROXIMATE BASED ON INTERPRETATION OF PREVIOUS SURVEYS AND AERIAL PHOTOGRAPHY. THE CONTRACTOR SHALL CONFIRM THE LOCATION AND MINIMUM THICKNESS OF FILL COVER ALONG THE TIE IN LIMITS.
5. DEPTH OF COVER BELOW EXISTING GROUND HAS NOT BEEN CONFIRMED. THE CONTRACTOR SHALL CONDUCT SUBEXACATION AND BACKFILL ACTIVITIES IN THESE AREAS AS DIRECTED BY THE RESIDENT GEOTECHNICAL ENGINEER TO ENSURE A MINIMUM 1.0m FILL COVER OVER TAILINGS.

Client
LUPIN MINES INC.

Project
LUPIN MINE CLOSURE

Title
CELL 3 CLOSURE
PROFILE ALONG CHANNEL CENTERLINE

Scale:- Drawing No. 007

Dwn.	Dsgn.	Chkd.	YYYY.MM.DD	Revision: A
SS	PK	AT	2020.04.29	

Project No.: 129500081

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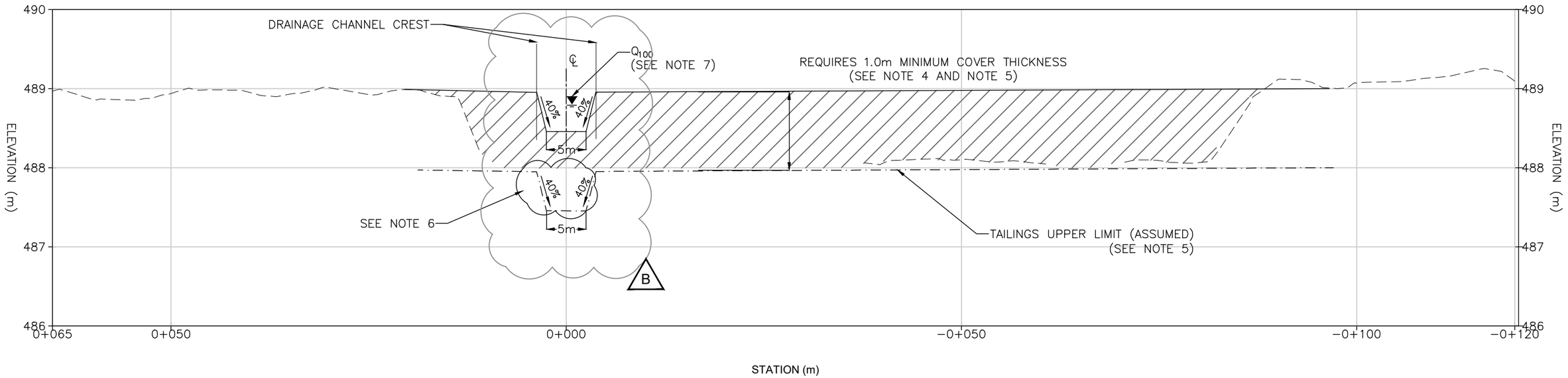
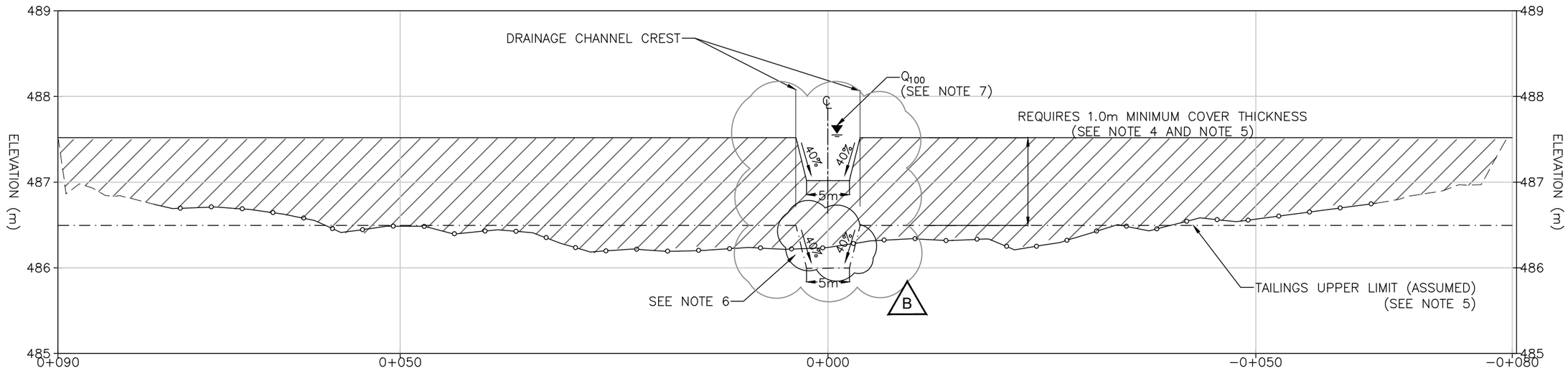


STATION (m)

CROSS−SECTION E−E

VERTICAL EXAGGERATION: 10X



STATION (m)

CROSS−SECTION F−F

VERTICAL EXAGGERATION: 10X

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LEGEND

- EXISTING GROUND PROFILE
- DESIGN COVER
- DRAINAGE CHANNEL CENTERLINE
- NO DATA (SEE NOTE 3)
- SEE NOTE 6
- ESKER COVER FILL MATERIAL

NOTE

1. EXISTING TOPOGRAPHIC CONTOURS AND WATER COVERED AREAS DELINEATED FROM LIDAR SURVEY COMPLETED AUGUST 2019 AND BATHYMETRY SURVEYS COMPETED JUNE 2019.
2. COORDINATES ARE PRESENTED IN NAD83 UTM, ZONE 12.
3. TOPOGRAPHY AND BATHYMETRY SURVEYS NOT AVAILABLE FOR THESE AREAS DUE TO PONDED WATER. THE CONTRACTOR SHALL REMOVE ANY PONDED WATER PRIOR TO PLACEMENT OF COVER FILL IN THESE AREAS. THE CONTRACTOR SHALL ALSO ADJUST THE COVER FILL SURFACE ELEVATIONS AND/OR SUBEXCAVATE IN THESE AREAS TO ENSURE A MINIMUM 1.0m FILL COVER OVER TAILINGS AS DIRECTED BY THE RESIDENT GEOTHECHNICAL ENGINEER.
4. OUTLINE OF FILL COVER PLACEMENT IS APPROXIMATE BASED ON INTERPRETATION OF PREVIOUS SURVEYS AND AERIAL PHOTOGRAPHY. THE CONTRACTOR SHALL CONFIRM THE LOCATION AND MINIMUM THICKNESS OF FILL COVER ALONG THE TIE IN LIMITS.
5. DEPTH OF COVER BELOW EXISTING GROUND HAS NOT BEEN CONFIRMED. THE CONTRACTOR SHALL CONDUCT SUBEXACATION AND BACKFILL ACTIVITIES IN THESE AREAS AS DIRECTED BY THE RESIDENT GEOTECHNICAL ENGINEER TO ENSURE A MINIMUM 1.0m FILL COVER OVER TAILINGS.
6. COVER TIE IN WILL BE FIELD FITTED UNDER DIRECTION OF THE RESIDENT GEOTECHNICAL ENGINEER DEPENDING ON ACTUAL FIELD CONDITION AND TOPOGRAPHIC INFORMATION.
7. ILLUSTRATES APPROXIMATE FLOW DEPTH FOR 1−IN−100−YEAR, 24−HOUR STORM EVENT.

B

Client
LUPIN MINES INC.

Project
LUPIN MINE CLOSURE

Title
CELL 3 CLOSURE

CROSS-SECTIONS

Scale:- Drawing No. 008

Dwn.	Dsgn.	Chkd.	YYYY.MM.DD	Revision:
SS	PK	AT	2020.05.08	B

Project No.: 129500081

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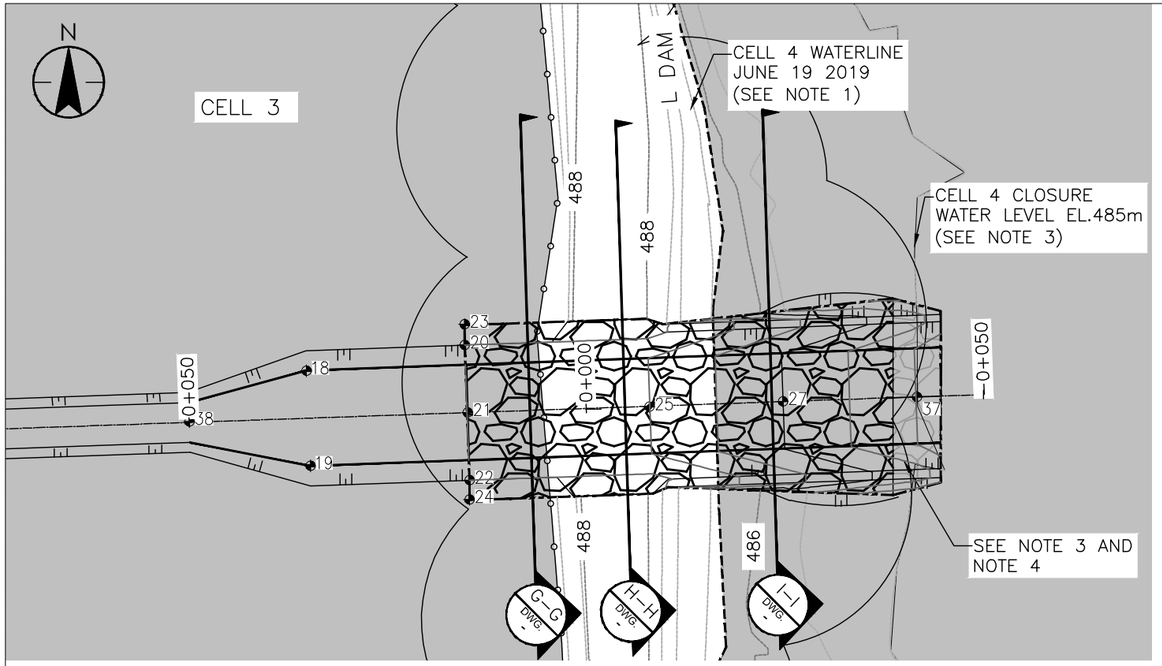
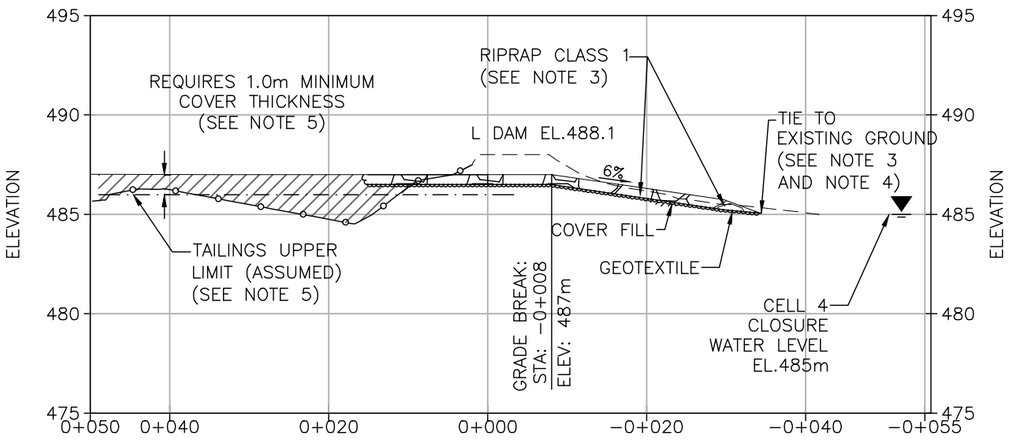
ORIGINAL SHEET - ANSI B (11"x 17")



PLAN VIEW – OUTFLOW CHANNEL

SCALE 1:750



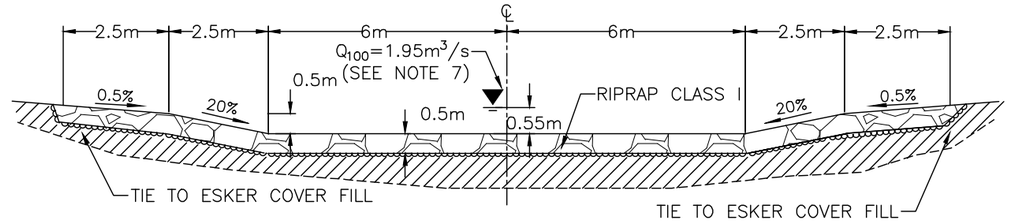
PROFILE – OUTFLOW CHANNEL

VERTIVAL EXAGGERATION: 2.5X

POINT NUMBER	NORTHING	EASTING	ELEVATION
18	7288604	487270	487.0
19	7288592	487270	487.0
20	7288608	487290	487.5
21	7288599	487290	487.0
22	7288591	487290	487.5
23	7288610	487295	488.0

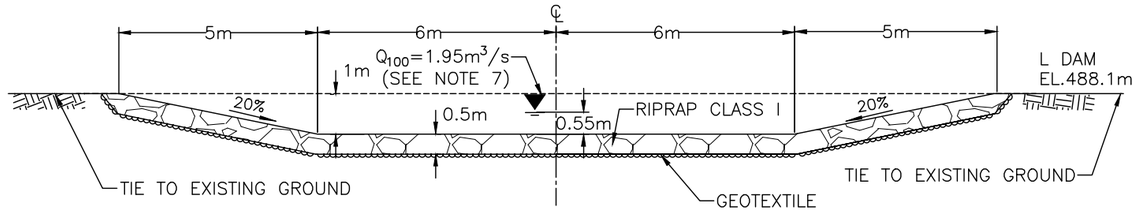
POINT NUMBER	NORTHING	EASTING	ELEVATION
24	7288588	487295	488.0
25	7288599	487312	487.0
27	7288600	487330	486.0
37	7288601	487353	485.0
38	7288597	487255	487.0

OUTFLOW WORK POINTS



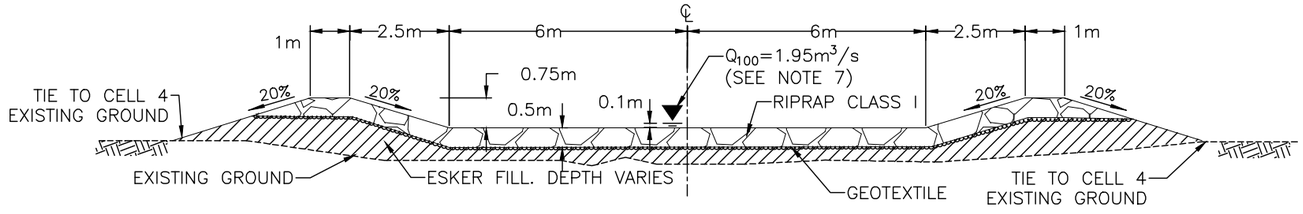
CROSS SECTION G–G

N.T.S



CROSS–SECTION H–H

N.T.S



CROSS–SECTION I–I

N.T.S

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LEGEND

- 2m EXISTING GROUND CONTOURS
- 0.5m EXISTING GROUND CONTOURS
- 2m DESIGN CONTOURS
- 0.5m DESIGN CONTOURS
- APPROXIMATE OUTFLOW CHANNEL WORKS EXTENT
- GEOTEXTILE
- NO DATA. SEE NOTE 6.
- WATERLINE
- SEE NOTE 5
- WATER COVERED AREA
- ESKER COVER FILL MATERIAL
- RIPRAP–CALSS 1
- RIPRAP–CALSS 1 EXTENDED PLACEMENT. (SEE NOTE 3)

NOTE

1. EXISTING TOPOGRAPHIC CONTOURS AND WATER COVERED AREAS DELINEATED FROM LIDAR SURVEY COMPLETED AUGUST 2019 AND BATHYMETRY SURVEYS COMPETED JUNE 2019.
2. COORDINATES ARE PRESENTED IN NAD83 UTM, ZONE 12.
3. CLOSURE ELEVATION WATER EXTENT SHOWN IS APPROXIMATE. RIPRAP SHALL EXTEND AT LEAST TO THE EDGE OF WATER.
4. ROCK PLACEMENT AND TIE IN TO EXISTING TOPOGRAPHY SHALL BE FIELD FITTED UNDER THE DIRECTION OF THE RESIDENT GEOTECHNICAL ENGINEER AND MAY BE ADJUSTED DEPENDING ON TOPOGRAPHY, GEOLOGY, AND/OR AVAILABILITY OF LARGER ROCK MATERIALS. REFER TO CONSTRUCTION SPECIFICATIONS DRAWING 001 TABLE 2.
5. COVER TIE IN WILL BE FIELD FITTED UNDER DIRECTION OF THE RESIDENT GEOTECHNICAL ENGINEER DEPENDING ON ACTUAL FIELD CONDITION AND TOPOGRAPHIC INFORMATION.
6. TOPOGRAPHY AND BATHYMETRY SURVEYS NOT AVAILABLE FOR THESE AREAS DUE TO PONDED WATER. THE CONTRACTOR SHALL REMOVE ANY PONDED WATER PRIOR TO PLACEMENT OF COVER FILL IN THESE AREAS. THE CONTRACTOR SHALL ALSO ADJUST THE COVER FILL SURFACE ELEVATIONS AND/OR SUBEXCAVATE IN THESE AREAS TO ENSURE A MINIMUM 1.0m FILL COVER OVER TAILINGS AS DIRECTED BY THE RESIDENT GEOTHECHNICAL ENGINEER.
7. ILLUSTRATES APPROXIMATE FLOW DEPTH AND FLOW RATE (Q) FOR 1–IN–100–YEAR, 24–HOUR STORM EVENT.

Client
LUPIN MINES INC.

Project
LUPIN MINE CLOSURE

Title
CELL 3 CLOSURE
OUTFLOW CHANNEL

Scale:- Drawing No. 009

SS	PK	AT	2020.05.08
Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Revision: A

Project No.: 129500081

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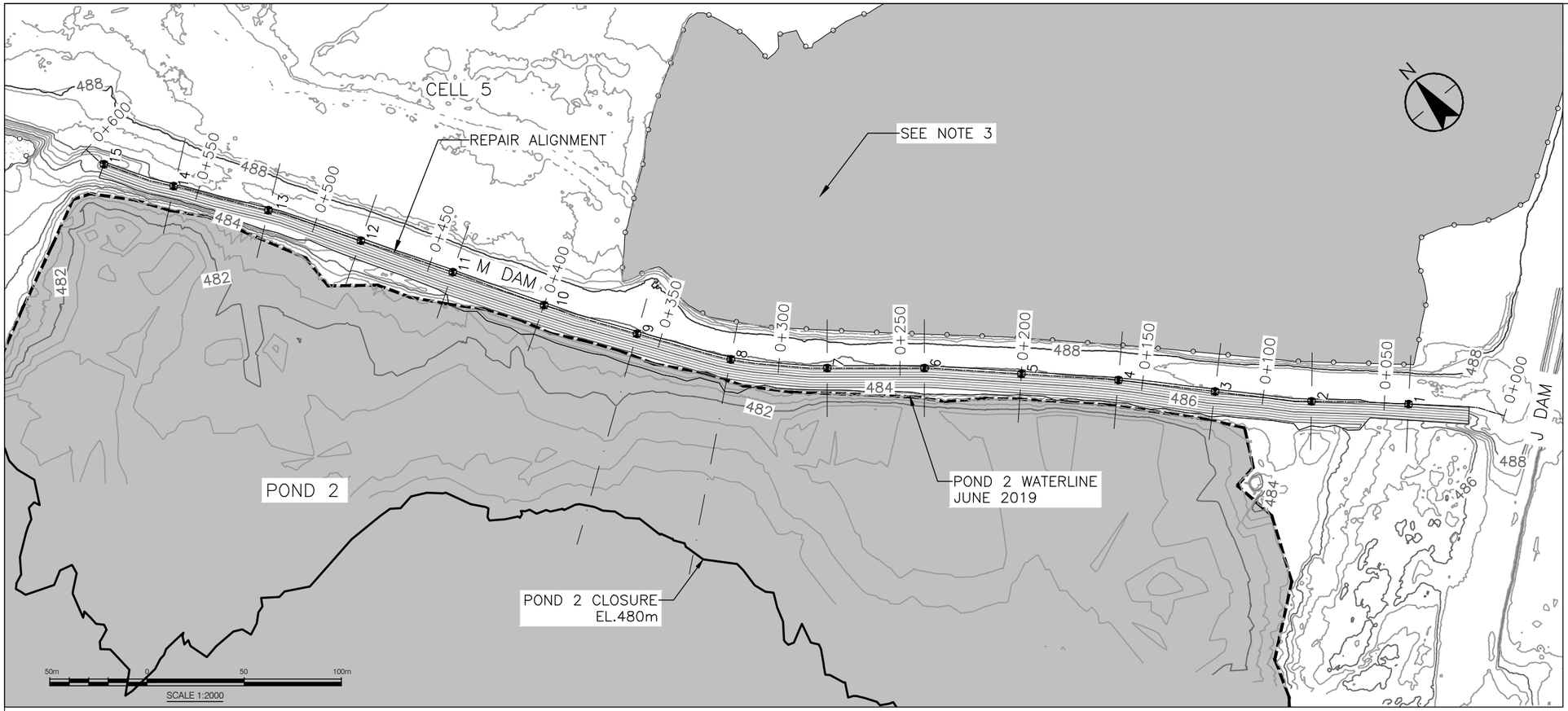
ORIGINAL SHEET - ANSI B (11"x 17")



NOTE

1. EXISTING TOPOGRAPHIC CONTOURS AND WATER COVERED AREAS DELINEATED FROM LIDAR SURVEY COMPLETED AUGUST 2019 AND BATHYMETRY SURVEYS COMPETED JUNE 2019.
2. COORDINATES ARE PRESENTED IN NAD83 UTM, ZONE 12.
3. TOPOGRAPHY AND BATHYMETRY SURVEYS NOT AVAILABLE FOR THESE AREAS DUE TO PONDED WATER. THE CONTRACTOR SHALL REMOVE ANY PONDED WATER PRIOR TO PLACEMENT OF FILL IN THESE AREAS.
4. REFER TO DRAWING 001 FOR GENERAL MATERIAL FILL SPECIFICATION AND FOUNDATION PREPARATION.
5. THE RESLOPED DOWNSTREAM FACE MUST BE 2.1H:1V OR FLATTER, MEASURED FROM THE EXISTING CREST.
6. ANY LOOSE AND OVERHANG MATERIAL MUST BE REMOVED TO THE APPROVED OF SITE ENGINEERING REPRESENTATIVE. THE REMOVED SAND AND GRAVEL MATERIAL CAN BE USED ELSEWHERE ALONG THE RESLOPE SUBJECT TO ENGINEER'S APPROVAL.
7. ALL SAND AND GRAVEL (ESKER) MATERIAL TO BE PLACED WITHIN THE RESLOPE MUST BE TRACK COMPACTED, SUBJECTED TO EQUIPMENT SIZE AND OPERATION PATTERN AS APPROVED BY THE ENGINEER.
8. ALL EROSION GULLIES ALONG THE DOWNSTREAM CREST INCURRED PREVIOUSLY MUST BE REPAIRED TO PROVIDE A UNIFORMLY ALIGNED CREST LINE. THE REPAIRED SHALL BE DONE WITH COMPACTED SAND AND GRAVEL (ESKER) MATERIAL, WITH ALL LOOSE OR OVERHANG MATERIAL MUST BE REMOVED, TO THE APPROVED OF THE ENGINEER.
9. THE FINAL SURFACE SHOULD BE AN EVEN, FIRM, SMOOTH SURFACE THAT MEETS THE SLOPE REQUIREMENT ABOVE AT THE DOWNSTREAM FACE OF THE DAM.

WORK POINTS DESCRIPTION

WORK POINTS	NORTHING	EASTING	ELEVATION
1	7289813	487376	488.5
2	7289840	487346	488.4
3	7289868	487318	488.4
4	7289897	487291	487.9
5	7289925	487262	487.5
6	7289952	487233	488
7	7289978	487202	487.7
8	7290006	487174	487.8

WORK POINTS	NORTHING	EASTING	ELEVATION
9	7290039	487151	487.8
10	7290073	487130	488
11	7290108	487109	488.5
12	7290142	487089	488.1
13	7290176	487068	488
14	7290209	487044	488
15	7290234	487028	487.7

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LEGEND

- 2m EXISTING GROUND CONTOURS
- 0.5m EXISTING GROUND CONTOURS
- 2m DESIGN CONTOURS
- 0.5m DESIGN CONTOURS
- DESIGN M DAM – RESLOPE
- SECTION LINES
- BATHYMETRY SURVEY WATERLINE (JUNE 2019)
- NO DATA. SEE NOTE 3
- WATER COVERED AREA

Client: LUPIN MINES INC.

Project: LUPIN MINE CLOSURE

Title: M DAM REPAIR
PLAN VIEW

Scale: 1:2000 Drawing No. 010

SS	PK	AT	2020.05.13
Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Revision: A

Project No.: 129500081

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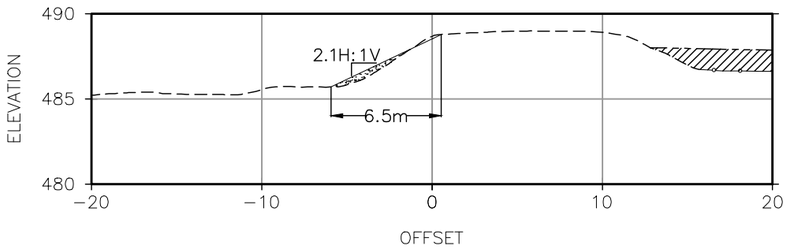
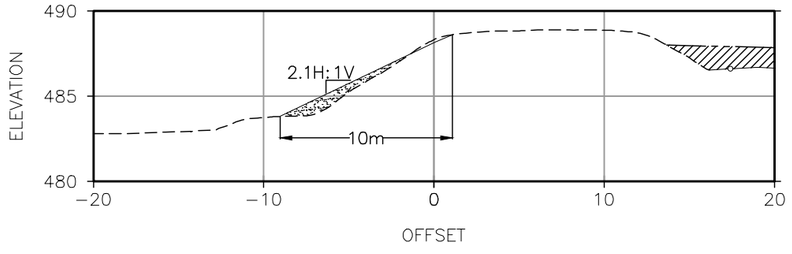


SECTION 0+040



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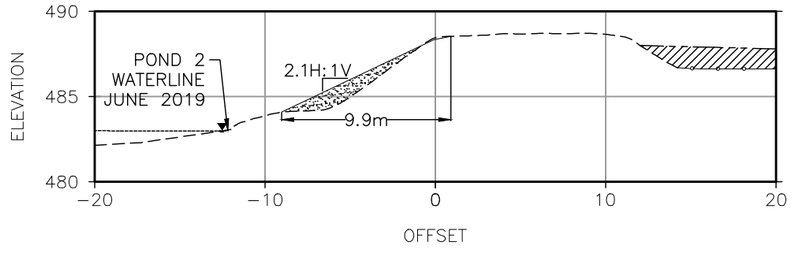

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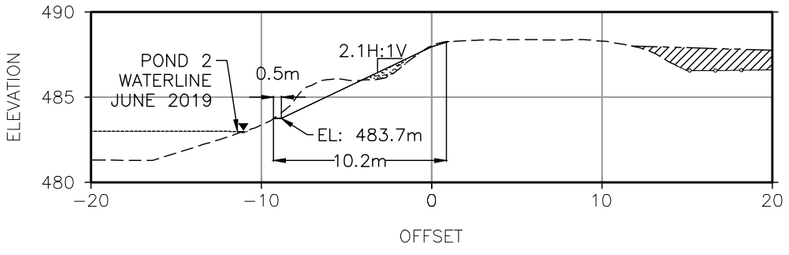

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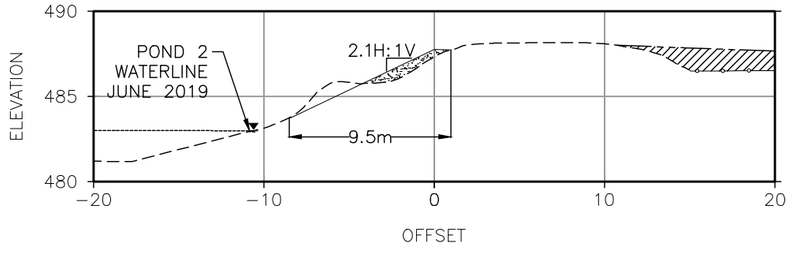

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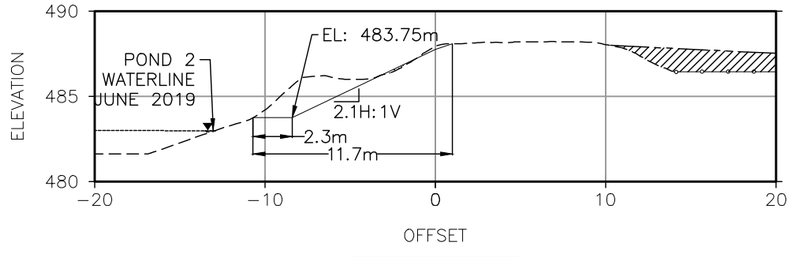

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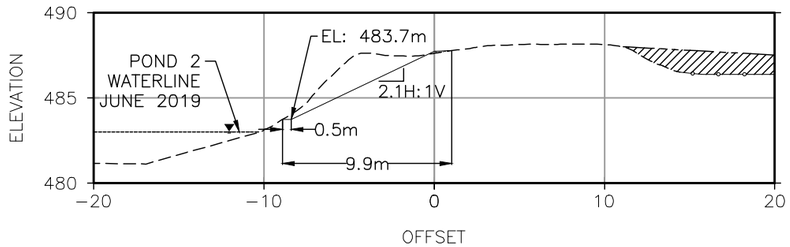

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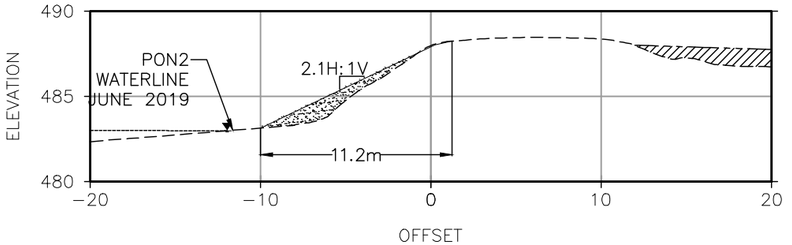

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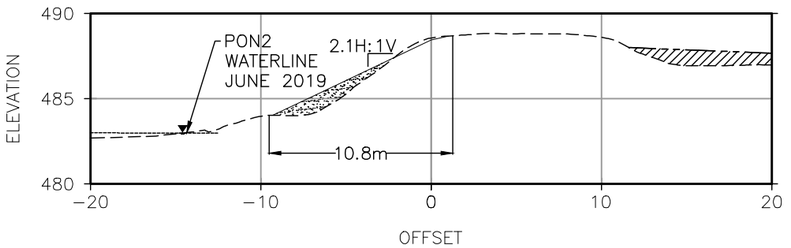

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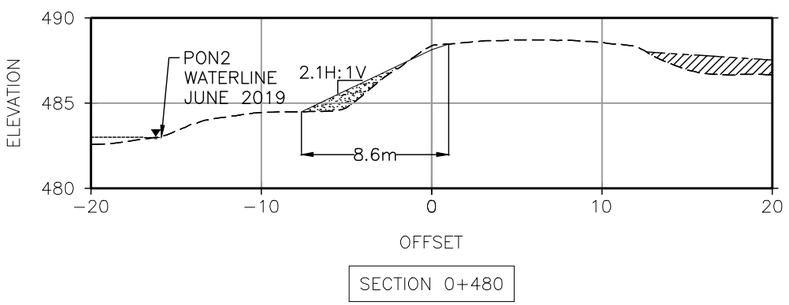

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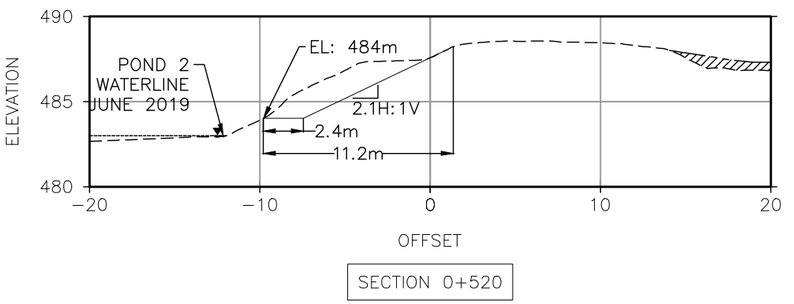

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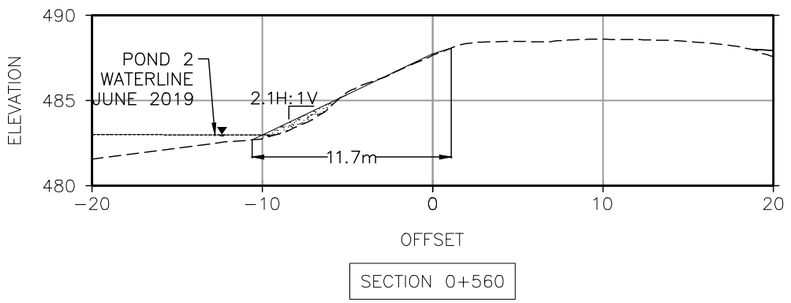

SECTION 0+560

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LEGEND

- EXISTING GROUND
- DESIGN DAM
- CELL 5 DESIGN COVER
- COMPACTED FILL
- NO DATA. SEE NOTE 3
- ESKER COVER FILL MATERIAL

NOTE

1. EXISTING TOPOGRAPHIC CONTOURS AND WATER COVERED AREAS DELINEATED FROM LIDAR SURVEY COMPLETED AUGUST 2019 AND BATHYMETRY SURVEYS COMPETED JUNE 2019.
2. COORDINATES ARE PRESENTED IN NAD83 UTM, ZONE 12.
3. TOPOGRAPHY AND BATHYMETRY SURVEYS NOT AVAILABLE FOR THESE AREAS DUE TO PONDED WATER. THE CONTRACTOR SHALL REMOVE ANY PONDED WATER PRIOR TO PLACEMENT OF FILL IN THESE AREAS.

Client
LUPIN MINES INC.

Project
LUPIN MINE CLOSURE

Title
M DAM REPAIR

CROSS SECTIONS - 1

Scale: 1:500 Drawing No. 011

SS	PK	AT	2020.05.13
Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Revision: A

Project No.: 129500081

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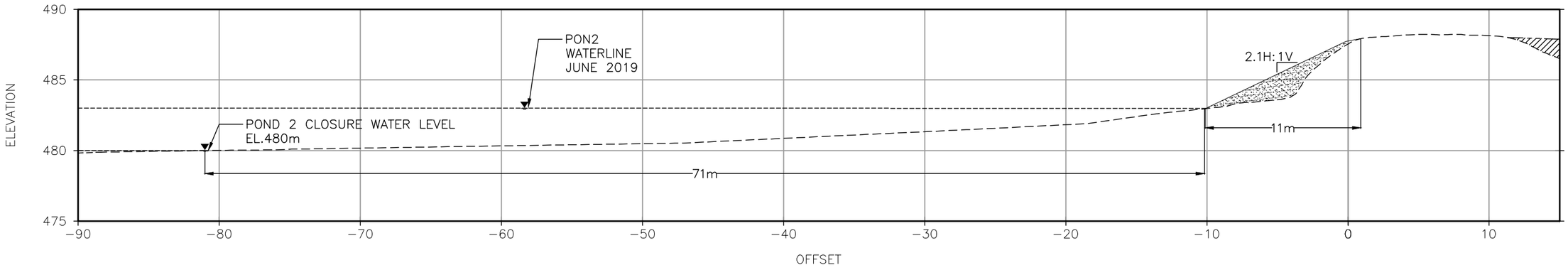

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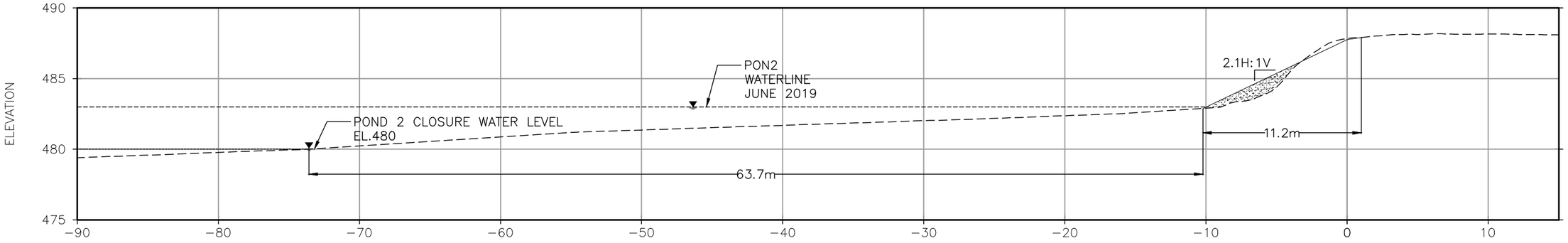

SECTION 0+360

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LEGEND

- EXISTING GROUND
- DESIGN DAM
- WATER LEVEL
- CELL 5 DESIGN COVER
- COMPACTED FILL
- NO DATA. SEE NOTE 3
- ESKER COVER FILL MATERIAL

NOTE

1. EXISTING TOPOGRAPHIC CONTOURS AND WATER COVERED AREAS DELINEATED FROM LIDAR SURVEY COMPLETED AUGUST 2019 AND BATHYMETRY SURVEYS COMPETED JUNE 2019.
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Client
LUPIN MINES INC.

Project
LUPIN MINE CLOSURE

Title
M DAM REPAIR

CROSS SECTIONS - 2

Scale:1:500 Drawing No. 012

SS	PK	AT	2020.05.13
Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Revision: A

Project No.:129500081

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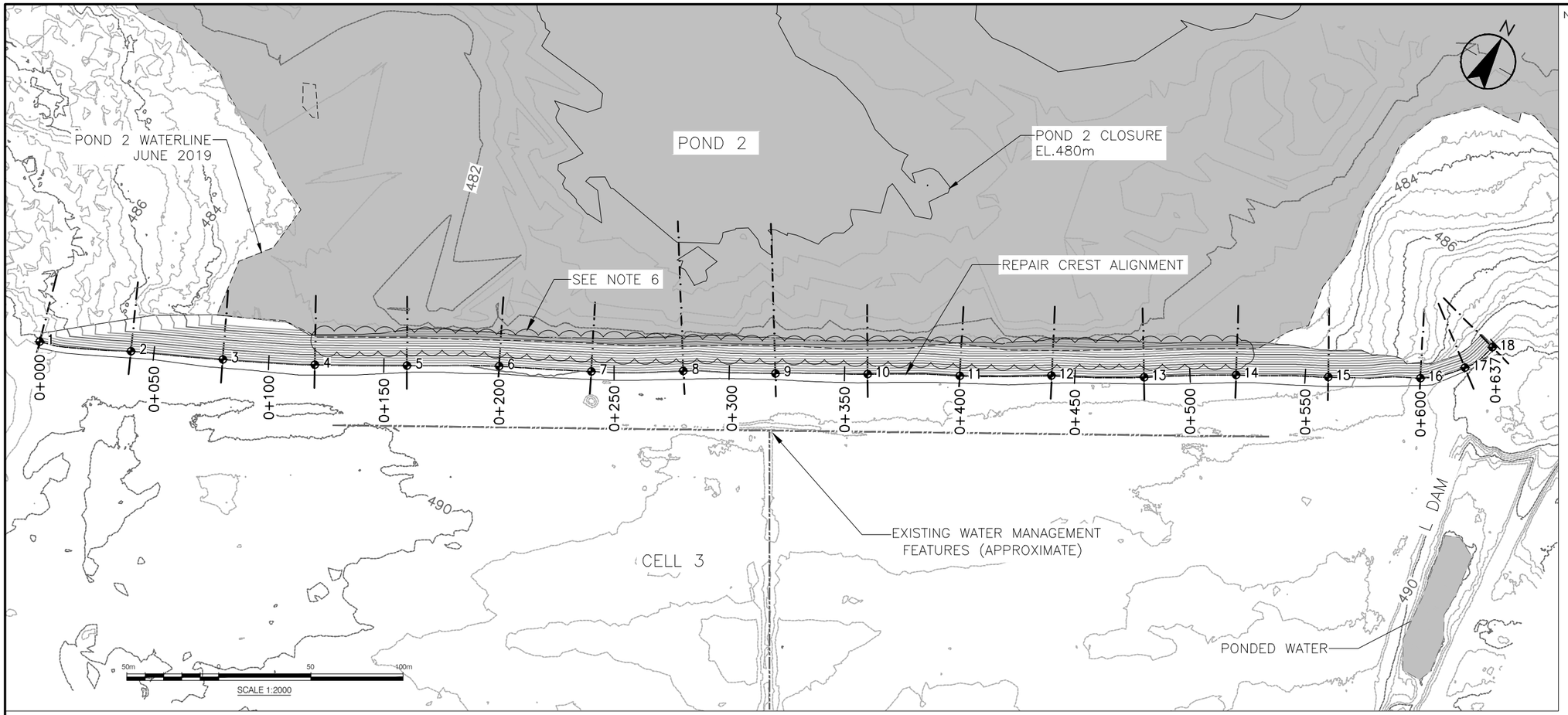

NOTE:

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2. COORDINATES ARE PRESENTED IN NAD83 UTM, ZONE 12.
3. TOPOGRAPHY AND BATHYMETRY SURVEYS NOT AVAILABLE FOR THESE AREAS DUE TO PONDED WATER. THE CONTRACTOR SHALL REMOVE ANY PONDED WATER PRIOR TO PLACEMENT OF FILL IN THESE AREAS.
4. REFER TO DRAWING 001 FOR GENERAL MATERIAL FILL SPECIFICATION AND FOUNDATION PREPARATION.
5. THE RESLOPED DOWNSTREAM FACE MUST BE 2.1H:1V OR FLATTER, MEASURED FROM THE EXISTING CREST.
6. THE DOWNSTREAM TOE AND THE DAM CREST WERE ERODED BASED ON 2019 OBSERVATION. THE EXTENT OF THE CREST EROSIONS AND OVERHANG WILL BE CONFIRMED BY ENGINEER REPRESENTATIVE. ALL ERODED SECTION OF THE DAM MUST BE REPLACED WITH SUITABLE SAND AND GRAVEL (ESKER) MATERIAL ACCORDING TO THE SPECIFICATIONS AND NOTE HEREIN.
7. ANY LOOSE AND OVERHANG MATERIAL MUST BE REMOVED TO THE APPROVED OF SITE ENGINEERING REPRESENTATIVE. THE REMOVED SAND AND GRAVEL MATERIAL CAN BE USED ELSEWHERE ALONG THE RESLOPE SUBJECT TO ENGINEER'S APPROVAL.
8. ALL SAND AND GRAVEL (ESKER) MATERIAL TO BE PLACED WITHIN THE RESLOPE MUST BE TRACK COMPACTED, SUBJECTED TO EQUIPMENT SIZE AND OPERATION PATTERN AS APPROVED BY THE ENGINEER.
9. ALL EROSION GULLIES ALONG THE DOWNSTREAM CREST INCURRED PREVIOUSLY MUST BE REPAIRED TO PROVIDE A UNIFORMLY ALIGNED CREST LINE. THE REPAIRED SHALL BE DONE WITH COMPACTED SAND AND GRAVEL (ESKER) MATERIAL, WITH ALL LOOSE OR OVERHANG MATERIAL MUST BE REMOVED, TO THE APPROVED OF THE ENGINEER.
10. THE FINAL SURFACE SHOULD BE AN EVEN, FIRM, SMOOTH SURFACE THAT MEETS THE SLOPE REQUIREMENT ABOVE AT THE DOWNSTREAM FACE OF THE DAM.

WORK POINTS DESCRIPTIONS

WORK POINTS	NORTHING	EASTING	ELEVATION
1	7289015	486648	490.3
2	7289031	486684	490.0
3	7289048	486720	490.0
4	7289066	486756	490.0
5	7289086	486791	490.0
6	7289106	486826	489.7
7	7289123	486861	490.0
8	7289144	486896	489.9
9	7289163	486931	489.9

WORK POINTS	NORTHING	EASTING	ELEVATION
10	7289183	486966	490.0
11	7289202	487001	490.1
12	7289222	487035	490.1
13	7289241	487070	490.2
14	7289262	487104	490.2
15	7289281	487140	490.3
16	7289301	487174	491.0
17	7289315	487189	491.6
18	7289328	487195	491.9

LEGEND

- 2m EXISTING GROUND CONTOURS
- 0.5m EXISTING GROUND CONTOURS
- 2m DESIGN CONTOURS
- 0.5m DESIGN CONTOURS
- DESIGN K DAM – RESLOPE
- SECTION LINES
- BATHYMETRY SURVEY WATERLINE (JUNE 2019)
- EXISTING WATER MANAGEMENT FEATURES (APPROXIMATE)
- APPROXIMATE TOE UNDERCUT EXTENT (SEE NOTE 6)
- WATER COVERED AREA

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Client: LUPIN MINES INC.

Project: LUPIN MINE CLOSURE

Title: K DAM REPAIR
PLAN VIEW

Scale: 1:2000 Drawing No. 013

SS	PK	AT	2020.05.22
Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Revision: A

Project No.: 129500081

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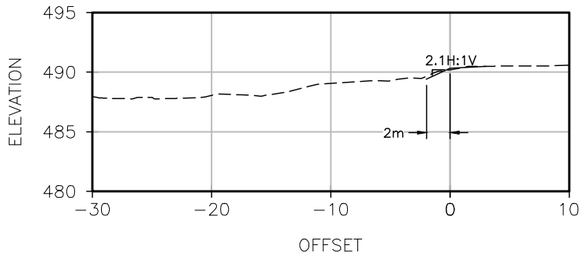

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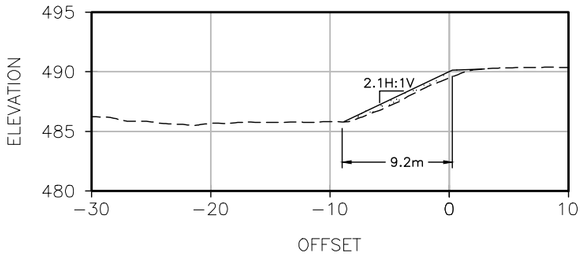

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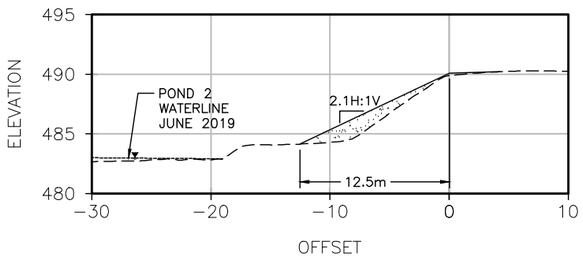

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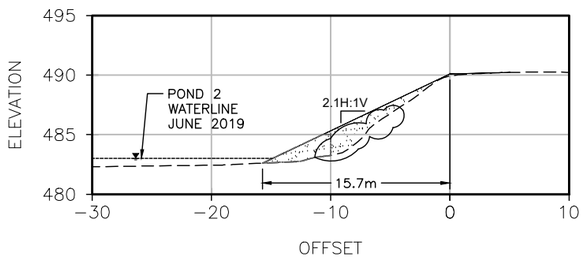

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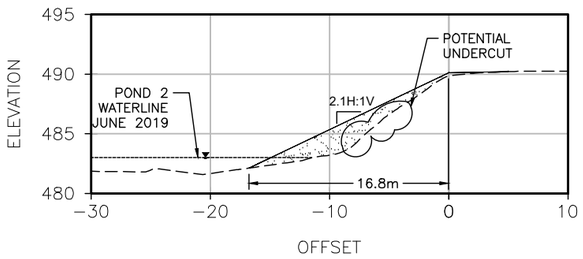

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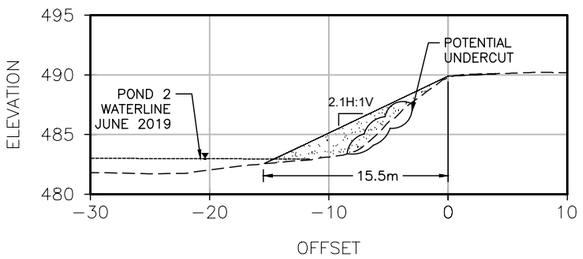

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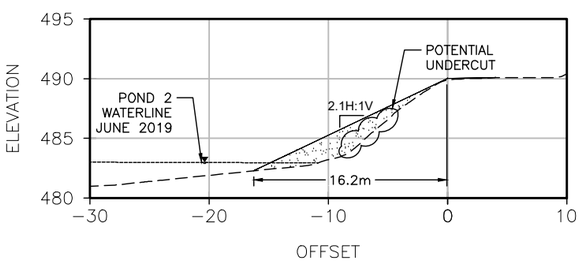

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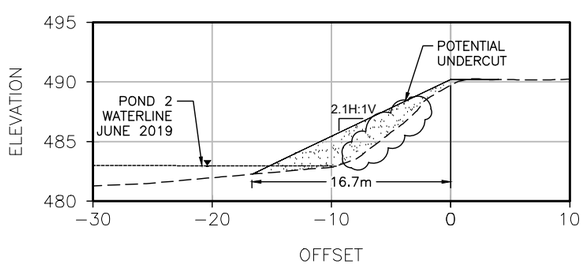

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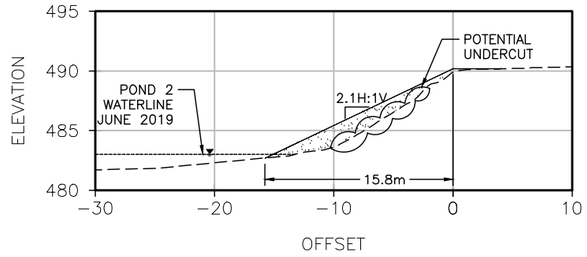

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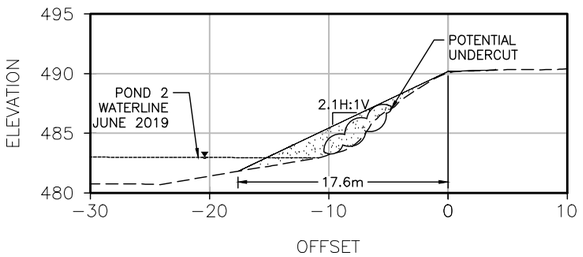

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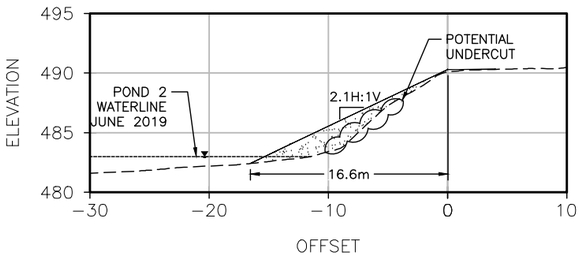

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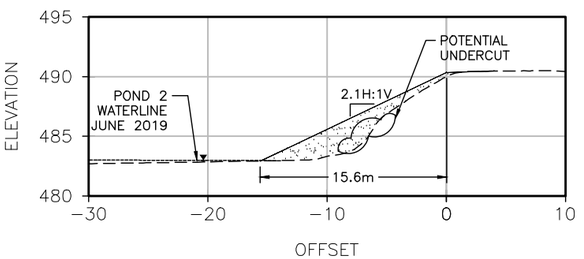

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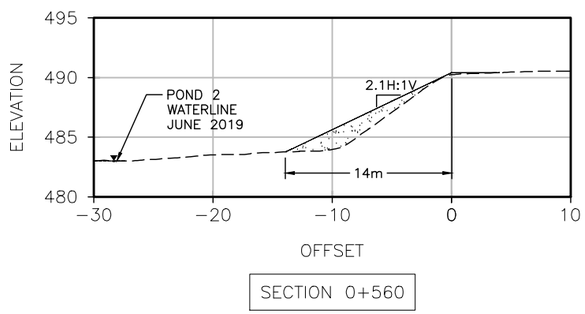

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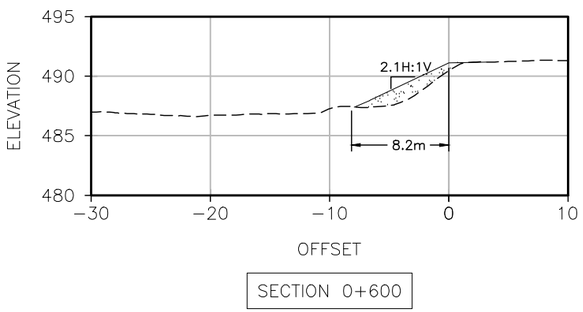

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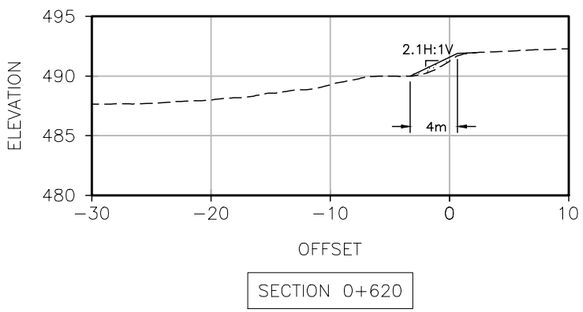

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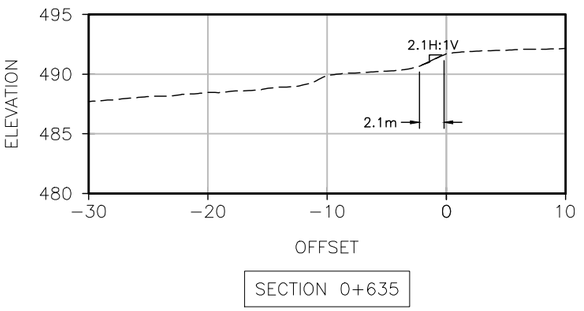

SECTION 0+635

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LEGEND

- EXISTING GROUND
- DESIGN DAM
- WATER LEVEL
- CELL 5 DESIGN COVER
- COMPACTED FILL
- APPROXIMATE TOE UNDERCUT EXTENT (SEE NOTE 4)

NOTE

1. EXISTING TOPOGRAPHIC CONTOURS AND WATER COVERED AREAS DELINEATED FROM LIDAR SURVEY COMPLETED AUGUST 2019 AND BATHYMETRY SURVEYS COMPETED JUNE 2019.
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Client
LUPIN MINES INC.

Project
LUPIN MINE CLOSURE

Title
K DAM REPAIR
CROSS SECTIONS - 1

Scale: 1:500 Drawing No. 014

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Revision: A

Project No.: 129500081

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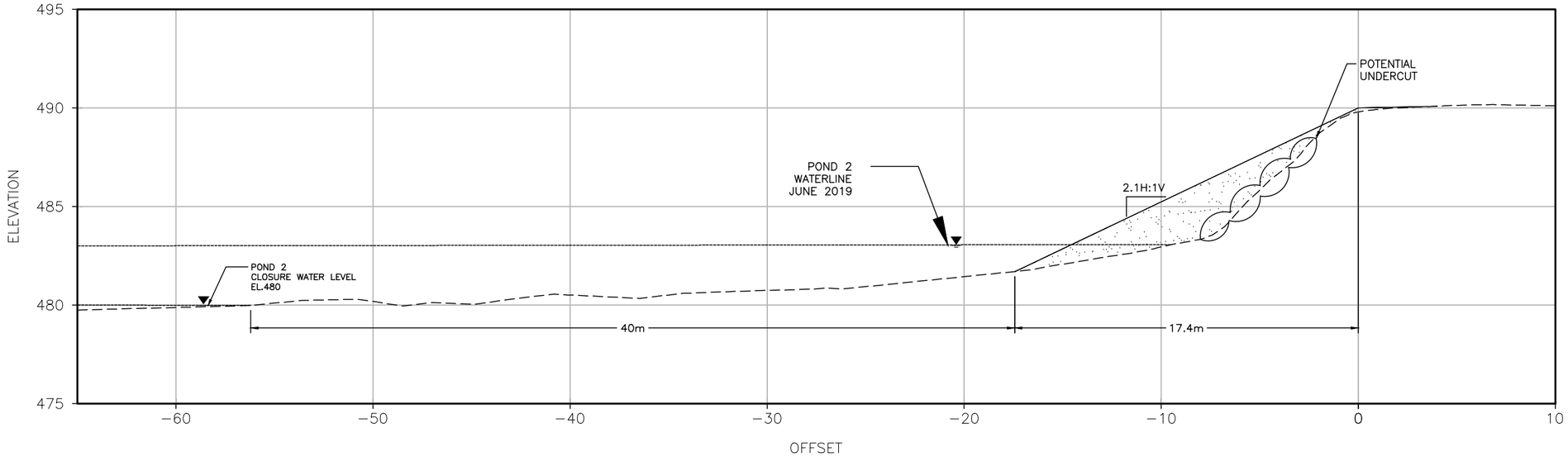

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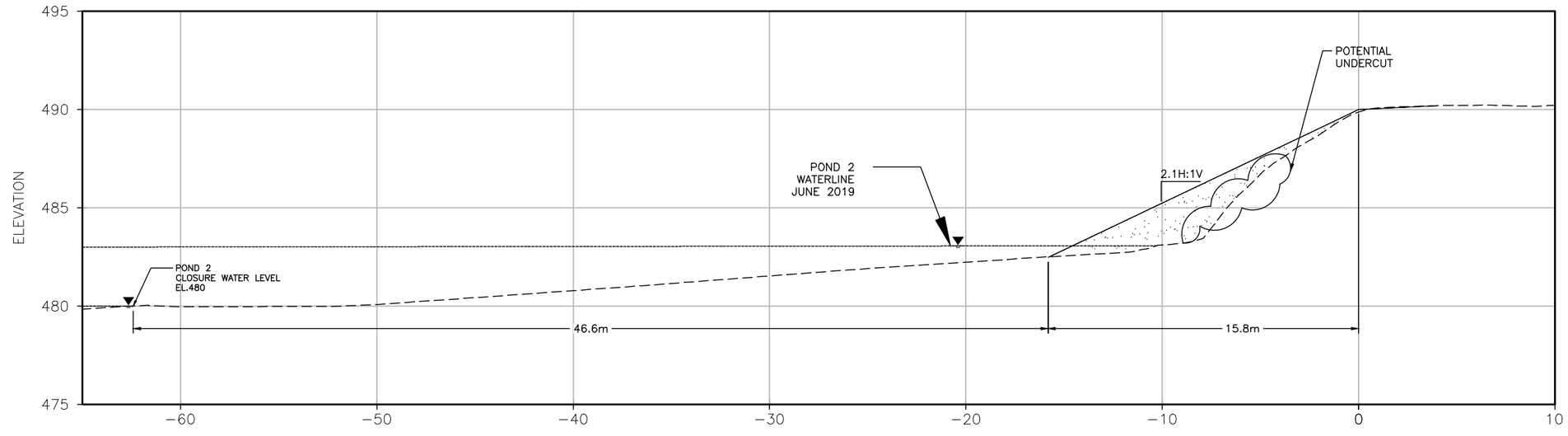

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LEGEND

- EXISTING GROUND
- DESIGN DAM
- WATER LEVEL
- CELL 5 DESIGN COVER
- COMPACTED FILL
- APPROXIMATE TOE UNDERCUT EXTENT (SEE NOTE 4)

NOTE

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Client
LUPIN MINES INC.

Project
LUPIN MINE CLOSURE

Title
K DAM REPAIR

CROSS SECTIONS - 2

Scale: 1:250 Drawing No. 015

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Revision: A

Project No.: 129500081

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