February 7th, 2017

Karen Kharatyan
Manager of Licensing
Nunavut Water Board
P.O Box 119
Gjoa Haven, NU X0B 1J0

Re: Water License 2AM-MEL1631 Part D, Item 3 / NIRB Project Certificate 11MN034 Condition 18 - Submission of Construction Summary Report for the Saline Pond

Mr. Kharatyan,

A saline water storage pond with a till core berm was required for temporary storage of excess saline water from underground operations from 2016-Q3 to 2017-Q4 before a long-term saline water treatment and disposal plan is finalized. The required maximum total storage capacity of the underground excess saline water during the period was specified to be 23,000 m^3 for the design of this pond. Construction of the saline pond began in early September and continued through November 3, 2016.

The pond and berm were generally constructed according to the designed construction drawings and specifications, with the following two changes that were initiated by the construction team and approved by the design engineer of the saline pond and berm:

a) The as-built minimum pond bottom elevation was approximately 53.5 m, which is 2.0 m lower than the design pond bottom elevation of 55.5 m. This change was initiated to slightly increase the total volume of the rock to be excavated during the pond construction. The excavated rock was used as construction material for dike construction.

b) The design centerline of the till core berm was re-located outwards away from the pond during the construction to facilitate constructing a temporary access road around the pond for the pond construction. The as-built berm centerline was approximately 4 m to 7 m outside of the design berm centreline.

The final as-built maximum total storage capacity of the underground excess saline water is approximately 25,100 m^3, which is 2,100 m^3 greater than the designed capacity.

In accordance with Water License 2AM-MEL1631, Part D, Item 3 and Schedule D, and Project Certificate 11MN034 Condition 18, please find enclosed with this letter, a copy of the Construction Summary Report for the Saline Pond.

Should you have any questions regarding this submission, do not hesitate to contact me.

Regards,

Agnico Eagle Mines Limited – Meliadine Division

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MELIADINE

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CONSTRUCTION SUMMARY (AS-BUILT) REPORT FOR SALINE WATER STORAGE/TRANSFER POND AND BERM, MELIADINE GOLD PROJECT



PRESENTED TO

AGNICO EAGLE MINES LIMITED

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REVISION 0

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EXECUTIVE SUMMARY

Tetra Tech Canada Inc. (Tetra Tech) was retained by Agnico Eagle Mines Limited (Agnico Eagle) to prepare a construction summary (as-built) report for the underground saline water storage/transfer pond and the surrounding till core berm (saline pond and berm), located close to Portal No1 at the Meliadine Gold Project, Nunavut. Tetra Tech provided quality assurance (QA), quality control (QC), and monitoring during the construction of the saline pond and berm.

A saline water storage pond with a till core berm is required for temporary storage of excess saline water from underground operations during the period from 2016-Q3 to 2017-Q4 before a long-term saline water treatment and disposal plan is finalized. The required maximum total storage capacity of the underground excess saline water during the period was specified to be 23,000 m^3 for the design of this pond.

Construction of the saline pond began in early September and continued through November 3, 2016. The saline pond and berm were constructed by the prime Construction Contractor, MTKSL Contracting Joint Venture (MTKSL). Construction was carried out in three phases: 1) Removal of the overburden in the design footprint down to competent bedrock; 2) Bedrock excavation using drill and blast methods down to the design floor elevation; and 3) Construction of a till core berm around the perimeter of the excavation.

On site QA/QC efforts by Tetra Tech involved monitoring construction activities to ensure design specifications were being met. This included assessing construction material properties, verifying competent bedrock, directing scaling efforts, and monitoring slope stability.

The pond and berm were generally constructed according to the designed construction drawings and specifications, with the following two changes that were initiated by the construction team and approved by the design engineer of the saline pond and berm:

a) The as-built minimum pond bottom elevation was approximately 53.5 m, which is 2.0 m lower than the design pond bottom elevation of 55.5 m. This change was initiated to slightly increase the total volume of the rock to be excavated during the pond construction. The excavated rock was used as construction material for dike construction.

b) The design centerline of the till core berm was re-located outwards away from the pond during the construction to facilitate constructing a temporary access road around the pond for the pond construction. The as-built berm centerline was approximately 4 m to 7 m outside of the design berm centreline.

The final as-built maximum total storage capacity of the underground excess saline water is approximately 25,100 m^3, which is 2,100 m^3 greater than the designed capacity.

It is important to note that the current as-built is not precise due to safety concerns at the time of surveying the pond, not all edges were surveyed and the volume capacity for the pond has been extrapolated.

This report summarizes the construction process and as-built information for the saline water pond and till core berm.

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1.0 INTRODUCTION

Tetra Tech Canada Inc. (Tetra Tech) was retained by Agnico Eagle Mines Limited (Agnico Eagle) to prepare a construction summary (as-built) report for the underground saline water storage/transfer pond and the surrounding till core berm (saline pond and berm), located close to Portal No1 at the Meliadine Gold Project, Nunavut. Figure 1 presents the general location plan for the saline pond and berm. Tetra Tech provided quality assurance/quality control (QA/QC) and monitoring during the construction of the pond and berm.

Agnico Eagle is advancing the underground ramp downwards at the Tiriganiaq deposit and has recently advanced through into the cryopeg zone below the frozen permafrost. Consequently, saline connate water is now reporting to the underground sumps. Based on an underground water management plan developed by Agnico Eagle, a surface storage pond is required to temporarily store the excess underground saline water during the period from 2016-Q3 to 2017-Q4 before a long-term saline water treatment and disposal plan is finalized. The required maximum total storage capacity of the underground saline water was specified to be 23,000 m^3 for the design of this pond (Tetra Tech 2016).

Construction of the saline pond commenced in early September and continued through November 3, 2016. This report summarizes the as-built information for the saline pond and berm.

This report is prepared to meet the requirements in the Type “A” Water Licence No. 2AM-MEL1631 – Agnico Eagle Mines Limited for the Meliadine Gold Project (Part D, item 3).

2.0 CONSTRUCTION MONITORING AND QA/QC

The saline pond and berm were constructed by the prime Construction Contractor, MTKSL Contracting Joint Venture (MTKSL).

Tetra Tech was not initially involved in the construction of the saline pond and only became involved in a QA/QC role at the request of Agnico Eagle after initial construction activities had begun. As a result, Tetra Tech relied upon information provided by Agnico Eagle and the construction contractor in documenting the early stage of the project. Tetra Tech’s specific role on the project included:

- Monitor daily construction activities including a list of equipment on-site and weather conditions;
- Provide a summary of visual inspections and observations from inside and outside the work area;
- Record any construction deficiency and appropriate actions taken, if any;
- Prepare daily reports summarizing QA/QC observations/results and monitoring data; and
- Report on construction and design changes made during construction.

Monitoring by Tetra Tech began on September 14 after most of the overburden material had been excavated and blasting of the bedrock had already started. Tetra Tech staff were on site during the following periods:

- Jennifer Pyliuk, P.Eng. – September 14 to 21, 2016 and October 12 to 25, 2016;
- Cam Bartsch, P.Geo. – September 22 to October 11, 2016; and
- Fai Ndofor, P.Geo. – October 26 to November 3, 2016 (completion).

3.0 CIVIL EARTHWORKS CONSTRUCTION EQUIPMENT AND MATERIALS

3.1 Construction Equipment

The following construction equipment was used during construction activities:

- Caterpillar Inc. (CAT) 336E excavator;
- CAT 345B excavator;
- CAT 740 rock trucks;
- CAT 988 loader;
- CAT D9 dozer;
- CAT D6 dozer;
- CAT CS-563E Roller; and
- Hydra-Trac 400 RAB Drill (blast holes).

3.2 Construction Materials

The construction of the pond and berm mainly consisted of excavation of unfrozen/frozen overburden and bedrock for the pond, and fill placement over the excavated overburden slope and for the berm. Two types of fill materials were used for the construction, including:

- Run-of-Mine (ROM) Rockfill (600 mm minus): general waste rock from mine operation; and
- Selected Unfrozen Till Fill (300 mm minus): sourced from the Tiriganiaq esker on site.

The ROM was used as armouring for overburden slopes and cover for the till core berm. The ROM can have a wide variation of gradation with a maximum particle size of 600 mm.

Selected unfrozen till fill was used to construct the core of the berm surrounding the pond. Till fill represents a wide range of natural overburden materials including inorganic, till, and native granular materials. The material can have a wide variation in gradation with a maximum particle size of 300 mm and a fines (less than 0.08 mm) content of between 20% and 60% by weight and has a relatively low hydraulic conductivity after compacted.

3.3 Construction Material Quantities

The as-built survey data and initial as-built construction material quantities for the saline pond and berm were provided by Mr. Yanick Hamel of Hamel Arpentage to Mrs. Blandine Arseneault of Agnico Eagle who forwarded them to Tetra Tech on November 28, 2016. The final as-built construction material quantities were estimated based on the as-built survey data provided and are summarized in Table 1. Since the as-built survey data for the berm foundation preparation excavation are not available, the overburden excavation quantity for the berm foundation preparation in Table 1 is adopted from the initial value provided by Mr. Yanick Hamel.

Table 1: Construction Material Quantities

Item	Material	As-Built In-Place Quantity (m^3)
Overburden Slope Protection Fillet	Run-of-Mine Rockfill (600 mm Minus)	1,839
Till Core Berm	Selected Unfrozen Till Fill (300 mm Minus)	3,599
	Run-of-Mine Rockfill (600 mm Minus)	1,715
Overburden Excavation	Overburden for Berm Foundation Preparation	1,635
	Overburden for Pond	23,066
Bedrock Excavation	Bedrock for Pond	35,947

4.0 CONSTRUCTION ACTIVITIES

Construction of the pond consisted of the following sequence of activities, each of which is described in detail in the following sections:

1. Excavation of both unfrozen and frozen overburden materials down to competent bedrock, followed by placement of a ROM rockfill fillet on the exposed overburden slopes;
2. Drilling and blasting bedrock in two benches down to a final floor elevation of approximately 53.5 m (above mean sea level); and
3. Construction of the till core berm surrounding the pond excavation.

Note that all elevations in this document refer to elevations above mean sea level.

4.1 Overburden Excavation

4.1.1 Methodology

Excavation of the organic and non-organic overburden was carried out in two cuts, with the first cut removing the unfrozen portion of the till overburden in the active layer down to permafrost.

The second cut involved ripping of the frozen material by mechanical means down to competent bedrock. The bedrock surface proved to be highly undulating and irregular, with elevations differing by as much as 1 m to 2 m (Photo 1).

The exposed overburden slope was shaped to achieve a 2H:1V slope, as per design. The final shape of the slope was determined through a combination of visual assessment by the geotechnical engineer on site and measurements taken in the field by contractor’s surveyor (Photos 2 and 3). The excavation was confirmed to be down to competent bedrock by the site geotechnical engineer prior to placing the ROM fillet (the rockfill layer placed over the excavated overburden slope) to complete the protection of the slope (Photos 4 and 5).

For mobile equipment traffic safety during construction, a temporary safety berm built from ROM was placed around the perimeter of the excavation (Photo 6). The safety berm was built to a height of 1.5 m along the main existing road and 1 m around the remaining outer portion of the excavation. Note that this temporary safety berm is not the permanent till core berm constructed later around the three sides of the saline pond perimeter.

4.1.2 QA/QC Observations

- The stability of the frozen non-cohesive material decreased rapidly once exposed to surface conditions. Due to scheduling limitations, blasting of the bedrock occurred simultaneously with overburden excavation and the ROM fillet could not always be placed immediately after overburden excavation. Because of this, it proved important to armour the exposed slope with ROM material as soon as possible after exposure. Armouring with approximately 0.3 m of ROM successfully mitigated thawing and slumping and allowed for more precise control of the quantities of excavated material;
- However, armouring in the northwest corner was not done quickly enough and resulted in excessive thawing and slumping of the overburden material, exacerbated by frequent rainfall events in mid-September. The removal of this unconsolidated material was required in order to achieve a stable overburden slope, resulting in an over-excavation in this area (Photo 7). One of the effects of this over-excavation was that the entire northern slope and associated safety berm encroached onto the main road and inhibited traffic flow in the area;
- Overburden was under-excavated along the southeast wall and the temporary access road was placed too close to the excavation footprint along the south wall. Therefore, the design first bench crest in this location was only 1 m or less away from the toe of the excavation footprint and the temporary access road. As a result, removal of additional overburden was required, requiring additional time and resources to complete the project; and
- The highly undulating nature of the bedrock surface meant that the toe of the ROM fillet (the rockfill layer placed over the excavated overburden slope) formed an inconsistent line which factored into the final safety bench width when excavating the 59.5 m elevation bench.

4.2 Bedrock Excavation

4.2.1 Methodology

A rock slope stability assessment was conducted by Tetra Tech during the design phase of the saline pond to determine the appropriate number of benches and wall slopes for the excavation. Based on information from the closest borehole to the excavation (GT09-21), a rock cut slope of 0.5H:1V with a crest setback of 3 m was originally recommended. During the design review, Agnico Eagle recommended a vertical face of bedrock excavation to simplify the drill/blasting operation. After further discussion, a 3 m wide level bench was adopted between two vertical bedrock excavation faces to reduce the risk of local rock wedge failure or rock falls during construction or operation; however, it was decided that the final slope geometry would ultimately be determined by a qualified geotechnical engineer (from Tetra Tech or other qualified third party) based on actual rock conditions.

A total of two benches were excavated into bedrock using the drill and blast method (Photos 8 and 9). The upper bench was excavated from the uneven bedrock surface down to 59.5 m elevation, and the lower bench from 59.5 m to 53.5 m elevation. A 3 m safety bench was designed between the toe of the ROM fillet slope on the bedrock surface and the 59.5 m elevation bench crest, and a 4 m safety bench was designed between the 59.5 m (elevation) bench toe and 53.5 m (elevation) bench crest.

Blast patterns were initially drilled using a 2.6 m by 2.6 m spacing; however, this was decreased to 2.15 m by 2.15 m midway through excavation of the first bench in an attempt to limit the amount of oversize material being produced (Photo 10).

Scaling of the rock face was done following each blast to remove loose or overhanging material and identify any potential stability concerns. All loose materials were removed until a stable slope was achieved.

4.2.2 QA/QC Observations

- Achieving the design crest and slope geometry proved difficult due to a combination of the blast methods employed and rock conditions encountered. The geometry of the pond walls was largely dictated by the strong East-West trending, steeply north dipping, foliation (Photo 11) that acted as preferential planes of weakness for rock breakage. Scaling of the rock faces followed each blast along the bench walls; however, in most cases the face was excavated back to a persistent foliation plane before a stable slope was achieved (Photo 12). This was especially common on the north and south walls because the trend of the face was nearly parallel to the foliation;
- Scaling of the rock faces back to stable foliation planes resulted in a “zig-zag” geometry of both bench crests due to the foliations strikes oblique to the orientation of the bench wall (Photo 13). The resulting overall final slope is consistent with the north-dipping foliation (approximately 65°). The final bench crest was examined to determine if appropriate widths between the rock face and the toe of the ROM fillet slope have been maintained. While there is a lot of variability in the crest due to the geological features, it appears that adequate widths to maintain slope stability exist;
- Orientations of discontinuities in the rock on the south wall (chainage 0+100 and 0+150) were shown to be conducive to forming metre (+) scale overhanging blocks due to the intersection of a flat-lying to gently dipping joint set with the dominant East-West foliation. Scaling carried out by MTKSL was successful in removing many of the unstable blocks; however, additional overhanging material remains in this area; and
- Although the overburden on the south wall from approximately 0+150 to 0+170 was initially excavated to design specifications and confirmed to be in bedrock, there was insufficient space on the bench to place the design thickness of the ROM fillet following scaling of the rock at this location and to maintain the 3 m bench width. Additional excavation was required to remove the overburden in this location and place the ROM fillet to design thickness.

4.3 Till Core Berm Construction

4.3.1 Methodology

A till core berm was constructed around the three sides of the pond perimeter to reduce potential water inflow into the pond from surrounding water bodies. This berm also serves as a safety berm during pond operation to reduce the risk of accidental falling into the pond. The berm was constructed by excavating organics, peat, cobbles, and other permeable materials in the till core berm footprint (Photo 14). The excavated trench was then immediately backfilled with a first lift of approved unfrozen till material from the Tiriganiaq esker and compacted as it was placed using a CAT CS-563E Vibratory Smooth Drum Roller (Photos 15 and 16). This was followed by the placement of the second lift of till backfill and compacted again. The compacted till at its final elevation was then shaped and trimmed and a ROM cover placed to design thickness.

The construction was monitored to ensure the design lift heights and adequate compaction of the placed material were achieved.

4.3.2 QA/QC Observations

- QA/QC on selected unfrozen till fill consisted of visual observations during and after compaction. No compaction testing was carried out on the material;
- Water infiltration into the excavated berm trench was generally observed to be minimal, and the excavation was not allowed to remain open for any length of time. However, at approximate chainage 0+060, seepage water was observed and attributed to a possible seepage path from the nearby P3 pond. A temporary sump was dug to the west of the excavation footprint and pumping commenced until the berm was completed in this area (Photo 17);
- Tetra Tech observed ice within the trench in the vicinity of the temporary sump. MTKSL was directed to remove ice in this area before continuing placement and advised to take caution to break up frozen lumps of fill material during placement;
- Bedrock was exposed during the trench excavation at approximate chainage 0+095 (Photo 18). The operator proceeded to excavate to a depth of approximately 1.0 m below ground surface in an attempt to dig out the rock before Tetra Tech was alerted. MTKSL was directed to halt excavation in this area, backfill with a thin lift of till and compact around the rock. Survey was directed to pick up this location;
- On October 18, 2016, Tetra Tech observed that the berm was overbuilt (Photo 19) and that removal of material was required. This work was completed on October 20, 2016; and
- Warm weather on October 18, 2016 caused the contractor to cease compaction of the till material due to the material becoming unstable. Compaction resumed once the weather cooled on October 20, 2016.

5.0 DESIGN CHANGES DURING CONSTRUCTION

Several changes to the original design of the saline pond were made prior to, and during construction. These changes were the results of formal requests made by MTKSL to Agnico Eagle. Responses to these requests were submitted to Agnico Eagle by the Design Engineer of Tetra Tech.

5.1 Ramp/Berm Locations (RFI_6515-C-235-003_002)

August 8, 2016: MKTSL requested the location of the access ramp be moved to the northwest wall of the excavation in order to mitigate potential issues related to blast relief. MKTSL also requested that the perimeter berm be shifted 5 m out from the excavation limits in order to accommodate a temporary access road for use during overburden excavation and ROM placement. Both of the proposed changes were agreed to by Agnico Eagle and Tetra Tech, although it is noted that the access ramp was not moved and remained along the southeast wall during construction, as designed. The as-built berm centreline was shifted about 4 m to 7 m outside the design berm centreline.

5.2 Ramp Removal and Cut Depth (RFI_6515-C-235-003_005)

August 28, 2016: MTKSL requested the access ramp design be amended to accommodate the removal of the ramp following construction in order to produce additional rock material. MKTSL also requested clarification on the design requirement to excavate the overburden down to competent bedrock and not limit to the 3 m cut as per the design drawing. The bedrock surface was shown to be highly undulating in the area and the concern was competent rock could not be guaranteed with a uniform cut depth. Tetra Tech recommended leaving at least a portion (upper portion) of the access ramp in place for future servicing, but deferred to Agnico Eagle to make the final decision. Regarding excavation depth, Tetra Tech confirmed that all overburden must be removed down to competent bedrock prior to placing the ROM fillet cover over the excavated overburden slope and requested that a qualified geotechnical engineer should inspect and confirm that the required depth has been reached. This practice was implemented during construction.

5.3 Floor Elevation (RFI_6515-C-235-003_010)

September 22, 2016: The designed final pond floor elevation was 55.5 m. MTKSL requested that the designed elevation be lowered 2 m to 53.5 m in order to increase the supply of useable clean rock material for dike construction. The change involved increasing the height of the second bench to 6 m from the original 4 m. Tetra Tech deferred the decision to Agnico Eagle; however, it was recommended that the 3 m (original design) width of the 59.5 m elevation bench be increased to 4 m should they proceed with the decision to deepen the excavation. This increased bench width would provide increased stability and safety for the higher bench. Agnico Eagle approved the Contractors request and the recommendation to increase the bench width was adopted during construction.

6.0 DEFFICIENCIES AND OBSERVATIONS DURING CONSTRUCTION

The following sections outline some of the deficiencies and pertinent observations recorded by field QA/QC engineers (Tetra Tech) during construction which resulted in variation from design, affected the pond and berm construction, or may potentially increase the risk of seepage water flowing from the outside into the saline pond.

6.1 Blasting – Oversize Material

6.1.1 Observations

Production of oversized material was an issue throughout saline pond excavation. It was especially problematic for the 59.5 m (elevation) bench and many of the blasts were estimated to contain up to 40% oversize material (Photo 20). A number of factors likely contributed to the oversize material, including but not limited to, using explosive mixtures designed for underground use and a failure to account for the orientation of the dominant rock fabric when designing blast patterns and/or timing. The significance of having a large amount of oversize is the inability to use it as crusher feed without further treatment/cost (i.e. additional blasting or mechanical rock breaking).

6.1.2 Mitigation Measures

The following adjustments to the drill and blast methods were made to limit the amount of oversize material produced during blasting:

- Blast pattern hole spacing was reduced from 2.6 m by 2.6 m to 2.15 m by 2.15 m;
- The collar was reduced from about 2.4 m to approximately 1.5 m;
- The orientation of the free face was changed from parallel to the foliation to perpendicular;
- Larger blasts were conducted to allow for more complete breakage; and
- Different combinations of explosives (i.e. introduction of ANFO) were utilized.

The combination of the above generally reduced the amount of oversize material produced, especially during blasting of the 53.5 m (elevation) bench, but did not eliminate the problem. Large cap rock in particular, remained an issue even during blasting of the 53.5 m (elevation) bench.

6.2 Blasting – Over-break

6.2.1 Observations

Over-break of the bedrock occurred on both benches during many of the blasts, but was especially prevalent on the south wall between approximate chainages of 0+120 to 0+130 and 0+150 to 0+170. Over-break likely occurred due to many of the same factors that created the oversize material. The effect of the over-break was that it reduced the width of the safety bench above and contributed to overall slope instability due to increased fracturing.

6.2.2 Mitigation Measures

Mechanical features of the rock were considered during the drill/blast process by increasing the distance between the bench wall and the blast pattern. Most of the 53.5 m (elevation) bench blast patterns were reduced by at least one row of blast holes to account for over-break experienced on the 59.5 m (elevation) bench.

6.3 Seepage into Excavation

6.3.1 Observations

Water inflow was observed from several discrete locations on the excavated faces during the early stage of construction of the saline pond, ranging from minor seeps along partially open fractures to measurable flows. On the west wall near approximate chainage 0+020, clear water was observed exiting a steeply dipping (east) joint approximately 2 m below the original bedrock surface (Photos 21 and 22). Seepage rates at this location were originally estimated to be between 1 litre/minute to 2 litres/minute, but as the excavation progressed, increased to between 7 liters/minute to 10 litres/minute with the exit point migrating along the existing fracture network to the north. On the south wall, between approximate chainage 0+130 and 0+140 at elevation of 60.5 m, clear water was observed seeping from a steeply dipping (east) fracture approximately 1.5 m from the bedrock surface (Photos 23 and 24). Flow rates here were estimated at 3 litres/minute to 4 litres/minute but again appeared to increase as additional excavation took place. At their peak, combined inflows from these two areas was estimated at 30 litres/minute by Agnico Eagle Operations personnel.

Seepage water into the excavation impacted construction activities by making it difficult to load blast holes and formed pools of standing water on the excavation floor that required extra resources. To address this, MTKSL installed an additional pump, insulated water lines, and a temporary sump at the base of the 53.5 m (elevation) bench. Water was pumped from the sump to containment pond P3 (P3). Note that the water collected in the excavation bottom consisted of both the seepage and natural runoff water from several rainfall events.

6.3.2 Mitigation Measures

Seepage inflows into the pond were monitored during pond excavation. The seepage locations were noted and the seepage flow rates were estimated. In addition, limited structural mapping of the 59.5 m (elevation) bench was also carried out to identify and characterize geological features associated with the inflows. The results indicate that the majority seepage water was infiltrating into the excavation at two seepage locations along a sub-horizontal joint set close to the bedrock surface and filtering down along a sub-vertical, open fracture network (Photos 25 and 26). The sub-horizontal joint set is persistent with a strong weathering profile, indicating a significant potential to act as a hydraulic conduit. Given the persistence of these sub-horizontal joints throughout the pond excavation, attempting to seal the leaks would be a difficult process and would likely require systematic grouting (grout curtain) around the entire perimeter.

In addressing concerns surrounding the seepage inflows, a meeting was held with various Agnico Eagle Operations, Construction, and Tetra Tech personnel to discuss seepage concerns and potential mitigation options/grouting requirements. A summary of the action items undertaken by Agnico Eagle Operations as a result of this meeting included a sampling/salinity testing program to determine the source of the infiltration, regular and reliable flow rate monitoring, and the production of a geological drawing. Results of the sampling by Agnico Eagle indicated water was primarily infiltrating from P3 on the north or northwest sides and from A54 North on the south side. Monitoring indicated an upper limit total flow rate of approximately 30 litres/minute in early October 2016. Seepage inflows into the pond were not observed and reported during the later period close to the completion of the pond construction. This may indicate that the seepage inflows may be reduced or stopped when A54 Lake was dewatered, the P3 water level was lowered, the surrounding till core berm was constructed, and the ground started to freeze back.

During the design stage, Tetra Tech carried out a simple seepage evaluation and concluded that until the berm and the active layer of the berm foundation become frozen during the following winter, seepage water from the surrounding unfrozen soils into the pond is expected (Tetra Tech 2016). The total volume of seepage between October and December 2016 was estimated to range between 500 m^3 and 3,000 m^3, depending on the assumed hydraulic conductivity of the soils and water elevations in the surrounding water bodies (A54 North and P3). The estimated volume of potential seepage into the saline pond had been considered in the pond design capacity.

The design intent of the till core berm outside the saline pond is to limit seepage through the berm and promote permafrost development in the original ground below the center of the berm to limit the seepage through the berm foundation into the pond. Thermal analyses indicate that the overburden and bedrock below the center of the berm will become frozen after one winter following berm construction and remain frozen for the zone with an elevation below approximately 65.9 m. Therefore, the seepage through the frozen berm foundation would be limited if the water elevation outside of the berm is lower than 65.9 m.

The maximum design operating water elevation in the saline pond is 62.9 m under mean precipitation conditions and 63.4 m under a design inflow flood. Note that these elevations are generally below the top bedrock surface elevations around the pond perimeter. These pond water elevations were also designed to be at least 2 m lower than the minimum water elevations in the surrounding areas (A54 North and P3) outside of the saline water pond. The minimum operating water elevation is 65.2 m in A54 North (or CP5 North) (south of the saline pond) and 65.8 m in P3 (north and northwest of the saline pond). As a result, it is expected that any seepage water between the saline pond and the surrounding areas would flow from the surrounding areas into the pond; therefore, the potential risk of saline water seeping out of the pond into the surrounding areas during the pond operation is minimized.

6.4 Saline Water Discharge Location

6.4.1 Observation

Pumping of saline water from underground into the saline pond began on October 20, 2016. Tetra Tech observed that the discharged point was onto the ROM fillet slope approximately three quarters down the slope at approximate chainage 0+020 (Photo 27). The concern was raised that the introduction of large, continuous volume of saline water onto the slope would cause local erosion, negatively impact local stability at this location, and increase the salinity of the fill and overburden soils in the area.

6.4.2 Mitigation Measures

Operations were instructed to redirect the discharge to a rock bearing surface as soon as possible. The discharge line was extended by Agnico Eagle Construction on October 22, 2016 following two days of discharge onto the overburden slope.

6.5 As-Built Surveys

6.5.1 Observation

Interim as-built survey data showing the excavated surfaces, ROM fillet thicknesses over excavated overburden slopes, bench widths, wall face heights, and bench crest elevations were required to verify and confirm whether the construction meets the design requirements. The information was routinely requested by the QA/QC team throughout the course of construction activities, as per Section 1.6 of the Geotechnical Specifications for Construction (Tetra Tech 2016). However, the requested information was not provided to the QA/QC team for review during pond construction.

Due to lack of the interim survey data during construction, the exact dimensions and geometries of constructed components could not be verified during pond construction.

6.5.2 Mitigation Measures

Hamel Arpentage, a survey contractor already at site, was hired to survey pond construction. Gaps in the survey data were partially filled in later by Hamel Arpentage. The as-built survey data for the construction of the saline pond and berm were provided to Tetra Tech by Agnico Eagle on November 28, 2016, after the completion of the pond and berm construction.

The review of the as-built survey data indicated the following findings:

- The as-built survey data appear reasonable and are generally consistent with the field visual observations during construction;
- The as-built dimensions and geometries are generally consistent with those in the design construction drawings and the approved changes made during construction;
- The as-built ROM fillet thicknesses over the excavated overburden slopes in most locations (refer to as-built drawings 65-695-230-225 to 228) are thinner than designed. The reduced ROM fillet thickness will increase the potential risk of local slope instability during the next spring freshet when the overburden soils below the ROM fillet thaw, especially where the overburden soils have excess ice. Nevertheless, any local instability at the ROM fillet locations would not affect the overall stability of the pond walls and the till core berm, nor the safe operation of the saline pond. Therefore, the potential consequence of failure is relatively low;
- The as-built crest widths of the till core berm in some locations (Stations 0+010 to 0+050, 0+110, 0+130, 0+150, 0+180 to 0+210, and 0+230 to 0+240) range from 3.54 m to 3.94 m, which are less than the designed width of 4.0 m. Similarly, the till core crest widths in some locations (Stations 0+030, 0+060, 0+070 to 0+080, 0+100 to 0+160, and 0+200) range from 3.49 m to 3.74 m, which are less than the designed width of 3.8 m. The shorter widths will slightly increase the risk of potential higher seepage through the berm and its foundation. Nevertheless, the risk is manageable during the pond operation. If excess seepage through the berm into the pond is observed at some locations, additional fill can be placed to reduce the seepage rate.
- The as-built survey data of the final excavation surface for the berm foundation preparation are not available. However, the excavation quantity was provided by Agnico Eagle on November 28, 2016. The observations during the construction indicated that the berm foundation excavation was conducted.

7.0 AS-BUILT DRAWINGS AND POND STORAGE CAPACITY

7.1 As-Built Drawings

As-built drawings for the pond and berm are presented in Appendix A. The drawings were developed by Tetra Tech based on the source as-built survey data drawing provided to Tetra Tech by Agnico Eagle on November 28, 2016.

7.2 As-Built Storage Capacity of the Saline Pond

Table 2: As-built Storage Capacity for Saline Water Storage/Transfer Pond

Item	Water Balance under Inflow Design Flood Conditions (IDF)	Water Balance under Mean Precipitation Conditions
Design Maximum Pond Operating Water Elevation (m)	63.4	62.9
Estimated Maximum As-built Pond Storage Capacity at Design Maximum Pond Operating Water Elevation (m^3)	35,244	32,675
Maximum As-built Pond Capacity to be Available for Storing Excess Saline Water to be Pumped from Underground into Pond during October 2016 to December 2017 (m^3)	23,000 (original design capacity) + 2,067 (additional capacity)	23,000 (original design capacity) + 2,371 (additional capacity)

Note that the maximum as-built pond storage capacity at the design maximum pond operating water elevation in Table 2 includes the capacity for the saline water to be pumped into the pond during the period from October 2016 to December 2017, the capacity to store the net precipitation into the pond and its catchment area during the period from October 2016 to June 2018, and the potential seepage water into the pond during the same period.

It is important to note that the current as-built is not precise due to safety concerns at the time of surveying the pond, not all edges were surveyed and the volume capacity for the pond has been extrapolated.

8.0 LIMITATIONS

This report and its contents are intended for the sole use of Agnico Eagle Mines Limited (Agnico Eagle) and their agents. Tetra Tech Canada Inc. (Tetra Tech) does not accept any responsibility for the accuracy of any of the data, the analysis, or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than Agnico Eagle or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Tetra Tech's General Conditions are provided in Appendix B of this report.

9.0 CLOSURE

We trust this report meets your present requirements. If you have any questions or comments, please contact the undersigned.

Respectfully submitted,
Tetra Tech Canada Inc.

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TETRA TECH CANADA INC.
Signature
Date FEB. 3, 2017
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

REFERENCES

Tetra Tech, 2016. Design Report for Saline Water Storage/Transfer Pond and Berm, Meliadine Project, Nunavut. Technical report submitted to Agnico Eagle Mined Ltd. by Tetra Tech EBA Inc., July 2016, Agnico Eagle Document Number: 6515-E-132-007-132-REP-002.

FIGURES

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DRAWING NO.

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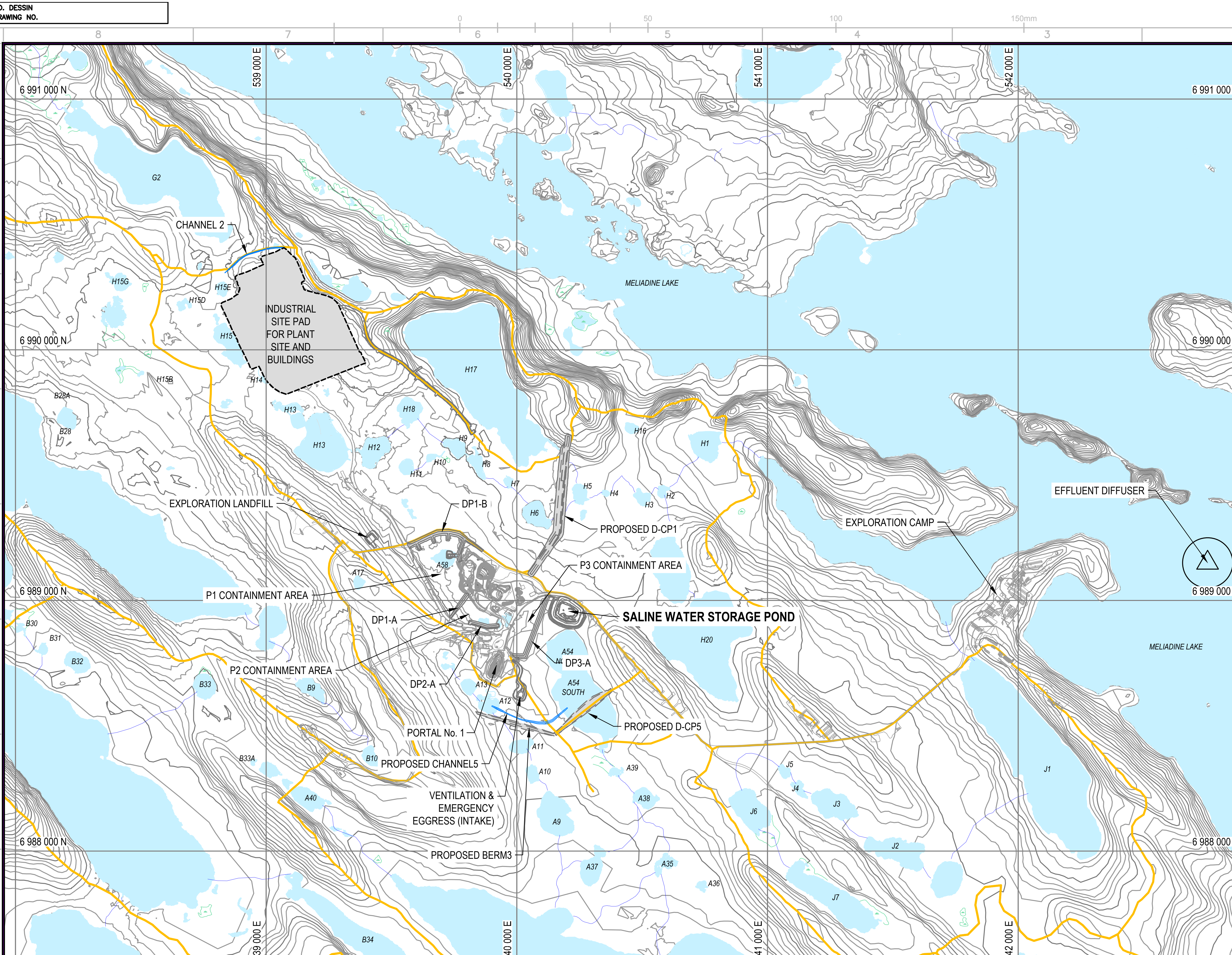

NOTES:

AGNICO EAGLE

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DESSINS EN RÉFÉRENCE/REFERENCE DRAWINGS

REV	DESCRIPTION	DATE	PAR BY
0	ISSUED FOR RECORD	2017–02–02	GZ
A	ISSUED FOR REVIEW	2016–12–19	GZ

REVISIONS

DESSINÉ PAR / DRAWN BY	EL	DATE	2017–02–02
VÉRIFIÉ PAR / CHECKED BY	GZ		2017–02–02
APPROUVÉ PAR / APPROVED BY	KJ		2017–02–02
No. PROJET / PROJECT NO.	6515		
DATE	2017–02–02		

TITRE / TITLE
AGNICO EAGLE MELIADINE GOLD PROJECT

FIGURE 1
GENERAL SITE LAYOUT PLAN

ÉCHELLE/SCALE 1:15,000 | FICHIER FILE

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AE-CART-ANSI B

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PHOTOGRAPHS

Photo 1: Excavation of overburden down to bedrock surface (looking south)

Photo 2: Shaping overburden slope (south wall)

Photo 3: Shaping overburden slope (west wall)

Photo 4: Excavating to competent bedrock (southeast corner)

Photo 5: Completed ROM fillet (north wall)

Photo 6: Safety berm along road (looking east)

Photo 7: Over excavation of thawed overburden (northwest corner)

Photo 8: 59.5 m bench (looking northwest)

Photo 9: Excavating to 53.5 bench (north side)

Photo 10: 2.15 m spacing blast pattern (looking east)

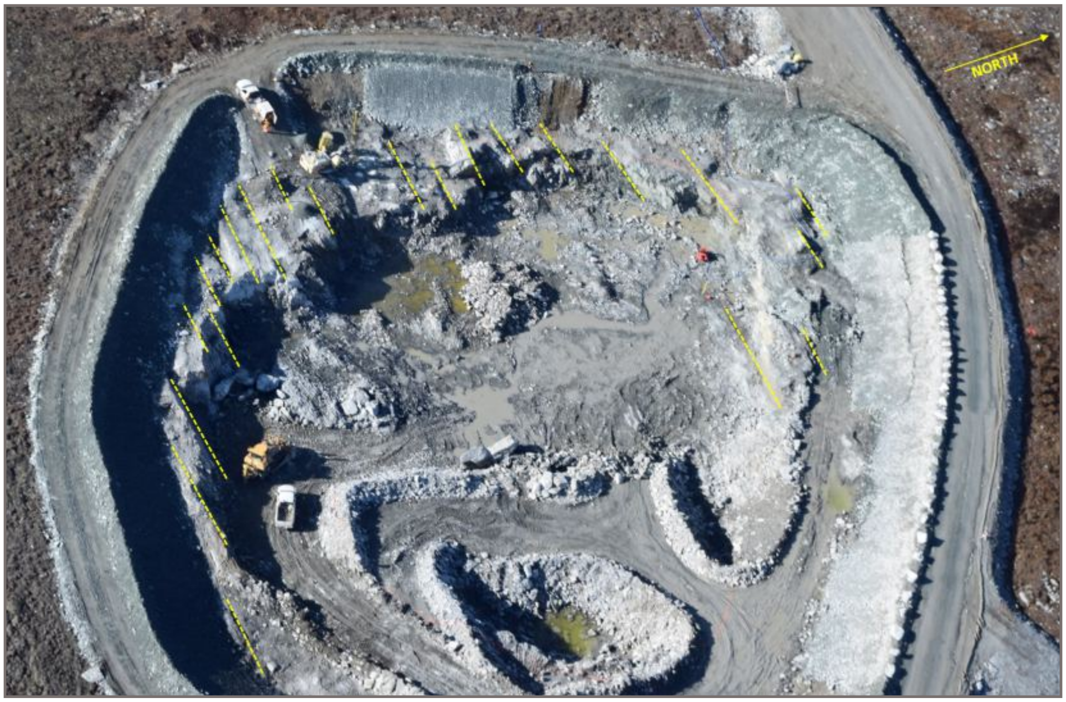

Photo 11: Ariel view with East-West lineaments highlighted

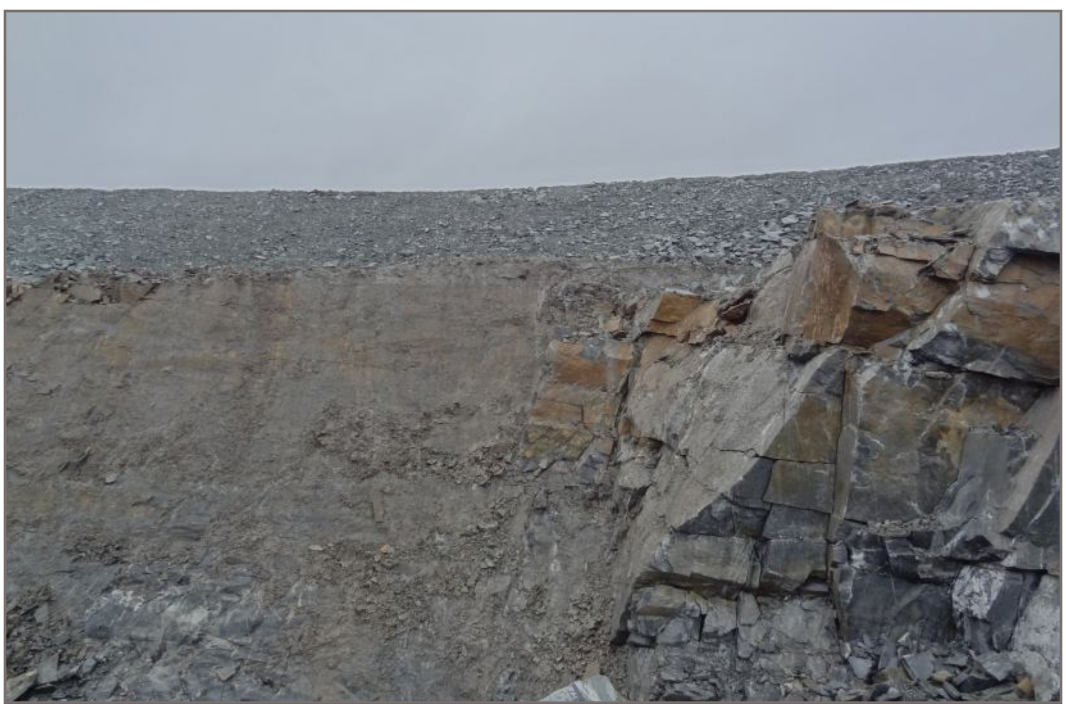

Photo 12: Excavating to stable foliation plane (south wall)

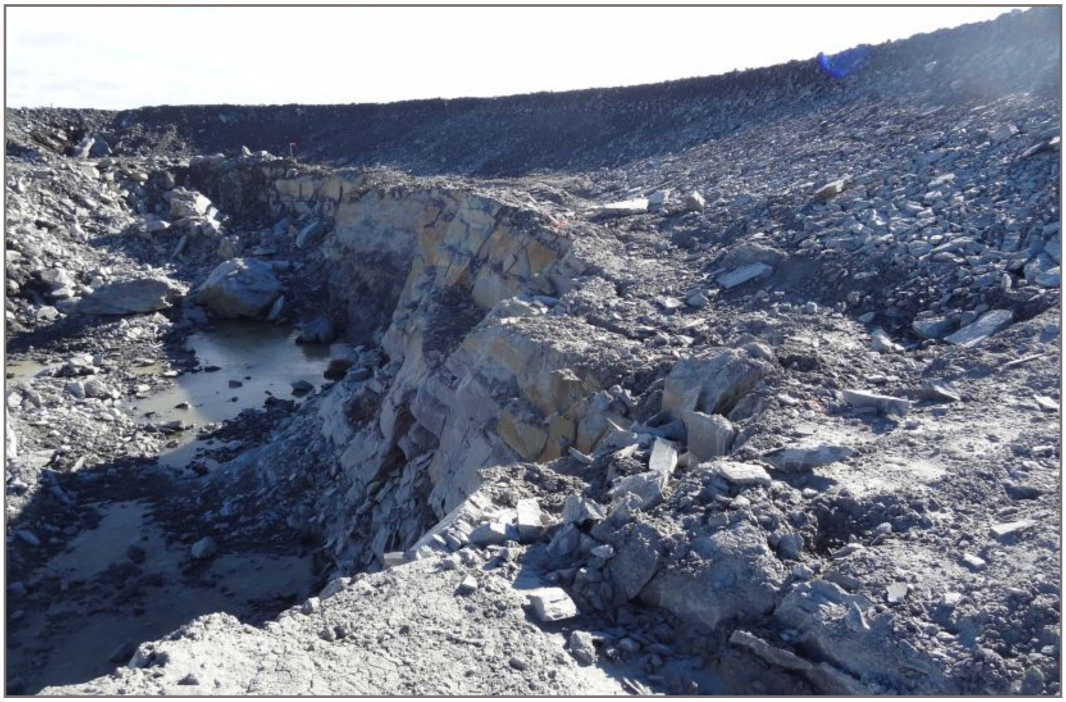

Photo 13: Irregular crest (south wall)

Photo 14: Berm trench after excavation of organics

Photo 15: Frist lift of till

Photo 16: Compaction of till with roller

Photo 17: Temporary sump (west side)

Photo 18: Bedrock encountered during trench excavation

Photo 19: Crest and toe stakes showing overbuild, approx. chainage 0+190 (looking west)

Photo 20: Blast showing oversize material (looking north)

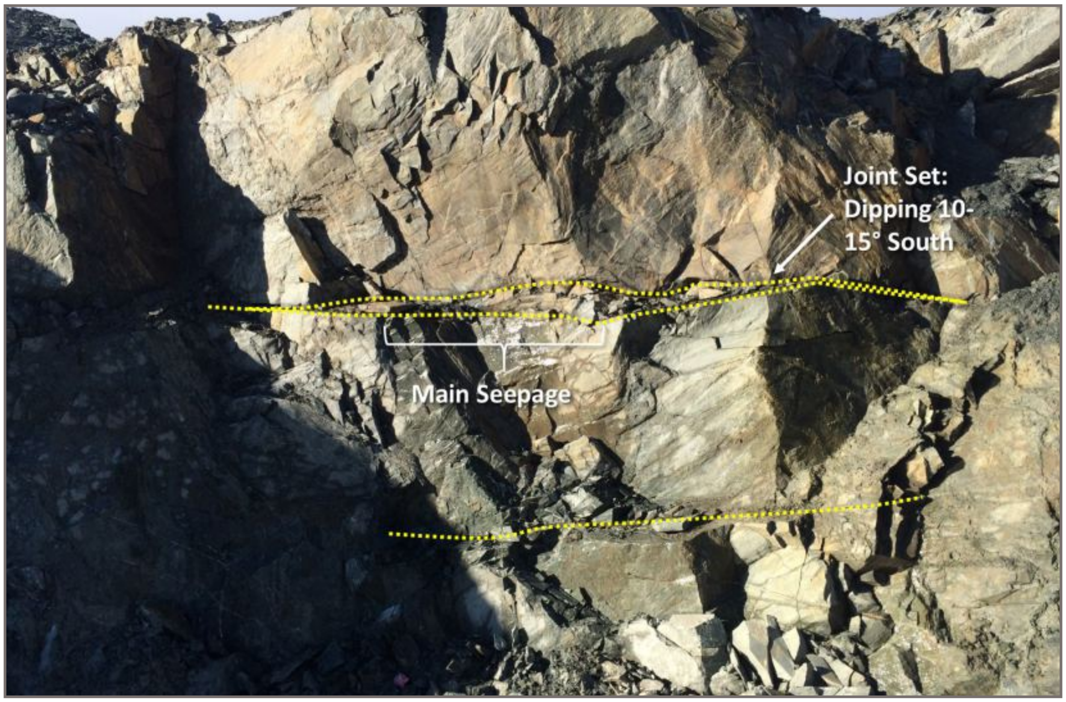

Photo 21: Inflows observed in northwest corner

Photo 22: Close-up of inflow (northwest corner)

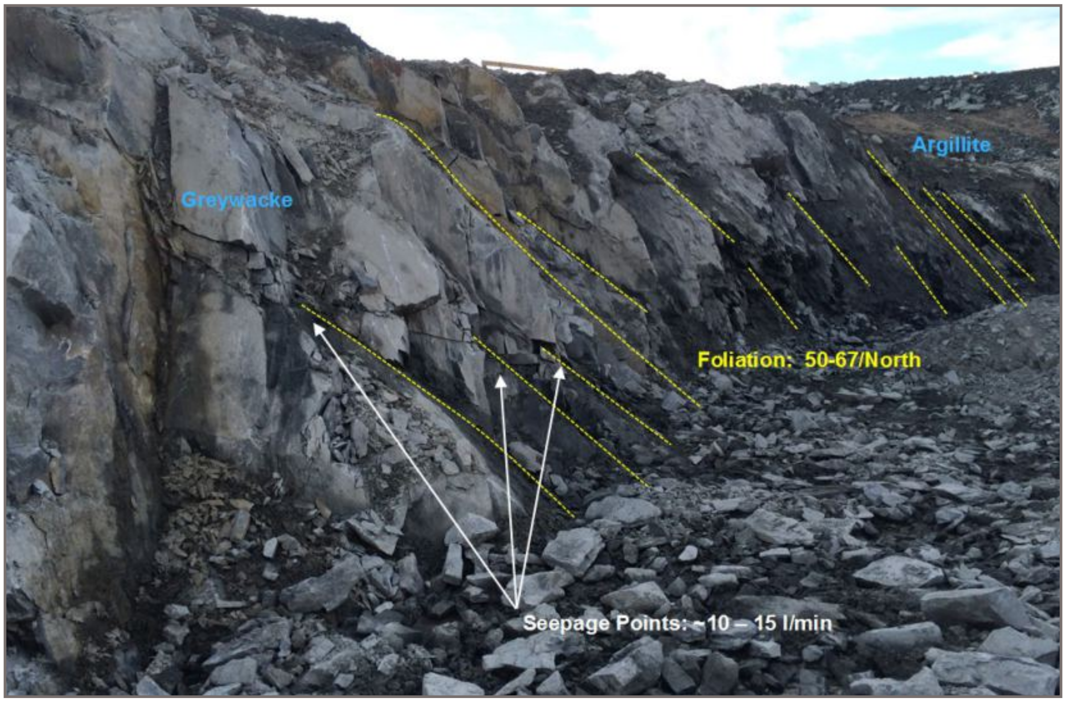

Photo 23: Seepage points observed in south wall

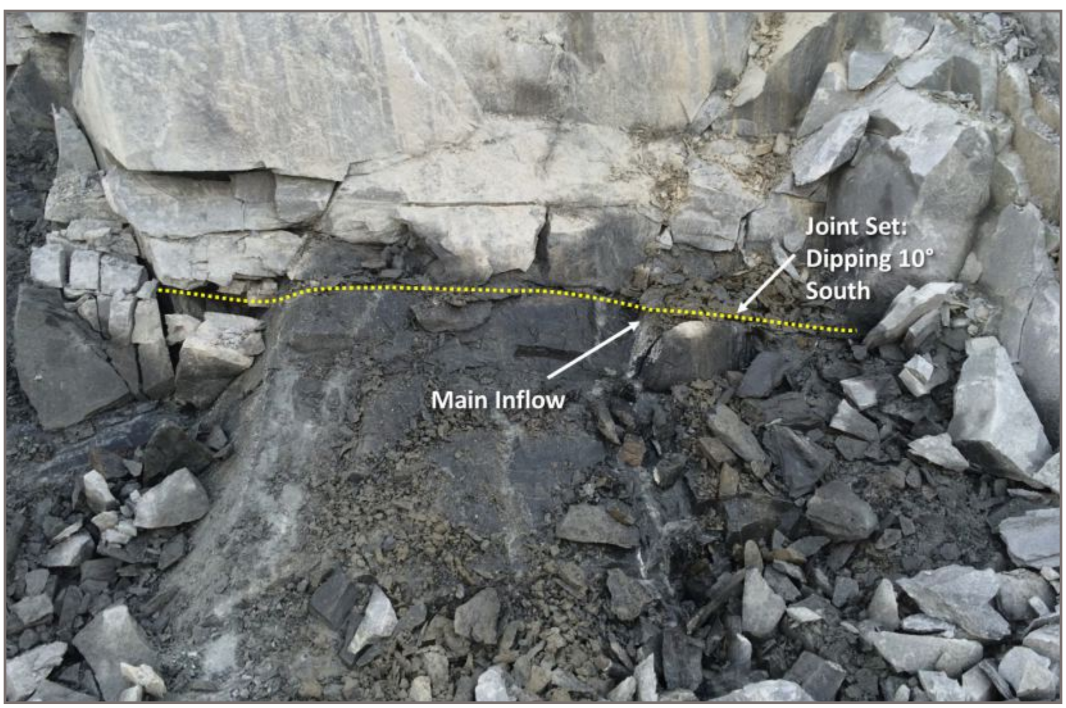

Photo 24: Close-up of inflow (south wall)

Photo 25: Sub-horizontal jointing associated with water infiltration (looking north)

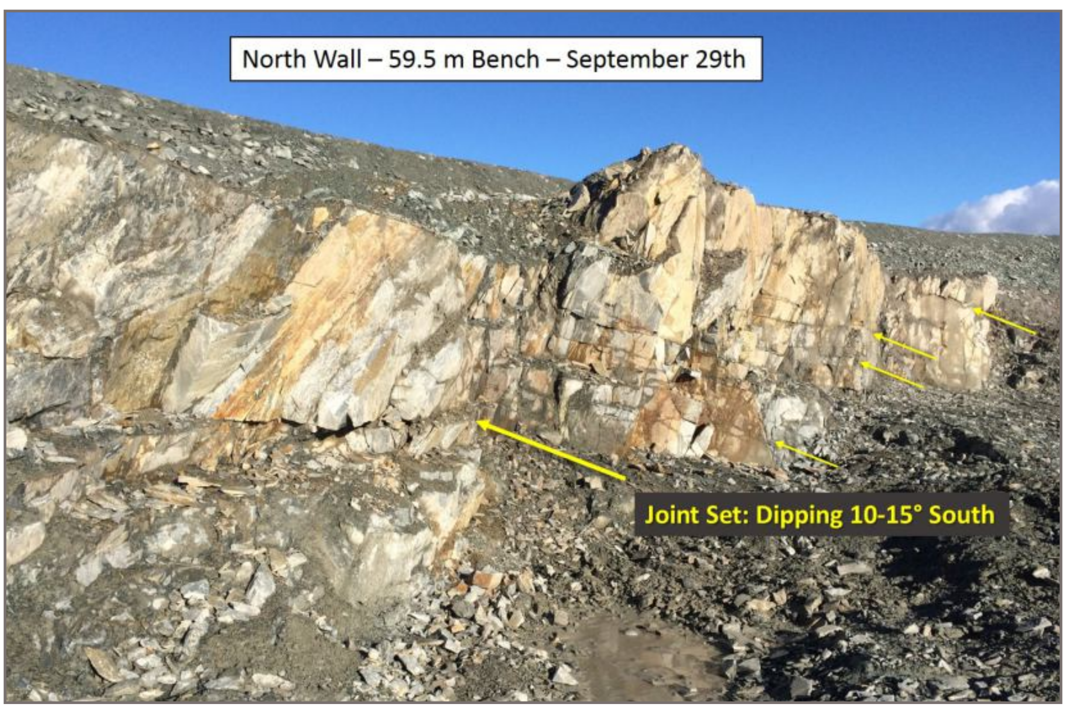

Photo 26: Sub-horizontal jointing associated with water infiltration (looking northeast)

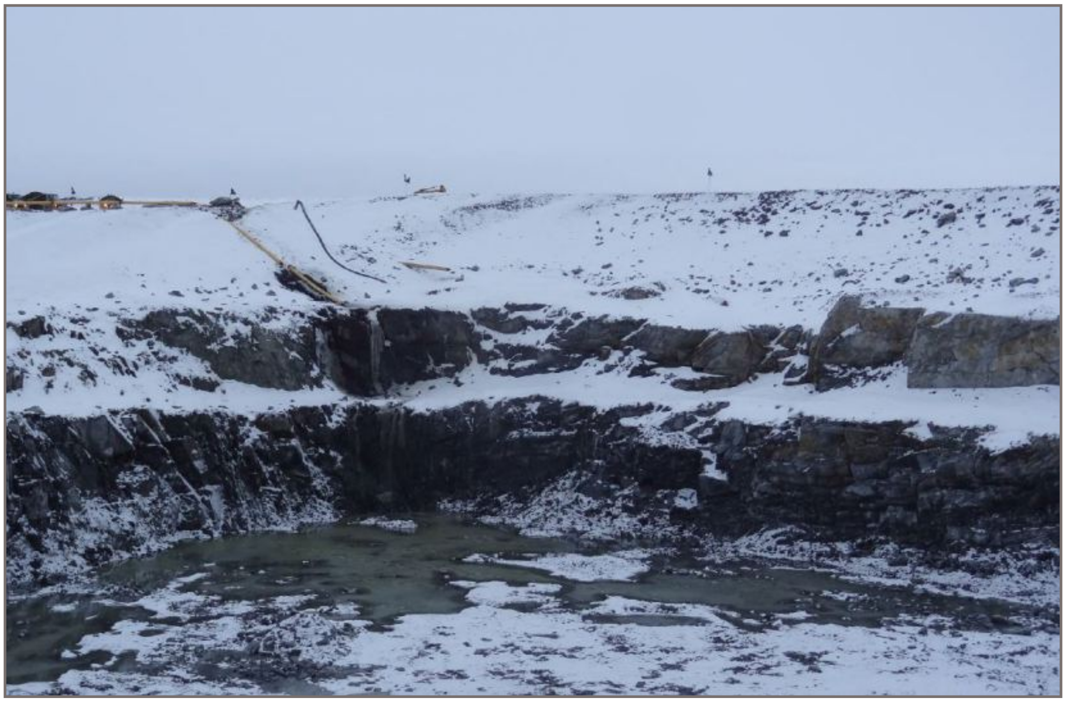

Photo 27: Discharge of saline water onto ROM slope (looking northwest)

APPENDIX A
AS-BUILT DRAWINGS

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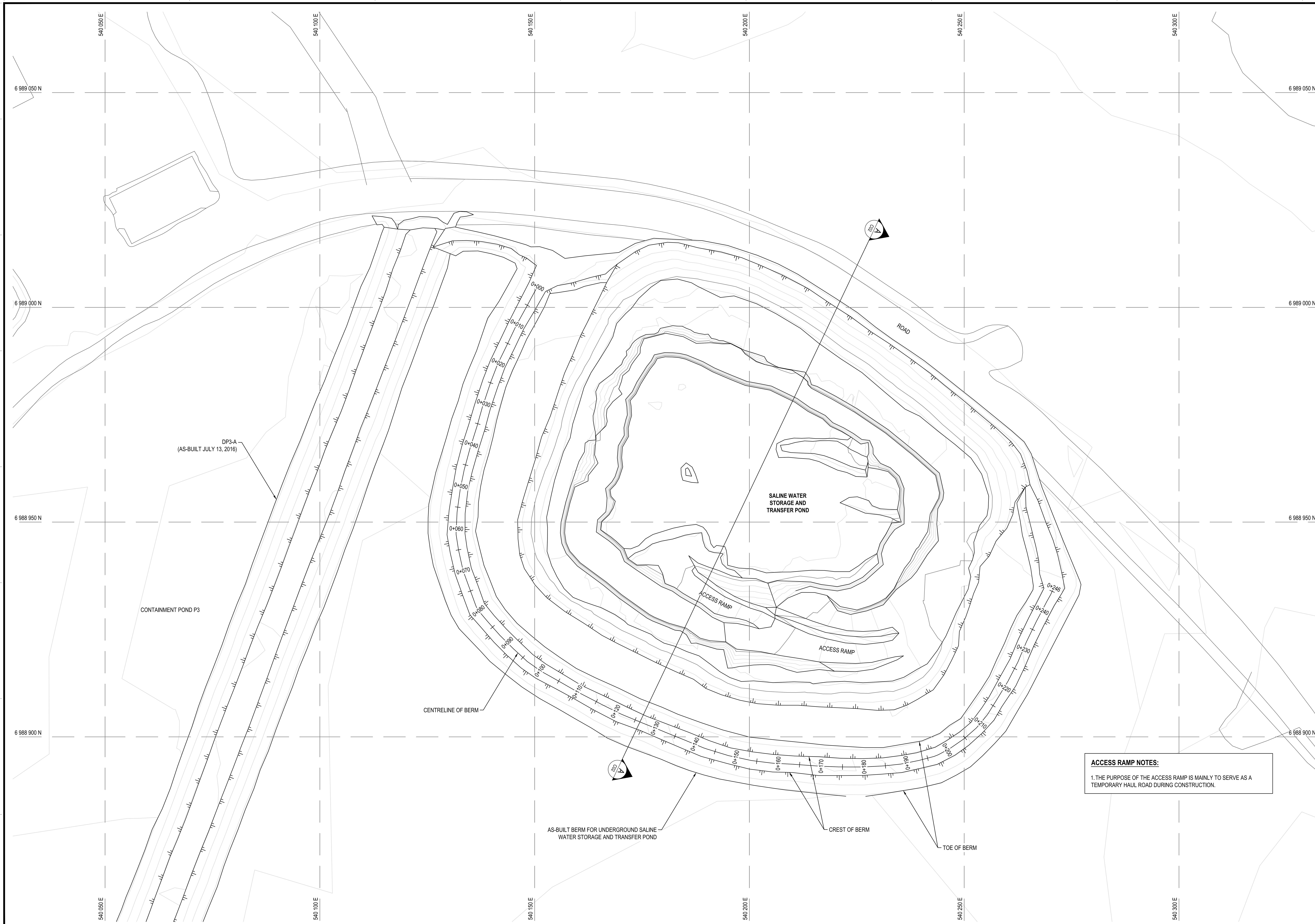

ACCESS RAMP NOTES:

1. THE PURPOSE OF THE ACCESS RAMP IS MAINLY TO SERVE AS A TEMPORARY HAUL ROAD DURING CONSTRUCTION.

PLAN CLÉ / KEY PLAN: DP1-B, DP1-A, DP2-A, DP3-A, PROPOSE CHANNELS, PROPOSE BERMS, PROPOSED CP5, CONTAINMENT POND P3, SALINE WATER STORAGE POND

TETRA TECH EBA

NOTES GÉNÉRALES / GENERAL NOTES

- AS-BUILT SURVEY PROVIDED BY AGNICO EAGLE ON NOVEMBER 28, 2016.

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TETRA TECH CANADA INC.
Signature
Date Feb. 2, 2017
PERMIT NUMBER: P 018
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DATE : 2017-02-02

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0	2017-02-02	ISSUED FOR RECORD	EL	GZ	
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REVISIONS

REGISTERED PROFESSIONAL ENGINEER — G. ZHANG — LICENSEE — NWT/NU — Feb. 02, 2017
REGISTERED PROFESSIONAL ENGINEER — KEVIN W. JONES — LICENSEE — N.W.T. — FEB. 2, 2017

TITRE / TITLE
AGNICO EAGLE MELIADINE GOLD PROJECT

AS-BUILT PLAN FOR SALINE WATER STORAGE/TRANSFER POND AND BERM

DESSINÉ PAR / DRAWN BY	EL	DATE 2017-02-02
VERIFIÉ PAR / CHECKED BY	GZ	2017-02-02
APPROUVÉ PAR / APPROVED BY	KJ	2017-02-02
ÉCHELLE / SCALE	1:400	DATE 2017-02-02

NO. DESSIN / DRAWING NO. 65-695-230-223

NO. PROJET / PROJECT NO.	REVISION	FEUILLE / SHT
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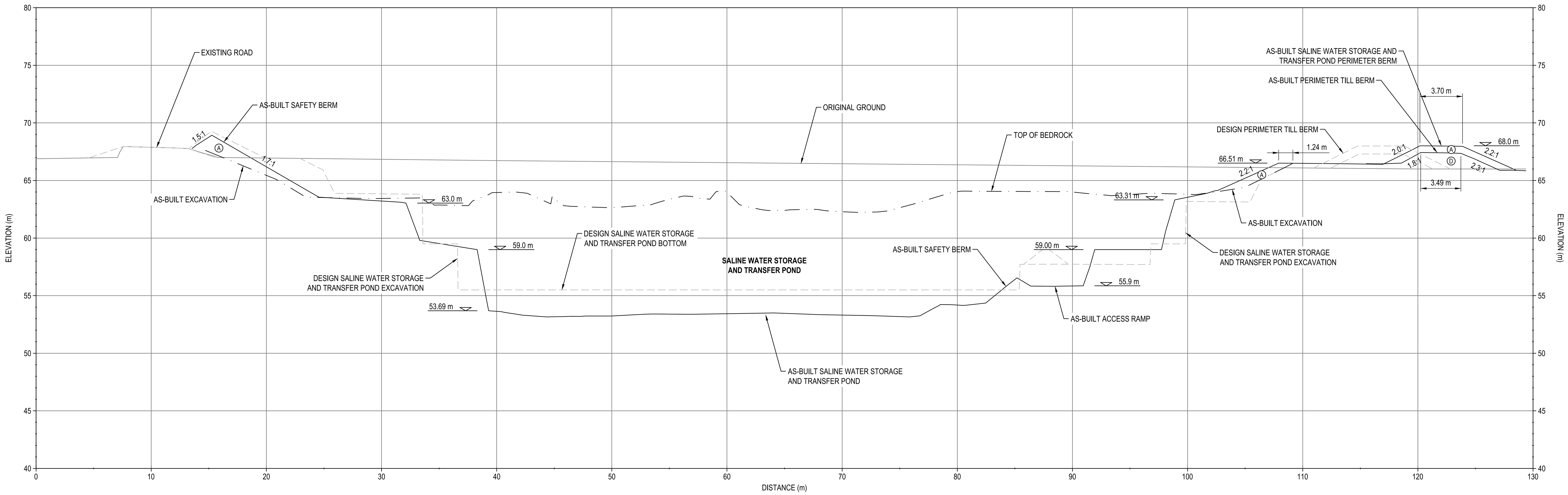

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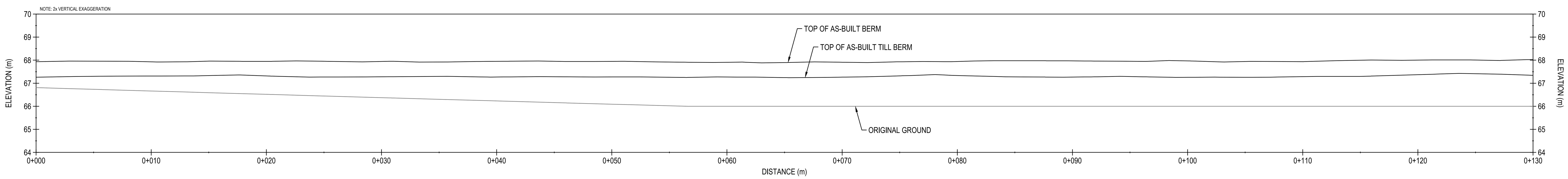

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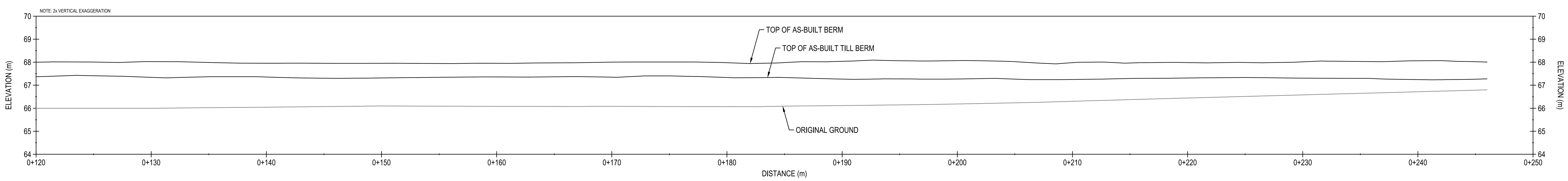

AS-BUILT SALINE WATER STORAGE/TRANSFER POND - BERM PROFILE
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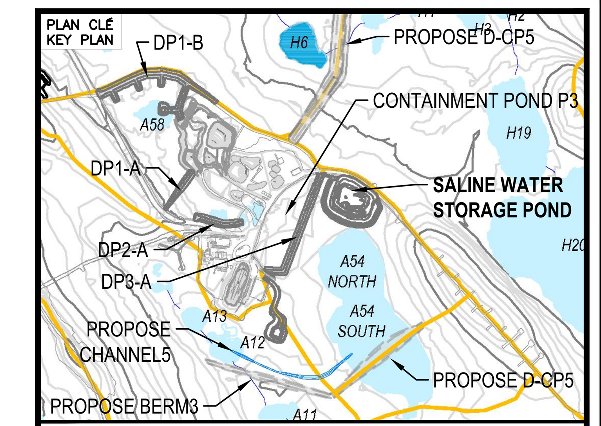

TETRA TECH EBA

NOTES GÉNÉRALES / GENERAL NOTES

- AS-BUILT SURVEY PROVIDED BY AGNICO EAGLE ON NOVEMBER 28, 2016.

LEGEND

- Ⓐ RUN-OF-MINE ROCKFILL (600 mm MINUS)
- Ⓓ SELECTED UNFROZEN TILL FILL (300 mm MINUS)

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REGISTERED PROFESSIONAL ENGINEER KEVIN W. JONES LICENSEE NWT

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AS-BUILT BERM PROFILE AND SECTION FOR SALINE WATER STORAGE/TRANSFER POND AND BERM

DESSINÉ PAR DRAWN BY	EL	DATE	2017-02-02
VÉRIFIÉ PAR CHECKED BY	GZ		2017-02-02
APPROUVÉ PAR APPROVED BY	KJ		2017-02-02
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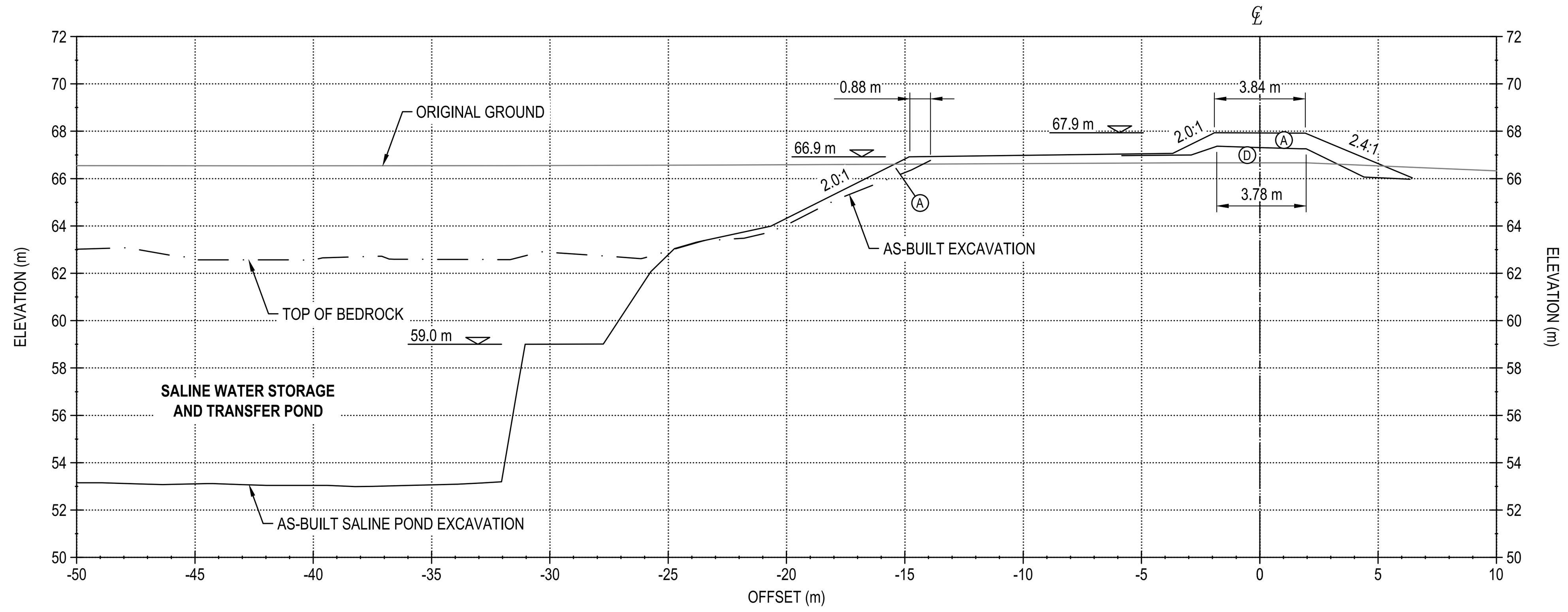

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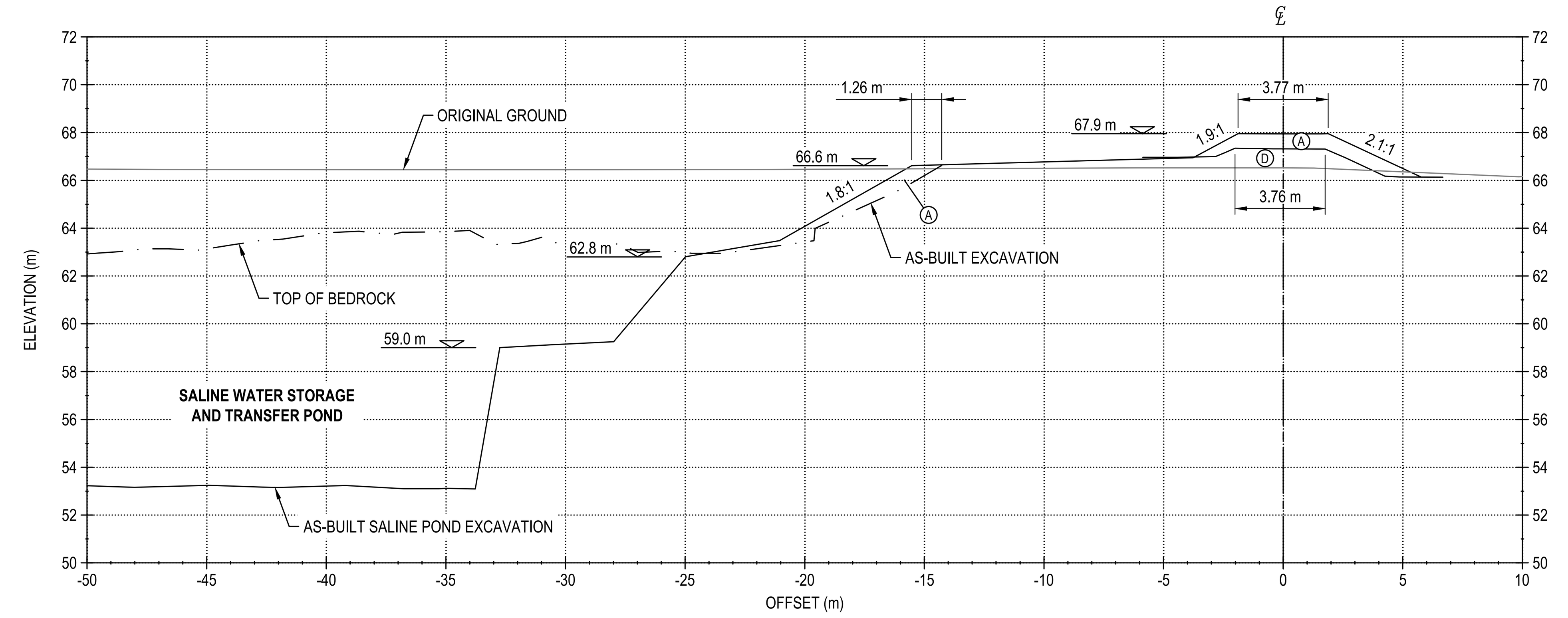

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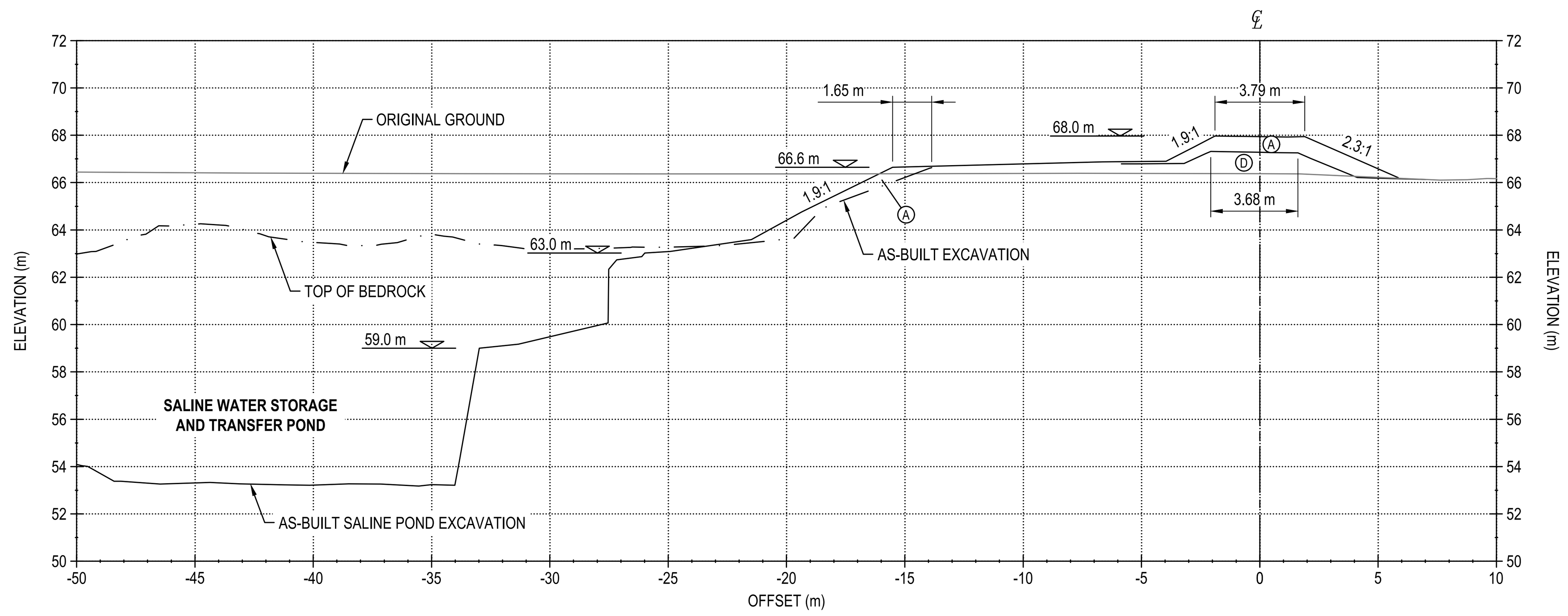

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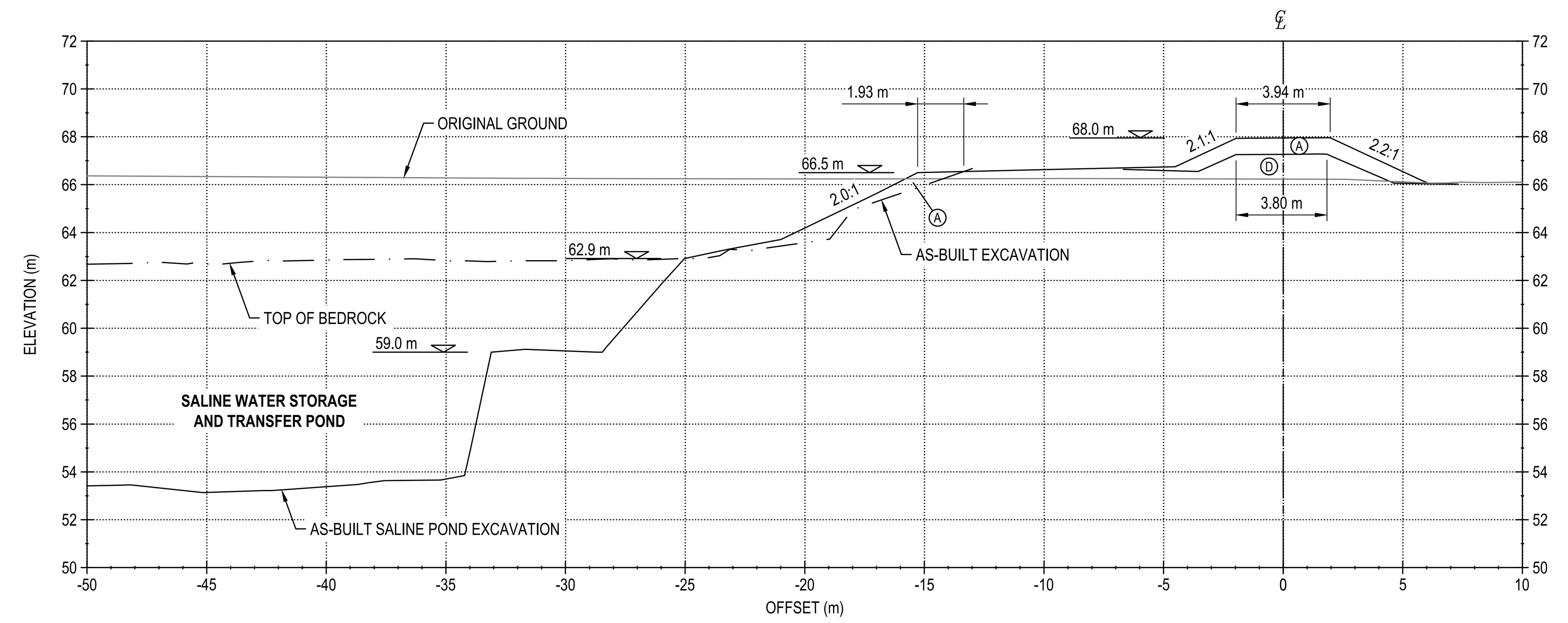

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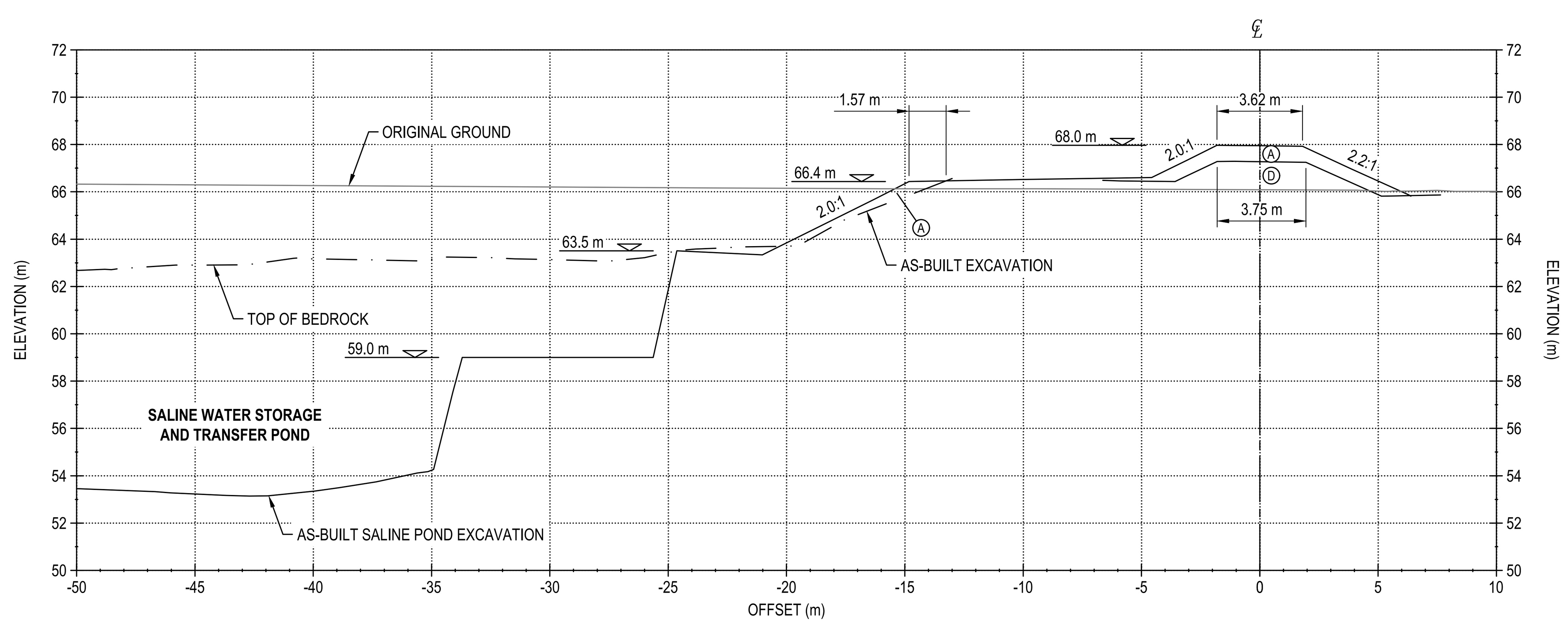

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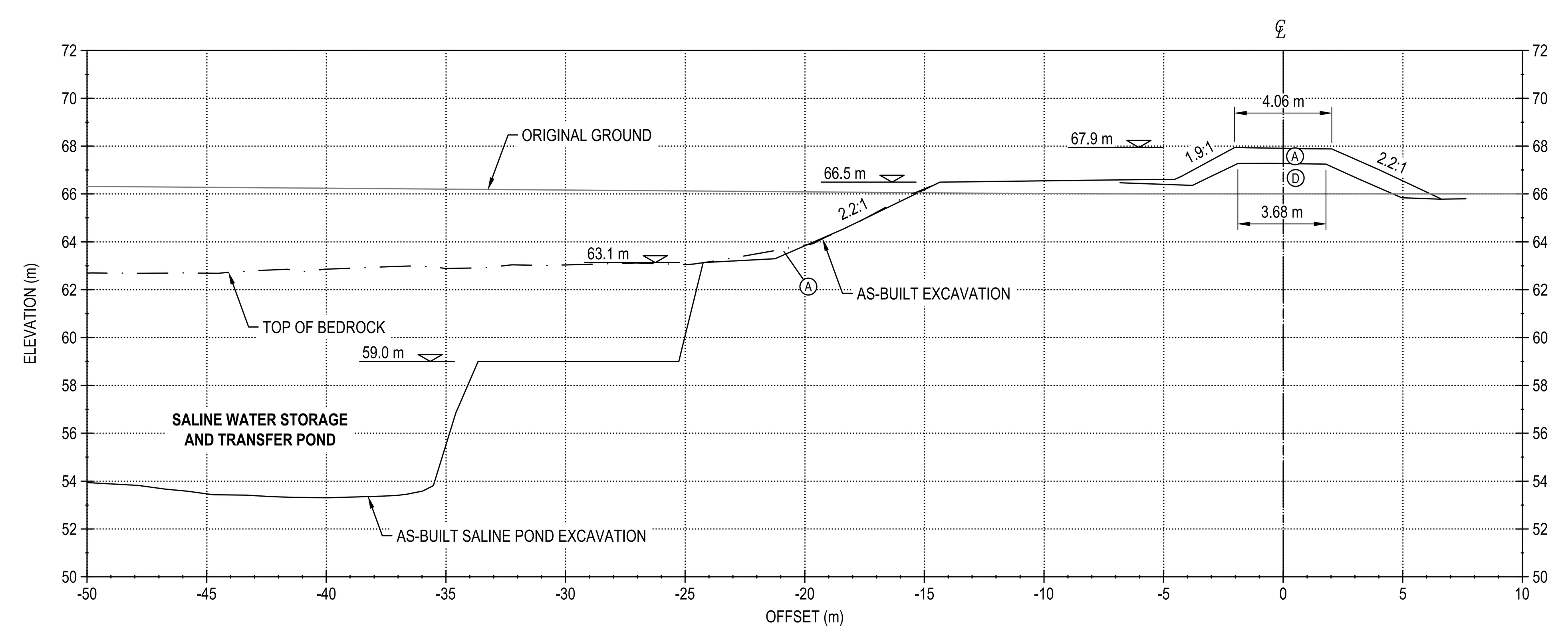

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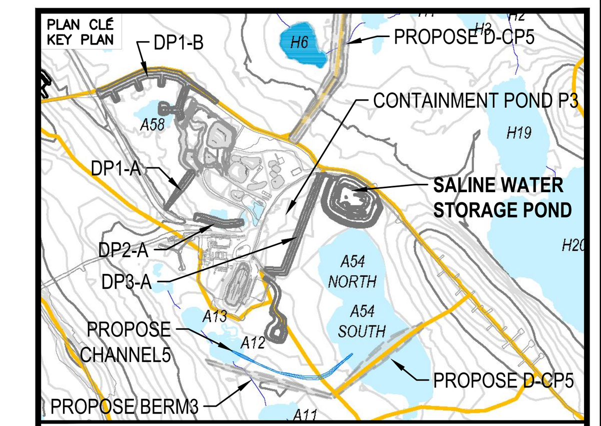

TETRA TECH EBA

NOTES GÉNÉRALES / GENERAL NOTES

- AS-BUILT SURVEY PROVIDED BY AGNICO EAGLE ON NOVEMBER 28, 2016.

LEGEND

(A) RUN-OF-MINE ROCKFILL (600 mm MINUS)

(D) SELECTED UNFROZEN TILL FILL (300 mm MINUS)

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TETRA TECH CANADA INC.
Signature
Date Feb. 2/2017
PERMIT NUMBER: P 018
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0	2017-02-02	ISSUED FOR RECORD	EL	GZ	
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REVISIONS

REGISTERED PROFESSIONAL ENGINEER G. ZHANG LICENSEE NWT/NU

REGISTERED PROFESSIONAL ENGINEER KEVIN W. JONES LICENSEE NWT/NU

TITRE / TITLE
AGNICO EAGLE MELIADINE GOLD PROJECT

AS-BUILT SECTIONS FOR SALINE WATER STORAGE/TRANSFER POND AND BERM
STA. 0+010 TO 0+060

DESSINÉ PAR DRAWN BY	EL	DATE	2017-02-02
VÉRIFIÉ PAR CHECKED BY	GZ		2017-02-02
APPROUVÉ PAR APPROVED BY	KJ		2017-02-02
ÉCHELLE SCALE	1:200	DATE	2017-02-02

NO. DESSIN DRAWING NO. 65-695-230-225

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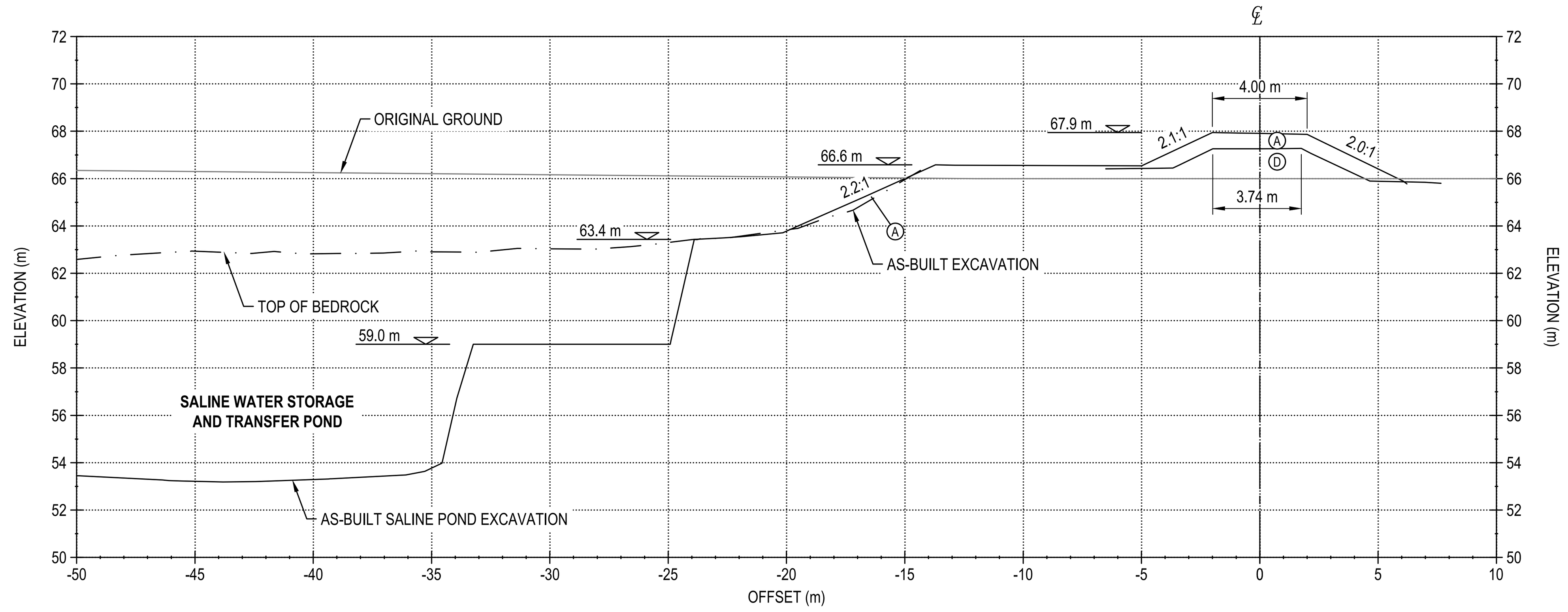

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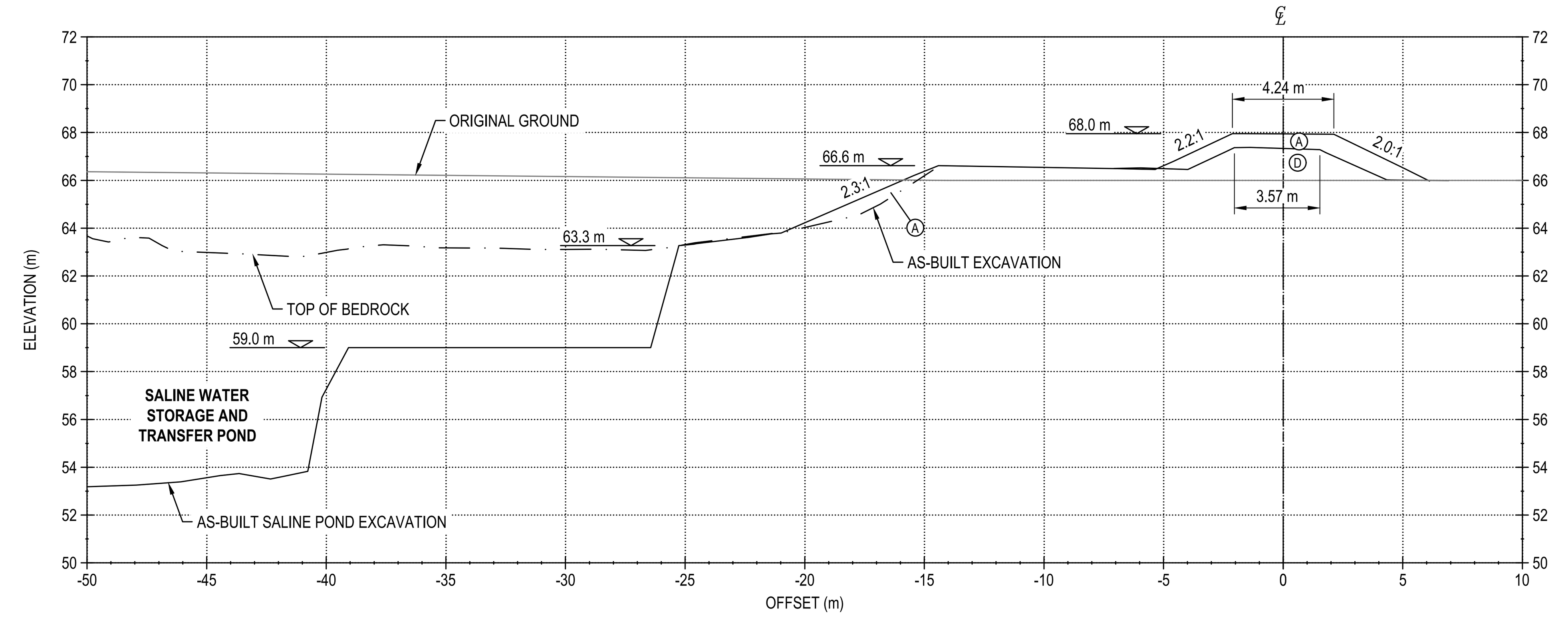

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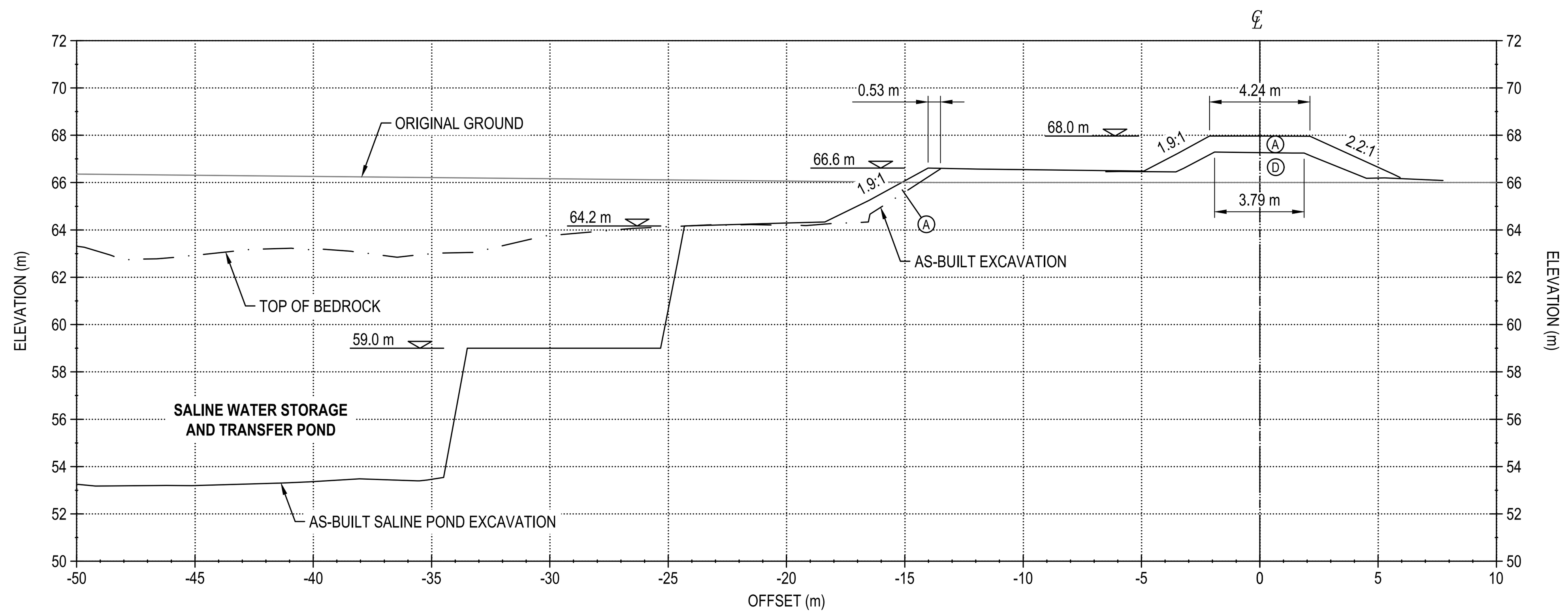

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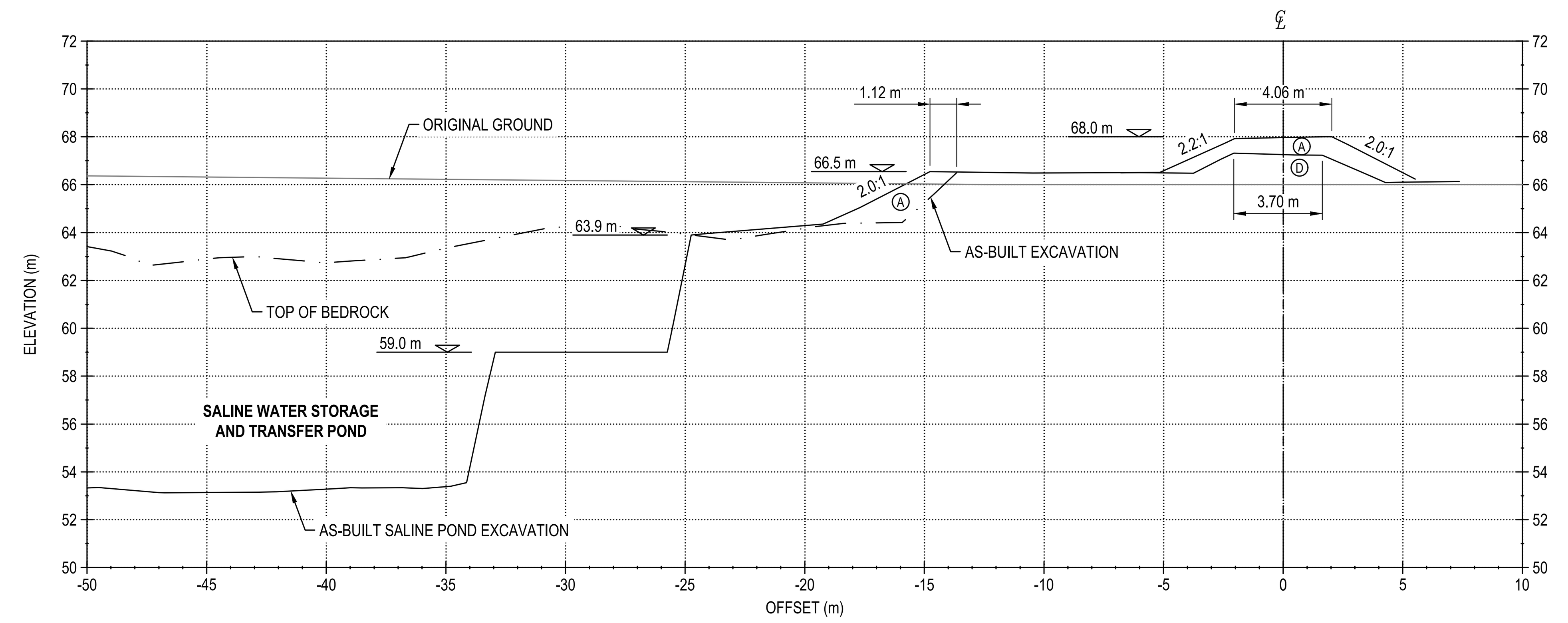

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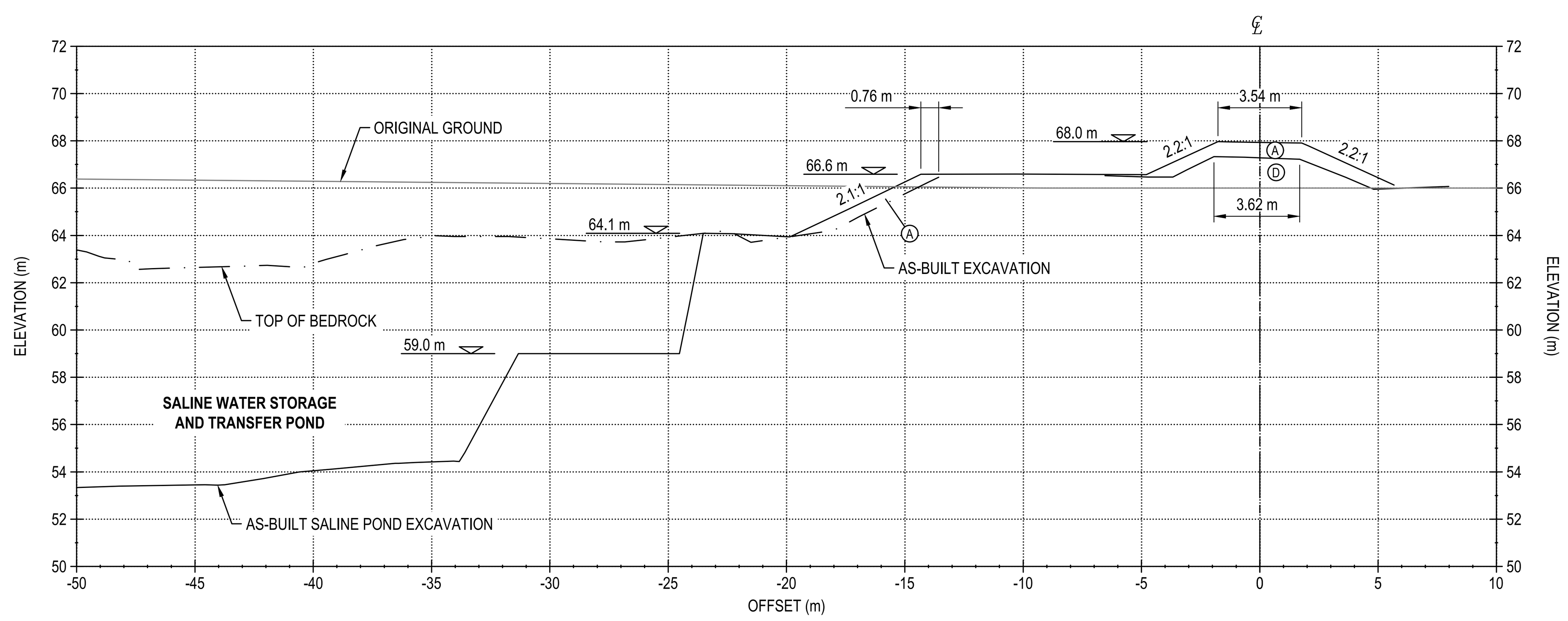

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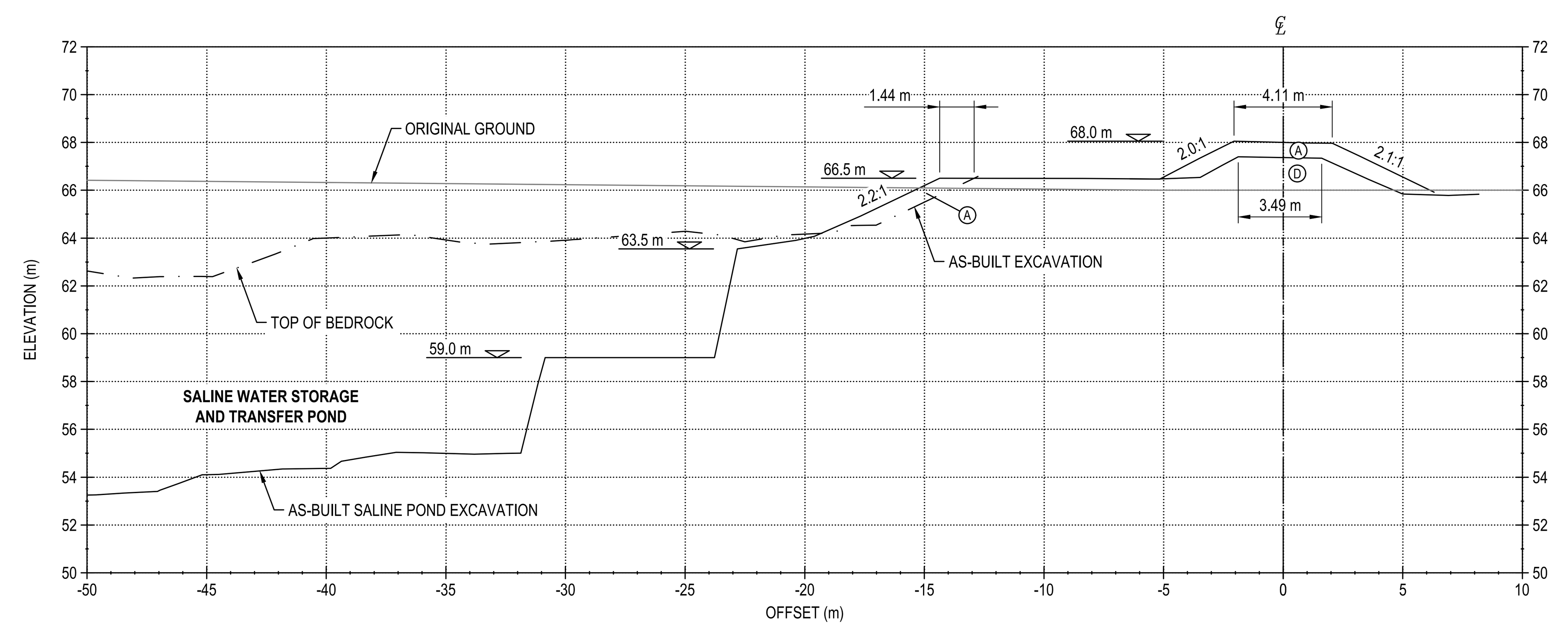

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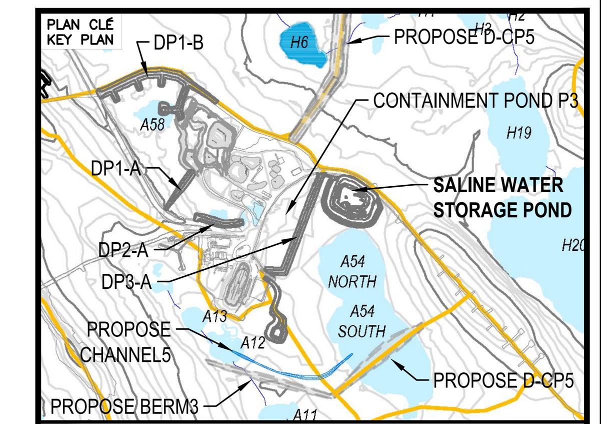

TETRA TECH EBA

NOTES GÉNÉRALES / GENERAL NOTES

- AS-BUILT SURVEY PROVIDED BY AGNICO EAGLE ON NOVEMBER 28, 2016.

LEGEND

Ⓐ RUN-OF-MINE ROCKFILL (600 mm MINUS)

Ⓓ SELECTED UNFROZEN TILL FILL (300 mm MINUS)

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature [signature]
Date Feb. 2/2017
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

TEL QUE CONSTRUIT
AS BUILT
AGNICO EAGLE
DATE : 2017–02–02

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AGNICO EAGLE

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A	2016–12–21	ISSUED FOR REVIEW	EL	GZ	

REVISIONS

REGISTERED PROFESSIONAL ENGINEER G. ZHANG LICENSEE NWT/NU Feb. 02, 2017
REGISTERED PROFESSIONAL ENGINEER KEVIN W. JONES LICENSEE N.W.T. Feb. 2, 2017

TITRE / TITLE
AGNICO EAGLE MELIADINE GOLD PROJECT

AS–BUILT SECTIONS FOR SALINE WATER STORAGE/TRANSFER POND AND BERM STA. 0+070 TO 0+120

DESSINÉ PAR DRAWN BY	EL	DATE 2017–02–02
VERIFIÉ PAR CHECKED BY	GZ	2017–02–02
APPROUVÉ PAR APPROVED BY	KJ	2017–02–02
ÉCHELLE SCALE 1:200	DATE 2017–02–02	

NO. DESSIN DRAWING NO. 65–695–230–226

NO. PROJET PROJECT NO.	REVISION	FEUILLE / SHT
6515	0	4 / 6

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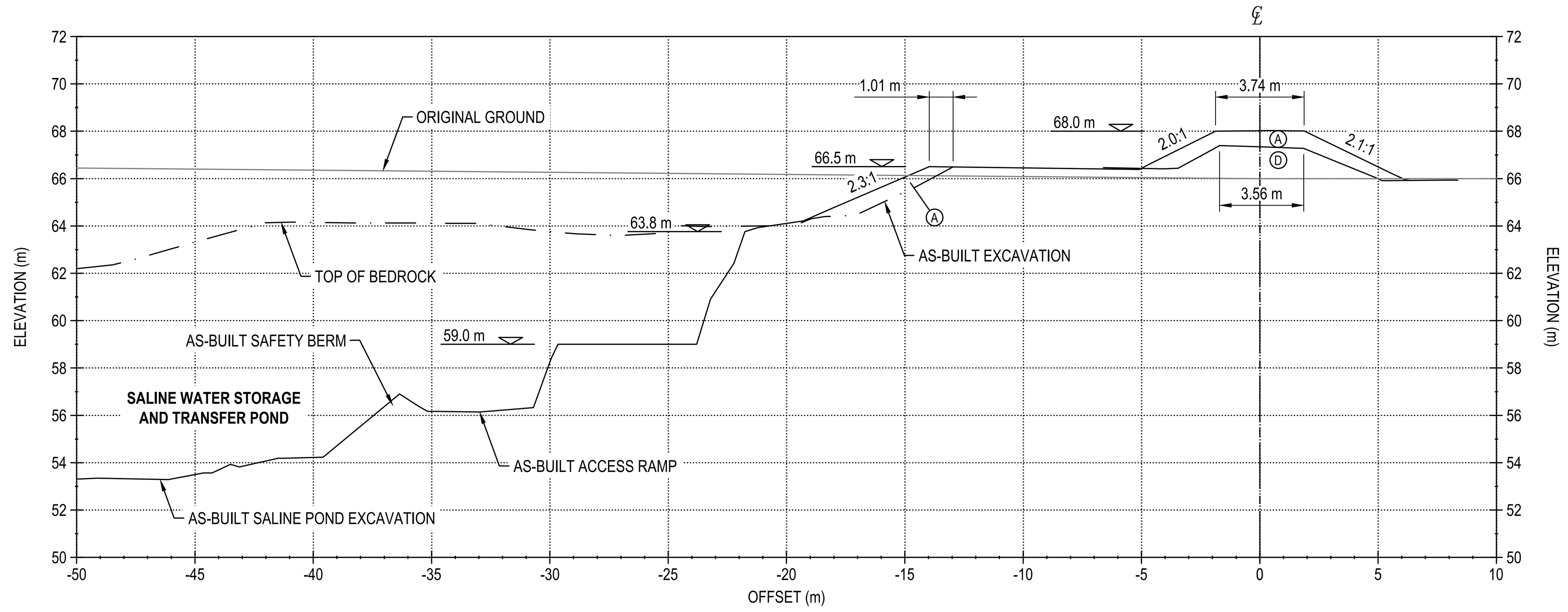

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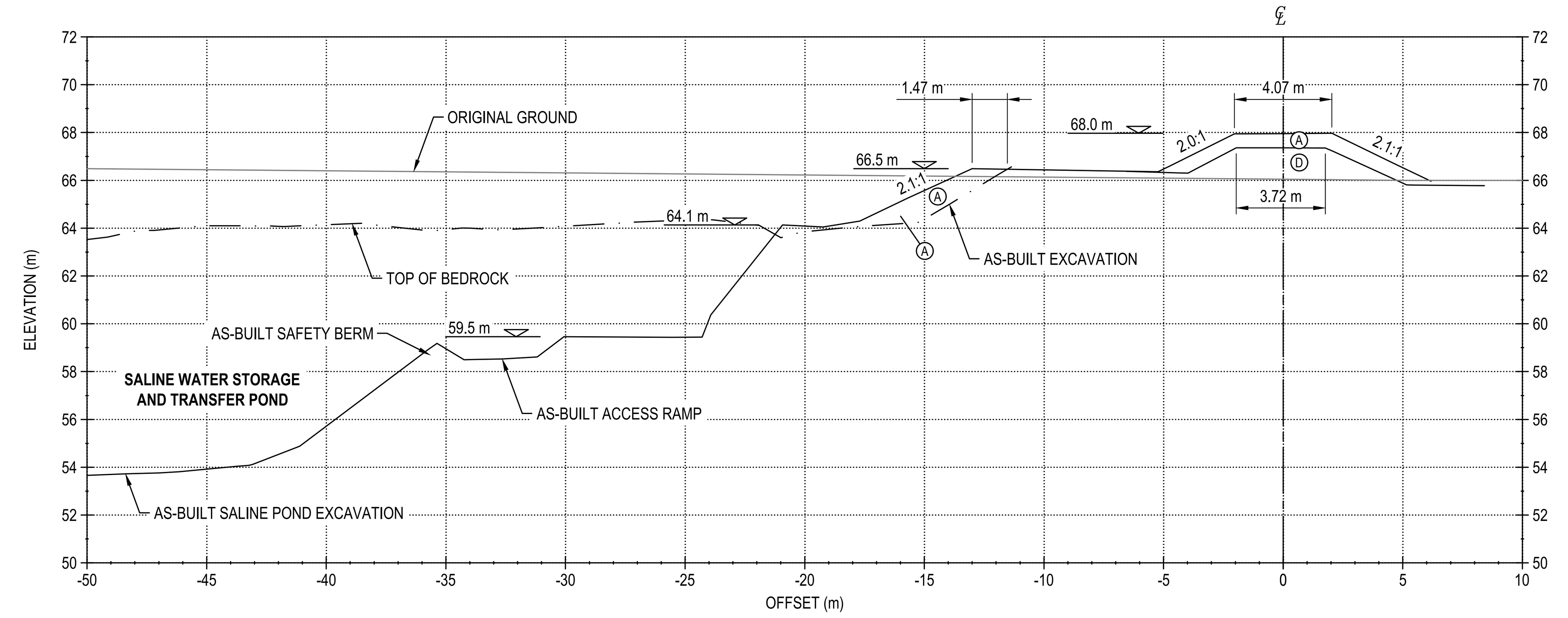

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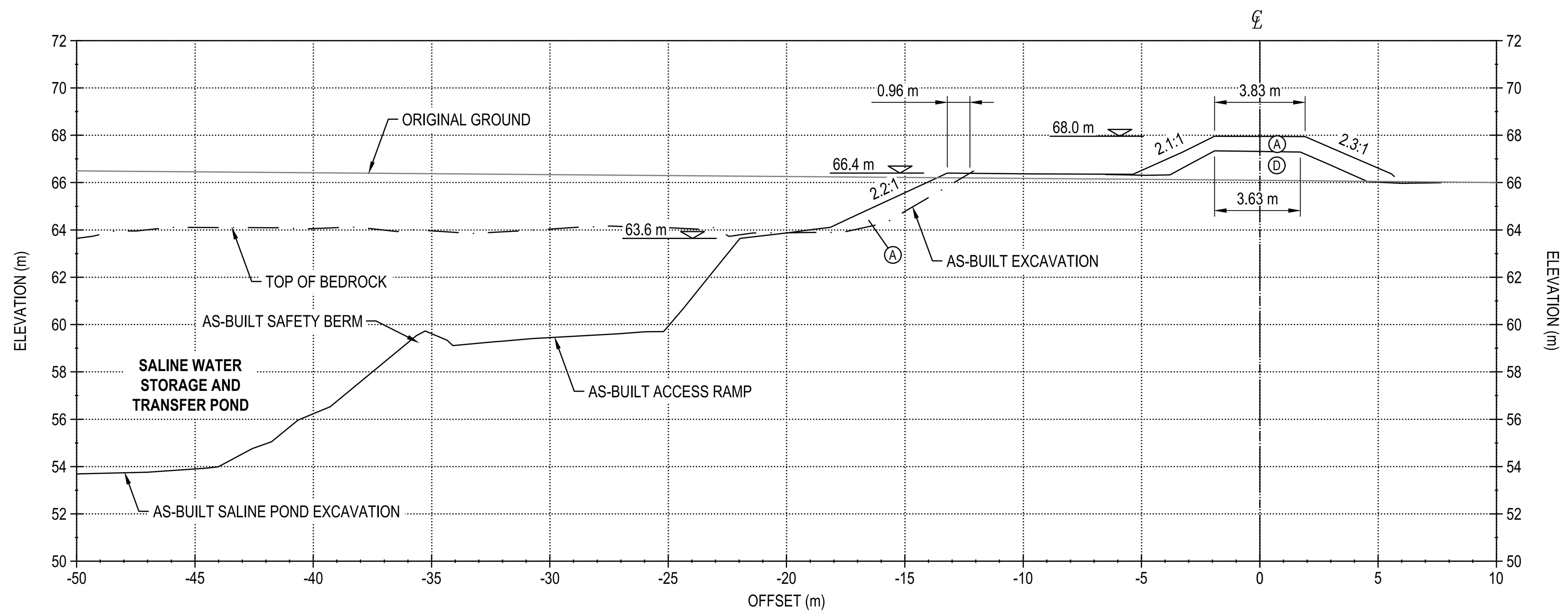

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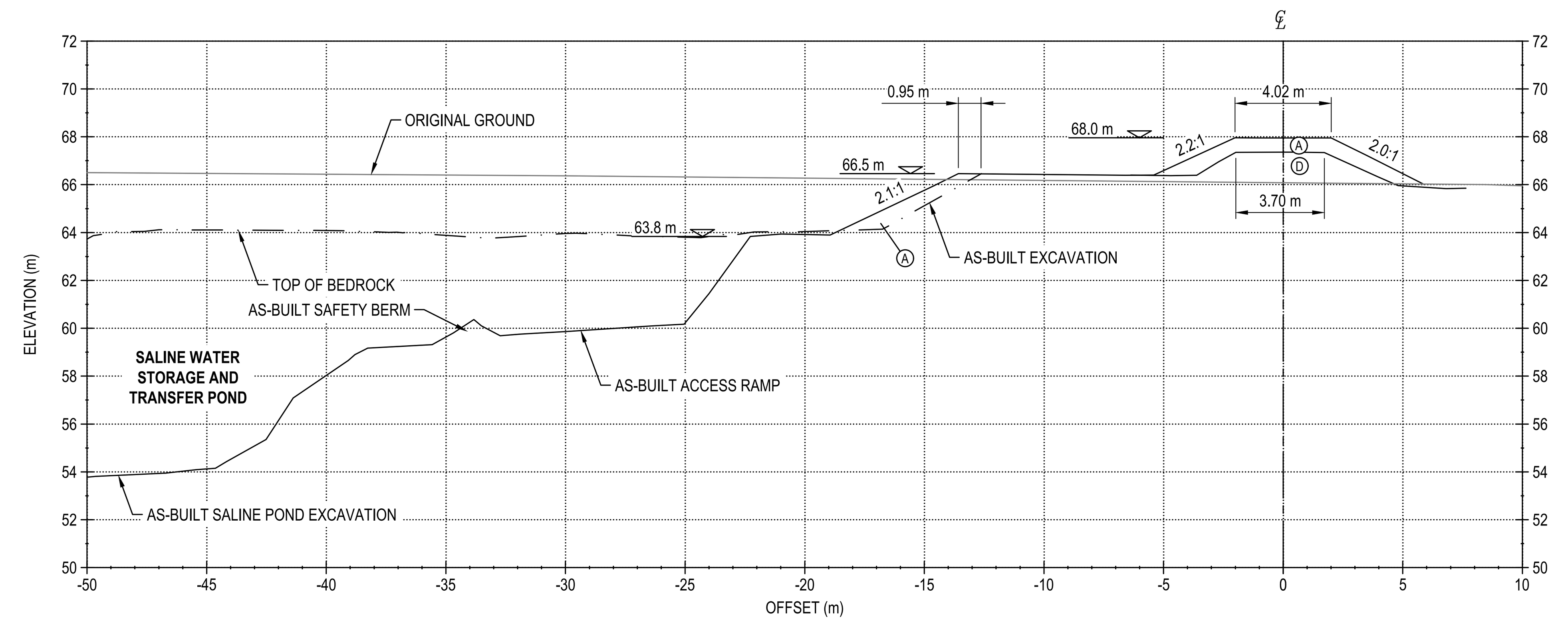

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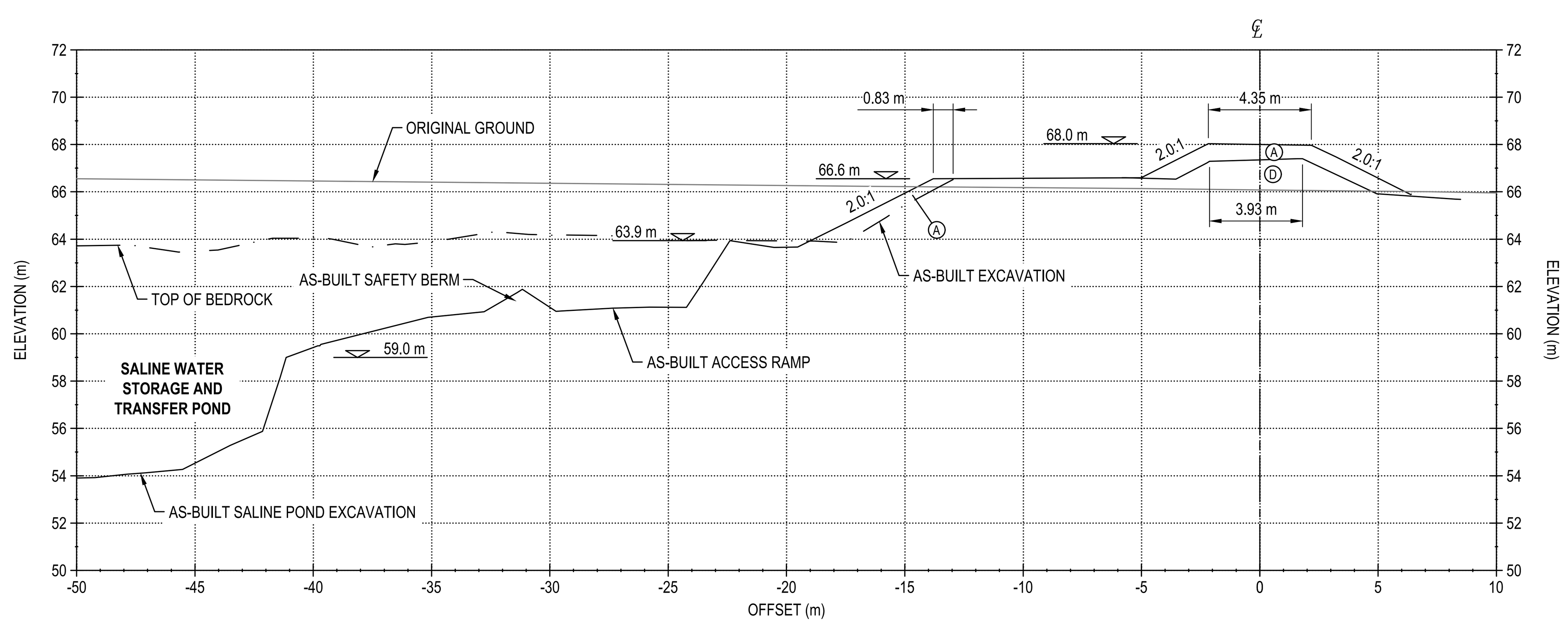

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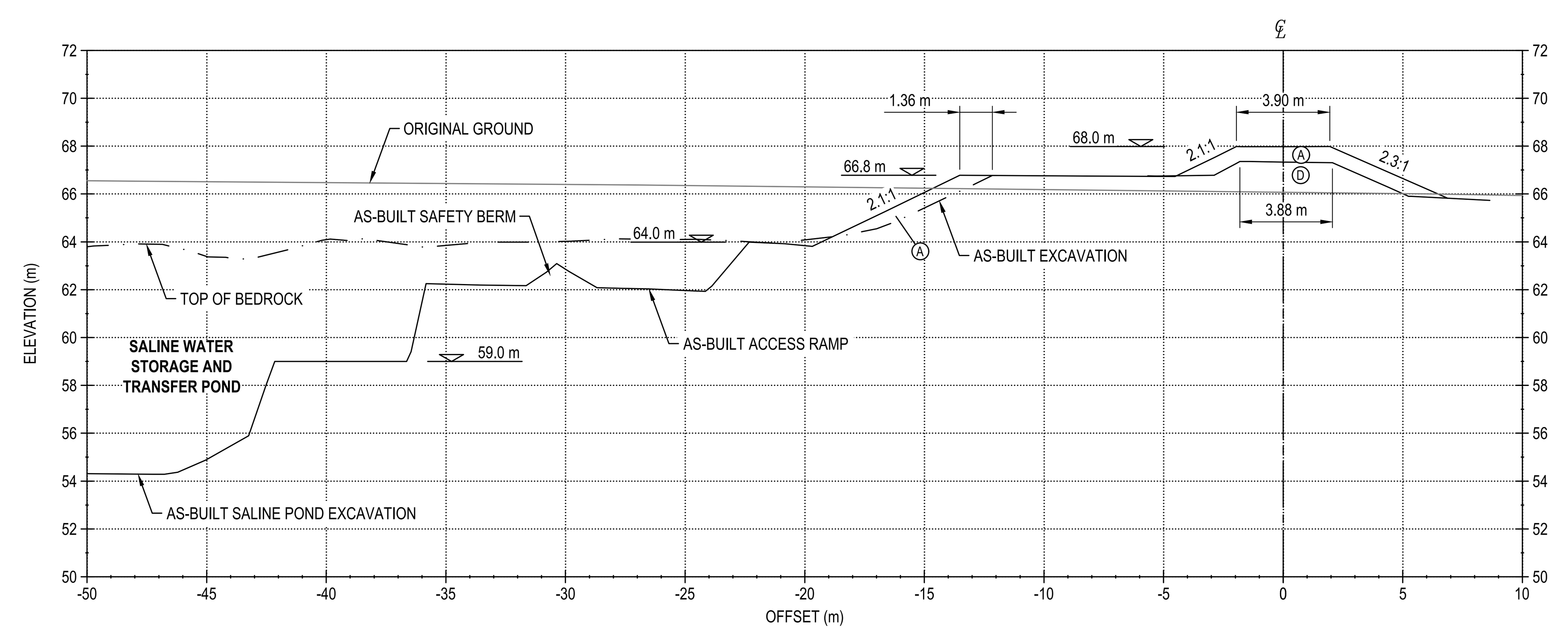

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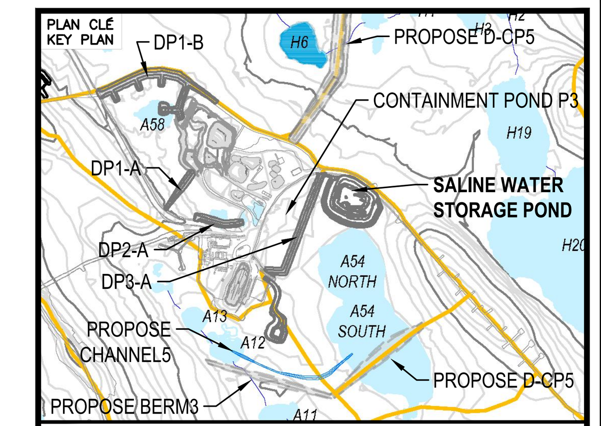

TETRA TECH EBA

NOTES GÉNÉRALES / GENERAL NOTES

- AS-BUILT SURVEY PROVIDED BY AGNICO EAGLE ON NOVEMBER 28, 2016.

LEGEND

- Ⓐ RUN-OF-MINE ROCKFILL (600 mm MINUS)
- Ⓓ SELECTED UNFROZEN TILL FILL (300 mm MINUS)

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature [signature]
Date Feb. 2/2017
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

TEL QUE CONSTRUIT
AS BUILT
DATE : 2017-02-02
AGNICO EAGLE

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
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AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
0	2017–02–02	ISSUED FOR RECORD	EL	GZ	
A	2016–12–21	ISSUED FOR REVIEW	EL	GZ	

REVISIONS

G. ZHANG LICENSEE NWT/NU
KEVIN W. JONES LICENSEE NWT

TITRE / TITLE
AGNICO EAGLE MELIADINE GOLD PROJECT

AS–BUILT SECTIONS FOR SALINE WATER STORAGE/TRANSFER POND AND BERM
STA. 0+130 TO 0+180

DESSINÉ PAR / DRAWN BY	EL	DATE	2017–02–02
VÉRIFIÉ PAR / CHECKED BY	GZ		2017–02–02
APPROUVÉ PAR / APPROVED BY	KJ		2017–02–02
ÉCHELLE / SCALE	1:200	DATE	2017–02–02
NO. DESSIN / DRAWING NO.	65–695–230–227		
NO. PROJET / PROJECT NO.	6515	REVISION 0	FEUILLE / SHT 5 / 6

FORMAT ARCHD

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FILE NO. Saline Water Storage Pond_As–Built.dwg

NO. DESSIN DRAWING NO. 65-695-230-228

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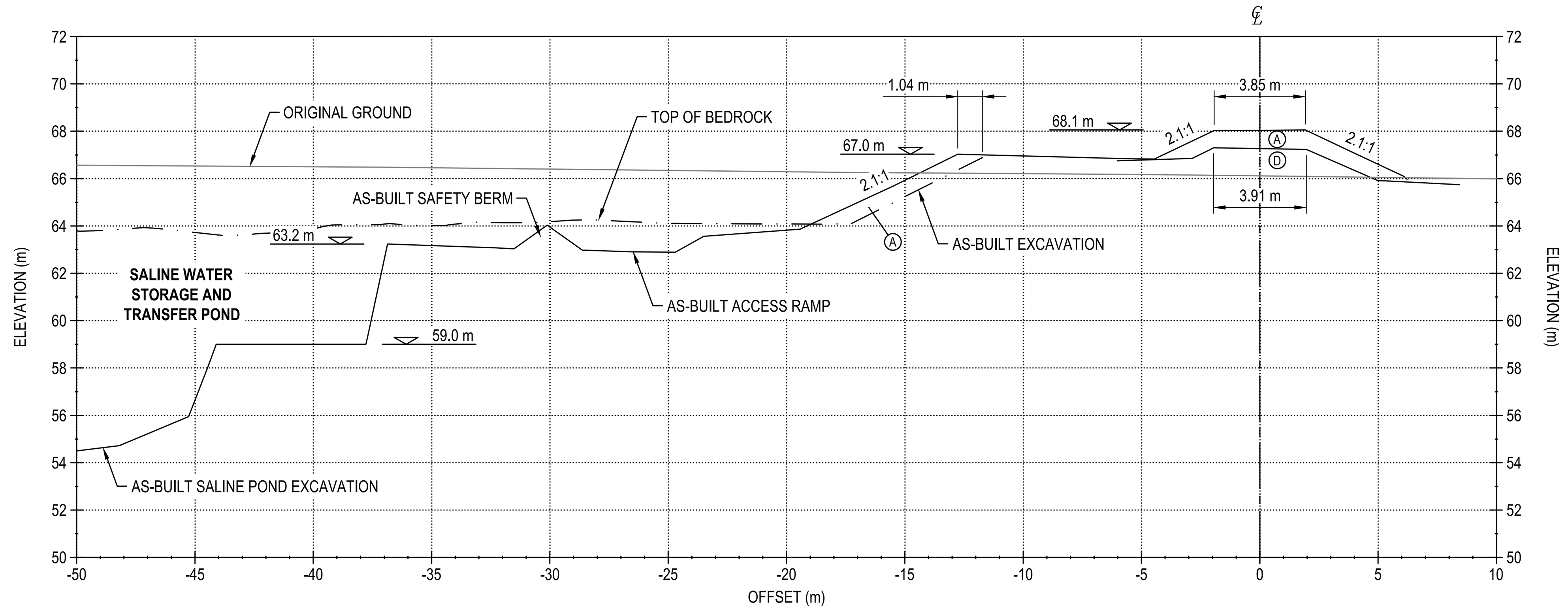

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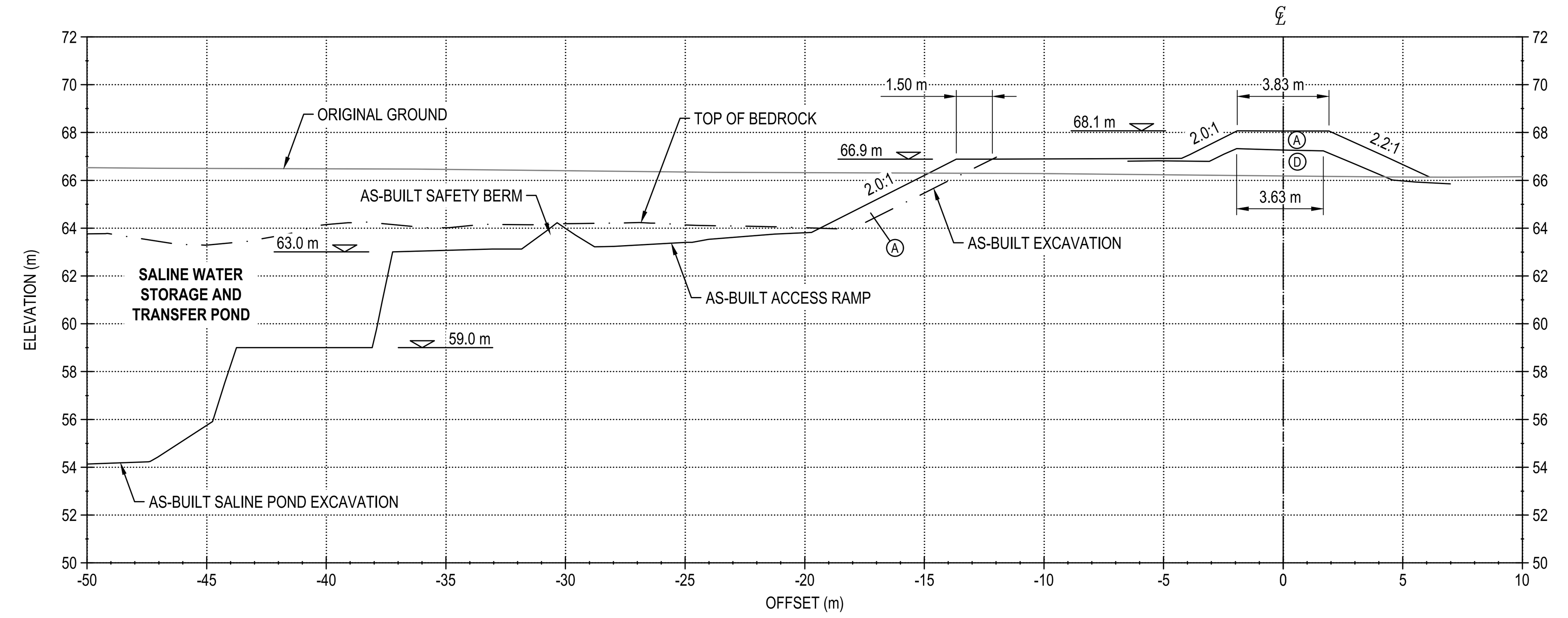

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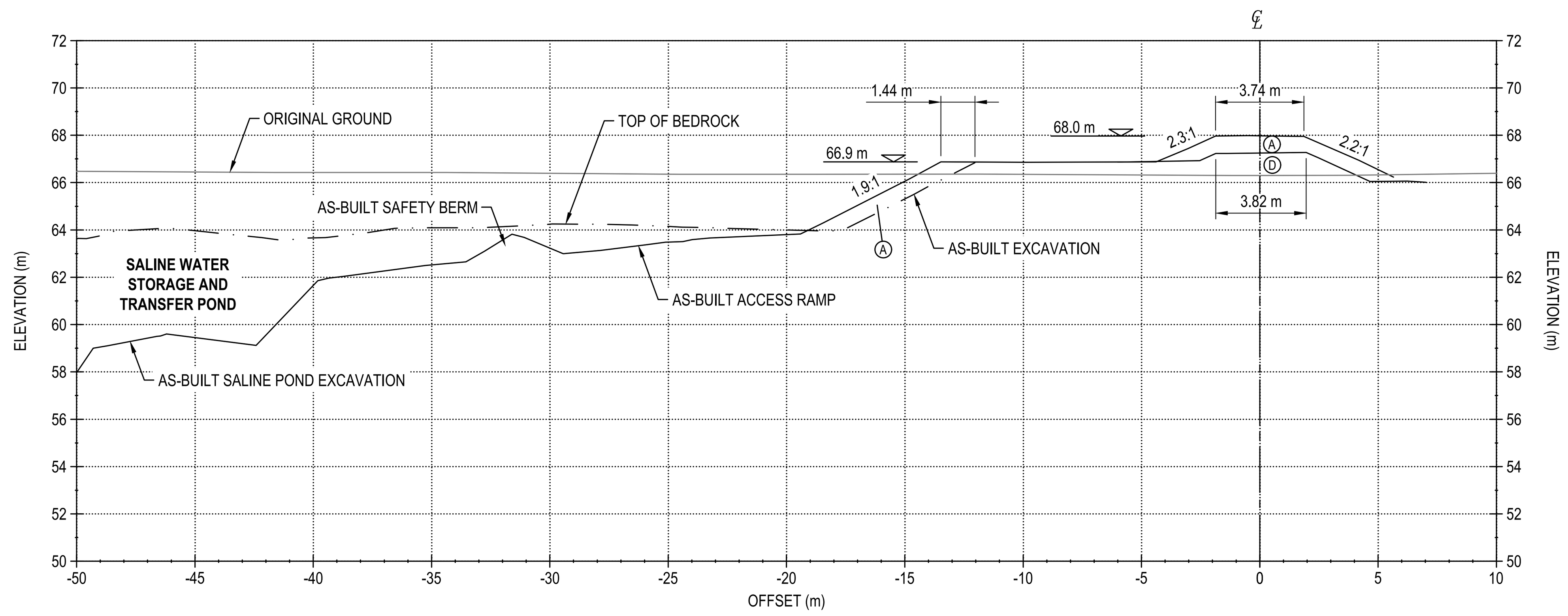

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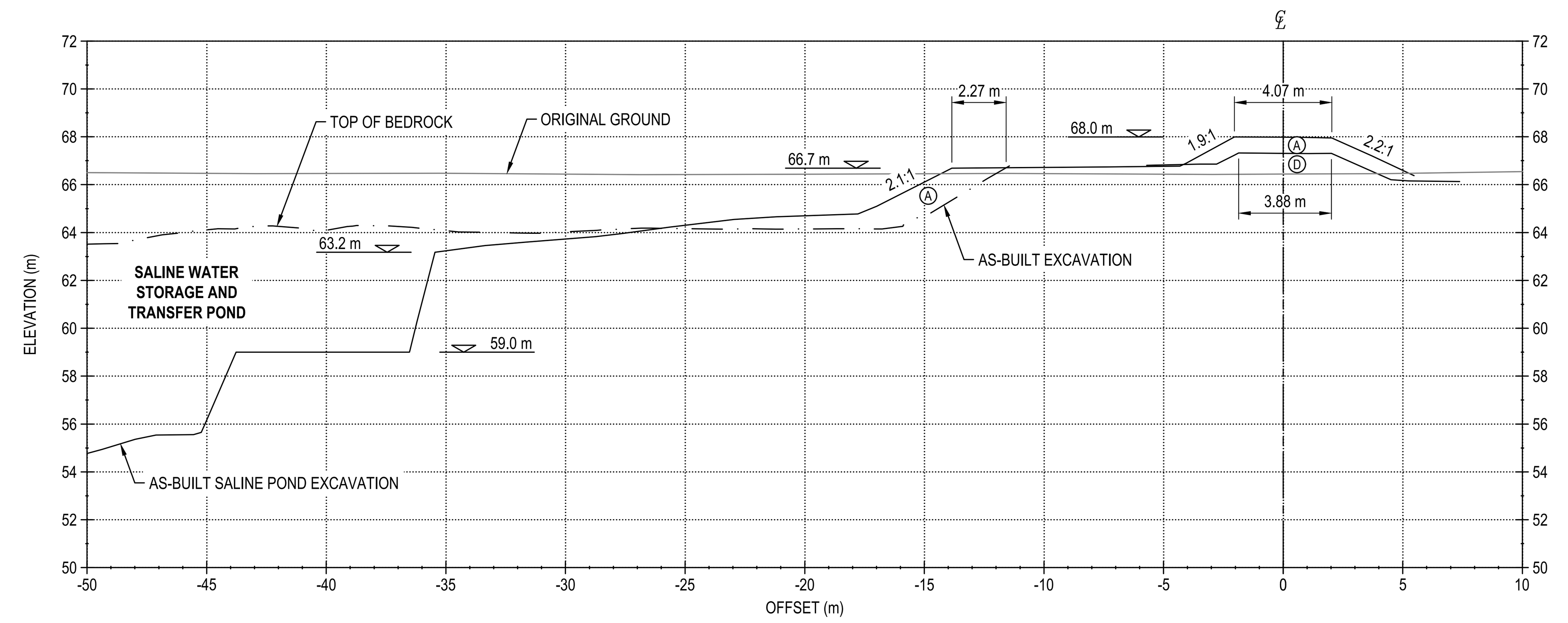

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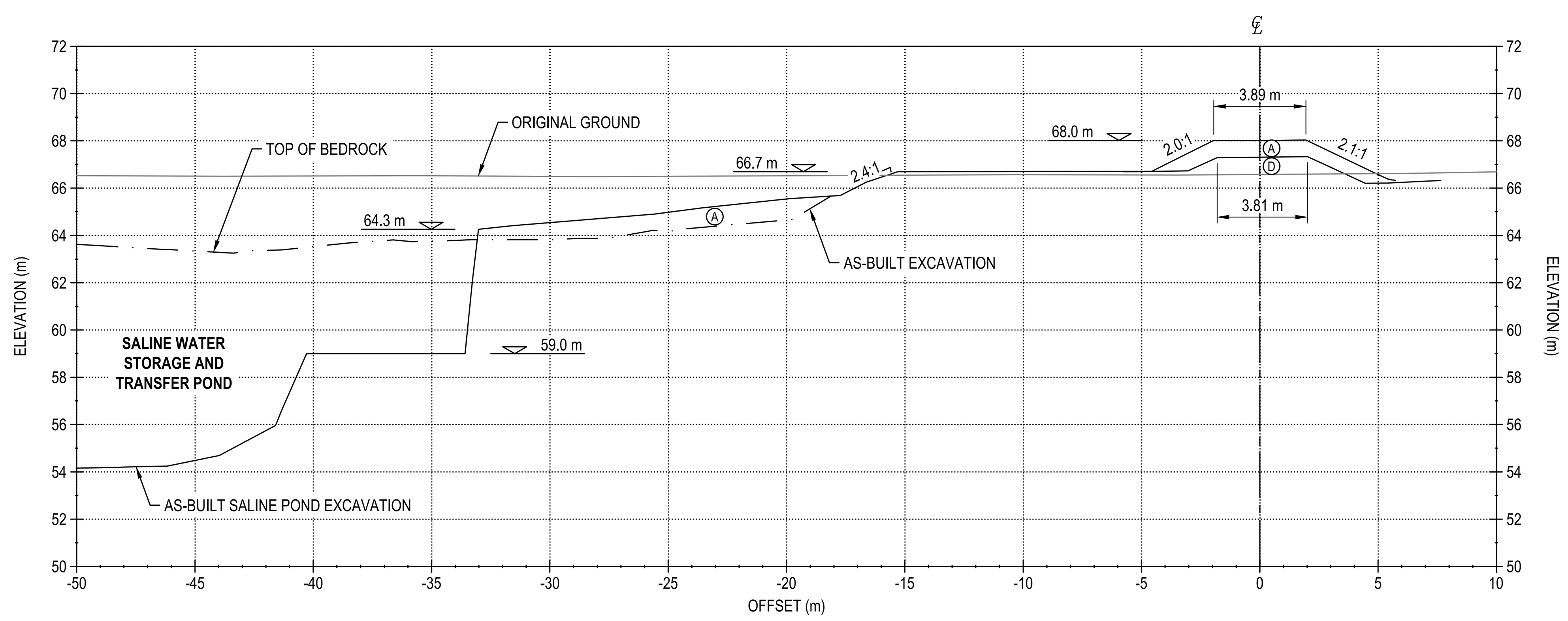

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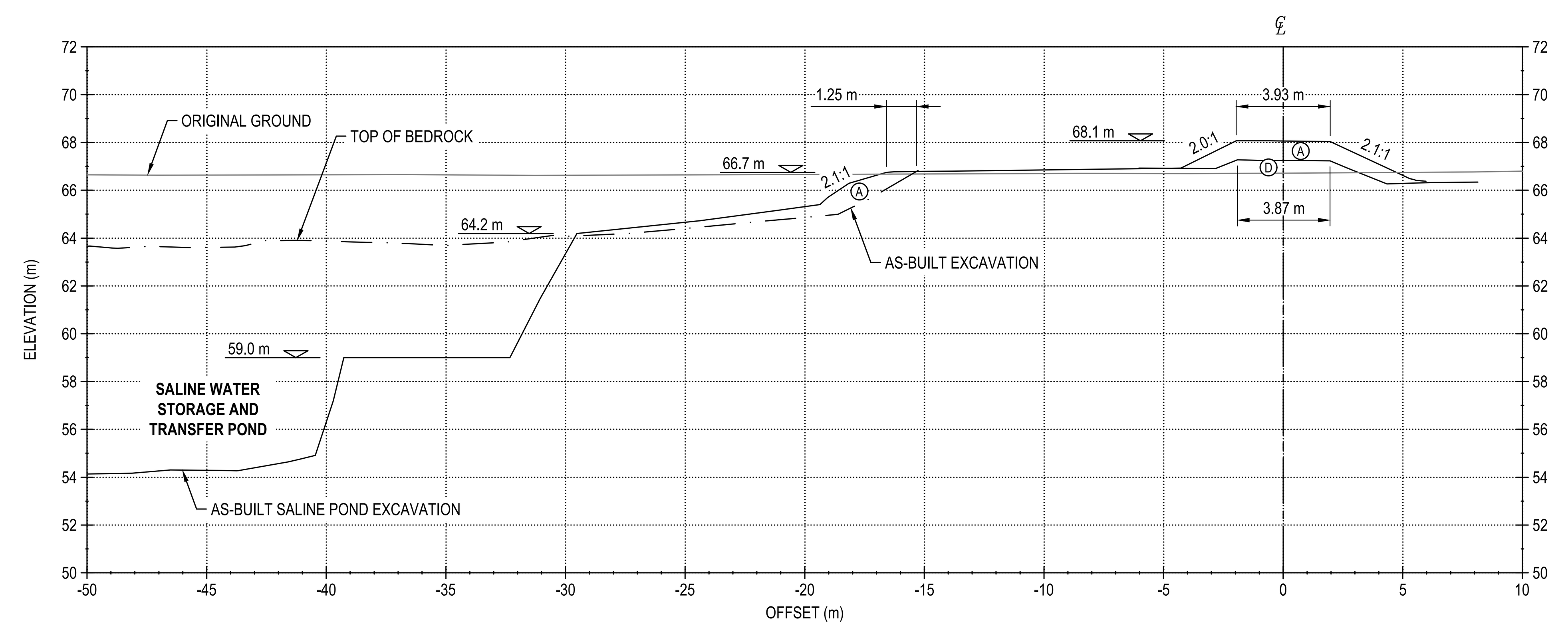

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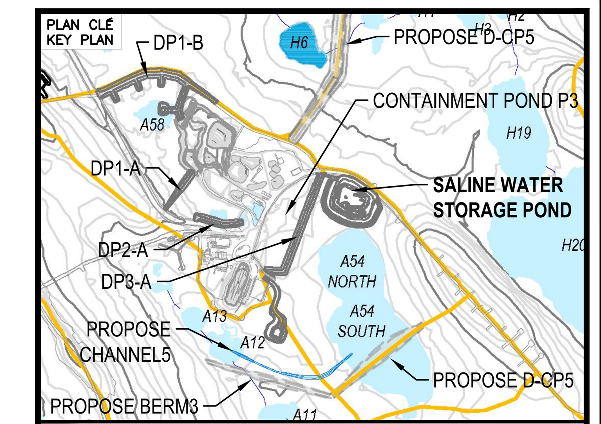
PLAN CLÉ KEY PLAN



TETRA TECH EBA

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TETRA TECH CANADA INC.
Signature
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NT/NU Association of Professional Engineers and Geoscientists

TEL QUE CONSTRUIT
AS BUILT
AGNICO EAGLE DATE : 2017-02-02

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
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AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
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A	2016-12-21	ISSUED FOR REVIEW	EL	GZ	

REVISIONS

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TITRE / TITLE
AGNICO EAGLE MELIADINE GOLD PROJECT

AS-BUILT SECTIONS FOR SALINE WATER STORAGE/TRANSFER POND AND BERM
STA. 0+190 TO 0+240

DESSINÉ PAR DRAWN BY	EL	DATE	2017-02-02
VÉRIFIÉ PAR CHECKED BY	GZ		2017-02-02
APPROUVÉ PAR APPROVED BY	KJ		2017-02-02
ÉCHELLE SCALE	1:200	DATE	2017-02-02

NO. DESSIN DRAWING NO. 65-695-230-228

NO. PROJET PROJECT NO.	REVISION	FEUILLE / SHT
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FILE NO. Saline Water Storage Pond_As-Built.dwg

APPENDIX B
TETRA TECH'S GENERAL CONDITIONS

GENERAL CONDITIONS

GEOTECHNICAL REPORT

This report incorporates and is subject to these "General Conditions".

1.1 USE OF REPORT AND OWNERSHIP

This geotechnical report pertains to a specific site, a specific development and a specific scope of work. It is not applicable to any other sites nor should it be relied upon for types of development other than that to which it refers. Any variation from the site or development would necessitate a supplementary geotechnical assessment.

This report and the recommendations contained in it are intended for the sole use of TETRA TECH's Client. TETRA TECH does not accept any responsibility for the accuracy of any of the data, the analyses or the recommendations contained or referenced in the report when the report is used or relied upon by any party other than TETRA TECH's Client unless otherwise authorized in writing by TETRA TECH. Any unauthorized use of the report is at the sole risk of the user.

This report is subject to copyright and shall not be reproduced either wholly or in part without the prior, written permission of TETRA TECH. Additional copies of the report, if required, may be obtained upon request.

1.2 ALTERNATE REPORT FORMAT

Where TETRA TECH submits both electronic file and hard copy versions of reports, drawings and other project-related documents and deliverables (collectively termed TETRA TECH's instruments of professional service); only the signed and/or sealed versions shall be considered final and legally binding. The original signed and/or sealed version archived by TETRA TECH shall be deemed to be the original for the Project.

Both electronic file and hard copy versions of TETRA TECH's instruments of professional service shall not, under any circumstances, no matter who owns or uses them, be altered by any party except TETRA TECH. TETRA TECH's instruments of professional service will be used only and exactly as submitted by TETRA TECH.

Electronic files submitted by TETRA TECH have been prepared and submitted using specific software and hardware systems. TETRA TECH makes no representation about the compatibility of these files with the Client's current or future software and hardware systems.

1.3 ENVIRONMENTAL AND REGULATORY ISSUES

Unless stipulated in the report, TETRA TECH has not been retained to investigate, address or consider and has not investigated, addressed or considered any environmental or regulatory issues associated with development on the subject site.

1.4 NATURE AND EXACTNESS OF SOIL AND ROCK DESCRIPTIONS

Classification and identification of soils and rocks are based upon commonly accepted systems and methods employed in professional geotechnical practice. This report contains descriptions of the systems and methods used. Where deviations from the system or method prevail, they are specifically mentioned.

Classification and identification of geological units are judgmental in nature as to both type and condition. TETRA TECH does not warrant conditions represented herein as exact, but infers accuracy only to the extent that is common in practice.

Where subsurface conditions encountered during development are different from those described in this report, qualified geotechnical personnel should revisit the site and review recommendations in light of the actual conditions encountered.

1.5 LOGS OF TESTHOLES

The testhole logs are a compilation of conditions and classification of soils and rocks as obtained from field observations and laboratory testing of selected samples. Soil and rock zones have been interpreted. Change from one geological zone to the other, indicated on the logs as a distinct line, can be, in fact, transitional. The extent of transition is interpretive. Any circumstance which requires precise definition of soil or rock zone transition elevations may require further investigation and review.

1.6 STRATIGRAPHIC AND GEOLOGICAL INFORMATION

The stratigraphic and geological information indicated on drawings contained in this report are inferred from logs of test holes and/or soil/rock exposures. Stratigraphy is known only at the locations of the test hole or exposure. Actual geology and stratigraphy between test holes and/or exposures may vary from that shown on these drawings. Natural variations in geological conditions are inherent and are a function of the historic environment. TETRA TECH does not represent the conditions illustrated as exact but recognizes that variations will exist. Where knowledge of more precise locations of geological units is necessary, additional investigation and review may be necessary.

1.7 PROTECTION OF EXPOSED GROUND

Excavation and construction operations expose geological materials to climatic elements (freeze/thaw, wet/dry) and/or mechanical disturbance which can cause severe deterioration. Unless otherwise specifically indicated in this report, the walls and floors of excavations must be protected from the elements, particularly moisture, desiccation, frost action and construction traffic.

1.8 SUPPORT OF ADJACENT GROUND AND STRUCTURES

Unless otherwise specifically advised, support of ground and structures adjacent to the anticipated construction and preservation of adjacent ground and structures from the adverse impact of construction activity is required.

1.9 INFLUENCE OF CONSTRUCTION ACTIVITY

There is a direct correlation between construction activity and structural performance of adjacent buildings and other installations. The influence of all anticipated construction activities should be considered by the contractor, owner, architect and prime engineer in consultation with a geotechnical engineer when the final design and construction techniques are known.

1.10 OBSERVATIONS DURING CONSTRUCTION

Because of the nature of geological deposits, the judgmental nature of geotechnical engineering, as well as the potential of adverse circumstances arising from construction activity, observations during site preparation, excavation and construction should be carried out by a geotechnical engineer. These observations may then serve as the basis for confirmation and/or alteration of geotechnical recommendations or design guidelines presented herein.

1.11 DRAINAGE SYSTEMS

Where temporary or permanent drainage systems are installed within or around a structure, the systems which will be installed must protect the structure from loss of ground due to internal erosion and must be designed so as to assure continued performance of the drains. Specific design detail of such systems should be developed or reviewed by the geotechnical engineer. Unless otherwise specified, it is a condition of this report that effective temporary and permanent drainage systems are required and that they must be considered in relation to project purpose and function.

1.12 BEARING CAPACITY

Design bearing capacities, loads and allowable stresses quoted in this report relate to a specific soil or rock type and condition. Construction activity and environmental circumstances can materially change the condition of soil or rock. The elevation at which a soil or rock type occurs is variable. It is a requirement of this report that structural elements be founded in and/or upon geological materials of the type and in the condition assumed. Sufficient observations should be made by qualified geotechnical personnel during construction to assure that the soil and/or rock conditions assumed in this report in fact exist at the site.

1.13 SAMPLES

TETRA TECH will retain all soil and rock samples for 30 days after this report is issued. Further storage or transfer of samples can be made at the Client's expense upon written request, otherwise samples will be discarded.

1.14 INFORMATION PROVIDED TO TETRA TECH BY OTHERS

During the performance of the work and the preparation of the report, TETRA TECH may rely on information provided by persons other than the Client. While TETRA TECH endeavours to verify the accuracy of such information when instructed to do so by the Client, TETRA TECH accepts no responsibility for the accuracy or the reliability of such information which may affect the report.