

## **Appendix 17**

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### **Meadowbank TSF South Cell Permeable Berm As-Built Report**

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**AGNICO EAGLE**

**MEADOWBANK GOLD MINE**

**SOUTH CELL PERMEABLE BERM AS-BUILT REPORT**

**AGNICO-EAGLE MINES LIMITED  
MEADOWBANK GOLD PROJECT**

**MAY 2019**

## **EXECUTIVE SUMMARY**

The construction of the South Cell Permeable Berm at Meadowbank occurred from December 29<sup>th</sup> 2018 to February 14<sup>th</sup> 2019. The permeable berm is located in the northwest corner of the South Cell of the Tailings Storage Facility along the downstream toe of Stormwater Dike and in front of the reclaim pump area.

This permeable berm was designed and constructed to secure the reclaim pond by preventing the subaqueous slurry beach from reaching the reclaim pump suction. The objective is to optimize the tailings deposition and water management of the South Cell. It will also help prevent issues at the mill by improving water quality in the reclaim pond, as water will seep through, but not the tailings slurry. The built internal structure is 320m long, 25.5m wide, and built to an elevation of 142.5m. The construction required 59,607 tonnes of material.

Work carried out during construction of the internal structure included an access road, 110m long, oriented East-West, built with NAG material and a berm crossing the South Cell from South to North, 210m long, built with both NAG and PAG material. This as-built report presents the design and the construction procedure of the permeable berm.

## DOCUMENT CONTROL

Document Version	Date	Revised Section	Revision
Version 2	05-30-2019	Appendix	Remove construction specifications and JHA
Final	05-29-2019	All	

# **SOUTH CELL INTERNAL STRUCTURE AS-BUILT REPORT**

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## **SECTION 1.0 - INTRODUCTION**

The South Cell at Meadowbank is located in the North portion of the main mine site, and is one of the two cells within the Meadowbank Tailings Storage Facility (TSF). The South Cell TSF is contained within 5 tailings dikes: Stormwater Dike, Central Dike, Saddle Dam 5, Saddle Dam 4, and Saddle Dam 3. In the beginning of 2019, tailings deposition was ongoing in the South Cell from Central Dike. Water in the South Cell is reclaimed and sent to the mill through the reclaim pump located at the northwest corner of the South Cell. Figure 1 presents the Meadowbank Mine site and Figure 2 presents the general arrangement of the South Cell TSF and the location of the reclaim pump area.

The South Cell Permeable Berm was constructed by placing rockfill within the South Cell to optimise tailings deposition and to secure the reclaim pond area by preventing the tailings' subaqueous slurry from reaching the reclaim suction, potentially causing reclaim water quality issues at the mill. A similar structure was previously built with success in the fall of 2017 in the same general area.

Construction of the structure was done from December 29<sup>th</sup> 2019 to February 14<sup>th</sup> 2019. Figure 3 presents the location of the South Cell Permeable Berm.

This as-built report presents the work construction procedures for the South Cell Permeable Berm. This document presents the design, a description of the construction activities and a summary of the QA/QC activity done during the construction.

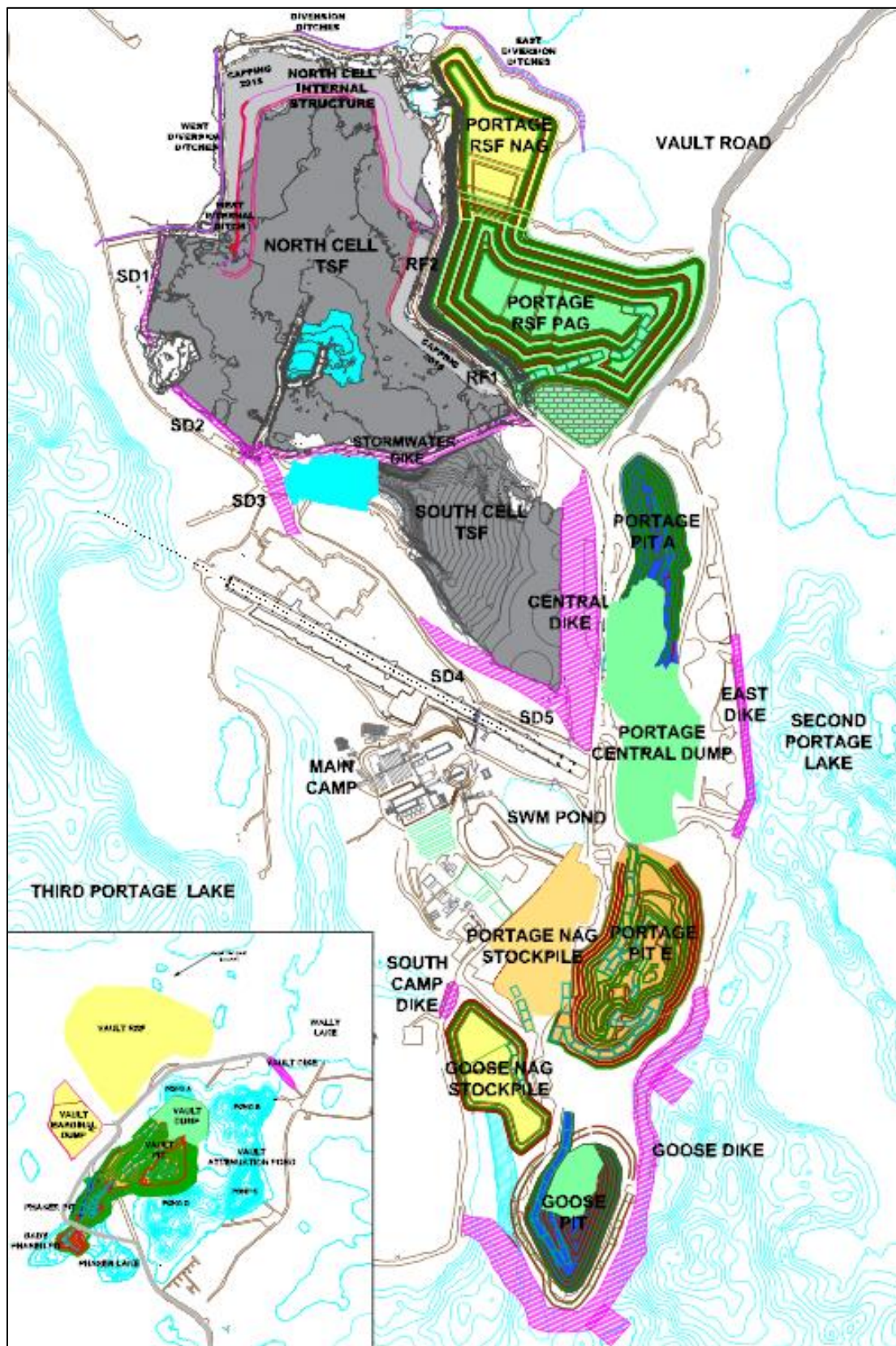


Figure 1: General arrangement of the Meadowbank mine site



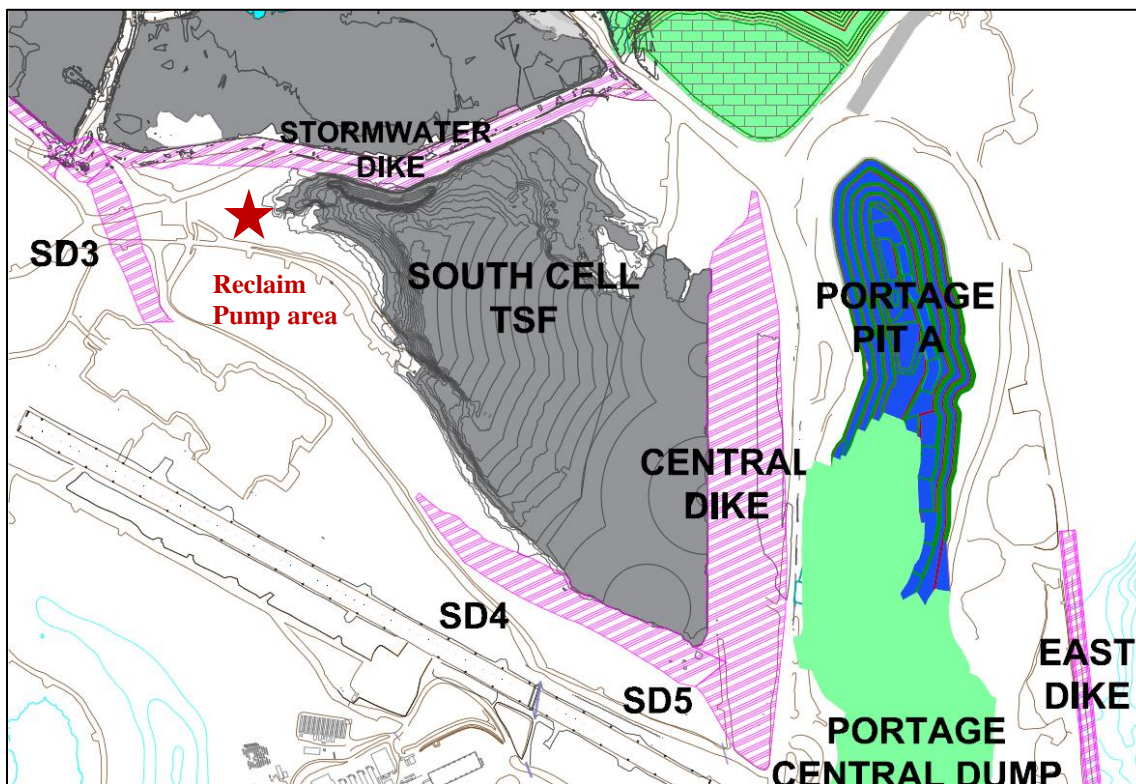
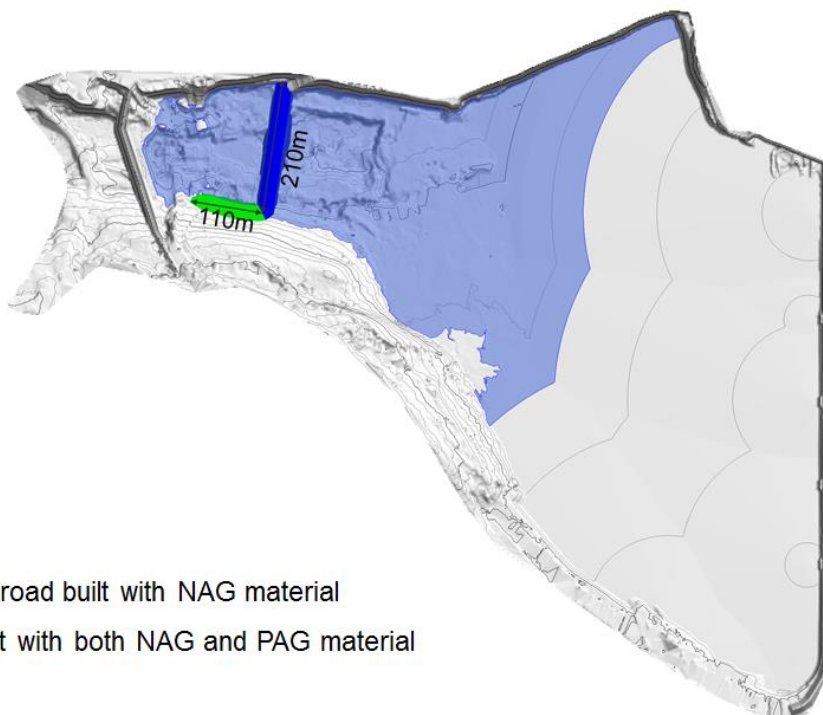


Figure 2: General arrangement of the South Cell TSF and location of the reclaim pump area



- In green : Access road built with NAG material
- In blue : Berm built with both NAG and PAG material

Figure 3: Overview of the South Cell Permeable Berm



## **SECTION 2.0 - DESIGN**

The design of the permeable berm was prepared by AEM. It was designed similarly to the permeable berm built in the fall of 2017. The Design and Construction Specifications were developed by the Meadowbank Engineering Department prior to the start of the construction.

The South Cell Permeable Berm is a 210 m long structure made of rockfill built in the South Cell pond in a location where the maximum water depth was 7 m. The design intent of the structure is to isolate the reclaim pond area from the South Cell Pond to block the tailings but allow the water to go through. The elevation of the structure is at El. 142.5 which is 1.2m above the expected water level at the end of the construction period. The structure has safety berms and a width of 25.5m to avoid building turnarounds for trucks.

### **SECTION 3.0 - CONSTRUCTION ACTIVITIES AND DESCRIPTION OF THE WORK**

The construction of the 2019 South Cell Permeable Berm was done by the Mine Operations Department with guidance from the Meadowbank Engineering Department. The construction surveillance was done by AEM representatives and the Geotechnical team. Survey of the work was completed by AEM. The construction of the South Cell Permeable Berm was conducted from December 29<sup>th</sup> 2019 to February 14<sup>th</sup> 2019 and consisted of the following activities:

- Access road construction
- Berm construction
- Excavation of two trenches

Selected photographs of the work progress are included in Appendix A. As-built drawings are available in Appendix B.

#### **3.1 ACCESS TO THE WORK AREA**

To access the area where the permeable berm need to be constructed a 110m access road was built on dry land within the South Cell using NAG material.

#### **3.2 ROCKFILL PLACEMENT**

Construction of the internal structure was done with the placement of a single lift of rockfill to El. 142.5 m in the South Cell. Due to winter condition during construction, the ice was progressively broken and removed using a Caterpillar 345 excavator prior to rockfill placement.

The Permeable Berm was built using 100T haul trucks operated by the Mine Operations Department. PAG and NAG rockfill from the Portage Pit E was hauled to the construction area. The rockfill was dumped onto the surface of the internal structure and a dozer pushed the rockfill in the South Cell Pond to advance the internal structure. Compaction of the rockfill surface was achieved through heavy equipment passage. Construction of the permeable berm within the South Cell was conducted during both night and day shifts.

30,867 tonnes of PAG and 28,740 tonnes of NPAG material were hauled to the area for construction of the access and the structure (total volume of 27,715 m<sup>3</sup>). Refer to Table 1 for more details.

**Table 1: Quantity of Material Used During 2019 South Cell Permeable Construction**

SOUTH CELL PERMEABLE BERM	DATE	NPAG	PAG	TOTAL
	29-12-2018	83.0		83.0
	01-01-2019	682.1		682.1
	02-01-2019	939.3		939.3
	14-01-2019	86.0		86.0
	16-01-2019	1,636.5		1,636.5
	17-01-2019	2,411.6		2,411.6
	18-01-2019	2,583.9		2,583.9
	19-01-2019		775.2	775.2
	20-01-2019		3,531.3	3,531.3
	21-01-2019	258.4	861.3	1,119.7
	22-01-2019	86.1	1,464.2	1,550.3
	23-01-2019	1,636.5	1,894.9	3,531.3
	27-01-2019		1,815.7	1,815.7
	28-01-2019		826.5	826.5
	01-02-2019		433.3	433.3
	02-02-2019		650.4	650.4
	03-02-2019		2,239.4	2,239.4
	08-02-2019	2,396.9	413.3	2,810.1
	09-02-2019	3,058.1	2,582.2	5,640.2
	10-02-2019	5,454.9	1,830.7	7,285.6
	11-02-2019	6,000.2	2,066.3	8,066.5
	12-02-2019	1,901.0	3,471.3	5,372.3
	13-02-2019	413.1	330.3	743.4
	14-02-2019	1,239.8	3,554.0	4,793.7
	<b>TOTAL</b>	<b>30,867.2</b>	<b>28,740.0</b>	<b>59,607.2</b>

#### **SECTION 4.0 - QA/QC ACTIVITY DURING CONSTRUCTION**

AEM representatives routinely conducted visual observation of work procedures during the construction of the South Cell Permeable Berm. Review of the work procedure was done on a daily basis and corrections were made if needed. Daily surveys were conducted by AEM representatives for daily progress and to ensure that limits and grades were followed as per the construction specification. Photographs of the work progress were taken throughout the construction of the permeable berm. A visual monitoring program consisting of frequent field visits by the Geotechnical team was put into place to verify the integrity of the internal structure. No instabilities or adverse conditions were encountered during the construction of the internal structure.

## **APPENDIX A –CONSTRUCTION PHOTOS**

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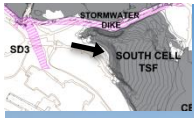


Photo 1: Placement of piquets to align the structure

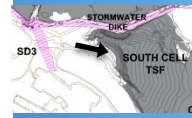


Photo 2: Construction of the access road



Photo 3: Removal of ice with an excavator



Photo 4: Broken ice

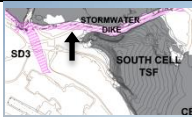


Photo 5: Permeable berm rockfill placement

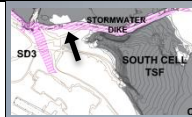


Photo 6: permeable berm construction. Excavator is broken the ice before the dozer advance the structure





Photo 7: Equipment use for the construction



Photo 8: View of the berm



Photo 9: View of the access road

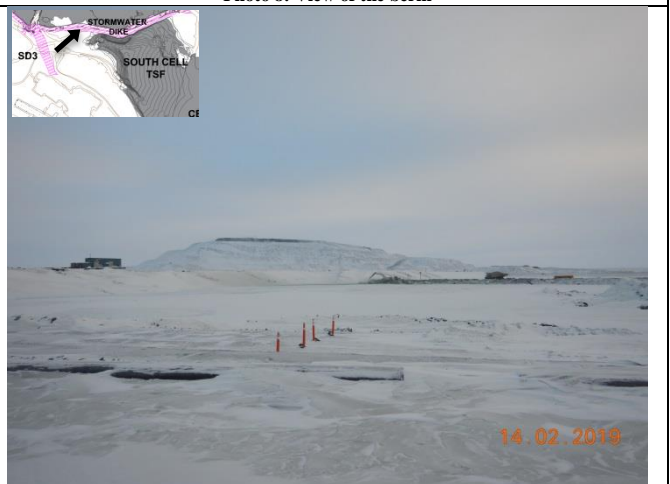
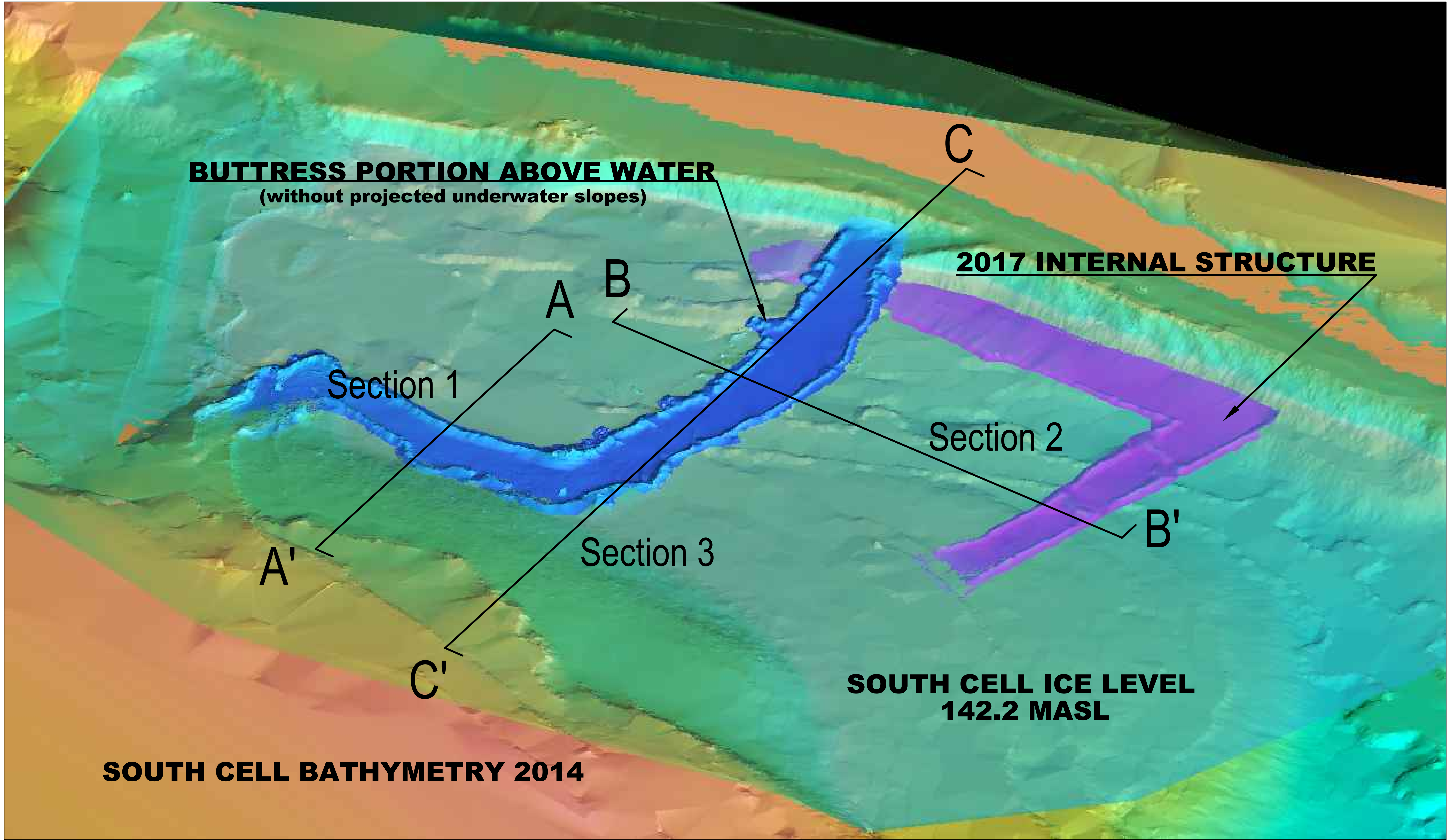


Photo 10: View of the work area from a distance



## **APPENDIX B – AS-BUILT DRAWINGS**

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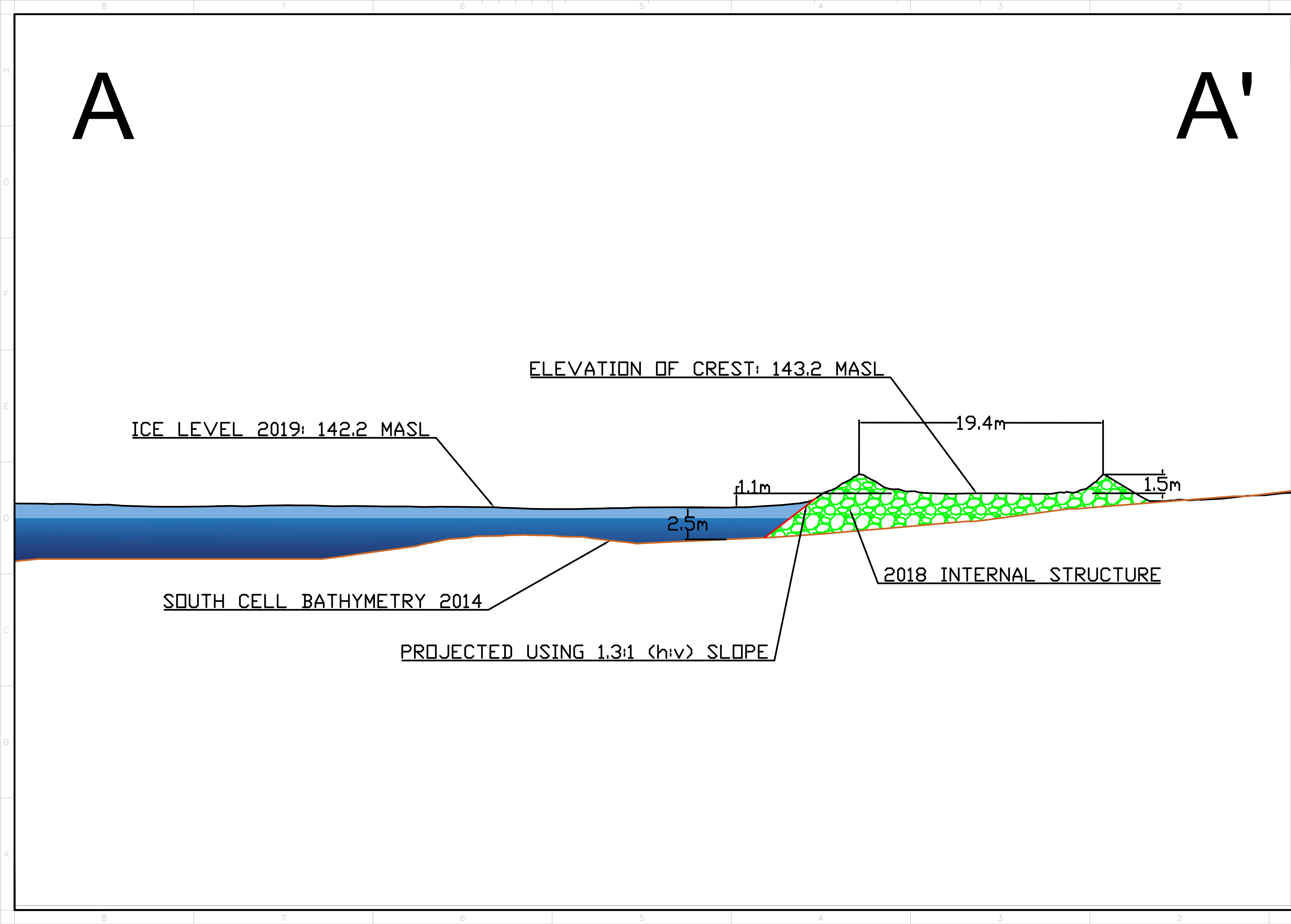
KEY PLAN	

GENERAL NOTES	

REVISIONS	
REV.	DATE

REFERENCE DRAWINGS	

AGNICO EAGLE MEADOWBANK	
TITLE AGNICO—EAGLE — MEADOWBANK DIVISION SOUTH CELL INTERNAL STRUCTURE 2018 3D VIEW	
DRAWN BY Lydia Charbonneau	DATE 29/05/2019
CHECKED BY F.B.	29/05/2019
APPROVED BY F.B.	29/05/2019
SCALE —	DATE 29/05/2019
DRAWING NO.	
PROJECT NO.	REVISION 1 / 1



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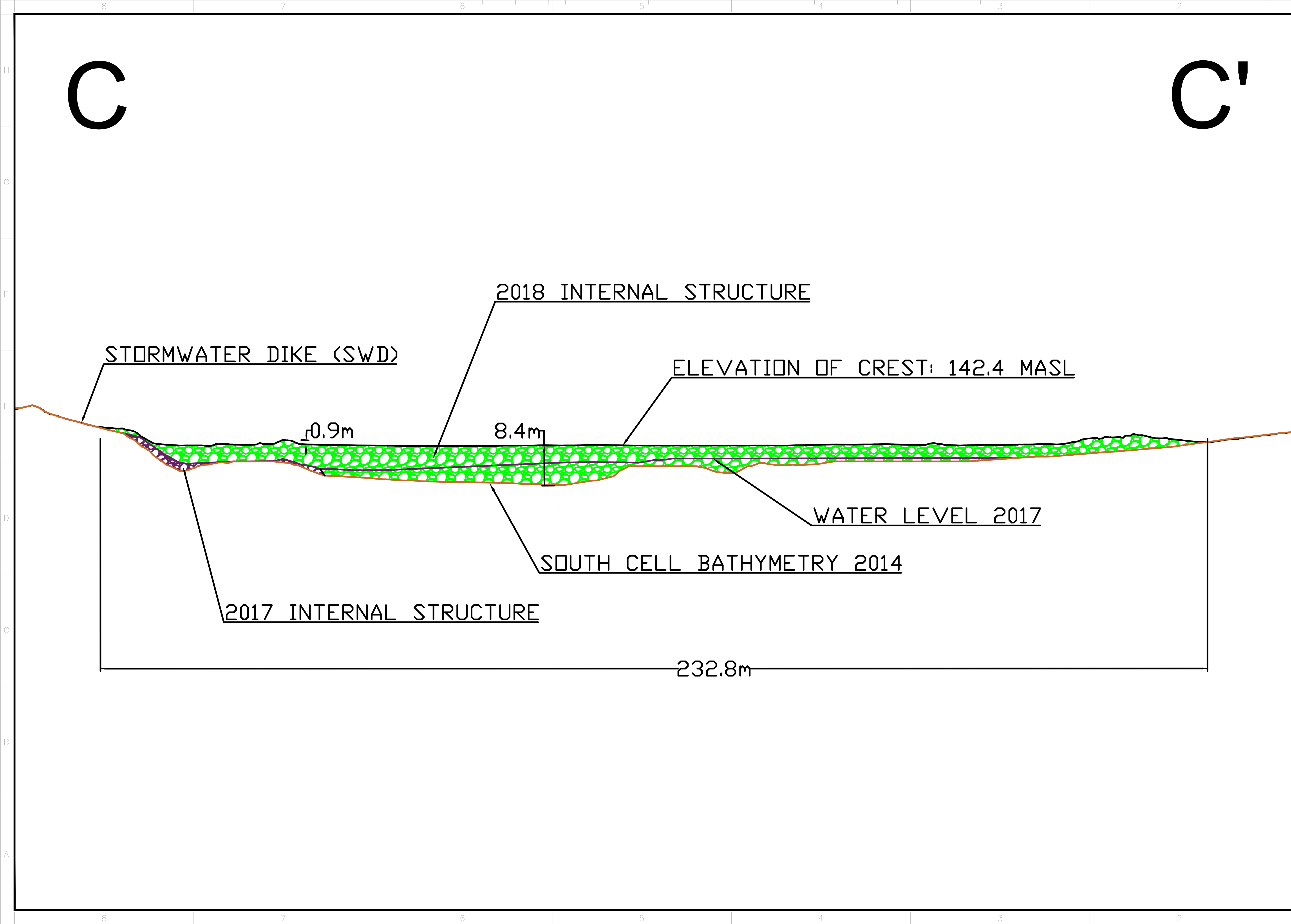
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AGNICO—EAGLE — MEADOWBANK DIVISION  
SOUTH CELL  
INTERNAL STRUCTURE 2018  
SECTION 1: A—A'

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SECTION 3: C—C'

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