

Dominion Diamond Corporation

Jay Project Developer's
Assessment Report

**Project Description and
Engineering**

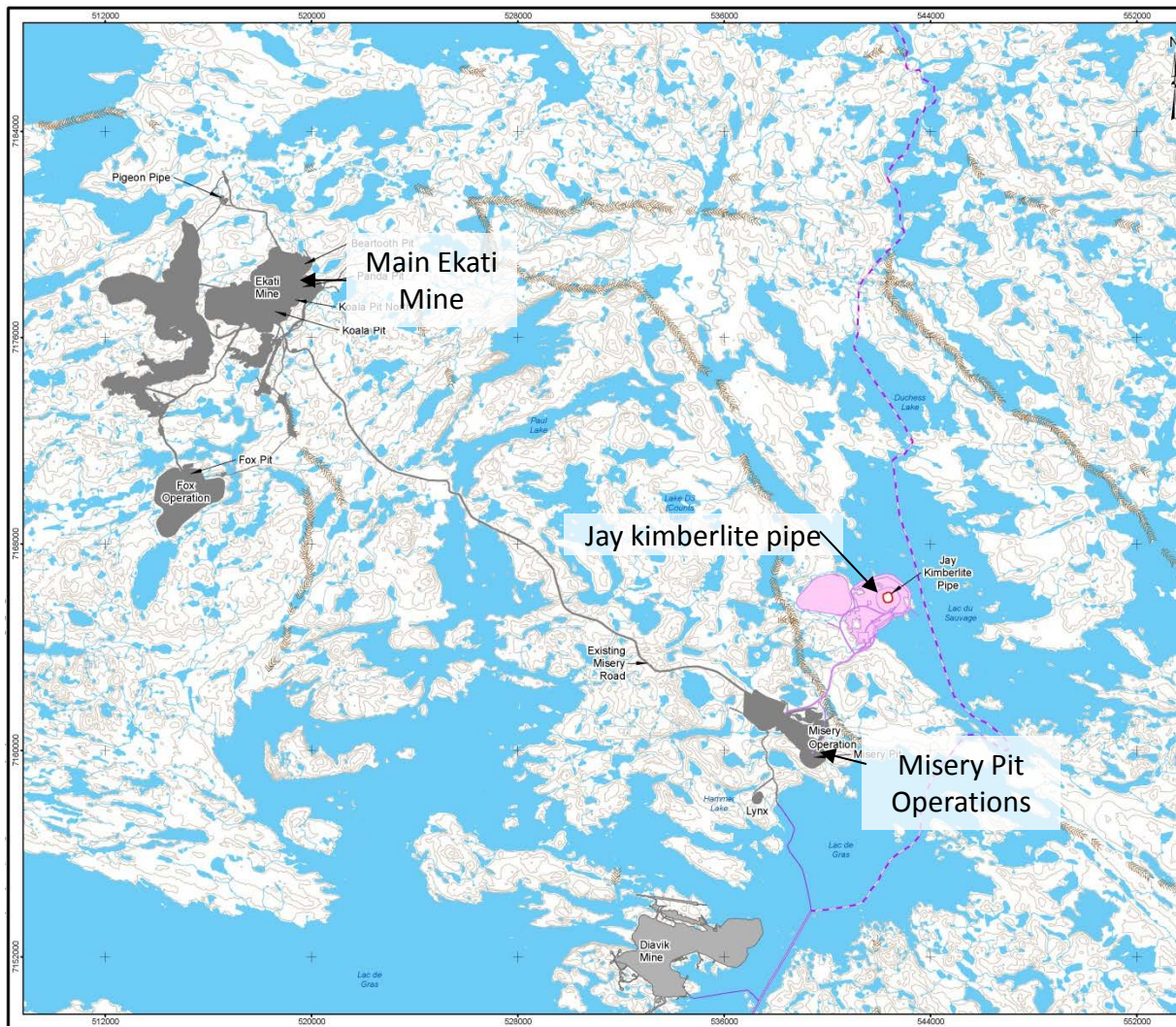


Jay Project

Project Description and Engineering:

- Jay Project Location and Overview
- Access Roads (include power line, pipelines)
- Dike Design
- Operations: Jay Pit, waste rock storage area, ore transport, processed kimberlite
- Water Management

Jay Project Location and Overview



Jay kimberlite pipe is located beneath Lac du Sauvage, in the southeast portion of the Ekati claim block, approximately 25 km from the main Ekati mine facilities and 7 km northeast of the existing Misery Pit operations

Jay Project Design – Utilizing Existing Infrastructure

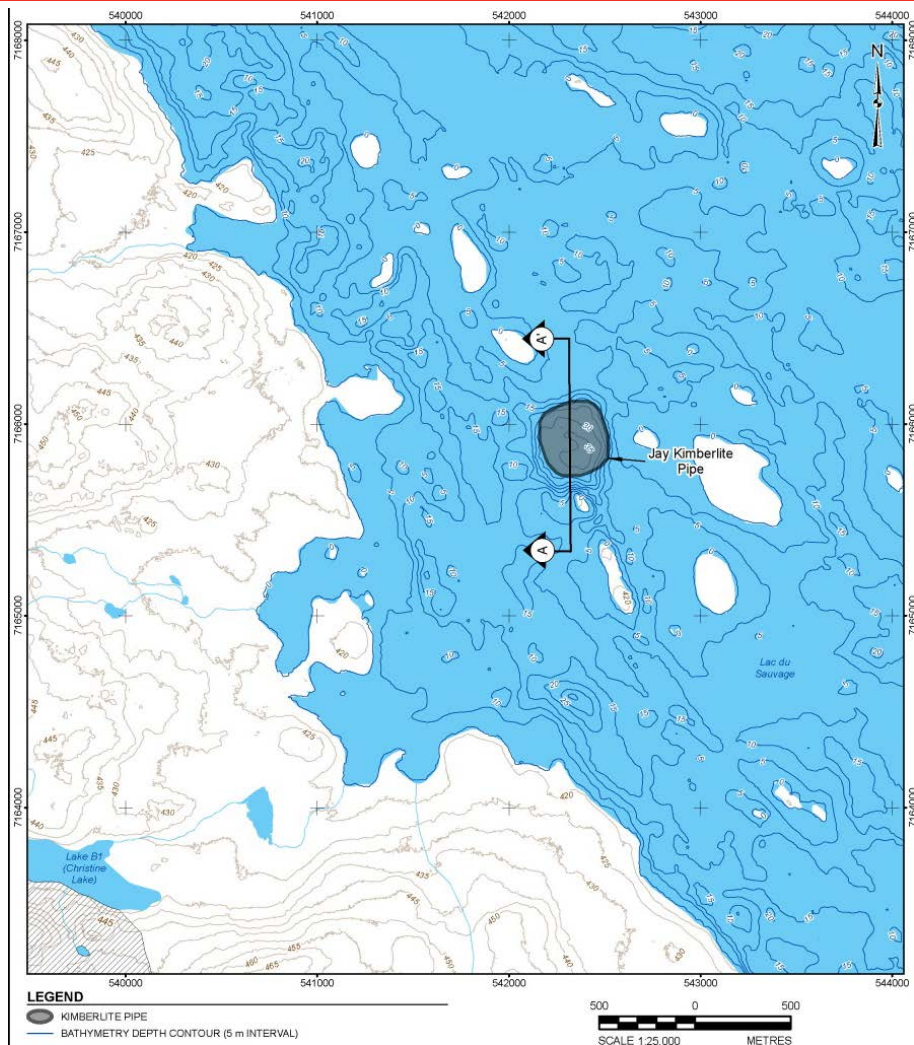


Extend the mine life

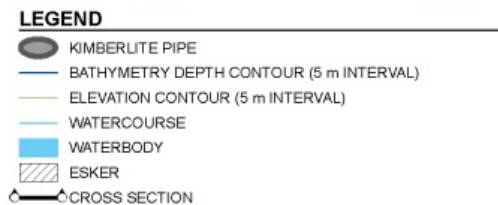
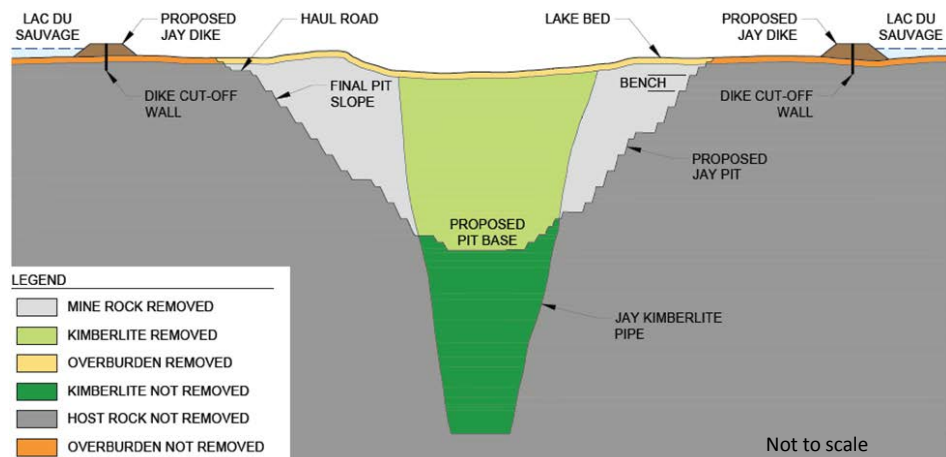
Use existing infrastructure:
current camp, airstrip,
processing plant, and
Misery Road

Other Ekati Mine areas will
be reclaimed during mining
of the Jay Pipe

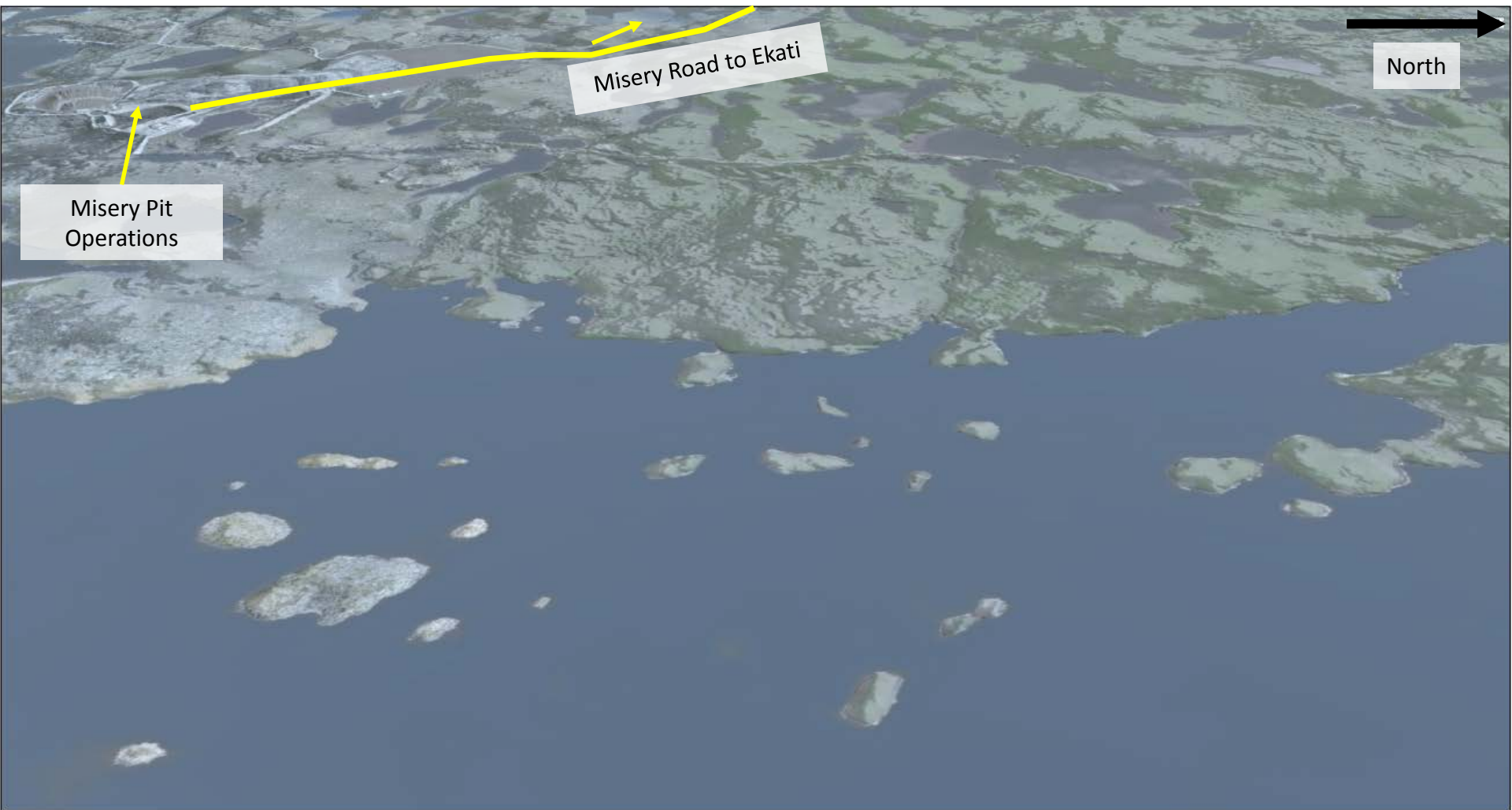
Jay Pipe Location



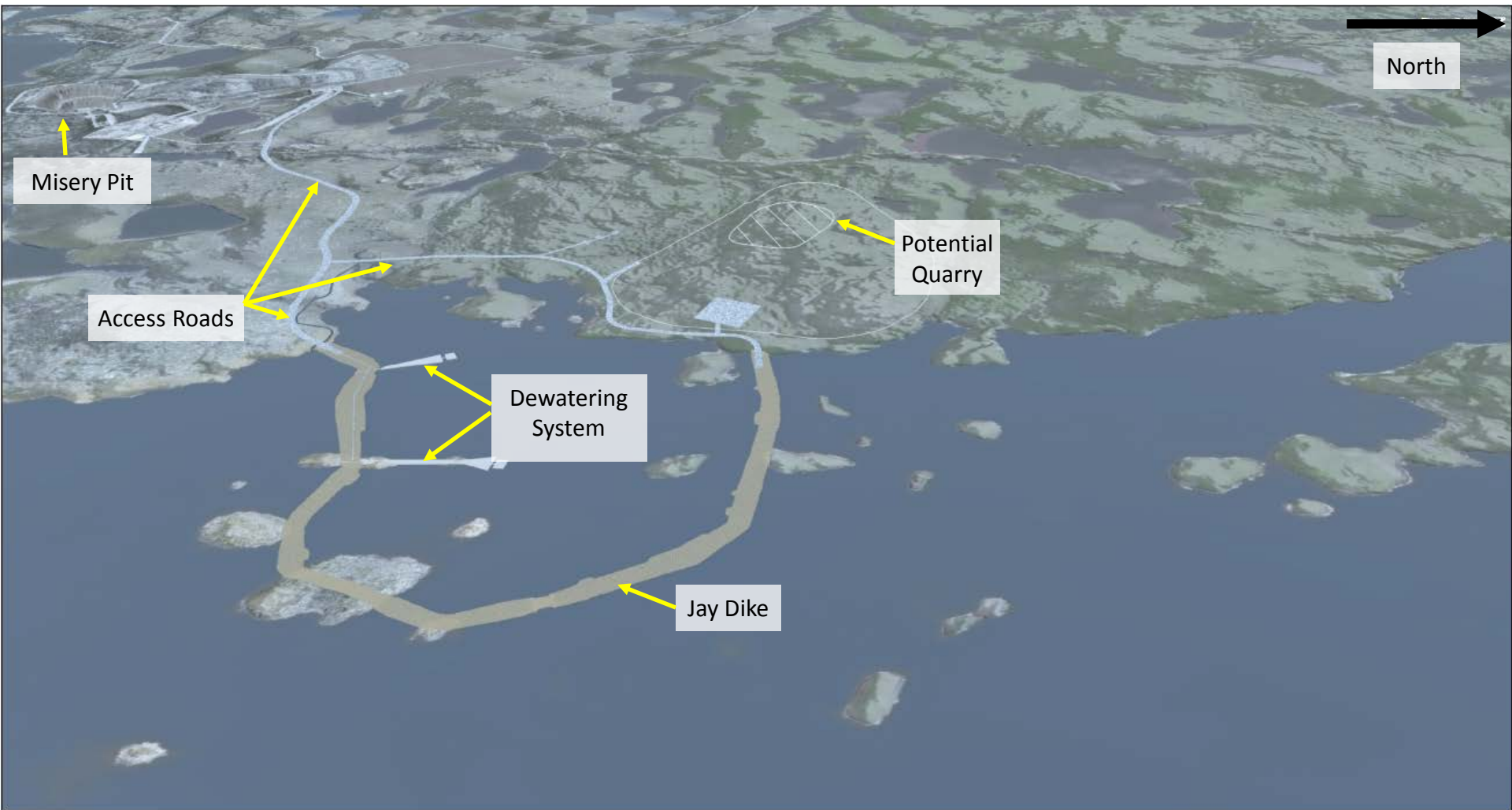
Jay Pipe is located beneath Lac du Sauvage, overlain by 5 to 10 m of overburden and covered by up to 35 m of water



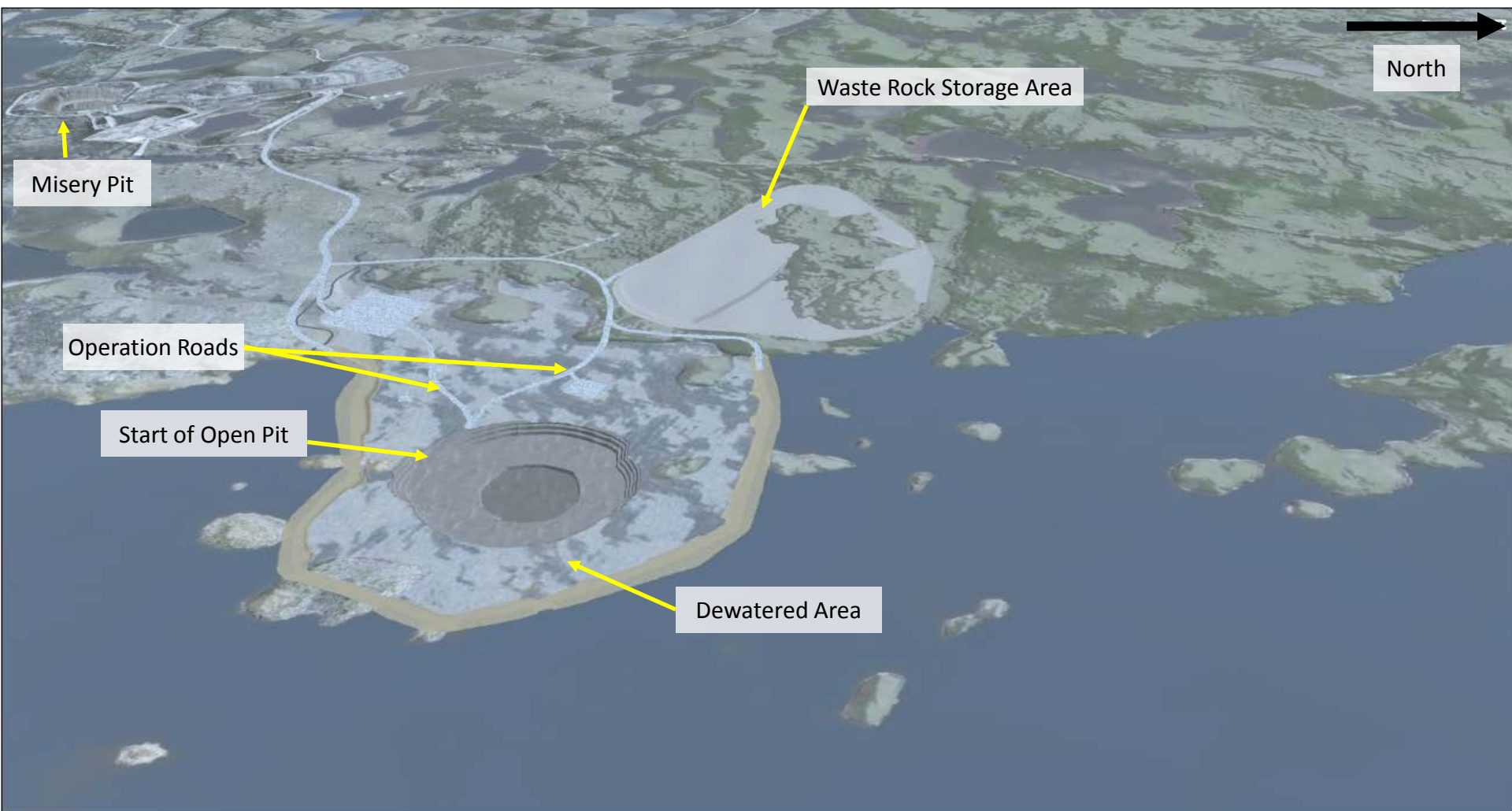
Jay Project Design - Pre-Construction



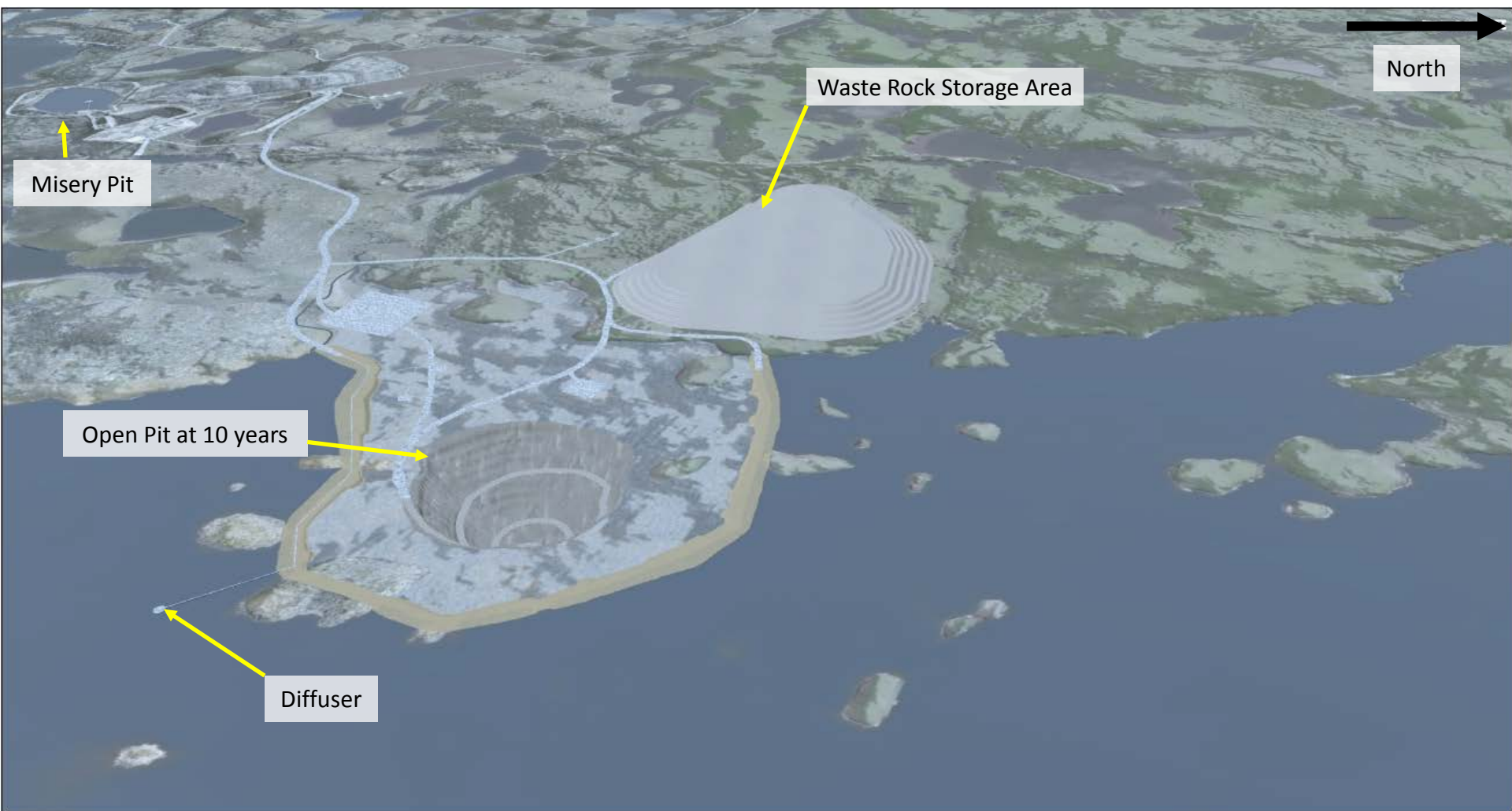
Jay Project Design - Construction



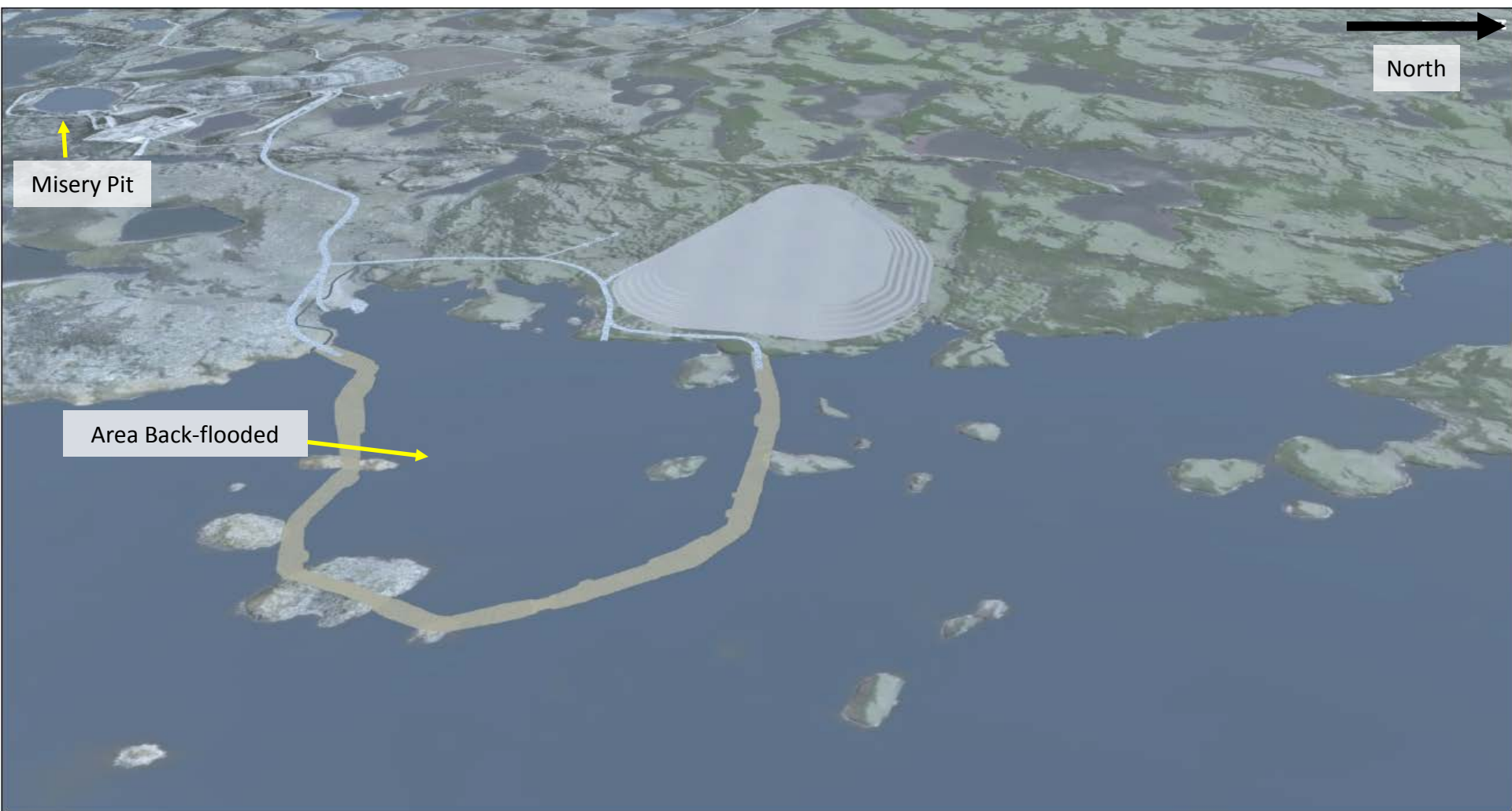
Jay Project Design - Operations 1st Year



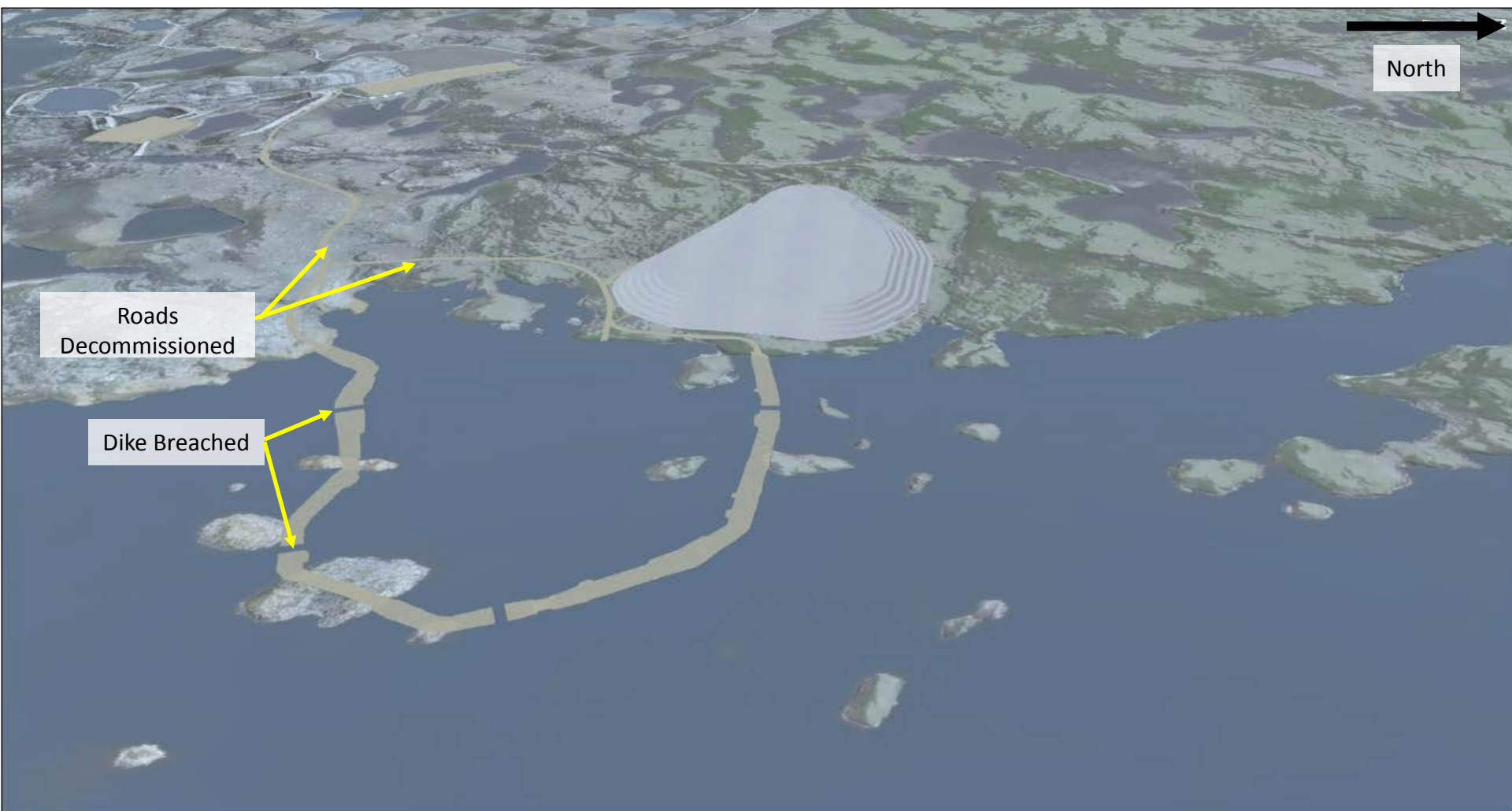
Jay Project Design - Operations 10th Year



Jay Project Design - Closure



Jay Project Design - Post-Closure



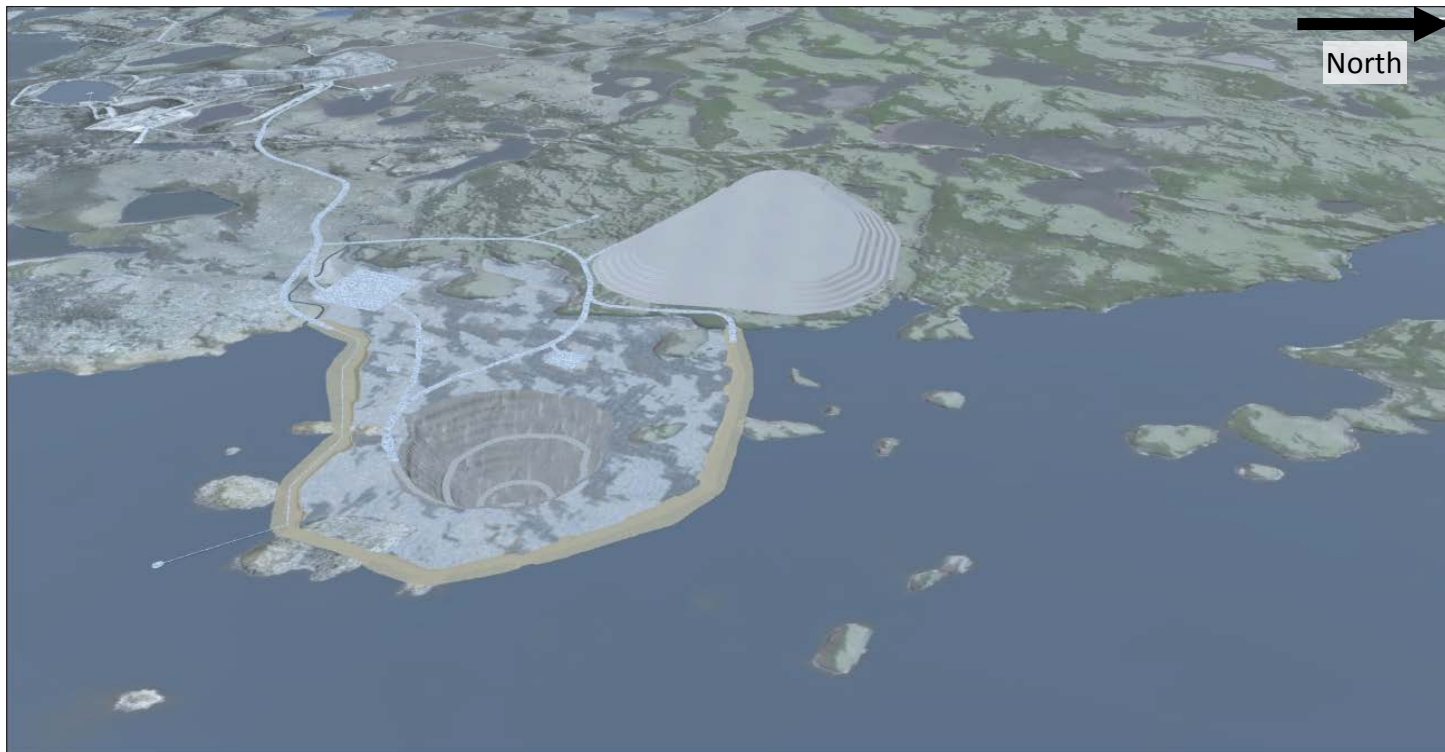
Jay Project Schedule

Construction
2016 to
2019

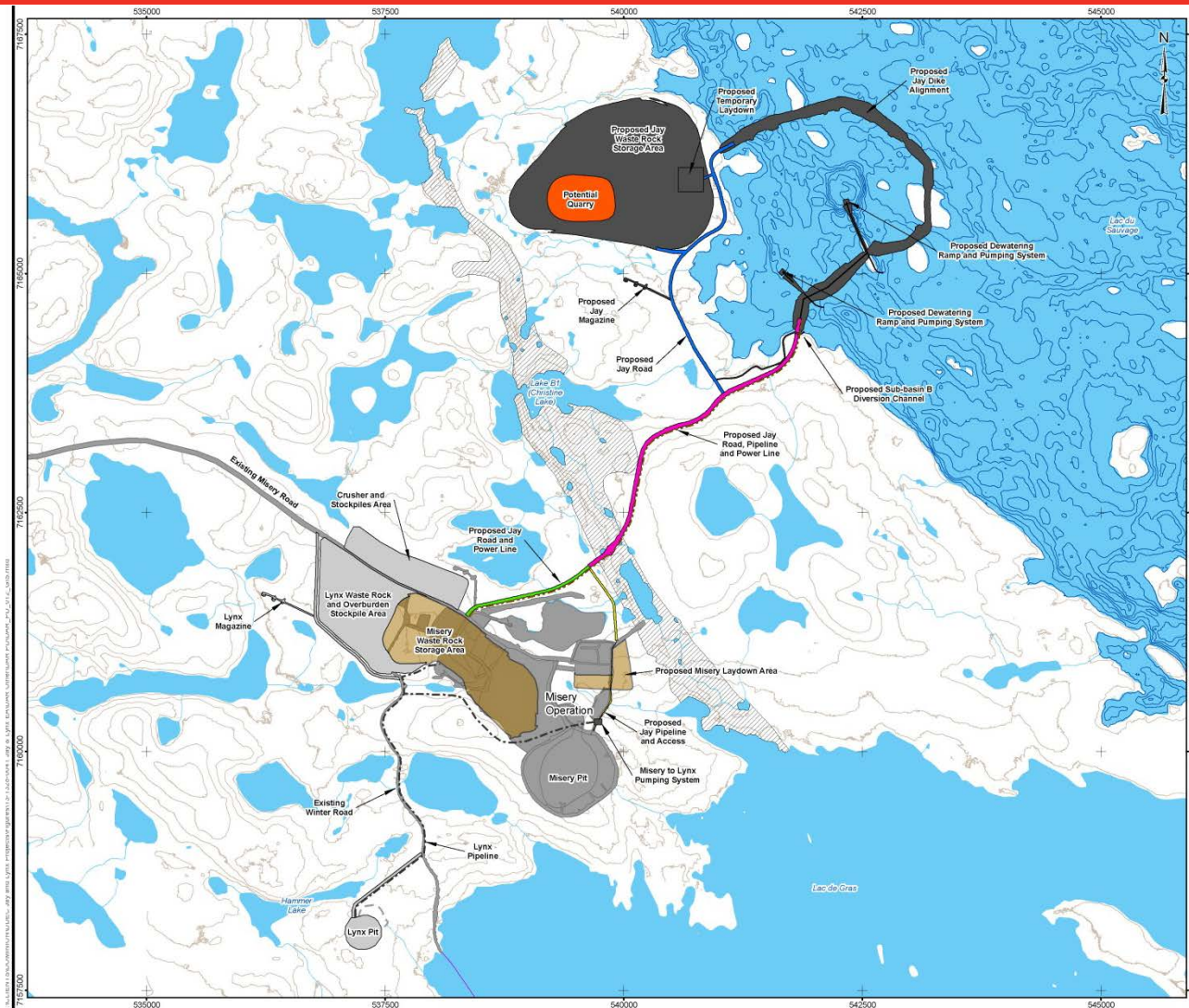
Operations
2020 to
2029

Closure
2030 to
2033

Post-Closure
2033 on



Jay Project Construction

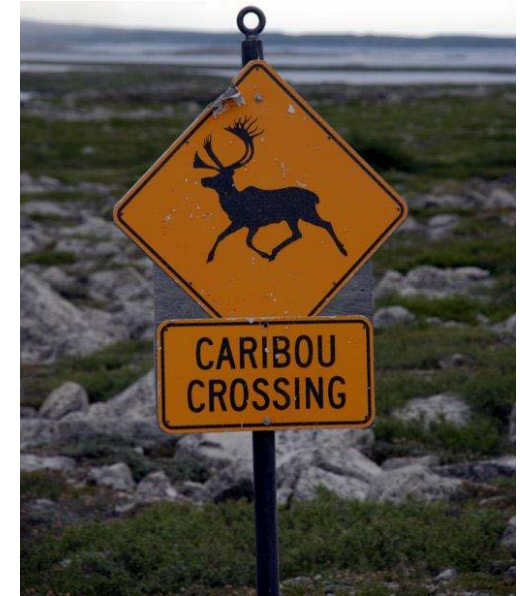


Approach to mining Jay pipe: isolation of the area through construction of a dike to allow local dewatering and open pit development

Construction includes: access roads, pipelines, power lines, dike, diversion channel, pumping systems, and water management (Lynx and Misery pits)

Jay Project Roads

Caribou crossings:
finer grained material and
flatter slopes



Access Roads



Power line

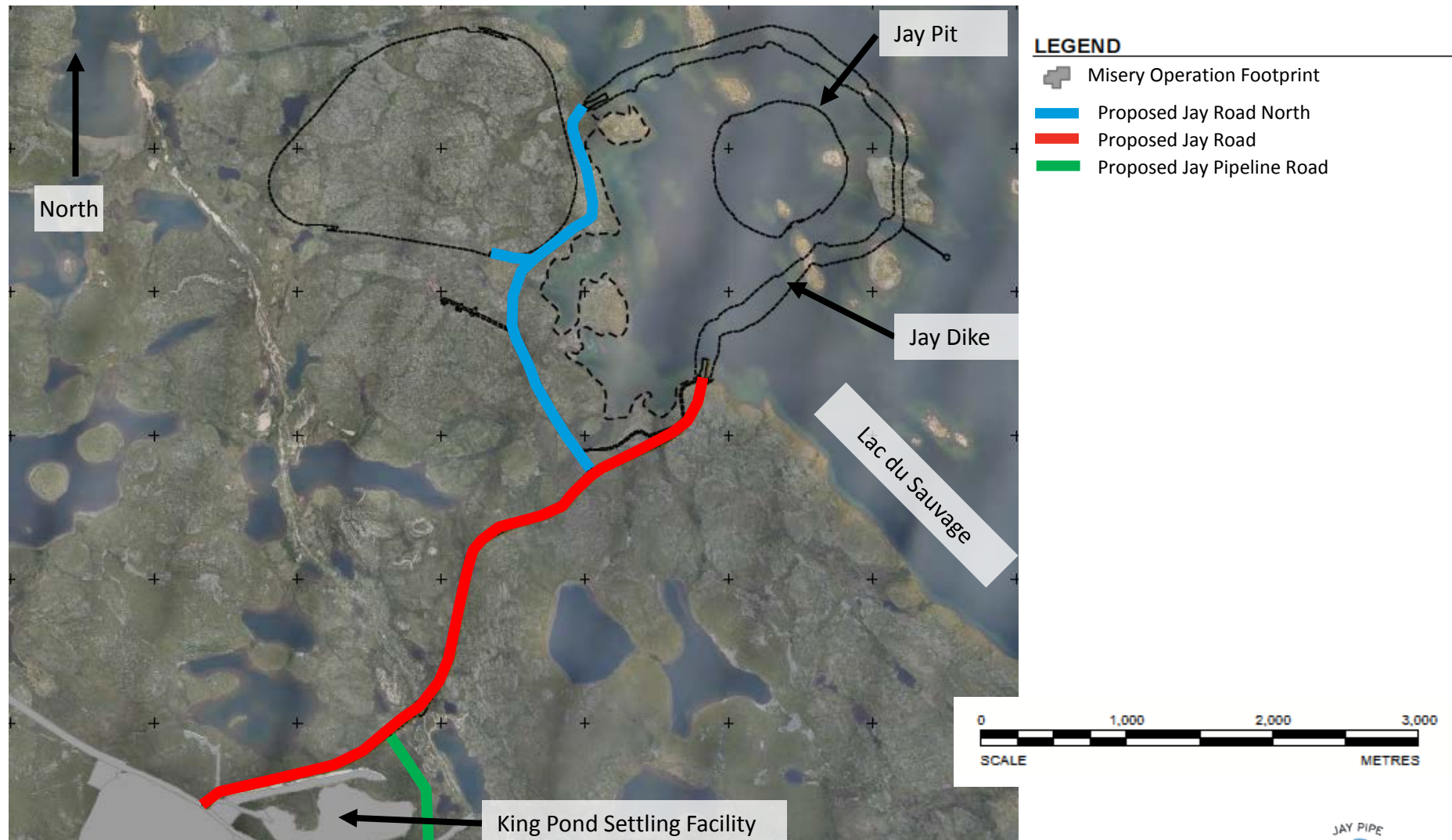
Road

36 inch diameter pipe

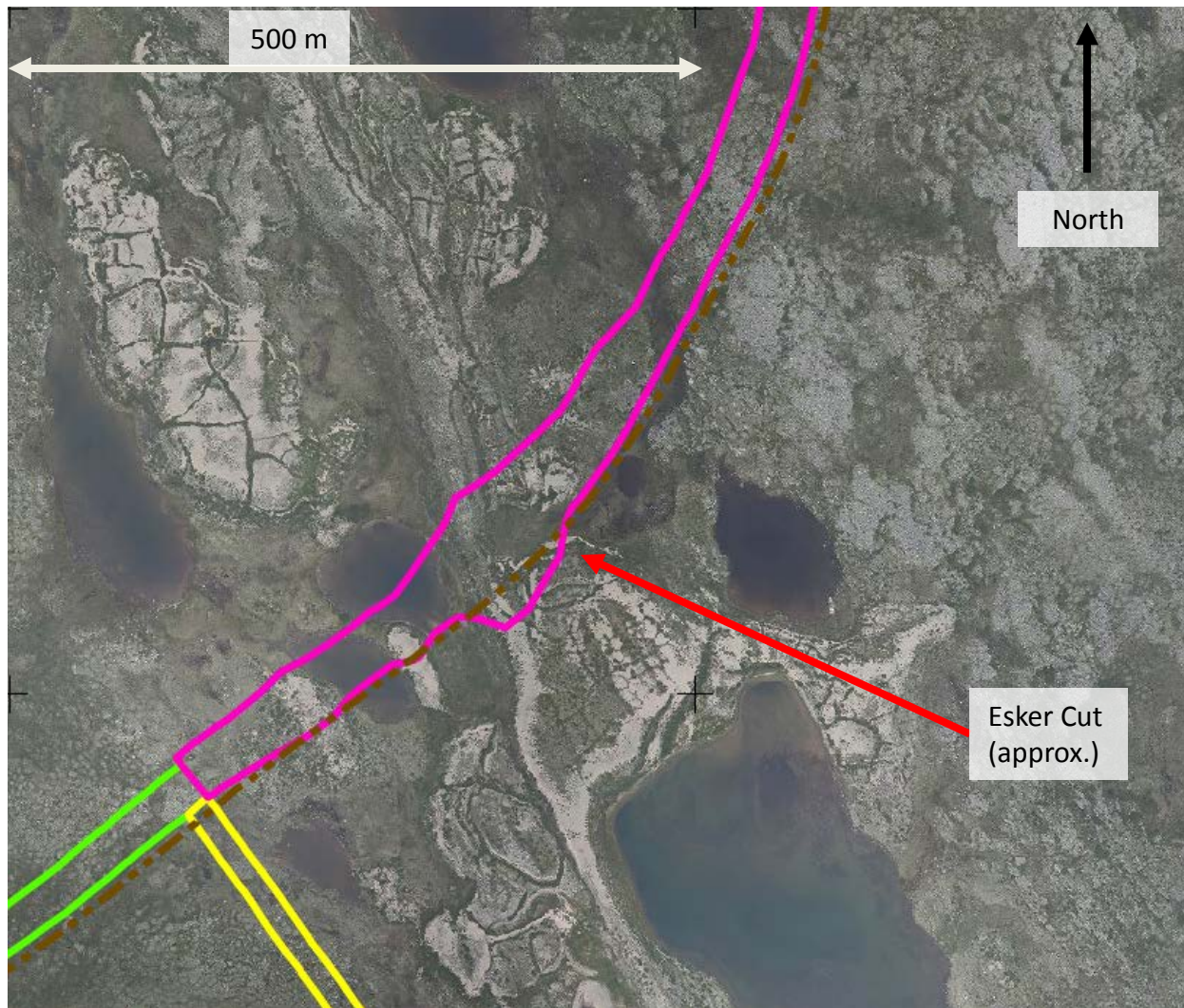
30 inch diameter pipe

26 inch diameter pipe

Jay Project Construction Roads



Jay Project Construction Roads – Esker Crossing



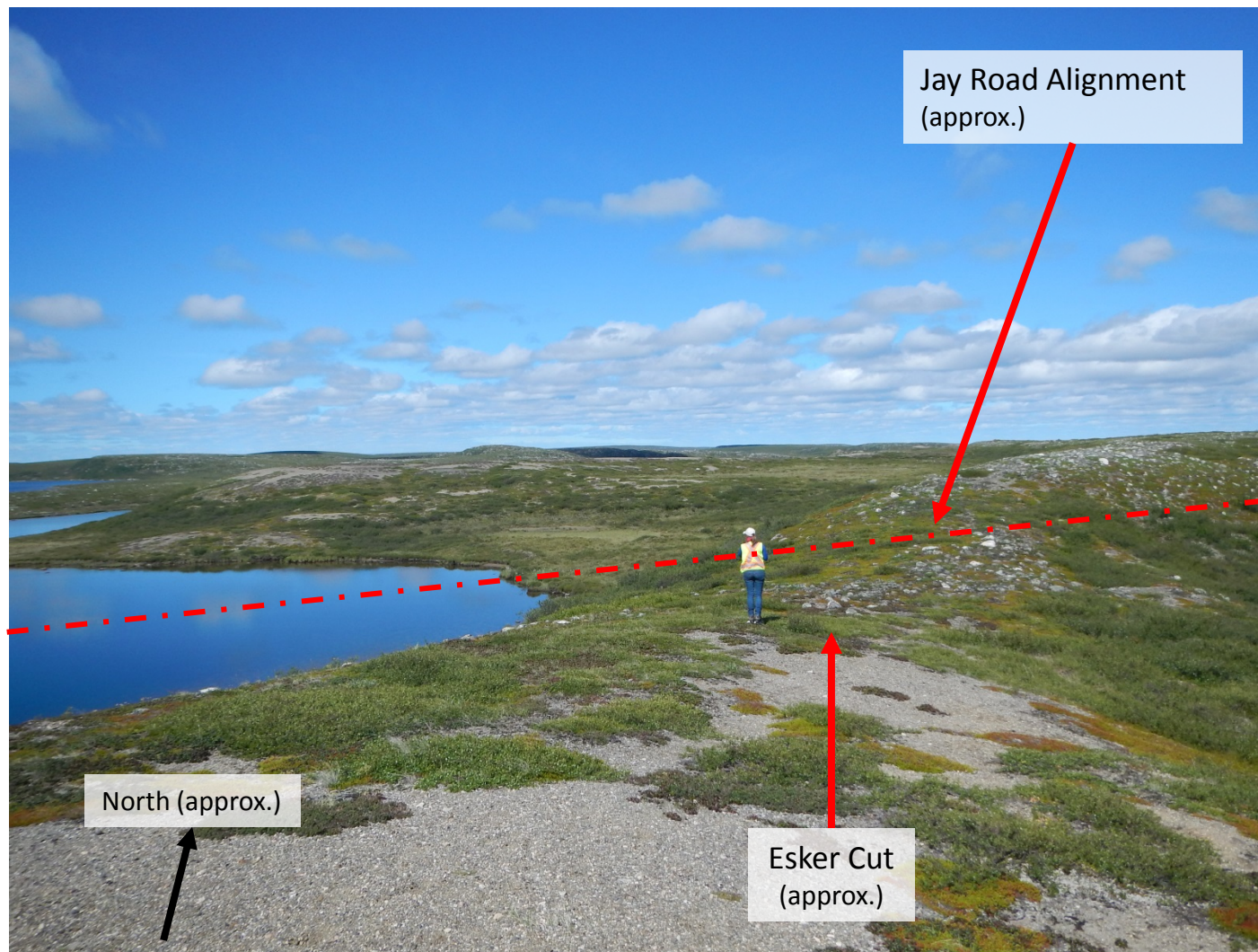
LEGEND

- Misery Operation Footprint
- Proposed Jay Road North
- Proposed Jay Road and Power line
- Proposed Jay Road, Power line, and Pipeline
- Proposed Jay Pipeline Road

Jay Project Roads – Esker Crossing



Jay Project Roads – Esker Crossing



Jay Dike Design

Meadowbank Bay – Goose Dike and Goose Pit

Courtesy of Agnico Eagle Mines Limited, Meadowbank Division



New Dike design will be similar to dikes used at the Meadowbank Gold Mine near Baker Lake, NU

Diavik Mine – A154 and A418

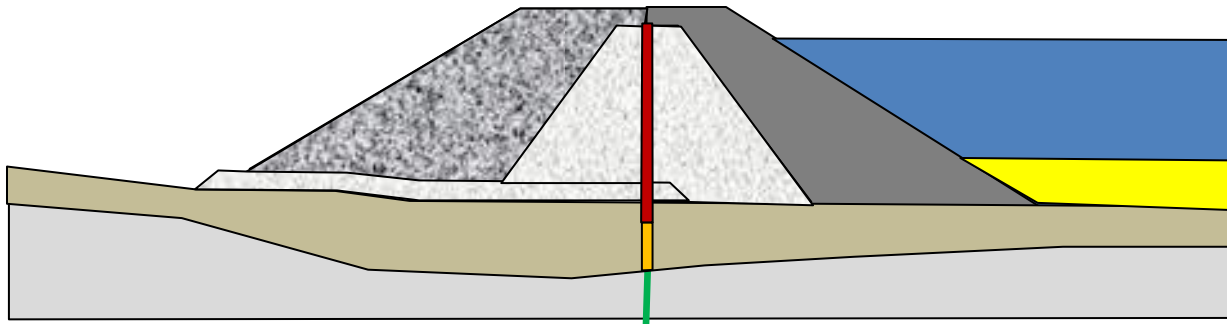


New Dike design for Jay Project (5 km) will be comparable in length to the current Diavik dikes

Comparison of Typical Design Sections (Diavik – Meadowbank)

DOWNSTREAM

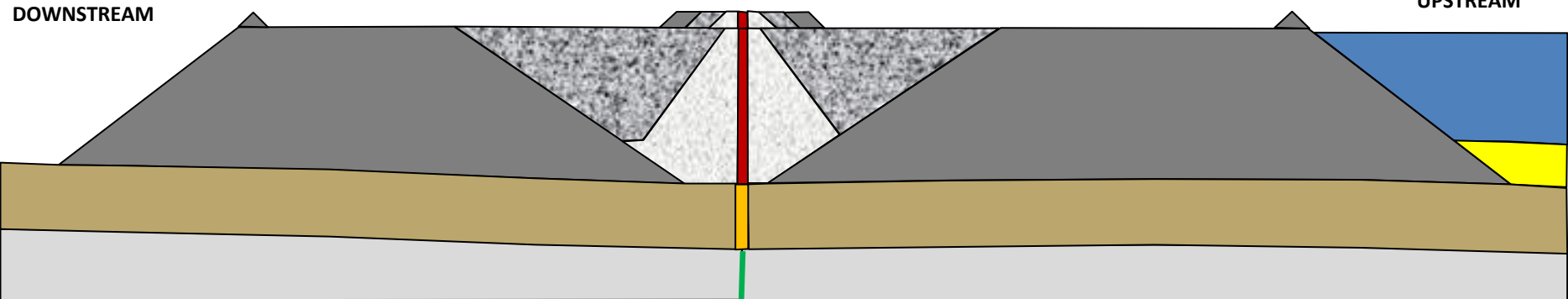
UPSTREAM



Diavik Diamond Mine – A418 and A154 Dikes










UPSTREAM

DOWNSTREAM



Meadowbank Gold Mine – Bay Goose Dike

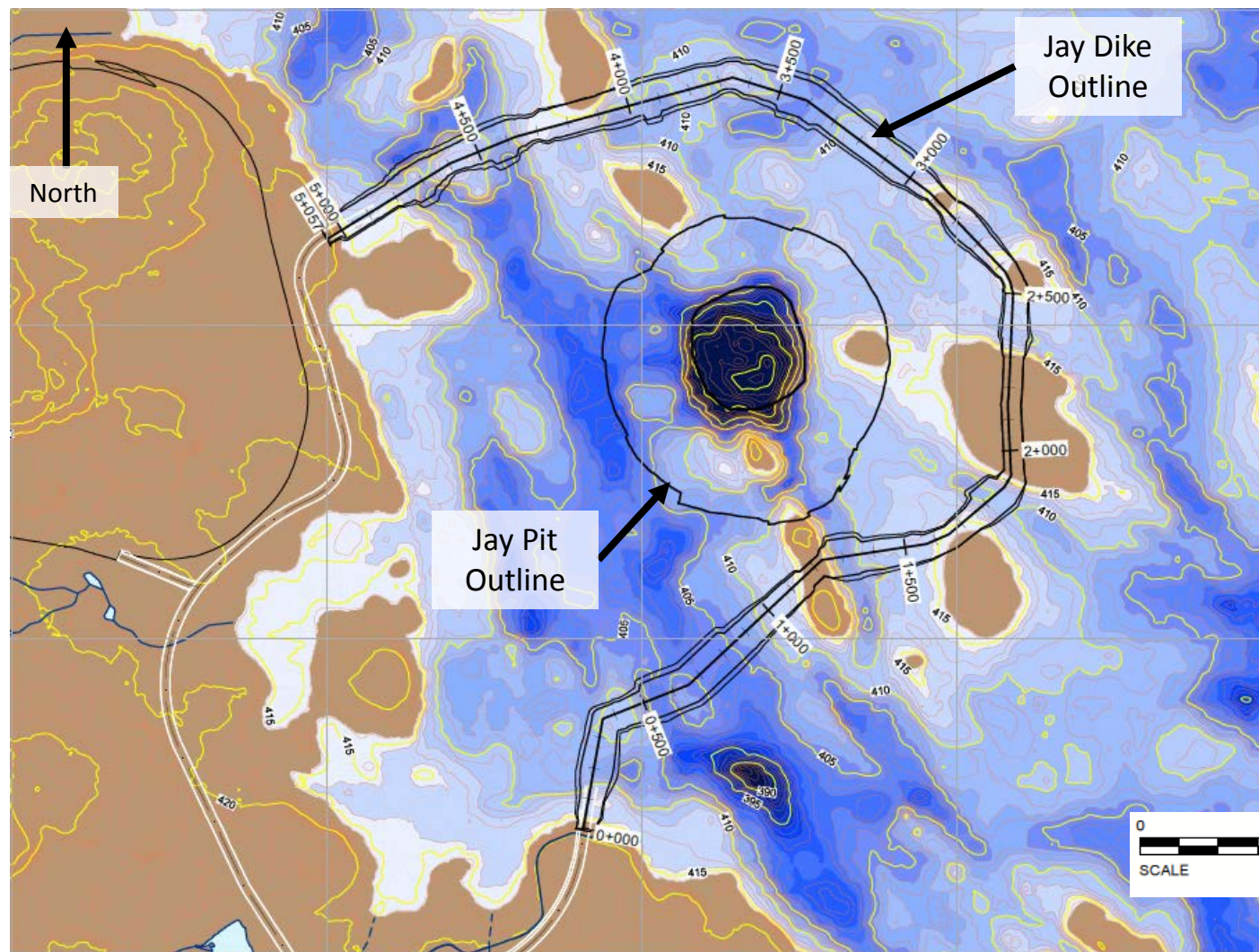
LEGEND

	Water		Bedrock		Fine Filter
	Lakebed Sediment		Rockfill		Coarse Filter
	Competent Soil		Cut-off Wall		Grout Curtain




Summary of Northern Dikes

	Ekati Jay Dike (proposed)	Meadowbank Bay-Goose Dike	Meadowbank East Dike	Diavik A154	Diavik A418
Length (m)	5,050	2,200	800	3,900	1,300
Max. Water Depth (m)	13	8.5	6	25	32
Avg. Water Depth (m)	5	4.5	3		11
Max. Bedrock Depth (m)	23 estimated	22	8	27	35
Volume of Lake Isolated (million m ³)	27	3	15.3	10.3	2.3
Surface Area Isolated (km ²)	4.2	0.14	1.3	1.5	0.25
Construction Years	3 estimated	3	2	2	2

Jay Dike – Proposed Alignment

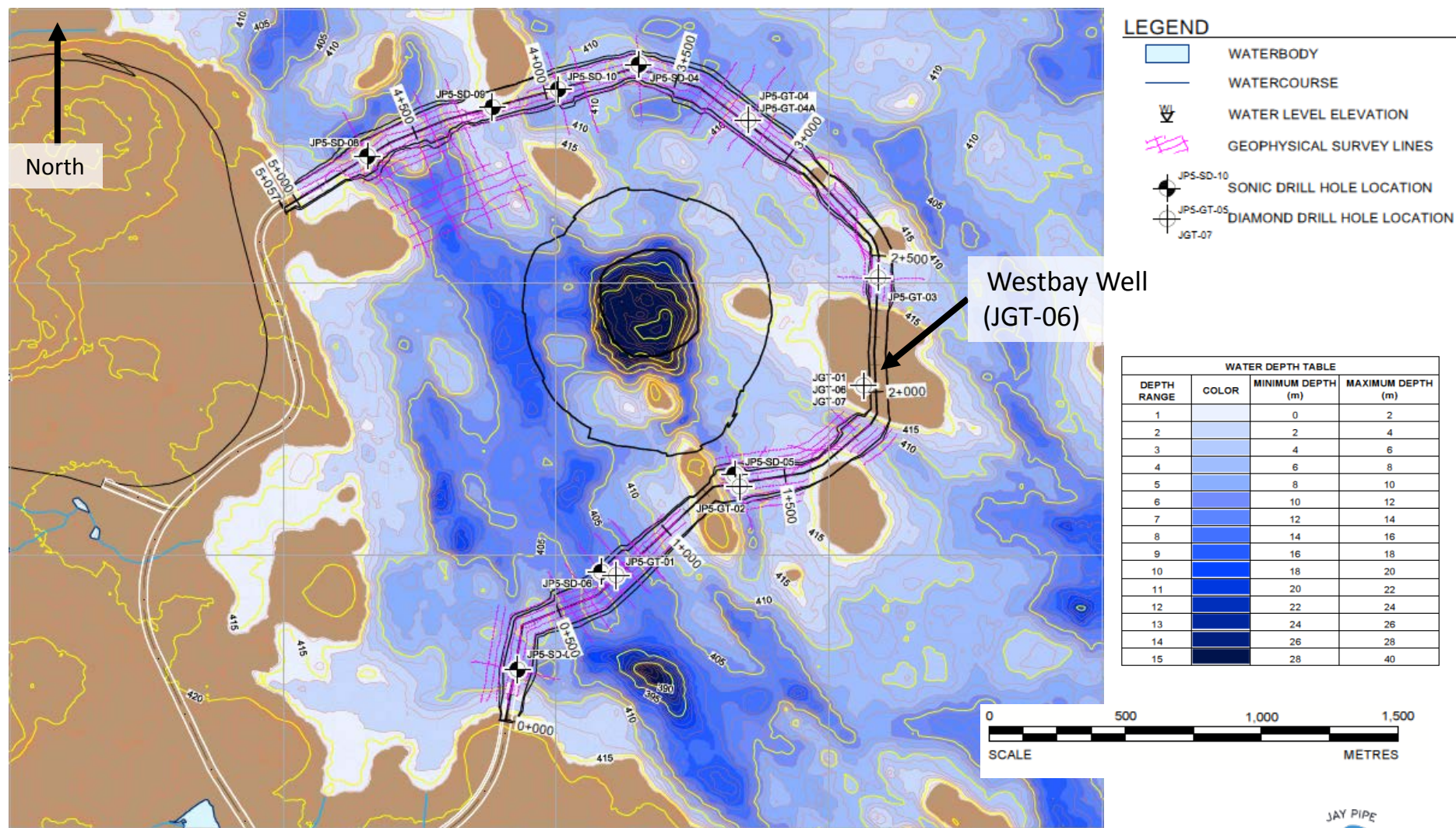


LEGEND

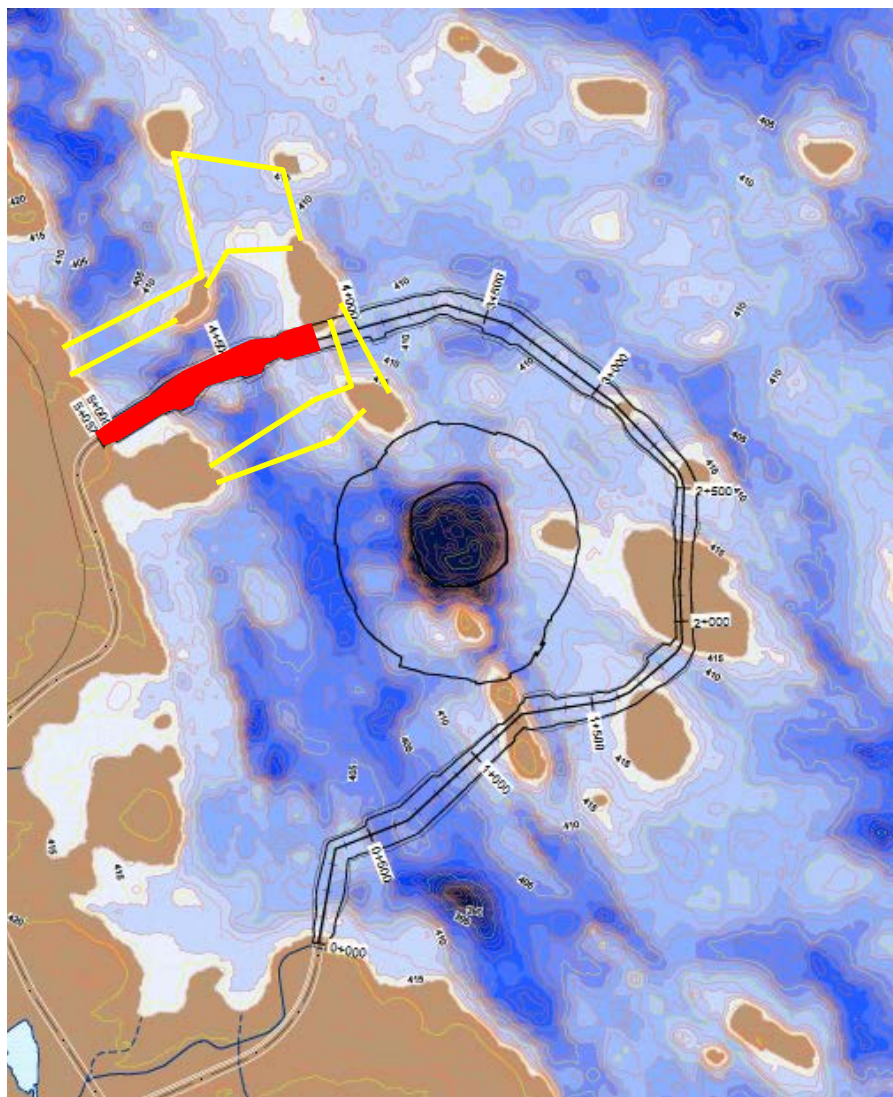
-  WATERBODY
-  WATERCOURSE
-  WATER LEVEL ELEVATION

WATER DEPTH TABLE			
DEPTH RANGE	COLOR	MINIMUM DEPTH (m)	MAXIMUM DEPTH (m)
1		0	2
2		2	4
3		4	6
4		6	8
5		8	10
6		10	12
7		12	14
8		14	16
9		16	18
10		18	20
11		20	22
12		22	24
13		24	26
14		26	28
15		28	40








Jay Dike – 2015 Geotechnical and Geophysical Investigations



Jay Dike – Summer 2016 Construction



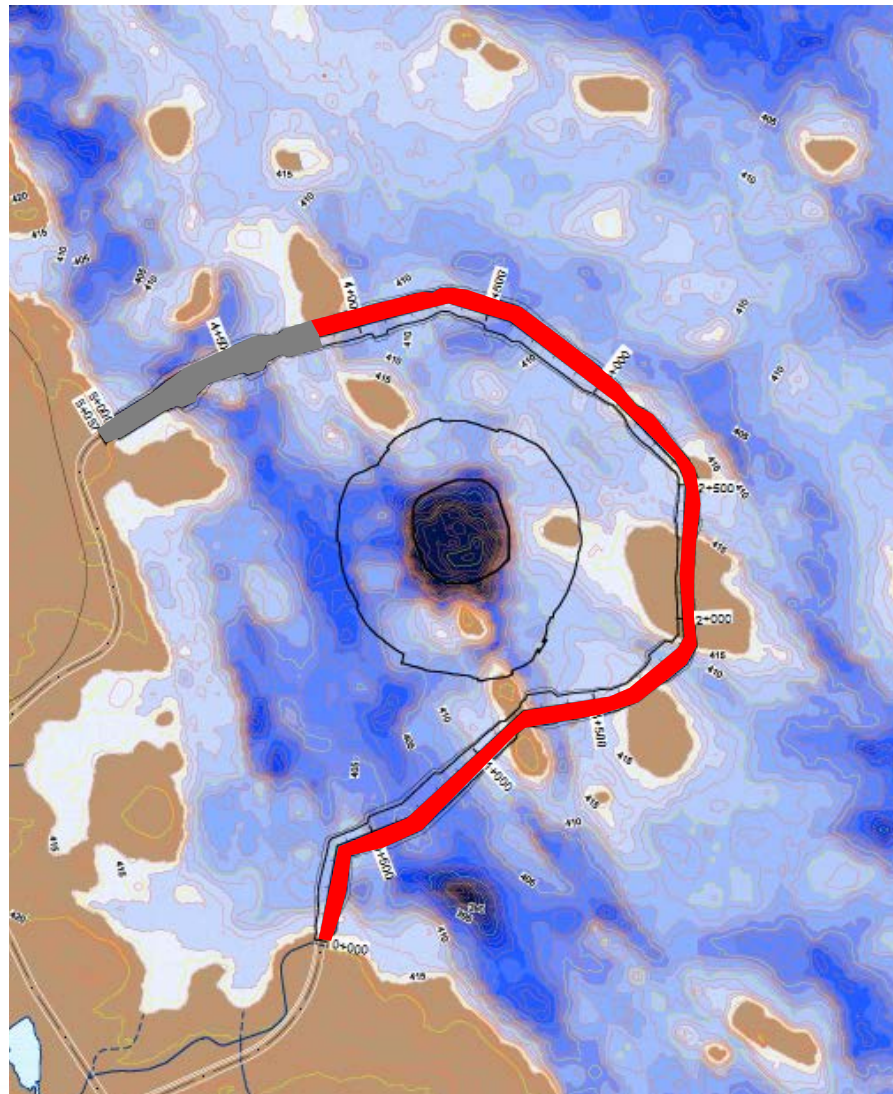
LEGEND

-  WATERBODY
-  WATERCOURSE
-  WATER LEVEL ELEVATION
-  TURBIDITY CURTAIN (APPROXIMATE LOCATION)
-  CONSTRUCTION IN PROGRESS
-  NOT YET CONSTRUCTED
-  CONSTRUCTED








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8		14	16
9		16	18
10		18	20
11		20	22
12		22	24
13		24	26
14		26	28
15		28	40



Jay Dike – Winter 2016/2017 Construction



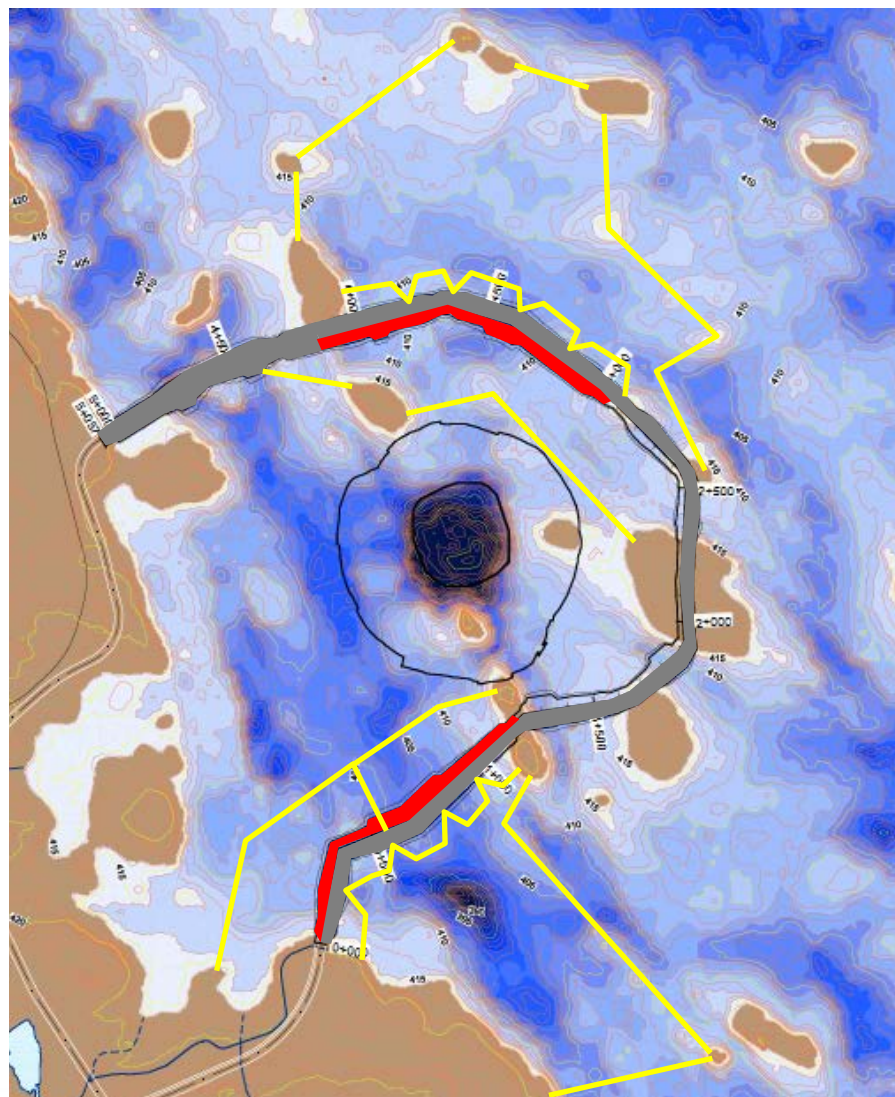
LEGEND

-  WATERBODY
-  WATERCOURSE
-  WATER LEVEL ELEVATION
-  TURBIDITY CURTAIN (APPROXIMATE LOCATION)
-  CONSTRUCTION IN PROGRESS
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






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Jay Dike – Summer 2017 Construction



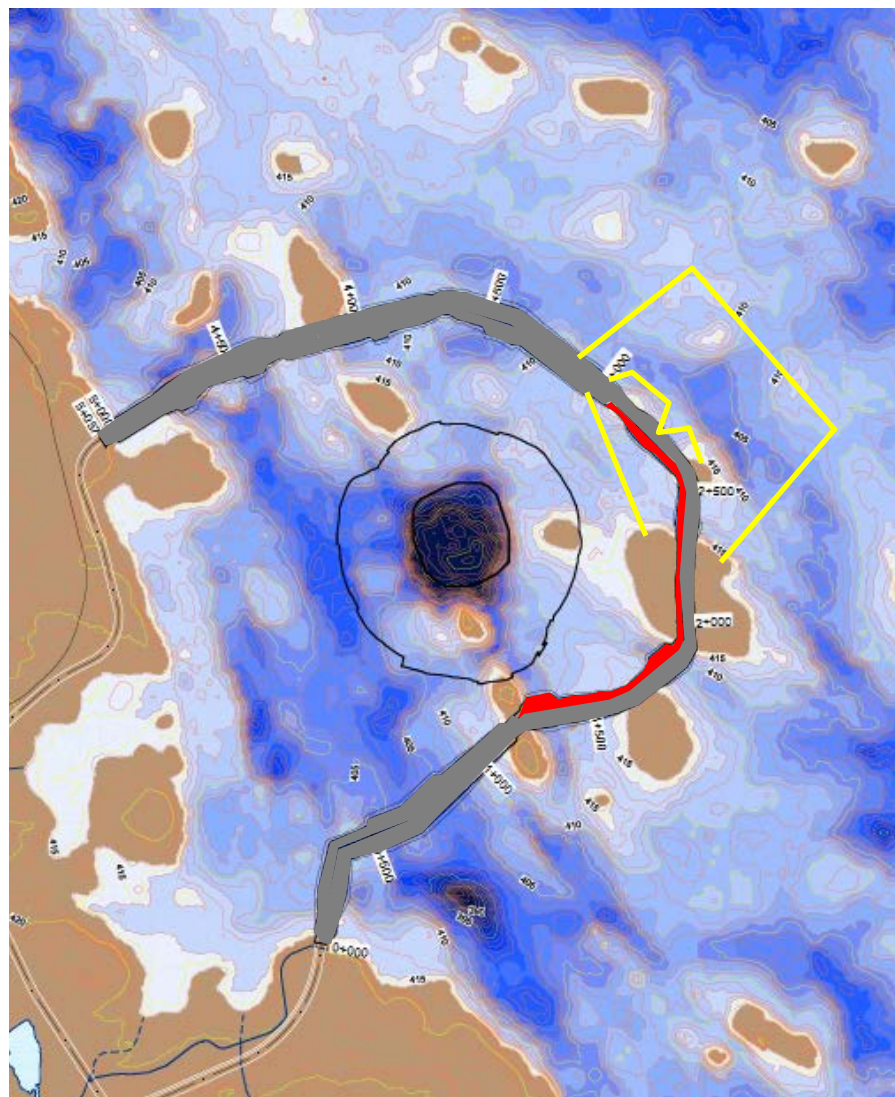
LEGEND

-  WATERBODY
-  WATERCOURSE
-  WATER LEVEL ELEVATION
-  TURBIDITY CURTAIN (APPROXIMATE LOCATION)
-  CONSTRUCTION IN PROGRESS
-  NOT YET CONSTRUCTED
-  CONSTRUCTED








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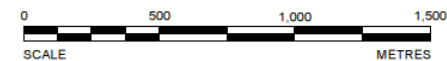
Jay Dike – Summer 2018 Construction



LEGEND

-  WATERBODY
-  WATERCOURSE
-  WATER LEVEL ELEVATION
-  TURBIDITY CURTAIN (APPROXIMATE LOCATION)
-  CONSTRUCTION IN PROGRESS
-  NOT YET CONSTRUCTED
-  CONSTRUCTED

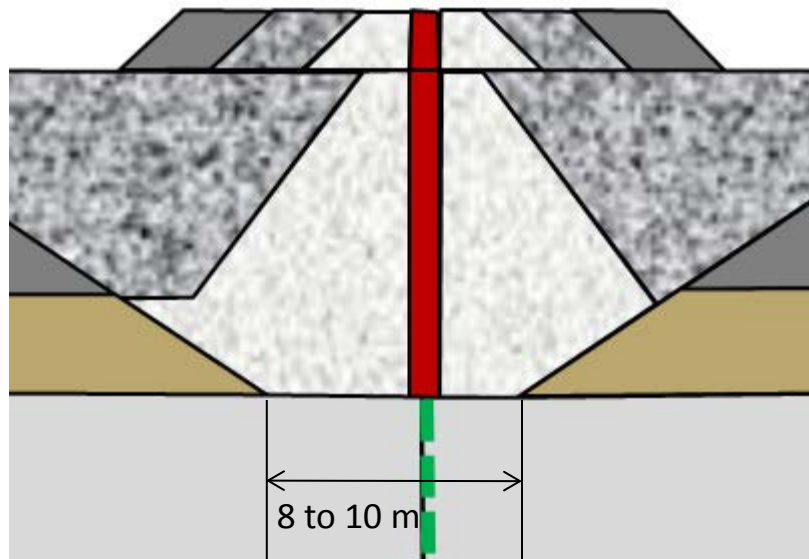
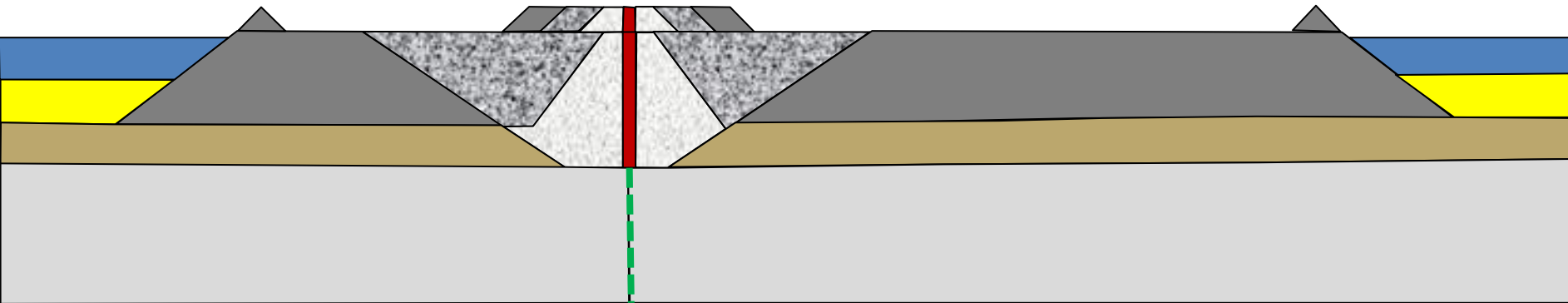
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12		22	24
13		24	26
14		26	28
15		28	40












Jay Dike – Typical Section: Shallow and Intermediate

DOWNSTREAM

UPSTREAM



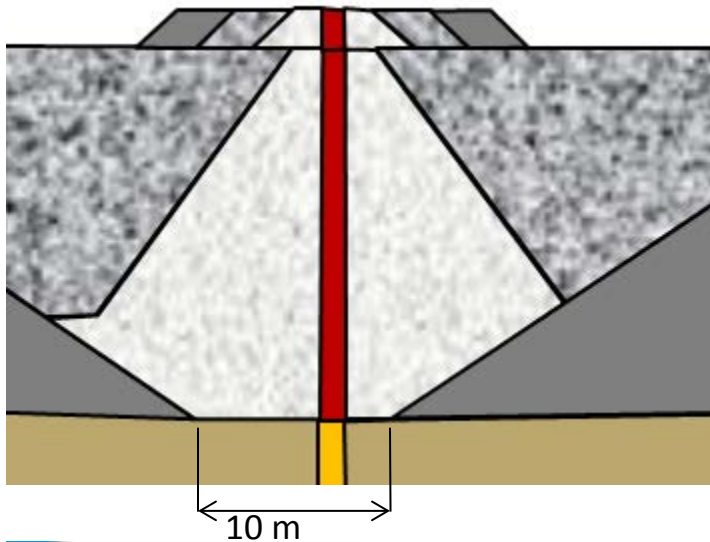
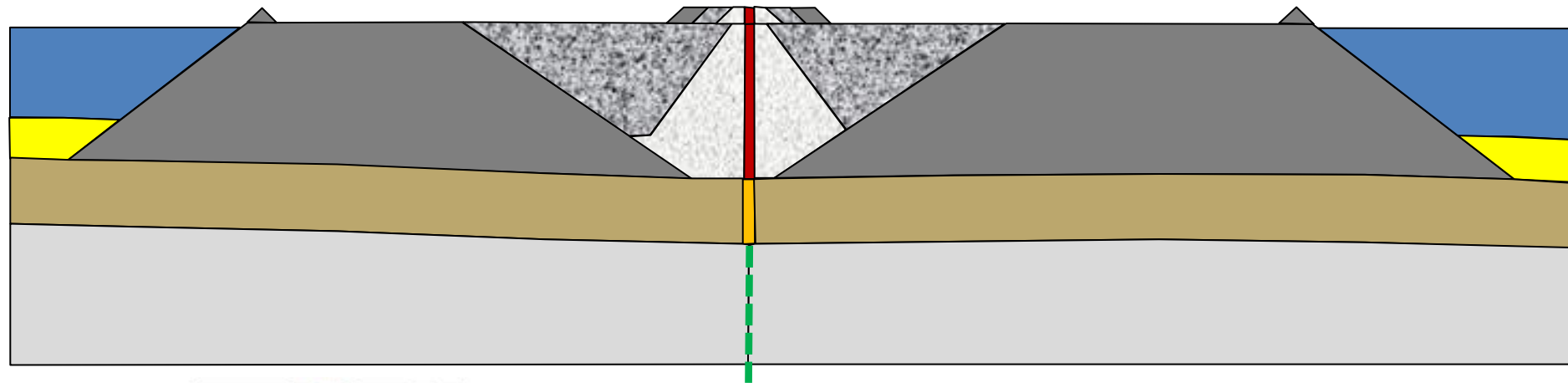
LEGEND

	Water		Fine Filter
	Lakebed Sediment		Coarse Filter
	Competent Soil		Cut-off Wall
	Bedrock		Grout Curtain
	Rockfill		











Jay Dike – Typical Section: Deep

DOWNSTREAM

UPSTREAM



LEGEND

	Water		Fine Filter
	Lakebed Sediment		Coarse Filter
	Competent Soil		Cut-off Wall
	Bedrock		Jet Grout
	Rockfill		Grout Curtain

Jay Dike Construction Sequence

Summer Rockfill Placement



Jay Dike Construction Sequence

Winter Rockfill Placement

- Winter placement of rockfill upstream portion
- Approximately 0.5 m above lake elevation
- Slow placement rate, based on turbidity measurements



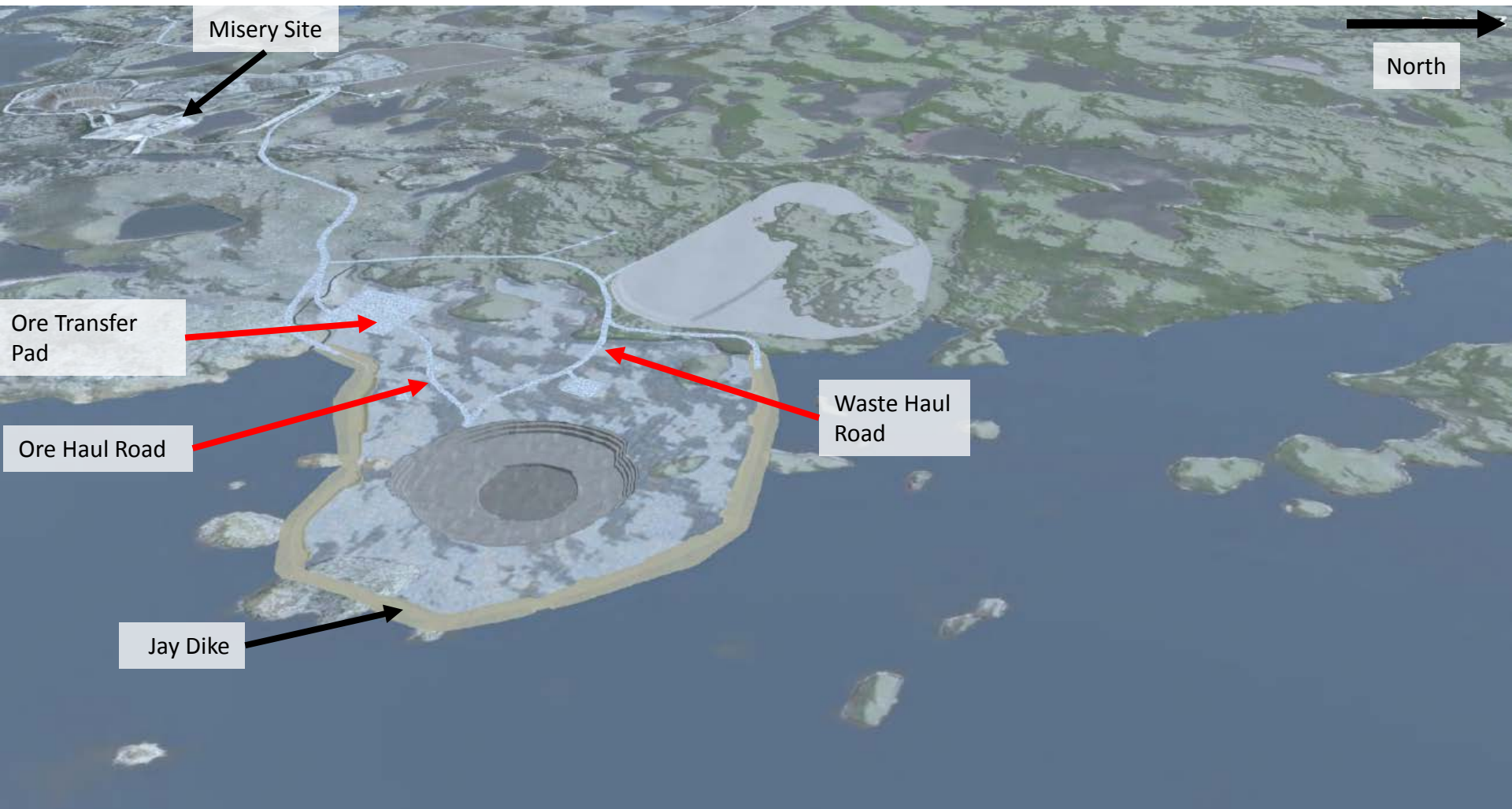
Jay Dike Construction Sequence

Turbidity Curtain Installation

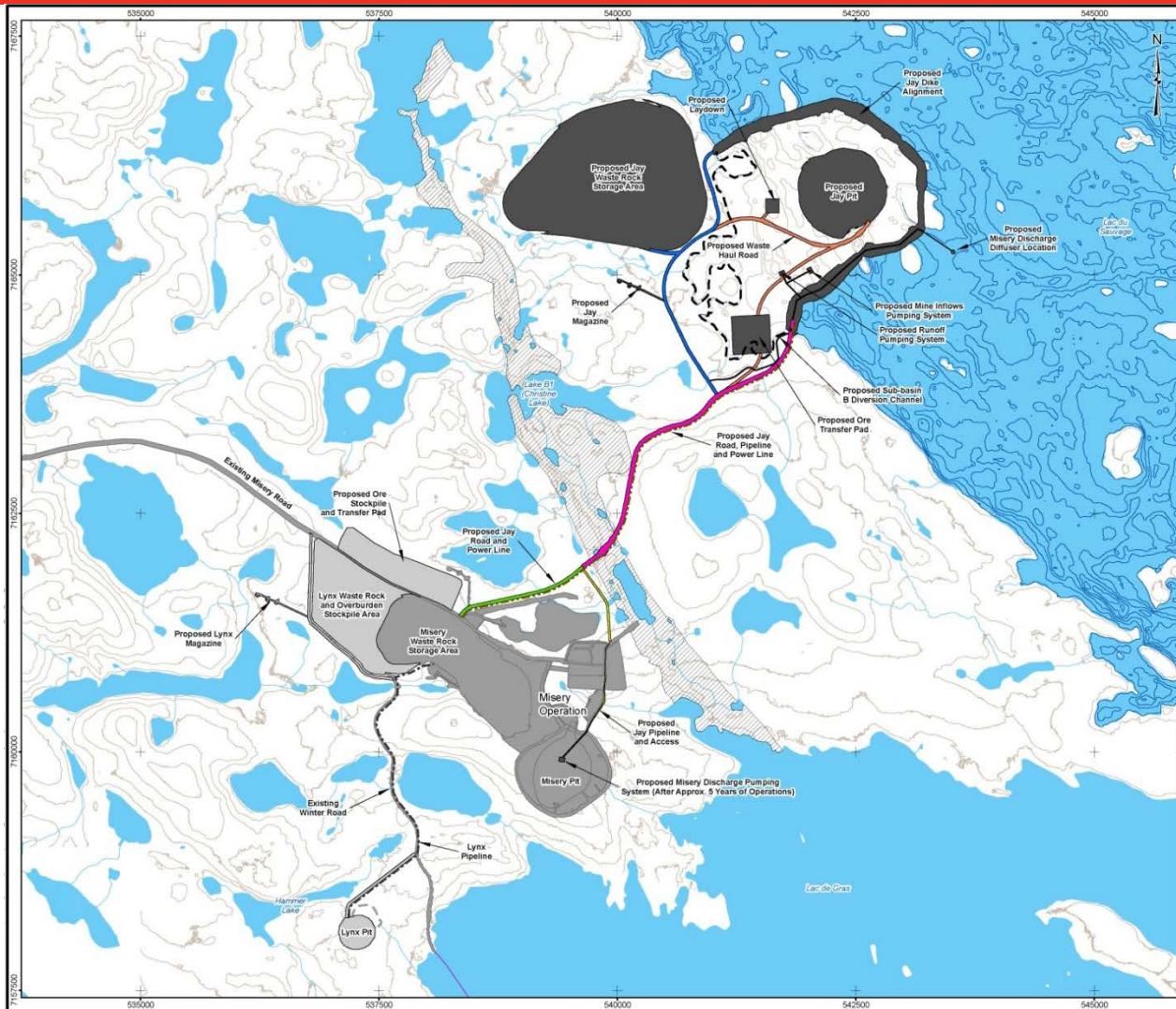


- Turbidity curtain installation
- Rapid expansion of rockfill platform (shallow and intermediate sections)
- Deep section: parallel platform, with water in between

Jay Project Operation Roads

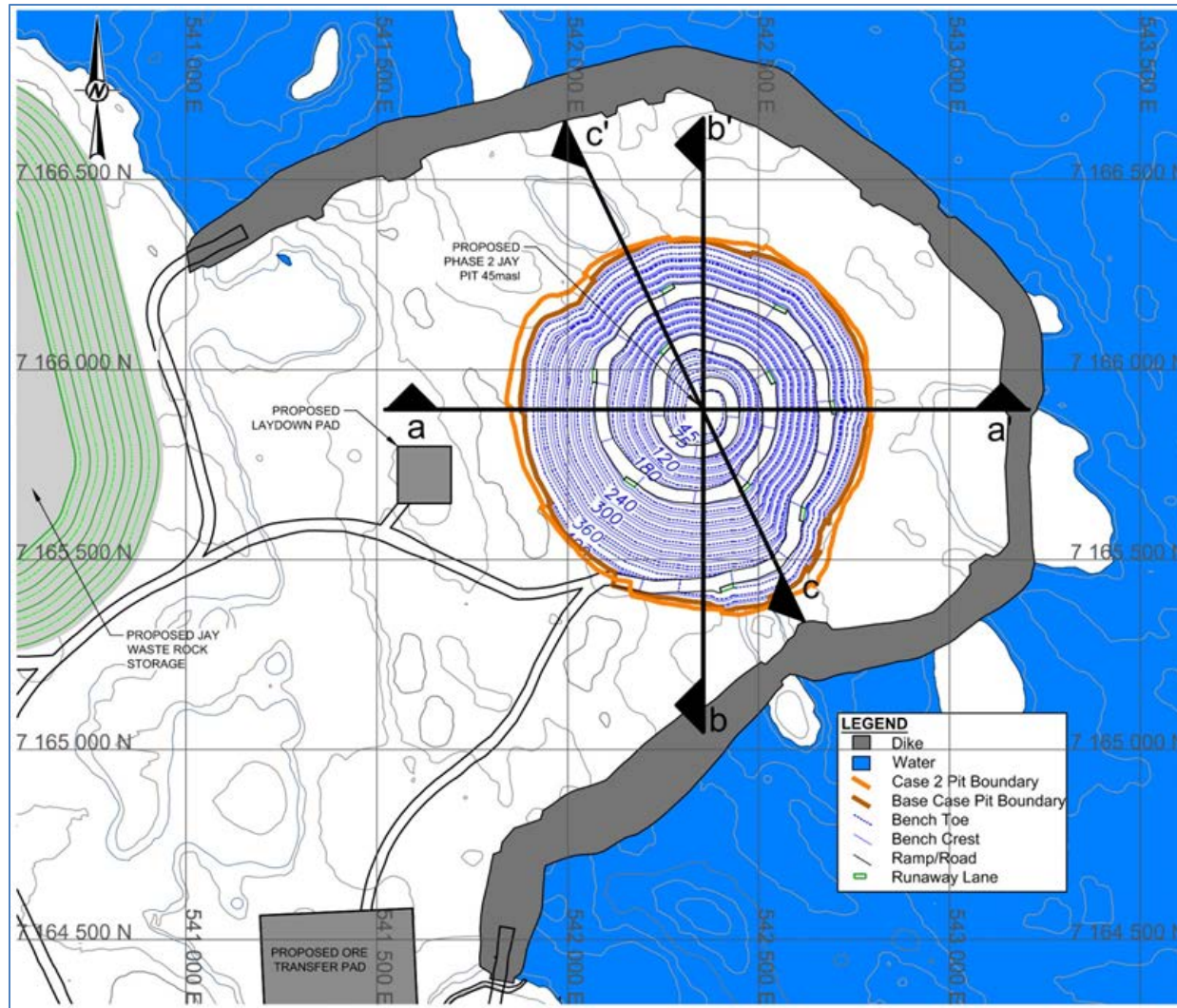


Jay Project Operation Phase Components

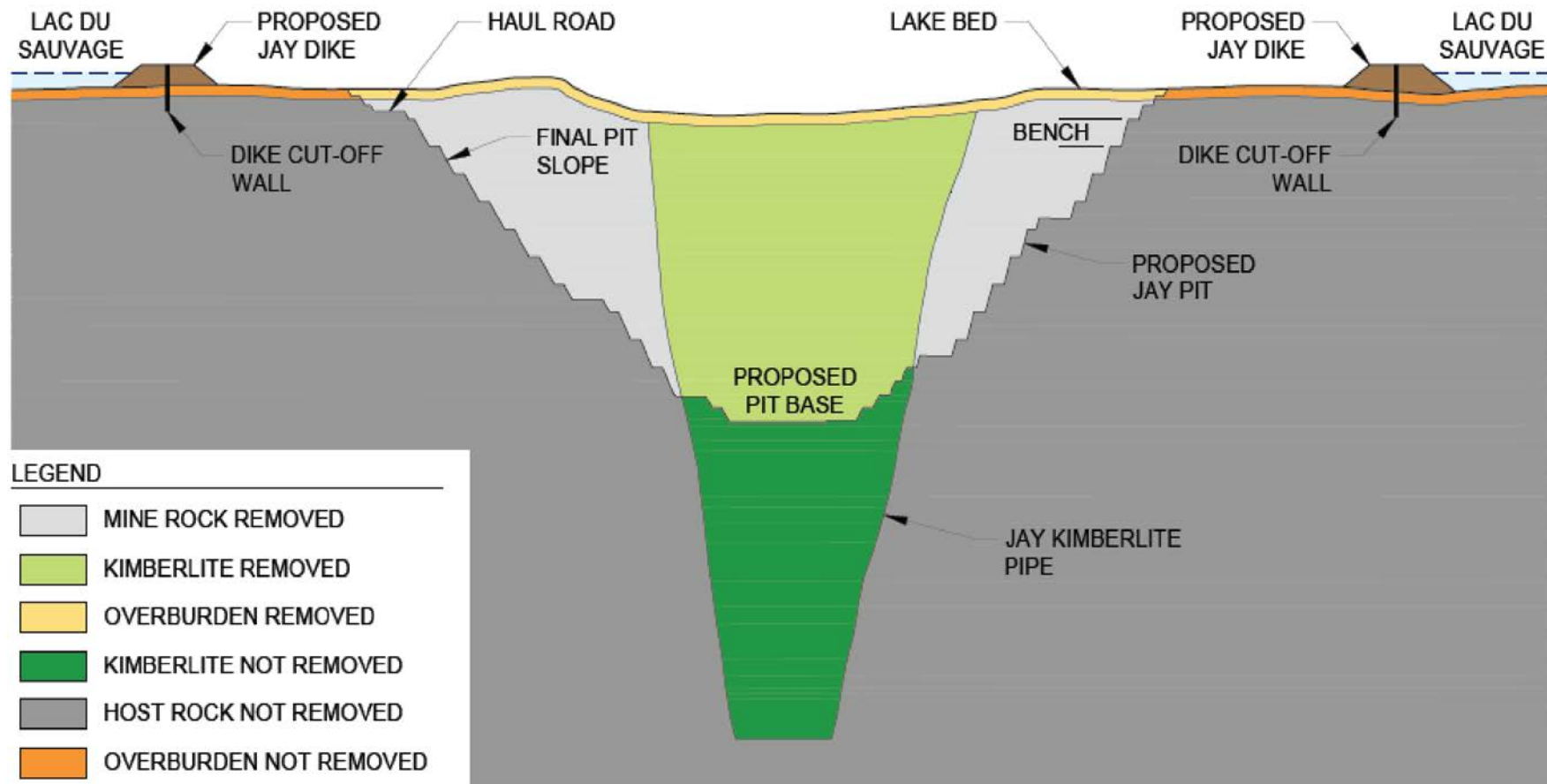


Operations includes:
operational haul
roads, laydowns,
stockpiles, Jay open
pit, Jay Waste Rock
Storage Area,
Misery Pit for water
management

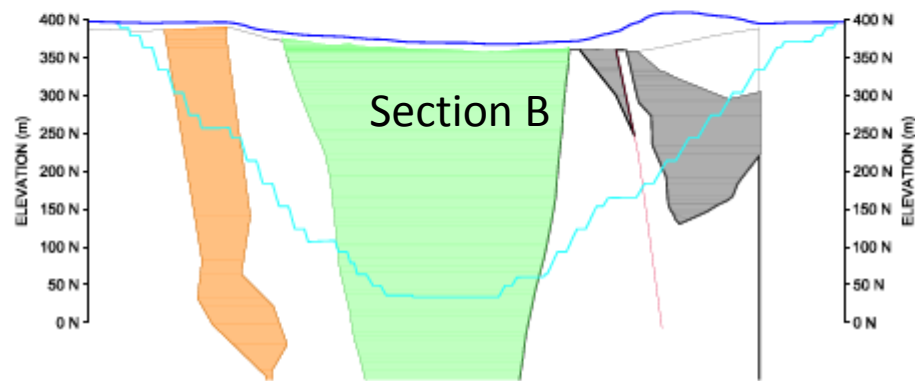
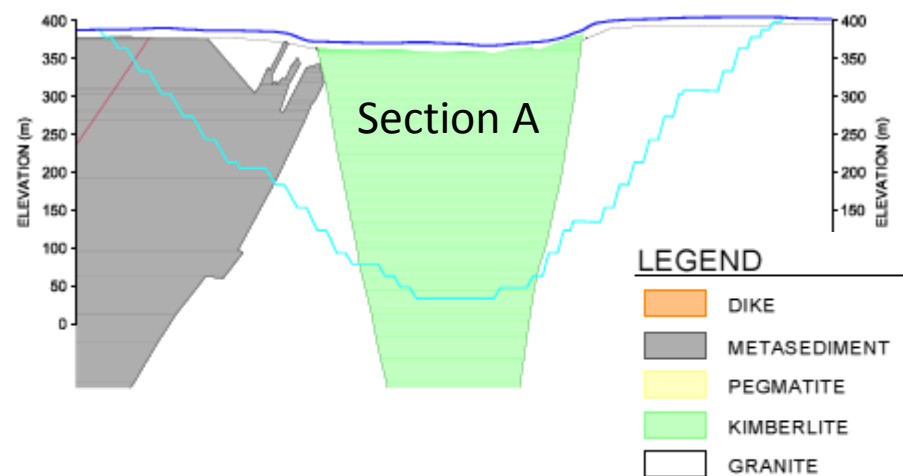
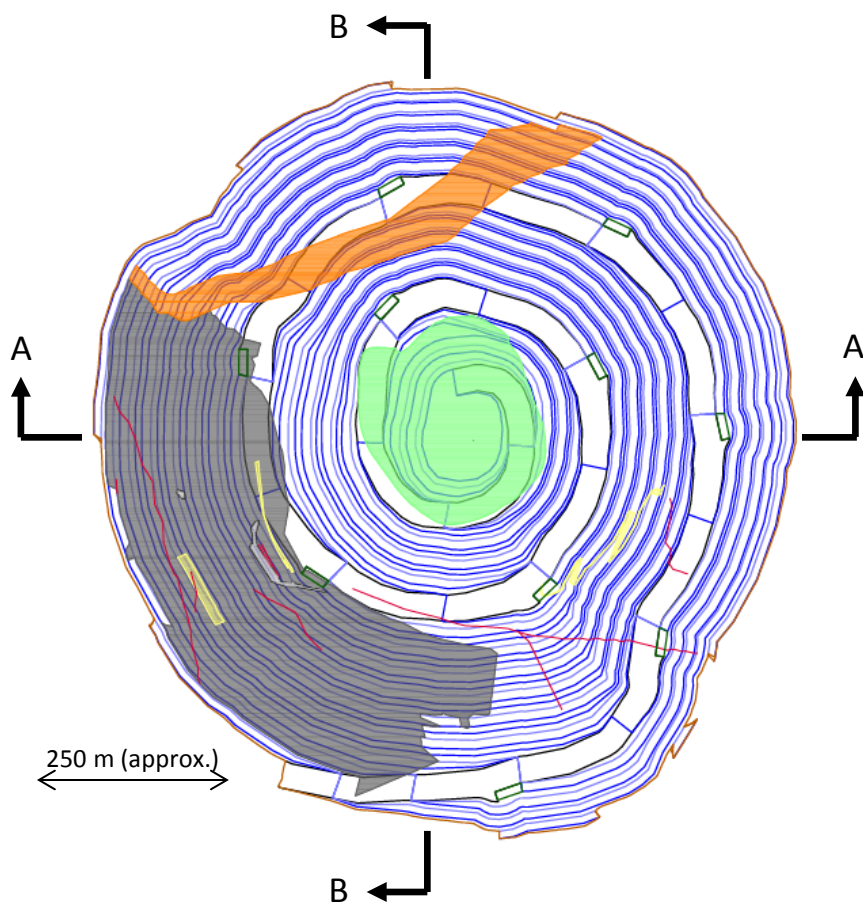
Operations – Jay Open Pit



Jay Pit Cross Section



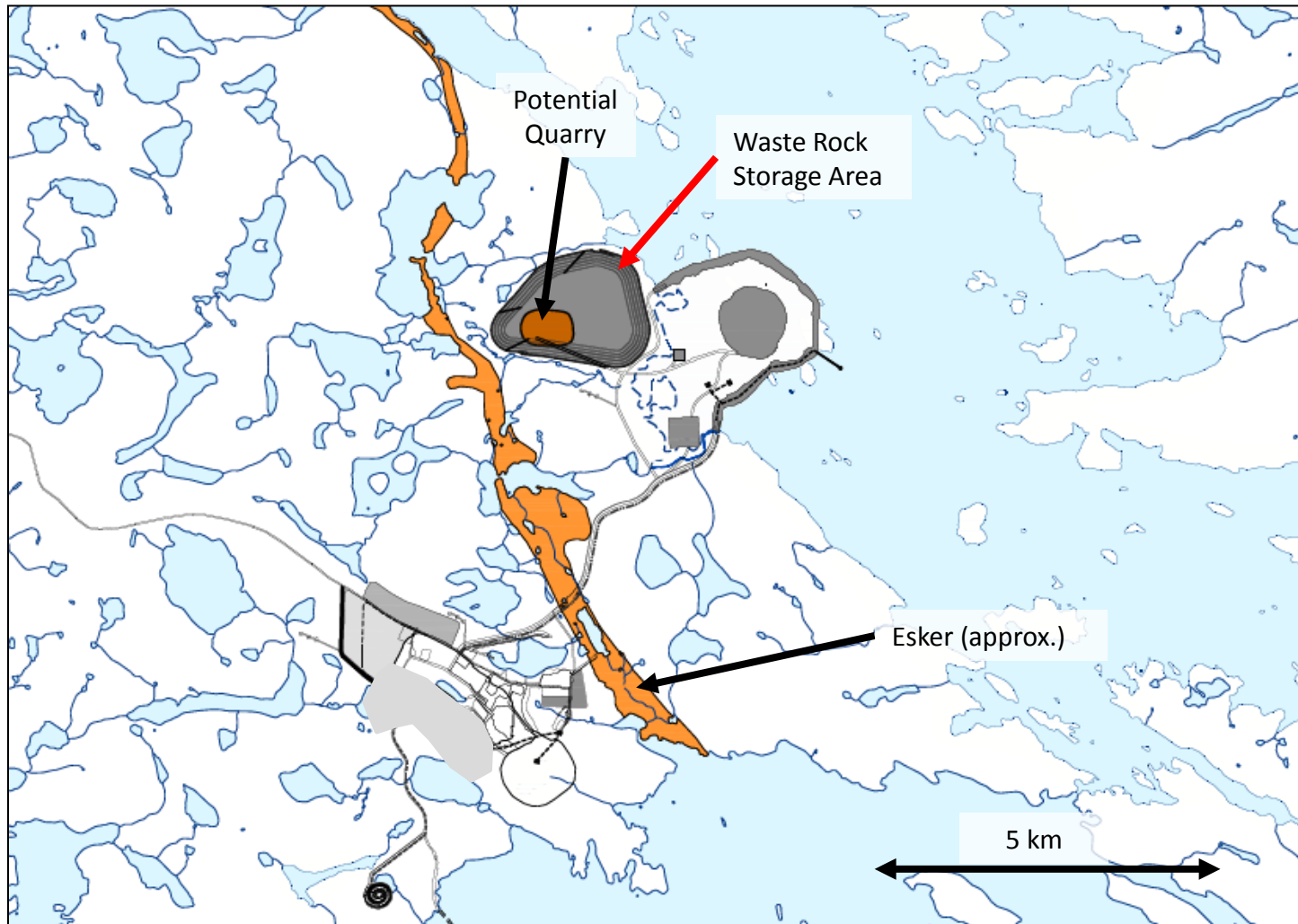
Jay Open Pit Design



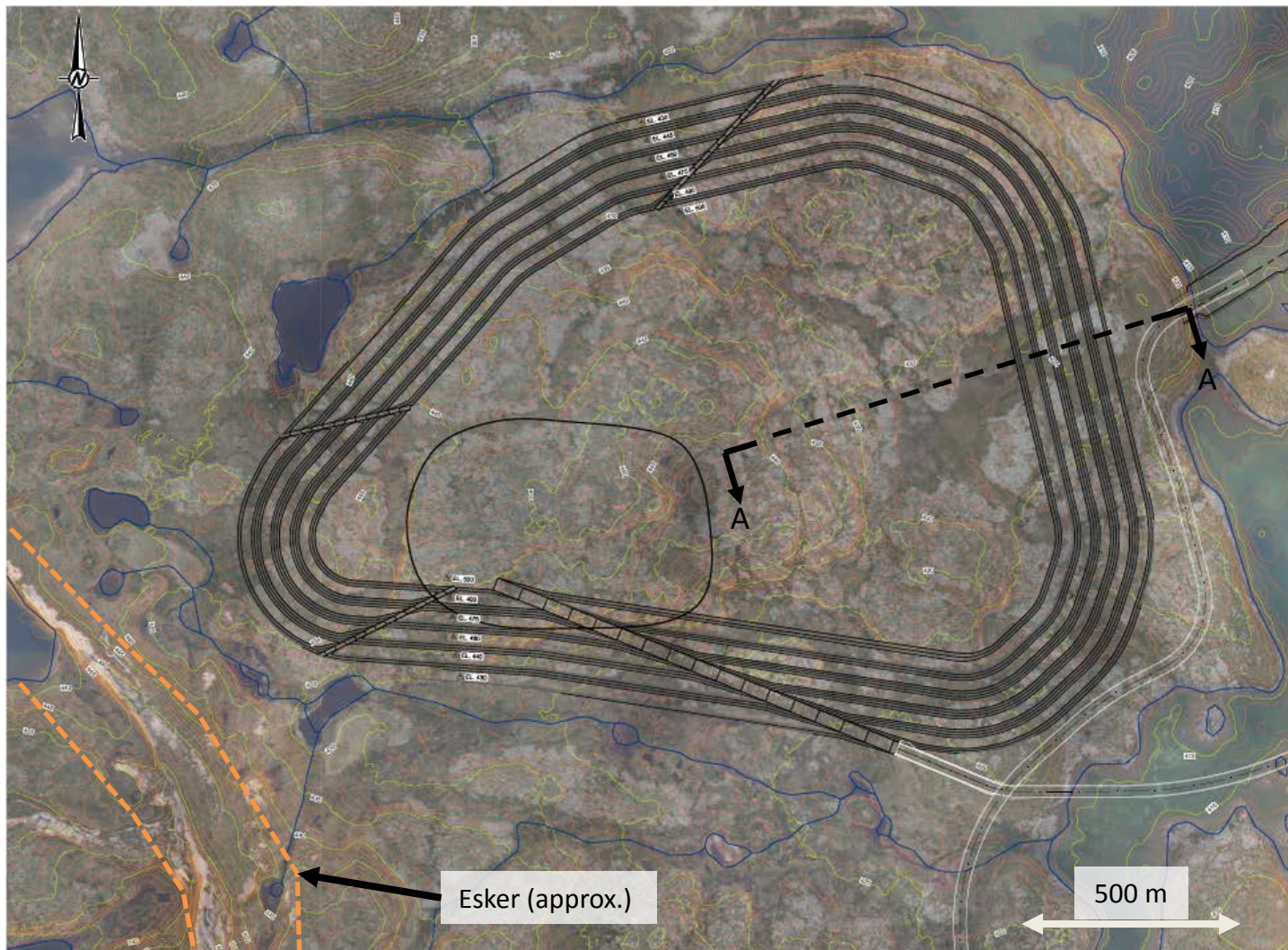
Horizontal Scale - Section



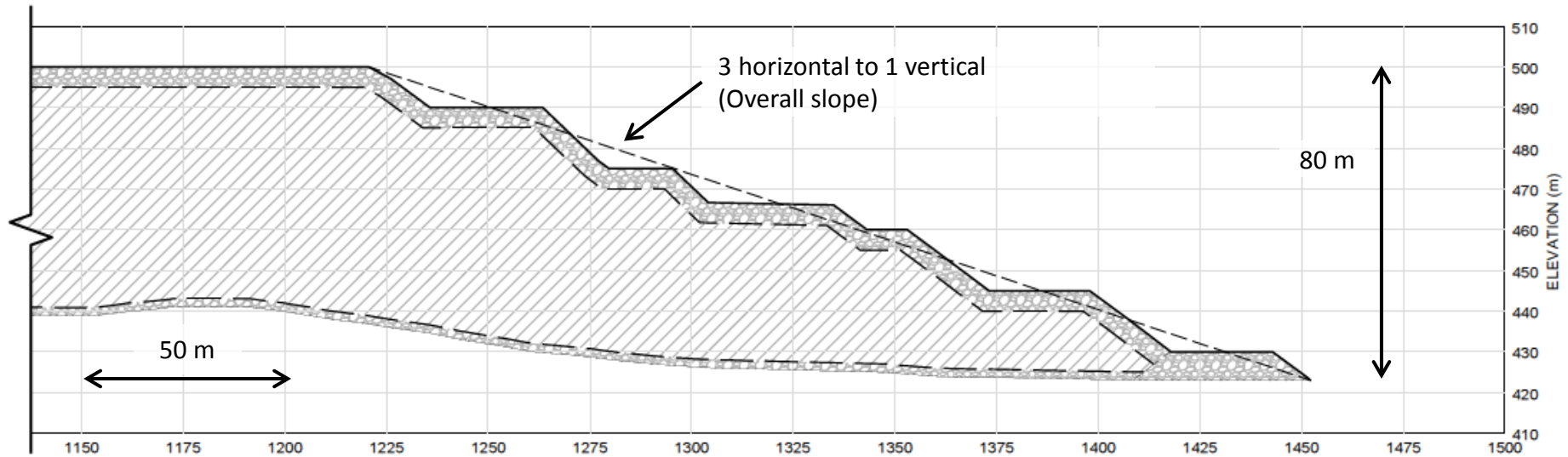
Jay Waste Rock Storage Area



Jay Waste Rock Storage Area



Jay Waste Rock Storage Area Section



LEGEND



Non-potentially acid generating waste rock



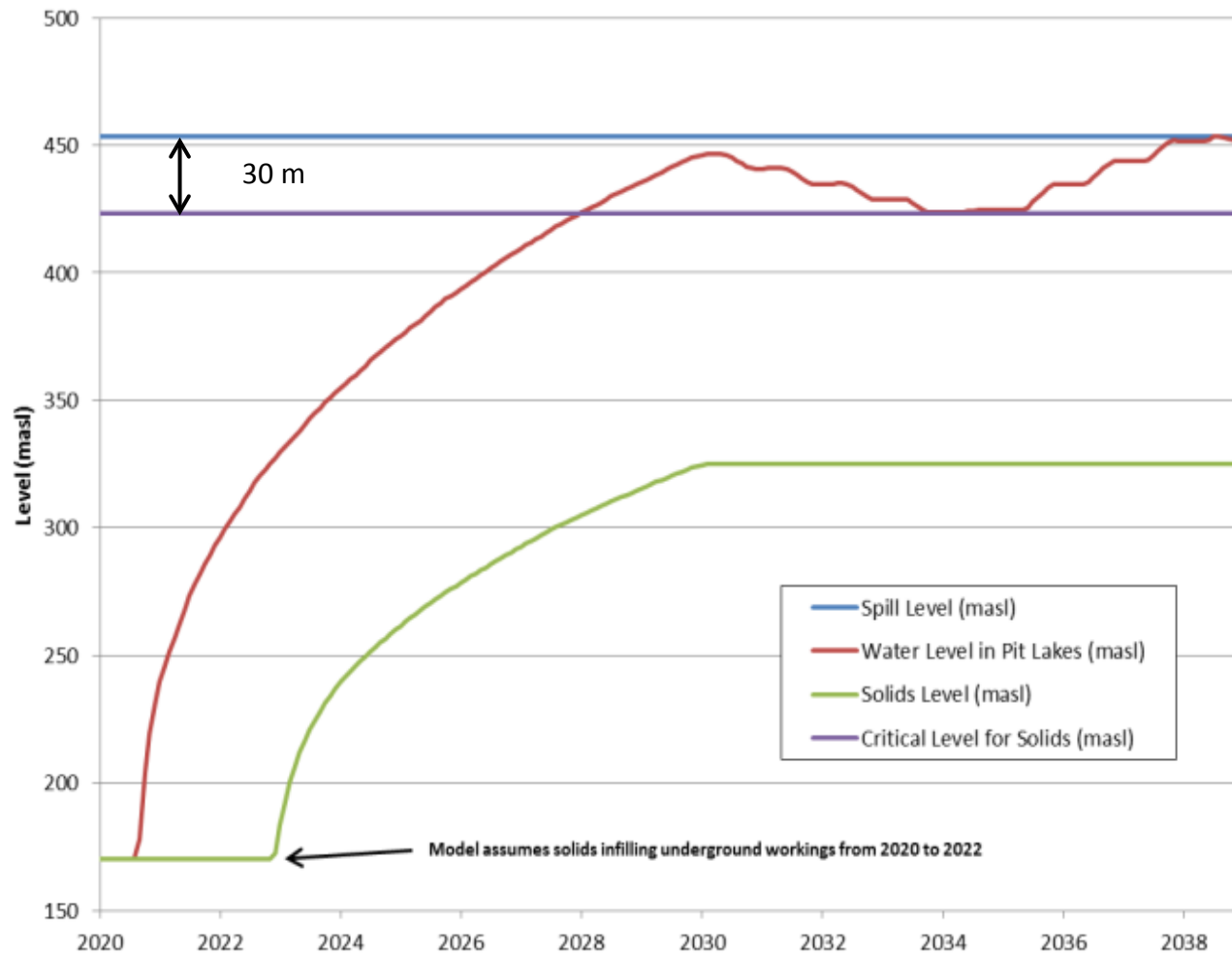
Mixed placement of waste rock (potentially and non-potentially acid generating)

Processed Kimberlite Management

- Processed kimberlite will go in the mined-out Panda and Koala open pits



Processed Kimberlite Management



Panda and Koala Pit Filling Curves

Mine Water Management - Definitions

The following definitions apply

Minewater: *runoff from facilities associated with the project and all water or waste pumped or flowing out of any pit or underground mine.*

- **Surface minewater:** diked area runoff, including runoff from waste rock storage area and portion of the roads, and Jay Dike seepage
- **Open pit minewater:** inflows to the Jay Pit

Natural runoff: *runoff water from natural catchments*

Discharge: *direct or indirect release of any water or waste to the receiving environment*

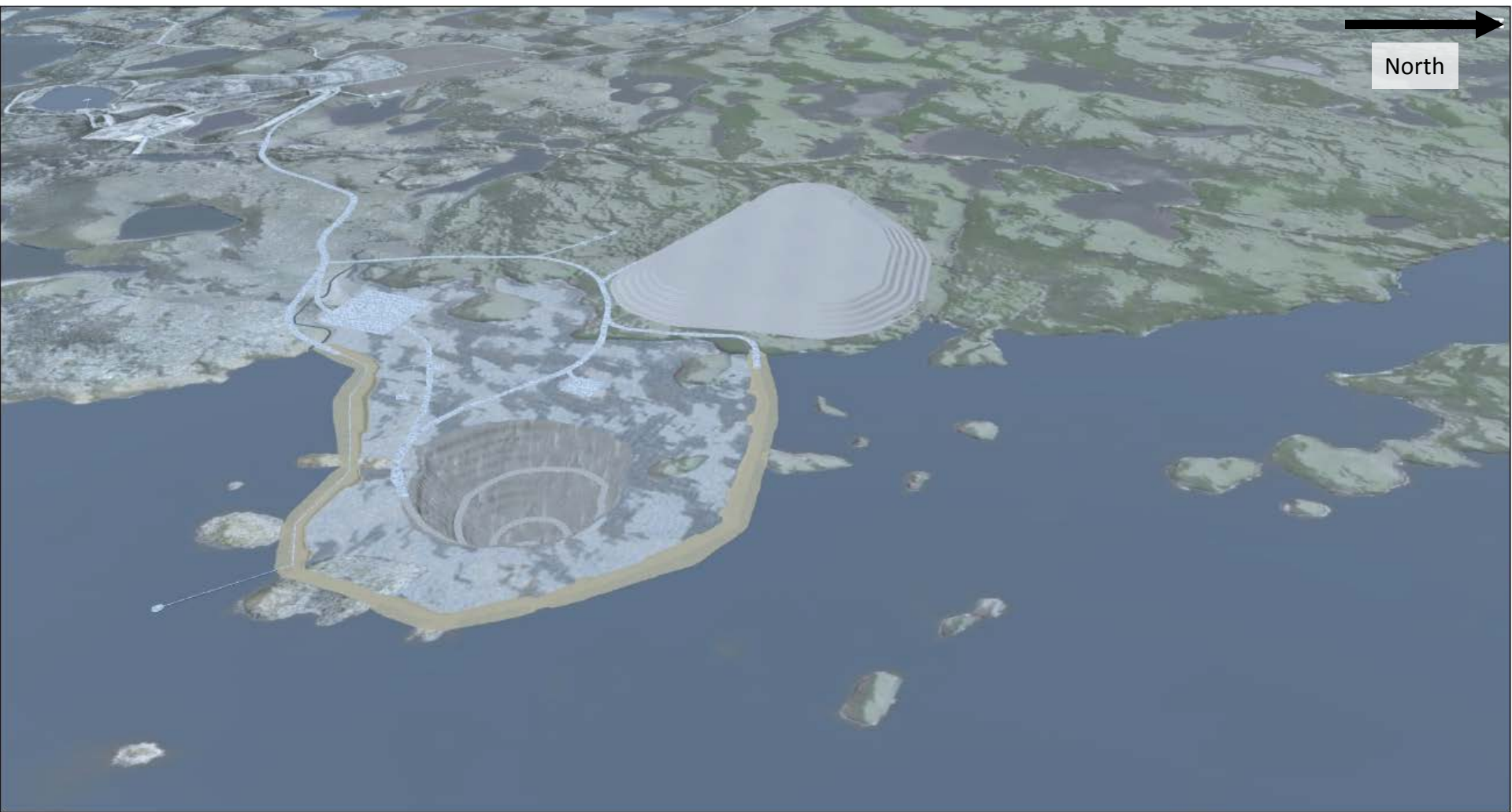
Mine Water Management – Objective and Strategies

The objective of the plan *“is to enable safe and timely mining of the Jay kimberlite pipe, while preventing adverse negative impacts in the aquatic receiving environment in terms of water quantity, water quality, and aquatic life.”*

The following strategies are planned to achieve the objectives

- To the extent practicable, minimize the quantity of minewater for management and monitoring
- To the extent practicable, intercept and divert runoff from natural catchments away from the mine site
- Plan for the safe discharge of water to the receiving environment such that adverse negative impacts are not anticipated or likely
- Utilize experience and data from the Ekati Mine and other similar mines to develop sound management plans
- Implement monitoring plans throughout the various stages of mine development to allow for development of adaptive management strategies if required

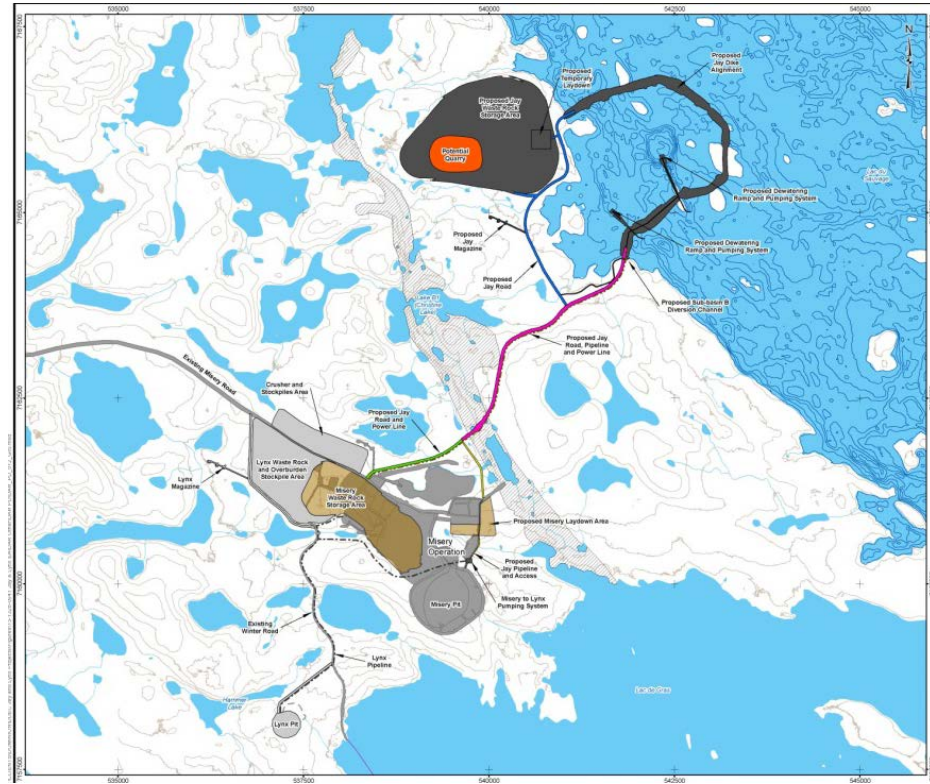
Mine Water Management – Modelling



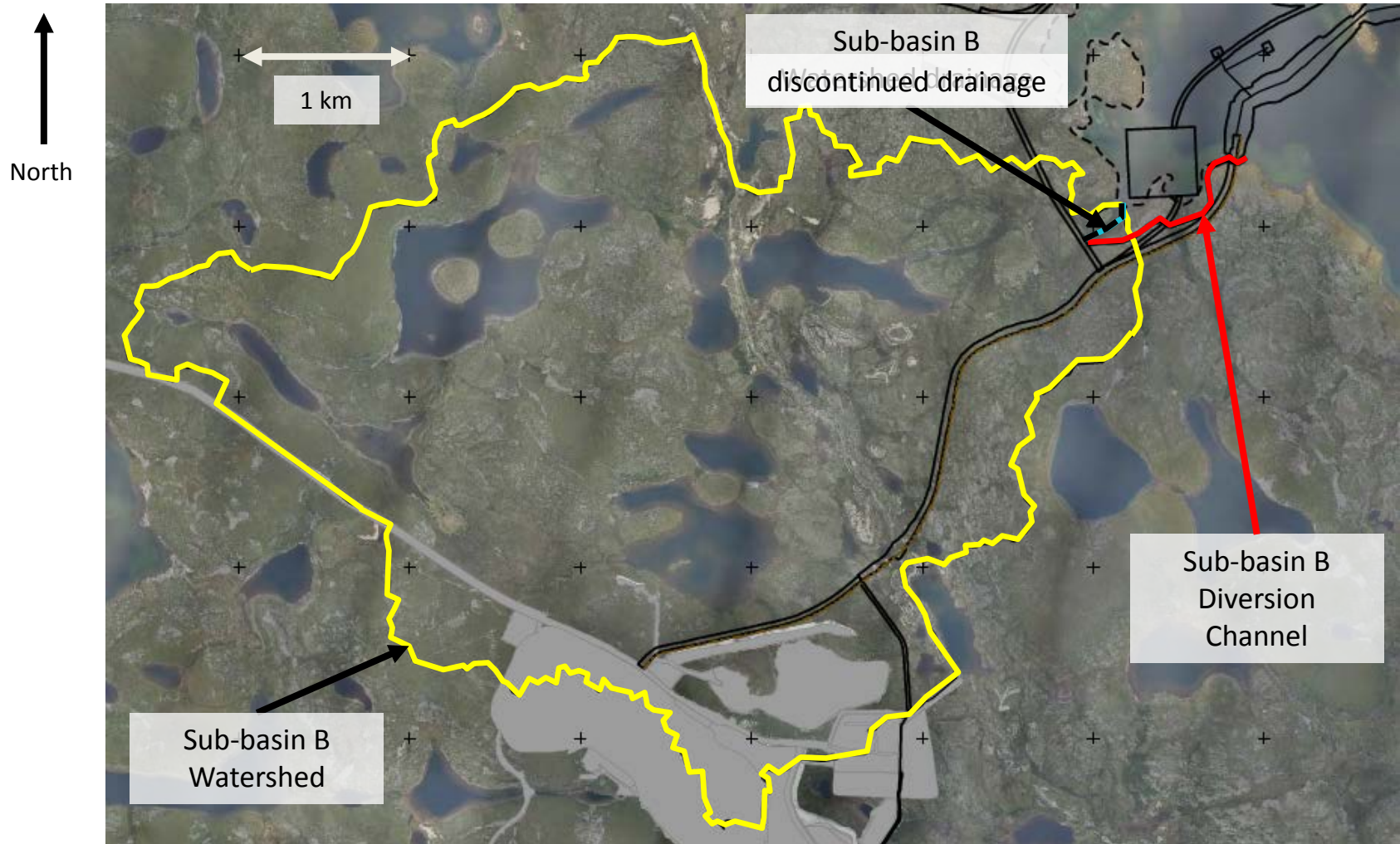
Mine Water Management – Construction/Dewatering Stage

The Mine Water Management Plan for the **construction/dewatering** stage includes:

- Turbidity curtains during dike construction
- A diversion channel (Sub-Basin B Diversion Channel) to divert stream water from natural catchments upstream of the diked area
- Pumping and pipeline systems to allow dewatering of the portion of Lac du Sauvage within the containment dike
- Mined-out Lynx Pit and Misery Pit to be used for management of water with elevated concentrations of total suspended solids

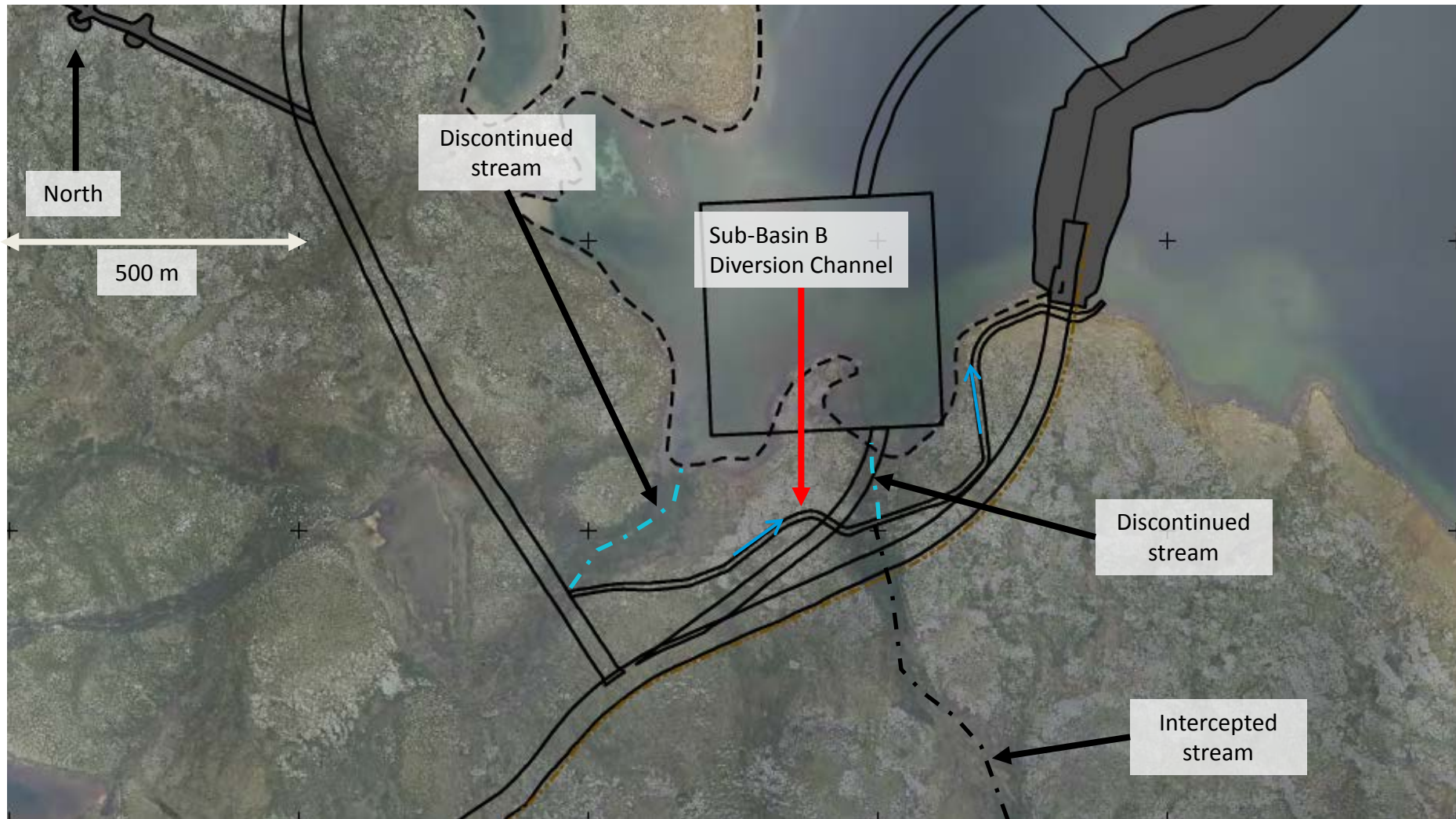


Mine Water Management – Construction Stage - Sub-basin B Diversion Channel - Catchment

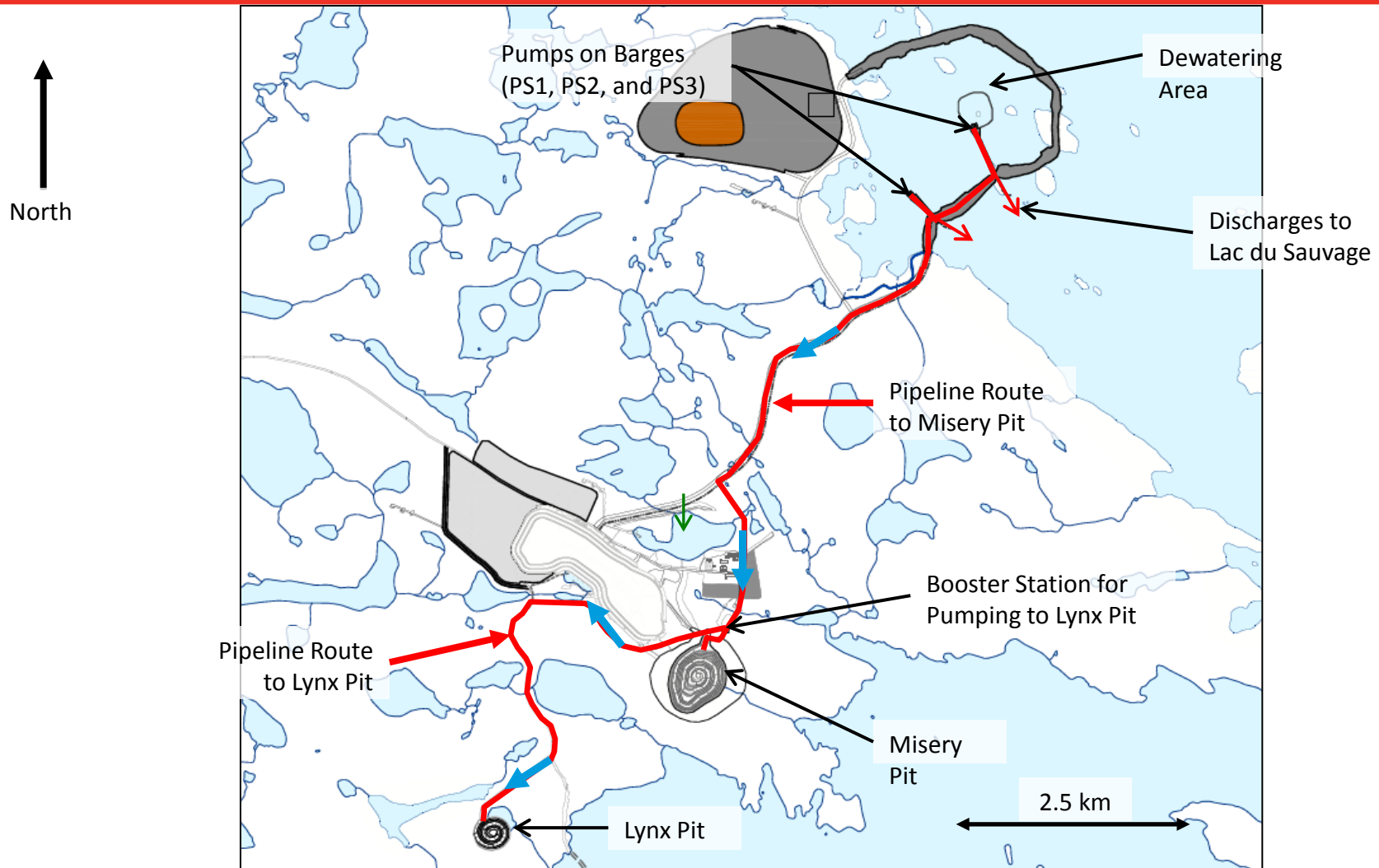


Mine Water Management – Construction Stage - Sub-basin B

Diversion Channel - Details



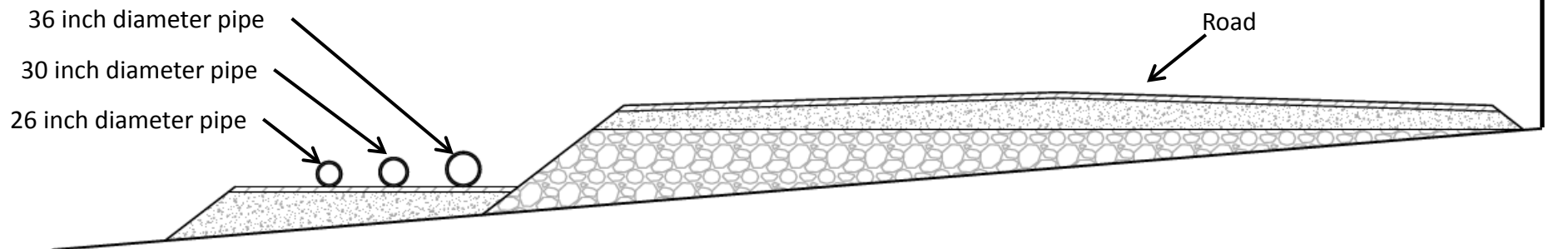
Mine Water Management – Dewatering Pumping and Pipelines



Mine Water Management – Dewatering Pumping and Pipelines



Dewatering of A418 Dike at Diavik Diamond Mine



Mine Water Management – Dewatering Pumping and Pipelines

Purpose

- Pumping and pipelines for dewatering within diked area
- Dewatering will occur in two phases
 - Estimated, first 50% of volume pumped to Lac du Sauvage across the Jay Dike
 - Second 50% of volume pumped to Misery Pit and Lynx Pit for sediment control
 - Actual distribution (discharge vs. storage) will be dependant on suspended solids in discharge

Design Criteria

- Complete dewatering in 6 months equivalent to an average pumping rate of 6,500 m³/hr

Dewatering volumes summary

Dewatering Area	Initial Reservoir Volume (million m ³)	Inflow Volume (million m ³)	Total Dewatered Volume (million m ³)	Duration (months)	Average Dewatering Rate (m ³ /hr)
Jay Pipe	27.0	2.6	29.6	6	6,500

Capacity of Lynx Pit: 5.2 million m³ storage capacity

Capacity of Misery Pit: 40 million m³ storage capacity

Mine Water Management – Dewatering Pumping and Pipelines

Pumping System	Phase	From	To	Flow Rate (m ³ /hr)	Pipeline Size (in)	Length (m)
PS1	Initial dewatering	Diked area	Lac du Sauvage	1,350	20	700
	Final dewatering	Diked area	Misery Pit	1,350		7,200
PS2	Initial dewatering	Diked area	Lac du Sauvage	1,600 ^(a)	24	500
	Final dewatering	Diked area	Misery Pit	1,600		6,100
PS3	Initial dewatering	Diked area	Lac du Sauvage	3,550	30	700
	Final dewatering	Diked area	Misery Pit	3,550		7,200
Misery to Lynx System	Final dewatering	Misery site	Lynx Pit	2,500	24	5,300

Mine Water Management – Dewatering - Mined-out Lynx & Misery Pits

Lynx Pit

Purpose

- The mined-out Lynx Pit (~ 5.2 million m³ storage capacity) will be used as settling facility during final dewatering

Design Criteria

- 4.9 million m³ of water will be pumped to the mined-out Lynx Pit; this will provide approximately 3 m of freeboard or 300,000 m³ storage allowance, which corresponds to approximately 2.5 years of natural net inflows to the Lynx Pit

Misery Pit

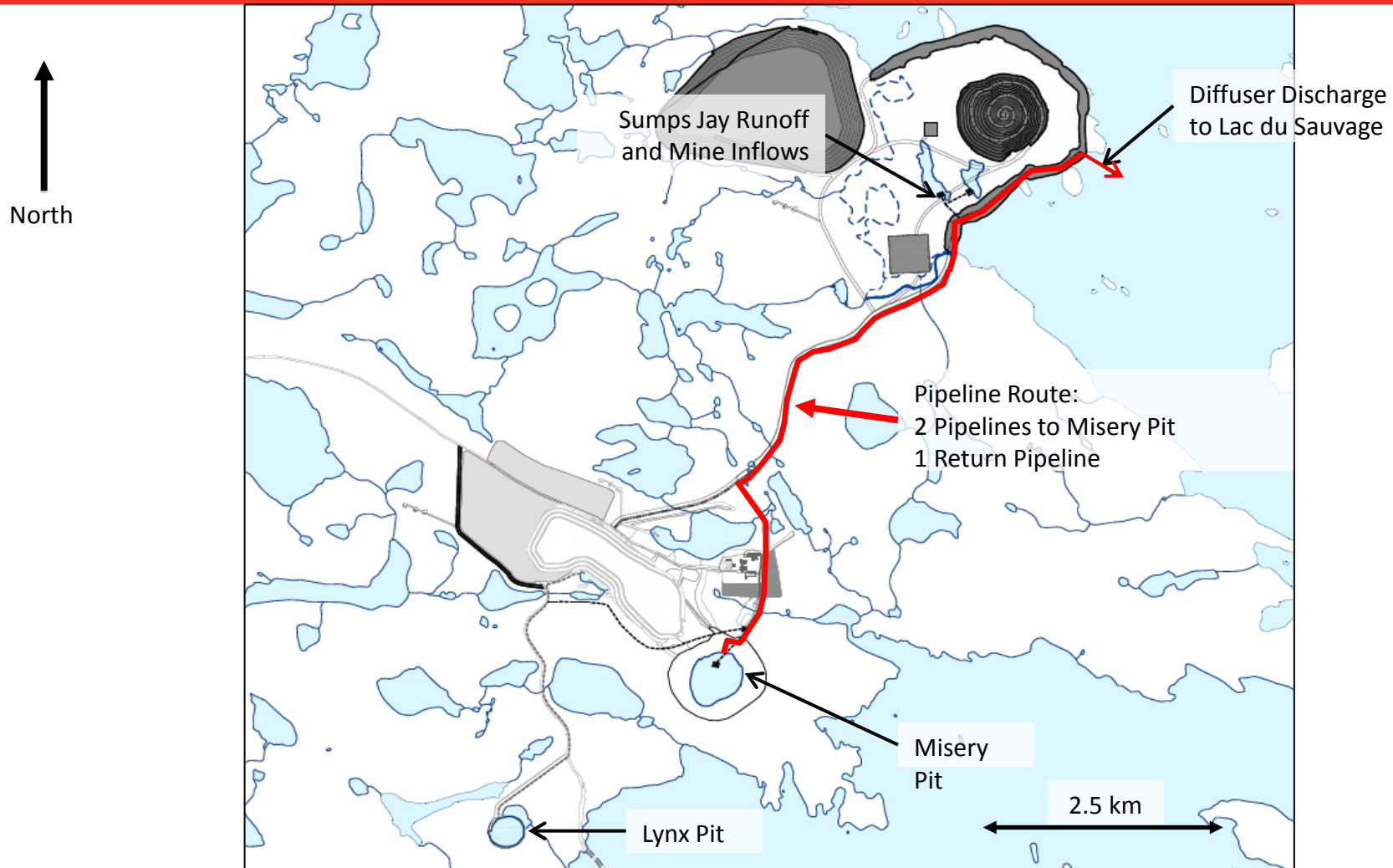
Purpose

- The mined-out Misery Pit (~ 40 million m³ storage capacity) will be used as settling facility during final dewatering

Design Criteria

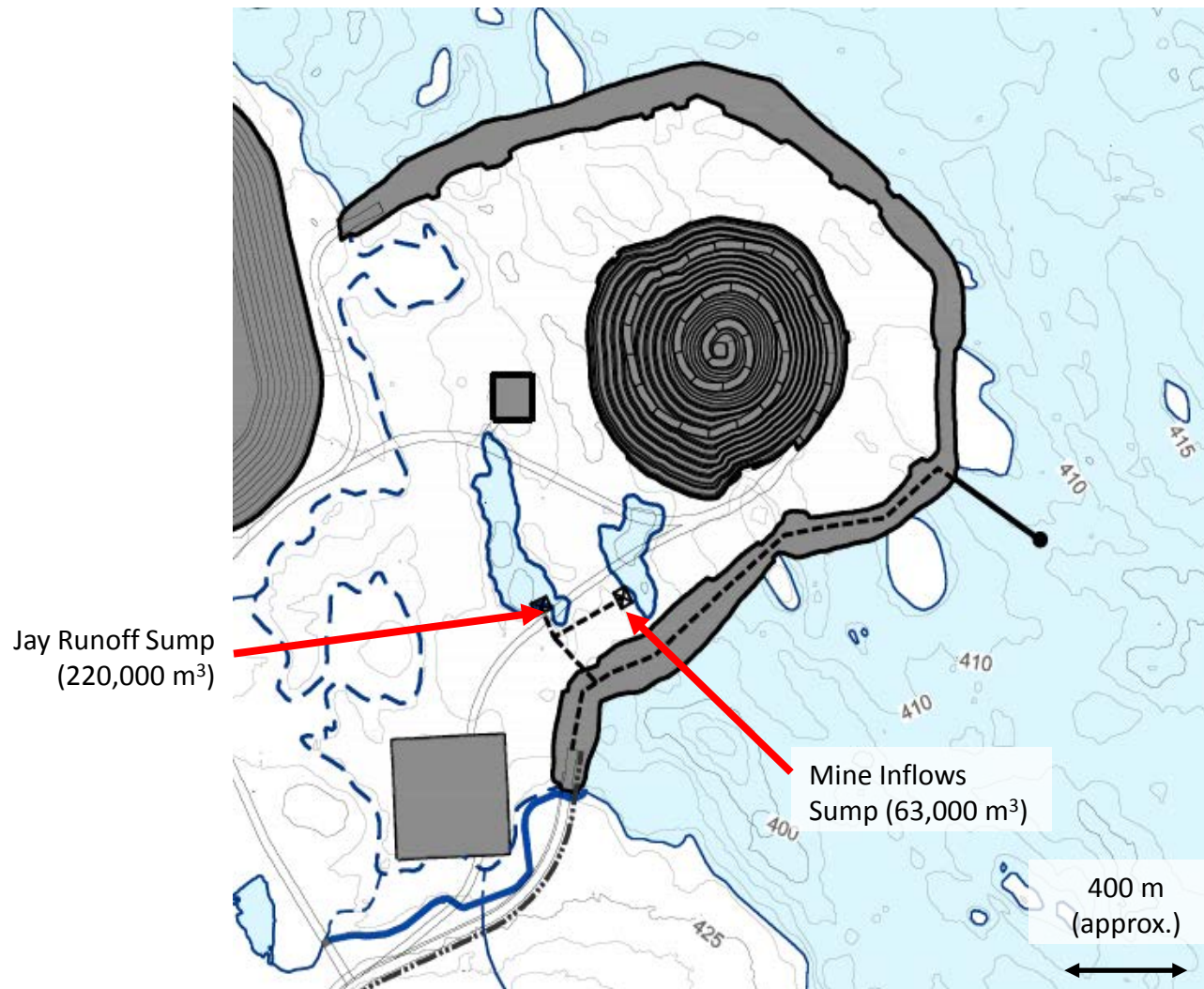
- Estimated 7.9 million m³ of water will be pumped to the mined-out Misery Pit

Mine Water Management – Operations Pumping and Pipelines



Mine Water Management – Operations - Collection Sumps

North
↑

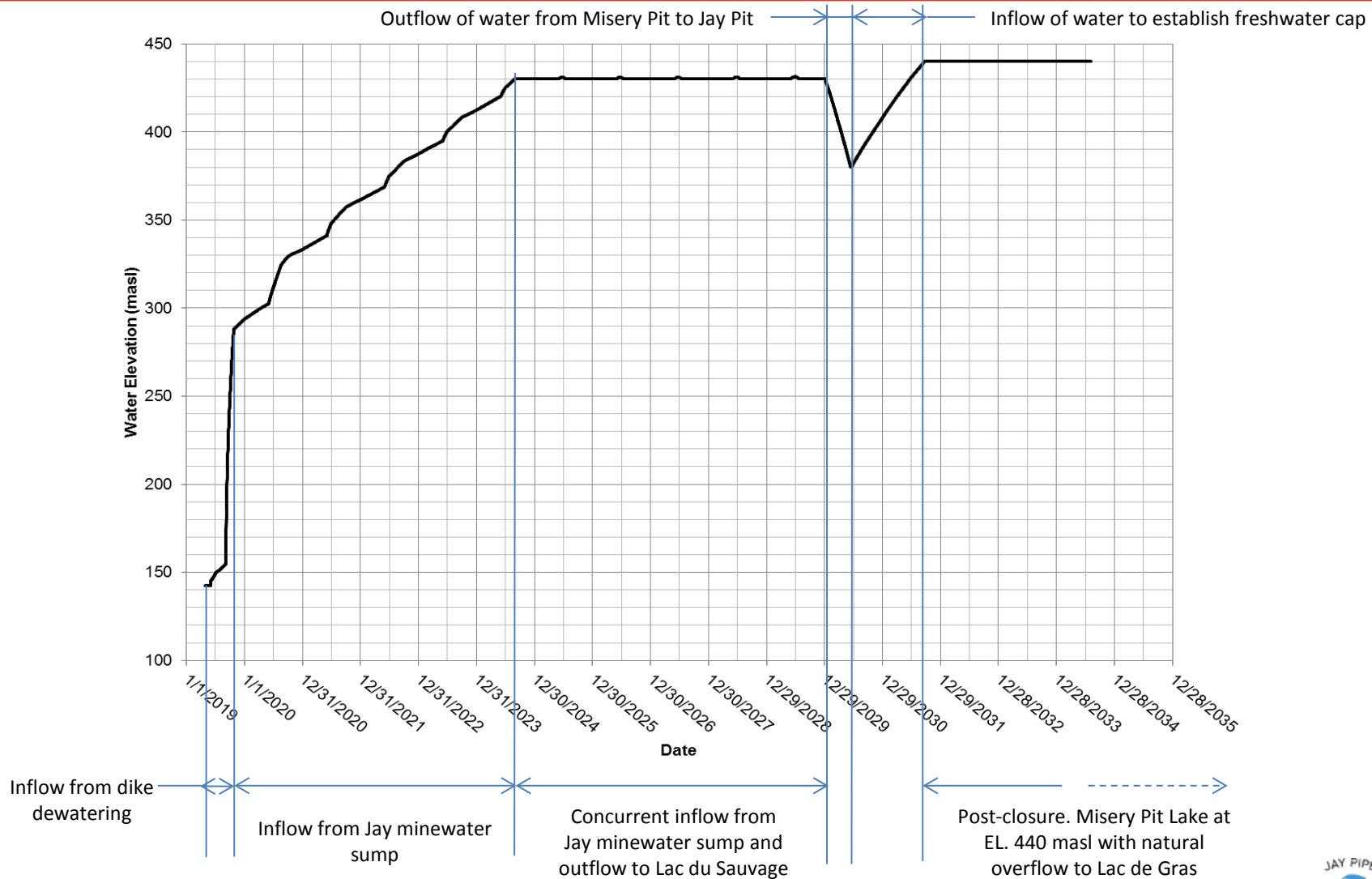


Mine Water Management – Operations - Pumps and Pipelines

Pumping systems

Pumping System	Phase	From	To	Flow Rate (m ³ /hr)	Pipeline Size (in)	Length (m)
PS1	Operations	Mine Inflows Sump	Misery Pit – Bottom	1,230	20	9,700
PS2	Operations	Jay Runoff Sump	Misery Pit - Top	1,350	24	6,100
PS3	Operations	Misery Pit	Lac du Sauvage	2,000	30	7,800

Mine Water Management – Operations – Misery Pit – Volumes



Diffuser Outfall

The geometry of the diffuser:

- Ten ports spaced at 5 m intervals
- Port openings of 84 mm in diameter, positioned 8 m below lake surface
- Port openings oriented 45° upwards towards water surface
- Port openings orientated inline with main lake current



Mine Water Management – Adaptive Management Strategies

Possible adaptive management strategies that would be considered:

- maintaining a storage contingency allowance in the existing King Pond
- maintaining the contingency storage in the Misery Pit (approximately 3 million m³) throughout the operations stage for use as emergency minewater storage
- maintaining pumping and a pipeline between the Misery and Lynx pits throughout the operations stage to allow for lowering of the Lynx Pit water level to provide additional contingency minewater storage
- increasing storage capacity in the sumps to provide additional temporary capacity
- direct discharge to the environment from the Jay runoff sump if water is found to meet discharge criteria
- use of storage capacity available at the Ekati site
- treatment of parameters of concern prior to discharge to Lac du Sauvage

Questions?

