

Freshet Inspection Report

Location: Itivia, Bypass Road, AWAR, Mine Site, Exploration Camp

Owner: Sites Services/Environment

DATE : 2019-04-19

Inspected By : JAB, BH

Applicable Management Plans:

- Freshet Action Plan – March 2019 – Version 5

Applicable Licence

- Water Licence No: 2AM-MEL1631 – April 2016
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Exploration Camp Area & Road

Specific Risks:

- TSS transport from core stockpile
- TSS transport across road
- Snow pad and runoff at the back of Explo towards Mel. Lake
- TSS transport on downstream end of J1 Culvert towards Mel. Lake
- Ensure snow storage and padding is done in designated area

Observations:

- Snow-piles: North side of explo laydown road; core box road; all areas surrounding camp; generator area
- Snow drifting against most structures on interior side of road, poses risk of draining across road towards Mel Lake
- Good padding at tire laydown

Mitigation Measures:

- Flatten snow-piles into pads
- Clear snow drifts next to structures
- Monitor areas for high instances of drainage across access roads

Pictures No.: 1-6

Exploration Camp Road to Portal No. 1

Specific Risks:

- Ponding and runoff (erosion potential) across road from temporary stockpile to P3
- Ensure snow storage and padding is done in designated area

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Observations:

- No issues observed

Mitigation Measures:

Pictures No.:

Landfarm B and Fuel Farm B

Specific Risks:

- Water level within berm (i.e., required pumping)
- Seepage through berm
- Excessive snow amongst fuel tanks causing high runoff adjacent to Landfarm B

Observations: Some snow in in landfarm B? Large drifts between tanks.

- Large drifts between fuel tanks and adjacent/connecting to Landfarm B pile
- Lone stockpile across road

Mitigation Measures:

- Remove excessive drifting with small equipment, flatten into pads across road or adjacent to Landfarm/Fuel Farm
- Continue monitoring for runoff and inundation within containment

Pictures No.: 7-9

SP1

Specific Risks:

- Slumping or failure of walls
- Ensure no unplanned inputs

Observations: Looked okay

- No structural issues observed
- No unplanned inputs

Mitigation Measures:

- Continue monitoring towards freshet

Pictures No.:

SP2

Specific Risks:

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- Slumping or failure of walls
- Ensure no unplanned inputs

Observations:

- No structural issues observed
- No unplanned inputs

Mitigation Measures:

- Continue monitoring towards freshet

Pictures No.:

D-CP5/CP5

Specific Risks:

- Water levels approaching toe of dike
- Ponding in D-CP5 trench and potential for migration downstream
- Ensure snow is cleared from downstream toe to minimize potential for downstream migration of TDS
- Seepage through the downstream dike slope
- Ensure no unplanned inputs

Observations: Pile of snow?

- Small stockpile of snow to the east of D-CP5, next to access road
- No water observed
- Large snow drifts on downstream D-CP5 toe

Mitigation Measures:

- Flatten snow piles into pads
- Remove snow accumulation on downstream D-CP5 toe

Pictures No.: 10

Channel 5

Specific Risks:

- Blockages in channel
- Slope failure
- Water levels flooding back and impounding against Berm 3
- Greater than usual TSS transport
- Inflows to channels on site which are not part of the water management system

Observations:

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- 2 Sets of yellow lay-flat lines running across Channel 5/Berm 3
- No water observed or blockage risks

Mitigation Measures:

- Determine if lay-flats are acceptable in their location and won't generate snow/ice-damming

Pictures No.: 11-12

Berm 3

Specific Risks:

- Slumping, cracking or erosion of berm
- Pooling at upstream toe and resultant seepage through berm
- Flow along downstream toe of berm - TSS entrainment

Observations:

- 2 Sets of yellow lay-flat lines running across Channel 5/Berm 3
- Snow drifting against entire length of berm, US and DS toes

Mitigation Measures:

- Determine if lay-flats are acceptable in their location and won't generate snow/ice-damming
- Monitor drifts during melt for seepage/pooling

Pictures No.:

P3 and DP3

Specific Risks:

- Seepage under dike trench and toward CP5
- Water levels approaching base of SP3 liner
- Ensure no unplanned inputs

Observations:

- Snow accumulation in D-P3 sump
- Pooling of water/ice in southern corner of P3, beside back-fill pad

Mitigation Measures:

- Monitor snowmelt and pooling for seepage during freshet

Pictures No.:

SP3

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Specific Risks:

- Cracking or slumping of SP3 pad/base
- Seepage from containment

Observations:

- Under construction, no issues observed

Mitigation Measures:

Pictures No.:

Portal No.1

Specific Risks:

- Channelized flow down the portal
- Significant ponding adjacent to the portal

Observations:

- No issues observed

Mitigation Measures:

Pictures No.:

ANFO Plant

Specific Risks:

- TSS transport off of laydown
- Incision of tundra and TSS transport due to snowmelt from snowpad

Observations:

- Large pile of overburden/snow on North side of Anflo Plant road, high TSS runoff potential
- Numerous snowpiles with high sediment content

Mitigation Measures:

- Monitor runoff from piles, implement TSS logs as required

Pictures No.: 13-16

CP4 and D-CP4

Specific Risks:

- Water level within CP4 nearing OMM (bedrock elevation)

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- Greater than expected TSS transport from WRSF or surrounding area to CP4
- Slumping, Cracking of D-CP4
- Ensure no unplanned inputs

Observations:

- No issues observed

Mitigation Measures:

Pictures No.:

Channel 4

Specific Risks:

- Channel is not completed, but initial blasts done
- Slope failure
- Therefore look for TSS migration from blasted area
- Incision due to channelized flow and associated TSS transport
- Inflows to channels on site which are not part of the water management system

Observations:

- In construction, no issues observed

Mitigation Measures:

Pictures No.:

P2

Specific Risks:

- Cracking, slumping of DP2-A
- Ensure no unplanned inputs

Observations:

- No issues observed

Mitigation Measures:

Pictures No.:

P1

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Specific Risks:

- Cracking, slumping of DP1-B
- Migration of water from DP1-B trench towards CP1 or Portal 2
- Water level in Contaminated Snow Cell
- Ensure no unplanned inputs

Observations:

- No issues observed

Mitigation Measures:

Pictures No.:

Portal No. 1 Road to Industrial Pad

Specific Risks:

- Ponding along roadside (particularly close to Portal 2)
- Ensure no snow storage outside of designated snow pad areas (P2/P3)

Observations:

- Numerous snow piles observed beside Paste Plant, large snow pile north of Batch Plant, snow piles adjacent to esker padding along esker road

Mitigation Measures:

- Remove snow piles and deposit to P1/P2

Pictures No.: 17-19

Portal 2

Specific Risks:

- Any sort of ponding near Portal 2

Observations:

- Not observed, prioritize for next inspection

Mitigation Measures:

Pictures No.:

Culvert 2

Specific Risks:

- Blockages impeding flow

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- Greater than expected TSS transport
- Damage to in the inlet or outlet which may impede flow capacity
- Ensure no snow cover or snow piles, which would prevent routing of water into or out of the culvert
- Ensure no bed erosion upstream and downstream

Observations:

- Not observed, prioritize for next inspection

Mitigation Measures:

Pictures No.:

Channel 1

Specific Risks:

- Blockages impeding flow
- Slope failure
- Greater than expected TSS transport
- Overtopping of banks
- Inflows to channels on site which are not part of the water management system

Observations:

- Not observed, prioritize for next inspection

Mitigation Measures:

Pictures No.:

Landfill A

Specific Risks:

- Seepage through landfill berm
- Pooling within landfill (or snow drifted within which will pool upon thaw)

Observations:

- No issues observed

Mitigation Measures:

- Continue monitoring for seepage during freshet

Pictures No.:

H15

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Specific Risks:

- TSS transport from TSF

Observations:

- No issues observed

Mitigation Measures:

Pictures No.:

TSF

Specific Risks:

- Excessive snow/runoff on tailings and resultant transport of tailings
- Integrity of Waste Rock perimeter

Observations:

- Cell 1 free of excessive snow
- Cell 2 has large snow pile – drainage to CP3 blocked by overburden

Mitigation Measures:

- Remove overburden and deposit on opposite side of snow pile, flatten snow pile into pad

Pictures No.: 23-24

CP3 and D-CP3

Specific Risks:

- Water level within CP3 nearing OMM (bedrock elevation)
- Greater than expected TSS transport from TSF to CP3
- Slumping, Cracking of D-CP3
- Ensure no unplanned inputs

Observations:

- Snow drifting on north wall of pond, potential for high runoff along berm

Mitigation Measures:

- Observe during freshet for large runoff

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Pictures No.:

Channel 3

Specific Risks:

- Bridge constructed (and removed) for waste rock transport – ensure no TSS entrainment in this area
- Blockages impeding flow
- Overtopping of banks
- Greater than expected TSS transport
- Inflows to channels on site which are not part of the water management system

Observations:

- Portion of channel 3 was filled in and subsequently cleared – potential source of TSS and slumping

Mitigation Measures:

- Monitor “repaired” area of channel 3 for TSS or erosional issues

Pictures No.: 20-22

Berm 2

Specific Risks:

- Slumping, cracking or erosion of berm
- Pooling at upstream toe and resultant seepage through berm
- Flow along downstream toe of berm - TSS entrainment

Observations:

- No issues observed

Mitigation Measures:

Pictures No.:

Emulsion Plant and Road

Specific Risks:

- Flow across road (take GPS coordinates of significant flow to plan culverts)
- TSS transport to the Environment (install straw logs if flow off site observed)
- Flow from laydown or snow pads towards environment that is causing incision and TSS transport
- Ensure snow is padded off the side of emulsion laydown
- Ensure no snow piles along road

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Observations:

- No issues observed along road
- Large quantities of snow piling in first laydown and at site pad
- Large drifts along sides of emulsion plant pad and roads
- Snow within drainage channel

Mitigation Measures:

- Flatten snow piles into pads, perform additional clearing on site
- Keep snow out of drainage channel

Pictures No.: 25-29

Channel 2

Specific Risks:

- Slope failure
- Overtopping banks
- Greater than expected TSS transport
- Inflows to channels on site which are not part of the water management system

Observations:

- Not observed, prioritize for next inspection

Mitigation Measures:

Pictures No.:

Main Camp Area

Specific Risks:

- Runoff at back of camp causing incision or TSS transport to Channel 2
- Significant flow or ponding on pad or parking areas
- Ensure no snow storage outside of designated snow pad (CP1)

Observations:

- Snow accumulation between wings only cleared half-way
- Large snow piling on south face of camp, behind Heavy Vehicle parking zone

Mitigation Measures:

- Continue to remove snow piles and transport to snow dump (CP1)

Pictures No.:

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Specific Risks:

- TSS transport to CP1 due to quarrying

Observations:

- Not observed, prioritize for next inspection

Mitigation Measures:

Pictures No.:

Landfarm A

Specific Risks:

- Sump water level
- Seepage towards CP1 or away from Landfarm

Observations:

- Not observed, prioritize for next inspection

Mitigation Measures:

Pictures No.:

Industrial Pad Site

Specific Risks:

- Significant pooling causing erosion with vehicle traffic
- Flow across pads or roads causing increased TSS runoff to water management system
- Snow banks or piles causing erosion upon melt
- Ensure no snow storage outside of designated snow pad (CP1)

Observations:

- Numerous snow buildup and snowpiles along structures and sea cans

Mitigation Measures:

- Additional snow removal required to be moved to snow dump (CP1)

Pictures No.: 30

East Access Road

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Specific Risks:

- Flow or pooling along roadside causing TSS transport or washout concerns
- Ensure no snow storage along roadside

Observations:

- No issues observed

Mitigation Measures:

Pictures No.:

Culvert 3

Specific Risks:

- Blockages impeding flow
- Greater than expected TSS transport
- Damage to in the inlet or outlet which may impede flow capacity
- Ensure no snow cover or snow piles, which would prevent routing of water into or out of the culvert
- Ensure no bed erosion upstream and downstream

Observations:

- Blocked with snow

Mitigation Measures:

- Continue to monitor and begin clearing closer to freshet

Pictures No.:

Culvert 4

Specific Risks:

- Blockages impeding flow
- Greater than expected TSS transport
- Damage to in the inlet or outlet which may impede flow capacity
- Ensure no snow cover or snow piles, which would prevent routing of water into or out of the culvert
- Ensure no bed erosion upstream and downstream

Observations:

- Blocked with snow

Mitigation Measures:

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- Continue to monitor and begin clearing closer to freshet

Pictures No.:

CP1 and D-CP1

Specific Risks:

- Overtopping of containment area on downstream end of D-CP1
- Cracking, slumping of D-CP1
- Water levels encroaching on upstream toe of D-CP1
- Ensure no unplanned inputs
- Seepage through the downstream dike slope

Observations:

- No issues observed

Mitigation Measures:

Pictures No.:

H5

Specific Risks:

- Runoff from D-CP1 to H5 (transporting TDS or TSS)

Observations:

- Not observed, prioritize for next inspection

Mitigation Measures:

Pictures No.:

AWAR and Bypass Road

Specific Risks:

- Blockages in culverts impeding flow
- Ice dams upstream or downstream of bridges
- Flow across or along roads (install straw logs as needed)
- Slumping of roadside
- TSS transport from quarries along AWAR into water bodies or streams
- Ensure no snow banks or piles along roadside
- Damage to in the inlet or outlet of culverts which may impede flow capacity
- Ensure no snow cover or snow piles, which would prevent routing of water into or out of the culverts

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- Ensure no bed erosion upstream and downstream of watercourse crossing structures
- Ensure no scour under bridge abutments and abutment foundations
- Ensure no erosion along cutslopes and fillslopes of embankments

Observations:

- Not observed, prioritize for next inspection

Mitigation Measures:

Pictures No.:

Itivia

Specific Risks:

- Blockages of main culvert impeding flow
- Integrity of strawlogs, silt fences, and check dams installed to control TSS
- Any runoff from lease area towards Melvin Bay (sample as needed, install straw logs/silt fences)
- Integrity of all geotechnical structures, laydowns, etc.
- TSS transport from Itivia Quarry
- Ensure snow is stored in designated snow pad
- Damage to in the inlet or outlet of the culvert which may impede flow capacity
- Ensure no snow cover or snow piles, which would prevent routing of water into or out of the culvert
- Ensure no bed erosion upstream and downstream of Culvert
- Ensure no erosion along cutslopes and fillslopes of embankments

Observations:

- Not observed, prioritize for next inspection

Mitigation Measures:

Pictures No.:

Environmental Personnel:

Signature :

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Figure 1



Figure 2





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Figure 3



Figure 4



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Figure 5



Figure 6



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Figure 7



Figure 8



Freshet Inspection Report

Figure 9



Figure 10



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Figure 11



Figure 12



Freshet Inspection Report

Figure 13



Figure 14



Freshet Inspection Report

Figure 15



Figure 16



Freshet Inspection Report

Figure 17



Figure 18



Freshet Inspection Report

Figure 19



Figure 20

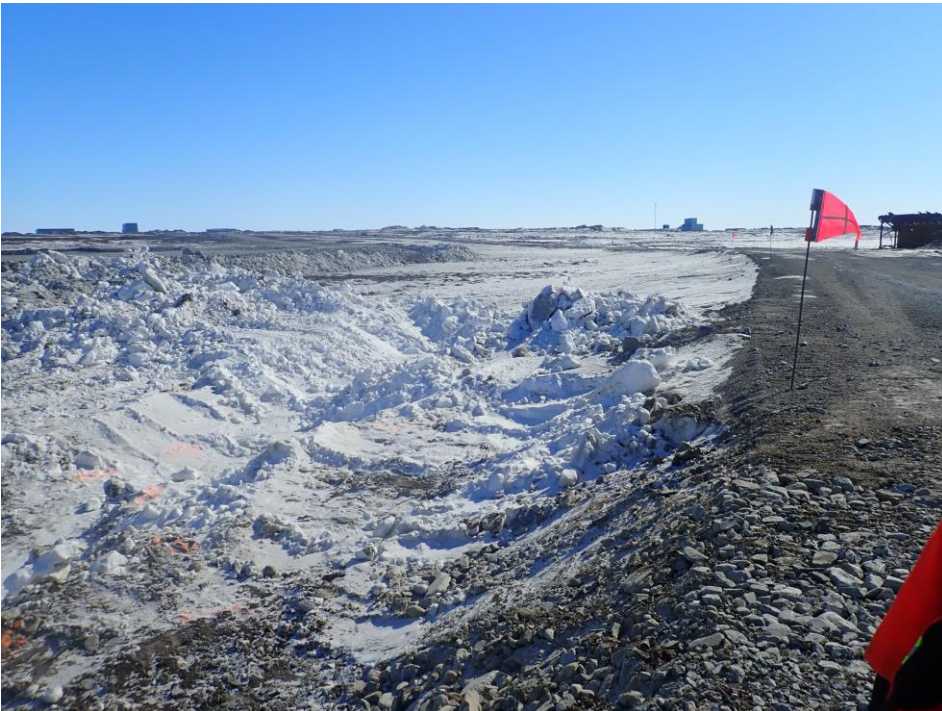


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Figure 21



Figure 22



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Figure 23

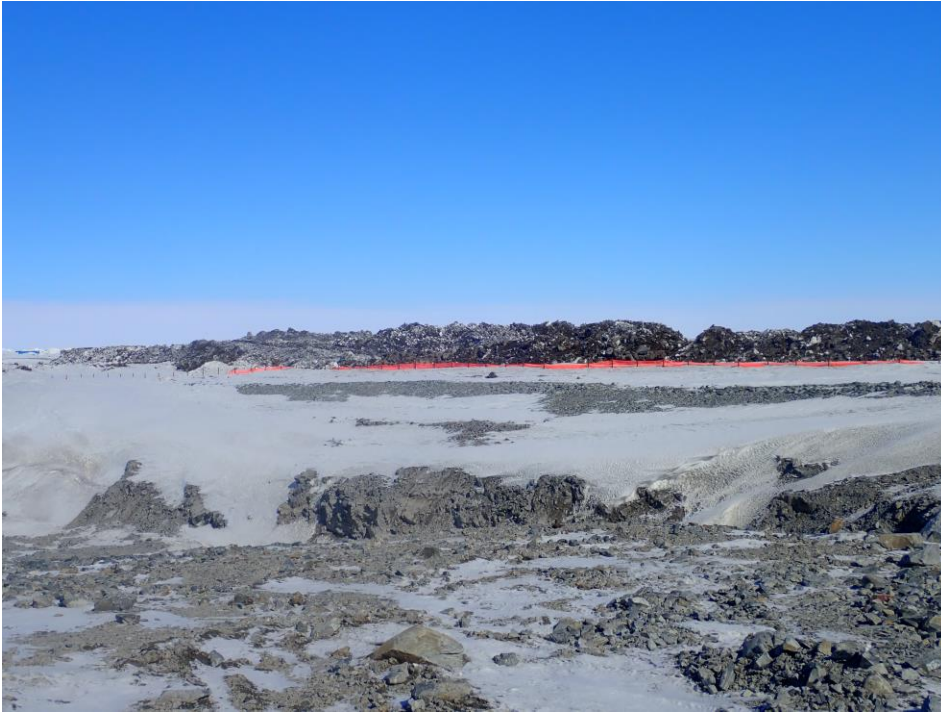
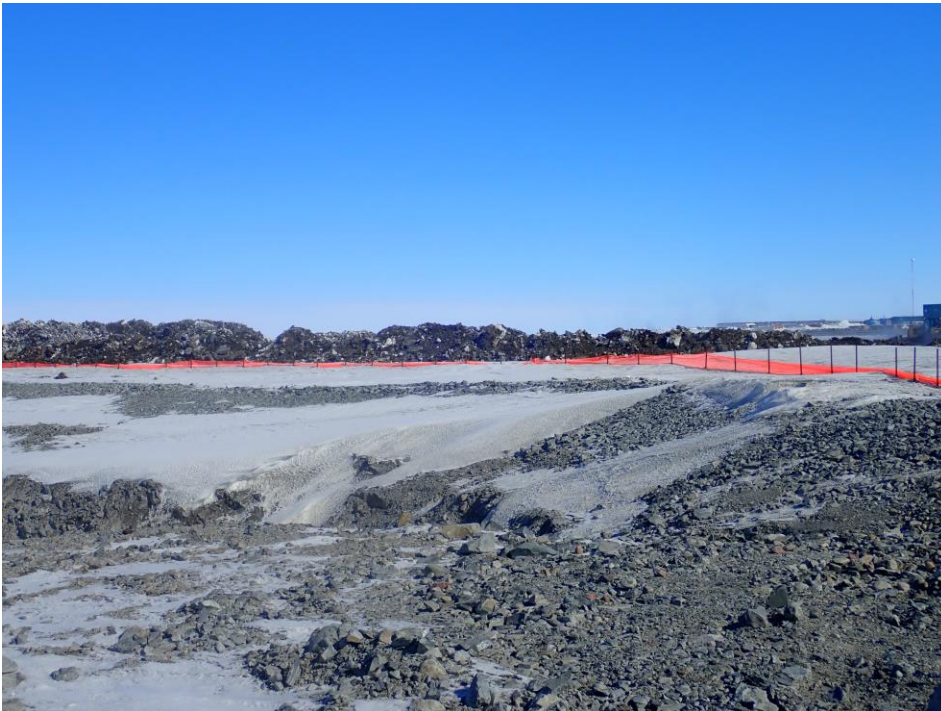


Figure 24



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Figure 25



Figure 26



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Figure 27



Figure 28



Freshet Inspection Report

Figure 29



Figure 30

