TAILINGS SYSTEM EMERGENCY PREPAREDNESS PLAN

1.0 INTRODUCTION

1.1 Objective

1.1.1 This document satisfies section 10.6.8 of the Health, Safety and Reclamation code (HSRC) and additional Fording River Operations requirements for emergency preparedness in relation to Tailings Management. This document is meant to be understood in conjunction with the SP&P GN.029A: Tailings System Operation, Maintenance and Surveillance manual (OMS). Reference is also made to the SP&P EP.001 "Emergency Response Procedure".

1.1.2 It is the intention of this SP&P to be compliant with the MAC and CDA guidelines to the extent applicable.

1.1.3 This EPP must be reviewed annually at the annual Tailings Committee Meeting, and revised if necessary. Any revisions must be submitted to a dam safety officer for acceptance.

1.1.4 This procedure will aid in the prevention of a dam breach and potential ground and water contamination as a result of tailings escape.

2.0 EMERGENCY PLANNING AND RESPONSE

2.1 Emergency Preparedness Plan (EPP)

2.1.1 Purpose

2.1.1.1 An EPP is required so that personnel involved in the operation of a tailings facility have a clear response procedure in the unlikely event of a dam breach, or similar major dam related incident.

2.1.2 Type of Incident That May Require the Implementation of SP&P EP.001 "Emergency Response Procedure" (Sections 3.0, 3.1.1, 3.1.1.6)

2.1.2.1 During a dam breach

2.1.2.2 If the dam is overtopping

2.1.2.3 Excessive or dirty seepage through the impoundment

2.1.2.4 If an uncontrolled discharge is occurring or is imminent

2.1.2.5 Major dam subsidence or cracking

2.1.2.6 Active erosion of the dam structure by the Fording River

2.1.3 Land Area That Would be Affected by a Dam Incident

2.1.3.1 Both the North Tailings Pond and the South Tailings Pond were constructed adjacent to the Fording River. In the event of a dam breach at either facility, the contents of the impoundment would likely flow down the Fording River valley in a southerly direction. In November 1976 an inundation study was conducted by Kerr Wood and Leidal (see Appendix A) which concluded by the time the breach flows travel 5 miles (8 km), coincident with the Chauncey Creek tributary, the velocity would be about 2 feet per second and the water level would rise in the ponded zones in the area by about 1.3 feet. A wave of that magnitude would not affect the wildlife or damage the existing vegetation at that point in the opinion of Kerr Wood Leidal. The analysis assumed that the width of the impact would be the floodplain width. By the time the wave reached this area 80-90 percent of the fine and coarse tailings would have settled out. Below this location, coal slimes and glacial till from the failure zone would stay in suspension and colour the water at least as far as the confluence with the Elk River about 40 km below the tailings ponds.

2.1.4 Personnel That Could be Affected by a Dam Incident

2.1.4.1 The closest downstream inhabitants are those living near the Elk River on acreages more than 40 km away, below the confluence of the Fording and Elk Rivers. These inhabitants are not exposed to risk from a tailings pond rupture.

2.1.4.2 No public highway bridges that cross the Fording River are in the area of risk.

2.1.4.3 Fisherman and other outdoor enthusiasts including hunters, trappers, etc. could be present in hazardous areas of the valley south of the property limit, (3-8 km below the ponds) however such presence is infrequent.

2.1.4.4 Mine facilities located downstream of the North Tailings Pond and the South Tailings Pond include the Bulk Explosives Plant, Nohels equipment yard, Environmental greenhouse facility and sewage treatment plant. With the exception of the explosives plant, these facilities are located out of harm's way above the 200 year flood plain and are occupied on an irregular basis. The explosives plant is manned 12 hours /day.

2.1.4.5 Other mine and non-mine personnel may be located downstream of the North and South Tailings ponds on an irregular, in frequent basis (mine personnel conducting surveillance of dams, rivers, and settling ponds). Public access to the Fording River floodplain is prohibited within approximately 3 km downstream of the South Tailing pond.

2.1.5 Environment that could be Affected By a Dam Incident

2.1.5.1 The area affected by a breach of either the North Tailings pond or the South Tailings pond would consist of the Fording River and its adjacent flood plain area, downstream and south of the minesite. This area is inhabited by elk, moose, deer and other wildlife species. The only fish species present in the Fording River for more than 20 km(above the falls) is Cutthroat trout.

2.1.6 Site Emergency Management Team Response to Dam Incident

2.1.6.1 Refer to Section 9.0 of SP&P EP.001"Emergency Response Procedure".

2.1.7 Specific Response Activities to Dam Incident (refer to Figure 1):

2.1.7.1 Evacuate personnel downstream of the tailings ponds to and including the Gun Range, south of the Chauncey Creek tributary. Evacuate dredge personnel if in use and MSI plant. Evacuate and blockade/guard all west accesses off the highway north of and including the shooting range extending up to the MSI entrance. Evacuate and lock gate on accesses from the Greenhills side of Fording River operations which lead to the NTP dyke or down into the valley bottom (like the Maxam connector road access and sediment pond accesses in vicinity of the Quarry). Place blockade on the river bank at the shooting range to prevent personnel on foot along the river from moving into an unsafe area

2.1.7.2 Take appropriate actions to stop, reduce or mitigate the breach, seep, flow or other discharge through over or around the dam. See Appendix A. Control access appropriately to area where mitigation work is required to ensure personnel trying to mitigate the problem are safe.

2.1.8 Notifications

2.1.8.1 Refer to onsite notification list of SP&P EP.001 "Emergency Response Procedure." – Appendix A - Site Emergency Response Team.

2.1.9 Refer to Off Site Resource Contact List of SP&P EP.001 "Emergency Response Procedure" – Appendix C

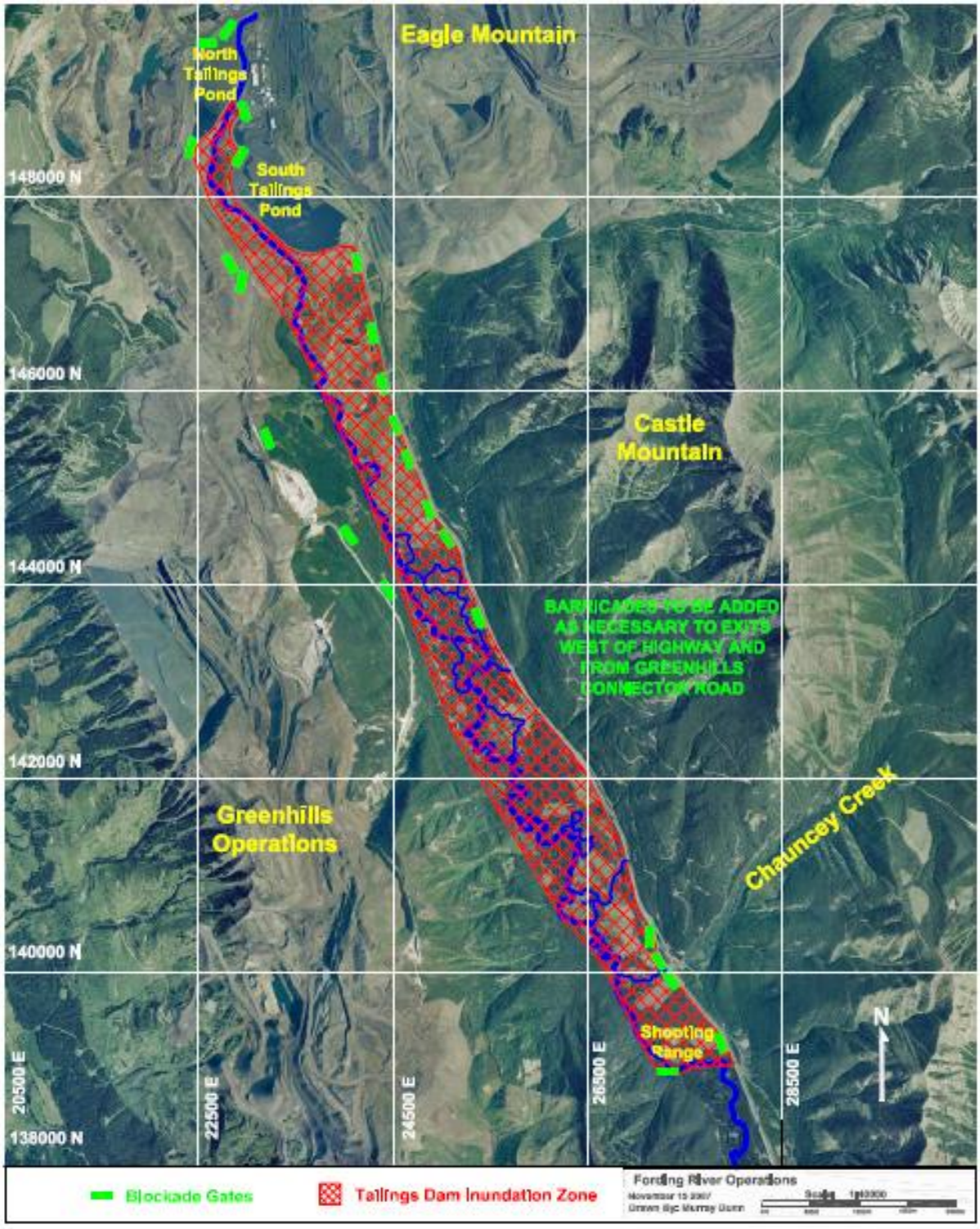

Figure 1: Tailings Dam Inundation Zone

2.2 Tailings Pipeline Emergency Repair Procedure (Rev 3)

(This is to supplement Section 9 of the Tailings OMS Manual)

Description of facilities:

A. Section of Pipe from Washplant to Drop Structure No 1 (Buried)

- 32" Driscopipe SDR 26 (installed in 1982 to replace original 30" steel pipe)

B. Section of Pipe from DS 1 to DS 3 (Buried)

- 28" Series 60 Sclairpipe except one section just upstream of DS 3 which was changed to 28" SDR 26 Sclairpipe during 2003 repairs. Balance of pipe was installed in 1977.

- 28" Series 60 Sclairpipe is 28.03" OD, 25.64" ID and 28" SDR 26 Sclairpipe is 28.00" OD, 25.717" ID (Catalogue dimensions).

C. Section of Pipe from DS 3 to the South Tails Pond (On Surface)

- 32" Sclairpipe Series 45 except one section just downstream of DS3 which was changed to 32" Sclairpipe SDR 26 during 2003 repairs. Balance of pipe was installed in 1977.

- 32" Series 45 Sclairpipe is 31.594" OD, 29.55" ID and 32" SDR 26 Sclairpipe (Imperial) is 32" OD and 29.4" ID (dimensions supplied by Perma Engineering)

Repair Components on Hand (as of October 14, 2010)

The following is located in the SW corner of the 'new' boneyard:

- One 2' long Robar repair clamp for repairing 32" pipe
- Four PSI custom restrain harnesses for repairing 28" pipe
- Two PSI custom restrain harnesses for repairing 32" pipe

The following is located on a dock west of the Carpenter shop:

- One 4' long Robar repair clamp for repairing 32" pipe

The following is located alongside the Fording River (behind the truck shop):

- Three used sections of 28" Series 60 HDPE pipe , approx lengths 4m, 6m and 7m long
- Three used sections of 32" HDPE pipe, various wall thicknesses, one length approx 11m long and the other two approx 15m long
- One new section of 32" SDR26 HDPE pipe, approx 15m long, c/w with a stub end and backing ring at one end

Robar couplings are considered temporary, emergency repairs only and are not to be used as permanent repairs. A permanent thermal fuse must be made in place of the coupling as soon as possible.

Emergency Repair Procedures

- A small hole, crack or pipe deformity may be temporarily repaired using either a 4' long or 6' long Robar band clamp

- Band clamps alone should not be relied on to join sections of pipe together because movement of the pipe (ie thermal expansion and contraction) will cause the pipe to pull out of the coupler resulting in a tailings leak

- In the event of a clean vertical pipe break (ie loss of a butt fuse), this may be temporarily repaired using one restraint harness assembly along with a band clamp (the band clamp seals the pipe and the restraint harness prevents the pipe from pulling out of the band clamp). Install a ring clamp on both ends of the pipe and join the two ring clamps together via (14) 1" diameter redi rods (remove from stores). Cut the redi rods to length to suit the ring clamp location, on either side of the band clamp (i.e. if a 48" band clamp is used to repair the pipe, set the harness rings on either side of the band clamp and use 60" rods to join the harness rings).

- In the event of a large pipe failure, remove the length of failed pipe and replace it with a replacement section of pipe. Install one repair harness assembly at each end of the repair pipe section (two harness assemblies consist of four clamping rings). Note – for maximum effectiveness the supplier recommends that the clamping ring ID exactly matches the OD of the pipe.

- The three harness assemblies currently on site were machined to fit the 32M Series 60 Sclairpipe originally supplied (the OD was measured at 31.42"). The 28" harness assemblies were machined to fit 28.00" OD pipe. As per above, install band clamps to seal the pipe and harness rings to straddle the band clamp. Cut the redi-rod to suit the length of the band clamp.

- Following repairs carried out on the original (32" Metric pipe) on March 28, 2008, Phil Rees recommends cutting ½" of the end of each harness half ring for Imperial (32" OD) pipe and cutting 1" of the end of each harness half ring for Metric (31.5" OD) pipe prior to installing the harness on the pipe.

S. K. Muller

Chief Project Engineer

First issued September 12, 2005

Rev 1 issued November 9, 2005

Rev 2 issued April 2, 2008

Rev 3 updated by Tathlina Lovlin & Alessandro Deviato November 15, 2010 to fill gaps in regulatory and MAC Guidelines.

3.0 EMERGENCY PLANNING AND RESPONSE

3.1 North Tailings Pond Failure

	Event	Event Consequence	Probability Of Occurrence	Mitigation Steps, Response, Additional Comment
1	Dam breach following an earthquake of sufficient magnitude to cause a mass movement of the dam structure	Could result in tailings discharge into the Fording River Valley, downstream, and to the south of the tailings impoundment.	Extremely remote "once in 5,000 – 10,000 years" according to the tailings dam geotechnical engineer based on the safety factors built into the design of the dam and due to the low earthquake rating of the area.	In the unlikely event of an earthquake resulting in a dam breach: - Implement emergency response plan
2	Dam breach caused by overtopping	Could result in tailings discharge into the Fording River Valley, downstream, and to the south of the tailings impoundment.	Low Probability -No known occurrences or close calls since the dam was constructed in 1971 - Other than precipitation, the only sources of water entry are: (i) via controlled pipeline flow and. (ii) via uncontrolled surface runoff from the watershed area to the west. The watershed area is relatively small as most surface runoff is intercepted and directed to mined out pits to the west of the North Tailings Pond	Prevent occurrence by close monitoring In the event overtopping occurs: - shut off/divert all flows into the North Tailings Pond - install pumps and pump water from the North Tailings Pond to the South Tailings Pond (providing there is room) - amour area with pit run In the event a breach occurs - Implement emergency response plan
3	Dam breach caused by River Erosion, following a flood	Could result in tailings discharge into the Fording River Valley, downstream, and to the south of the tailings impoundment.	Low Probability A 200 year flood event of the Fording River occurred in 1995. The high river flow eroded the dam, resulting in dam material loss. The dam, although compromised, remained structurally sound and no tailings escaped. Repairs were made to the dam and the entire toe was armored with rip rap to prevent recurrence.	Prevent erosion by protecting the dam section adjacent to the river with rip rap In the event erosion occurs, without a breach: - take steps to rebuild the dam structure using the method employed to repair the North Tailings pond dam, following erosion caused by the flood of 1995 In the event a breach occurs: - Implement emergency response plan

4	Dam breach caused by seepage through the dam structure	Could result in tailings discharge into the Fording River Valley, downstream, and to the south of the tailings impoundment.	Low Probability There has never been visual evidence of seepage exiting the downstream face of the North Tailings Pond dam structure.	To minimize the risk of seepage resulting in dam structural concerns: - monitor seepage on a regular basis - if required, install piezometers to permit monitoring of the water level within the dam - if seepage rate warrants, under the direction of the dam geotechnical engineer, install filter material and ballast the affected area on the outside face of the dam In the event a dam breach occurs: - Implement emergency response plan
5	Dam breach resulting from a pipeline failure	Could result in tailings discharge into the Fording River Valley, downstream, and to the south of the tailings impoundment	Low Probability. Pipelines associated with the North Tailings Pond include: (1) Tailings and reclaim pipelines – The existing tailings and reclaim pipelines have reached the end of their life and are non-compliant. These facilities will be upgraded to current standards prior to placing the North Tailings Pond back into active service. (2) Make up water pipelines. A single, active pipeline (Shandley pump) passes over high ground at the west side of the pond where a pipeline failure would not damage the impoundment dam.	Consequential dam failure, resulting from a burst pipe is prevented by: - regular monitoring - avoiding pipelines passing through a dam - double walling pipelines that pass over a dam In the event a pipeline fails, that does not result in a dam breach: - shut off the pipe flow immediately - do not resume pipe flow until the dam has been inspected, a damage assessment carried out and necessary repairs carried out to the dam and the pipeline In the event a dam breach occurs: - Implement emergency response plan

3.2 South Tailings Pond Failure

	Event	Event Consequence	Probability Of Occurrence	Mitigation Steps, Response, Additional Comment
1	Dam breach following an earthquake of sufficient magnitude to cause a mass movement of the dam structure	Could result in tailings discharge into the Fording River Valley, downstream, and to the south of the tailings impoundment.	Extremely remote "once in 5,000 – 10,000 years" according to the tailings dam geotechnical engineer based on the safety factors built into the design of the dam and due to the low earthquake rating of the area.	In the unlikely event of an earthquake resulting in a dam breach: - Implement emergency response plan
2	Dam breach caused by overtopping	Could result in tailings discharge into the Fording River Valley, downstream, and to the south of the tailings impoundment.	Low Probability -No known occurrences or close calls since the dam was constructed in 1979 - Other than precipitation, the only sources of water entry are: (i) via controlled pipeline flow and. (ii) via uncontrolled surface runoff through infiltration and culverts below the railway embankment on the north and east sides of the tailings pond. The combined flow averages around 500 usgpm and is expected to peak at around 15,000 usgpm during extreme conditions. At 15,000 usgpm, it would take approx. 7 days to raise the level in the tailings pond 1m assuming no withdrawals	Prevent occurrence by close monitoring In the event overtopping occurs: - shut off/divert all flows into the South Tailings Pond - install pumps and pump water from the South Tailings Pond to Kilmarnock Settling Pond (located just south of the South Tailings Pond) - armour area with pit run In the event a breach occurs - Implement emergency response plan
3	Dam breach caused by River Erosion, following a flood	Could result in tailings discharge into the Fording River Valley, downstream, and to the south of the tailings impoundment.	Very Low Probability (A 200 year flood event of the Fording River occurred in 1995. Although much damage occurred, both upstream and downstream of the South Tailings Pond, no appreciable erosion occurred on the dam section adjacent to the river)	Prevent erosion by protecting the dam section adjacent to the river with rip rap In the event erosion occurs, without a breach: - take steps to rebuild the dam structure using the method employed to repair the North Tailings pond dam, following erosion caused by the flood of 1995 In the event a breach occurs: - Implement emergency response plan

4	Dam breach caused by seepage through the dam structure	Could result in tailings discharge into the Fording River Valley, downstream, and to the south of the tailings impoundment.	Low Probability Seepage of clear water has been occurring through the dam in a controlled manner. According to the designer of the dam, there is very low probability of the seepage flow increasing to a rate which may result in loss of dam structure material.	To minimize the risk of seepage resulting in dam structural concerns: - monitor seepage on a regular basis - if required, install piezometers to permit monitoring of the water level within the dam - if seepage rate warrants, under the direction of the dam geotechnical engineer, install filter material and ballast the affected area on the outside face of the dam In the event a dam breach occurs: - Implement emergency response plan
5	Dam breach resulting from a pipeline failure	Could result in tailings discharge into the Fording River Valley, downstream, and to the south of the tailings impoundment	Low to Medium Probability. Pipelines associated with the South Tailings Pond include: 1) seepage return pipeline – runs up and over the SE abutment. Pipeline failure unlikely to compromise the structural integrity of the dam 2) tailings and reclaim pipelines – do not pass over dam or the abutments. Pipeline failure would not compromise the dam integrity. (In addition, the tailings pipe is protected such that a tailings leak resulting from pipeline failure would be contained) (3) Make up water pipelines. There are two pipelines which pass over the dam. One is inactive (River pump) and the other, active pipeline (Smith pumps) is double walled to prevent a pipe burst from eroding the dam. The inactive pipeline will not be used until similarly protected. A third, active pipeline (Shandley pump) passes over high ground at the north end of the pond where a pipeline failure would not damage the impoundment dam. (4) Dredge discharge pipeline is double walled where it passes over the dam and river. A pipe burst would be contained thus preventing dam erosion as well as a discharge to the river. Instrumentation alerts the dredge operator to shut down in the event of a pipe leak.	Consequential dam failure, resulting from a burst pipe is prevented by: - regular monitoring - avoiding pipelines passing through a dam - double walling pipelines that pass over a dam In the event a pipeline fails, that does not result in a dam breach: - shut off the pipe flow immediately - do not resume pipe flow until the dam has been inspected, a damage assessment carried out and necessary repairs carried out to the dam and the pipeline In the event a dam breach occurs: - Implement emergency response plan

3.3 Dredge

	Event	Event Consequence	Probability of Occurrence	Mitigation , Response, Comment
1	Burst Tails line releasing tails to environment	Tails release into Fording River or onto land	Very Low(would have to fill the containment sumps before impacting environment)	Dredge shut down Notify authorities
2	Burst water return line at Vicinity of dyke	Erode dyke resulting in breach if occurs for long enough	Low	Shut off appropriate pump, may require stopping dredge to maintain zero overflow tolerance from Smith pond while dredging. If breach, institute EPP
3	Uncontained Dirty Seepage in Smith Pond area or anywhere on west side of Fording River	Tailings release into environment and possibly Fording River	Low(system is designed to contain any dirty seepage)	Shut down dredge Contain release , prevent further discharge into River by trenching and digging sumps Ensure all Smith pond pumps running if sumps overflowing. Notify Senior Environmental Officer, Environmental services
4	Contained Dirty seepage in Smith pond area	None	Moderate to high	Dredge Shut down Notify Processing Superintendent, Senior Environmental Officer – Environmental services
5	Dredge cutting hole in till zone of impoundment	Breach by overtopping or piping	insignificant	Follow response to piping or over topping of STP – see STP Risk Assessment

3.4 Awareness of High Pressure Gas Line / Till Liner

	Event	Event Consequence	Probability of Occurrence	Mitigation , Response, Comment
1	Gas Line Hit	Major release of flammable substance	Low	Shut off supply to site Notify authorities
2	Till layer disrupted by construction	Breach by overtopping	Low	Stop work, replace till and inspect are by qualified person

APPENDICES

Appendix A – KWL Inundation Report, 1976

REPORTS
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APPENDIX G
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FORDING COAL LIMITED

SOUTH TAILING POND

Report for

The Department of Mines
and Petroleum Resources

NOV 76

KERR WOOD LEIDAL ASSOCIATES LTD.
Consulting Engineers

SECTION D

Characteristics of Downstream Area which May be Affected by a Tailing Dam Failure

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Characteristics of Downstream Area Which May be Affected by a Tailing Dam Failure

From discussions with Golder Brawner and Associates Ltd., we understand that from their experience in reviewing earth dam failures around the world that most failures involve only a small area of the structure. For example, the Teton Dam failure (water reservoir) which occurred last summer in the United States involved only a relatively small section of the crest of the dam.

Therefore, for the purposes of this report we have assumed that an instantaneous failure occurs which involves a 50-foot wide opening of the dam crest for the full depth of the liquid in the Tailing Pond. We have assumed the Tailing Pond is nearing full storage capacity and the water depth at the south end of the pond is approximately 15' deep with 2 to 3 feet of the liquid being slimes in suspension. (See Figure B).

This would result in an instantaneous maximum flow of approximately 10,000 cfs. The velocities through the failure section would be approximately 12 feet per second which would result in further widening of the opening. Combined with the dropping head and further erosion of the failure section we estimate it would take approximately half an hour to discharge the water and the semi-liquid material within the Pond. After

the loss of the free liquid the majority of the tailings would remain within the pond. However, a small flow of liquid would continue to be discharged until the water level within the Tailings reached the invert elevation of the failure section.

This latter quantity of water would drain over a long period of time and could be retained in an emergency dug-out or pond prior to entering the river.

Briefly described below is the river valley for the first five miles below the South Tailing Pond.

(1) For the first 2 - 2½ miles below the proposed Tailing Dam the area has been cleared of all trees and vegetation. The overall valley bottom varies in width from 1500 to 2000 feet with a defined flood plain of 600 to 1000 feet. (See photograph at the end of this section.)

(2) Between 2½ and 5 miles below the tailings dam the river valley widens into a natural area of swamp, oxbow meanders, grasses and clusters of first growth trees. The area is typical of the feeding areas frequented by wildlife such as moose and elk. The river valley at this point varies in width between 2000 and 3000 feet with the defined flood plain exceeding 2000 feet in the ponded areas.

It should be noted that the river gradient varies between 0.70 and 0.80 percent for the first five mile section below the Tailing Pond.

From the Water Survey of Canada records in 1974 the Fording River at its confluence with the Elk River was 5400 cfs (approximately a 30 year flood occurrence). For the same year the maximum flows as measured 1½ miles above the mine site was 1200 cfs.

In comparison, we are predicting a flood wave of 10,000 cfs if the tailing dam should ever fail.

For a flood plain width of 1600 feet and a flow of 10,000 cfs the velocity would be 3.3 feet per second with an average water depth of 2 feet. By the time the water reached the pond area between 2½ and 5 miles downstream the velocity would be about 2 feet per second and the water level would rise in the ponded areas by approximately 1.30 feet. We doubt a wave of this magnitude would affect the wildlife or damage the existing vegetation.

From our work in the north Tailing Pond, and particularly the study of settling velocities in the existing Tails Line, we predict that about 80 to 90 percent of the fine to coarse tailings which may wash out during the failure would settle out before reaching the wildlife rearing area. However the coal slimes and 20 to 30 percent of the glacial till material from the failure zone would stay in suspension and colour the water at least as far as the confluence of the Fording and Elk Rivers (near Sparwood a distance of about 30 miles).