EMERGENCY PREPAREDNESS and RESPONSE PLAN (EPRP)

HB MINE TAILINGS STORAGE FACILITY
SALMO, BRITISH COLUMBIA

Prepared by:
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HB Dam Tailings Facility - Document Control

Emergency Preparedness and Response Plan

File No. 6300-HBD-30

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2014-11-28	V1	EPRP prepared (downstream contact TBD)	Email		

Contents

LIST OF FIGURES (Following Text)

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1.0 INTRODUCTION

This Emergency Preparedness and Response Plan (EPRP) pertains to the HB Mine Tailings Storage Facility (Facility). An EPRP has been prepared to define the potential for accidents, to describe the actions required in the event of an emergency, and to prevent/mitigate environmental and safety impacts associated with emergency situations.

This EPRP has been prepared with reference to the following documents:

- Mine Reclamation Permit No. M-218
- Dam Safety Guidelines, Inspection and Maintenance of Dams (BC DSG). British Columbia Ministry of Environment (MOE) (formerly Ministry of Environment, Lands and Parks) Water Management Branch, March 2011
- Dam Safety Guidelines (DSG). Canadian Dam Association (CDA), 2007
- Mine Emergency Response Plan, Guidelines for the Mining Industry, Ministry of Energy and Mines and Natural Gas (MEM), February 2013, V1.3

The level of detail within the EPRP is reflective of the classification of the Facility as a Very High Consequence classification rating based on CDA definitions and degree of potential impact, as determined in the 2014 Dam Safety Review (DSR) of the facility.

1.1 DOCUMENT ORGANIZATION

This report is organized into the following sections:

Section 1.0 Introduction
Section 2.0 Facility Information
Section 3.0 Emergency Identification & Evaluation
Section 4.0 Emergency Response
Section 5.0 Emergency Follow-up Procedure
Section 6.0 EPRP Management

2.0 FACILITY INFORMATION

2.1 ACCESS TO FACILITY

The Facility is located approximately 6 kilometres (km) south of the village of Salmo, British Columbia (BC) at an approximately latitude of 49°08' N and longitude of 117°15' W. Directions to the Facility from Salmo are provided in Figure 2.1.

Access to the Facility is off Emerald Mine Road, via unnamed gravel roads through the Central Landfill property as presented in Figure 2.2. The dam is accessed via the gravel road along the outside refuse of limits in a southern direction. The impoundment area is accessed via the gravel road verging to the west along the northern refuse limits of the landfill. The dam access roads are best suited to 4x4 vehicles.

2.2 FACILITY DESCRIPTION

The Facility is owned by the RDCK and regulated under Mine Reclamation Permit M-218. The Facility was decommissioned to current day standards during the summer of 2005. The Facility is located at the southern end of a small valley and consists of a tailings deposition area, reservoir, dam, and spillway.

The tailings pond is located to the north of the dam with a plan area of approximately six hectares (ha). At the time of fieldwork conducted in the fall of 2000 by BGC, the lowest point in the pond was approximately 5.5 metres (m) lower than the dam crest and the water level was approximately 4.4 m deep. After a slough in July 2012 on the downstream slope, the spillway sill elevation was permanently lowered to reduce hydraulic pressure behind the dam.

Approximately 200,000 cubic metres (m^3) of water storage is available within the pond up to the dam crest elevation. The total catchment area draining to the pond is approximately 207 ha.

The existing dam is approximately 25 m high and 240 m. The existing crest width of the earth dam is approximately 6 to 7 m and the crest elevation is 713.0 m Above Mean Sea Level (AMSL). Rip rap has been constructed along the upstream slope to provide long-term erosion protection. A toe berm was constructed as part of the decommissioning works in 2005 to satisfy dam stability requirements.

A permanent open channel spillway was constructed adjacent to the right abutment of the dam to ensure long-term protection of the dam against over-topping. The spillway was originally designed for a 1000-year return period with an outflow capacity of 3.19 cubic metres per second (m^3/s). Outflow capacity was based on a spillway width of 3 m and invert elevation 1.7 m below the existing crest elevation. The outlet channel was designed to terminate in a riprap-lined stilling pool prior to discharge into the downstream outlet ditch.

The DSR completed in 2014 determined the facility should be upgraded to a Very High consequence classification rating, as per the 2007 Canadian Dam Safety Guidelines, based on economic losses. As such the spillway design flow was increased to accommodate 2/3rd of the way between the 1000-year flood and the Probable Maximum Flood, resulting in a required outflow capacity of 16.6 m^3/s. This was reached by the lowering of the spillway sill elevation in 2012 to 709.39 m AMSL.

2.3 DOWNSTREAM RECEPTORS

Provincial Highway 3 is located south of the Facility. Across Highway 3, the land is privately owned. Reservoir water discharged into the outlet ditch flows under Highway 3 via a culvert into a man-made ditch and drains into the Salmo River, located approximately 1 km west of the Site.

Services such as telecommunications, electricity, and natural are located along the Highway 3 corridor.

3.0 EMERGENCY IDENTIFICATION & EVALUATION

The Facility has been designed to meet current standards and has been designated a Very High consequence classification rating, as per the 2007 Canadian Dam Safety Guidelines, based on potential economic losses. Emergency situations can develop from a structural failure or failure due to environmental impact (such as extreme weather events or seismic activity). Early detection and evaluation of an emergency situation is important to ensure the appropriate course of action is taken based on the level of urgency.

3.1 POTENTIAL FAILURE MECHANISMS

Examples that can lead to potential emergency situations at the Facility include:

- Overtopping;
- Post seismic upstream and downstream slope instability;
- Internal erosion through the embankment; and
- Slope instability.

A significant failure is considered a breach in the dam leading to release of water and tailings from the reservoir. The occurrence of failure may or may not be associated with an extreme event. Continual surveillance of the Facility and routine maintenance are preventative measures that can mitigate the occurrence of failures. The RDCK conducts routine inspection and instrumentation measurements at a frequency that reflects seasonal conditions. See the Facility's Operation, Maintenance and Surveillance (OMS) Manual for a detailed description of on-going monitoring and maintenance. In addition to routine inspections, the Facility shall be inspected for any damage after an extreme event.

If poor performance is noted, the engineer shall be immediately contacted to discuss the severity of the condition and determine the appropriate measures which should be taken. The emergency response protocol detailed in Section 4.0 shall be followed if an emergency situation is identified.

3.2 INUNDATION MAPS

The critical mode of failure for earthfill embankments that retain water is considered a breach in the dam leading to release of water and tailings from the reservoir. The 2014 DSR reports the volume of water in the reservoir is 200,000 m^3 and the volume of tailings is 514,000 m^3. Detailed inundation maps completed as part of the 2014 DSR are included as Figures 3.2 A and 3.2B, which present the Final Mud/Tailings Deposition Depth (m) and the Time (hrs) for 0.6 m Depth, respectively.

3.3 EMERGENCY MONITORING PACKAGE

An emergency monitoring package shall be readily available in order to evaluate potential environmental concerns associated with discharge from the reservoir arising from abnormal conditions. The package is situated at the Central Landfill scale house. The emergency monitoring package shall include the following:

- Clip board
- Tape measure
- Camera/video
- Pencils
- Flashlight
- Field book
- Water level tape
- Water sampling specifications consistent with the most recent Environmental Monitoring Program (EMP) established in the Operation, Monitoring and Surveillance (OMS) manual for the Facility
- Water and Sediment sampling containers

The RDCK has qualified staff that is able conduct emergency monitoring at the site. In addition, the RDCK has an on-going contract for environmental monitoring with a technician who is familiar with the Facility and regularly performs environmental monitoring at the site. The contractor maintains an inventory of sampling containers.

4.0 EMERGENCY RESPONSE

An emergency response must be activated if the performance of the Facility is deemed abnormal and the situation can lead to environmental or safety impacts both on-site and/or off-site.

4.1 EMERGENCY RESPONSE PROTOCOL

An emergency response protocol is presented in Figure 4.1 outlining the procedure necessary for timely notification of personnel responsible for taking action. Lines of communication and potential actions are specified. Specific names, positions, and telephone numbers are further defined in the EPRP Contact List (see Appendix A). Other potentially affected external stakeholders, relevant off-site contacts, and regulatory contacts are also listed in Appendix A.

The initial observer of a potential incident must assess the severity and initiate the appropriate protocol. An incident could range from a suspected concern to a full scale emergency, which would take one of two routes:

- Incident for further assessment, or
- Emergency (or potential) situation

If significant failure has begun or is on the verge of developing, the priority is to safely evacuate the Facility and all areas downstream of the facility, and notify all stakeholders. Emergency corrective measures may be undertaken by site personnel to mitigate the problem with input from an engineer provided that the safety of the workers is not compromised.

4.1.1 Incident for Further Assessment

As noted in the emergency response protocol presented in Figure 4.1, if an incident requires further assessment the initial observer must contact the designated RDCK incident commander (IC) who, depending on severity, shall immediately attend the site. If required, the RDCK IC shall contact the Engineering Consultant for the Facility, other professional(s), and/or contractors to conduct further assessment or corrective action. The RDCK IC or, if designated, the initial observer, shall contact Emergency Management BC (EMBC) to provide them advance notice that a situation is being investigated which may require assistance. Follow-up actions will depend on the situation.

4.1.2 Emergency (or potential) Situation

If a situation is observed that appears to have potential to become an emergency, the initial observer must contact the RDCK IC who will assess the situation and determine the next steps. Depending of the situation this would involve contacting EMBC to provide advance notice or immediate response. Further assessment must be completed immediately by the RDCK IC, Engineering Consultant, other professional(s), and/or contractors and corrective action taken. Follow-up actions will depend on the situation.

If an emergency situation exists, or is imminent, the initial observer must immediately contact EMBC, followed by the RDCK IC. EMBC will initiate the emergency response by contacting the Provincial Ministries required for the response. EMBC will notify the RDCK Emergency Operation Centre (EOC) director, who in turn will activate an EOC to assist the RDCK IC with site support. The RDCK IC must attend the site as soon as possible. Once on-site the IC shall develop an incident action plan to determine resources required for corrective action and pass such on to the EOC.

In either situation, the initial observer must remain on-site, in a safe location, until such time as the designated RDCK IC attends the site and assumes the role of IC or otherwise deems the situation to be non-emergency.

4.2 EMERGENCY REPAIR ACTIONS

Emergency repair actions for observations of potential concern are summarized in Table 4.2. Emergency repair actions shall only be undertaken if the situation has been discussed with the engineer responsible for safety surveillance and the safety of the workers is not compromised.

Immediate lowering of the water level in the reservoir shall be attempted in most emergency situations that could potentially result in dam failure. A high capacity pump is permanently located at the site on the east abutment. The pump may be used to discharge reservoir water via discharge hoses into the surface water drainage along the east abutment. The discharge point should be the rip rap area located immediately north of the measurement weir. This drainage pathway is routed to the stilling basin located at the end of the spillway.

4.3 SOURCES OF EQUIPMENT AND MATERIALS

Resources are available both on-site and off-site to deal with emergency situations. Limited machinery (loader, dump truck, excavator and pumps) may be available from the Central Landfill located immediately to the northeast of the Facility. A high capacity pump is located on-site but a rental may be required depending on the pumping rate required to address the urgency of the emergency situation. There are no personnel working full- time on-site; therefore

external help may be required. Other potential sources of equipment suppliers and contractors are listed in Table 4.3.

Materials available for emergency repairs shall be chosen based on material strength and low permeability characteristics. Materials to be used for emergency repairs are listed in Table 4.3. A quarry is located on the west side of the spillway and rip-rap may be sourced there. Potential sources of material located within the landfill property include a gravel quarry located to the northeast and low permeability soils (silts/clay) located south of the limits of refuse. Sand bags may also be acquired from the Salmo Public Works yard.

5.0 EMERGENCY FOLLOW-UP PROCEDURE

Following an emergency event, necessary repairs will need to be completed to ensure safe conditions are restored at the Facility. A monitoring program may need to be conducted to evaluate the extent of environmental impact caused by the emergency situation. The appropriate requirements shall be determined with a detailed review of the design, operation, maintenance, and surveillance of the Facility.

The emergency event shall be documented including details pertaining to the activation of the emergency response, emergency decision making used, lessons learned, and follow-up activities undertaken as remedial measures or to investigate potential impacts. The EPRP and OMS for the Facility shall be revised accordingly to avoid similar emergency situations if possible and incorporate areas of improvement for future emergencies.

6.0 EPRP MANAGEMENT

6.1 DOCUMENT CONTROL AND UPDATE

EPRP details and procedures and requirements shall be reviewed annually and updated as required for continual improvement and to ensure available information is correct (i.e. assigned responsibilities, telephone numbers, materials, equipment, etc.).

Revisions shall be clearly documented on the Document Control page preceding the Table of Contents of this report. Once revisions have been made, the updated version or affected pages will be distributed to all involved parties identified in the Distribution List presented on the Document Control page. All material changes will be communicated in a timely fashion. Out-of-date materials shall be removed from active files and archived accordingly.

6.2 TRAINING

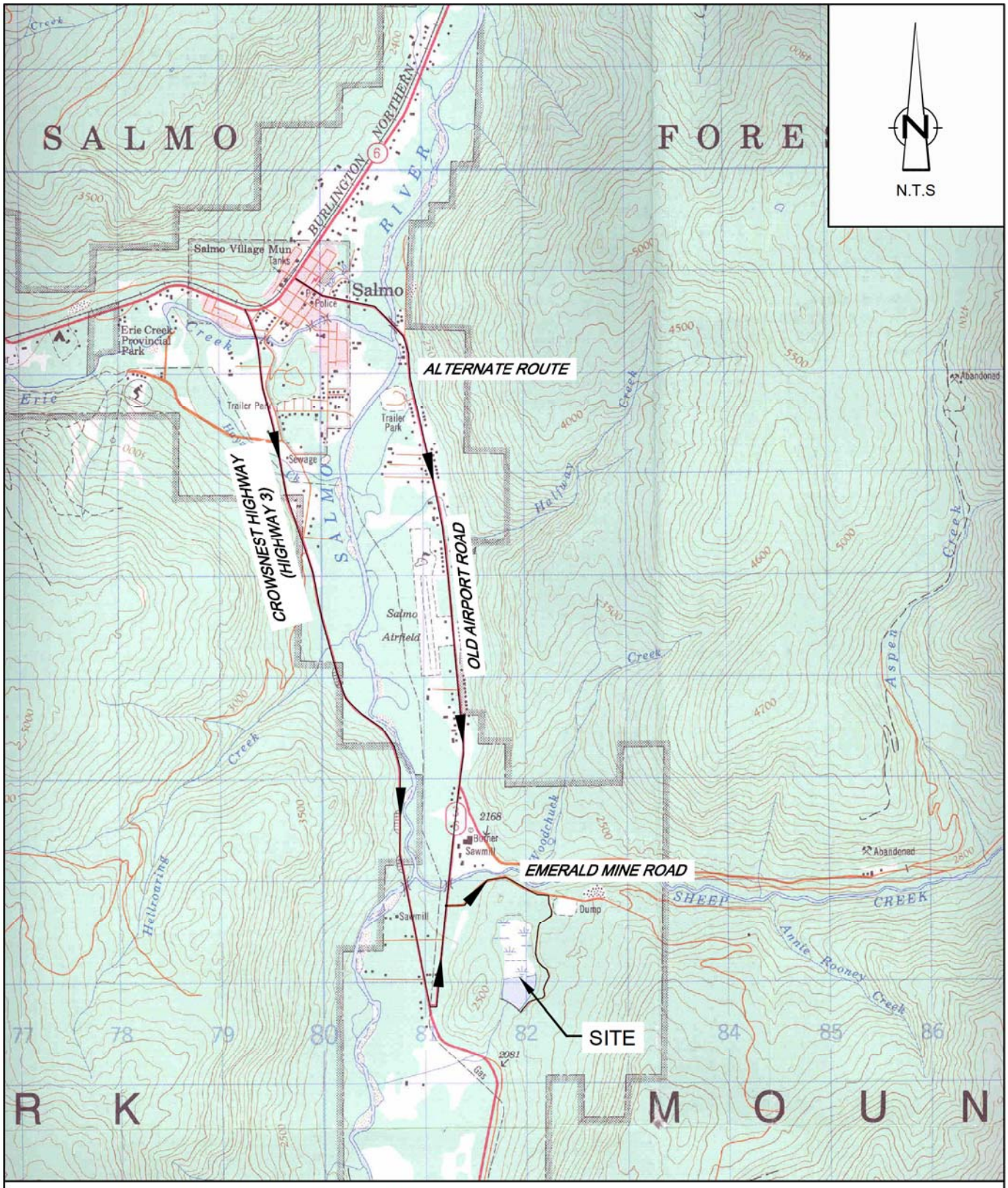
RDCK personnel shall have an appropriate understanding of the EPRP and their respective roles and responsibilities. All site personnel shall be aware of the visual signs that are indicative of the Facility's structural integrity and safety.

Training of personnel responsible for Facility inspections includes a site walk-thru identifying areas for observation and instruction for instrumentation measurement. Instruction shall be provided by experienced staff and/or the Engineering Consultant. Site inspection forms have been designed for multiple levels of inspection and guide personnel through the requirements of each type of inspection and steps for notification if abnormal conditions exist.

6.3 PROGRAM VALIDATION

Orientation meetings with those who have responsibilities under the plan or potentially affected external stakeholders shall be held periodically to review roles, responsibilities, and procedures of those involved, as well as address any concerns regarding coordination of the emergency response.

FIGURES



SOURCE: ENERGY, MINES AND RESOURCES CANADA
TOPOGRAPHIC MAP - SALMO 82 F/3, EDITION 5

figure 2.1

SITE LOCATION MAP
EMERGENCY PREPARDNESS PLAN
HB MINES TAILINGS STORAGE FACILITY
Regional District of Central Kootenay

17275-11(025)GN-VA001 JAN 30/2008

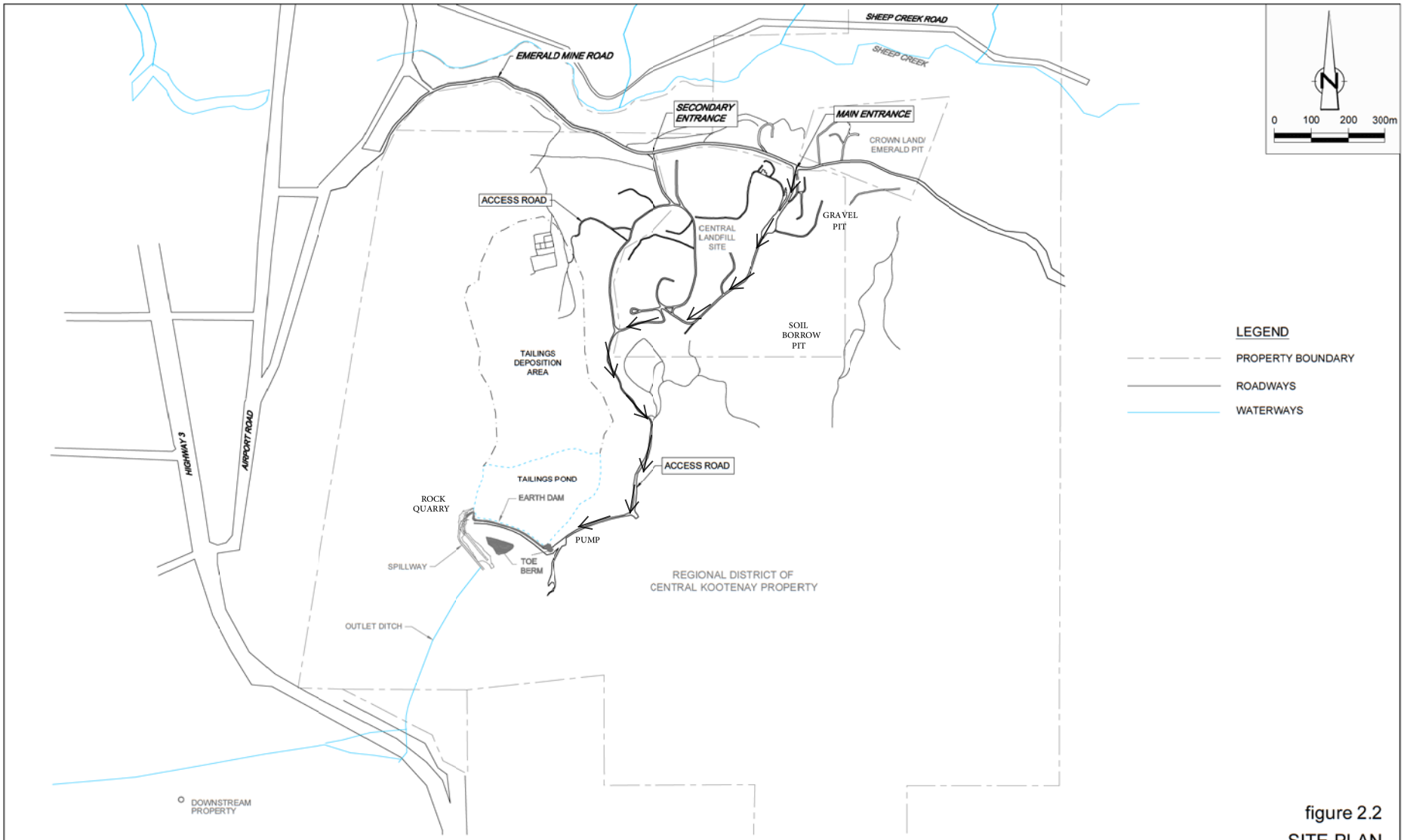
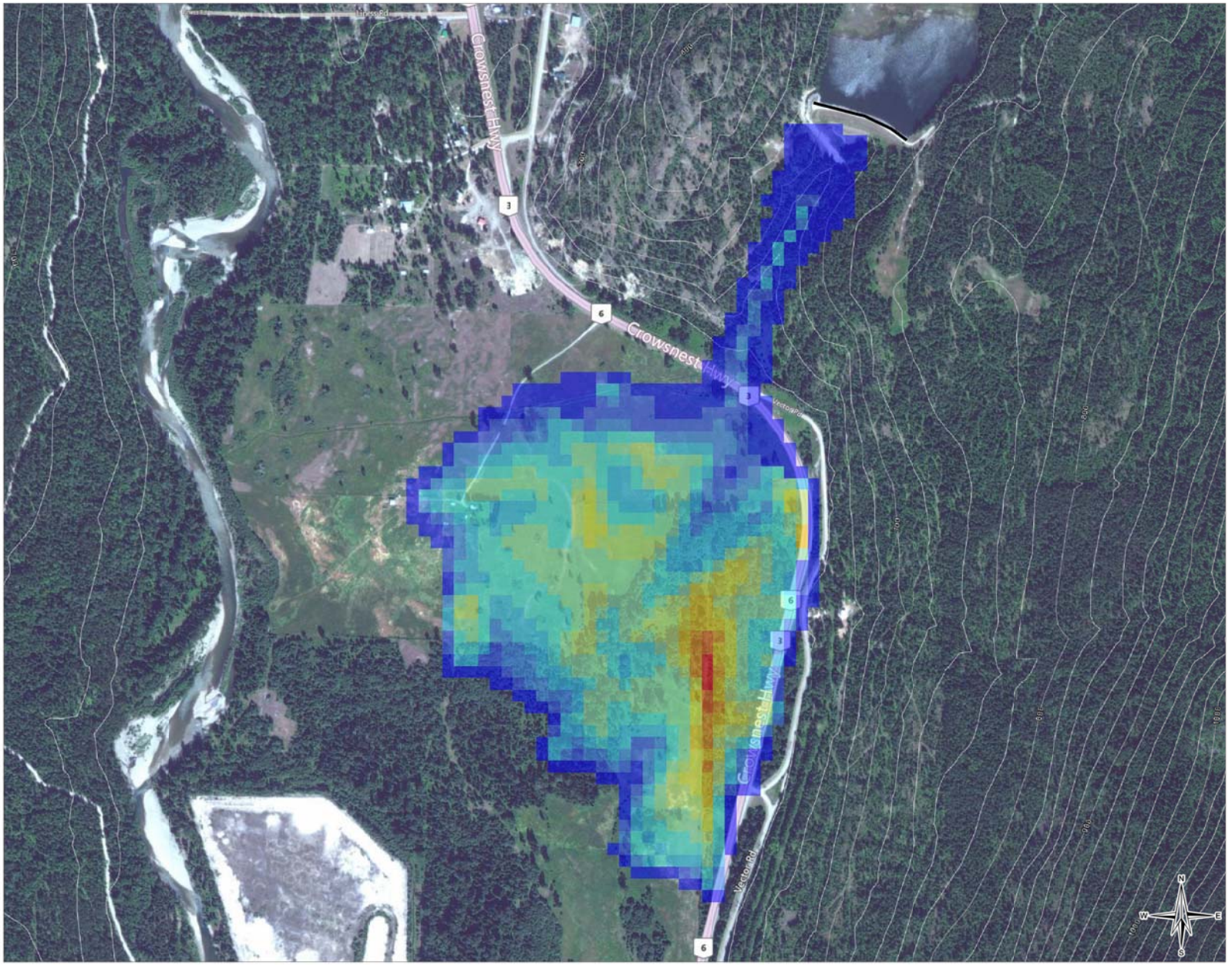


figure 2.2

SITE PLAN
EMERGENCY PREPARDNESS PLAN
HB MINES TAILINGS STORAGE FACILITY
Regional District of Central Kootenay

SOURCE: JUNE 22, 2007 AEROGEOMETRICS SURVEY
PLAN NO. NEP 77677
2005 CADASTRAL MAP

17275-11(025)GN-VA002 JAN 30/2008



LEGEND

Final Mud/Tailings Deposition Depth (m)

- 0.010 - 0.50
- 0.501 - 1.00
- 1.001 - 1.50
- 1.501 - 2.00
- 2.001 - 2.50
- 2.501 - 3.00
- 3.001 - 3.50
- 3.501 - 4.00
- 4.001 - 4.50
- 4.501 - 5.00
- 5.001 - 5.50
- 5.501 - 5.62

Total Impacted Area = 0.73 km^2

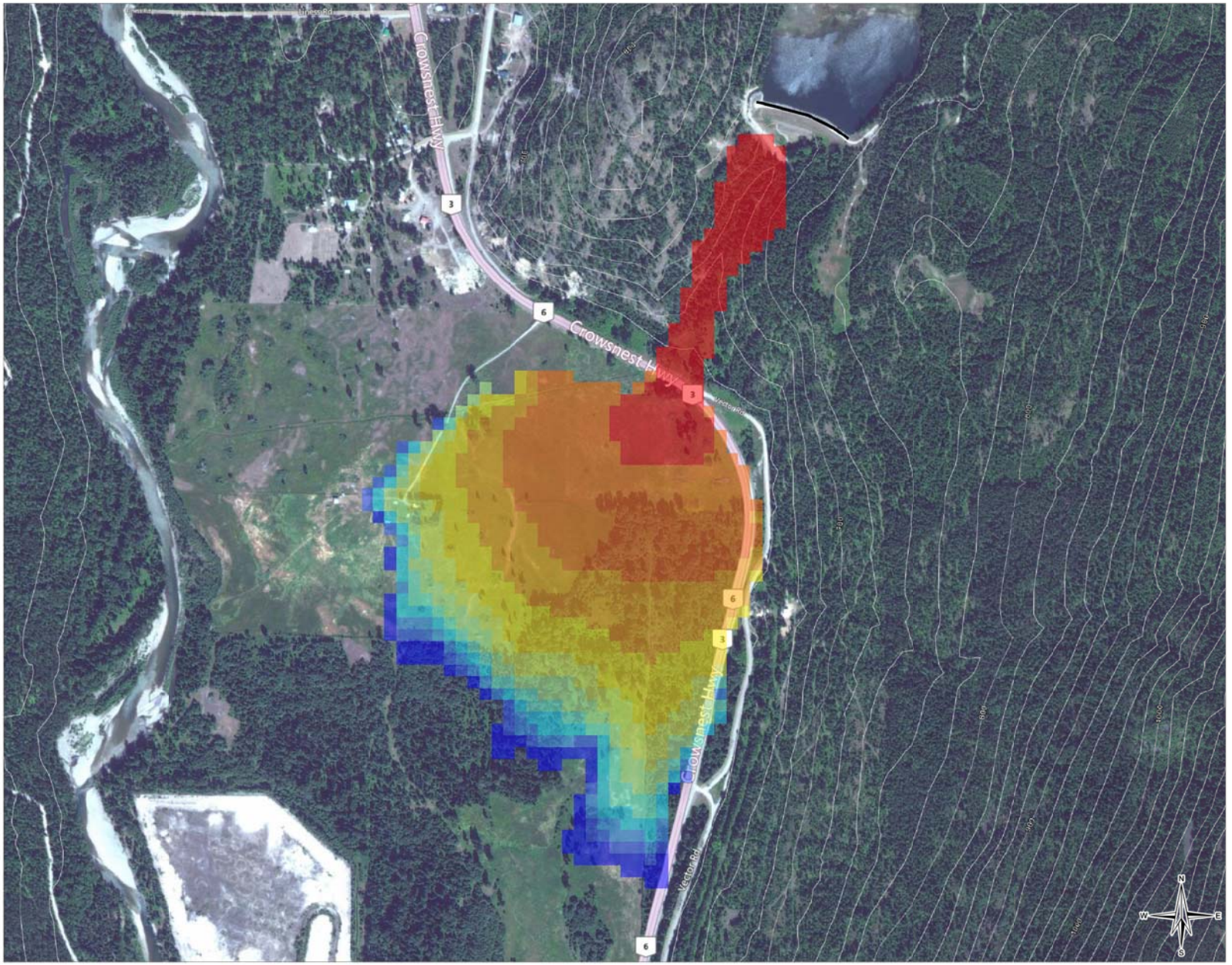
NOTES
Base data source:
Base imagery (date unknown) from Bing provided by ESRI.
Contours (20 m interval) are used throug the GeoBC web map service.

STATUS
ISSUED FOR USE

HB DAM - 2013 DAM SAFETY REVIEW

Final Mud/Tailings Deposition Depth (m)

PROJECTION: UTM Zone 11N			DATUM: NAD83		CLIENT: Central Kootenay Regional District
Scale: 1:8,000 — 100 50 0 100 200 Meters					TETRA TECH EBA
FILE NO.: Figure 5.0e - Final MudTailings Deposition Depth.mxd					
PROJECT NO.: K13103109-01	DWN: SB	CKD: SP	APVD: MJL	REV: 0	Figure 3.2A
OFFICE: TtEBA-KELOWNA	DATE: January 28, 2014				



LEGEND

Time (hrs) for 0.6 m (2 ft) Depth

- 0.030 - 0.250
- 0.251 - 0.500
- 0.501 - 1.000
- 1.001 - 2.000
- 2.001 - 3.000
- 3.001 - 4.000
- 4.001 - 5.000
- 5.001 - 6.000
- 6.001 - 7.000
- 7.001 - 8.000
- > 8.00

NOTES
Base data source:
Base imagery (date unknown) from Bing provided by ESRI.
Contours (20 m interval) are used throug the GeoBC web map service.

STATUS
ISSUED FOR USE

HB DAM - 2013 DAM SAFETY REVIEW

Time (hrs) for 0.6 m (2 ft) Depth

PROJECTION	DATUM	CLIENT
UTM Zone 11N	NAD83	Central Kootenay Regional District

Scale: 1:8,000

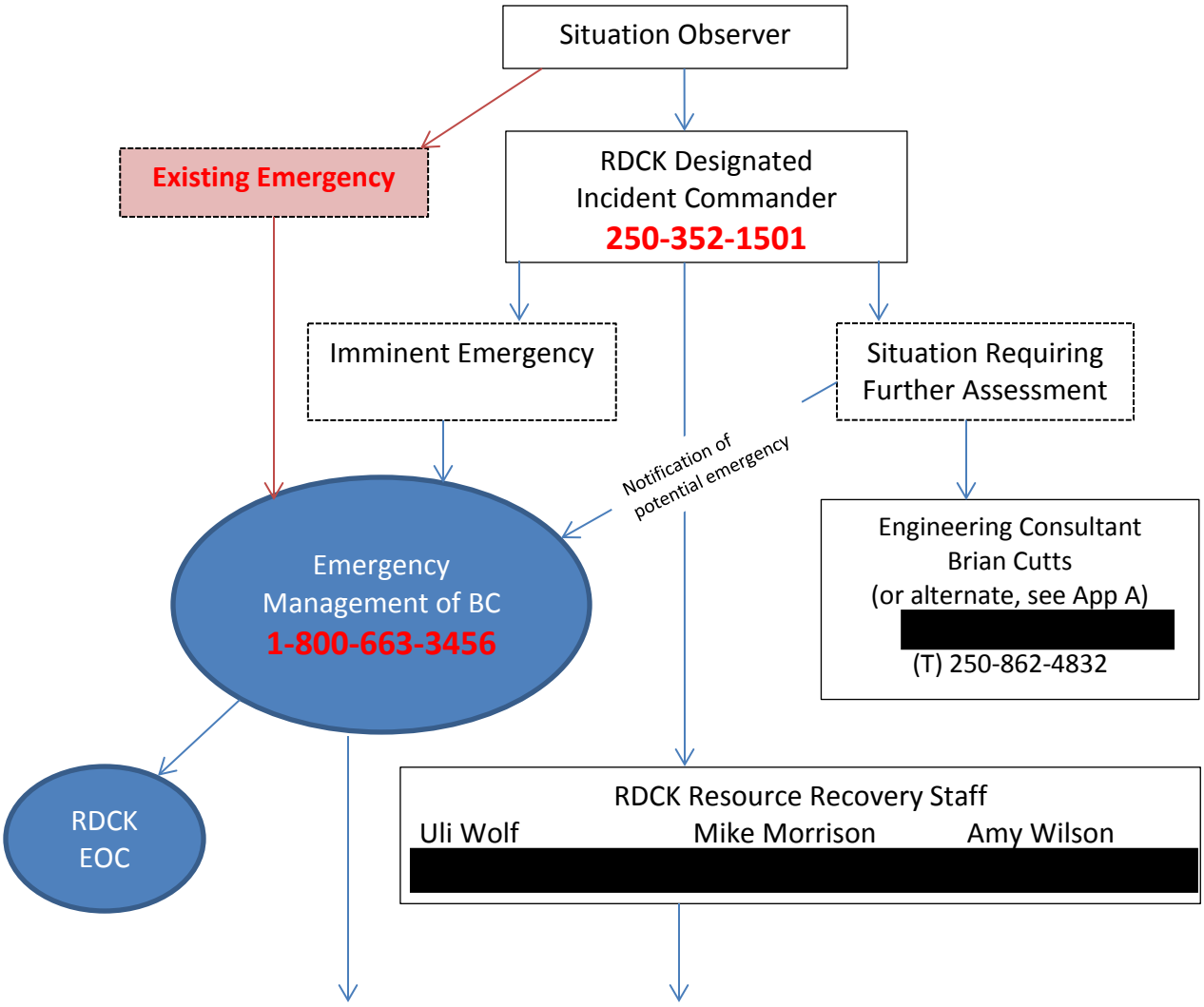
100 50 0 100 200

Meters

TETRA TECH EBA

FILE NO.				
Figure 5.0f - Time for 0.6m Depth.mxd				
PROJECT NO.	DWN	CKD	APVD	REV
K13103109-01	SB	SP	MJL	0
OFFICE	DATE			
TtEBA-KELOWNA	January 28, 2014			

Figure 3.2B



Other Contacts notified depending on severity (see Appendix A)	
MEM - H&S Inspector 250-420-1860	RCMP **911**
MoTI 1-866-707-7862	[redacted]
Village of Salmo 250-357-9433	MoE - RAPP 1-877-952-7277

Figure 4.1
EMERGENCY RESPONSE COMMUNICATION FLOWCHART
EMERGENCY PREPAREDNESS and RESPONSE PLAN (EPRP)
HB MINE TAILINGS STORAGE FACILITY
REGIONAL DISTRICT OF CENTRAL KOOTENAY

TABLES

TABLE 4.2

EMERGENCY REPAIR ACTIONS
EMERGENCY PREPAREDNESS AND RESPONSE PLAN
HB MINE TAILINGS STORAGE FACILITY
SALMO, BRITISH COLUMBIA

Observation	Emergency Action
Excessive seepage/signs of piping	- Add erosion material or drain material to stabilize slope - Prepare adequate drainage of area - Lower reservoir level
Clogged spillway leading to high water level with potential overtopping of dam	- Remove blockage from spillway - Lower reservoir level
Sinkhole	- Plug sinkhole with rockfill or low permeability material - Investigate downgradient for evidence of seepage - Lower reservoir level
Slope Movement	- Add reinforcement material to toe berm - Lower reservoir level
Upstream Erosion	- Add or repair erosion protection (i.e., rip rap)
Cracking/Slump/Slide	- Add reinforcement material to toe berm - Lower reservoir level

TABLE 4.3

EMERGENCY SOURCES OF EQUIPMENT AND MATERIALS
EMERGENCY PREPAREDNESS and RESPONSE PLAN
HB MINE TAILINGS STORAGE FACILITY
SALMO, BRITISH COLUMBIA

Source	Location	Contact
Equipment		
high capacity pump and hoses	HB Dam, near crest at East abutment	[redacted]
HL 757 Loader dump truck fire pump	Central Landfill, adjacent to Landfill entrance (see figure 2.1).	
Kootenay Valley Helicopters	89 Lakeside Dr, Nelson, BC	
Andex Rentals & Sales Ltd. (pumps, light plants, barriers, etc.)	107 Pine St, Nelson, BC	
Canadian Dewatering (high capacity pumps)	130 Crescent Street, Castlegar, BC	
Trowlex Rentals and Sales (pumps, light plants, barriers, etc.)	4450 Columbia Ave, Castlegar, BC	
Impact Equipment Ltd. (heavy equipment/rock trucks, pumps, light plants, barriers, etc.)	306 1 Ave, Trail BC	
Materials		
Gravel	Central Landfill, northeast quadrant (see figure 2.2)	[redacted]
Low permeability soils (silt)	Central Landfill, southern property (south of Cell 4) (see figure 2.2)	
Rock	HB Dam, rock quarry and stockpiles of various dimension rock located on west side of spillway (see figure 2.2)	
Sand Bags (1 pallet = 5000 bags)	Salmo Public Works yard	
Earthworks Contractors		
Custom Dozing (Henry Huser)	Salmo, BC	(T) 250-357-9686 [redacted]
Glover Contracting Ltd.	Salmo, BC	(T) 250-357-2505
Alpine Group (Greg Amantea)	Trail, BC	(T) 250-367-0099 [redacted]
Maglio Installations	Nelson, BC	(T) 250-352-7939
McNally Excavating	Nelson, BC	250-352-3838
Civil-Tech Services	Castlegar, BC	250-365-2005
Cham Rd/Markin	Castlegar, BC	250-304-2011

APPENDIX A

HB DAM EPRP CONTACT LIST

EMERGENCY COORDINATION CENTRE

1 800 663 3456

RDCK

Waste Emergency Line (available after hours)		250 352 1501
EOC Manager (available after hours)		250 352 7701
Nelson RDCK office (office hours)		250 352 6665
Mike Morrison	Resource Recovery Manager	[redacted]
Uli Wolf	GM of Environmental Services	
Amy Wilson	Environmental Technologist	
David Bromley	RR Operations Supervisor	
Alanna Garret	Emergency Coordinator	
Terry Swan	Regional Fire Chief	
Stuart Horn	CAO	

Emergency Management BC **1 800 663 3465**

Gundula Brigl	EMBC, Regional Officer	250 354 5904

Engineering Consultant (Tetra Tech EBA) 250 862 4832

Brian Cutts	Senior Geotechnical Engineer	[redacted]
		Brian.Cutts@tetratech.com
Michael Laws	Geotech & Dam Safety Engineer	[redacted]
		Michael.Laws@tetratech.com
Scott Martin	Geotechnical Engineer	[redacted]
		Scott.Martin@tetratech.com

Downstream Residents

Downstream property tenant		[redacted]
Martin & Trudie Ross	Property owners	[redacted]

Ministry of Energy and Mines

Jerrold Jewsbury	MEM, H&S Inspector	[redacted]
		250 420 2189
Alan Day	MEM, Senior H&S Inspector	250 426 1701
George Warnock	MEM, GeoTech Engineer	[redacted]
		250 565 4457

Ministry of Environment

Veron Novosad	Enviro Emerg Response	[redacted]
		250 489 8516
Brad McCandlish	EPO (Permitting)	250 354 6393
Tamara Mickel	EPO (Compliance/Spills)	250 354 6162

Ministry of Transportation and Highways and Maintenance Contractor

Regional Transportation Management Centre		**1 866 707 7862**
Cliff Razzo	Area Manager	[redacted]
		250 402 6428
YRB (Nelson)	Highways Maint Contractor	250 352 3242
YRB (Salmo)	Highways Maint Contractor	250 357 2229
Mark Dale	YRB Area Manager	250 428 0605

Forest, Lands and Natural Resource Operations

Sarah Crookshanks	Reg Dam Safety Officer	250 354 6349
Dwain Boyer	Water Section Head	250 354 6388

RCMP

Salmo		250 357 2212
Trail		250 364 2566

Local Government (Salmo)

Village of Salmo	Office	250 357 9433
Jason McNeil	Operations Manager	[redacted]
Jamie Birk	Public Works Foreman	[redacted]
Salmo Fire Department		250 357 9912
David Hearn	Salmo Fire Chief	[redacted]

Local Radio Stations

The Goat	1-877-560-1010
CBC Radio News	1-866-306-4636
Juice FM	250-352-1902
EZ Rock	250-352-6675
Kootenay Coop Radio	250-352-3706

Equipment Rentals and Sales

Canadian Dewatering (pumps)	250-365-3200
Impact Equipment (Trail)	250-364-9964
Andex Equipment Rentals (Nelson)	250-352-6291
Trowlex Rentals & Sales (Castlegar)	250-365-3315

Heavy Equipment Contractors

Henry Huser	Custom Dozing	250-357-9686
		[redacted]
Greg Amantea	Alpine Group	250-367-0099
		[redacted]
Maglio Installations		250-352-7939
McNally Excavating		250-352-3838
Civil-Tech Services		250-365-2005
Cham Rd/Markin		250-304-2011

Security and Flagging

Mountain Eagle Security		250 777 2253
Safety Zone Traffic Control		250-225-3598
George	Scrap King (H'way Flagging)	250 505 7818

Consultants and Other Parties

Chris Perdue	Perdue Geotechnical	250 354 3524
Dorothy English	Enviro tech - water sampling	250 229 5751
		[redacted]
Peter Ward	Ward Engineering (Surveyor)	250 354 1660
		[redacted]
Bruce Donald	Teck	250 426 9845