ELKVIEW OPERATIONS
Inactive Tailings Facilities

Emergency Preparedness Plan (EPP)
&
Emergency Response Plan (ERP)

For
Lagoon Breach Emergencies

Prepared and Administered by Teck Coal Elkview Operations
November, 2014

Teck

ISSUING EMERGENCY PREPAREDNESS PLAN (EPP) FOR THE TAILINGS FACILITIES

The Inactive Tailings Facility Emergency Preparedness Plan (EPP) has been produced by Elkview's Geotechnical Group on behalf of Elkview Operations for Teck Coal and has been distributed to the following affected parties mentioned in the plan:

1. General Manager EVO
2. Manager Community and Aboriginal Affairs
3. Manager Public Affairs
4. Superintendent Processing
5. Superintendent Mine Operations
6. Superintendent Engineering
7. Superintendent Health Safety Environment
8. Superintendent Employee Relations
9. General Foreman Processing
10. General Foreman Mine Operations Projects
11. General Foreman Mine Operations Pits
12. Senior Forman Mine Operations
13. Road Crew Foreman
14. Plant Foreman
15. Foreman Mine Operations
16. Senior Geotechnical Engineer
17. Senior Engineer Processing

Each party understands and has agreed to fulfil their role as detailed in the Emergency Preparedness Plan (EPP) and their approved Emergency Response Plan (ERP) or Municipal Emergency Response Plan (MEP).

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1. INTRODUCTION

1.1 PURPOSE

This **Emergency Preparedness Plan (EPP)** is a guide to assist emergency planners in developing local response plans to deal with a major flood and/or dam breach at one of the inactive tailing facilities. Local authorities should use this plan as a guide to developing annexes to their existing **Municipal Emergency Plans (MEP)** that deal specifically with their response to a major flood and/or dam breach.

The plan specifically addresses what would happen downstream of the inactive tailing facilities should a major flood or dam breach occur. The plan addresses how people and property could be affected, and how emergency responders would be notified in such an emergency.

In case of an emergency at the inactive tailings facilities, Teck will contact local authorities, as shown on the Organization Response Matrix (Section 3.1). Teck will request that local authorities initiate their **Emergency Response and Recovery Plans**. Teck will attempt, as is feasible at the time, to provide any material or technical support for emergency services as requested by local authorities. Other responding agencies can use this plan to develop their own local plans.

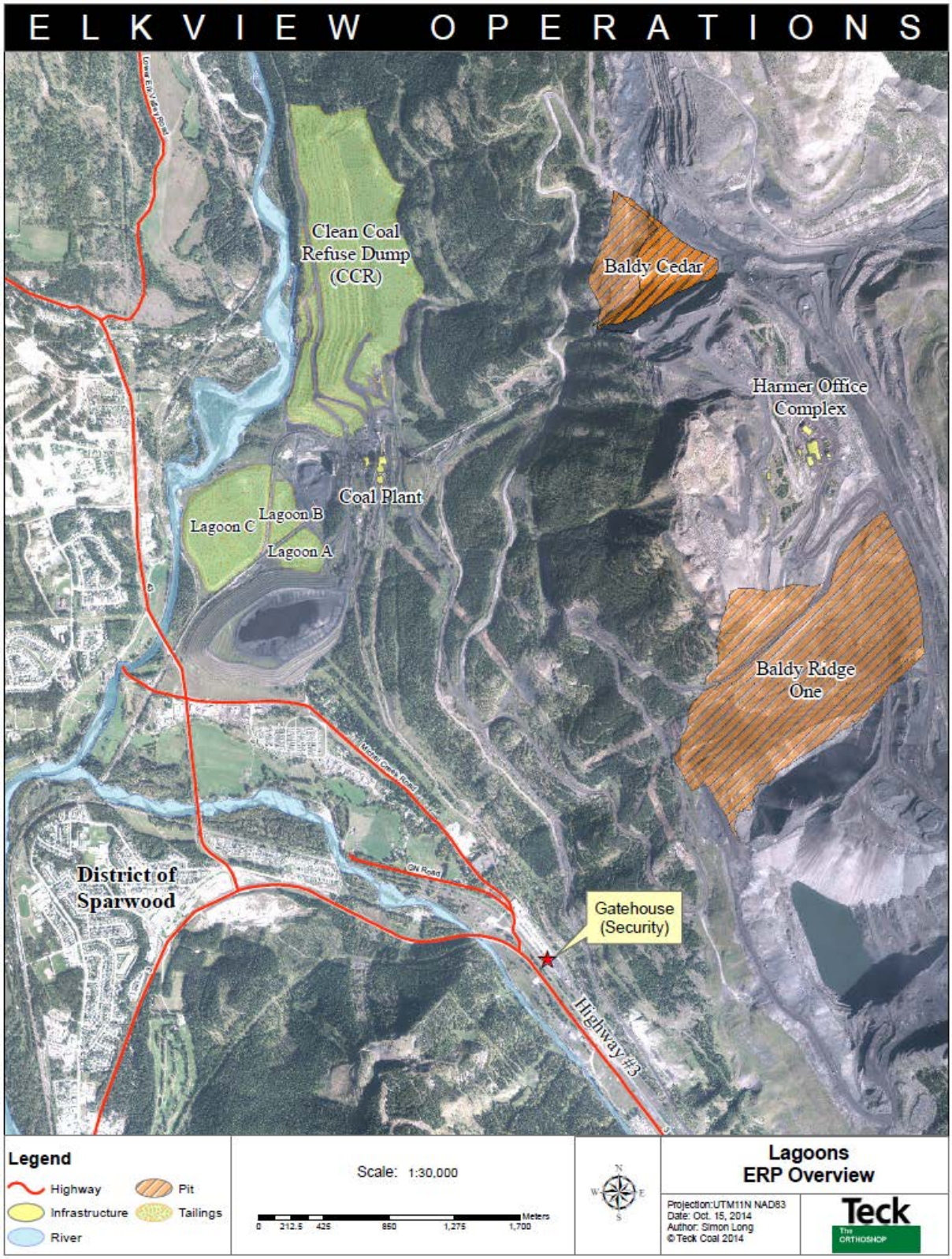
To assist emergency responders this plan contains the following information:

- The nature of the anticipated inundation (Section 2)
- A map showing the extent of the inundation (Section 2)
- The role of key responders (Section 5)

This guide identifies two levels of emergencies that are possible at the inactive tailings facilities; these are a Potential Flood Emergency and an Imminent Flood Emergency. It is incumbent upon each local authority to ensure their **Emergency Response and Recovery Plan for** a major flood or dam breach emergency is current and functional.

The Inactive Tailings Facilities **Emergency Preparedness Plan (EPP)** is a guide to assist responders in developing a flood response annex to their existing emergency plans and not to be used to replace or supersede any existing emergency plans of local authorities or other responding agencies.

Figure 1: Facilities Location Map



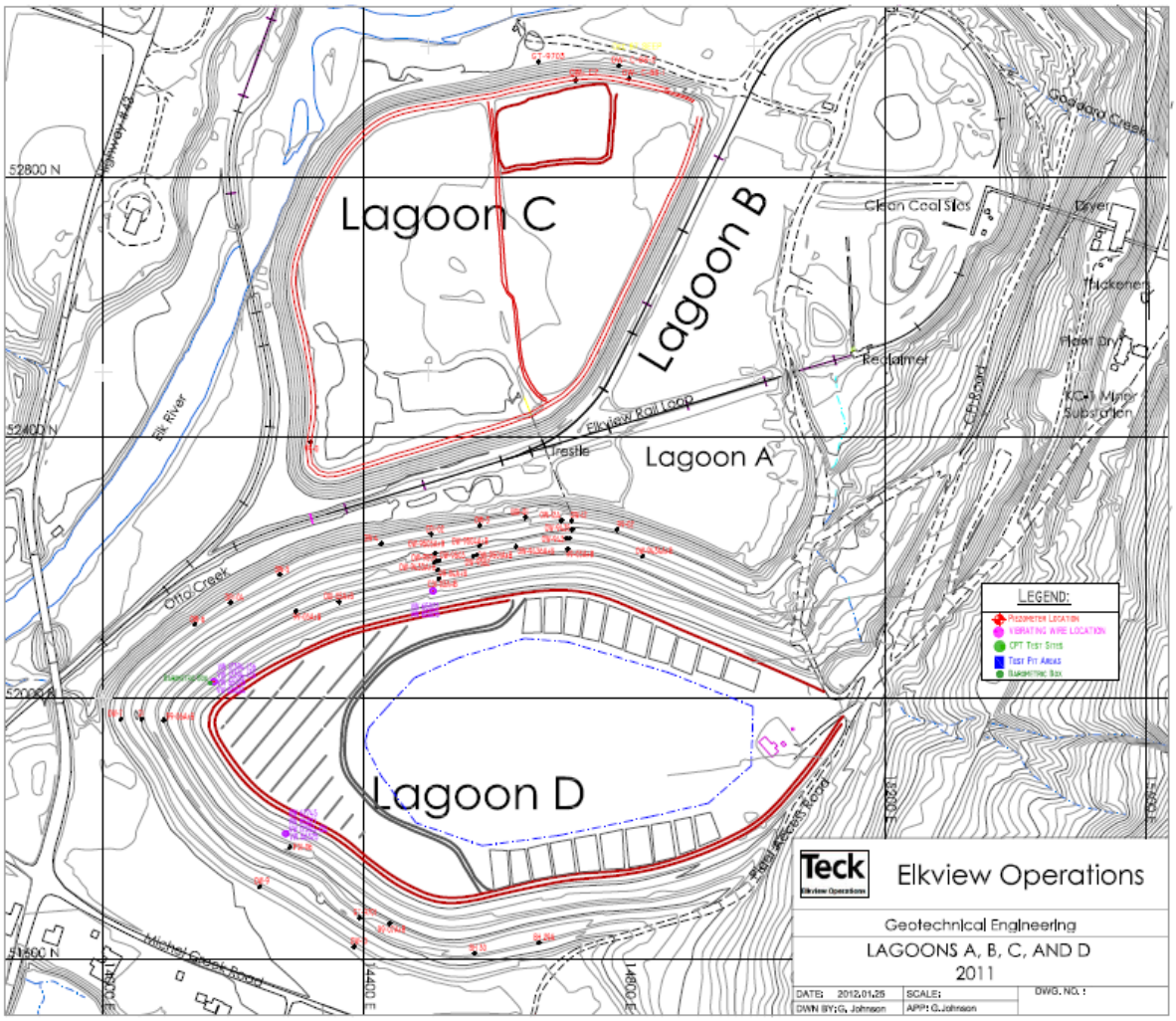
This **Emergency Preparedness Plan (EPP)** is issued for the inactive Lagoons A, B, and C by the owner and operator Teck Coal Elkview Operations (EVO). It has been prepared in compliance with Federal and Provincial Regulatory Bodies.

2. PHYSICAL CHARACTERISTICS OF INACTIVE LAGOONS

2.1 FACILITY LOCATION

The inactive tailings facilities are located near the Elk River, approximately 0.8km from Sparwood Heights and 0.4km from the Spardell Trailer Park. Access to the site from Sparwood is via the Main Gate on Michelle Creek Rd, off Highway 3.

Figure 2: Inactive Tailings Facilities and Surrounding Infrastructure



2.2 DESCRIPTION OF THE FACILITIES

The inactive tailing facilities are owned by EVO and are no longer used to store tailings. Each facility will be described separately; however each contains material derived from a common process.

Metallurgical coal washing creates two waste streams: a fine and a coarse refuse product. Coarse refuse was stored in several dumps that were later merged to form the present-day CCR dump. Fine refuse was transported and deposited as a slurry in Lagoons A, B, and C respectively.

2.2.1 Lagoon A

Little information is known of the construction and deposition history of Lagoon A. Lagoon A is bordered on the East by Harmer Ridge and on the South by Lagoon D. To the north, a ditch separates the lagoon embankment from the railroad embankment, and on the West (downstream), the embankment lies above Otto Creek (see **Figure 3.**). A small ephemeral pond is present near the downstream embankment.

Several sedimentation ponds are constructed along the path ofOtto Creek, which ultimately discharge into the Elk River. At present, the facility is used as a wetland to control sediment from Cossarini Creek. This facility is inspected monthly by the site Geotechnical Engineer. An annual Dam Safety Inspection is conducted on Lagoon A by an external Professional Engineer.

Table 1: Lagoon A Key Facts

Dam Type	Flow through-pervious
Storage Capacity	185,550 m^3
Max Downstream Face Height	4m
Crest Elevation	1119m
Crest Perimeter	350m

2.2.1.1 Effect of Inundation for Lagoon A

Failure of the embankment is likely to have minimal consequences since no permanent structures are located downstream and any water surge will be damped by the sedimentation ponds downstream before reaching the Elk River.

A tailing inundation zone assuming a 10 percent sludge run out zone is shown in Figure 3. This number is consistent with historic failures of similar material. The major effect will be exceedence of total suspended solids (TSS) specifications for a short time.

Figure 3: Lagoon A Sludge Inundation Area- shown by yellow dashed line

2.2.2 Lagoon B

As with Lagoon A, no construction records are available for Lagoon B. However, the materials are thought to be similar and consequences can be estimated by comparison with Lagoon A.

Lagoon B is bounded on the East by coal stockpiles and Harmer Ridge. These are at a higher elevation and the embankment cannot fail in this direction. No streams run onto Lagoon B.

To the North, the embankment overlooks a ditch and wetland used for sedimentation and infiltration of runoff from the coal stockpile and plant area. The West and South bounds consist of deep ditches along the railroad loop for coal cars. In essence, the entire facility is bounded by either ditches or hillside.

At present the facility is occasionally used as an emergency overflow for process water from the coal dryer. The Plant General Foreman requires approval from the Geotechnical and Environmental groups prior to releasing any water into Lagoon B. This facility is inspected

monthly by the site Geotechnical Engineer. An annual Dam Safety Inspection is conducted on Lagoon B by an external Professional Engineer.

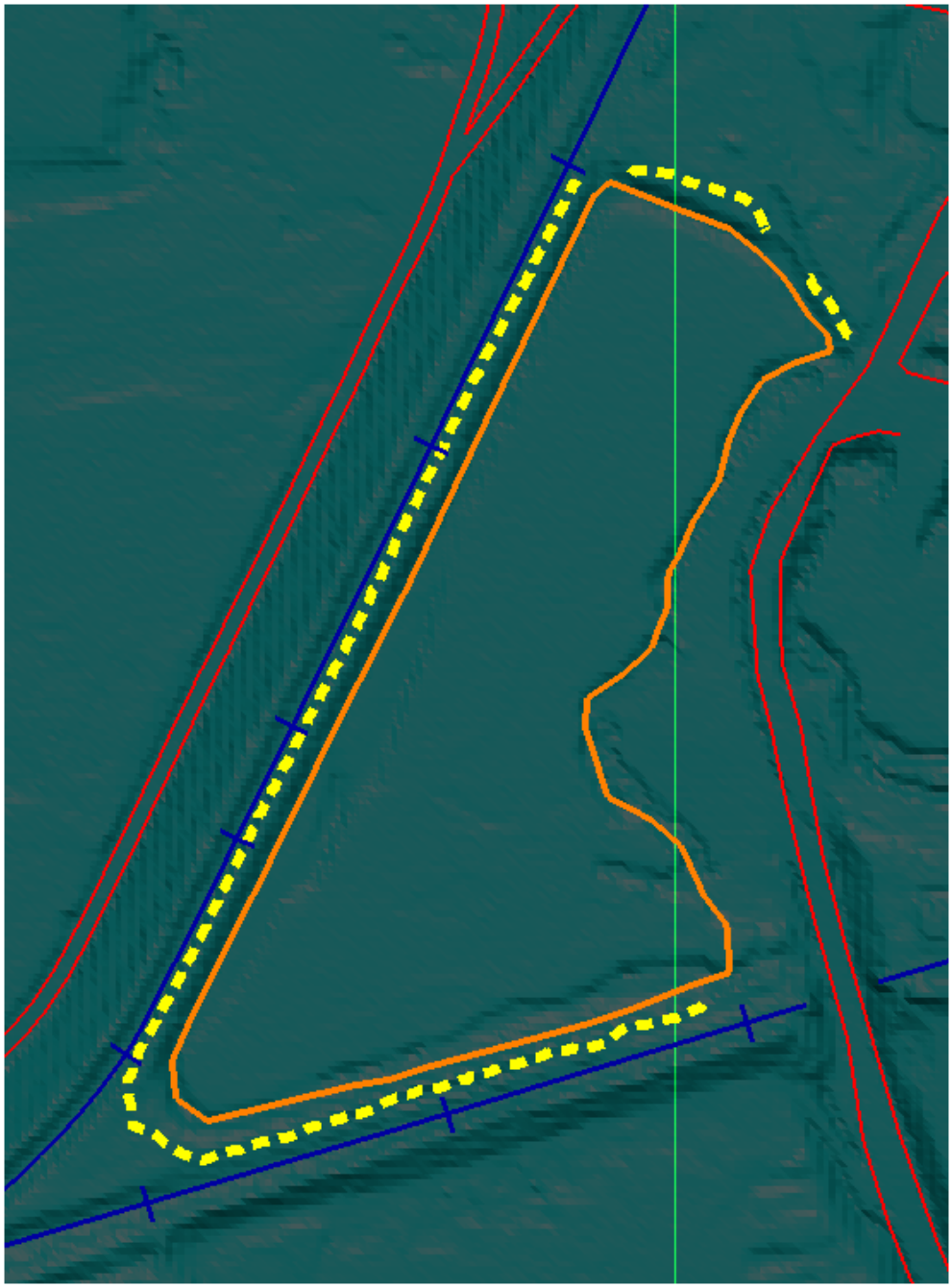
Table 2: Lagoon B Key Facts

Dam Type	Flow through-pervious
Storage Capacity	295,000 m^3
Max Downstream Face Height	4m
Crest Elevation	1119m
Crest Perimeter	800m

2.2.2.1 Effects of Inundation of Lagoon B

Since there is generally no water ponded in Lagoon B, the major impact from embankment failure will come from sludge. As with the other lagoons, a 10% shadow for sludge inundation is used and shown in Figure 4. Effects are expected to be contained by ditching and existing sedimentation structures; therefore are not expected to migrate off site. However, the railroad loop may be inundated resulting in closure and inability to load coal onto rail cars.

Figure 4: Lagoon B Sludge Inundation Area - shown by yellow dashed line



2.2.3 Lagoon C

Lagoon C was constructed in stages, with tailings deposition occurring between 1970 and 1987. More recently, Lagoon C has been flooded to minimise dust creation and as an Emergency Decant Option for Lagoon D. Listed below are some key features of Lagoon C.

- Lagoon C was conceptually designed for a maximum elevation of 1154m. Tailings deposition into Lagoon C was discontinued in 1987 at an approximate elevation of 1130m.
- The majority of the Lagoon has been covered in soil and hydroseeded, with some trees at the base of the lagoon.
- The embankments were raised incrementally as summarisied in Table 3 below. .

Table 3: Construction and Operational History of Lagoon C

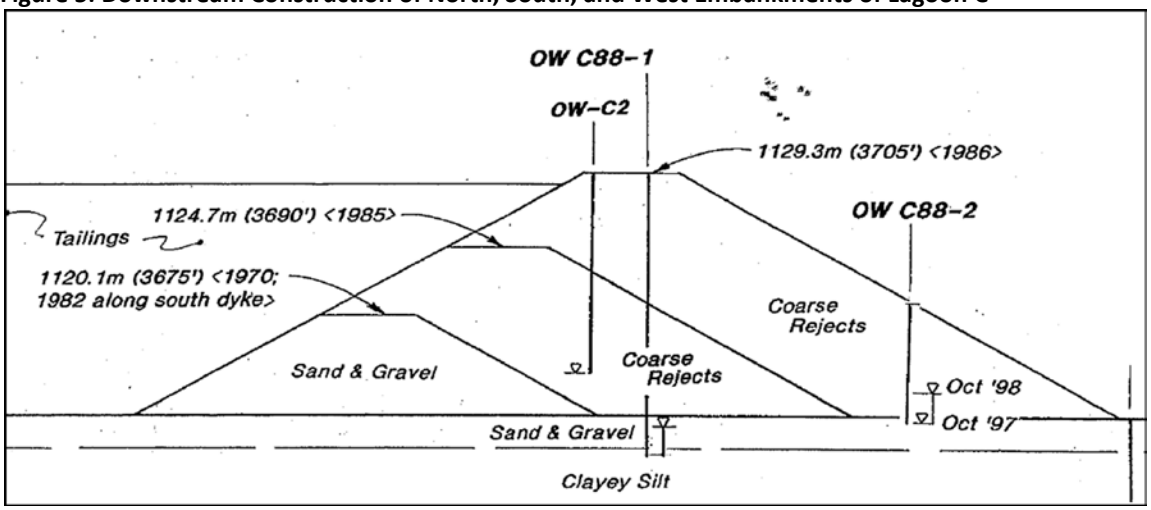
Year	Crest Elevation (m)	Construction Material	Comments
1970	1120.4	Sands and gravels	Initial embankment; sands and gravels were borrowed from pond interior and compacted to 95% of Standard Proctor.
1982	1120.4	Sands and gravels/ Coarse Coal Rejects	South extension embankment with sand and gravel to 1114 m and continued with CCR to 1120 m.
1985	1125.0	Coarse rejects	Upstream method-of-construction was used for Northeast Embankment due to proximity of railway line. Downstream method-of-construction was reported for the other embankments.
1986	1129.3	Coarse rejects	Continuation of the East Embankment from elevation 1125 m. Downstream method-of-construction was reported for the other embankments.
1987	1129.3	NA	Tailings operation terminated and Lagoon C became inactive.
1992	1129.3	NA	Lagoon C was flooded to minimize dust generation. North half of Lagoon C was used for temporary storage of excess wash plant water decanted from Lagoon D.
1994	1129.3	NA	Lagoon C was flooded to minimize dust generation.
2002	1129.3	NA	Pond water elevation increased from 1126 m to 1127.8 m.
2008	1129.3	NA	No reported water impoundment.
2010	1129.3	NA	Pumping of water from Lagoon D restarted.
2012	1129.3	NA	Use of Lagoon C for water storage and as a decant option stopped.

Table 4: Lagoon C Key Facts

Dam Type	Flow through-pervious
Storage Capacity	5 million m^3
Max Downstream Face Height	19.5m
Crest Elevation	1130m
Crest Perimeter	2km

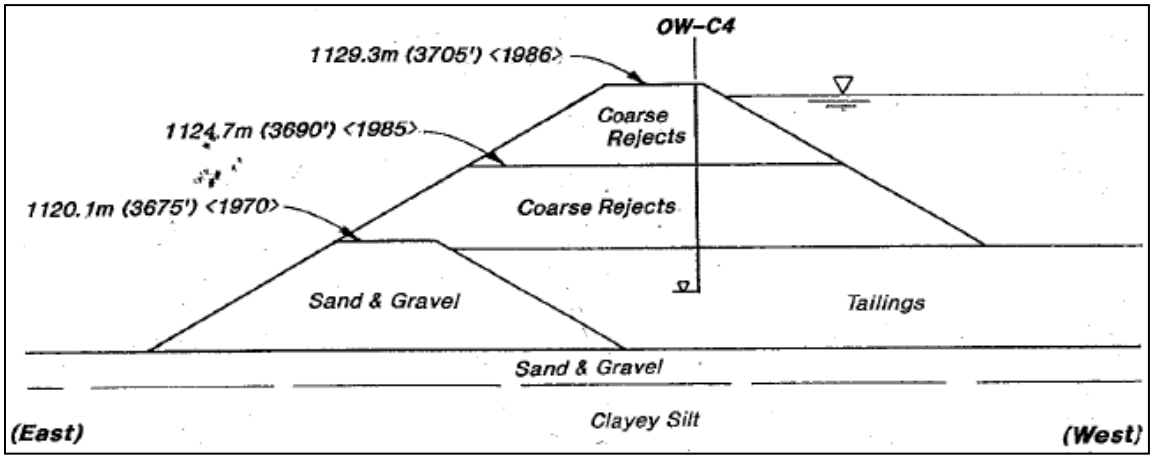
The North, West, and South embankments of Lagoon C were built in lifts using "downstream" construction, where successive lifts expand the starter dike over natural ground (see Figure 5). This is a robust and stable construction method since each lift is founded on well prepared material.

Figure 5: Downstream Construction of North, South, and West Embankments of Lagoon C



The East embankment was constructed using "upstream" construction where successive lifts are built over the previously-deposited tailing (see Figure 6). This type of construction is not as robust but was required due to the proximity of the railroad embankment. As a consequence of being founded on tailings, this embankment is considered potentially liable to failure through liquefaction.

Figure 6: Upstream Lift Construction on Lagoon C



No water is presently stored in Lagoon C. Except for precipitation, there is no source of water. Therefore, except for ephemeral puddles, the surface of the lagoon is dry.

The coarse nature of the sand and gravel and coarse reject embankment material allows the water inside the impoundment to filter to the ground water table. The level of ground water is an important stability parameter and is measured through a series of standpipe piezometers.

2.2.3.1 Effect of Inundation Lagoon C

The Lagoon C Tailings facility has a documented history of geotechnical monitoring and surveillance in compliance with Canadian Dam Association (CDA) and Mining Association of Canada (MAC) Operational Guidelines. The Dam Safety Review completed in 2013 by AMEC showed that the hazard classification for Lagoon C was High under flooding and fair weather conditions.

An Inundation study was carried out by AMEC in 2014 to assist in formulating an integrated company and regional response to a potential breach of Lagoon C. Two hypothetical failure scenarios were considered for Lagoon C: Fair Weather and Flood Induced.

Key Conculsions from the Inundation Study:

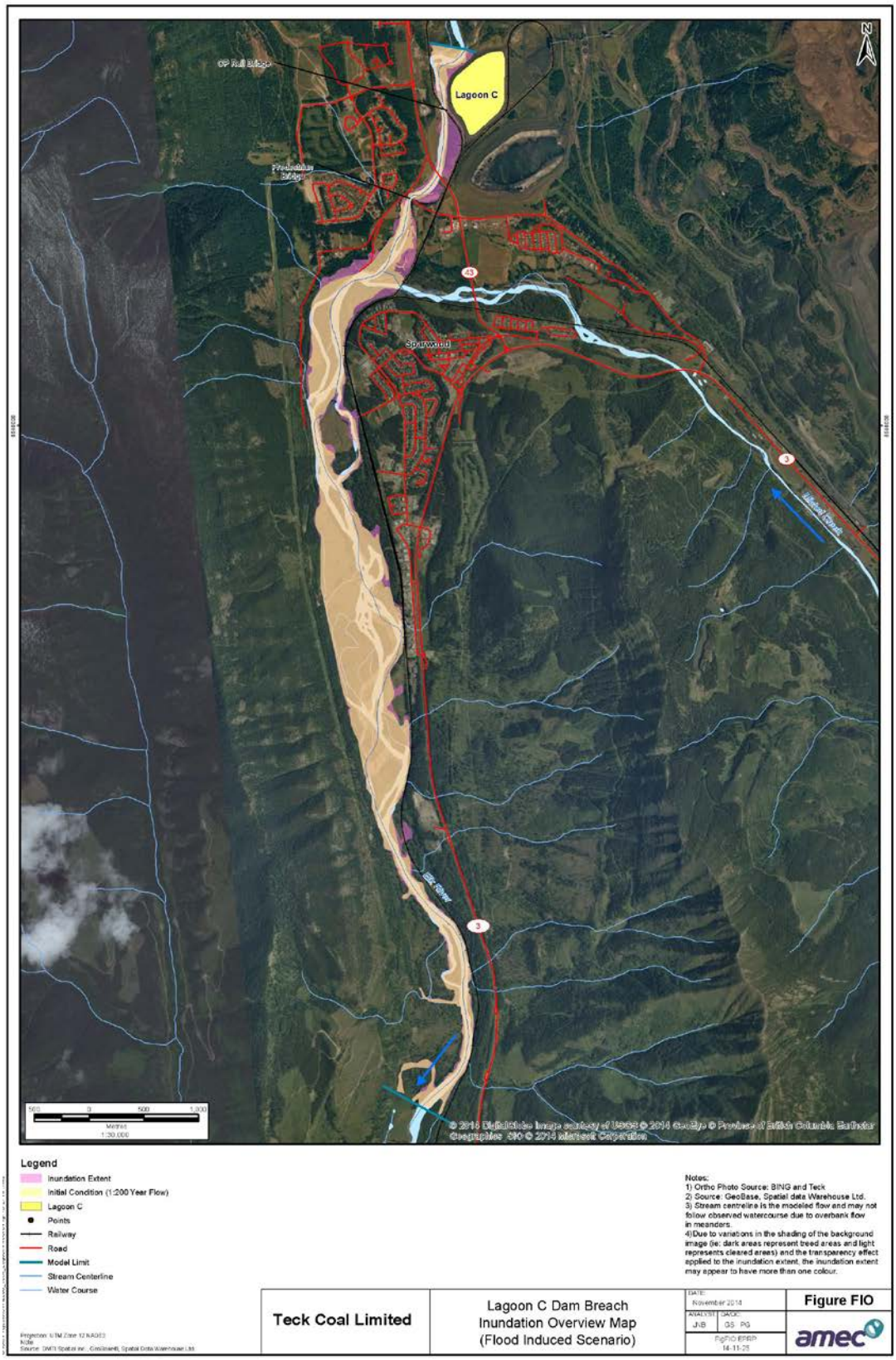
- A potential breach coud result in the release of between 0.24M m3 to 1.8 M m3 of tailings.
- Assuming the breach outflow entered the Elk River, the flooding effects could travel approximately 10.5km downstream.
- Peak outflow at the breach is estimated to be between 1,122 m3/s under fair weather conditions and 1,102 m3/s under flood condtions.
- The increase in water level 10.5 km downstream would be approximately 1.54m under fair weather conditions or 0.61m under flooding condtions with consideration for attenuation effects.

- Maximum inundation, under flooding condtions, 10.5km downstream would occur approximately 1.75hours after breach initiation at Lagoon C.
- Embankment breach is expected to develop to approximately 38m average width with a height of 18.5m for both flood fair weather and flood induced breach over 0.5 hours.

Failure of the South or East embankments will likely result in consequences limited to the Elkview mine site. On-site effects will likely be blockage of the rail loop and interruption of coal rail haulage until the debris is cleaned up. Workers would be at risk of engulfment with potential fatal results. Although it is possible for a breach to occur along these embankments the Inundation study focused on the North and West embankments. This focues was due to the higher consequence of failure to public infrastructure and property located in close proximity to the Elk River. Please refer to Figure 7 in regards to maxium affected inundation area.

Based on the above conclusions, the study supported Lagoon C's classification as a high consequence facility. According to HSRC Section 10.6.8 an impoundment facility that has a high classification is required to have an **Emergency Preparedness Plan (EPP).**

Figure 7: Lagoon C Flood Scenario Inundation Map



3. OVERVIEW OF EMERGENCY RESPONSE STRUCTURE

In the event that a tailings facility experiences a flood emergency, Elkview employees are trained to activate the on-site **Emergency Response Plan (ERP).** Activation of the plan facilitates a standard "Incident Command" system and mobilizes the following response mechanisms:

1. **Site Command Post (SCP)** will manage the emergency related to a likely breach. It will attempt mitigation measures if required and also perform initial notifications as described in the ERP. Site staff will man the **SCP** that will be located in **Room 301** at the main Harmer office.

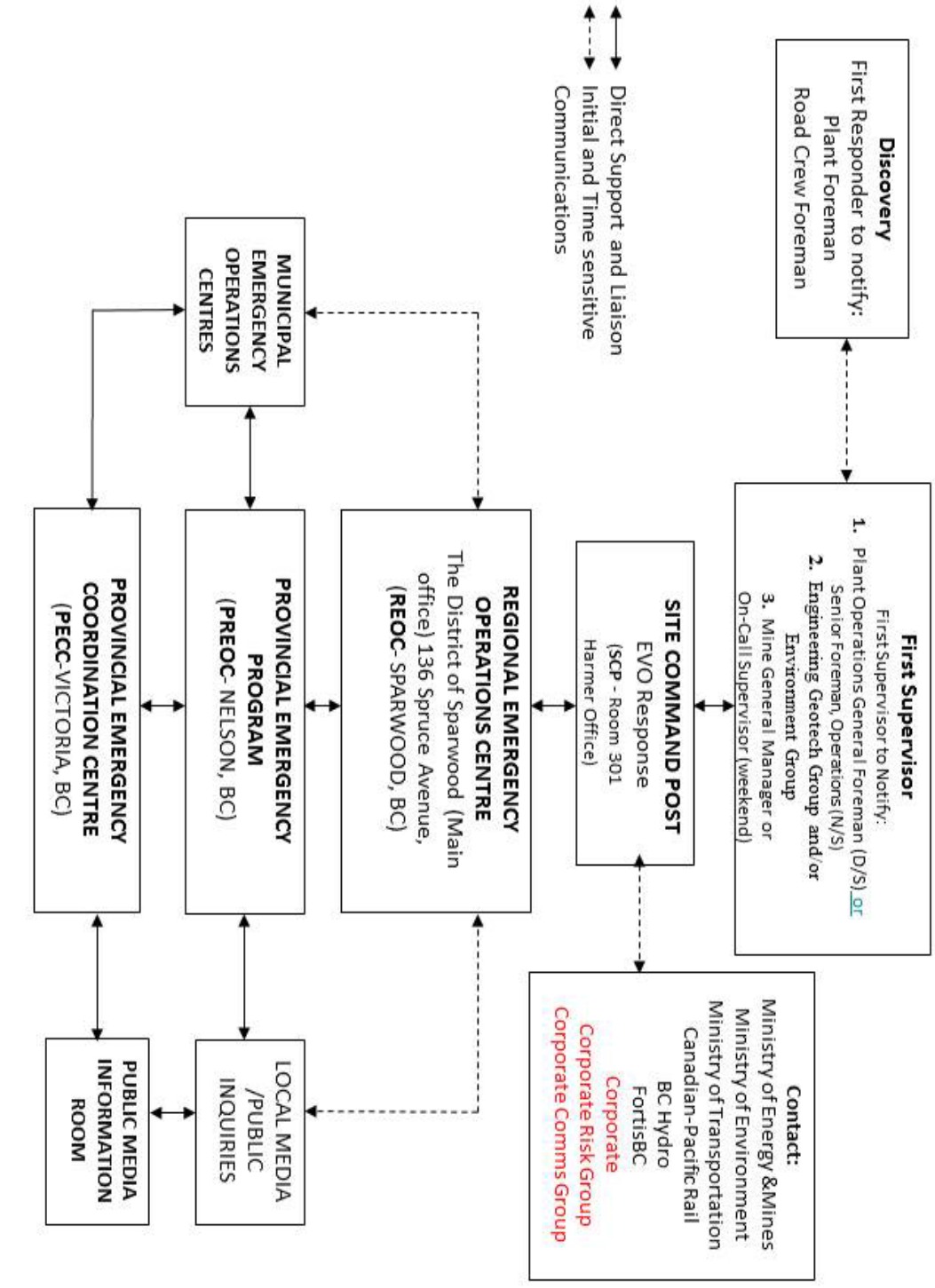
2. **Regional Emergency Operations Centre (REOC)** will be established by local authorities to provide support to the site level response activities. The District of Sparwood, (main office) 136 Spruce Avenue, will provide community notification of a major flood event if required. The centre will provide comprehensive support to site activities by co-ordinating logistical requirements, communications and administrative support. The **REOC** primary function is to support the activities of the **SCP** and will be manned by the Sparwood emergency program coordinator and municipal representatives with disaster and emergency response duties. The **REOC** would work directly with **Provincial Regional Emergency Operations Centre (PREOC)** established by the province to address the emergency.

3. **Provincial Regional Emergency Operations Centre (PREOC)** located in Nelson will be activated to support any emergency response activities occurring by a **REOC** within the Southeast BC Region. It may also be activated to direct, control or coordinate any provincially-led response measures. **PREOC** staffing will be provided by **Provincial Emergency Program (PEP)** staff and team members.

4. **Provincial Emergency Coordination Centre (PECC)** directs and coordinates the overall emergency response, recovery and support activities of the provincial government. The **PECC** will be activated in support of any activated **PREOC**. In addition, it will be activated during any major emergency/disaster. The **PECC** manages provincial level resources on behalf of the **Central Coordination Group (CCG)** in response to the emergency needs of the operational area(s). It manages and coordinates mutual aid between PREOCs at the provincial central level, and serves as the coordination and communications link with the federal disaster support structure. Integral to the**PECC** is the **Emergency Coordination Centre (ECC),** a 24/7 emergency operations unit within the Provincial Emergency Program. The **ECC** provides operational communications and tasking. The **PECC** will also activate the **Public Media Information Room**.

3.1 ORGANIZATIONAL RESPONSE MATRIX

Figure 8: Incident Command System



4. KEY PERSONNEL AND DESCRIPTION OF ERP SPECIFIC ROLES AND REPONSIBILITIES

4.1 FIRST RESPONDER

The First Responder is the person(s) first to the scene of the potential emergency. They should observe and note as many details as possible regarding the nature of the potential emergency. This individual(s) is tasked to initiate emergency response by calling the area Foreman. They are also tasked with securing the area until the Foreman arrives. The First Responder should then communicate all observations and the timeline of events to the responding Foreman. The list of duties that this individual has is summarized in ERP Sec 10 Table 5: First Responder / First Supervisor Checklist.

4.2 FIRST SUPERVISOR

Management of the inactive tailings facilities is primarily the responsibility of the Plant and Mine Operations'Road Crew, with technical support and monitoring provided by the Geotechnical Group within the Engineering Department.

When the Foreman arrives on scene they should observe the current conditions and receive the initial report from the First Responder. The foreman will then decide based on conditions and potential concerns to contact key on-site personnel:

- Plant Operations General Foreman (D/S) or Senior Foreman Operations (N/S)
- Engineering Geotechnical Group and/or Environmental Group
- General Manager or On-call Manager

Alternate Key On-site Personnel to Contact:

- Plant Superintendent
- Engineering Superintendent
- Operations Superintendent

All emergency contact details are listed in the Emergency Preparedness Manual

4.3 EMERGENCY COORDINATOR

The Emergency Coordinator position will be held by either the:

- Primary
    - Road Crew Foreman
    - Operations Foreman as designated by the Senior Operations Foreman
    - Operations General Foreman
- Secondary
    - Plant Foreman
    - Plant General Foreman
    - Senior Operations Foreman

This individual will be positioned at the hazard site organizing and monitoring the progress of any mitigation work and/or progress of the hazard. The list is divided into Primary and Secondary based on which roles would have access to the most appropriate resources.

The Emergency Coordinator will designate mine personnel, as needed, to act inoperations, planning, and logistical roles. The list of duties that this individual has varies depending on the degree of the hazard rating. Refer to ERP Sec 10 Table 6: Emergency Coordinator Checklist – Imminent Flood Emergency.

A summary of the Emergency Coordinator's responsibilities include but are not limited to:

- Confirming the hazard rating with the General Manager and Engineering/ Plant Superintendents
- Receiving written information from the First Responder/ First Supervisor on how the hazard has progressed
- Supervising ground operations personnel
- Approving action items and requesting resources
- Liaising with the Site Commander, the Lead Communication Specialist, and Senior Management
- Maximization of available resources

4.4 SITE COMMANDER

The Site Commander will be selected by Senior Staff and will be situated in Room 301 at the Harmer office. During night shifts or weekend, the Senior Operations Foreman will act as the Site Commander until relieved by the first Superintendent to arrive at the Site Command Post. This individual will communicate with the Emergency Coordinator and the Lead Communications specialist to give updates on how the hazard is progressing and to help mobilize resources.

A summary of the Site Commander's responsibilities include but are not limited to:

- Setup the Site Command Post (SCP) in Harmer 301.

- Ensuring that occupational health and safety procedures are in place to protect site personnel
- Appointing Duty Officers
- Ensuring that adequate communications equipment is ready and available
- Securing Resources and/or Personnel for the Emergency Coordinator
- Helping coordinate the mitigative and remedial operations at the site and maintain communication with Safety Department

For a more detailed description of the Site Commander Roles and responsibilities, please refer to the ERP Section 10 Table 7: Site Commander Checklist.

4.5 LEAD COMMUNICATION SPECIALIST

The Lead Communication Specialist (LCS) will communicate with the Site Commander and will activate the REOC in Sparwood. This position is responsible for talking to the media, relevant government institutions, local authority, and emergency services. Refer to ERP Section 10 Table 8: Lead Communications Specialist checklist. The only roles that can communicate to the media are: Manager of Community and Aboriginal Affairs, General Manager EVO, and a spokesperson as designated by External Affairs, Teck Resources Ltd., Vancouver. If these personnel are not available locally, the remaining duties of the LCS, will be delegated according to the Site Commander.

5. FLOOD EMERGENCY

5.1 DEFINITIONS

Any change to the current condition of the inactive tailings facilities main dike should be classified as a hazardous or non-hazardous condition.

A ***Non-Hazardous Condition*** (standard degradation) requires routine maintenance by the Road Crew. Under such conditions there is no requirement to activate the ERP.
For example; minor erosion events, minor seepage events/wet spots appearing with clear/clean water, tailings line breach, small sinkhole forming in the beach with no corresponding seepage at toe etc.

A ***Hazardous Condition*** constitutes a significant change, potentially influencing the stability of the dike and requires a specific response within a defined time period. Assuming such response conditions can be reasonably met, there is no requirement to activate the ERP. If the condition cannot be addressed, within a defined time period or is likely to degrade, the risk should be re-evaluated. If necessary, the condition will need to be elevated to a ***Potential Flood Emergency*** or an ***Imminent Flood Emergency***, both requiring the implementation of the ERP.

A ***Potential Flood Emergency*** is any condition that could cause a significant and/or sudden increase in water levels downstream of the Lagoon Facilities. A Potential Flood Emergency is

a condition that has been identified but not yet confirmed as to severity. For the purpose of this plan:

- "Condition" is defined as an impending flood event or structural/operational situation that threatens, or may threaten, the dam's integrity.
- "Significant increase in water levels" will be defined as those flows likely to exceed bank full capacity at critical downstream locations.
- "Sudden increase" is defined as an operator directed increase due to a dam emergency or due to a dam breach.

An ***Imminent Flood Emergency*** is defined as any condition that will, or likely will, produce significant and/or sudden increases in flow downstream of the Inactive Tailings Facilities. It is a condition that has been confirmed as serious with a defined time scale whereby all precautionary measures for protection will be implemented.

It is the task of the Site Commander to declare the level of emergency based on information available at the time. It is unlikely that events on inactive Lagoons A and B will result in a potential or imminent flood emergency due to the size and location of the structures. However, the location and size of Lagoon C could result in an emergency situation requiring the activation of this plan.

5.2 TAILINGS FACILITY SITE OPERATING PERSONNEL ACTIONS

Upon initial indication of a Tailing Flood Emergency, site staff shall immediately activate the On-site **Emergency Response Plan** that will direct them to:

1. Activate the **Site Command Post (SCP).**
2. Activate the **Regional Emergency Operations Centre (REOC)** to be established at The District of Sparwood (Main office buildings) 136 Spruce Avenue, Sparwood.
3. Immediately attempt to lower the pond water level through siphoning into Otto Creek (North side of Lagoon D)
4. Stop any Plant feed into Lagoon D and attempt to stop water entering the inactive tailings facility if possible.

If a decision is made to issue an *Imminent Flood Emergency* notification (see ERP Section 10 Table 7: Emergency Coordinator Checklist), facility **SCP** staff will then activate the next response level in the **Emergency Response Plan** that will direct them to:

1. Notify District and Regional Authorities as per the Organization Response Matrix (Section 3.1)
2. If requested, assist out Authorities to notify residents below the facility, as per the EMP Downstream Water and Stakeholder Contact List.

5.3 MUNICIPAL AFFAIRS – EMERGENCY MANAGEMENT BRITISH COLUMBIA ACTIONS

Upon initial notification of an *Imminent Flood Emergency* at the Tailings Facility, the REOC and PREOC staff will contact Elkview Operations Lead Communications Specialist to confirm the notification of Imminent Flood Emergency. Upon verification of the *"Imminent Flood Emergency"* declaration, Government Emergency Operations staff will begin the evacuation process of the inundation area.

5.4 LOCAL AUTHORITIES ACTIONS

Local Authorities notified of an "Imminent Flood Emergency" will:

1. Activate the **Emergency Response and Recovery Plan: Elk Valley Sub Region** for the *Imminent Flood Emergency*, outlined as the Sparwood District Emergency Response Plan.
2. If necessary, send a representative to the **Regional Emergency Operations Centre (REOC)** at The District of Sparwood (Main office) 136 Spruce Avenue, Sparwood.

5.5 R.C.M.P. ACTIONS

Upon notification of an *"Imminent Flood Emergency"* the RCMP may be requested to send a representative to the **Regional Emergency Operations Centre (REOC)**. The RCMP will respond in co-ordination with the local authorities and their Municipal Emergency Plans

PART 2: EMERGENCY RESPONSE PLAN

EMERGENCY RESPONSE PLAN (ERP)
FOR FLOOD EMERGENCIES AT THE INACTIVE TAILINGS FACILITIES

6. INTRODUCTION

The **Emergency Response Plan (ERP)** for Flood Emergencies was developed from previous work carried out by the Dam Safety Group for Water Stewardship in the BC Ministry of the Environment. It is intended as a guideline to assist facility operators in the development, implementation, assessment and revision of their *Emergency Response Plan for Flood Emergencies.*

The Canadian Dam Association, administered with the assistance of The Dam Safety Group for the BC Ministry of the Environment requires all owners of any tailings facility to have in place an **Emergency Preparedness Plan (EPP)** that defines the emergency response measures to be implemented in the event of a dam breach. The operator's **Emergency Response Plan (ERP)** for flood emergencies outlines, in order of priority, the key emergency response roles and responsibilities to implement the **Emergency Preparedness Plan (EPP)**. Staff and contractors who may have a response role should receive emergency preparedness training and be involved in exercising the emergency plans.

The **Emergency Response Plan (ERP)** is divided into three sections as follows:

1. **General Plan**: outlines the purpose of the **Emergency Response Plan (ERP)**, the roles and responsibilities for the various components of the **ERP** and the general policies that apply and the procedures that will activate the **ERP**.
2. **Check-sheets**: define the actions to be taken by the individuals assigned to key roles when the **ERP** has been activated. They are placed in order of priority by which key personnel may be assigned.
3. **Appendices**: forms and assignment lists.

7. GENERAL PLAN

7.1 PURPOSE

Teck Coal has an obligation to protect lives and prevent property damage in the event of a dam breach. Therefore, it is necessary to have a dam breach **Emergency Response Plan (ERP)** in a state of preparedness that extends beyond normal procedures.

This **ERP** is integrated within the **Emergency Preparedness Plan (EPP),** the Elkview Operations Emergency Preparedness Manual and the District of Sparwood's Disaster Response Plan(s).

7.2 AUTHORITY

The **Emergency Preparedness Plan (EPP)** that forms the basis for these procedures and check-lists has been developed in accordance with the Dam Safety Guidelines of the Canadian Dam Association and the guidelines prepared by Dam Safety of British Columbia. The local authority (The District of Sparwood) shall be responsible for the control and direction of the emergency response to a disaster or emergency event within their municipality. Teck will assist the Municipality's efforts when Teck is asked to and where Teck can provide reasonable support. The Municipal Government Act, Part 1, Section 3, requires a municipality to develop and maintain safe and viable communities.

7.3 SITE ACCESS

The mine site is gated to provide security from inadvertent access of the public and to ensure that only authorized personnel enter the work site. Fences are also used to keep personnel on foot or smaller vehicles out of the site.

Please see Figure 9 below for map a map showing access from the Main Gate to the Inactive Tailings Facilities.

Figure 9 - Inactive Lagoons Access Map

No vehicular access is available onto the embankments of Lagoons A and B. Vehicular access is available along the embankment of Lagoon C.

An alternate site entrance is through the Plant Gate if access is pre-approved.

7.4 EMERGENCY RESPONSE ROLES AND RESPONSIBILITIES

The decision to activate the **Emergency Response Plan (ERP)** is the General Manager or General Manager's designate. The ERP will be activated for the following two conditions:

- Potential Flood Emergency: Defined as any condition that could cause a significant and/or sudden increase in water levels downstream of the Lagoon Facility. A Potential Flood Emergency is a condition that has been identified but not yet confirmed as to severity.

- Imminent Flood Emergency: Defined as any condition that will, or likely will, produce significant and/or sudden increases in flow downstream of the Tailings Lagoon. An Imminent Flood Emergency is a condition that has been confirmed as serious with some indication of potential timescale.

Once the ERP is activated the following group's general responsibilities are listed below:

Elkview Operations, Teck Coal Limited (Facilities Owner and Operator)

1. Assessment and determination of the level of emergency at the dam site.
2. Mitigation and repair work at site of emergency.
3. Technical Support to the municipality(s).
4. Activation of, and technical support to, the Site Command Post (SCP), and Regional Emergency Operations Centre (REOC).
5. Emergency public information communications.
6. Assistance in notifying potential affected parties downstream if requested by the municipality.
7. Notify MEM of Geotechnical Incident as per HSRC sec. 1.7.1 & 1.7.3 within 4 or 16 hours.

Municipal Government

1. Notification of persons in the flood inundation area.
2. Evacuation of inundation area.
3. Search and rescue at local level.
4. Road closures.
5. Public safety.
6. Emergency lodging and provisions.
7. Emergency medical services.
8. Emergency Public Communication.

Provincial Emergency Program –British Columbia

1. Co-ordinate provincial government assistance to the municipality(s) as required.
2. Co-ordinate provision of federal government assistance, as required.
3. In mutually agreed circumstances, conduct emergency operations in National Parks, First Nation Reserves, or on other properties under federal jurisdiction.

8. POTENTIAL FAILURE METHODS DEFINITIONS AND DESCRIPTIONS

Below are examples of several of the most common failures and how to identify them. Mitigation suggestions are located in Section 3 Checklist – Emergency Coordinator.

1. **Piping-** Piping describes the event where water moves through the ground (in this case tailings) picking up particles; those particles are then deposited away from the structure. Piping always has a definitive start and an end point. The damage is most visible at the end point where the particles are being removed from. The most common form of piping is a seep; and so long as the water in the seep runs clear there is minimal risk. Once a seep starts moving particles, and the water turns dirty, it can continue to erode an open "pipe" that will allow water to flow freely. Free flowing water starts accelerating and continues to erode material until the overall structure fails. At the toe and on the face of a structure look for flowing water, mud flows that come out of the bank, or circular divots in the slope. On the top of the structure look for sink holes or whirlpools; although by the time these features appear on top the "pipe" is almost fully complete.

2. **Overtopping-** Overtopping occurs when water in the lagoon pond flows over the top of a dike crest. This water surge could be the result of increased water inflow from rain, snow melt, or plant discharge. It could also be due to a decrease in pond volume due to slumping of solids into the pond. During overtopping, water will flow quickly from the high to low side and erode the upper crests of the dike. This flow could lead to further erosion as more water is released

3. **Foundation Spreading-** Spreading (similar to slumping as discussed below) occurs when material in the slope face loses strength and flows away from the slope. This is most often associated with an increase of water, or pore pressure, within the slope. The material may fail on its own or it may be driven from above by unaffected material. The material flow will spread outward until it reaches a new equilibrium. Visually, the spreading may initially look like a bulge in the slope; it could then turn into a flow where the material may be rolling and mixing as it fans out to the sides.

4. **Crest or Face Slumping-** Slumping is very similar to spreading described above. The main difference is instead of a large portion of material losing strength, only a smaller/thinner layer fails. The solid material on top slides on the thin layer. All of

the material will flow until the thin layer is depleted or reaches a new equilibrium. The advantage to a slump is that it may be possible to identify the weak layer and isolate it. Upon visual inspection with a slump, usually, there would be an abundance of coarse material at the bottom of the failure and a clean failure surface above.

5. **Liquefaction-** Liquefaction occurs when fine particles become suspended in water. When tailings fines settle out of water but do not form any bonds with other fines, they are very weak with no cohesion. Two occurences are needed to liquefy the weak material: 1.) the area needs to become slowly saturated, and 2.) a strong jolt such as a large slump or earthquake disturbs the material. A jolt could also be from heavy truck traffic or a local blast. An example of a liquefied material could look like quicksand or slurry. Once this liquefied material starts flowing it will act like water and flow to the lowest point around.

9. EMERGENCY RESPONSE STRUCTURE

The response structure with regard to site coordination can be broken down into two phases:

1. The Initial Response Procedure (see Figure 10)
2. The ERP Activation Flowsheet (see Figure 11)

Figure 10: Initial Response Procedure

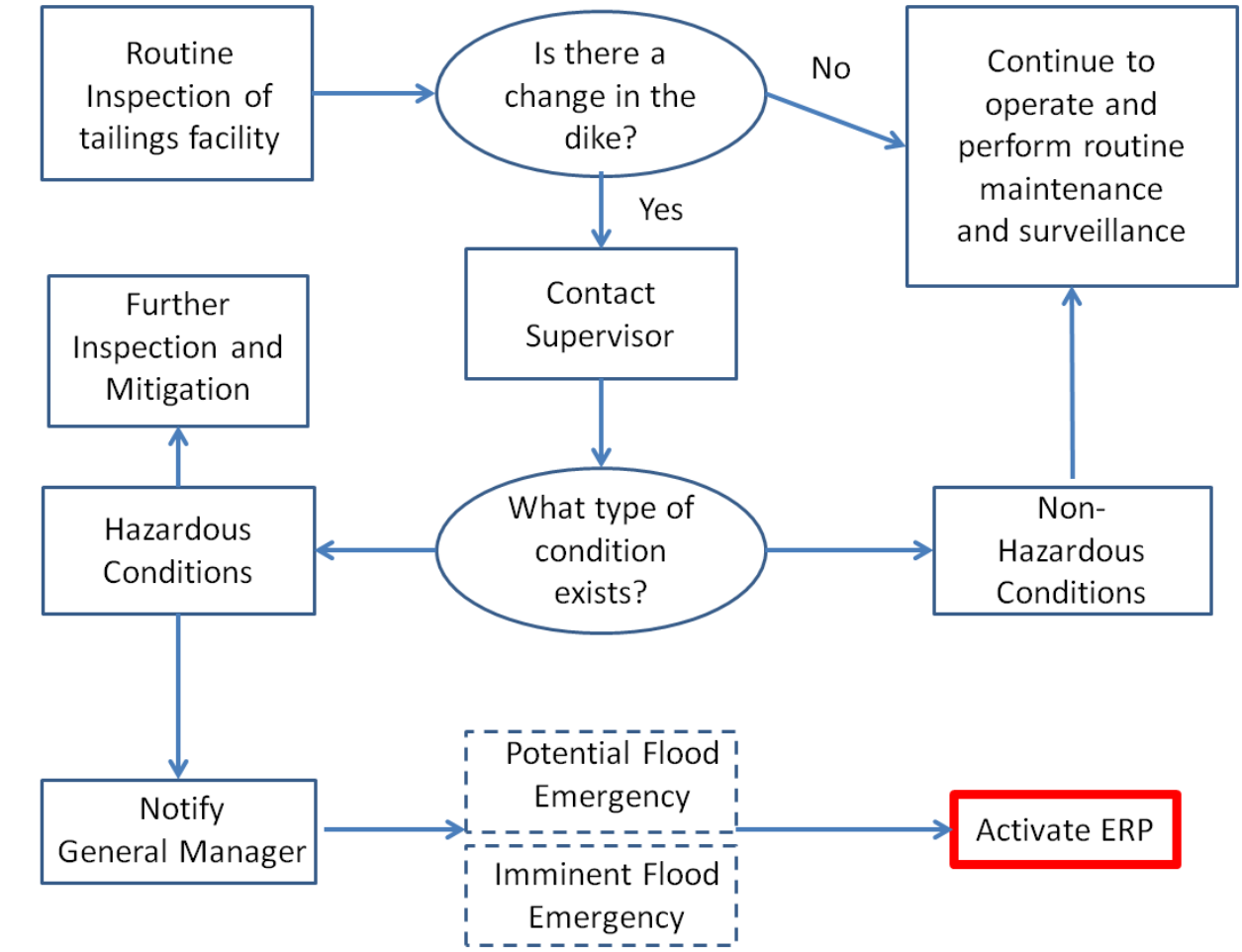
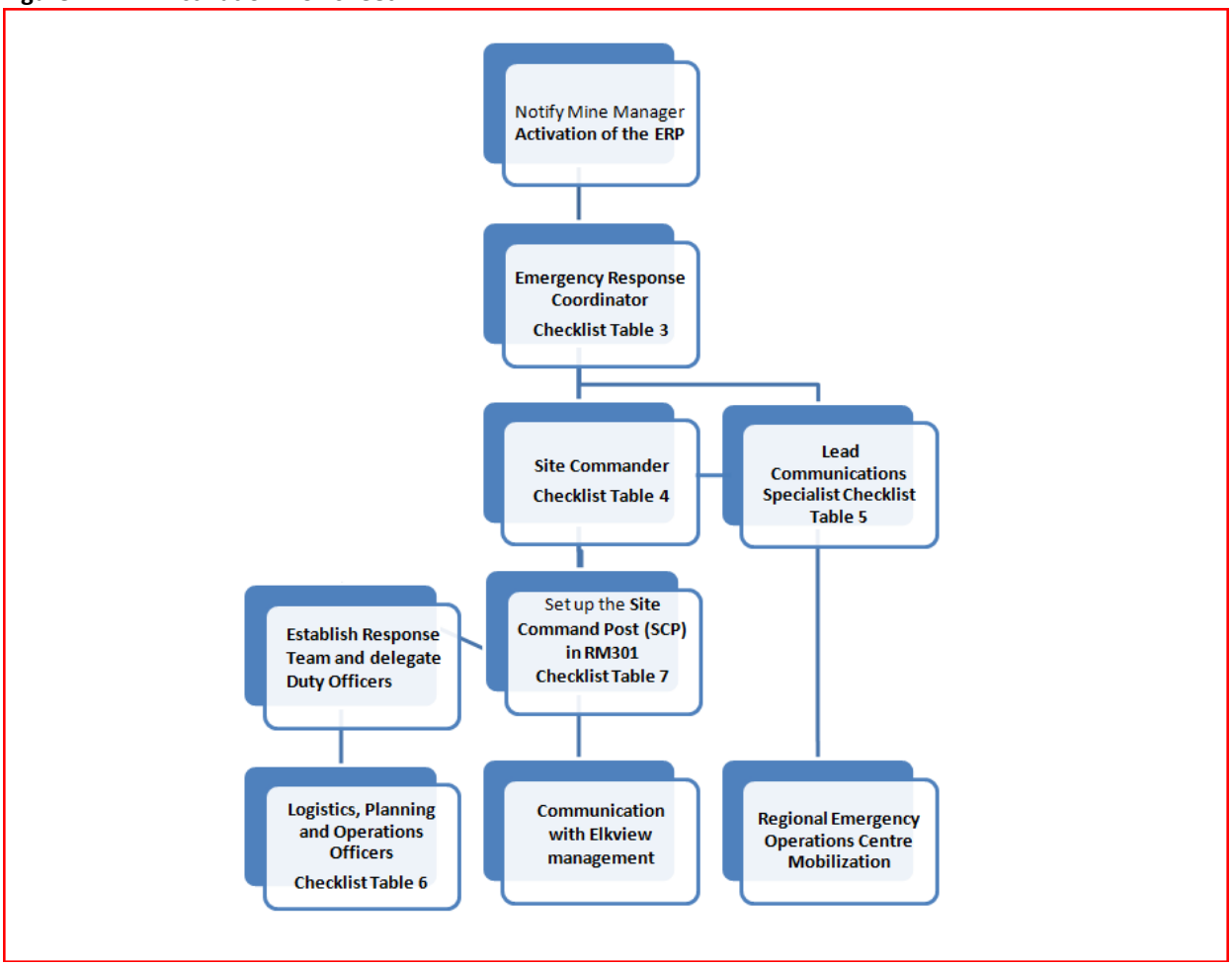


Figure 11: ERP Activation Flowsheet



10. CHECKLISTS

Table 5: First Responder Checklist

FLOOD EMERGENCY - FIRST RESPONDER / FIRST SUPERVISOR CHECKLIST		
First Responder		
1.	Determine the nature of the emergency. Observe and note as many details as possible. Write them down.	
2.	Immediately contact the area foreman to assess the situation.	
First Supervisor		
3.	Assess the site condition. Talk with the First Responder. Is the situation hazardous or not?	If yes, proceed to Step 4.
4.	Contact the following Job Roles, in order:	See EPM Contact List for Phone #'s
	1. Plant Ops. General Foreman	Or on N/S Snr. Ops. Foreman
	2. Engineering – Geotechnical Group	And/or Environment Group
	3. General Manager	Or On-call Manager
	If contact cannot be made with any of the above roles, or as time permits, then contact:	
	4. Plant Superintendent	
	5. Engineering Superintendent	
	6. Operations Superintendent	
	In discussion with the General Manager, and/or above parties, a determination to ***activate the ERP*** will be made; if there is risk of one of the following: • Potential Flood Emergency • Imminent Flood Emergency The decision to activate the ERP must be made by the General Manager or Designate. At this stage only the ERP has been initiated; an Emergency may not yet be declared.	
5.	Secure the area and ensure the safety of all site personnel. Begin mitigation efforts.	
6.	Continue to monitor the area until directed otherwise by Emergency Coordinator.	

NOTES	Time:

Table 6: Emergency Coordinator Checklist – Imminent Flood Emergency

<table>
<tr><th colspan="2">FLOOD EMERGENCY – EMERGENCY COORDINATOR</th></tr>
<tr><td>1.</td><td>Go to the hazard site.</td></tr>
<tr><td>2.</td><td>If the Site Commander is not at Harmer 301 and is not in good communication, contact the Plant Foreman. The Foreman is to function as the Site Commander until the Site Command Post (SCP) has been manned in RM301 at the Harmer Office. The Foreman’s duties are listed in ERP Section 10 and Table 7.</td></tr>
<tr><td>3.</td><td>Observe the situation.</td></tr>
<tr><td>4.</td><td>Receive reports from First Responder and/or First Supervisor.</td></tr>
<tr><td>5.</td><td>A.) Contact senior management and advise them of the situation.
<table>
<tr><td>Job Roles (attempt to contact In Order): See EPM Contact List for Phone #’s</td></tr>
<tr><td>General Manager or On-call Manager</td></tr>
<tr><td>Plant Superintendent</td></tr>
<tr><td>Operations Superintendent</td></tr>
<tr><td>EH&S Superintendent</td></tr>
<tr><td>Engineering Superintendent</td></tr>
<tr><td>BRE Superintendent</td></tr>
<tr><td>Maintenance Superintendent</td></tr>
<tr><td>Employee Relations Superintendent</td></tr>
<tr><td>Controller</td></tr>
</table>
B.) Decide to declare an <u>Emergency</u>.
This decision will be made by the General Manager or On-call Manager. If un-available the decision will be made by a Superintendent. The flood emergency may be considered:
Potential- (uncertain time scale, full scale evacuation not yet required) or
Imminent- (definite time scale, full scale evacuation required).

C.) Inform the Site Commander that a Potential or Imminent Flood Emergency has been declared.</td></tr>
<tr><td>6.</td><td>Request a written report from the First Responder and First Supervisor</td></tr>
<tr><td>7.</td><td>Assume Command of Hazard Site (see Step 8 for specific site task list).</td></tr>
</table>

Notes	Time:

8.	Ensure that the below items are performed: • Attempt to stop any current inflow into the facility • Set-up a decant pump to siphon water into Otto Creek to lower the pond level • Continue to monitor the condition, assign a trained observer. A trained observer will be shown by technical staff or a supervisor on what to look for and who to contact. Specific instructions pertain to the mode of failure as described below. **For Piping Failures** • Fill in any holes on the surface beach with sand and coarse material hauled in. • Mobilize equipment required to provide coarse reject for backfilling the depression on the beach area (scrapers, small haul trucks and loader, 992 loader and haul truck, lighting plants, etc.). • Dozer on beach can push adjacent excess beach sand into the depression. • Dozer to push access ramp off dike for closer access for scrapers or small haul trucks. • Dump short and push material into the depression. • If the depression continues to enlarge, the dike stability has been reduced. Personnel and equipment should evacuate to a safe location. • If the depression is able to retain material, continue to backfill as necessary and proceed to seepage location. • Keep Plant Control Room Operator/SCP informed of proceedings. • Organize personnel and material to the location of the seepage. • Place membrane filter cloth over seep (this is to allow drainage but retain the dike material). o Membrane filter cloth required is stored in or by the Plant Supply Tent. • Bury filter cloth with coarse rejects or other suitable drainage material. • Continue to observe dike near seepage for new seeps, remediate as required. • If seepage is uncontrollable, evacuate personnel to a safe location. **For Overtopping Failures** • Use additional pumps to rapidly draw down the water level. Water can be directed to Lagoon D or in emergency conditions Otto Creek. • If water level has been successfully reduced follow procedure for Piping Failures to backfill the breached section **For Foundation/ Spreading Failures** • Identify the source of instability • Use appropriate earthworks (buttress construction) to minimize further deformation and collapse of the dike. • If seepage has developed follow procedure outlined for Piping Failure **For Liquefaction Failures** • Initiate immediate evacuation.

Notes	Time:

Table 7: Site Commander Checklist

FLOOD EMERGENCY – SITE COMMANDER	
1.	A.) Designate an Emergency Coordinator if not already done. B.) Relocate to Harmer Rm 301. C.) Assign regular duties to alternate.
2.	Obtain a full report on activities to date from the Emergency Coordinator and First Responder/First Supervisor. Confirm the level of emergency with the Emergency Coordinator.
3.	Phone Lead Communication Specialist (LCS) and inform the LCS of the Level of Hazard. Tell the LCS that their list of duties is in the ERP Section 10 Table 8 - Lead Communication Specialist Checklist. Tell the LCS to proceed to the REOC.
4.	Ensure that Lagoon equipment is operational (gates, generator, etc).
5.	Evacuate the Hazard Area - Contact Mine Operations dispatch, available maintenance/plant staff and/or Duty Officers are to evacuate Mine employees and contractors working within the hazard area and lock and/or control all gates.
6.)	Contact LCS at REOC or contact REOC directly.
6.	Report communications with REOC to the Emergency Coordinator.
7.	Establish Duty Officers: Duty Officer 1: Event Scribe and Data Recorder of all events Duty Officer 2: Logistics Duty Officer 3: Planning Duty Officer 4: Operations
8.	Ensure occupational health and safety procedures are in place to protect site personnel.
9.	Ensure that adequate communications equipment is available and operational.
10.	Co-ordinate the mitigative and remedial operations at the site and maintain communication with the Site Safety and Emergency Coordinator.

Notes	Time:

Table 8: Lead Communication Specialist Checklist

FLOOD EMERGENCY – LEAD COMMUNICATION SPECIALIST (LCS)	
1.	Proceed to the Regional Emergency Operations Centre • Activate the PR/REOC mobilization plan • Ensure the telephone lines and other communications equipment is operational.
2.	Assign duties to Communication Support Staff and provide assistance with REOC in regard to contacting key agencies, people in the evacuation area if failure is imminent (otherwise RCMP role), transportation, utilities, and First Nations representatives if requested to do so by the Municipality.
3.	Liaise with the Public Media & Information Room at the District of Sparwood Main Office and the Provincial Regional Emergency Operations Centre at the BC Ministry Branch, Nelson, for Southeast BC.
4.	Liaise with the media. Prepare media releases in conjunction with the Emergency Coordinator and management containing the following information: • Expected magnitude of the flood wave • Likely impact on downstream users • The amount of time available for evacuation • The location of the evacuee staging area and/or Reception Centre • Which areas are likely to flood • Which areas likely will not be flooded • How those in the flood path should protect themselves • Any other pertinent information
5.	A staging area for the media will be set up in The District of Sparwood (Main Office), 136 Spruce Avenue, Sparwood if required. The Lead Communication Specialist will provide regular situation updates to the media. Access to the dam site is restricted.
6.	Media kits with background material containing the following information will be available for the public and media with the approval of the Emergency Coordinator: • What caused the emergency? • Who owns the dam? • What type of dam is it? • What kind of emergency (piping, overtopping, etc) is it? • When were people first warned? • Are people being evacuated and where are the reception centres? • How can we contact evacuees? • Which roads and bridges are closed/being closed?
Notes	Time:

Table 9: Duty Officers Checklist

FLOOD EMERGENCY – OFFICERS	
1.	Act on instructions, directions and requests from the Emergency Coordinator and the Emergency Co-ordinator staff. Recording all actions using Tables 13 and 14 in Section 14.
2.	**Duty Officer:** Open an Event Log • maintain operations logs, maps and situation boards • Contact required evacuees in affected areas
3.	**Operations Officer**: Coordinate activity of site machinery and their support through communications with maintenance
4.	**Planning Officer:** Work alongside the Emergency Coordinator and help facilitate action plans to minimize the impact of the inundation.
5.	**Logistic Officer:** Put into action directives from the Operations and Planning Group • Contact contractors and auxiliary support equipment coming on-site as well resources in support of the evacuation response
Notes	

Table 10: Site Command Post Checklist

FLOOD EMERGENCY – SITE COMMAND POST (SCP)	
1.	Site Command Post – RM301 Harmer Office requirements: • Inundation Maps • Event Logs • Two meridian telephones and two standard telephones (clearly marked). • Situation status board with flip chart (located in supply room). • Situation status board with dry erase board (located in supply room). • Stationery; adequate pens, paper etc. • Two copies of the ***Inactive Tailings Facilities*** Emergency Preparedness Plan. • Media kits with pre-worded background material. • Large wall map. • Battery operated radios. • Extra phone cable extensions. • Video Conferencing
2.	Set up the status board so that all responders can clearly see it. Key events should be written on this board (time, event, actions, and response).
3.	Hang up the large wall map to track real time progress of the response efforts and any flooding
4.	The Lead Communication Specialist will assign the communication priority functions to responders as they arrive: Establish contact with the Public Media and Inquiry Room at The District of Sparwood (Main Office), 136 Spruce Avenue, Sparwood, B.C. Establish contact with the Government Emergency Operations Centre. Establish contact with the BC Environment (Flow Forecasting Program). Handle all public inquiries. Handle all media inquiries.
5.	Answers to questions relating to the emergency will be supplied by the Site Command Post on a regular basis and may include: How is the situation progressing? What actions are being taken? What resources are being used for mitigation? Who/which communities have been evacuated?
6.	The Lead Communication Specialist will lend support to the Site Command Post if directed to do so by the Emergency Coordinator.

Notes	Time:

11. MAINTAINING A STATE OF READINESS

11.1 UPDATING THE EMERGENCY PREPAREDNESS PLAN AND RESPONSE PLAN

Inactive tailings facility operations, site security and engineering staff will be responsible for updating the **Emergency Preparedness Plan (EPP)** and on-site **Emergency Response Plan (ERP).** Updates may include but are not limited to: procedures, phone list, roles and responsibilities. Revisions will be circulated to all affected agencies identified in the record of manual holders (Refer to Section 14.3).

Any revisions and/or comments to the inactive tailings facility **Emergency Preparedness Plan (EPP)** or **Emergency Response Plan (ERP)** should be forwarded to the Emergency Co-ordinator listed in the communications directory of this plan. All revisions will be recorded on the Record of Revisions sheet(s) included in this plan.

11.2 TRAINING GENERAL STATEMENT

Elkview Operations staff managing the inactive tailings facilities, identified as emergency responders, will be familiar with all aspects of the **Emergency Preparedness (EPP)** and **Response Plans (ERP)**. Teck Coal Limited is responsible for ensuring the **Site Command Post (SCP)** is functional and that staff are adequately trained. Municipalities and other responders are responsible for their Emergency Measures.

11.3 TRAINING SPECIFICS

All Teck EVO personnel employed in roles mentioned in this document, and those involved in the operation, maintenance and surveillance of the Inactive Tailings Facilities will have a working knowledge of their potential roles and responsibilities as outlined in this document. All such employees are to know where updated copies of this document are kept for reference. A review of this document is to be carried out by these employees annually and tracked through their training requirements in Siteline.

11.4 TESTING PLANS AND PROCEDURES

Elkview Operations personnel managing the inactive tailings facilities will co-ordinate and participate in periodically testing the EPP and dam breach emergency response procedures jointly with downstream agencies and stakeholders. It is incumbent upon each responding agency to have adequate plans and trained staff in place to deal with any emergency within their jurisdiction. Testing will comprise of periodic tabletop scenarios, review of ERP and EPP working documents, as well as the OMS.

12. KEY CONTACT NUMBERS

MINE LOCAL NUMBERS

Mine Gate Security	58899
ANY EMERGENCY	**58888**
Emergency First Aid	58888
Harmer First Aid	58779
Plant First Aid	58935

REPORTING STATIONS

Mine	58199
Plant	Channel 10
Plant Alternate	58913
Mine Rescue Team	58199/58779/58899/58888

ECC RADIO FREQUENCIES

Used to relay information to outside services, additional information can be found in section 1 page 10.

CHANNEL #	RX FREQ.& SQUELCH	TX FREQ.& SQUELCH
3 – for Harmer	168.93 – "TPL 91.5"	168.06 – "TPL 91.5"
10 – for Plant	169.99 – "TPL 103.5"	167.925 – "TPL 103.5"

Channel 3 is an emergency channel at Harmer (Mine Site)
Channel 10 is an emergency channel at Plan (Coal Plant)
Major Disaster Conference Room #301 425-8937

13. MEDIA

Only the Lead Communication Specialist, General Manager, or Manager of Public Affairs will contact the Media if necessary

14. EPP AND ERP DISTRIBUTION AND REVISIONS

14.1 EPP RECORD OF REVISIONS

Table 11: EPP Record of Revisions

Revision #	Date	**Section(s) Revised/Added/Deleted and Reason**
Original		
1	January 2012	First draft completed
2	November 2014	All sections reviewed and updated to meet current procedures and standards. The majority of Contact Information has been moved to the Emergency Preparedness Manual (EPM).

14.2 ERP RECORD OF REVISIONS

Table 12: ERP Record of Revisions

REVISION #	DATE	**SECTION(S) REVISED/ADDED/DELETED AND REASON**
Original		
1	January 2012	First draft completed
2	November 2014	All sections reviewed and updated to meet current procedures and standards. The majority of Contact Information has been moved to the Emergency Preparedness Manual (EPM).

14.3 ERP DISTRIBUTION LIST FOR REVISIONS

This document now forms its own chapter in the Emergency Preparedness Manual (EPM) for Teck Coal Elkview Operations. Please refer to the distribution list in the EPM. THE EPP/ERP is also available online as part of SiteLine and SharePoint Standard Practices and Procedures; in the Engineering section.

15. EVENT LOG AND RECORD OF ASSIGNMENT

Table 13: Event Log

Event:					
Responder's Name:		Assigned Position:			
Date:		Time Log Opened:			
Instructions	Begin this log immediately on being assigned to an emergency response function. Document all events and responses as they occur. Care and control of this log is your responsibility. Continue to keep this log until advised to stand down. Submit this log only to the Emergency Coordinator or to the Site Control Post				
TIME	TO	FROM	ACTION	FOLLOW-UP	CLOSED

Table 14: Record of Assignment

RECORD OF ASSIGNMENTS Page __ of __ Event:		
Date: _____ Time Record Opened: _____		
DATE & TIME	NAME	ACTION and FOLLOW-UP