

Nechako Reservoir

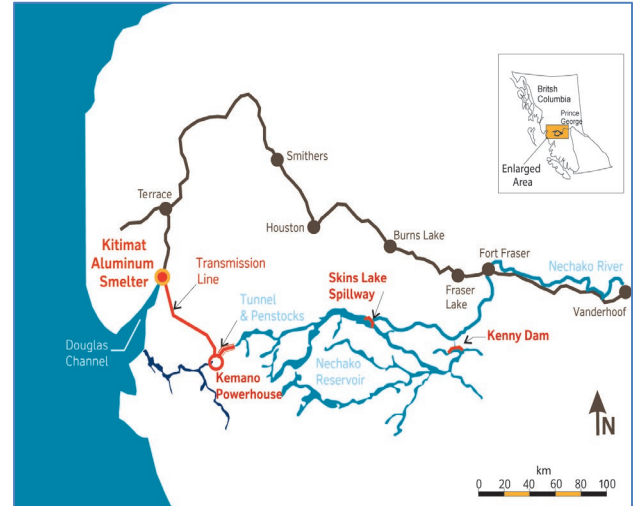
Dam Emergency Plan (DEP)

Dam Alert

**Kenny Dam
(Breach)**

**Saddle
Dams
(Breach)**

**Extreme
Flood**



DAM Owner: RioTinto (Operations Director - Power & Services)

Prepared By: Rio Tinto BC Works Power and Nechako Reservoir Management Teams

**** About this Document ****

This document is specific to Nechako Reservoir emergency management and details information and procedures **to be used and followed by Rio Tinto** staff during the following events;

1. **Dam Alert** (Risk of Dam Breach) - refer to [section 2.1](#)
2. **Dam Breach** - refer to [section 2.2](#) (Kenney Dam) or [section 2.3](#) (Saddle Dams)
3. **Extreme Flood** - refer to [section 2.4](#)
4. **DEP Communication Test** - refer to [section 8](#)
5. **Other Emergencies** - refer to [Appendix E](#).

This plan is intended to have sufficient detail regarding the potential flooding impacts downstream of the Nechako Reservoir to assist downstream communities prepare emergency response plans as per BC Dam Safety Guidelines.

In an emergency event, Rio Tinto will notify the affected stakeholders identified under [Appendix A2 - Notification Chart](#) using One Call Now notification system. This will be a notification of the event only!

IMPORTANT – it is your responsibility to enact your emergency response plan upon receiving this notification.

Subsequent notifications about the event will be made by Rio Tinto as information becomes available, using the same notification procedure, and until alternate emergency communication coordination is developed, as deemed appropriate.

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ECopy of this document available on the 'Get Involved Nechako' website.

Link here → https://www.getinvolvednechako.ca/learn-more-our-operations?tool=qanda#tool_tab

PREFACE

Rio Tinto BC Works has prepared this Dam Emergency Plan (DEP), once referenced as the Emergency Preparedness Plan (EPP) in keeping with regulatory requirements, and for the benefit of downstream communities. This plan is intended to have sufficient detail regarding the potential flooding impacts downstream of the Nechako Reservoir to assist downstream communities prepare emergency response plans as per B C Dam Safety Guidelines ([Dam Safety Regulation \[O.I.C. 114, B.C. Reg. 40/2016\]](#) under the Water Sustainability Act effective February 29, 2016).

This edition of the DEP has been prepared with reference to [Guide & Template for Preparing a Dam Emergency Plan \(DEP\) in British Columbia](#) .

How to use this document and when to use this document:

- 1) **DAM ALERT:** This document is to be used in the event of a Dam Alert, of a risk of a dam breach. **Go to [section 2.1](#)**
- 2) **DAM BREACH:** This document is to be used in the event of a Dam Breach Emergency. **Go to section 2.2 for Kenney Dam, Go to [section 2.3 for Saddle Dams](#)**
- 3) **EXTREME FLOOD:** This document is to be used in the event of an extreme flood such as the Probable Maximum Flood. **Go to [section 2.4 for Extreme Flood](#)**
- 4) **DEP COMMUNICATION TEST:** This document is to be used for all Nechako Reservoir DEP communication tests. **Go to [Section 8 -NECHAKO RESERVOIR DEP COMMUNICATION TEST](#)**

FOR OTHER EMERGENCIES: If other emergencies arise refer to [Appendix E – Other Emergency and Response Guidance Chart](#) for information that may be useful.

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1. INTRODUCTION

1.1 General

This Nechako Reservoir DEP facilitates communication and understanding of potential consequences of flood emergencies related to Nechako Reservoir.

The DEP contains information that can be used to prepare emergency response plans, warnings, and evacuation procedures for the protection and security of downstream communities.

In the event of a Nechako Reservoir DEP Communication test, refer to [Section 8 - NECHAKO RESERVOIR DEP COMMUNICATION TEST](#).

1.2 Roles & Responsibilities

The following are the basic emergency planning and response roles and responsibilities for the five key agencies involved when a level 2 or 3 emergency occurs. For more detailed information regarding emergency planning, preparedness, response and recovery refer to the document, [British Columbia Emergency Management System \(BCEMS\) 2016](#).

1.2.1 Dam Owner (Rio Tinto BC Operations Director)

- As soon as an emergency event is observed or reported, immediately determine the emergency level (see [APPENDIX F - Guidance for Determining the Emergency Level, Appendix F](#)).
 - Level 1: unusual event, slowly developing
 - Level 2: potential dam failure situation, rapidly developing
 - Level 3: dam failure appears imminent or is in progress
- Immediately notify the personnel in the order shown on the [Appendix A-2 – Notification Chart](#) for the appropriate emergency level.
- Undertake appropriate remedial actions during Level 2. Remedial actions may be recommended by the Dam Owners Technical Representative or required by the Dam Safety Officer.
- Provide updates of the situation to the local emergency authority to assist them in making timely and accurate decisions regarding warnings and evacuations.
- Provide leadership to assure the DEP is reviewed and updated annually and copies of the revised DEP are distributed to all who received copies of the original DEP including the records for the local emergency authorities. Undertake DEP exercises as appropriate.

1.2.1.1 Rio Tinto Internal Roles & Responsibilities

BC Works General Manager

Responsibility for overall safety of the Dams.

Operations Director

Act as the DAM Owner as described in 1.2.1 responsibilities, and delegate activities in the response to Reservoir Operations personnel and Manager, Communication and Communities.

Reservoir Operations Personnel

Responsible for day to day operation of the reservoir and to carry out the necessary actions under the Nechako Reservoir DEP and as directed by the Operations Director.

In the event of an emergency which could affect downstream communities, the designated Reservoir Operations personnel are responsible for initiating a warning system to notify the specified emergency agencies. Roles performing this responsibility include;

- Nechako Reservoir Coordinator & Power Operations Superintendent (*supports role as Dam Owner's Technical Representative*)
- System Operations
- Resident Attendant
- Power Control Room
- Plant Protection

Manager, Communication and Communities

Responsible for development and implementation of the Rio Tinto BC Operations Emergency Communications Plan. This includes announcements, updates and releases, as well as responses to media enquiries, the co-ordination of media interviews with designated spokespeople, and media site visits.

1.2.2 Local Emergency Authorities

Local emergency authorities support and coordinate the overall emergency response activities within its geographical or functional jurisdiction.

- Serve as the primary contact responsible for coordination of all emergency actions for potentially affected communities.
- When a Level 2 situation occurs:
 - Prepare emergency response personnel for possible evacuations that may be needed if a Level 3 situation occurs.
 - Consider drafting a State of Local Emergency in preparation for Level 3.
 - Provide resources as necessary to the dam owners.
- When a Level 3 situation occurs:
 - Initiate warnings and order evacuation of people at risk downstream of the dam.
 - Declare a State of Local Emergency if required.
 - Direct local emergency response services (may include local law enforcement) to carry out the evacuation of people and close roads within the evacuation area (see [APPENDIX G - Inundation Maps](#))
 - Provide resources as necessary to the dam owners.
- Decide when to terminate the emergency.
- Participate in review, updates and exercises of the DEP.

1.2.3 Emergency Management BC (EMBC)

Emergency Management BC (EMBC) is the lead agency in the provincial government for all emergency management activities. EMBC works with local governments, First Nations, federal departments, industry, non-government organizations and volunteers to support the emergency management phases of mitigation/ prevention, preparedness, response and recovery. EMBC has its headquarters, the Provincial Emergency Co-ordination Centre (PECC) and the 24/7 Emergency Call Centre (ECC) in Victoria. Six Provincial Regional Emergency Operations Centres (PREOCs) are located in Terrace, Prince George, Kamloops, Nelson, Surrey and Victoria (co-located with the PECC).

- When a Level 2 or Level 3 situation occurs, provide support as requested or required. For example:
 - Assist local emergency authority when notified of the activation of local emergency plans with issuance of an emergency task number.
 - Propagate the emergency information to other relevant stakeholders.
 - Support the communication needs of local emergency authority.
 - Declare a Provincial State of Emergency if required.
- Participate in exercises of the DEP.

1.2.4 Dam Owner's Technical Representatives

- Undertake an engineering assessment of the safety hazard at the dam.
- Assist the dam owner to determine the emergency level, if time permits.
- Advise the dam owner of remedial actions to take if Level 2 event occurs, as required.

1.2.5 Ministry of Forests, Lands and Natural Resource Operations

- MFLNRO is the ministry responsible for the provincial government "Dam Emergency Response Plan (DERP)" under the Emergency Program Act. The BC Dam Safety Program administers the DERP and has an active role in all levels.
- The DSO is the first point of contact in MFLNRO for Level 1, and, is required to inform EMBC if a dam is considered to be at Level 1. EMBC may contact the local emergency authority at their discretion.
- The DSO may have an active role in Levels 2 and 3. The DSO may advise the dam owner of the emergency level determination.
- The DSO may advise the dam owner of remedial actions to take if Level 2 event occurs.
- Support EMBC, local emergency authorities, and other agencies. The DSO may be called on to be the Subject Matter Expert at an emergency response center.
- The Dam Safety Officer (DSO) is responsible for reviewing and accepting the DEP.

1.3 Reporting

The **Plant Protection** phone number is posted on all Nechako Reservoir Dams to facilitate public reporting of dam related concerns and emergencies. However an emergency could be reported from or to any number of sources.

All emergencies should be reported first to **Plant Protection**. **Plant Protection** will immediately activate the communication protocol in this document on the Notification Chart provided in [Appendix A-2 – Notification Chart](#).

In order to facilitate the management of an emergency, each person involved will keep a written record of all communications related to the emergency. Within 24 hours of an emergency occurring or being reported, the Skins Lake Attendant, Plant Protection, the on-duty Power Control Room Operator, and the Operations Director (or in their absence, the Coordinator) will each complete and submit a "**Notification of Emergency Response**" form found in [Appendix B1 - Notification of Emergency Response](#) to Rio Tinto BC Works Power Control Room.

The **Operations Director** will also submit a copy of the report to the **General Manager of B.C. Works**.

Each person making or receiving reports will maintain a diary of events form found in [Appendix B-2 - Diary of Events](#). The diary will include brief details of:

- Date and time;
- Location of incident;
- Summary of incident, including times;
- Names of persons involved;
- Agencies notified and time called;
- Action taken and present condition; and
- Further action planned.

1.4 Review

The Nechako Operations Coordinator will ensure that all Reservoir Operations personnel become thoroughly familiar with the Nechako Reservoir DEP and the procedures for emergency reporting, notification, and action described in [Section 2 - EMERGENCY SCENARIOS](#).

Annual Nechako Reservoir DEP reviews will be conducted under direction of Operations Director using the following DEP Document Review **process steps**;

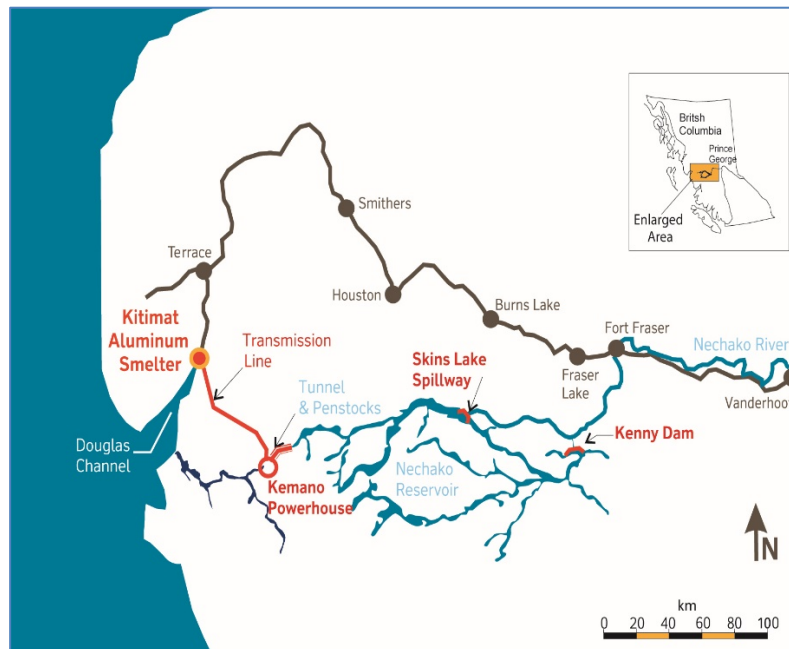
1.4.1 DEP Document REVIEW process Steps:

1. Operations Director requests Document Controller to perform Document Review (occurs annually)
2. Document Controller updates DEP, as required
 - a. Input: Filled forms of [C-2 Request for Revision](#) received
 - b. Input: Review of Contact information all [APPENDIX A - Notifications & Contacts](#) and any other updates to DEP document
 - c. Output: DEP updated document (*not reviewed*)
3. Document Controller will put DEP document into Review
 - a. Input: [Appendix C-3 Review Routing](#) and any Requests for outside agencies to review (made by internal Rio Tinto management with [Appendix C-4 Record of Review by Outside Agencies](#))
 - b. Output: DEP updated document (*reviewed with comments*)
4. Final Updates & Approval (update DEP & [Section 9 Record of Document Revision](#))
 - a. Output: DEP Document (Final with Version assigned)
5. DEP Document (new version) Copies Distributed and Letter of Understanding filled for each recipient
 - a. Input: [Appendix A-3 DEP Distribution List and Contacts](#)
 - b. Output: [Appendix C-1 Letter of Understanding](#) (filled for each DEP recipient)

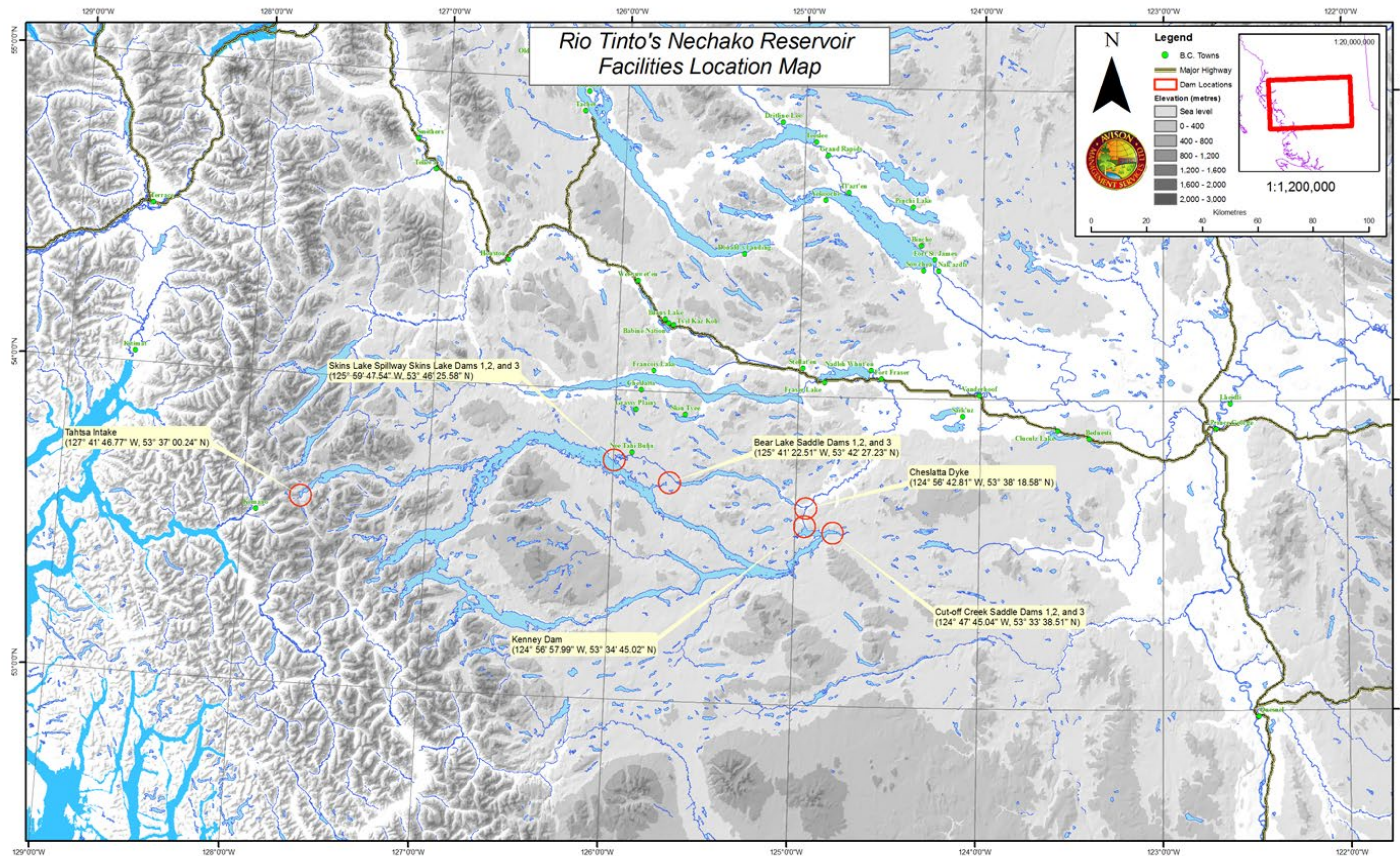
1.5 Location and Map

The Nechako Reservoir has one principal dam, the 95-m-high rockfilled dam with a clay core, Kenney Dam; nine smaller earthfill saddle dams; and Skins Lake Spillway, a reinforced concrete structure with two steel radial gates. Kenney Dam is situated at the eastern end of the reservoir, approximately 87 km south-west of Vanderhoof. Three of the saddle dams are situated at Cut-off Creek to the south-east of Kenney Dam. The spillway and another three of the saddle dams are situated at Skins Lake on the northern shore of the reservoir, approximately 70 km north-west of Kenney Dam. The remaining three saddle dams are situated at Bear Lake to the south-east of the spillway. Throughout the Nechako Reservoir DEP, the 10 dams and the spillway are referred to collectively as the dams. The dams were designed, constructed and have been maintained by Rio Tinto since the beginning of impoundment in 1953. Refer to the following image below and Map on the following page ([Section 1.5.1 Nechako Reservoir Facilities Location Map](#)):

Rio Tinto BC Works Aluminium Smelter, Power and Nechako Reservoir Facilities (shown in Red)



1.5.1 Nechako Reservoir Facilities Location Map



1.6 List of Facilities and Geographic Information

For geological reference, refer to Map → ([Section 1.5.1 Nechako Reservoir Facilities Location Map](#)):

Name of Facility	Latitude N	Longitude W	UTM Northing Zone 10 *(Zone 9)	UTM Easting Zone 10 *(Zone 9)
Kenney Dam	53°34'45.28"	124°56'58.29"	5938477	370931
Skins Lake Spillway	53°46'25.56"	125°59'47.55"	5962519	302542
Skins Lake Saddle Dam No. 1	53°46'35.57"	125°59'59.23"	5962837	302341
Skins Lake Saddle Dam No. 2	53°46'26.01"	125°59'48.13"	5962532	302532
Skins Lake Saddle Dam No. 3	53°46'13.17"	125°58'16.83"	5962066	304186
Bear Creek Saddle Dam No. 1	53°41'58.18"	125°42'13.07"	5953482	321524
Bear Creek Saddle Dam No. 2	53°42'27.23"	125°42'22.52"	5954386	321385
Bear Creek Saddle Dam No. 3	53°42'43.62"	125°42'34.50"	5954902	321185
Cut-off Creek Saddle Dam No. 1	53°34'26.21"	124°49'07.54"	5937659	379573
Cut-off Creek Saddle Dam No. 2	53°34'26.62"	124°49'00.70"	5937668	379699
Cut-off Creek Saddle Dam No. 3	53°34'24.96"	124°48'55.30"	5937614	379797
Cheslatta Dyke	53°38'32.48"	124°57'10.02"	5945504	370909
West Tahtsa Intake	53°37'00.24"	127°41'46.77"	*5941670 (Zone 9)	*586236 (Zone 9)

2. EMERGENCY SCENARIOS

The types of emergency situations covered within this Nechako Reservoir DEP are:

- **Dam Alert** ([Section 2.1](#))
- **Kenney Dam Breach** ([Section 2.2](#))
- **Saddle Dam Breach** ([Section 2.3](#))
- **Extreme Flood Release** ([Section 2.4](#))

Other emergencies (listed below) are referred to in [Appendix E-1 – Other Emergency and Response Guidance Chart](#). A table is provided and guidance given in terms of what to do if these circumstances occur.

- Landslides,
- Severe Storms,
- Fire,
- Oil, hazardous substances or pesticide spills,
- Major fish or wildlife losses in reservoir,
- Drownings and accidents in reservoir, or
- Criminal activity

2.1 Dam Alert

A dam alert is any condition that poses an immediate threat to the safety of any of the dams, the spillway, their foundations or abutments which could result in a large or rapidly increasing uncontrolled flow of water from the reservoir. This situation requires swift action to prevent development of a dam breach. The situation may require very large releases from the spillway, which may result in substantial downstream flooding.

The following 5 step process will be taken in the event of a Dam Alert Emergency:

- Step 1: Response
- Step 2: Verification
- Step 3: Notification and Remedial Action
- Step 4: Reporting
- Step 5: Media Contacts

2.1.1 Response

If you observe a dam alert condition at any of the dams, or anyone who learns or suspects for good reason that dam alert conditions exist, immediately contact and report to **Plant Protection** in Kitimat (telephone number 250-639-8273). If another person receives a dam alert report, they will transfer the call to **Plant Protection**.

Plant Protection will obtain the following information:

- the observer's name, current location and telephone number;
- details of the threat, including:
 - type, i.e. slide, slough, settlement, cracking, seepage, etc.;
 - location and extent;
 - likelihood of deterioration;
 - effect on adjacent structures;
 - reservoir level;
 - weather conditions; and
- any other relevant details.

2.1.2 Verification

Plant Protection will attempt to confirm that the report is genuine. Verification may include:

- recognition of the caller;
- corroborating evidence from current conditions, e.g. weather, earthquake;
- independent verification by the R.C.M.P. or other sources using the caller's name, telephone number and location;
- Rio Tinto personnel must be included in the verification process

2.1.3 Notification and Remedial Action

After attempting to verify that the dam alert report is genuine, **Plant Protection** will immediately relay the report to **the General Manager or Operations Director** or, delegate.

After whatever additional verification is deemed appropriate, the **Operations Director** will give authority for Plant Protection to:

- Follow notifications as shown in [Appendix A-2 Notification Chart](#), making certain that everyone understands the nature of a dam alert situation, and the possibility of an eventual dam breach.
- evaluate the threat;
- determine and implement immediate actions to reduce or eliminate the risk of a breach, including:
 - dumping of filler material on a boil, pipe or cloudy seepage;
 - dumping of fill material into a crack or void in the dam, or at the toe of a slide; and
 - repairs to structures or operating equipment.
 - if very large spillway releases are required, initiate the notifications shown on Appendix A-2 Notification Chart;
 - if the situation deteriorates and a dam breach becomes imminent or occurs, initiate the the appropriate Dam Breach notifications and procedures ([Section 2.2 - Kenney Dam Breach](#) or [Section 2.3 - Saddle Dam Breach](#)).

2.1.4 Reporting

Use form located in [Appendix B-1- Notification of Emergency Response](#).

- As soon as practicable, each person responding to an emergency or reported emergency will complete and submit a **Notification of Emergency Response** form to the **Operations Director**.
- The **Operations Director** will keep a complete record of any emergency or reported emergency and, as soon as practicable, will also complete and distribute a **Notification of Emergency Response**.

Filled Notification of Emergency response forms are to be sent to Power Operations Control Room.

2.2 Kenney Dam Breach

A breach of Kenney Dam consists of a failure of the dam or its foundations or abutments accompanied by a large or rapidly increasing uncontrolled flow of water from the reservoir. This is the most serious emergency involving the Nechako Reservoir, and will result in extensive downstream flooding.

The following 7 step process will be taken in the event of a Kenney Dam Breach Emergency:

- Step 1: Response
- Step 2: Verification
- Step 3: Notification
- Step 4: Remedial Action
- Step 5: Reporting
- Step 6: Inundation Maps
- Step 7: Media Contacts

2.2.1 Response

If you observe a breach in Kenney Dam, or flow conditions which indicate that a breach has occurred, you will immediately contact and report to **Plant Protection** on duty in Kitimat 250-639-8273. (If another person receives a dam breach report, they will transfer the call to **Plant Protection**.)

Plant Protection will obtain and record:

- the observer's name, current location and telephone number:
- the position and estimated size of breach:
- the estimated rate or depth of flow:
- the estimated rate of enlargement:
- the estimated time breach occurred:

2.2.2 Verification

Plant Protection will attempt to confirm that the report is genuine. Verification may include:

- recognition of the caller;
- corroborating evidence from current conditions, e.g. weather, earthquake;
- independent verification by the R.C.M.P. or other sources using the caller's name, telephone number and location;
- Rio Tinto personnel must be included in the verification process;
- Piezo Instrumentation;
- CCTV

2.2.3 Notification

After attempting to verify that the breach report is genuine, **Plant Protection** will immediately relay the report to the **Control Room Operators** and the **Operations Director** or, delegate. After whatever additional verification is deemed appropriate, the **Operations Director** will immediately initiate the notifications shown in Section 9. The notifications are listed in order of priority to maximize the time available for the safe evacuation of downstream communities at risk, and the time available for remedial action.

2.2.4 Remedial Action

After initiating the notifications, the **Operations Director** will take all practicable steps to stem the breach.

2.2.5 Reporting

Use form located in [Appendix B-1- Notification of Emergency Response](#).

- As soon as practicable, each person responding to an emergency or reported emergency will complete and submit a **Notification of Emergency Response** form to the **Operations Director**.
- The **Operations Director** will keep a complete record of any emergency or reported emergency and, as soon as practicable, will also complete and distribute a **Notification of Emergency Response**.

Filled Notification of Emergency response forms are to be sent to Power Operations Control Room.

2.2.6 Inundation Maps

Inundation maps provide sufficient information about potential flood arrival times and water levels to enable local and provincial emergency authorities to develop warning and evacuation procedures for threatened downstream communities.

The maps are based on computer model simulations of a hypothetical breach of Kenney Dam. These techniques involve making assumptions regarding the mode of dam failure and the existing downstream flows – actual conditions may differ from those assumed. The illustrated extent of the inundated areas is only approximate. Refer to [Appendix G for Inundation Maps](#) concerning a Kenney Dam Breach.

2.2.7 Media Contacts

The **Manager, Communication and Communities**, Rio Tinto BC Works will be responsible for overseeing communications, including announcements, updates and releases, as well as responses to media enquiries, the co-ordination of media interviews with designated spokespeople, and media site visits.

2.3 Saddle Dam Breach

A Saddle Dam Breach consists of a failure of one of the nine saddle dams, the spillway, or their foundations or abutments accompanied by a large or rapidly increasing uncontrolled flow of water from the reservoir. This is the second most serious emergency involving the Nechako Reservoir. A saddle dam breach may result in extensive downstream flooding.

The following 7 step process will be taken in the event of a Kenney Dam Breach Emergency:

- Step 1: Response
- Step 2: Verification
- Step 3: Notification
- Step 4: Remedial Action
- Step 5: Reporting
- Step 6: Inundation Maps
- Step 7: Media Contacts

2.3.1 Response

If you observe a breach in one of the saddle dams or the spillway, or of flow conditions which indicate that a breach has occurred, you will immediately contact and report to **Plant Protection** on duty in Kitimat (250-639-8273). If another person receives a dam breach report, they will transfer the call to **Plant Protection**.

Plant Protection will obtain and record:

- the observer's name, current location and telephone number:
- the position and estimated size of breach:
- the estimated rate or depth of flow:
- the estimated rate of enlargement:
- the estimated time breach occurred:

2.3.2 Verification

Plant Protection will attempt to confirm that the report is genuine. Verification may include:

- recognition of the caller;
- corroborating evidence from current conditions, e.g. weather, earthquake;
- independent verification by the R.C.M.P. or other sources using the caller's name, telephone number and location;
- Rio Tinto personnel must be included in the verification process

2.3.3 Notification

After attempting to verify that the breach report is genuine, **Plant Protection** will immediately relay the report to **Control Room Operators** and the **Operations Director** or, delegate. After whatever additional verification is deemed appropriate, the **Operations Director** will immediately initiate the notifications shown in Section 9. The notifications are listed in order of priority to maximize the time available for the safe evacuation of downstream communities at risk, and the time available for remedial action.

2.3.4 Remedial Action

After initiating the notifications, the **Operations Director** will take all practicable steps to stem the breach.

2.3.5 Reporting

Use form located in [Appendix B-1- Notification of Emergency Response](#).

- As soon as practicable, each person responding to an emergency or reported emergency will complete and submit a **Notification of Emergency Response** form to the **Operations Director**.
- The **Operations Director** will keep a complete record of any emergency or reported emergency and, as soon as practicable, will also complete and distribute a **Notification of Emergency Response**.

Filled Notification of Emergency response forms are to be sent to Power Operations Control Room.

2.3.6 Inundation Maps

Inundation maps provide sufficient information about potential flood arrival times and water levels to enable local and provincial emergency authorities to develop warning and evacuation procedures for threatened downstream communities.

The maps are based on computer model simulations of a hypothetical breach of a Saddle Dam. These techniques involve making assumptions regarding the mode of dam failure and the existing downstream flows - actual conditions may differ from those assumed. The illustrated extent of the inundated areas is only approximate. Refer to [Appendix G. for Inundation Maps](#) concerning a Saddle Dam Breach.

2.3.7 Media Contacts

The **Manager, Communication and Communities**, Rio Tinto BC Works will be responsible for overseeing communications with the media, including announcements, updates and releases, as well as responses to media enquiries, the co-ordination of media interviews with designated spokespeople, and media site visits.

2.4 Extreme Flood Release

An extreme flood release is defined as a Skins Lake Spillway discharge at or near the Probable Maximum Flood (PMF) of **1653** m³/s. The PMF results from the combination of a severe hydrometeorological event followed – or preceded - by a second extreme event (Canadian Dam Association Guidelines, 2007).

The PMF flood is estimated to produce a peak daily inflow to the Nechako Reservoir of between **3566** m³/s. The Nechako Reservoir is capable of temporarily storing the major portion of these inflows. However, the PMF would require very large releases from Skins Lake Spillway of up to a maximum of approximately **1653** m³/s. These releases would be necessary to prevent excessively high water levels which could cause breaching of the dams.

The PMF would also be accompanied by a substantial rise in reservoir level which would cause flooding around the shoreline. It is anticipated that snowpack and/or weather conditions, together with monitoring of reservoir levels would provide a minimum of several days warning of the need to make very large releases.

The following 4 step process will be taken in the event of an Extreme Flood Release Emergency:

- Step 1: Notification
- Step 2: Reporting
- Step 3: Inundation Maps
- Step 4: Media Contacts

2.4.1 Notification

If conditions indicate the need for very large releases from Skins Lake Spillway, the **Operations Director** will initiate the notifications as shown in [Appendix A-2 - Notification Chart](#).

2.4.2 Reporting

The **Operations Director** will keep a complete record of any information related to the assessment of the flooding forecast, and as soon as practicable, will also complete and distribute a Notification of Emergency Response, which will include the assessed flood forecast relevant to the PMF.

Use form located in [Appendix B-1- Notification of Emergency Response](#).

- As soon as practicable, each person responding to an emergency or reported emergency will complete and submit a **Notification of Emergency Response** form to the **Operations Director**.
- The **Operations Director** will keep a complete record of any emergency or reported emergency and, as soon as practicable, will also complete and distribute a **Notification of Emergency Response**.

Filled Notification of Emergency response forms are to be sent to Power Operations Control Room.

2.4.3 Inundation Maps

Inundation maps are based on computer model simulations of a Probable Maximum Flood (PMF) release from Skins Lake Spillway. These techniques involve making assumptions regarding various parameters and the existing downstream flows. If the PMF occurred, actual conditions may differ from those assumed. The illustrated extent of the inundated areas is only approximate. Refer to [Appendix G. for Inundation Maps](#) concerning an Extreme Flood Release.

2.4.4 Media Contacts

The **Manager, Communication and Communities**, Rio Tinto BC Works will be responsible for overseeing communications with the media, including announcements, updates and releases, as well as responses to media enquiries, the co-ordination of media interviews with the designated spokespeople, and media site visits.

3. ACCESS

3.1 Road

The dams are accessible from the north from Highway 16 by two gravel forest service roads, one near Houston, and the other at Burns Lake, which involves a ferry crossing of Francois Lake. The dams are also accessible from the north-east by roads from Highway 16 at Fraser Lake and Vanderhoof. Access roads are shown on [Appendix D-1 Access Map](#), located in the Appendix of this DEP.

3.2 Air

Airstrips suitable for fixed-wing aircraft are located at Burns Lake, Fraser Lake, and Vanderhoof. The reservoir may be suitable for the landing of float planes, depending upon weather conditions. There are suitable helicopter landing sites near each of the dams. Jet fuel is available at Skins Lake Spillway and Nechako Lodge near Kenney Dam.

3.3 Interruption of Access - Effect of Dam Breach

3.3.1 Road

In the event of a breach in Kenney Dam, access would still be possible from the north via the Houston forest service road, but large portions of Highway 16, including sections around the Burns Lake access road junction, and the access roads from Highway 16 at Fraser Lake and Vanderhoof would be impassable. In the event of a breach of one of the Skins Lake or Bear Creek saddle dams, road access would still be possible via Houston and Burns Lake as far as the breach, but road access to Kenney Dam would be lost.

4. ELECTRICAL POWER SOURCES

4.1 Skins Lake Spillway

The two gates are powered by separate electric motors. The motors are powered from underground electrical cable initiating at the Skins Lake Spillway generator building. Energy is provided by a connection to BC Hydro and in addition is backed by a 40 kW diesel generator.

The stoplogs are raised and lowered by hydraulically operated winches and, in case of emergency operation, by hydraulically operated cylinders. The hydraulic power is provided by a self-contained diesel powered portable hydraulic pump set.

4.2 Communication Systems

The electrical supply for the telephone land line network is integral with the telephone lines and is provided from the provincial grid.

The radio equipment and satellite phone at the Skins Lake Spillway Attendants residence can be independently powered by a generator.

The UHF telephone at the Nechako Lodge is independently powered by generators.

4.3 Power Supply - Effect of Dam Breach

The power supplies for the spillway gates and stoplogs would not be affected by a dam breach except if it is the spillway or adjacent dams that have been breached.

The interruption of land line telephone power supplies would match the interruption of land line telephone communications. The independent power supplies for the radio equipment and satellite phone at the Skins Lake Spillway Attendant's residence and the UHF telephone at the Nechako Lodge would not be affected.

5. WARNING SYSTEMS

A warning siren is mounted on the Skins Lake Spillway, and is sounded before changing the position of the gates, in order to warn persons in the valley immediately downstream of an impending increase in flow.

In the event of a PMF local and provincial emergency authorities will be notified of anticipated changes in spillway discharge as prescribed in this DEP, see [Section 2 - EMERGENCY SCENARIOS](#), specifically [Section 2.4 - EXTREME FLOOD RELEASE](#).

The **Manager, Communication and Communities**, Rio Tinto BC Works will be responsible for developing a communications plan.

6. CONSTRUCTION EQUIPMENT, MATERIAL, LABOUR & ENGINEERING EXPERTISE

6.1 Construction Equipment

Items of construction equipment which could be used to assist emergency repairs are located at the Skins Lake Spillway (telephone: 250-694-3532), including:

- Backhoe (4WD);
- Truck-mounted Hiab
- Pick up

6.2 Construction Materials

Types of construction materials which could be used to assist emergency repairs are located at the Skins Lake Spillway (telephone: 250-694-3532), including:

- Concrete mix (*Procured as required*)
- Crush rock (*Procured as required*)
- Sand (*Procured as required*)

6.3 Fill Materials

Sources of fill materials at each dam location are shown on Figures A2 and A3 and on the following drawings, shown on Figures A4-A8.

Note: The following identified drawing numbers are BC Works referenced file numbers.

Location	Material	Drawing Ref.	Appendix. Doc Ref.
Skins Lake Dams No. 1, 2 and 3			
Dam No.1 & 2	Rock Rip Rap	Drawing 120-SF-90	(Appendix D-3 – Drawing 120-SF-90 (Skins Lake Dam No. 1 & 2))
	Till-like material (“clay pit”)		
Dam No. 3	Rock Rip Rap	Drawing 120-191	Appendix D-4 - Drawing 120-191 (Skins Lake Dam No. 3)
	Till-like material (“clay pit”)	Drawing 120-191 and Drawing 120-SF-91	Appendix D-5 - Drawing 120-SF-91 (Skins Lake Dam No. 3)
Bear Lake Dams			
No. 1, 2 & 3	Till-like material (“clay pit”)	Drawing 117-BF-12	Appendix D-6 - Drawing 117-BF-12 (Bear Lake Dams No. 2 & 3)
	Sand and Gravel		Appendix D-2 – Drawing Fill Materials (Bear Lake Dam No.1)
	** Riprap is available at a quarry 1.5 miles along the road to the east (St.Mary Pit)		
Kenney Dam			
Kenney Dam & Cutoff Creek Dams No. 1,2 &3	Impervious Fill	Drawing 113-5	Appendix D-7 - Drawing 113-5 (Kenney Dam location of Borrow Areas)
	Gravel Filler		
	Rock Quarry		

7. COMMUNICATION RESOURCES

7.1 Telephone Facilities

Telephones land lines are located at the Skins Lake Spillway Attendant's residence. Radio communication equipment is also located at the Skins Lake Spillway Attendant's residence.

A telephone land line is located at the Nechako Lodge near Kenney Dam. The telephone operates on UHF via a repeater on Fraser Mountain.

Available communications at the Skins Lake Spillway residence include:

- Telephone 250-694-3532
- Satellite phone : 011-8816-514-50623
- Cell 250-251-0285

7.2 Mobile Radio Phone

If the attendant is not able to be contacted on the phone or by the Sat phone, contact can be made on the mobile radio by following these instructions.

Skins Lake Communications Procedures are:

Between Bear Lake Dams and the Spillway:

Dial 1-250-845-2631 - when you hear a beep dial in the ANI # 28461 which rings the Rio Tinto truck.

Between Kenney Dams and Cut-off Creek Dams:

Dial 1-250-692-7876 - when you hear a beep press * and dial in the ANI # 28461 which rings the Rio Tinto truck.

Dial 1-250-692-7994 - when you hear a beep dial in the ANI #28461 which rings the Rio Tinto truck.

7.3 Two-Way Radios

Procedures for notifying via truck radio have been updated using new province wide channels. There are truck-to-truck two-way radios in the Hiab (vehicle # 813, Motorola Serial 428TXS2286) and one mounted to the security cabinet in the attendant's office at the spillway (Motorola MaxTrac). There is one truck-to-truck two-way radio (Kenwood TK 270) which is available to install in the vehicle used by contractors on a seasonal basis.

There are three hand-held two-way radios which when not in use are kept in the attendant's office at the spillway (Motorola HT1250 Serial #749HJFA435 and Motorola HT 1250 Serial #749HFJB252).

There are no telephone facilities at the other dams. The nearest available telephone to each dam is as follows: for dam locations refer to map on Page 4, Section 1.5

<u>DAM</u>	<u>NEAREST TELEPHONE</u>	<u>NUMBER</u>
Kenney Dam	Nechako Lodge	250-412-2665
Cut-off Creek Dams	Nechako Lodge	250-412-2665
Bear Lake Dams	Skins Lake Spillway	250-694-3532

7.4 Interruption of Communication – Effect of Dam Breach

In the event of a breach in Kenney Dam, telephone communication with the Nechako Lodge could be interrupted, depending upon the extent of telephone system damage. Telephone communication with Skins Lake Spillway would probably still be possible via the land line, radio equipment, or satellite phone, depending upon the extent of telephone system damage in the Burns Lake area.

In the event of a breach in one of the saddle dams, other than Skins Lake No. 1 or No. 2, land line and radio telephone communication with the Spillway Attendant's residence would still be possible, but communication with Nechako Lodge could be interrupted. In the event of a breach in Skins Lake No. 1 or No. 2, radio telephone communication with the Spillway Attendant's residence would still be possible, but communication with Nechako Lodge could be interrupted.

8. NECHAKO RESERVOIR DEP COMMUNICATION TEST

8.1 General

The **Operations Director** will ensure that the emergency response procedures are practiced periodically. The practices will consist of limited and full communications tests, and operational tests. During tests, notifications must commence with the words "***This is test of the notification procedure for the Nechako Reservoir***" to ensure that there is no doubt that it is a test and not an emergency.

8.2 Limited Communications Tests within Rio Tinto BC Operations

The **Operations Director** will initiate and co-ordinate limited communications tests involving only Rio Tinto BC Operations employees at intervals which he deems appropriate based on staff changes.

8.3 Full Communications Tests Outside Rio Tinto BC Operations

The **Operations Director** will initiate and co-ordinate a full communications test, including external agencies, at least **once a year** as part of the annual DEP document review process.

***Note** - The communication test plan is performed by the DEP review routing participants. Names of the participants are identified in [Appendix C-3](#) Document Review Routing.

8.4 Operational Tests

The planning, co-ordination, and implementation of civil emergency response plans, including warning and evacuation procedures are the responsibility of local and provincial governments. Rio Tinto BC Operations will participate in the planning and initiation of operational tests at the request of the emergency response authorities. The timing of the operational tests will be at the discretion of the emergency response authorities.

8.5 Reporting

The **Operations Director** will ensure that each test is recorded on the log in [Appendix C-5 \(Record of Briefings, Limited and Full Communication Tests\)](#). DEP review routing participants (named in [Appendix C-3](#)) will be requested to provide feedback from the test. The team will meet post-test and feedback from the test will be collected either verbally, personal notes or by use of Test Report form [Appendix B3 \(Test Report\)](#).

The **Operations Director** will prepare and distribute a brief summary of each test ([Appendix C-6](#) - Debrief Meeting Annual DEP Review and Communication Test REPORT), noting any problems encountered and the steps taken to eliminate or overcome them in the future.

9. RECORD OF DOCUMENT REVISIONS

Version No	Change Description	Revised by	Reviewed by	Approved by	Date
6	Regularly scheduled review. Revised mobile radio data. Updated emergency contacts, distribution lists, titles, names.	Power Operations Mgmt	Power Operations Mgmt	Power Operations Management	2012/04
7	Annual review. Updated all references to PEP which is now known as Emergency Management BC. Updated emergency contacts, distribution lists, titles, names.	Power Operations Mgmt	Power Operations Mgmt	Power Operations Management	2013/04
8	Regularly scheduled review. Updated emergency contacts, distribution lists, titles, names.	Power Operations Management	Power Operations Mgmt	Power Operations Management	2015/04
9	Regularly scheduled review. Updated emergency contacts, distribution lists, titles, names.	Power Operations Mgmt	Power Operations Mgmt	Power Operations Management	2017/04
10	Extensive reformatting of document, including updates of Contacts and Distribution Lists.	Debbie Fossil Risk Management Coordinator	Marc Bedard Power Operations Mgmt	Andrew Czornohalan Plant Services and Power Operations Director	2019/04
11	Contacts and Distribution Lists. Document review/updates for 2019 records	Debbie Fossil Risk Management Coordinator	Marc Bedard Power Operations Mgmt	Andrew Czornohalan Plant Services and Power Operations Director	2020/11

APPENDIX A – NOTIFICATIONS & CONTACTS

1. [Appendix A-1](#) – Emergency Contacts for Dam (Rio Tinto BC Works)
2. [Appendix A-2](#) – Notification Chart
3. [Appendix A-3](#) – DEP Distribution List & Contacts
 - a. [Provincial Government Agencies](#)
 - b. [First Nations](#)
 - c. [Municiple Government Agencies](#)
 - d. [Rio Tinto BC Works](#)

Appendix A-1 – Emergency Contacts for Dam (Rio Tinto BC Works)

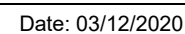
Location	Position	Name	Email Address	Office Phone Number	Contact Phone Numbers
Kitimat	Operation Director - Power & Services	Andrew Czornohalan	Andrew.Czornohalan@Riotinto.com	250-639-8202	250-639-6280 C
Vanderhoof	Nechako Operations Coordinator	TBA			
Vanderhoof	Advisor C&C Watershed	Danielle DeKay	Danielle.Dekay@Riotinto.com	na	250 691-1924 C
Kitimat	Manager Power Operations	Marc Bedard	Marc.Bedard@Riotinto.com	250-639-8060	250-407-2534 C 778-659-0715 H
Kitimat	Superintendent Power Operations	Javier Garcia	Javier.Garcia@Riotinto.com	250-639-8656	250-639-4284 C
Kitimat	Supervisor Power Operations	Jeff Burkitt	Jeff.Burkitt@Riotinto.com	250-639-8410	250-639-6440 C
Skins Lake Spillway	Resident Attendant	Ken and Leah Hanson	Ken.Hanson@Riotinto.com	250-694-3532	250-565-5316 C 011-8816-224-68224 (Sat)
Kemano	Kemano Superintendent	Matt Winks	Matt.Winks@Riotinto.com	250 639 3080	250 632 1164 C
Kitimat	Manager Comm & Communities BC	Kevin Dobbin	Kevin.Dobbin@Riotinto.com	250-639-8343	250-639-5949 C
Kitimat	Regional Security Officer Western Region	Ken Isaak	Ken.Isaak@Riotinto.com	250 639 8334	250-639-6253 C
Kitimat	Manager HSE Kitimat-Kemano	Melissa Winks	Melissa.Winks@Riotinto.com	na	250 407 2450 C
Kitimat	General Manager BC Works			250-639-8338	250-639-0370 C

* **C:** Cellular Phone Number; **H:** Home Phone Number

NECHAKO RESERVOIR DAM EMERGENCY PLAN

NOTIFICATION CHART

DAM ALERT, KENNEY DAM BREACH, SADDLE DAM BREACH, EXTREME FLOOD RELEASE



Appendix A-3 – DEP Distribution List & Contacts

Provincial Government Agencies

Contact		Mailing Address	Physical Address	Telephone	Copy # Issued
BC Water Stewardship	Sean Staplin	PO Box 5000, Smithers BC V0J 2N0	Skeena Region, MOE, 3726 Alfred Ave, Smithers BC	250-847-7362	10
Dam Safety - Victoria	Scott Morgan	PO Box 9340, Victoria BC V8W 9M1	3rd Floor, 395 Waterfront Cres, Victoria BC	250-387-3265	11
Dam Safety - Prince George	Michael Trudell		#325-1011 4th Ave, Prince George BC, V2L 3H9	250-561-3442	12
BC Comptroller of Water Rights	Ted White		395 Waterfront Cres, Victoria BC	778 698-3981	13
EMBC - Terrace					39
EMBC - Surrey	BRIAN KOSTER		14292 Green Timbers Way, Surrey BC V3T 0J4	604-586-4390	15
EMBC - Kamloops	Peter Prendergast		1255-D Dalhousie Dr, Kamloops BC V2C 5Z5	250-371-5240	16
EMBC – Prince George					14
ECOMM	Gail Oye Director Operations Support Services			604-215-622 c- 778-834-6748	34
BC Ambulance Service – Victoria					35
BC Ambulance Service – Vancouver					36
BC Ambulance Service - Kamloops					37
Vancouver Airport	Emer. Preparedness Coordinator			604-276-6124	38

***Note** – With Electronic version of DEP now available on-line for download (*link on cover page of this document*), hard copy holders will be contacted to confirm if they will continue to keep hard copy.

First Nations

Contact		Mailing Address	Physical Address	Telephone	Copy # Issued
Cheslatta Carrier Nation	Corrina Leween (Chief)	PO Box 909 Burns Lake BC, V0J 1E0	1215 Southbank School Rd, Burns Lake BC V0J 1E0	250-694-3334	17
Skin Tyee Nation	Rene Skin (Chief)		6914 Campbell Rd, Burns Lake BC, V0J 1E0	250-694-3517	18
Nee Tahi Buhn Band	Ray Morris (Chief)	RR#2, Site 7, Comp 28 Burns Lake, BC	47975 Olson Rd, Burns Lake, BC V0J 1E0	250-694-3494	19
Nadleh Whut'en First Nation	Larry Nooski (Chief)	PO Box 36 Fort Fraser, BC V0J 1N0	1416 Nautley Rd, Fort Fraser BC V0J 1N0	250-690-7211	20

***Note** – With Electronic version of DEP now available on-line for download (*link on cover page of this document*), hard copy holders will be contacted to confirm if they will continue to keep hard copy.

Municipal Government Offices

Contact		Mailing Address	Physical Address	Telephone	Copy # Issued
Regional District of Bulkley Nechako	Bill Miller (Chair)	PO Box 820 Burns Lake, BC V0J 1E0	37 3rd Ave, Burns Lake BC V0J 1E0	250-692-3195	22
Regional District of Fraser- Fort George	Ark Kaehn (Chair)	155 George St, Prince George BC V2L 1P8	155 George St, Prince George BC V2L 1P8	250-960-4400	23
Cariboo Regional District					32
Village of Fraser Lake	Dwayne Lindstrom (Mayor)	PO Box 430 Fraser Lake BC, V0J 1S0	210 Carrier Cres, Fraser Lake BC, V0J 1S0	250-699-6257	24
District of Vanderhoof	Gerry Thiessen (Mayor)	PO Box 900, Vanderhoof BC, V0J 3A0	160 Connaught St, Vanderhoof BC, V0J 3A0	250-567-4711	21
CITY	Lyn Hall (Mayor)	1100 Patricia Blvd. Prince George BC, V2L 3V9	1100 Patricia Blvd. Prince George BC, V2L 3V9	250-561-7600	25
City of Quesnel	Bob Simpson (Mayor)	410 Kinchant St, Quesnel BC, V2J 7J5	410 Kinchant St, Quesnel BC, V2J 7J5	250-992-2111	26
City of Williams Lake	Walt Cobb (Mayor)	450 Mart St, Williams Lake BC, V2G 1N3	450 Mart St, Williams Lake BC, V2G 1N3	250-392-2311	27
City of Lillooet	Margaret Lampman (Mayor)	PO Box 610, Lillooet BC, V0K 1V0	615 Main St, Lillooet BC, V0K 1V0	250-256-4289	28
District of Hope	Wilfried Vicktor (Mayor)	PO Box 609, Hope BC, V0X 1L0	325 Wallace St, Hope BC, V0X 1L0	604-869-5671	29
City of Chilliwack	Sharon Gaetz (Mayor)	8550 Young Rd, Chilliwack BC, V2P 8A4	8550 Young Rd, Chilliwack BC, V2P 8A4	604-793-2900	30
City of New Westminster	Jonathan Côté (Mayor)	511 Royal Ave, New Westminster BC V3L 1H9	511 Royal Ave, New Westminster BC V3L 1H9	604-521-3711	31

***Note** – With Electronic version of DEP now available on-line for download (*link on cover page of this document*), hard copy holders will be contacted to confirm if they will continue to keep hard copy.

Rio Tinto BC Works

***PLEASE NOTE** - Refer to [Appendix A-1 – Emergency Contacts for Dam \(Rio Tinto BC Works\)](#) for complete list of contacts, as this list only contains those persons with copies of the DEP!

Contact		Mailing Address	Physical Address	Telephone	Copy # Issued
Nechako Operations Coordinator	TBA				1
BC Works General Manager	Affonso Bizon	PO Box 1800, Kitimat BC, V8C 2H2	1 Smeltersite Rd, Kitimat BC, V8C 2H2		2
Operations Director	Andrew Czornohalan	PO Box 1800, Kitimat BC, V8C 2H2	1 Smeltersite Rd, Kitimat BC, V8C 2H2		3
Communications & Communities Manager	Kevin Dobbin	PO Box 1800, Kitimat BC, V8C 2H2	1 Smeltersite Rd, Kitimat BC, V8C 2H2		4
Supervisor Power Ops/Maintenance Ops	Jeff Burkitt	PO Box 1800, Kitimat BC, V8C 2H2	1 Smeltersite Rd, Kitimat BC, V8C 2H2		5
Plant Protection - Main Gate		PO Box 1800, Kitimat BC, V8C 2H2	1 Smeltersite Rd, Kitimat BC, V8C 2H2		6
Control Room Operators		PO Box 1800, Kitimat BC, V8C 2H2	1 Smeltersite Rd, Kitimat BC, V8C 2H2		7
Kemano Incident Commander	David Silva/Evan Baruta	PO Box 1800, Kitimat BC, V8C 2H2	1 Smeltersite Rd, Kitimat BC, V8C 2H2		8
Skins Lake Spillway	Ken & Leah Hanson				9
Power Operations Manager	Marc Bedard	PO Box 1800, Kitimat BC, V8C 2H2	1 Smeltersite Rd, Kitimat BC, V8C 2H2		33
Vanderhoof Office – Extra Copies					40-41-42
Rio Tinto Kitimat – Extra Copies	Debbie Fossil (Document Controller)	PO Box 1800, Kitimat BC, V8C 2H2			

***Note** – With Electronic version of DEP now available on-line for download (*link on cover page of this document*), hard copy holders will be contacted to confirm if they will continue to keep hard copy.

APPENDIX B – FORMS

1. [Appendix B-1](#) – Notification of Emergency Response
2. [Appendix B-2](#) – Diary of Events
3. [Appendix B-3](#) – Test Report
4. [Appendix B-4](#) – Request for Notification of Emergency

Appendix B-1 - Notification of Emergency Response



Notification of Emergency Response

Important : To be issued within 24 hours of any emergency or reported emergency by Skins Lake Attendant, Plant Protection, on-duty Power Control Room Operator, and Operations Director.

Report is to be submitted to Power Control Room!

To: _____

Date: _____

From: _____

File: _____

Date of Occurance:	
--------------------	--

Description of Problem:	

Person Notified:	
------------------	--

Action Taken:	

Action Proposed:	

cc: (as applicable)

Appendix B-2 - Diary of Events



Diary of Events

Important : To be issued within 24 hours of any emergency or reported emergency by Skins Lake Attendant, Plant Protection, on-duty Power Control Room Operator, and Operations Director.

Report is to be submitted to Power Control Room!

To: Operations Director,
Rio Tinto,
P.O. Box Box 1800
Kitimat, BC V8C 2H2

Date: _____

Email: ANDREW.CZORNOHALAN@RIOTINTO.COM

From: _____

Location of Incident:	
------------------------------	--

Summary of Incident::	

Names of Persons involved:		

Agencies notified and time called:	

Action Taken and Present Condition:	
Further Action PlanneededTaken and Present Condition:	

cc: (as applicable)

Appendix B-3 - Test Report



TEST REPORT

To: Mr. Andrew. Czornohalan
Operations Director
Rio Tinto
P.O. Box 1800
Kitimat, BC V8C 2H2
Email: ANDREW.CZORNOHALAN@RIOTINTO.COM

Date: _____

File: _____

Type of Test:

From: _____ Limited Communications Test ☐
_____ Full Communications Test ☐
_____ Operational Test ☐

Time and Date First Notified: _____

Notified by: _____

Notifications Made:

Name:	Agency(ies)	Time of Call

Message Received / Passed on:	
Comment on Test (If space is insufficient use additional sheet(s)) :	

Appendix B-4 - Request for Notification of Emergency

REQUEST for Notification (BC Works DEP)

***Please Note** – This form is to be added to the RioTinto one call now notification list for Dam Emergencies. In the event of an emergency, Rio Tinto will notify you as per information provided below using the “One Call Now” notification system. For voice/text messages, this will be a recorded message only, not a person to person communication. ***PLEASE NOTE – it is your responsibility to enact your emergency response plan upon receiving actual emergency notification and follow instructions accordingly.**

Date:	
Please Check box ✓ for appropriate notification destination type:	
☐ Community Organization	☐ Government Agency
Please specify Organization Name (if this is a Community Organization or Government Agency request) :	
Contact Person Name :	
Contact Location/Address :	
City / Town :	
Postal Code :	
Contact Phone Number :	
Message Preference (please check ✓):	☐ Voice Message and/or ☐ Text Message
<i>*Please note – The contact Phone Number provided will be notified by programmed message for any Nechako DEP events. Upon receipt of this form indicating Text Message request; RIO TINTO will send you a text message requesting that you Opt-in with instructions to complete the set-up. Please follow the instructions when you receive this text message.</i>	

Completed forms can be Emailed to Ken.Isaak@RIOTINTO.COM or Mailed to following address:

TO: Rio Tinto
P.O. Box 1800
Kitimat, BC V8C 2H2
RE: DEP Notification Request

OFFICE Use Only: * Attention BC Works Plant Protection (One Call list : DEP Notification REQs)	
Date Request Received: _____	
Process Date: _____	Processed By: _____

APPENDIX C – DOCUMENT CONTROL (for DEP)

1. [Appendix C-1](#) – Letter of Understanding
2. [Appendix C-2](#) – Request for Revision
3. [Appendix C-3](#) – Document Review Routing
4. [Appendix C-4](#) – Record of Review by Outside Agencies
5. [Appendix C-5](#) – Record of Briefings, Limited and Full Communication and Operational Tests
6. [Appendix C-6](#) - Debrief Meeting Annual DEP Review and Communication Test REPORT (Template)

Appendix C-1 - Letter of Understanding

Date: _____

Mr. Andrew Czornohalan

Operations Director

Rio Tinto

P.O. Box 1800

Kitimat, BC V8C 2H2

Email: ANDREW.CZORNOHALAN@RIOTINTO.COM

Dear Mr. Czornohalan:

Re: Nechako Reservoir Dam Emergency Plan

We acknowledge receipt of Copy # _____ of the Nechako Reservoir Dam Emergency Plan (DEP) prepared by Rio Tinto Aluminum. In the unlikely event of a breach or dam alert at any of the Nechako Reservoir Dams, or in the event of a severe flood release, we will co-operate in every way possible and as outlined in the DEP, in expediting action to mitigate the effects of the emergency, including assistance with alerting and, if necessary, evacuating the public which would be endangered.

We understand that we are to advise you of changes in our data recorded in the DEP, and that we may contribute information at any time to update or otherwise revise the Nechako Reservoir DEP for currency.

We request that we be provided with an updated copy of the DEP or errata sheets as they are produced. We appreciate the opportunity to participate in the DEP development.

Yours truly.

Signature

Name and Title

Appendix C-2 - Request for Revision

Revision Form

To: **Operations Director**

Date: _____

Rio Tinto

P.O. Box 1800

Kitimat, BC V8C 2H2

Email: ANDREW.CZORNOHALAN@RIOTINTO.COM

From: _____

File: _____

Proposed Revision:	

cc: (as applicable)

For Office Use Only:

Approved/Not Approved: _____

Date: _____

Actioned: _____

Date: _____

Appendix C-3 - Document Review Routing

Name	Title	Review Date	Comments
Marc Bedard	Manager, Power Operations		
Javier Garcia	Superintendent, Power Operations		
Jeff Burkitt	Supv. System Operations		
Ken Hanson	Skins Lake Attendant		
Ken Isaak	Plant Protection Coordinator		
Kevin Dobbin	Manager of Comm & Communities		
Danielle De Kay	Advisor C&C Watershed		

Appendix C-4 - Record of Review by Outside Agencies

AGENCY	DATE	REMARKS
SECTION HEAD – MFLNRO - DAM SAFETY SECTION SCOTT MORGAN	May 6/2019	Page 36 – Notifications print outside margin, Page 37 – Change Dam Safety resource names in PG to M.Trudell and Ted White APPENDIX D – did not print clearly – recommend reissue of higher resolution *COPY of communication in record of 2019 Debrief DEP Review and Comm Test

Appendix C-5 - Record of Briefings, Limited and Full Communications and Operational Tests

DATE	INITIATOR	DESCRIPTION	REMARKS
May 17/02	D. McDonagh (SL Attendant)	Drill - Breach of Saddle Dam #3	Outside Agencies require training on use of DEP Manual
			Notification Chart requires updating
			Map to be created showing location of all Dams (D. McAndrew)
			Discussion on necessity of placing emergency contact info at each dam
Aug. 30/04	G. Geeraert (SL Attendant)	Drill - Breach of Dam	Notification Chart requires updating
Nov. 25/05	Skins Lake Attendant	Drill - Breach of Kenney Dam	OK
Oct. 20/06	Al Grier (SL Attendant)	Drill - Breach of Kenney Dam	Notification Chart requires updating
Nov. 7/08	SLS Attendant	Drill – Breach of Kenney Dam	Notification Chart requires updating
Nov. 6/09	SLS Attendant	Drill – Breach of Saddle Dam #3	OK
Nov. 18/10	SLS Attendant	Drill – Breach of Kenney Dam	Notification Chart requires updating
June 20/2019	RT Plant Protection	Initiate Drill for DEP Communication Test	Debrief was held on July 5/2019. Records of Debrief in Doc Control system
Sept 16/2020	DEP Review Team	Initiate Drill for DEP Communication Test	Debrief on Sept 25 th 2020. Review of 2019 actions and 2020 actions developed

Appendix C–6 – Debrief Meeting Annual DEP Review and Communication Test

Debrief Meeting Annual DEP Review and Communication Test REPORT (Template)

DEP Review Team Participants

Name	Role

Contents

1. Objectives
 - Identify the objective of review for current year for the DEP Document and Communication Test
 - Status of previous recommendations and improvements
2. Introduction (provide the plans for current year and what happened)
 - DEP Document Review process
 - Stakeholder DEP Distribution / Communication planning
 - Communication Test
3. Observation (information gathered from Post-Test meeting, Meetings, etc)
 - Observation / Learning
 - Recommendation / Action Log
4. Conclusion and Next steps
5. Appendix (*items to be included as evidence*)
 - Meeting Minutes of the DEP REVIEW
 - Communication Message (Used During Test)
 - Communication Test - One Call Now Report (Email)
 - Communication Test - One Call Now Report (Phone)
 - Communication Test - One Call Now Report (SMS)
 - *Other pertinent emails, communication records, etc*

APPENDIX D – ACCESS MAPS & DRAWINGS

1. [Appendix D-1](#) – Access Maps
2. [Appendix D-2](#) – Fill Materials (Bear Lake Dam No.1)
3. [Appendix D-3](#) – Drawing 120-SF-90 (Skins Lake Dam No. 1 & 2))
4. [Appendix D-4](#) – Drawing 120-191 (Skins Lake Dam No. 3)
5. [Appendix D-5](#) – Drawing 120-SF-91 (Skins Lake Dam No. 3)
6. [Appendix D-6](#) – Drawing 117-BF-12 (Bear Lake Dams No. 2 & 3)
7. [Appendix D-7](#) – Drawing 113-5 (Kenney Dam location of Borrow Areas)

Appendix D-2 – Drawing Fill Materials (Bear Lake Dam No.1)

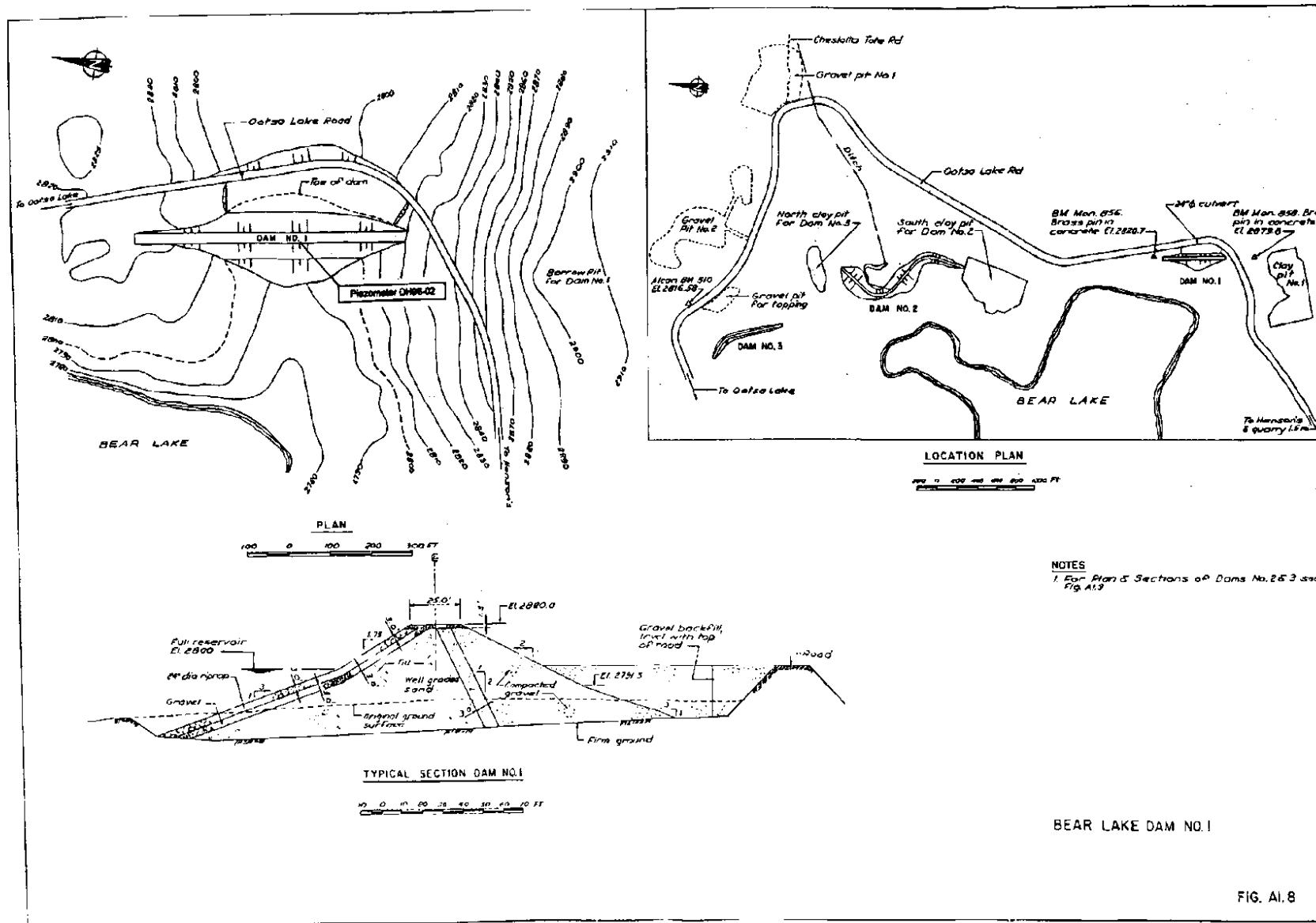
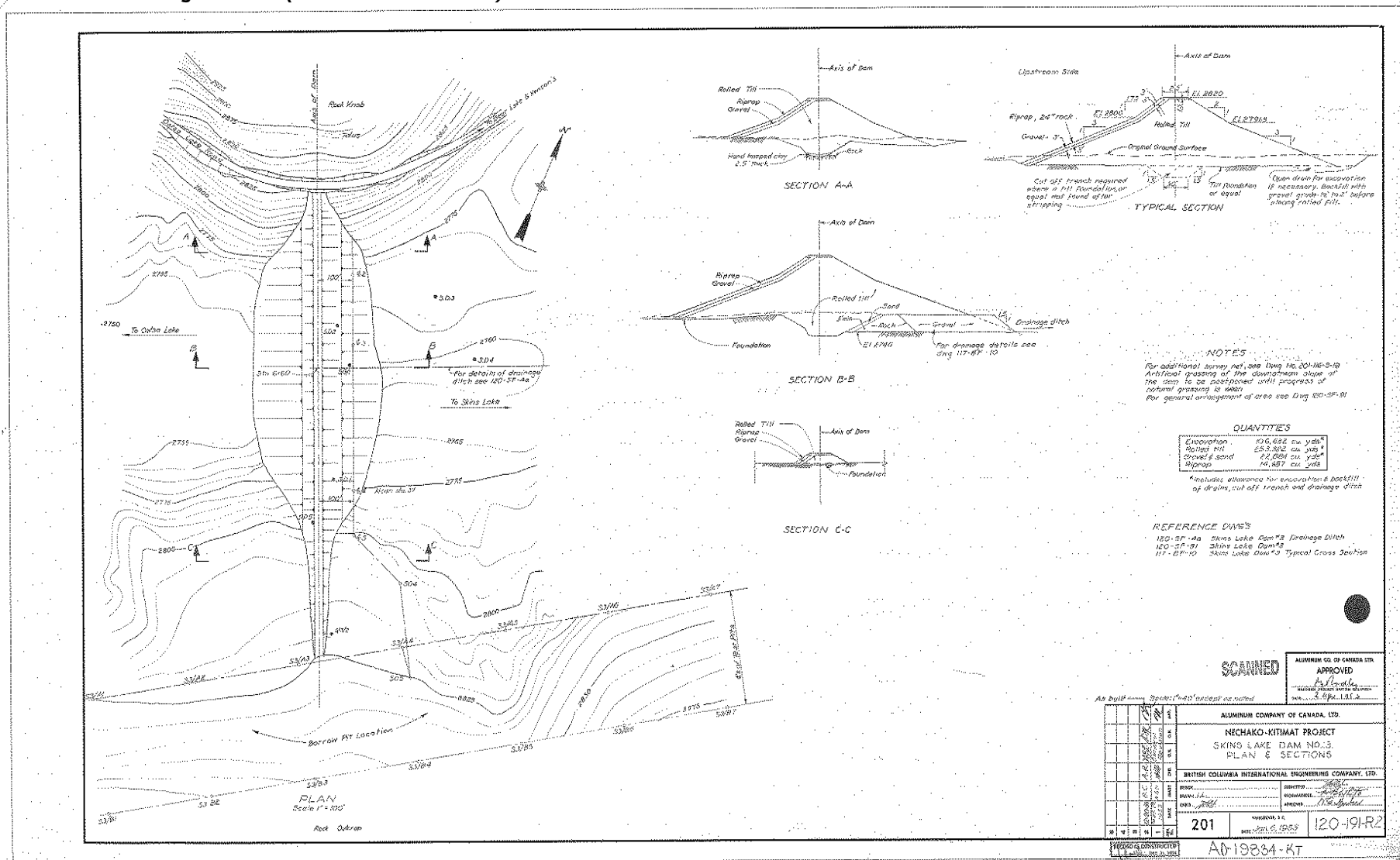


FIG. A1.8

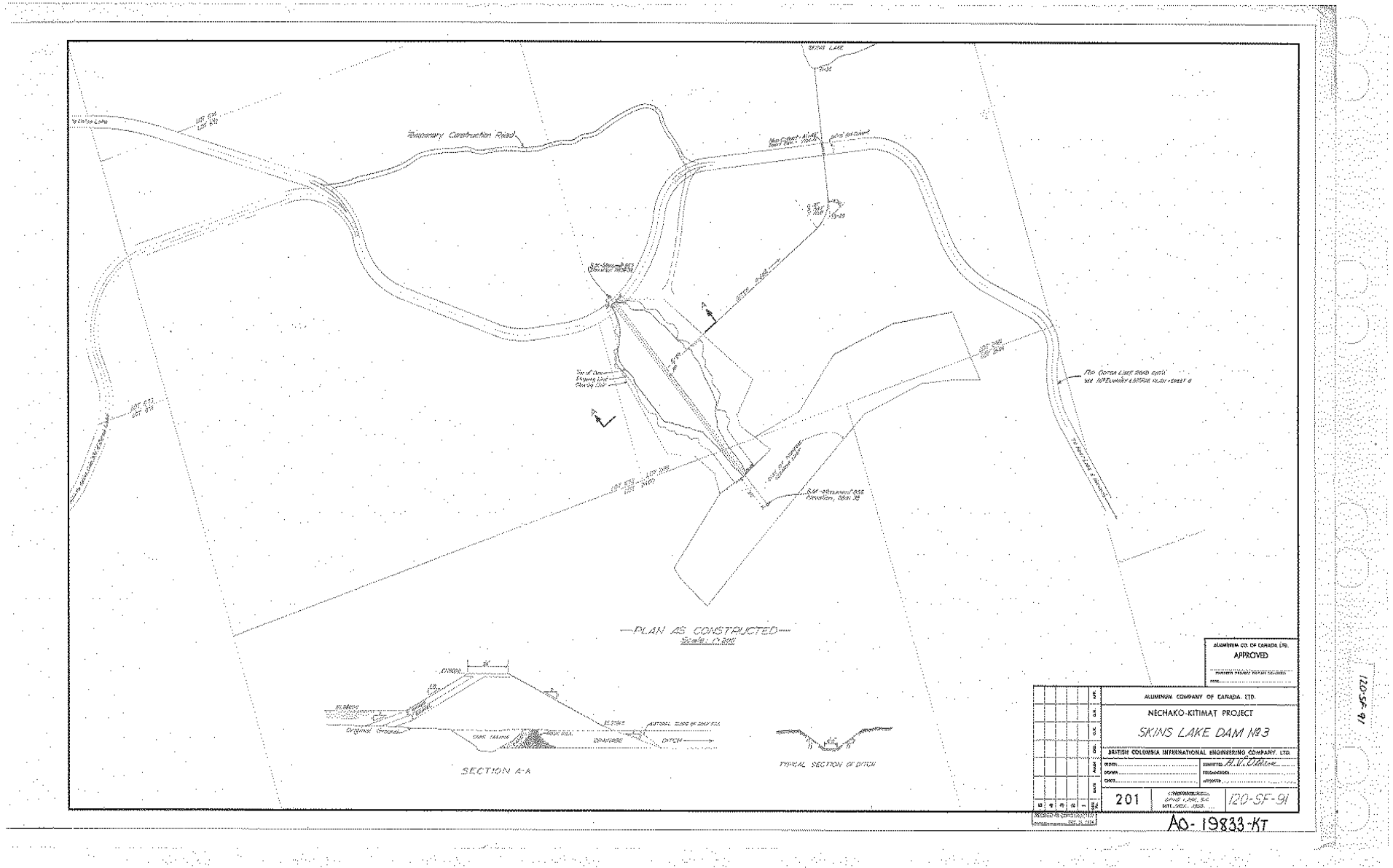
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120-54-90

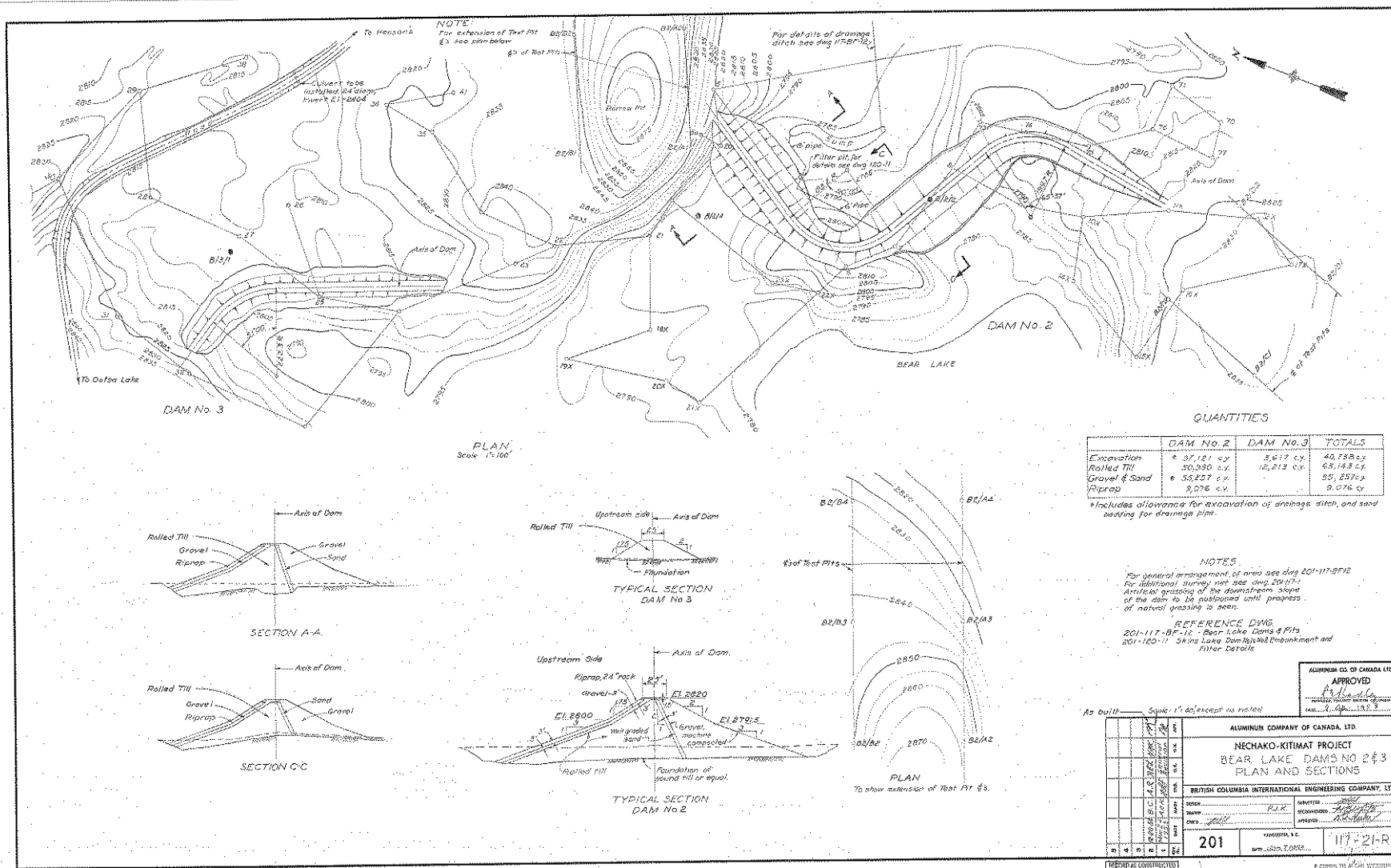
Appendix D-4 - Drawing 120-191 (Skins Lake Dam No. 3)



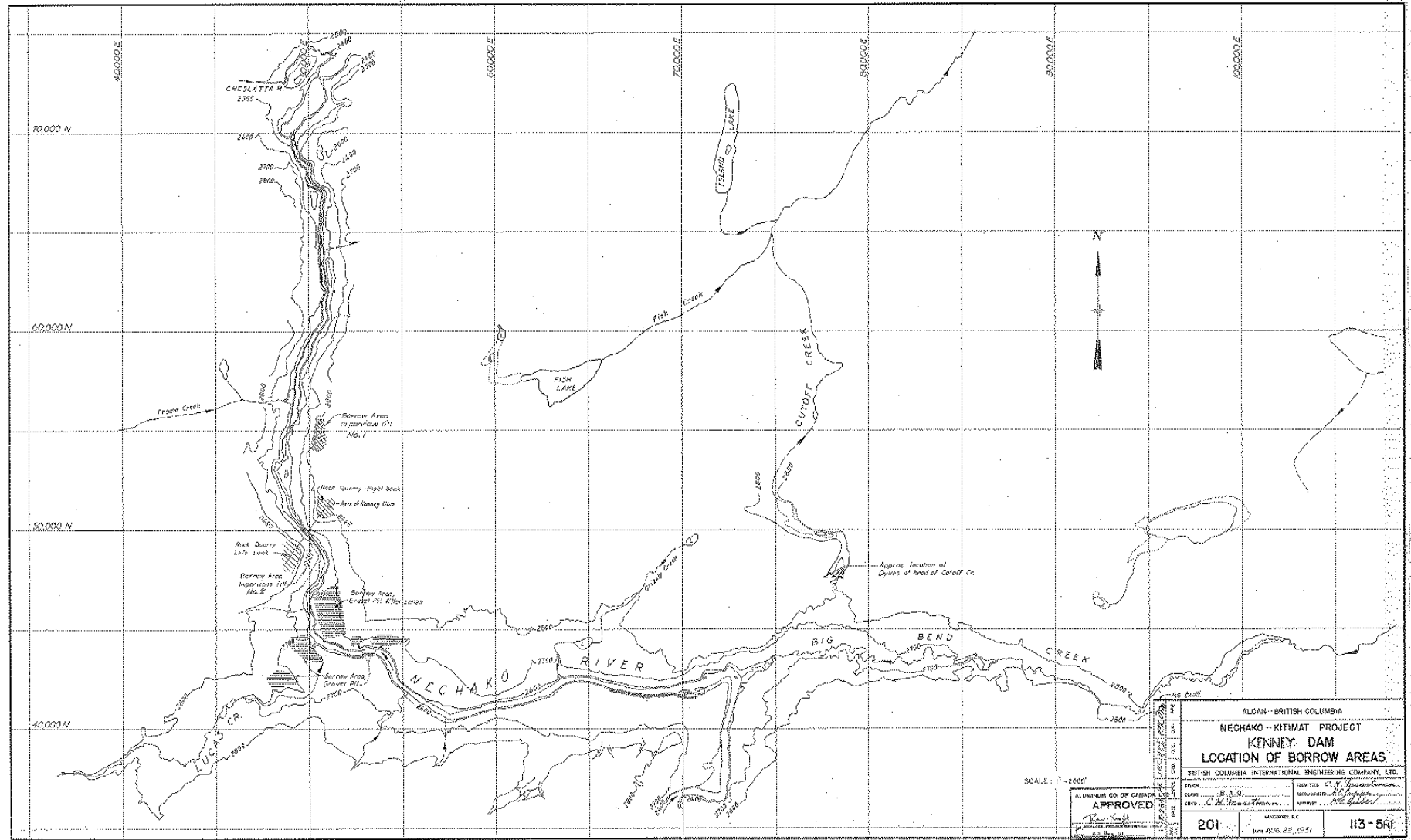
Appendix D-5 - Drawing 120-SF-91 (Skins Lake Dam No. 3)



Appendix D-6 - Drawing 117-BF-12 (Bear Lake Dams No. 2 & 3)



Appendix D-7 - Drawing 113-5 (Kenney Dam location of Borrow Areas)



APPENDIX E – OTHER EMERGENCY RESPONSE GUIDANCE

1. [Appendix E-1](#) – Other Emergency and Response Guidance Chart

- [Figure 1](#). Assumed Breach for Kenney DAM
- [Figure 2](#). Assumed Breach for Skins Lake DAM 3
- [Figure 3](#). Flood discharge Hygrographs resulting from assumed Kenney DAM Breach
- [Figure 4](#). Flood Elevation resulting from assumed Kenney DAM Breach
- [Figure 5](#). Flood Elevation resulting from assumed Kenney DAM Breach
- [Figure 6](#). Flood Elevation resulting from assumed Kenney DAM Breach
- [Figure 7](#). Flood Discharge Hygrographs resulting from assumed Skins Lake DAM 3 Breach
- [Figure 8](#). Flood Elevation resulting from assumed Skins Lake DAM 3 Breach
- [Figure 9](#). Flood Elevation resulting from assumed Skins Lake DAM 3 Breach
- [Figure 10](#). Flood Elevation resulting from assumed Skins Lake DAM 3 Breach
- [Figure 11](#). Flood Discharge Hygrographs resulting from assumed Extra Flood Release
- [Figure 12](#). Flood Elevation resulting from Extreme Flood Release
- [Figure 13](#). Flood Elevation resulting from Extreme Flood Release

Appendix E-1 – Other Emergency and Response Guidance Chart

*NOTE: The following graphs and figures contained in this section are provided to reference the following situations:

Other Emergencies	Situation and Important Information	*Response Type
Landslides	Landslides upstream or downstream could affect the stability of the dams and must be reported to the Power Control Room, who will inform the Operations Director who will take appropriate action including who caused the slide, monitor to determine ongoing movement, and post warning signs.	1
Severe storms	Heavy rainfall could lead to erosion of dam slopes, and high winds, heavy snowfall, or icing conditions could lead to equipment damage. Inspections should be carried out and repair all damage caused by storms.	3
Fire	Forest fires are unlikely to be damaging to any of the reservoir structures but the Skins Lake Spillway residence and facilities may be at risk. Report forest fires to BC Wildfire Service (1-800-663-5555) and Plant Protection (250-639-8273).	3
Oil, Hazardous substances or pesticide spills	Refer to Rio Tinto BC Operations Management Manual. Report to Plant Protection (250-639-8273).	1
Major fish or wildlife losses in reservoir	A significant loss of fish or wildlife will be recorded and reported to the Operations Director. The observer will record details of the loss, including species, number, location, causes and any other relevant information. The Operations Director will notify the Fish and Wildlife Branch and the federal Department of Fisheries and Oceans, and notify and update the Manager, Communication and Communities, BC Works.	1
Drownings or accidents in reservoir	All accidents in the reservoir will be reported to the Plant Protection, who will report to the R.C.M.P. as soon as possible. If personnel learn indirectly of an accident already reported to the R.C.M.P., the event will be reported to the Operations Director who will notify and update the Manager, Communication and Communities, BC Works.	2
Criminal Activity	All criminal activity in the vicinity of the Nechako Reservoir will be reported to the Plant Protection, who will report to the R.C.M.P. as soon as possible and notify and update the Manager, Communication and Communities, BC Works.	2

*** Response Type 1: Non Dam Emergency or other emergency, monitor event that is slowly developing**

*** Response Type 2: Emergency requiring R.C.M.P. direct involvement**

*** Response Type 3: Inspection of all Dams and Spillway and repair if needed**

Figure 1. Assumed Breach for Kenney Dam

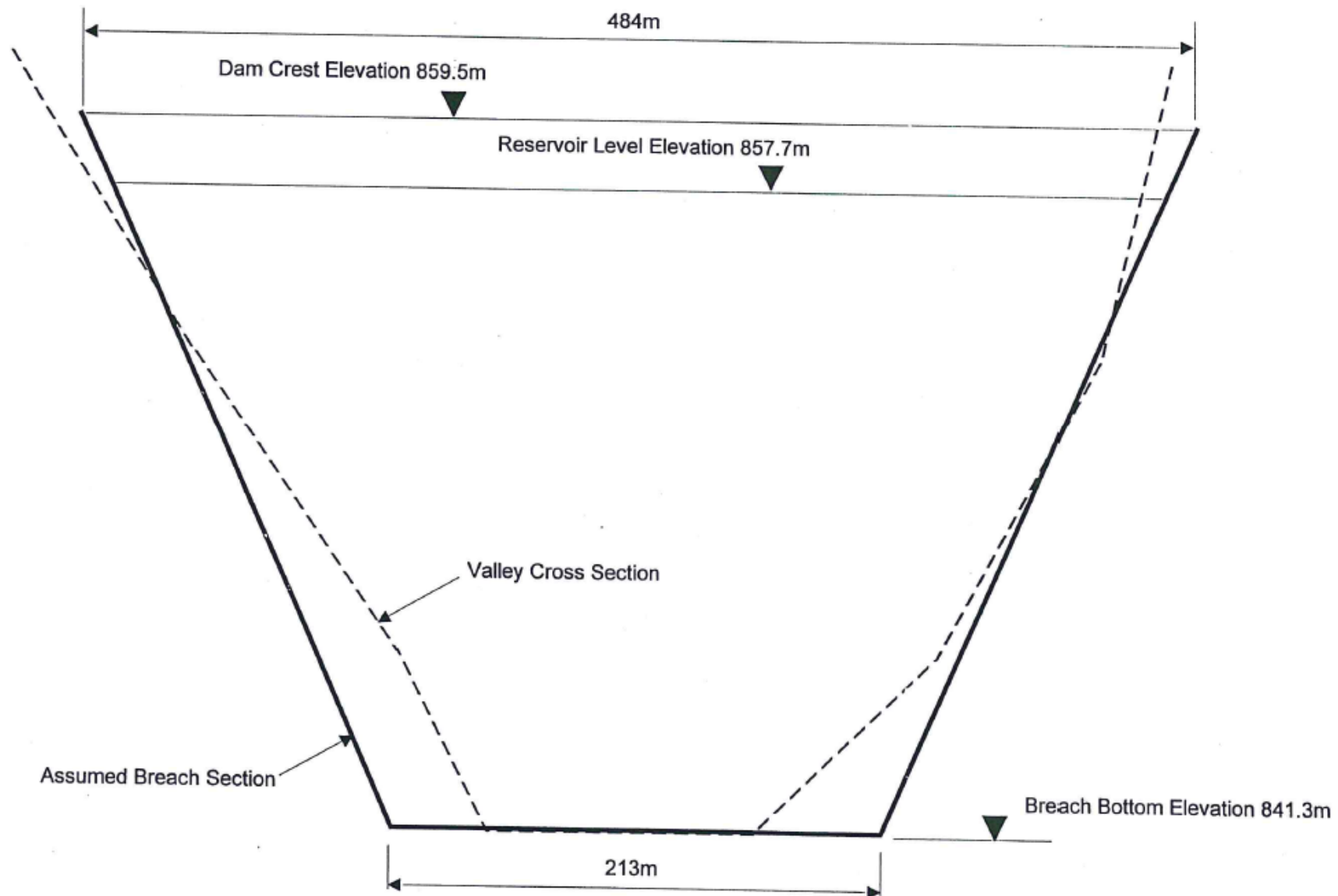


Figure 2. Assumed Breach for Skins Lake DAM 3

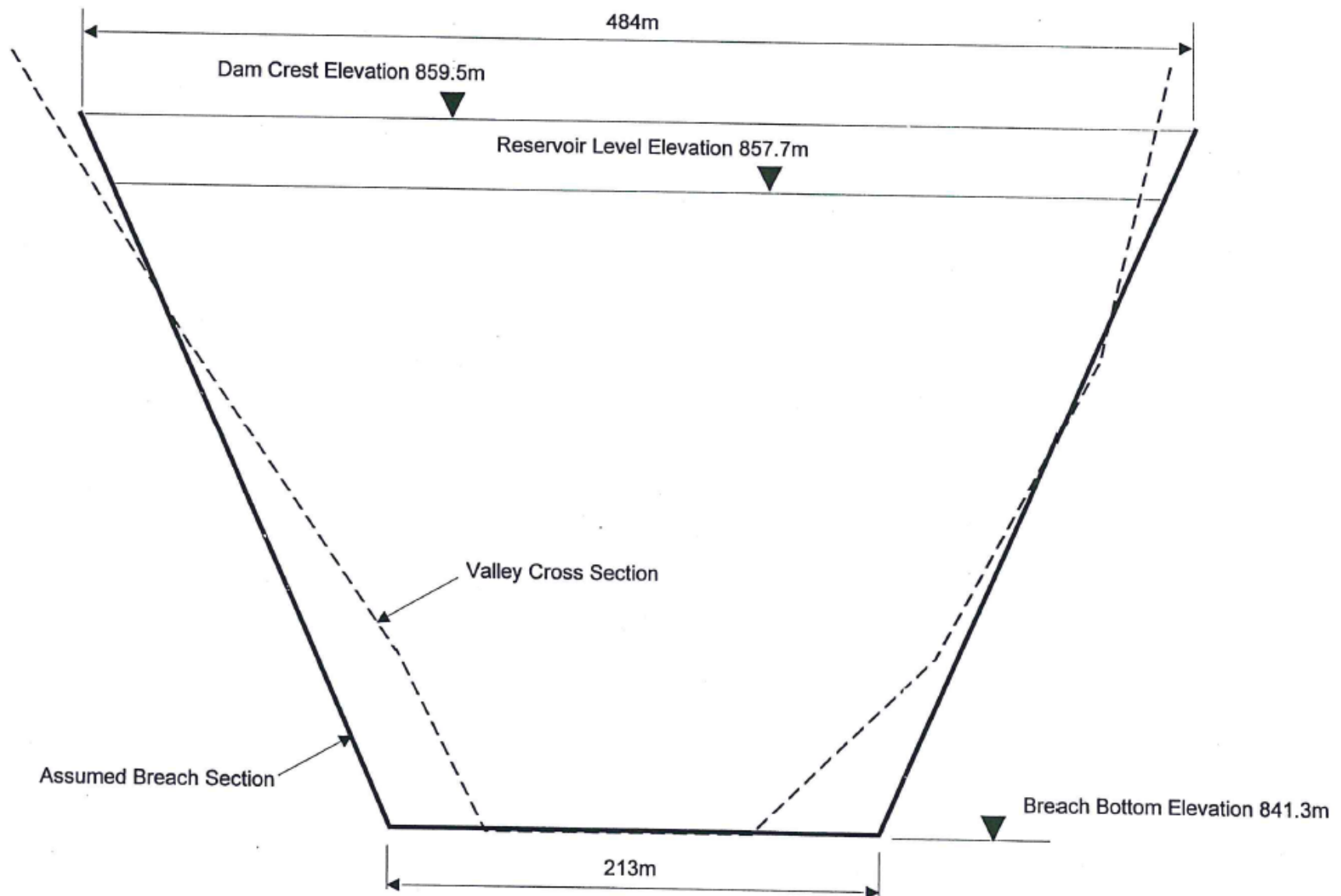


Figure 3. Flood discharge Hydrographs resulting from assumed Kenney DAM Breach

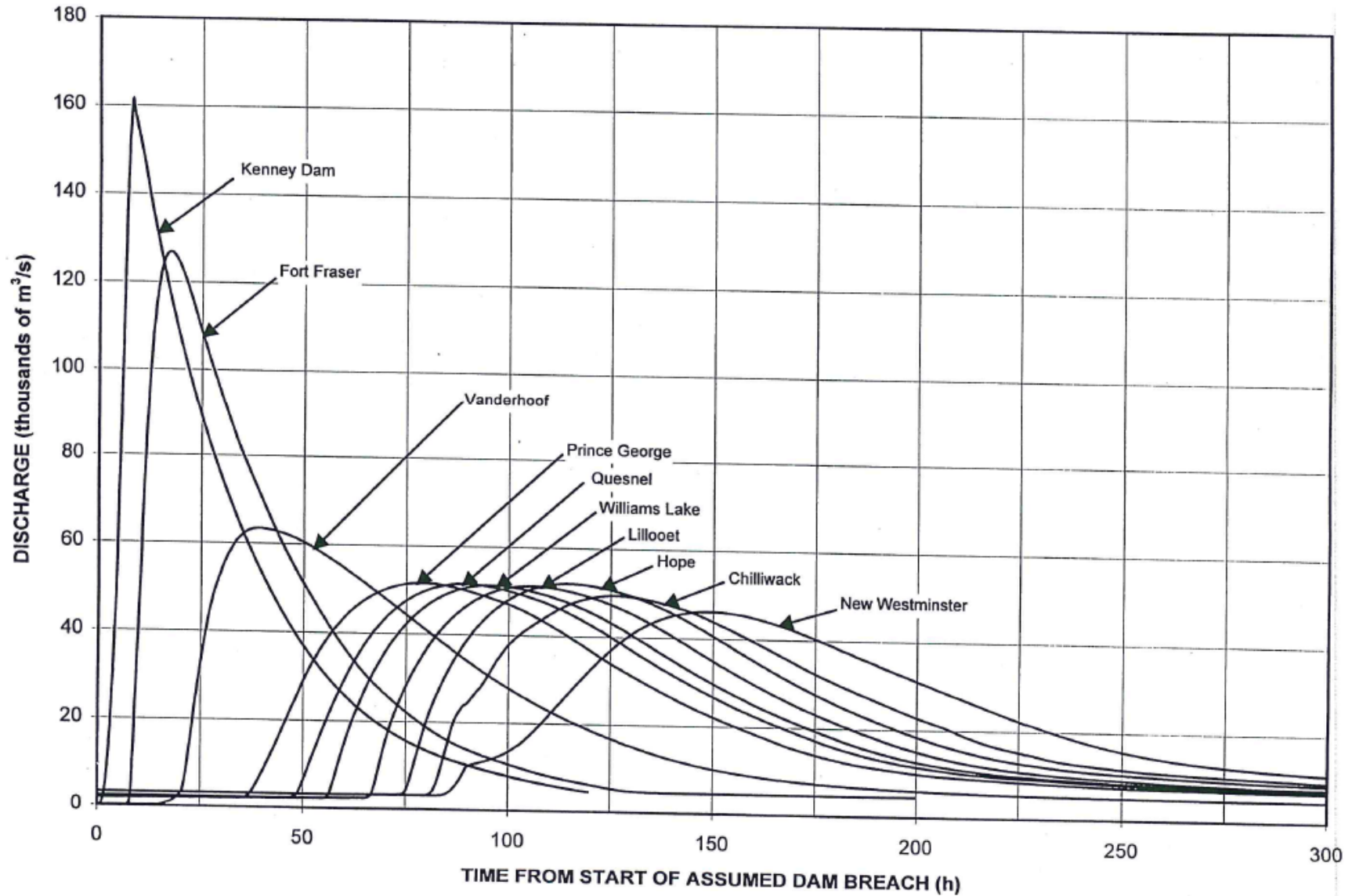


Figure 4. Flood Elevation resulting from assumed Kenney DAM Breach

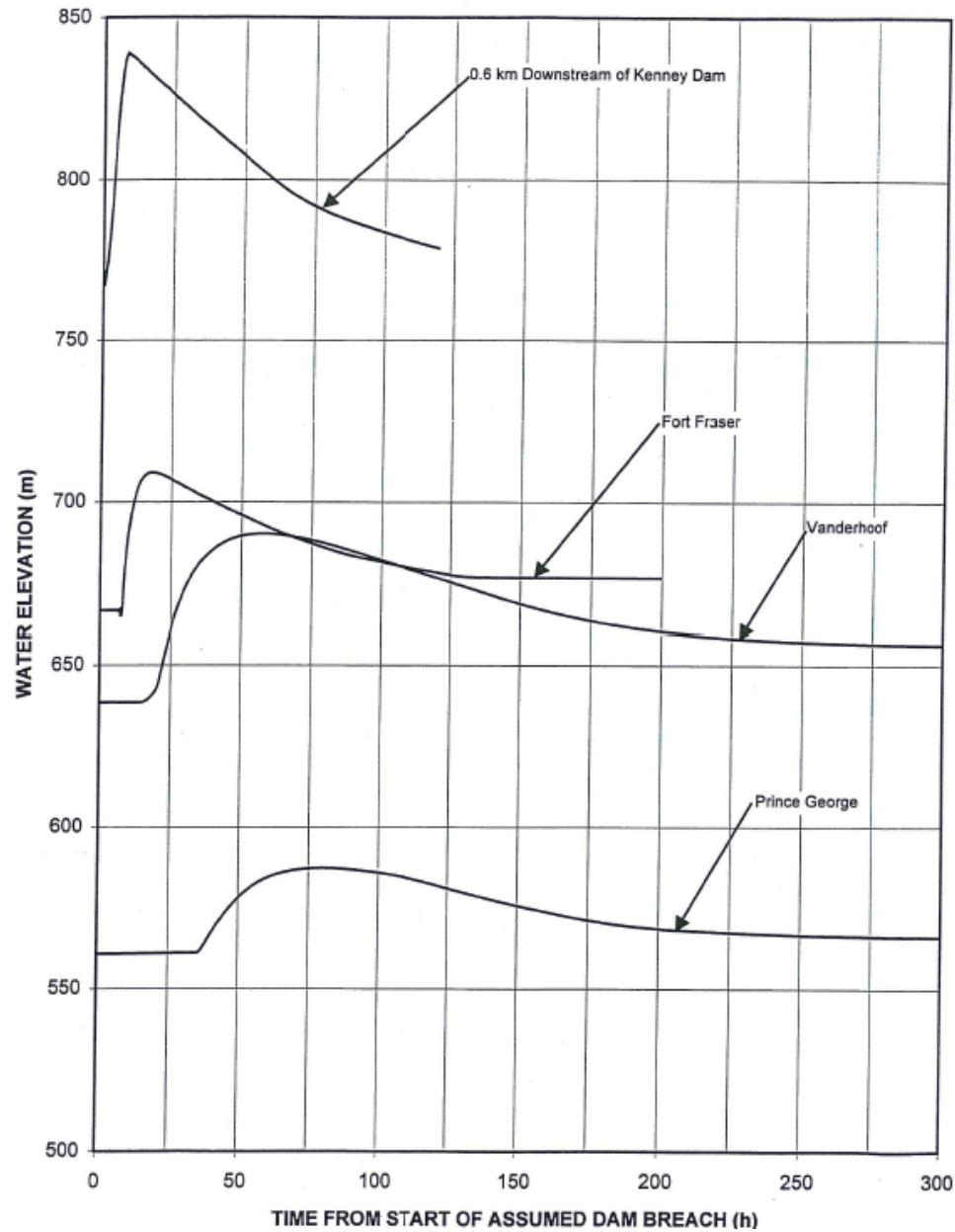


Figure 5. Flood Elevation resulting from assumed Kenney DAM Breach

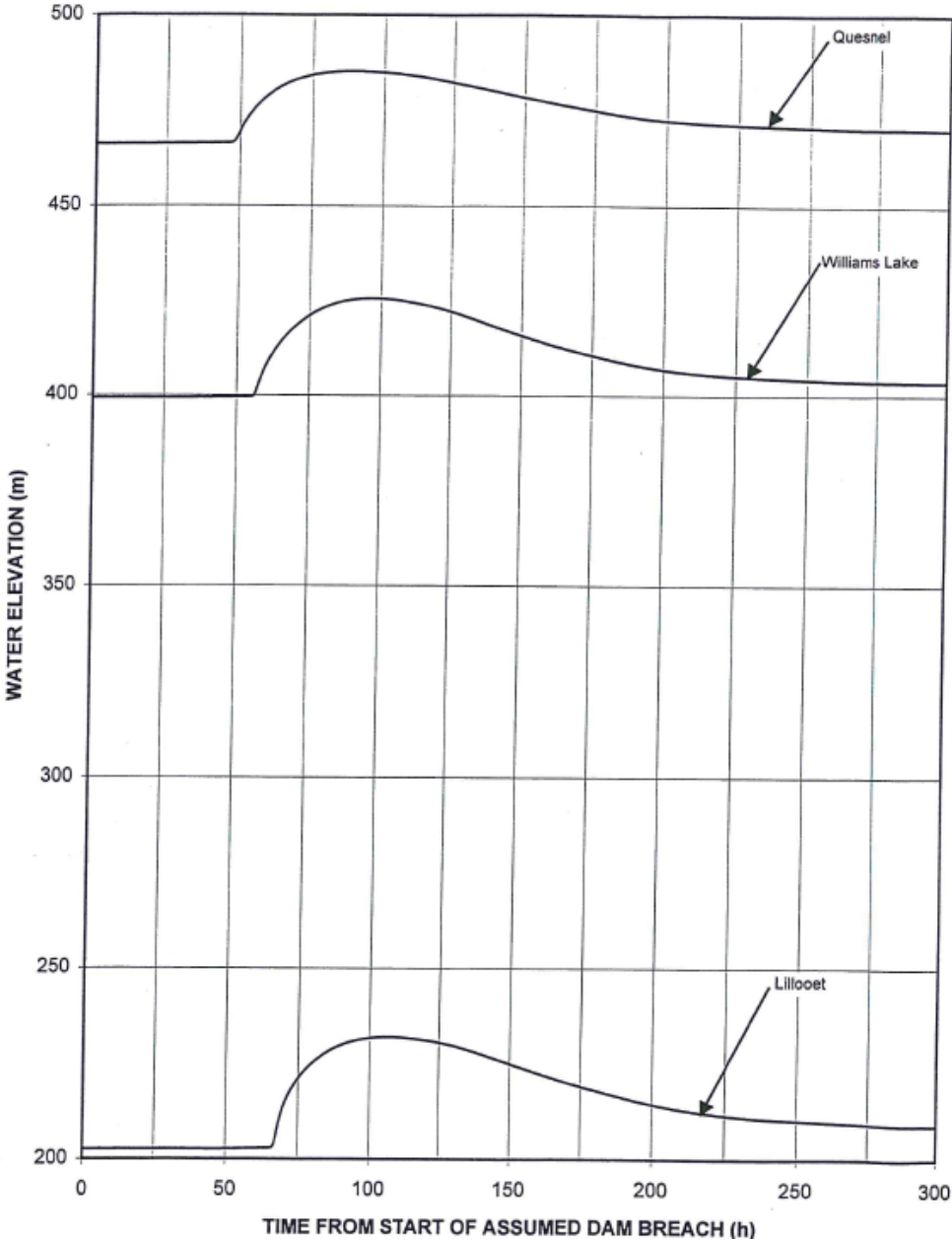


Figure 6. Flood Elevation resulting from assumed Kenney DAM Breach

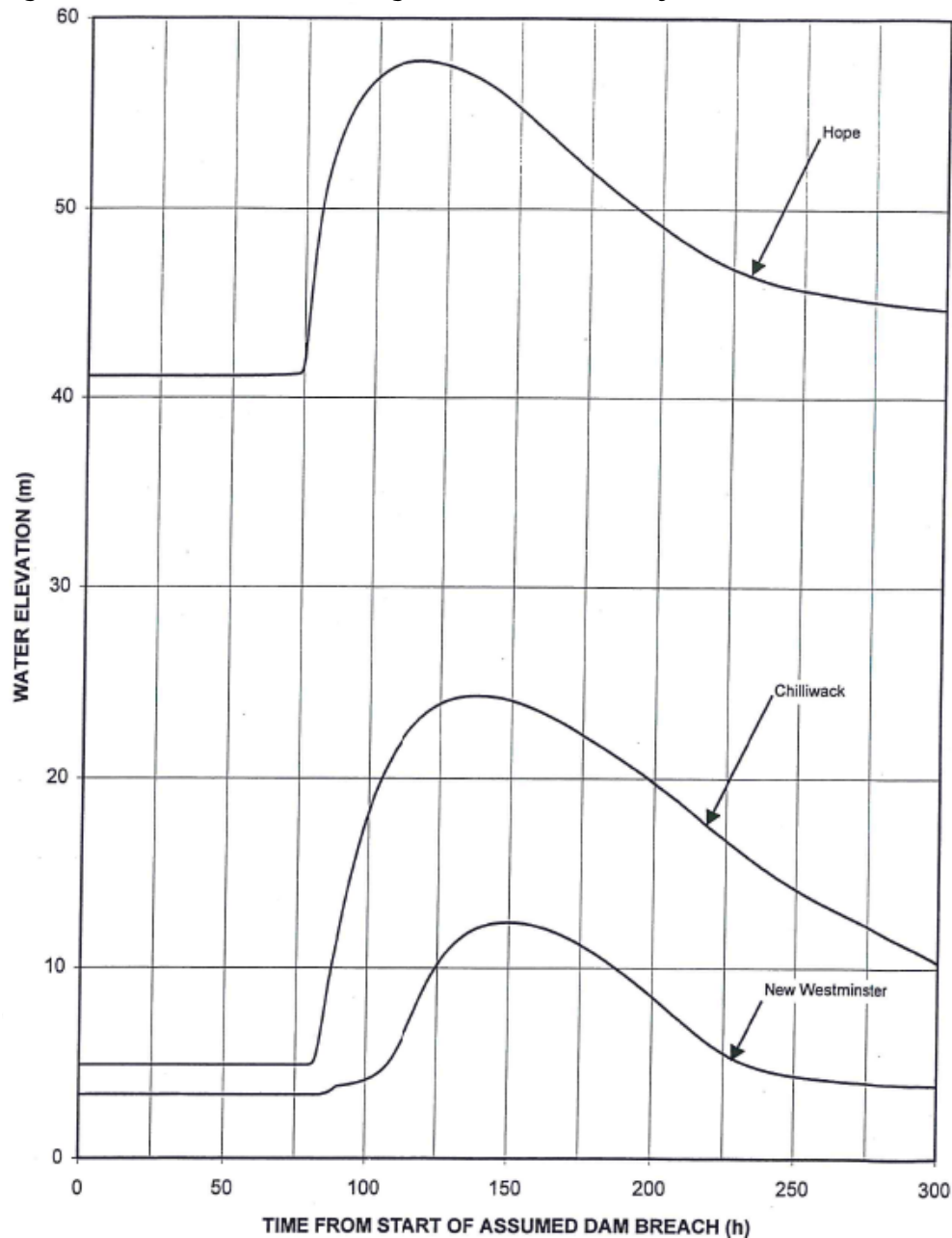


Figure 7. Flood Discharge Hydrographs resulting from assumed Skins Lake DAM 3 Breach

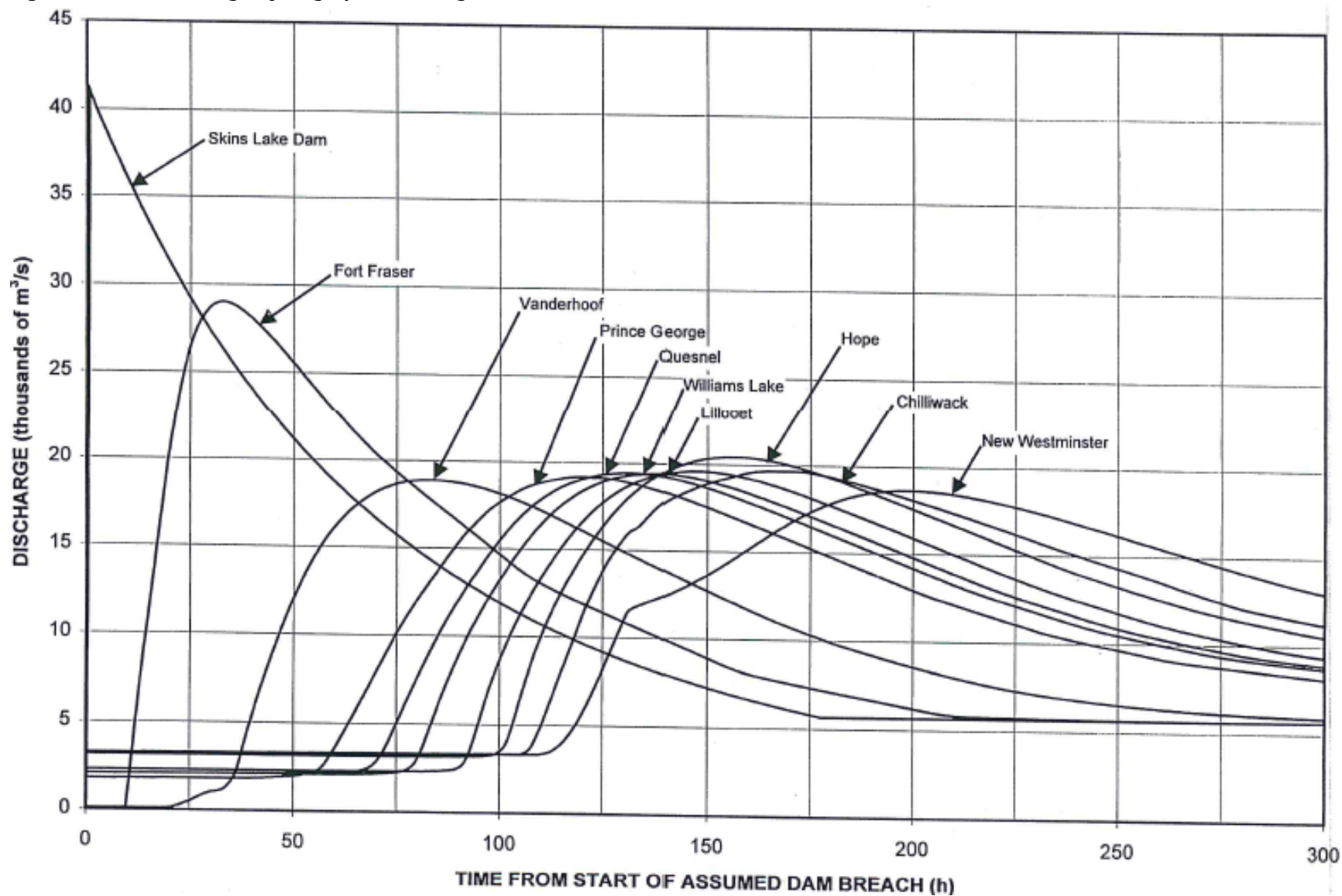


Figure 8. Flood Elevation resulting from assumed Skins Lake DAM 3 Breach

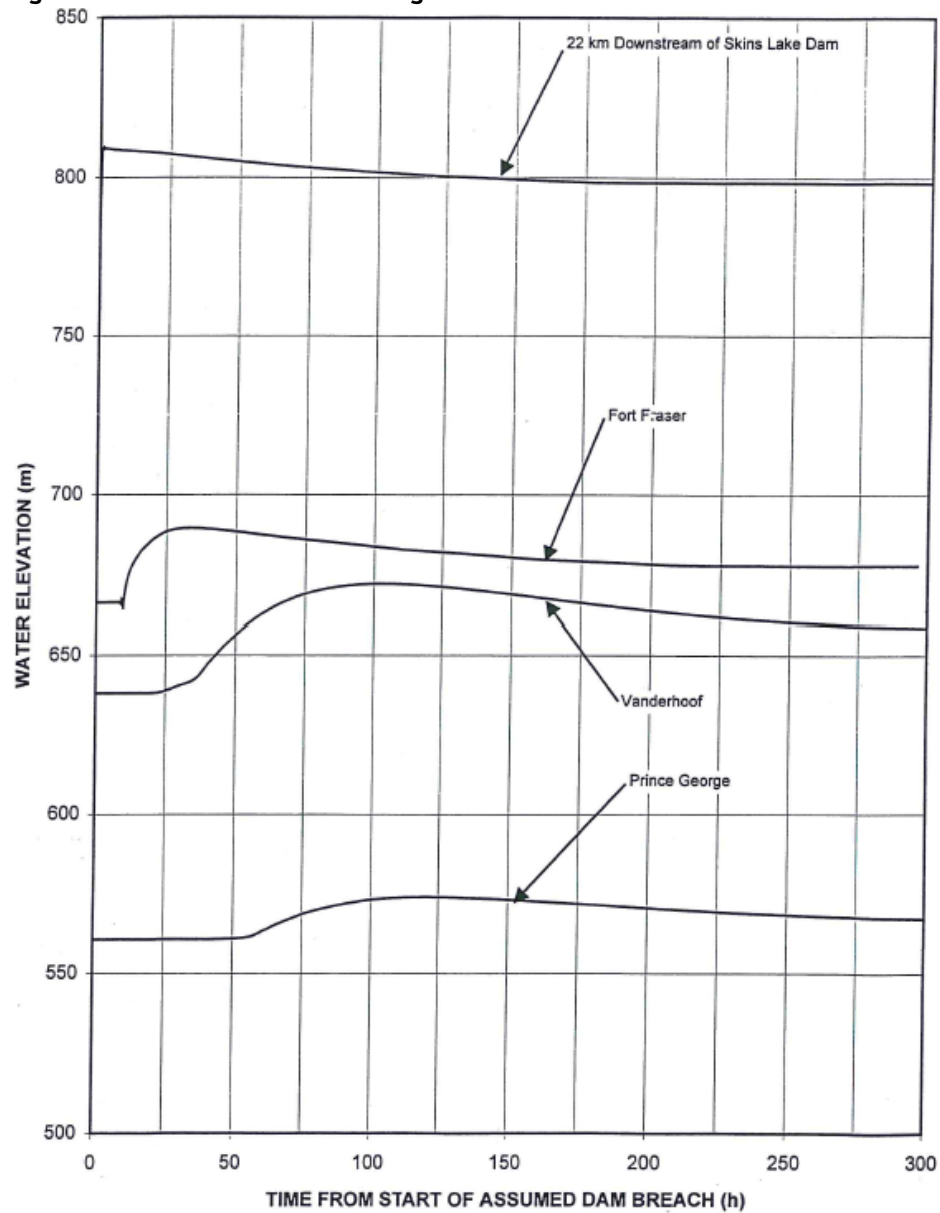


Figure 9. Flood Elevation resulting from assumed Skins Lake DAM 3 Breach

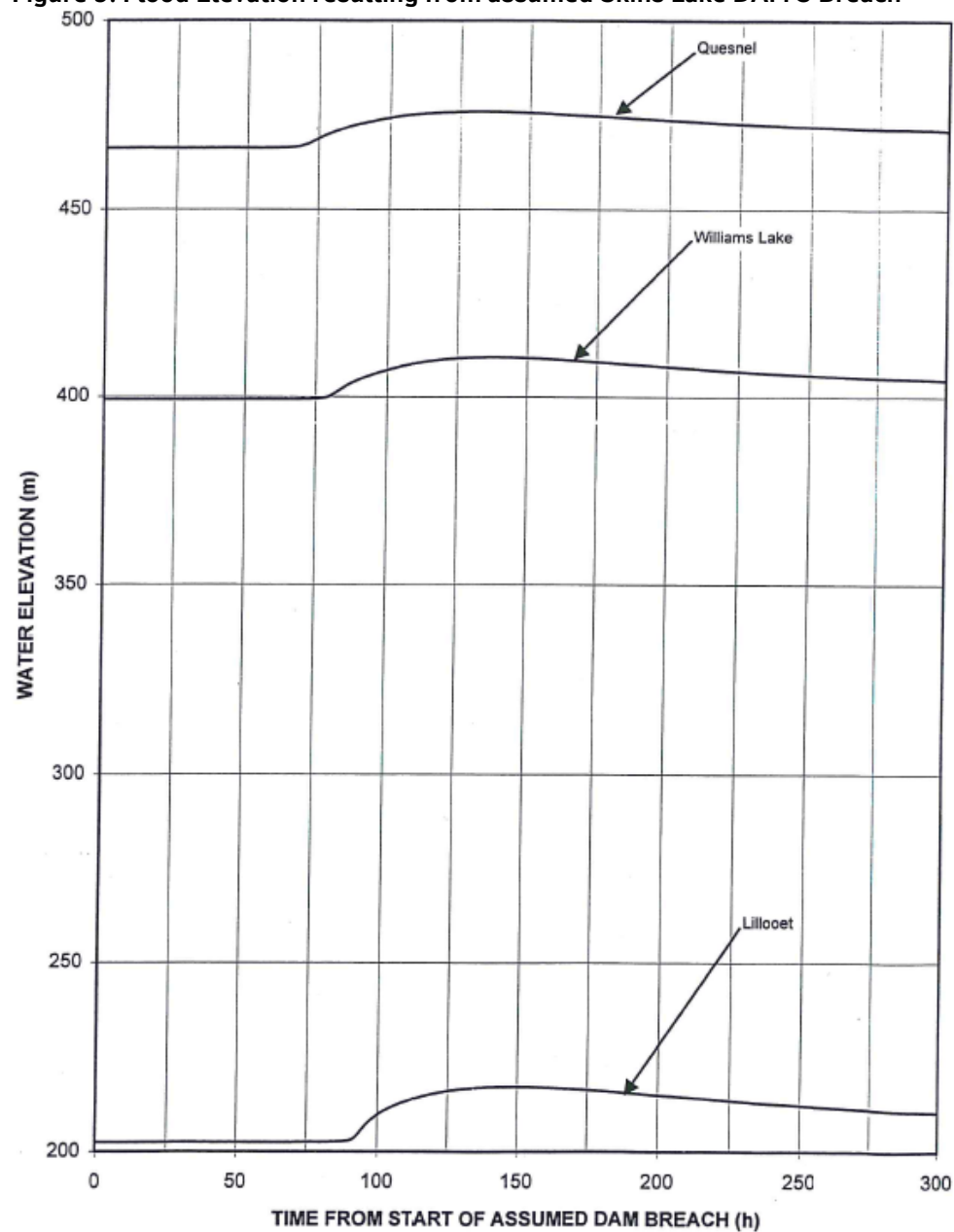


Figure 10. Flood Elevation resulting from assumed Skins Lake DAM 3 Breach

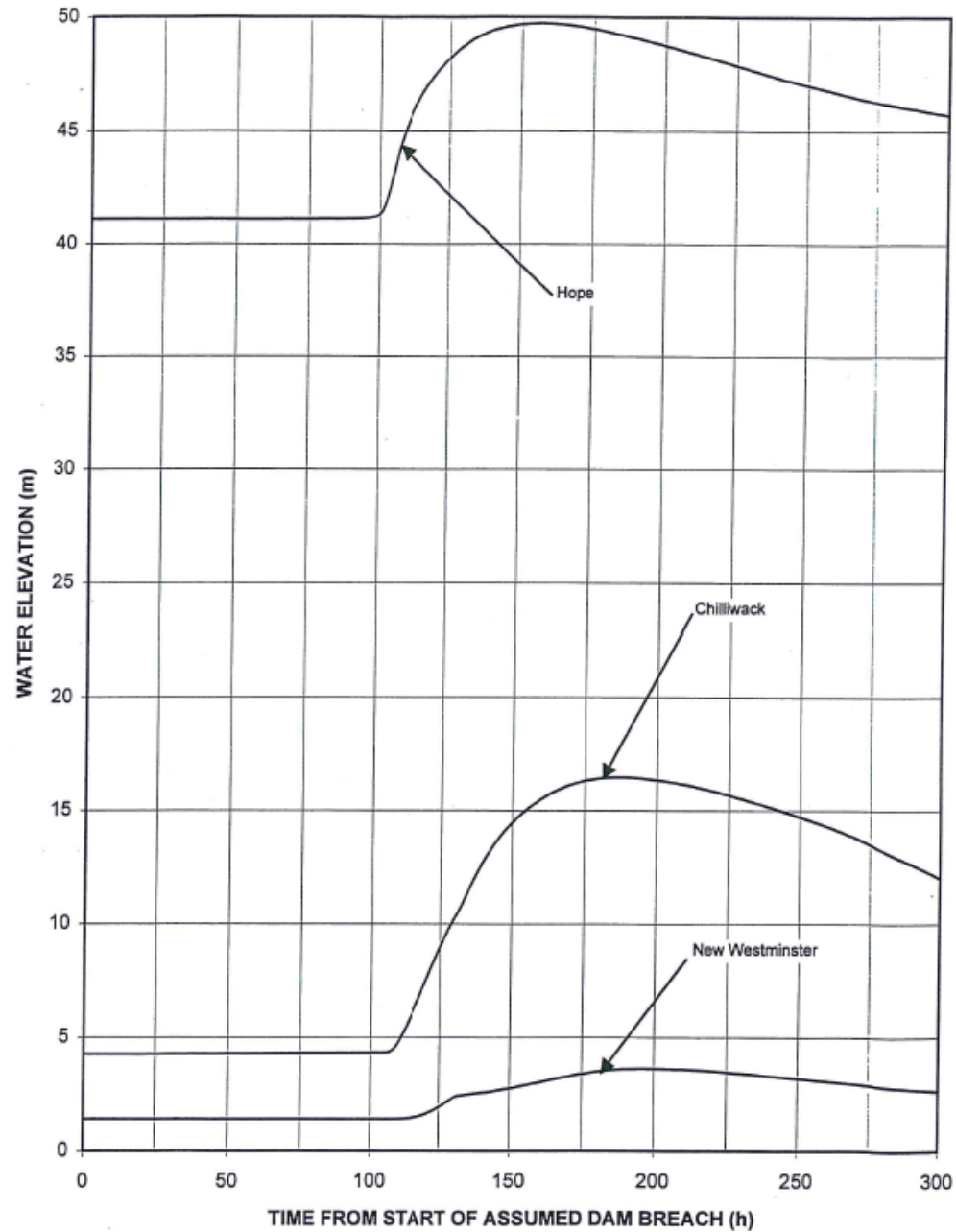


Figure 11. Flood Discharge Hydrographs resulting from assumed Extra Flood Release (All Areas)

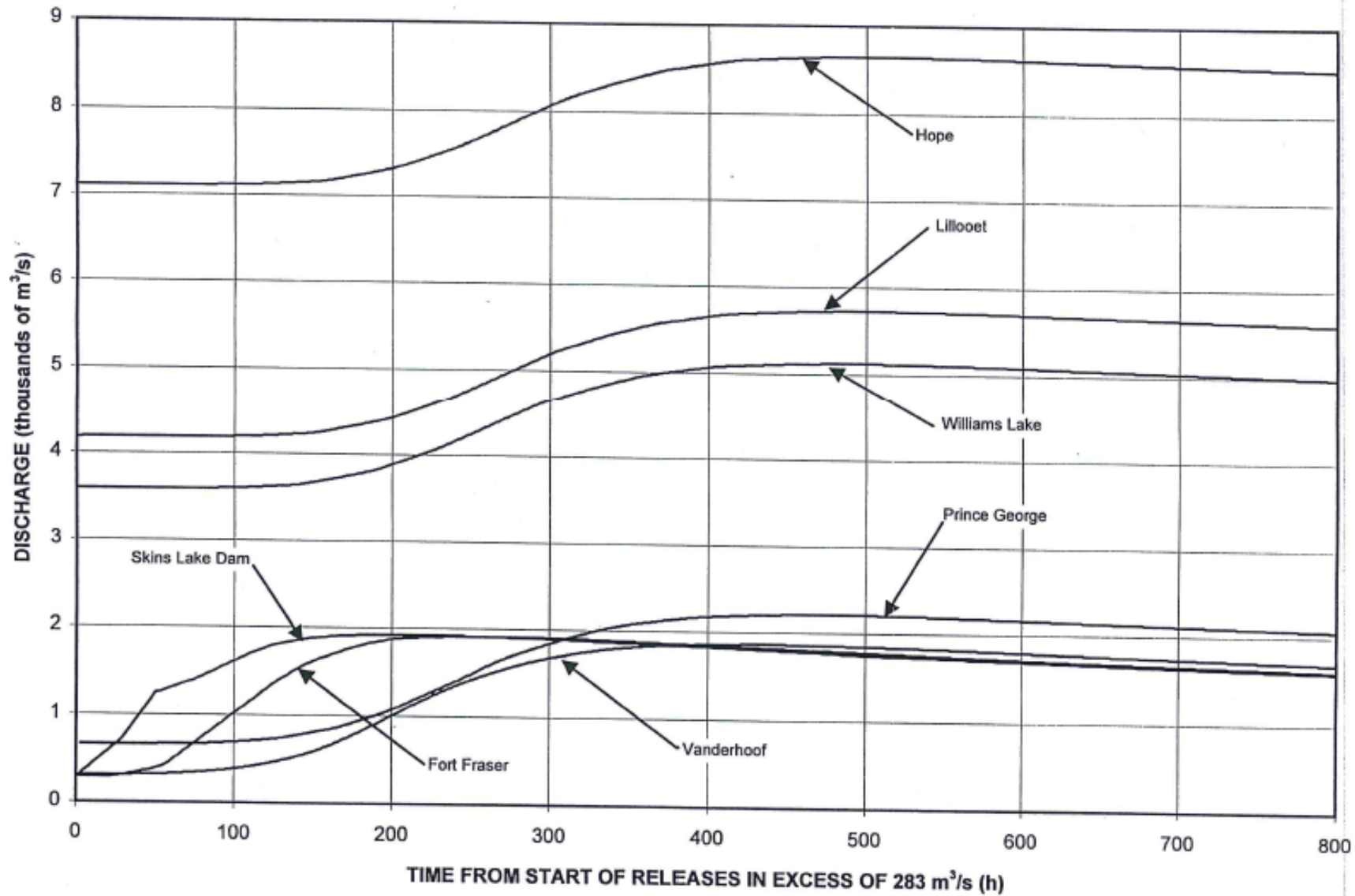


Figure 12. Flood Elevation resulting from Extreme Flood Release (Skins Lake, Fort Fraser, Vanderhoof & Prince George)

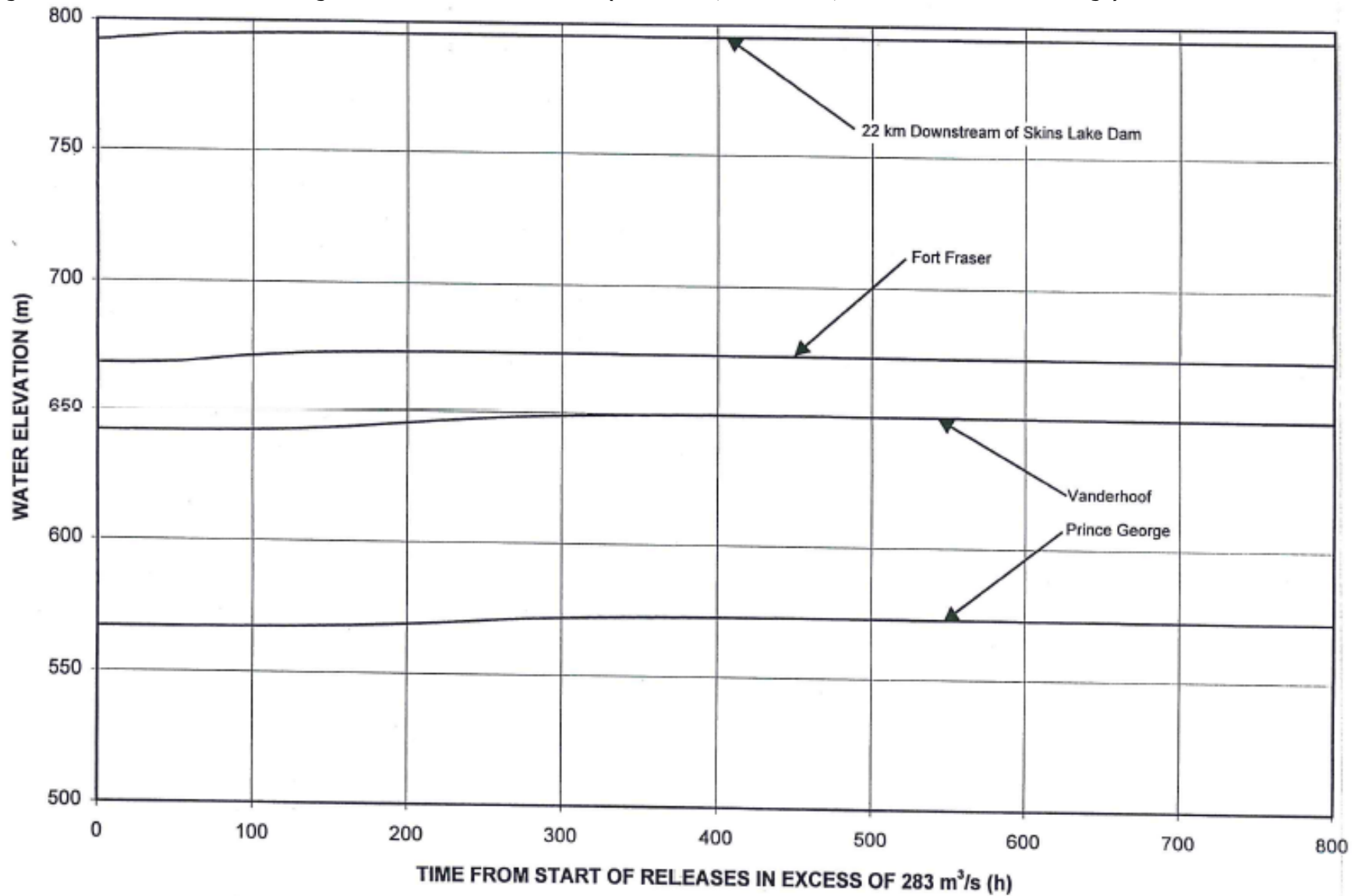
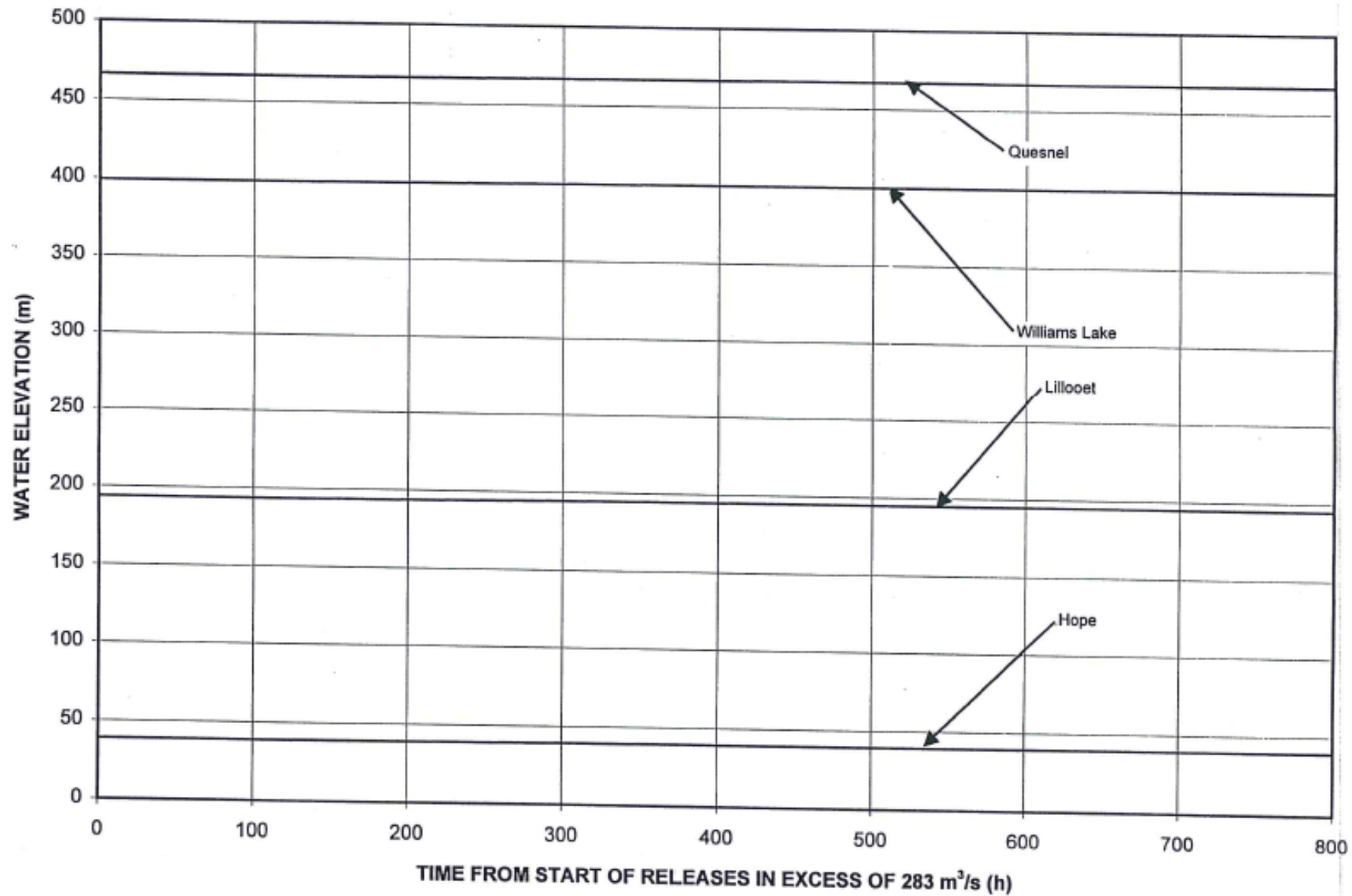


Figure 13. Flood Elevation resulting from Extreme Flood Release (Quesnel, Williams Lake, Lillooet & Hope)



APPENDIX F – GUIDANCE FOR DETERMINING THE EMERGENCY LEVEL

Event	Situation	Emergency level*
Earth spillway flow	Reservoir water surface elevation at spillway crest or spillway is flowing with no active erosion	1
	Spillway flowing with active gully erosion	2
	Spillway flow that could result in flooding of people downstream if the reservoir level continues to rise	2
	Spillway flowing with an advancing headcut that is threatening the control section	3
	Spillway flow that is flooding people downstream	3
Embankment overtopping	Reservoir level is 1 foot below the top of the dam	2
	Water from the reservoir is flowing over the top of the dam	3
Seepage	New seepage areas in or near the dam	1
	New seepage areas with cloudy discharge or increasing flow rate	2
	Seepage with discharge greater than 10 gallons per minute	3
Sinkholes	Observation of new sinkhole in reservoir area or on embankment	2
	Rapidly enlarging sinkhole	3
Embankment cracking	New cracks in the embankment greater than ¼-inch wide without seepage	1
	Cracks in the embankment with seepage	2
Embankment movement	Visual movement/slippage of the embankment slope	1
	Sudden or rapidly proceeding slides of the embankment slopes	3
Instruments	Instrumentation readings beyond predetermined values	1
Earthquake	Measurable earthquake felt or reported on or within 50 kilometers of the dam	1
	Earthquake resulting in visible damage to the dam or appurtenances	2
	Earthquake resulting in uncontrolled release of water from the dam	3
Security threat	Verified bomb threat that, if carried out, could result in damage to the dam	2
	Detonated bomb that has resulted in damage to the dam or appurtenances	3
Sabotage/ vandalism	Damage to dam or appurtenance with no impacts to dam function	1
	Modification to the dam or appurtenances that could adversely impact the functioning of the dam	1
	Damage to dam or appurtenances that has resulted in seepage flow	2
	Damage to dam or appurtenances that has resulted in uncontrolled water release	3

* Level 1: Nonemergency unusual event, slowly developing

* Level 2: Potential dam failure situation, rapidly developing

* Level 3: Urgent; dam failure appears imminent or is in progress

APPENDIX G – INUNDATION MAPS FOR DAM BREACH AND EXTREME FLOOD (Web Link)

The Inundation Maps are located at our stakeholder Nechako Reservoir website (Get Involved Nechako) at the following link ;

https://www.getinvolvednechako.ca/learn-more-our-operations?tool=qanda#tool_tab

Below lists the maps available for referencing geographical locations from Skins Lake to Vancouver (Map Sheets # 1 – 74). Inundation Map file (per area) that can be found at the website above for access, are as follows;

1. **Inundation Overview Map** (*BC Province – Cover page*)
2. **Skins Lake Spillway** (*Maps 1 thru 9*)
3. **Fort Fraser** (*Maps 10 thru 12*)
4. **Vanderhoof** (*Maps 13 thru 18*)
5. **Prince George** (*Maps 19 thru 27*)
6. **Quesnel** (*Maps 28 thru 34*)
7. **Williams Lake** (*Maps 35 thru 46*)
8. **Lillooet** (*Maps 47 thru 57*)
9. **Hope** (*Maps 58 thru 60*)
10. **Chilliwack** (*Maps 61 thru 70*)
11. **New Westminster** (*Maps 71 thru 74*)