Gillies Bay Improvement District

Emergency Response Manual

May 2017

(Updated March 2024)

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1.1 Water Lines – Broken Main Line

1.1.1 Isolate Leak

The GBID Water Operator must isolate the leak but maintain enough pressure to prevent backflow.

1.1.2. Advisory

The GBID Water Operator will report the break to the Administrator.
The Administrator will initiate ratepayer contact regarding the service disruption and possible boil water advisory for the service area affected. The Water Operator or Administrator will advise the Drinking Water Officer of the problem and the actions being taken.

1.1.3. Effect Repairs

The GBID Water Operator will organize and complete repair as promptly as the situation will allow.

1.2 Water Lines – Cross Contamination / Back Siphonage

1.2.1 Identify & Stop the Problem

As soon as the GBID is alerted to a possible cross contamination risk the Water Operator, Trustees, or Administrator must immediately investigate. If there is a cross contamination event occurring, the offending source must quickly be eliminated from further contamination. This will be done in a manner that ensures the situation creating the source cannot be recreated. This may involve shutting off the curb stop valve. The Drinking Water Officer must be promptly notified of the event and the steps taken. Consultation with the DWO regarding sampling and the restoration of potable water service is ongoing as the situation evolves.

1.2.2 Implement Advisory

Immediately issue either a 'boil water' advisory (see 3.1.2) or a 'do not use' advisory (see 2.2.3). Both of these situations will involve flushing of the affected parts of the system and should be part of the advisory.

1.2.3 Clean Water Lines

Flushing of the affected distribution and mainlines in the system and should be done immediately once it is determined that doing so won't further contaminate the system.

This is followed by bacterial sampling and or potable water sampling as specified by the Drinking Water Officer.

1.2.4 Lift Advisory

Notify the community as soon as the Drinking Water Officer indicates that the water meets regulatory guidelines, and the restoration of potable water service has resumed. (See 3.1.3)

2.1 Cranby Lake – Imminent Dam Failure

2.1.1 Causes

Earthquakes, overtopping, storm event, flash flooding downstream or other acts of nature could lead to hazardous conditions or the imminent failure of the dam.

2.1.2 Assess Dam Status

Once the GBID becomes aware of a situation which may affect the dam, the Water Operator is to visit the dam site and conduct a visual inspection to determine if the dam is at risk of hazardous conditions or imminent failure. If there is a risk present, the Water Operator will act in accordance with the Dam Emergency Plan. (June 2018 Revised) *document attached Appendix G

2.1.3 Imminent Failure – Mobilize Equipment

GBID Operator must contact Lafarge Texada Quarry (604-486-7627 daytime or 604-486-7381 after hours), and request that the mine superintendent begin mobilizing men and equipment to curtail the imminent dam failure. The mine superintendent will immediately dispatch the following equipment:

- Earthmoving equipment capable of loading dam material.
- Dump trucks capable of carrying material.

2.1.4 Emergency

GBID Water Operator to alert the Community of the impending disaster:

Organization	Contact	Primary Phone	2ndy Phone	Alert to Issue/Action
North Island 911	Police Fire Ambulance	911		Initiate emergency response agencies.
Gillies Bay Improvement District	George Kapetanakis, Water Operator	Cell/Text 604-208-3965		Water System Response
Van Anda Improvement District	Chris Gordon Back up Water Operator	Cell/Text 604-223-6567		Emergency Water System Response assistance
Van Anda Improvement District	back up water operator			Emergency Water System Response assistance.
Gillies Bay Improvement District	Theresa Beech, Corporate Officer	Work Cell/Text 604-223-7757 Office 604-486-7757	Cell/Text 604-223-7757	Assist in Community Alert (social media, phone, etc.). Advise Chair/Board of actions taken.
Gillies Bay Improvement District	Courtney Thomas bookkeeper	Office 604-486-7757	Cell/Text 604-396-7544	Assist Admin or act as Admin when Theresa is away.
Gillies Bay Improvement District	G.B.I.D. Chair Roger Kimmerly	Home 604 486-0009	Cell/Text	Status updates from Admin, contact trustees.
Gillies Bay Volunteer Fire Department	Rob McWilliam Fire Chief	Fire Chief Cell/Text 604-414-5121	Emergency 911 Home # 604-486-7109	Initiate evacuation of 'at risk' residents and businesses to higher ground

qathet Regional District Emergency Services Department.	Ryan Thoms	Cell/Text 604-414-4553		Community Notification System/facebook https://www.qathet.ca/2023/01/05/qathet-regional-district-launches-official-facebook-page/
PEP Prov. Emergency Preparedness	Ken Becotte, Emergency Services Coordinator	Cell/Text 604-997-2250		Contact Provincial Govt
Gillies Bay RCMP	Reception (Pat) or Member(s)	Office 604-486-7717	911	Move to higher ground
Texada Health Centre	Reception	Office 604-486-7525	Emergency 604-486-6353	Move to higher ground
Gillies Bay General Store	Owner/Staff	Office 604-486-7208		Move to higher ground

2.2 Cranby Lake – Water Contamination

2.2.1 Water Contamination

As soon as the GBID is alerted to a possible accident occurring in and around the lake, or other types of contamination risk the Water Operator, Trustees, or Administrator must immediately investigate. If there is a contamination event occurring, the offending source must quickly be eliminated from further contamination. This will be done in a manner that ensures the situation creating the source no longer threatens to do so. This may involve activating higher levels of assistance by calling 911. The Drinking Water Officer must be promptly notified of the event and the steps being taken. Consultation with the DWO regarding sampling and the restoration of potable water service is ongoing as the situation evolves.

2.2.2 Shut of Water Intake

As soon as there is evidence of water contamination, the GBID Water Operator will immediately shut off the water intake from the lake. The Drinking Water Officer must be promptly notified of the event and the steps being taken.

2.2.3 Implement Advisory

As directed by either the Water Operator or Drinking Water Officer, issue either a ‘boil water’ advisory (see 3.1.2) or a ‘do not use’ advisory.

2.2.4 Water Contamination/Do Not Use Advisory

GBID Water Operator to alert the Community of the impending disaster:

Organization	Contact	Primary Phone	2ndy Phone	Alert to Issue/Action
North Island 911	Police Fire Ambulance	911		Initiate emergency response agencies.
Gillies Bay Improvement District	George Kapetanakis, Water Operator	Cell/Text 604-208-3965		Water System Response
Van Anda Improvement District	Marianne Segers Water Operator	Cell/Text 604-315-1363		Emergency Water System Response assistance
Van Anda Improvement District				Emergency Water System Response assistance
Gillies Bay Improvement District	Theresa Beech	Work Cell/Text 604-223-7757 Office 604-486-7757	Cell/Text 604-223-7757	Initiate phone-tree advisory (see appendix B), distribute GBID advisory posters, notices on Gillies-bay.ca and Face book message boards
Gillies Bay Improvement District	Courtney Thomas Office Assistant	Office 604-396-7544	Cell/Text 604-414-8282	Assist in phone tree and other community notifications
Gillies Bay Improvement District	Roger Kimmerly G.B.I.D. Chair	Home 604 486-0009	Cell/Text	Status updates from Admin, contact trustees.
Gillies Bay Volunteer Fire Department	Rob McWilliam Fire Chief	Fire Chief Cell 604-414-5121	Emergency 911 Home # 604-486-7109	Initiate bull-horn announcement with fire truck
qathet Regional District Emergency Services Department.	Ryan Thoms	Cell/Text 604-414-4553		Community Notification System/Twitter
PEP Prov. Emergency Preparedness	Ken Becotte, Emergency services Coordinator	Cell/Text 604-997-2250		Contact Provincial Govt

Gillies Bay RCMP	Reception (Pat) or Member(s)	Office 604-486-7717	911	Do not use water & post advisory from GBID in visible location
Texada Health Centre	Reception	Office 604-486-7525	Emergency 604-486-6353	Contact at-risk patients and post advisory from GBID in visible location
Gillies Bay General Store	Owner/Staff	Office 604-486-7208		Do not use water & post Advisory from GBID in visible location
Texada Community Hall Marquee	qathet Regional District Caretaker Larry Newman	Cell/Text 604-223-4530		Place notice on Marquee at Texada Community Hall
Community Notice Boards	Theresa Beech	Cell/Text 604 223-7757		Place notice on Marquee at GBID, Library, and Farmer's market & concession

2.2.4 Alternate Water Supply

For those instances where no water can be supplied from Cranby Lake, the following alternative sources can be utilized.

1. Potable Water

- Short Term
  Locally, bottled water can be purchased at the Gillies Bay General Store and Texada Market in Van Anda. Shelter Point Park (Regional District) has an independent supply, which could also be accessed.
  Additionally, water may be sourced from Powell River grocery stores and bulk packaged water from Aaron Service and Supply.
- Medium Term
  Arrangements can be made with a licensed water hauler in Powell River.
- Long Term
  The District has water rights on Ball Park Creek and Hallet (Cranby) Creek. Arrangements could also be made via mutual aid agreements, to run water pipe from Paxton Lake into the Cranby water system.

2. Raw Water

* It is important to differentiate between raw water intended to be made potable and raw water intended for other uses such as fire fighting. Raw water must be properly treated before being introduced into the distribution system. Raw water that cannot be made potable should **NEVER** be introduced into the distribution system.

Care should be taken to flush clean and prevent backflow of a fire apparatus or tanker truck connected to the distribution system after utilizing an unsafe water source as discussed in the following.

- Short Term
  Using a water hauler, the Texada Quarry (Lafarge) could be used as a supplier, as could the water storage tank in the Blair Subdivision.
- Medium & Long Term
  The District has water rights on Ball Park Creek and Hallet (Cranby) Creek. As well, arrangements could be made to run water pipe from Paxton Lake via mutual aid agreements, into the Cranby water system.

3.1 Boil Water Advisory (due to poor water quality, chlorinator failure, etc.)

3.1.1 Failure

Should an event occur that causes failure of the chlorination process, the Water Operator will promptly assess the situation and its effect on the production of potable water. If the conditions are such that the safety of the water is questionable or immediate the Water Operator will consult with the Drinking Water Officer and proceed accordingly. The Water Operator will contact the Administrator to start the public notification process with one of the following.

Precautionary Boil Water Advisory

Boil Water Advisory

Do Not Use Advisory

The steps taken may be the following, repair failure issue, flush system to restore chlorine residual.

Consultation with the DWO regarding sampling and the restoration of potable water service is ongoing as the situation evolves.

3.1.2 Poor Water Quality

Often the quality of the raw water is affected as the seasons change in late April and early May. The quality progressively works its way towards exceeding the limits of acceptable water quality limits. The Water Operator must continually monitor these conditions and make proper adjustments at the chlorinator to maintain potability. The Water Operator must also pay heed to the bacterial samples and if necessary, increase the frequency of the samples to inform the maintenance of adequate treatment of raw water. During this period, it is best practice to regularly communicate with the Drinking Water Officer and Gillies Bay Improvement District Staff as a Boil Water Advisory becomes imminent. It is also good practice to forewarn the public of declining water quality so they can prepare in advance of a notice being issued.

3.1.3 Implement Boil Water Advisory (see Appendix A for advisory notice)
Administrator will implement the 'boil water' notice requirement, by initiating phone calls in the following order and by distributing printed & online notices:

Organization	Contact	Primary Phone	2ndy Phone	Alert to Issue/Action
Gillies Bay Improvement District	George Kapetanakis, Water Operator	Cell/Text 604-208-3965		Water Operator
Van Anda Improvement District	Marianne Segers, Water Operator	Cell/Text 604-315-1363		Backup Water Operator
Van Anda Improvement District				Backup Water Operator
Gillies Bay Improvement District	Theresa Beech, Corporate Officer	Work Cell/Text 604-223-7757 Office 604-486-7757		Initiate advisory (see appendix A), distribute GBID advisory posters, notices on Gillies-bay.ca and Face book message boards
Gillies Bay Improvement District	Courtney Thomas Administrator	Office 604-396-7544	Cell/Text 604-414-8282	Assist with distribution of posters and social media notices
Gillies Bay Improvement District	G.B.I.D. Chair Roger Kimmerly	Home 604 486-0009	Cell/Text	Status updates from Admin, contact trustees.

Gillies Bay Volunteer Fire Department	Rob McWilliam Fire Chief	Fire Chief Cell/Text 604-414-5121	Emergency 911 Home # 604-486-7109	Initiate bull-horn announcement with fire truck
qathet Regional District Emergency Services Department.	Ryan Thoms	Cell/Text 604-414-4553		Community Notification System/Twitter
Gillies Bay RCMP	Reception (Pat) or Member(s)	Office 604-486-7717	911	Boil water & post advisory from GBID in visible location
Texada Health Centre	Reception	Office 604-486-7525	Emergency 604-486-6353	Contact at-risk patients and post advisory from GBID in visible location
Gillies Bay General Store	Owner/Staff	Office 604-486-7208		Boil water & post Advisory from GBID in visible location
Texada Community Hall Marquee	qathet Regional District Caretaker Larry Newman	Cell/Text 604-223-4530		Place notice on Marquee at Texada Community Hall
Community Notice Boards	Theresa Beech	Cell/Text 604 223-7757		Place notice on Marquee at GBID, Library, and Farmer's market & concession

3.1.4 Lift Advisory

As soon as the Drinking Water Officer advises the Water Operator, Chair (or alternate) that the water meets regulatory guidelines for water quality, phone calls to **lift the boil water advisory** will be made by the Administrator to all the parties noted above, advising that the water is no longer under a boil water advisory, and that all notices can be removed. Paper and online notices will be removed and/or amended.

Appendix A

BOIL WATER ADVISORY

Gillies Bay – <<<*DATE*>>>

until further notice

Please boil your water at a full rolling boil for a minimum of one minute and help us spread the word. Water should be boiled for any of the following uses: drinking, food prep, coffee, brushing teeth, infant formula, ice, washing fruit/veg, beer/wine making, canning, immune-compromised individuals and for pets.

Thank you.

Appendix B

Phone Tree Water Contamination/Do Not Use Advisory List

In the event of a WATER CONTAMINATION ADVISORY, the following phone procedure shall be used. The GBID cell phone or the hard line at the fire hall can be used to make these calls.

Coordinator: GBID Corporate Officer – Theresa Beech- 604-223-7757

Volunteer – Courtney Thomas; volunteered to help make calls. 604-4396-7544

The procedure (prior to implementation of a provincial emergency system), is for each volunteer to take a portion of the phone book (i.e.: Admin gets A – H, volunteer gets I – P, and additional volunteer gets Q – Z). Call all residents listed as 'Gillies Bay' residents, including businesses and organizations such as the Medical Clinic, GB Store, Library/Old School and Community Hall.

NOTE: Plans for an Emergency Email Notification have been shelved, due to lack of uptake in the community.

NOTE: We are also waiting to hear about a provincial emergency phone system that can be utilized for notifying the public of any emergencies, including 'boil water' and 'do not use' advisories.

Appendix C

WATER CONTAMINATION ADVISORY

Gillies Bay – <<<*DATE*>>> until further notice

Gillies Bay Improvement District has detected unspecified waterborne contaminants. The water system will remain under a <u>'DO NOT USE'</u> advisory until further notice. We will post notices when this advisory is lifted.

Appendix D

GBID Contacts

(all contacts current as of March 2019)

Name	Title	Primary Phone	Secondary Phone	Email
George Kapetanakis	Water Operator	Cell/Text 604-208-3965	N/A	water@gillies-bay.ca
Christopher Gordon	Relief Water Operator	Cell/Text 604-223-6567		dirt_surfer@hotmail.com
Rob McWilliam	Fire Chief	Fire Chief Cell/Text 604-414-5121	Emergency 911 Home # 604-486-7109	chief@gilliesbayvfd.ca
Theresa Beech	Corporate Officer	Work Cell/Text 604-223-7757 Office 604-486-7757	Cell/Text 604-389-8886	admin@gillies-bay.ca
Courtney Thomas	administration	Office 604-486-7757	Cell/Text 604-414-8282	finance@gillies-bay.ca
Roger Kimmerly	Chair – Board of Trustees	Home 604 486-0009	N/A	rogerkimmerly@gmail.com
Keith Franklin	Board of Trustees	Home 604-223-4220	N/A	4737texada@gmail.com
Carolanne White	Board of Trustees	Home 250 589-3428	N/A	carolanne.white@hotmail.com
Lisa Alcos	Board of Trustees	Home 604-414-4457	N/A	lisaalcos@hotmail.com
Rolly Thorpe	Board of Trustees	Home 250-818-8098	N/A	rolly.thorpe@gmail.com

Appendix E

Boil Water Advisory - Quick Reference Sheet

Updated March 2019

Water Contamination – Bacterial

How BWA is to be initiated

The Water Operator or Drinking Water Officer will advise the Corporate Officer as soon as a "Boil Water" advisory must be implemented. The Corporate Officer will notify the GBID Chair. Boil Water Advisories can be initiated at the behest of the Water Operator or the Drinking Water Officer with Coastal Health. The Water Operator will notify the Drinking Water Officer immediately should a Boil Water Advisory be necessary.

As soon as the Water Operator or the Corporate Officer becomes aware of the boil water requirement, the Corporate Officer will initiate notifying the public.

Implement Boil Water Advisory

STEP ONE: The Fire Department can announce BWA over the loudhailer in the fire truck, throughout the water district. Please call Rob McWilliam to arrange this: 604-414-5121. If no one is available to drive the truck, that's okay. This is just an additional measure when available.

STEP TWO: as follows:

Medical Centre	604-486-7525
GB General Store	604-486-7208
RCMP	604-486-7717

qathet Regional District Emergency Services Department – Ryan Thoms Cell/Text 604-414-4553 for community notifications systems/Twitter.

STEP THREE: Activate the pre-recorded Boil Water Advisory Notice on our voicemail system on the GBID cell phone: **Greeting #2**

"*Thank you for calling the Gillies Bay Improvement District. Please be advised that a Boil Water Advisory is in effect for Gillies Bay until further notice. Please boil all water used for drinking, food preparation and brushing teeth for a minimum of 1 minutes at a full rolling boil. If you are calling about an urgent water-related issue such as a leak or a water line break, please hang up and call our water operator at 604-208-3965. If you are trying to reach the Gillies Bay Fire Department, please dial 604-414-5121. For all other inquiries please leave a brief message including your name, phone number and the reason for your call. We will get back to you as soon as possible. You can also visit our website at www.gillies-bay.ca. Thank you and have a nice day."*

STEP FOUR: Post paper notices printed on high visibility paper like pink or yellow. (Template is located in Emergency Procedures Manual and below) at the Gillies Bay Store, Library/Old School, Community Hall, Recycle Depot, Medical Clinic, Fire Hall, Ball Park and Shelter Point Concession notice board. A sample notice is provided below. Please fill in the date and make ***11*** copies (you can use the copy machine at the office).

STEP FIVE: Post online notices on Facebook – Texada Message Board and our GBID Facebook Page, as well as the GBID website. If Admin is away, the Trustees or the Office Assistance can log onto Facebook and post. Website can be updated by the Office Assistant or upon Admin's return.

STEP SIX: Call Larry (PRRD Caretaker) at 604-223-4530 and ask to post the BWA on the community hall marquee. Post on marquee board at the GBVFD. The notice should read: GB BOIL WATER ADVISORY IN EFFECT. L**et Larry Newman know that he will need to advise anyone who will be using water at the community hall, ballpark or library/old school.**

Lifting the Boil Water Advisory

The Drinking Water Officer will notify the chair (or water officer) when a series of test results indicates safe drinking water.

STEP ONE: phone calls must be made to advise that the BWA is lifted:

Medical Centre	604-486-7525
GB General Store	604-486-7208
RCMP	604-486-7717

qathet Regional District Emergency Services Department – Ryan Thoms Cell/Text 604-414-4553 for community notifications systems/Twitter.

STEP TWO: Paper notices must be removed from all locations.

STEP THREE: Online Notices must be amended to let people know that the advisory has been lifted. Please edit the original post *and* post in the comments (for Facebook). Don't forget to post the lift notice to the GBID website as well.

STEP FOUR: Call Larry (PRRD Caretaker) and have the marquee message changed to GB BOIL WATER ADVISORY LIFTED and post same at GBVFD location.

STEP FIVE: The answering machine message should be changed to: **Greeting #1**

Thank you for calling the Gillies Bay Improvement District. No one is available to take your call at the moment. If you are calling about an urgent water-related issue such as a leak or a water line break, please hang up and call our water operator at 604-208-3965. If you are calling for the Gillies Bay Fire Department, you can reach our fire chief at 604-414-5121. For all other inquiries please leave a brief message including your name, phone number and the reason for your call. We will get back to you as soon as possible. You can also visit our website at www.gillies-bay.ca. There are currently no boil water advisories in effect for Gillies Bay. Thank you and have a nice day.

BOIL WATER ADVISORY

Gillies Bay – _____ until further notice

Please boil your water at a full rolling boil for a minimum of one minute and help us spread the word. Water should be boiled for any of the following uses: drinking, food prep, coffee, brushing teeth, infant formula, ice, washing fruit/veg, beer/wine making, canning, immune-compromised individuals and for pets.

Thank you.

Appendix F

Contact Name(s)	Phone #	Cell #	Fax # or other #'s	Email
Water Operator George Kapetanakis BCWWA # EOCP # 1001835	Office 604-486-7757	Cell/Text 604-208-3965		water@gillies-bay.ca
Owner's Name and Address: Gillies Bay Improvement District Facility #11001 Theresa Beech, Corporate Officer	Office 604-486-7757	Cell/text 604-223-7757		admin@gillies-bay.ca
Electrician: Newport Electric Davis Vanzella	Office 604-485-0045 604 223-3333	Cell 604-483-1838		
Plumber: DJ's Plumbing George Kapetanakis	Office 604-483-1116 604 208-3965			
Equipment Supplier(s): Andrew Sheret Courtenay Keith Harvey – Sales	Office 205-334-3353	Cellular/Text 250-703-3361		Keith.harvey@sheret.com

Other: Christopher Gordon – backup water operator	Work	Cell/Text 604-223-6567	Home	
Public Health Contact Information				
Drinking Water Officer: Michael Nguyen, DWO	604-485-3324	604-414-5545	778-317-8567	Michael.nguyen@vch.ca
Back-up Health Contact Darren Molder, Manager	604-885-8711	604-989-1357	604-885-5200	Darren.molder@vch.ca
Back-up Health Contact Jack Davidson, EHO	604-485-3335	604-483-1981	604-314-0596	Jack.davidson@vch.ca
Medical Health Officer: Moliehi Khaketla **MHO**	604-984-5070	604-612-9433		Moliehi.khaketla1@vch.ca
Back-up Health Contact				

Location of Water Source(s)

Directions to Site: See Dam Emergency Plan

Attach photo's (Optional) See Dam Emergency Plan

GPS settings: (if Known) See Dam Emergency Plan

IN CASE OF EMERGENCY: *Enter name of the person responsible for tasks.*

If the water in the water system becomes contaminated or you receive an unsatisfactory water result, or in the event of an interruption in the treatment process:

1. Shut off water supply, if appropriate.
2. George Kapetanakis – Water Operator will notify DWO or back-up health contact.
3. Contact other appropriate person(s) from the list of emergency numbers.
4. Theresa Beech – Corporate Officer will notify any affected water users. Please keep a phone and address list of users and warning notifications handy. May need to phone or hand-deliver the notice (and water disinfection procedures) to the users.
5. Theresa Beech – Corporate Officer will post warning notifications.
6. George Kapetanakis – Water Operator will coordinate repairs.
7. Organize alternate source of safe drinking water (if available).

Start-up Procedure

1. Identify and correct source of contamination.
2. Entire system should be flushed and disinfected. Follow attached guideline.
3. Submit water sample(s) to appropriate approved Lab for testing. For bacteriological contamination three negative successive samples are usually required. Contact your DWO to confirm the number of samples necessary.
4. Contact DWO for approval to resume use of water supply.

Posting the Emergency Response Plan

The ERP must be posted in a conspicuous location that is easily accessible to the operator and management of the water supply.

Location of ERP: Office, Chlorinator, Dam, Fire Dept.

Additional Information

1. **Include a schematic drawing of the water supply system, from the source to the tap. Include all sources, storage, reservoirs, treatment, and distribution system.**

Include public notices which may be required in the event of a "boil advisory" or "do not consume" notice. Templates are attached. See Dam Emergency Plan

GILLIES BAY
IMPROVEMENT DISTRICT
PO BOX 102 GILLIES BAY BC V0N 1W0

Emergency Dam Safety Plan

420101-00

Gillies Bay Improvement District

January 2018

Prepared By:
Theresa Beech and Ken Taylor
Copy # 2of #2
Revision: Revision #2
Reviewed and Updated: 2023-02-07

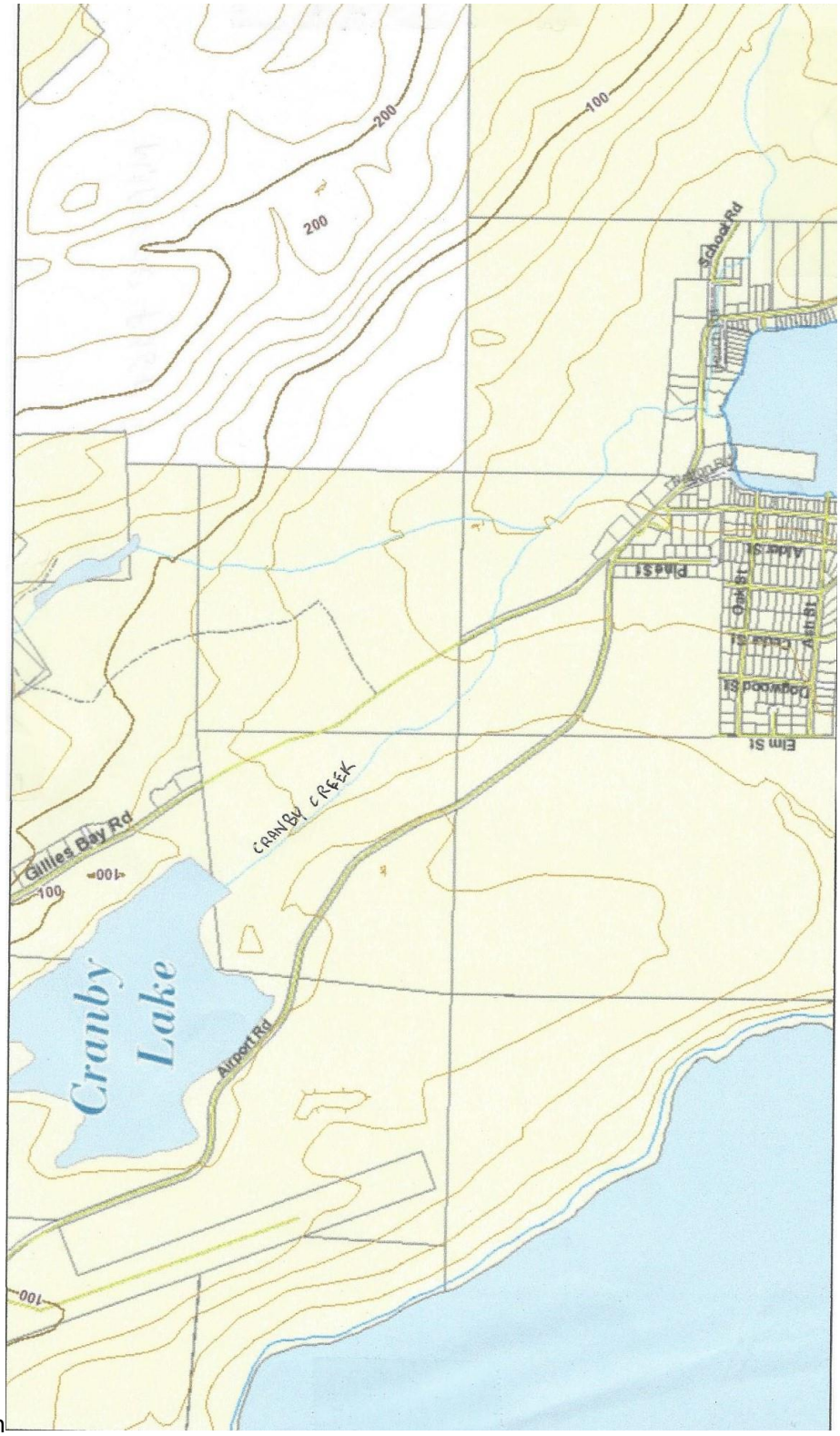
Dam Emergency Plan Overview

Section 1

The purpose of this Dam Emergency Plan (DEP) is to reduce the risk of human life loss and injury and minimize property damage during an unusual or emergency event at Cranby Lake Dam. This DEP has been prepared with the intent of meeting the requirements of the *Water Sustainability Act*, Dam Safety Regulation (Regulation). The dam owner and local, regional and provincial response agencies all play a role in responding to an emergency under the *Emergency Program Act*.

Notifications regarding an unusual or emergency event at the dam are based on the three emergency levels which are determined by the Gillies Bay Improvement District. The notification charts for each of the three emergency levels, must be reviewed, and if necessary, revised annually.

Section 9 (1) (a) (ii) of the Regulation requires the dam owner's DEP to include a record containing specific information on their dam to be used by local emergency authorities for their own local emergency plan; a plan mandated under the *Emergency Program Act*. Therefore, to fulfill this requirement, following approval by the Dam Safety Officer, the dam owner must provide *Sections 1 & 2* and *Appendix A (A-1, A-2 & A-3)* to relevant local emergency authorities. Subsequently, these sections are reviewed annually by the dam owner and, if required, updated and copies sent to the Dam Safety Officer and all local emergency authorities for that area.



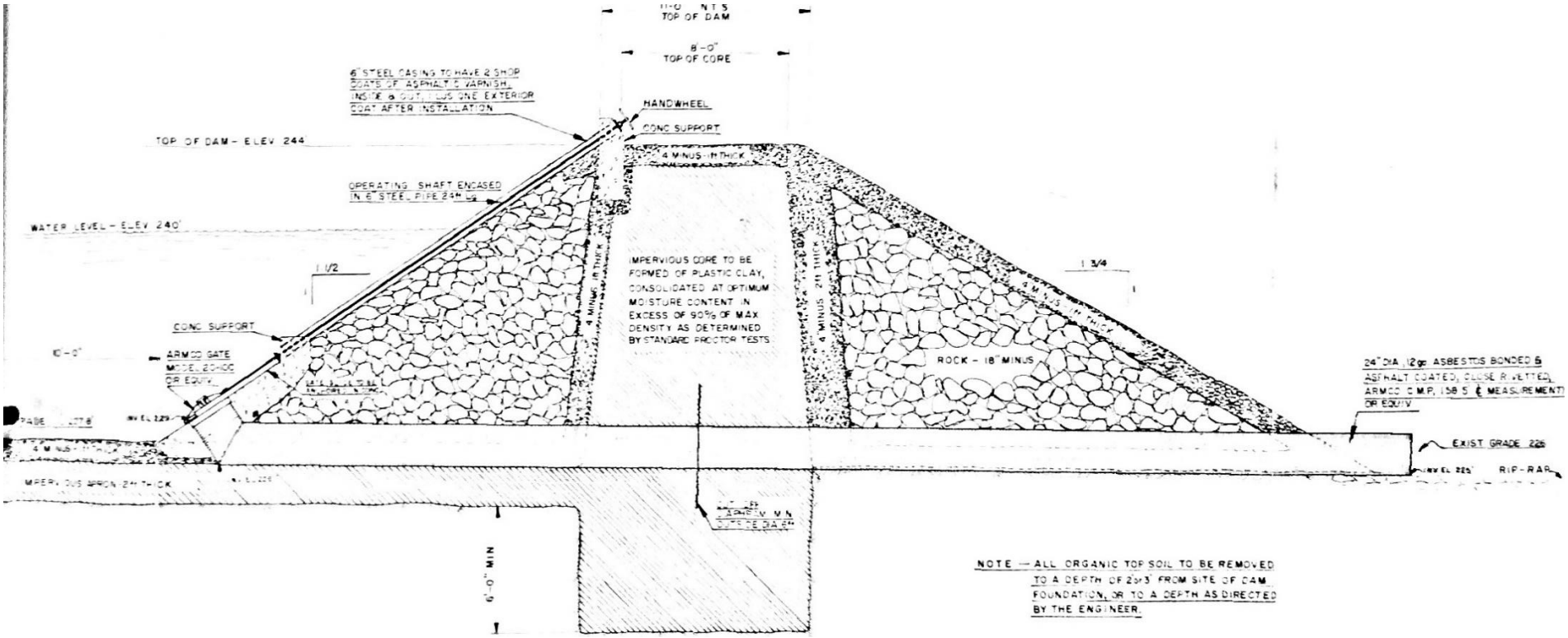
Cranby Lake Dam

2. Basic DEP Data

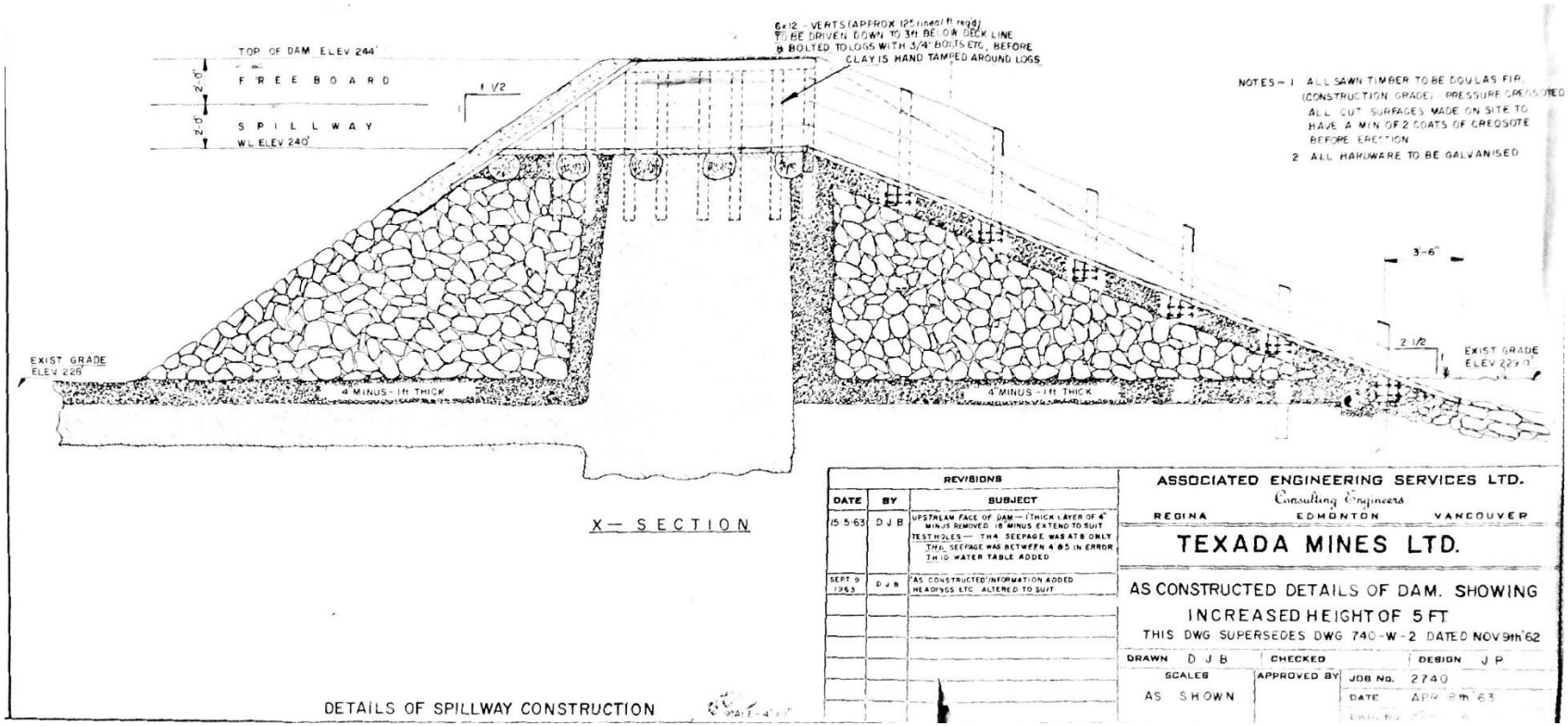
2.1 Dam Description

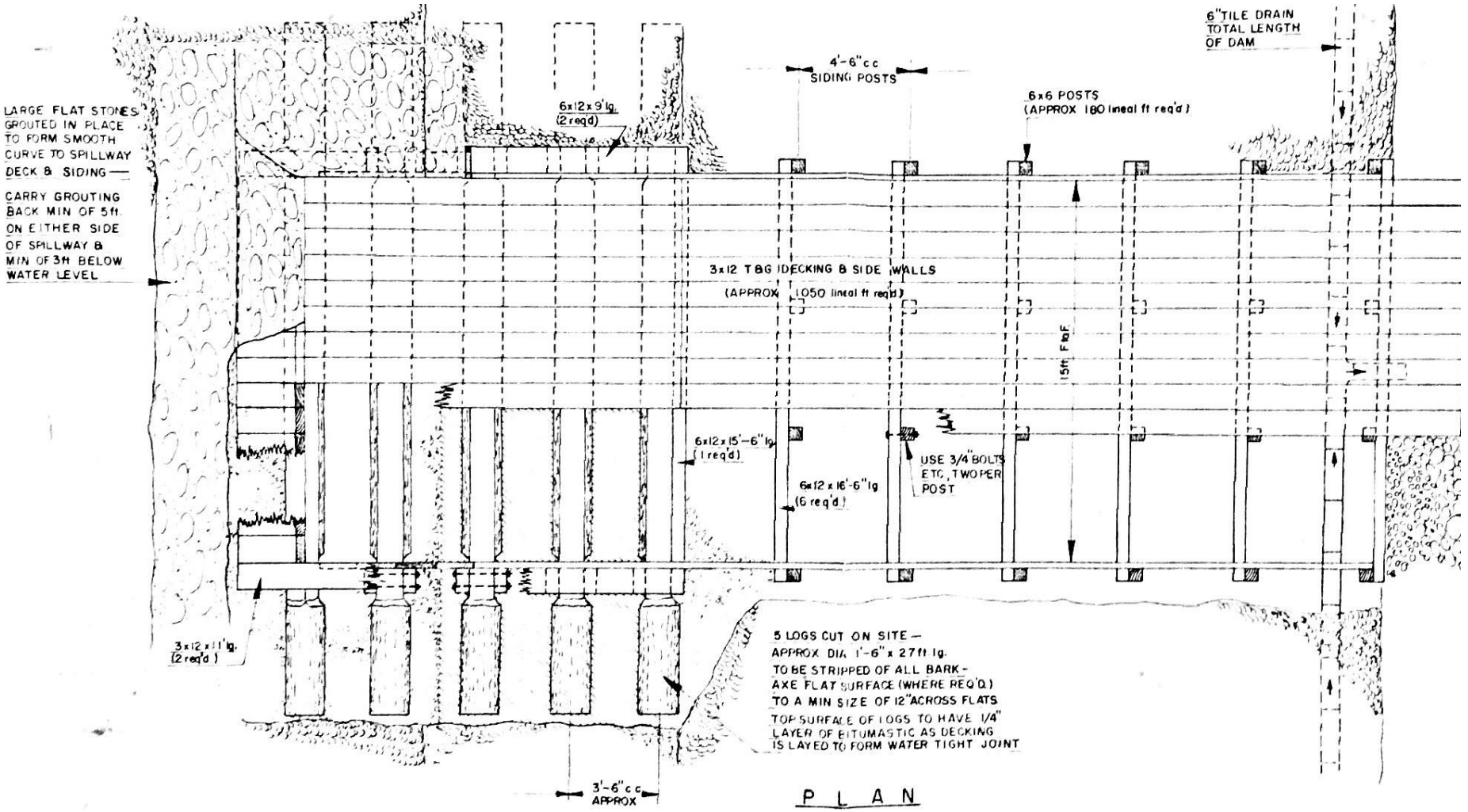
Dam Name:	Cranby Lake
Stream Name:	Cranby Creek
Consequence Classification:	Significant
Dam Type:	Earthfilled
Provincial Dam Number:	420101-00
Height:	4.87 m
Storage Volume:	382,378.8 m^3
Drainage Area:	km^2
Spillway type:	Gated If "other" identify type.
Low Level Outlet:	Plastic If "other" identify type.
Coordinates (i.e. lat/long or UTM):	49 deg 41' 34.74N / 124 deg. 30'4.74W
Other description:	

See Plan View of Dam

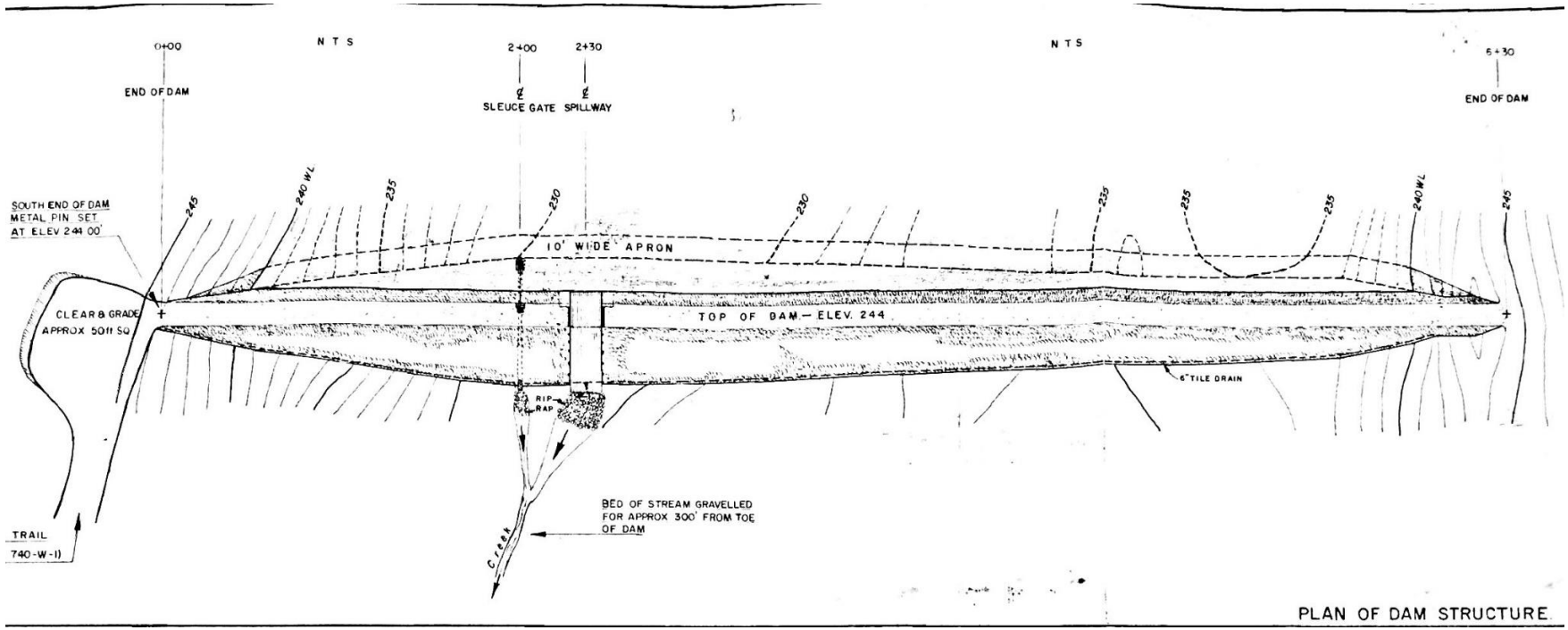


NOTE — ALL ORGANIC TOP SOIL TO BE REMOVED TO A DEPTH OF 2 to 3' FROM SITE OF DAM FOUNDATION, OR TO A DEPTH AS DIRECTED BY THE ENGINEER.


6x12 - VERTS (APPROX 125 lineal ft reqd)
TO BE DRIVEN DOWN TO 3ft BELOW DECK LINE
& BOLTED TO LOGS WITH 3/4" BOLTS ETC, BEFORE
CLAY IS HAND TAMPED AROUND LOGS
TOP OF DAM ELEV 244'
FREE BOARD
2'-0"
SPILLWAY
W.L. ELEV 240'
2'-0"
1 V/2
EXIST GRADE
ELEV 228'
4" MINUS - 1ft THICK
4" MINUS - 1ft THICK
3'-6"
2 1/2
EXIST GRADE
ELEV 229.0'
NOTES - 1 ALL SAWN TIMBER TO BE DOUGLAS FIR. (CONSTRUCTION GRADE) PRESSURE CREOSOTED
ALL CUT SURFACES MADE ON SITE TO HAVE A MIN OF 2 COATS OF CREOSOTE BEFORE ERECTION
2 ALL HARDWARE TO BE GALVANISED
X - SECTION
DETAILS OF SPILLWAY CONSTRUCTION
REVISIONS
DATE
BY
SUBJECT
15-5-63
D J B
UPSTREAM FACE OF DAM - 1' THICK LAYER OF 4" MINUS REMOVED. (6 MINUS EXTEND TO SUIT
TEST HOLES - TH4 SEEPAGE WAS AT 8 ONLY
TH6 SEEPAGE WAS BETWEEN 4 & 5 IN ERROR
TH10 WATER TABLE ADDED
SEPT 9 1963
D J B
'AS CONSTRUCTED' INFORMATION ADDED
HEADINGS ETC ALTERED TO SUIT
ASSOCIATED ENGINEERING SERVICES LTD.
Consulting Engineers
REGINA EDMONTON VANCOUVER
TEXADA MINES LTD.
AS CONSTRUCTED DETAILS OF DAM. SHOWING INCREASED HEIGHT OF 5 FT.
THIS DWG SUPERSEDES DWG 740-W-2 DATED NOV 9th '62
DRAWN D J B
CHECKED
DESIGN J P
SCALES
AS SHOWN
APPROVED BY
JOB No. 2740
DATE APR 8th '63


LARGE FLAT STONES GROUTED IN PLACE TO FORM SMOOTH CURVE TO SPILLWAY DECK & SIDING
CARRY GROUTING BACK MIN OF 5ft ON EITHER SIDE OF SPILLWAY & MIN OF 3ft BELOW WATER LEVEL
6"TILE DRAIN TOTAL LENGTH OF DAM
4'-6" c c SIDING POSTS
6x6 POSTS (APPROX 180 lineal ft req'd)
6x12x9'lg. (2 req'd)
3x12 T&G DECKING & SIDE WALLS (APPROX 1050 lineal ft req'd)
15ft F&F
6x12x15'-6"lg. (1 req'd)
6x12 x 16'-6"lg (6 req'd)
USE 3/4" BOLTS ETC, TWO PER POST
3x12 x 11'lg. (2 req'd)
5 LOGS CUT ON SITE — APPROX DIA 1'-6" x 27ft lg. TO BE STRIPPED OF ALL BARK - AXE FLAT SURFACE (WHERE REQ'D.) TO A MIN SIZE OF 12" ACROSS FLATS TOP SURFACE OF LOGS TO HAVE 1/4" LAYER OF BITUMASTIC AS DECKING IS LAYED TO FORM WATER TIGHT JOINT
3'-6" c c APPROX

PLAN



PLAN OF DAM STRUCTURE

2.2 Directions to Cranby Lake Dam

Vehicle Access – Driving NW along Gillies Bay Road, turn left onto Airport Road and travel 1.59 kilometers to 4735 Airport Road. Follow access road through the gate. Alternate route – access Cranby Lake Road and travel west to Airport Road. Turn left on Airport Road and drive 1.5 kilometers to 4735 Airport Road. There is a locked gate at the edge of the pavement. The Water Operator can provide access 604 414-3703.

2.3 Dam Access

3. General Roles and 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.

3.1 Dam Owner

- As soon as an emergency event is observed or reported, immediately determine the emergency level (see Guidance for Determining the Emergency Level*, Appendix D*).
  - 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 Notification Chart (Appendix B-1) for the appropriate emergency level. This includes "persons in the immediate vicinity of the dam to be evacuated", Appendix A-3.
- 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.

3.2 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 Evacuation Area Map, Appendix A-2).
  - Provide resources as necessary to the dam owners.
- Decide when to terminate the emergency.
- Participate in review, updates and exercises of the DEP.

3.3 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.

3.4 Dam Owner's Technical Representatives

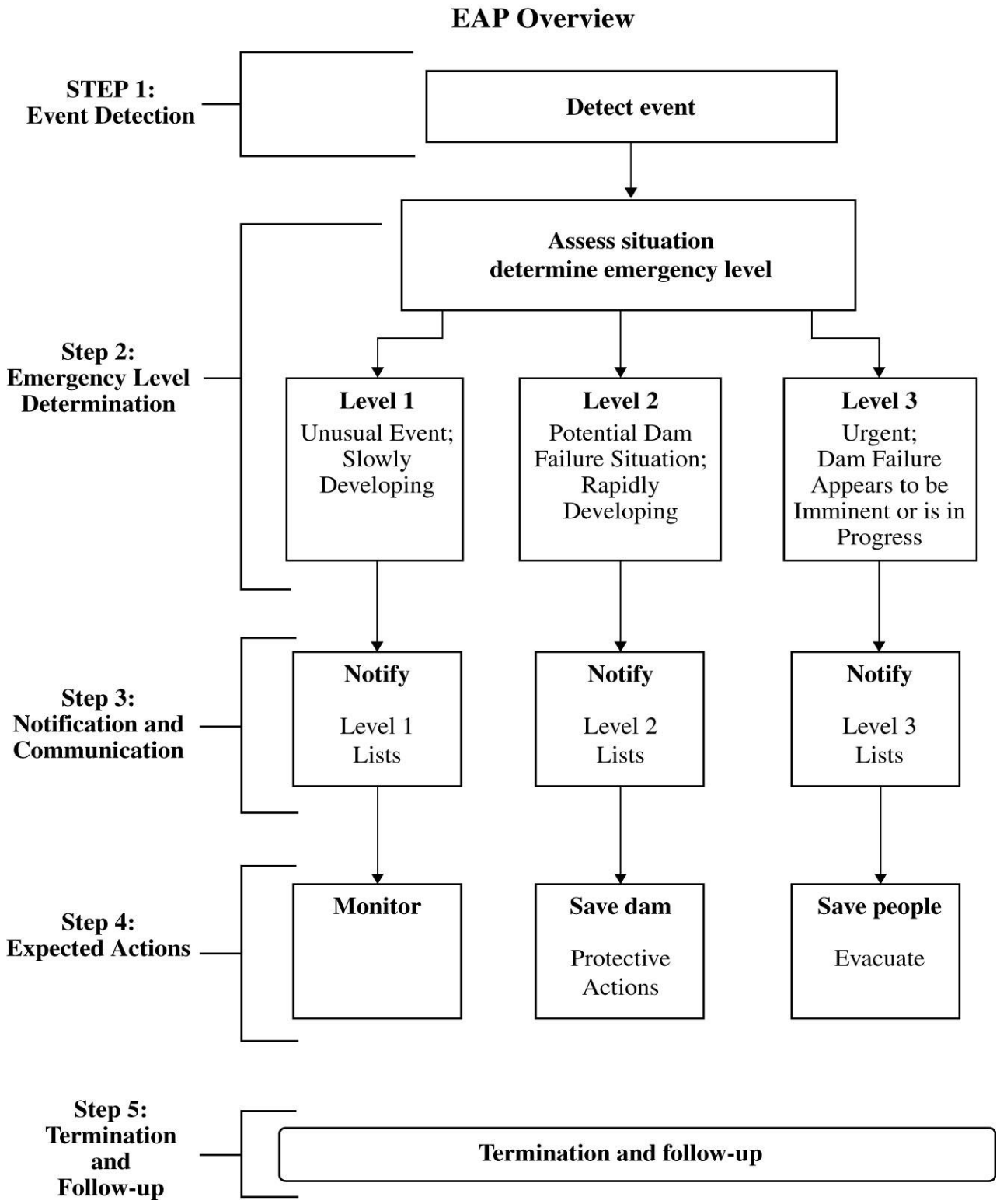
- Undertake an engineering assessment of the safety hazard at the dam.
- Assist the dam owner to determine the emergency level, if time permits.
- Advise the dam owner of remedial actions to take if Level 2 event occurs, as required.

3.5 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.

4. Five-Step DEP Process

4.1 DEP Overview



4.2 Five Steps

Step 1 - Event Detection

This step describes the detection of an unusual or emergency event and provides information to assist the dam owner in determining the appropriate emergency level for the event.

Unusual or emergency events may be detected by:

- Observations at or near the dam by dam owner, government personnel (local, Provincial, or Federal), landowners, visitors to the dam, or the public
- Dam safety review, formal inspection or site surveillance
- Evaluation of instrumentation data
- Earthquakes felt or reported in the vicinity of the dam
- Forewarning of conditions that may cause an unusual event or emergency event at the dam (for example, a severe weather or flash flood forecast)

Step 2 - Emergency Level Determination

After an unusual or emergency event is detected or reported, the dam owner or his alternate is responsible for classifying the event into one of the following three emergency levels *(See table* Guidance for Determining the Emergency Level *(Appendix D) for guidance in evaluating specific events to determine if they are unusual or emergency situations)*:

Emergency Level 1 - ***Non-emergency, unusual event, slowly developing*:**

This situation is not normal and has not yet threatened the operation or structural integrity of the dam, but possibly could if it continues to develop (corresponds to Section 15 - *Potential safety hazard* of the Dam Safety Regulation, *Water Sustainability Act*). A dam safety engineer or technical expert should be contacted to investigate the situation and recommend actions to take. The condition of the dam should be closely monitored, especially during storm events, to detect any development of a potential or imminent dam failure situation. The Local Emergency Authority should be informed if it is determined that the issue may possibly develop into a worse condition that may require emergency actions.

Emergency Level 2 - ***Potential dam failure situation, rapidly developing*:**

This situation may eventually lead to dam failure and flash flooding downstream, but there is not an immediate threat of dam failure (corresponds to Section 14 – *Hazardous conditions* of the Dam Safety Regulation, *Water Sustainability Act*). A dam safety engineer or technical expert should be contacted to investigate the situation, if time permits, and recommend actions to take. The dam owner should closely monitor the condition of the dam, modify the operation of the dam if needed, and undertake other appropriate hazard response activities. The dam owner should periodically update the status of the situation to appropriate emergency response authorities. If the dam condition worsens and failure becomes imminent, evacuation procedures must be implemented under Level 3.

Emergency Level 2 is also applicable when flow through the spillway has caused or is expected to cause flooding of downstream areas and people near the stream channel could be endangered. The dam owner may need to refer to flood release operations as outlined in the Operation, Maintenance and Surveillance manual.

Persons in the immediate vicinity of the dam, local emergency authorities, EMBC and the dam safety officer should be on alert to initiate evacuations or road closures if the flooding increases or the level 2 emergency escalates.

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

This is an extremely urgent situation where a dam failure is occurring or obviously is about to occur and cannot be prevented. This situation is also applicable when flow through the spillway is causing downstream flooding and creates a hazardous condition that places persons in danger. The following persons must be contacted immediately so persons in imminent danger can be evacuated from the endangered area, roads can be closed as needed and other emergency response activities can be undertaken (see Evacuation Area Map, *Appendix A-2*); the persons in the immediate vicinity of the dam, Emergency Management BC, Local Emergency Authority and the Dam Safety Officer (Regulation, Section 14, *Hazardous conditions*).

See Examples of Emergency Situations (*Appendix F).*

Step 3 - Notification and Communication

Notification

After the emergency level has been determined, the people on the Notification Chart (*Appendix B-1*) for the appropriate emergency level shall be notified immediately.

Communication

The Dam Emergency Situation Report (*Appendix F*) may be used as a guide for the information that should be communicated with the various emergency personnel.

Emergency Level 1 - *Non-emergency, unusual event, slowly developing*:

The dam owner should contact their Technical Expert and must notify the Dam Safety Officer to describe the situation and request technical assistance on next steps to take.

Emergency Level 2 - *Potential dam failure situation, rapidly developing*:

The dam owner should contact their Technical Expert if time permits but must notify the following of this emergency situation (see Regulation, Section 14, *Hazardous conditions*); Emergency Management BC, Local Emergency Authority, Persons in the Immediate Vicinity of the Dam (*Appendix A-3*) and the Dam Safety Officer.

The following message may be used to help describe the emergency situation to the Local Emergency Authority:

"This is _____, Water Operator at GBID.

We have an emergency condition at Cranby Lake Dam, located 1.5 kilometers North West of Gillies Bay.

We have activated the Dam Emergency Plan for this dam and are currently under Level 2.

We are implementing predetermined actions to respond to a rapidly developing situation that could result in dam failure.

Please be prepared to evacuate the area along low-lying portions of Hallet Creek.

Reference the evacuation map in your copy of the Dam Emergency Plan.

We will advise you when the situation is resolved or if the situation gets worse.

I can be contacted at the following number – 604 414-3703. If you cannot reach me, please call the following alternative number 604 223-7757."

<u>Emergency Level 3</u> - *Urgent; dam failure appears imminent or is in progress*:

The following actions should be taken:

1. Contact all Persons in the Immediate Vicinity of the Dam (*Appendix A-3*) to advise them to vacate the endangered area and call the Local Emergency Authorities. Be sure to say, "This is an emergency." The Local Emergency Authority will implement their mandated emergency plan and begin the evacuation.
   The following message may be used to help describe the emergency situation:

"This is an emergency. This is -.----------,

Cranby Lake Dam, located 1.5 kilometers North West of Gillies Bay is failing. The downstream area must be evacuated immediately. Repeat, Cranby Lake is failing; evacuate the area along low-lying portions of Hallet Stream.

We have activated the Dam Emergency Plan for this dam and are currently under Level 3. Reference the evacuation map in your copy of the Dam Emergency Plan.

I can be contacted at the following number 604 414-3703. If you cannot reach me, please call the following alternative number 604 223-7757."

2. Notify Emergency Management BC and the Dam Safety Officer of this emergency situation (see Regulation, Section 14, *Hazardous conditions*).
3. Do whatever is necessary to bring people in imminent danger (anyone on the dam, downstream from the dam, boating on the reservoir, or evacuees) to safety.
4. Keep in frequent contact with the Local Emergency Authorities and to keep them up-to-date on the condition of the dam. They can help handle the emergency.
5. If all means of communication are lost: (1) try to find out why, (2) try to get to another radio or telephone that works, or (3) get someone else to try to re-establish

communications. If these means fail, handle the immediate problems as best as you can, and periodically try to re-establish contact with Local Emergency Authorities.

The following message may be used as a guide for the Local Emergency Authorities to communicate the status of the emergency with the public:

> *Attention: This is an emergency message from the Gillies Bay Fire Department. Listen carefully. Your life may depend on immediate action.*
>
> *Cranby Lake Dam, located 1.5 kilometers North West of Gillies Bay is failing. Repeat. , Cranby Lake Dam, located 1.5 kilometers North West of Gillies Bay is failing.*
>
> *If you are in or near this area, proceed immediately to high ground away from the valley. Do not travel on Gillies Bay Road, Northwest of Gillies Bay or return to your home to recover your possessions. You cannot outrun or drive away from the flood wave. Proceed immediately to high ground away from the valley.*
>
> *Repeat message.*

Step 4 - Expected Actions

If the dam owner becomes aware of an unusual or emergency event at their dam, they should immediately determine the emergency level and the following actions should be taken. If time permits, the dam owner's Technical Expert should be contacted for technical consultation.

Emergency Level 1 - *Non-emergency, Unusual event, slowly developing*:

A. The dam owner should inspect the dam; at a minimum, inspect the full length of the upstream slope, crest, downstream toe, and downstream slope. Also, check the reservoir area, abutments, and downstream channel for signs of changing conditions. **If increased seepage, erosion, cracking, or settlement is observed, immediately report the observed conditions to their Technical Expert; refer to the table Guidance for Determining the Emergency Level (*Appendix D*) for guidance in determining the appropriate event level for the new condition and recommended actions.**
B. The dam owner must notify the Dam Safety Officer and prepare a plan, through their Technical Expert, that sets out any actions required to rectify this potential safety hazard (see Dam Safety Regulation, Section 15, *Potential Safety hazard*).
C. Record all contacts that were made on the Notification Chart (*Appendix B-1*). Record all information, observations, and actions taken. Note the time of changing conditions. Document the situation with photographs and video, if possible.

Emergency Level 2 - *Potential dam failure situation, rapidly developing*:

A. The dam owner should contact their Technical Expert, if time permits, to report the situation and request technical staff to investigate the situation and recommend corrective actions.

B. The dam owner must contact EMBC, the Local Emergency Authorities and Persons in the Immediate Vicinity of the Dam to inform them that the DEP has been activated and if current conditions get worse an emergency situation may require evacuation. Preparations should be made for possible road closures and evacuations.
C. Provide updates to the Persons in the Immediate Vicinity of the Dam and Local Emergency Authorities to assist them in making timely decisions concerning the need for warnings, road closures, and evacuations.
D. If time permits, the dam owner should inspect the dam. At a minimum, inspect the full length of the upstream slope, crest, downstream toe, and downstream slope. Also, check the reservoir area, abutments, and downstream channel for signs of changing conditions. **If piping, increased seepage, erosion, cracking, or settlement are observed, immediately report the observed conditions to the Technical Expert; refer to the table Guidance for Determining the Emergency Level (*Appendix D*) for guidance in determining the appropriate event level for the new condition and recommended actions.**
E. Record all contacts that were made on the Notification Chart (*Appendix B-1*). Record all information, observations, and actions taken. Note the time of changing conditions. Document the situation with photographs and video, if possible.
F. If time permits, follow the Emergency Remedial Actions for Level 2 Conditions (*Appendix E*) as appropriate.

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

A. The dam owner shall immediately advise the Local Emergency Authorities of the urgent condition of the dam and request that they lead the efforts to evacuate persons in the endangered area, carry out warnings and close roads (see Evacuation Area Map, *Appendix A-2*) to safeguard persons in imminent danger. The dam owner shall also immediately advise Persons in the Immediate Vicinity of the Dam (*Appendix A-3*) to vacate the endangered area.
B. The dam owner shall immediately contact others shown on the Notification Chart (*Appendix B-1*).
C. The dam owner shall maintain continuous communication and provide the Local Emergency Authorities with updates of the situation to assist them in making timely decisions concerning warnings and evacuations.
D. The dam owner should record all contacts that were made to Persons in the Immediate Vicinity of the Dam and record all information, observations, and actions and note the time of changing conditions. Document the situation with photographs and video, if possible.
E. Advise people monitoring the dam to follow safe procedures. Everyone should stay away from any of the failing structures or slopes and out of the potential breach inundation areas.

Step 5 - Termination

Whenever the DEP has been activated, an emergency level has been declared, all DEP actions have been completed, and the emergency is over, the DEP operations must eventually be terminated, and follow-up procedures completed.

Termination responsibilities

The Local Emergency Authority is responsible for terminating DEP operations and relaying this decision to the dam owner. It is then the responsibility of each person to notify the same group of contacts that were notified during the original event notification process to inform those people that the event has been terminated.

Prior to termination of an Level 3 event that has not resulted in an actual dam failure, the dam owner's Technical Expert or the Dam Safety Officer will inspect the dam or require the inspection of the dam to determine whether any damage has occurred that could potentially result in loss of life, injury, or property damage. If it is determined those conditions do not pose a threat to people or property, the Local Emergency Authority will be advised to terminate DEP operations as described above.

The dam owner shall ensure that a final Dam Emergency Situation Report (*Appendix F*) is completed and document the emergency event and all actions that were taken. The dam owner shall distribute copies of the completed report to the Dam Safety Officer.

5. DEP Maintenance

5.1 Annual Review of DEP

Update the emergency contact information in the DEP at least once a year as per the Regulation, Schedule 2. The DEP should be revised if any of the contacts have changed. The DEP annual review will include the following:

- Verifying that all of the contact information in Emergency Contacts for the Dam (*Appendix A-1*), Evacuation Area Map (*Appendix A-2*) and Persons in the Immediate Vicinity of the Dam to be Evacuated (*Appendix A-3*) is current.
- Verifying that all contact information in Notification Chart (*Appendix B-1*), Emergency Services Contacts and Other Agencies (*Appendix B-2*) and Emergency Response Resources (*Appendix B-3*), is current.

5.2 Revisions

Update the DEP document at least every 10 years for significant and high failure consequence classification dams and every 7 years for very high and extreme failure consequence classification dams as per Schedule 2 of the Regulation. The DEP document held by the dam owner is the master document. When revisions occur, the dam owner will provide the revised pages and an updated revision summary page to all the DEP document holders. The document holders are responsible for revising any outdated copy of the respective document(s) whenever revisions are received. Outdated pages shall be immediately destroyed to avoid any confusion with the revisions.

5.3 Exercises

The province along with the Canadian Dam Association recommends DEP training for all dam personnel and testing the DEP through internal exercises and periodic review and/or exercise of the DEP. Periodic exercise may consist of a simple review by the dam owner(s) and key dam owner personnel (i.e. emergency, principal, alternate contacts the dam owner's technical experts) or a more thorough exercise that could include external organizations such as the local emergency authorities (who may want to include emergency responders), persons in the immediate vicinity of the dam, the Dam Safety Officer, EMBC and others with responsibilities listed in the DEP. Other organizations that may be involved with an unusual or emergency event at the dam may also be encouraged to participate. It is recommended that before the tabletop exercise begins, meeting participants visit the dam to familiarize themselves with the dam site.

A tabletop exercise usually involves a facilitator presenting a scenario of an unusual or emergency event at the dam. The scenario should be developed prior to the exercise. Once the scenario has been presented, the participants will discuss the responses and actions that they would take to address and resolve the scenario. The facilitator controls the discussion, ensuring realistic responses and developing the scenario throughout the exercise.

After the tabletop exercise, the five-step DEP response process should be reviewed and discussed. Any recommendations for improvements should be documented.

6. Record of Holders of Control Copies of this DEP

Copies of the DEP should be provided to appropriate Dam Owner personnel and outside agencies and updates provided as the original is updated.

Copy Number	Entity or Organization	Person receiving copy	Whole DEP or Part[1]
1	Gillies Bay Improvement District	Theresa Beech	Whole
2	Water Operator GBID	George Kapetanakis	Whole
3	Gillies Bay Volunteer Fire Chief	Rob McWilliam	Whole
4	PRRD Emergency Services	Ryan Thom	Whole
5	Dam Safety Officer	Binod Acharya – Dam safety engineer	Whole
6	Lafarge Holcim	Carolanne White	Part
7	KWL		Part

. Record of Revisions and Updates Made to DEP

Revision Number	Date	Revisions made	By whom	Provided to Holders of Control Copies
1	Click here to enter a date.	Description	Name	
2	Click here to enter a date.	Description	Name	

Appendix A

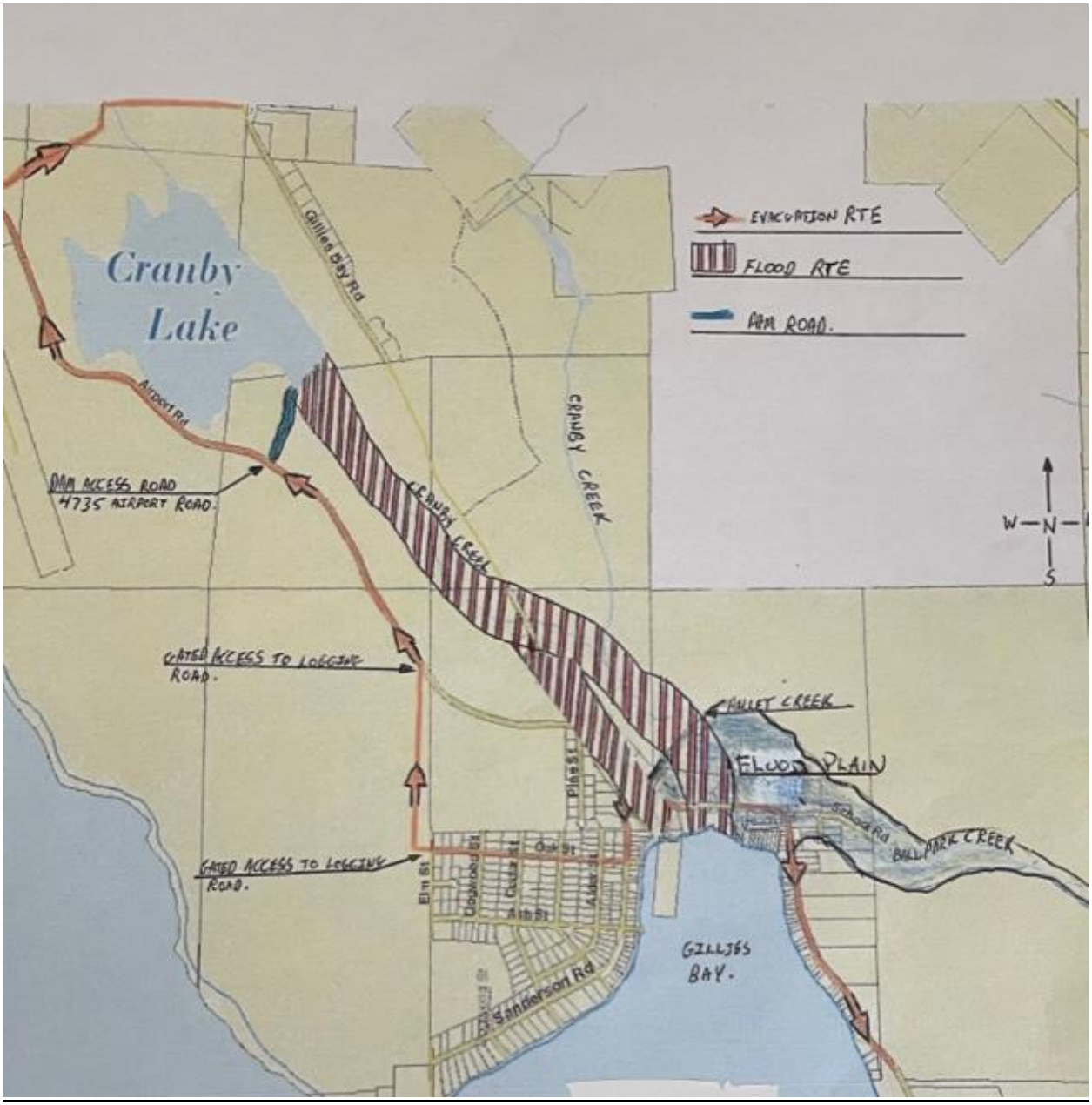
(Appendix A to be forwarded to local emeregency authorities)

1. Appendix A-1 – Emergency Contacts for Dam
2. Appendix A-2 – Evacuation Area Map
3. Appendix A-3 – Persons in the Immediate Vicinity of the Dam to be Evacuated

Appendix A-1 Emergency Contacts for the
Cranby Lake Dam

Dam Owner:	**Gillies Bay Improvement District**
Emergency Dam Contact:	**Theresa Beech**
Business Name:	GBID
Address	PO Box 102, Gillies Bay, BC. V0N 1W0
Business Phone	604 486-7757
Cell Phone:	604 223-7757
Fax:	
Email:	admin@gillies-bay.ca
Other:	
Principal Dam Contact:	**George Kapetanakis**
Business Phone:	604 486-7757
Cell Phone:	604 208-3965
Email:	water@gillies-bay.ca
Other:	
Alternate Dam Contact	**Christopher Gordon**
Business Phone:	
Cell Phone:	604-223-6567
Email:	
Other:	

Appendix A-2 Evacuation Area Map



Appendix A-3 Persons in the Immediate Vicinity of the Cranby Lake Dam to be Evacuated

A major flood caused by a sudden uncontrolled release of water from the dam is estimated to inundate lower Gillies Bay located in the immediate vicinity of the dam. '*Persons in the immediate vicinity of the dam*' means persons located immediately downstream and adjacent to the dam where available warning time is very limited (where local emergency authorities could not be expected to respond in time). The persons, including residents and/or property and business owners (marked on the evacuation map) that will need to be on *notice to evacuate* at Level 2 or to *be evacuated* at level 3 are listed below.

Persons (including residents and/or property & business owners)	**Address**	**Phone numbers**	**Distance from dam (m)**
RCMP Office	5010 – Gillies Bay Road	604 486-7717	
PRRD (Texada Library)	5079 – Gillies Bay Road	604 486-6728	
Eugene Pedneault	5078 – Gillies Bay Road	604 486-7470	
Gino Russo	5042 – Gillies Bay Road (does not live at residence)	778 878-4190	
Illuminada Movold	4901 – Gillies Bay Road (does not live at residence)	778 737-8478	
Angelita and Bernard Reyes	Abbotsford	604 226-2196	

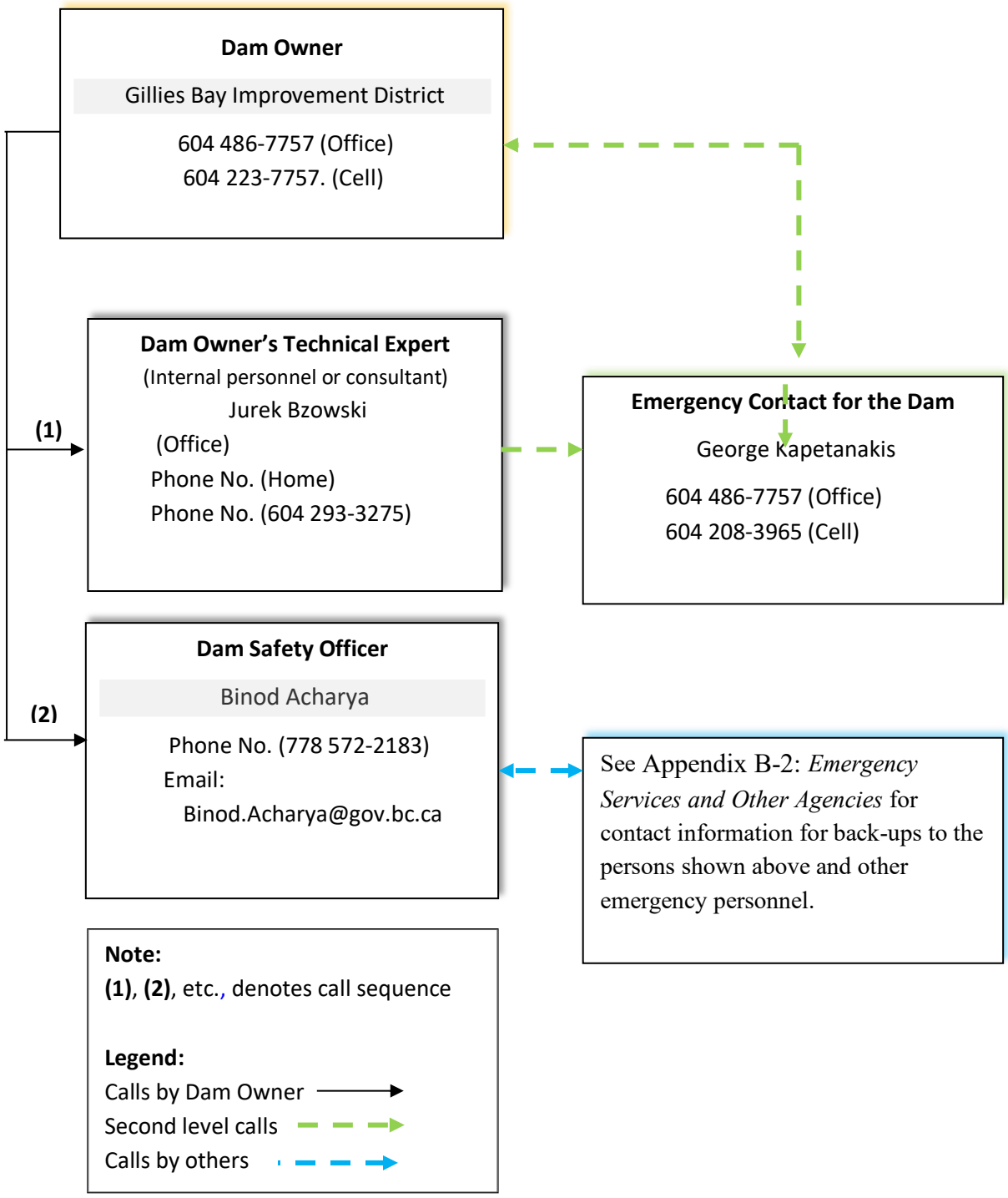
Appendix B

1. **Appendix B-1 – Notification Charts**
2. **Appendix B-2 – Emergency Services Contacts and other Agencies**
3. **Appendix B-3 – Emergency Response Resources**

Appendix B-1 Notification Charts

Emergency Level 1 Notifications

Non-emergency unusual event; slowly developing



Emergency Level 2 Notifications

Emergency event, potential dam failure situation; rapidly developing

Dam Owner

Gillies Bay Improvement District

604 486-7757. (Office)

604 223-7757 (Cell)

(1)

Dam Owner's Technical Expert

(Internal personnel or consultant)

Jurek Bzowski

Phone No. (604 293-3275)

Emergency Contact for the Dam

George Kapetanakis

Phone No. (604 208-3965)

(2)

Emergency Management BC

24 Hour Call Center

1 800 663 3456

(3)

Local Emergency Authority

local emergency authority

Phone No. (Office)

Phone No. (Home)

Phone No. (Cell)

See Appendix B-2: *Emergency Services and Other Agencies* for contact information for back-ups to the persons shown above and other emergency personnel.

(4)

Persons in the Immediate Vicinity of the Dam

Inform of the nature of the hazardous condition

(See *Appendix A-3*)

(5)

Dam Safety Officer

Binod Acharya

Phone No. (778 572-2183)

Note:

(1), **(2)**, etc., denotes call sequence

Legend:

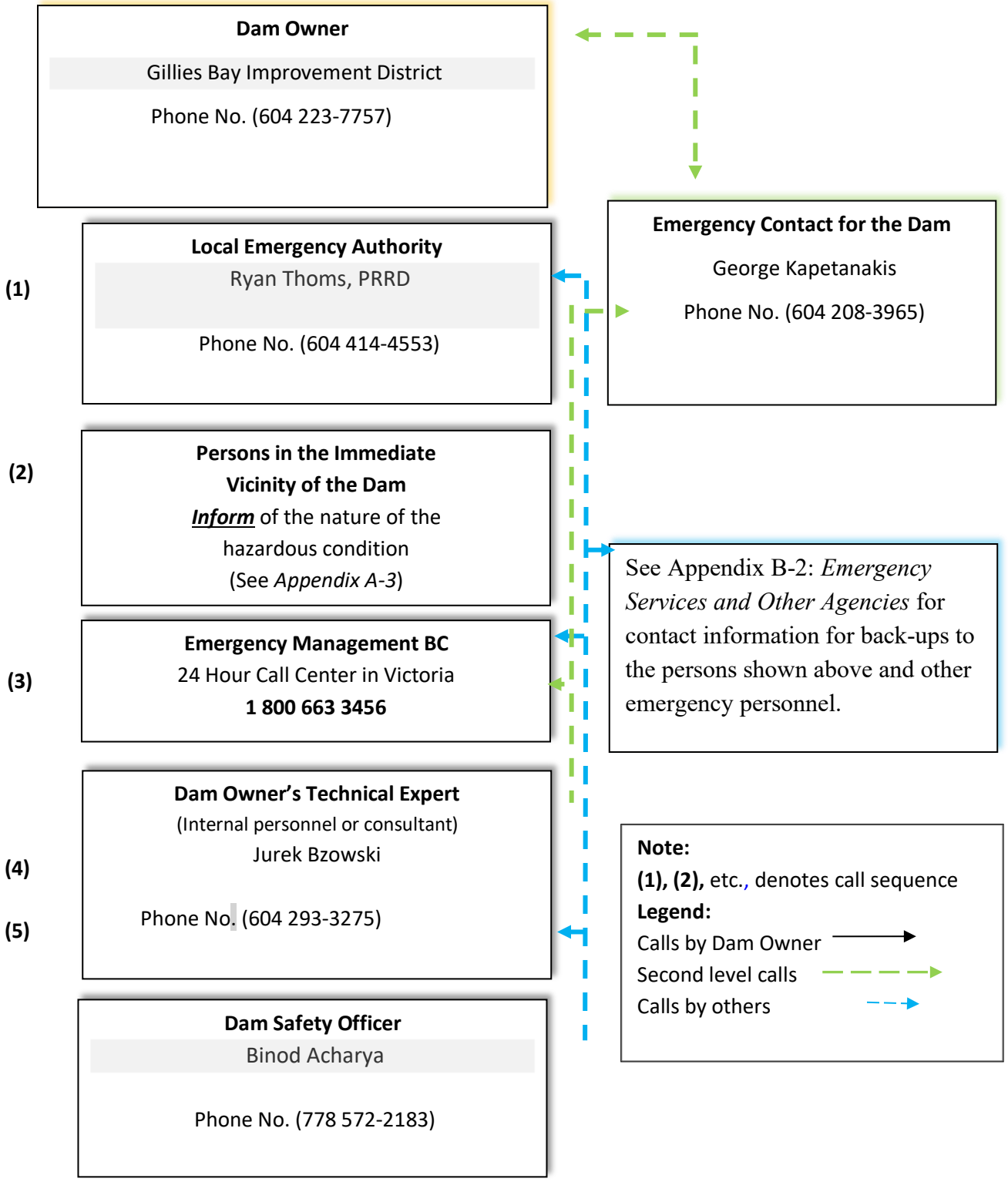
Calls by Dam Owner

Second level calls

Calls by others

Emergency Level 3 Notifications

Urgent event, dam failure appears imminent or is in progress



Appendix B2 Emergency Service Contacts				
Agency / Organization	**Principal contact**	**Address**	**Office telephone number**	**Alternate telephone numbers**
Dam Owner's Technical Expert (alternative)	Jurek Bzowski		604 293-3275	
RCMP or Police	Pat Collins		604 486-7717	
Local Search and Rescue	Texada Rescue			
Ministry of Transportation and Infrastructure			1 800 663-7867	
EMBC Regional Manager			1 800 663-7867	
Env. Canada Weather				
GSC Pacific Earthquakes				
Lafarge Holcim	Carolanne White		(604) 414-9933	250-589-3428

Appendix B-3 Emergency Response Resources

Locally available equipment, personnel, and materials.

The dam owner has the following resources that can be utilized in the event of an emergency:

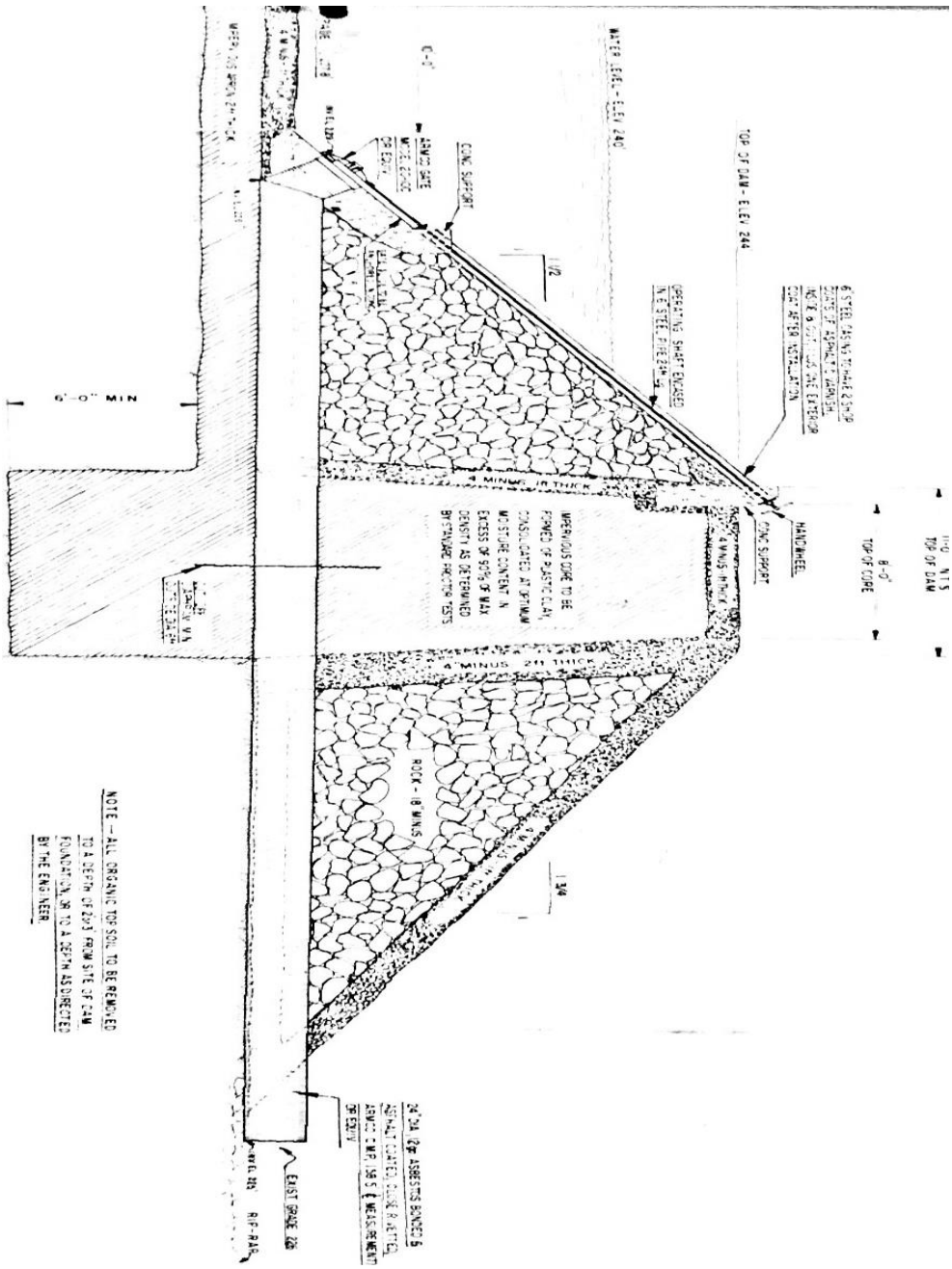
- Heavy Equipment 1
- Heavy Equipment 2
- Heavy Equipment 3
- Heavy Equipment 4

- Resource 1
- Resource 2
- Resource 3

Other locally available resources may include:

Heavy equipment service and rental	**Sand and gravel supply**	**Ready-mix concrete supply**
Jeff Nelmes 604 819-1772	Lafarge Concrete 604 414-9933 604 486-2202	Al Davis 604 414-9827 1 604 495-1968
ATV Rental	**Boat Rental**	**Helicopter**
Company Address line 1 Address line 2 Phone number (s)	Texada Boat Club 604) 414-5897	Oceanview Helicopters Powell River 604) 344-0595
Pumps	**Diving contractor**	**Sand bags**
Company Address line 1 Address line 2 Phone number (s)	Salish Sea Dive Powell River 604) 344-0595	GBID Sand and sandbags on hand

Appendix C Plan View of Cranby Lake Dam



Appendix D

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	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 Earthquake resulting in uncontrolled release of water from the dam 3	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 Damage to dam or appurtenances with no impacts to the functioning of the dam 1	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 E

Emergency Remedial Actions for Level 2 Conditions

If time permits, the following emergency remedial actions should be considered for Level 2 conditions. Immediate implementation of these remedial actions may delay, moderate, or prevent the failure of the dam. Several of the listed adverse or unusual conditions may be apparent at the dam at the same time, requiring implementation of several modes of remedial actions. Close monitoring of the dam must be maintained to confirm the success of any remedial action taken at the dam. Time permitting, any remedial action should be developed through consultation with the Dam Owner's Technical Expert. See Emergency Response Resources (*Appendix B-3*) for sources of equipment and materials to assist with remedial actions.

Embankment overtopping

1. If the water level in the reservoir is no longer rising, place sandbags along the low areas of the top of the dam to control wave action, reduce the likelihood of flow concentration during minor overtopping, and to safely direct more water through the spillway.
2. Cover the weak areas of the top of the dam and downstream slope with riprap, sandbags, plastic sheets, or other materials to provide erosion-resistant protection.

Seepage and sinkholes

1. Open the low-level outlet gate to lower the reservoir level as rapidly as possible to a level that stops or decreases the seepage to a non-erosive velocity. If the gate is damaged or blocked, pumping or siphoning may be required.

   Continue lowering the water level until the seepage stops.
2. If the entrance to the seepage origination point is observed in the reservoir (possible whirlpool) and is accessible, attempt to reduce the flow by plugging the entrance with readily available materials such as hay bales, bentonite, soil or rockfill, or plastic sheeting.
3. Cover the seepage exit area(s) with several feet of sand/gravel to hold fine-grained embankment or foundation materials in place. Alternatively, construct sandbag or other types of ring dikes around seepage exit areas to retain a pool of water, providing backpressure and reducing the erosive nature of the seepage.
4. Prevent vehicles and equipment from driving between the seepage exit points and the embankment to avoid potential loss from the collapse of an underground void.

Embankment movement

1. Open outlet(s) and lower the reservoir to a safe level at a rate commensurate with the urgency and severity of the condition of the slide or slump. If the gate is damaged or blocked, pumping or siphoning may be required.
2. Repair settlement of the crest by placing sandbags or earth and rockfill materials in the damaged area to restore freeboard.
3. Stabilize slides by placing a soil or rockfill buttress against the toe of the slide.

Earthquake

1. Immediately conduct a general overall visual inspection of the dam.
2. Perform a field survey to determine if there has been any settlement and movement of the dam embankment, spillway, and low-level outlet works.
3. Drain the reservoir, if required.

Appendix F

Dam Emergency Situation Report

To be completed by the owner at regular intervals during the emergency.

Dam Name: dam name

Provincial Dam Number: dam file number

Dam location: _____

Date: Time: Situation Report #:

Weather conditions: _____

General description of emergency/situation:

_____

_____

Area(s) of dam affected:

_____

_____

Extent of dam damage: _____

Possible cause(s): _____

Effect on dam's operation:_____

Initial reservoir elevation: _____ Time: _____

Maximum reservoir elevation: _____ Time: _____

Final reservoir elevation: _____ Time: _____

Description of area flooded downstream/damages/injuries/loss of life: _____

_____

_____

Other data and comments:

_____

Observer's name and telephone number:_____

Report prepared by: _____ Date: _____

Appendix G

Examples of Emergency Situations

The following are examples of conditions that usually constitute an emergency situation that may occur at a dam. Adverse or unusual conditions that can cause the failure of a dam are typically related to aging or design and construction oversights. Extreme weather events that exceed the original designed conditions can cause significant flow through the spillway or overtopping of the embankment. However, accidental or intentional damage to the dam may also result in emergency conditions. The conditions have been grouped to identify the most likely emergency-level condition. The groupings are provided as guidance only. Not all emergency conditions may be listed, and the dam operator is urged to use conservative judgment in determining whether a specific condition should be defined as an emergency situation at the dam.

Pre-existing conditions on this dam: There has been a small seepage area near the downstream toe on the north side of the release channel. This was first noticed in the 1990s but has not changed since that time.

Earth Spillway Flows

Level 2—Potential dam failure situation; rapidly developing:

1. Significant erosion or headcutting of the spillway is occurring, but the rate does not appear to threaten an imminent breach of the spillway crest that would result in an uncontrolled release of the reservoir.
2. Flow through the earth spillway is or is expected to cause flooding that could threaten people, homes, and/or roads downstream from the dam.

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

1. Significant erosion or headcutting of the spillway is occurring at a rapid rate, and a breach of the control section appears imminent.
2. Flow through the earth spillway is causing flooding that is threatening people, homes, and/or roads downstream from the dam.

Embankment Overtopping

Level 2—Potential dam failure situation; rapidly developing:

1. The reservoir level is within 1 foot from the top of the dam.

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

1. The reservoir level has exceeded the top of the dam, and flow is occurring over the embankment.

Seepage and Sinkholes

Level 2—Potential dam failure situation; rapidly developing:

1. Cloudy seepage or soil deposits are observed at seepage exit points or from internal drain outlet pipes.
2. New or increased areas of wet or muddy soils are present on the downstream slope, abutment, and/or foundation of the dam, and there is an easily detectable and unusual increase in volume of downstream seepage.
3. Significant new or enlarging sinkhole(s) near the dam or settlement of the dam is observed.
4. Reservoir level is falling without apparent cause.
5. The following known dam defects are or will soon be inundated by a rise in the reservoir:
   - Sinkhole(s) located on the upstream slope, crest, abutment, and/or foundation of the dam; or
   - Transverse cracks extending through the dam, abutments, or foundation.

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

1. Rapidly increasing cloudy seepage or soil deposits at seepage exit points to the extent that failure appears imminent or is in progress.
2. Rapid increase in volume of downstream seepage to the extent that failure appears imminent or is in progress.
3. Water flowing out of holes in the downstream slope, abutment, and/or foundation of the dam to the extent that failure appears imminent or is in progress.
4. Whirlpools or other evidence exists indicating that the reservoir is draining rapidly through the dam or foundation.
5. Rapidly enlarging sinkhole(s) are forming on the dam or abutments to the extent that failure appears imminent or is in progress.
6. Rapidly increasing flow through crack(s) eroding materials to the extent that failure appears imminent or is in progress.

Embankment Movement and Cracking

Level 2—Potential dam failure situation; rapidly developing:

1. Settlement of the crest, slopes, abutments and/or foundation of the dam that may eventually result in breaching of the dam.
2. Significant increase in length, width, or offset of cracks in the crest, slopes, abutments, and/or foundation of the dam that may eventually result in breaching of the dam.

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

1. Sudden or rapidly proceeding slides, settlement, or cracking of the embankment crest, slopes, abutments, and/or foundation, and breaching of the dam appears imminent or is in progress.

Glossary of Terms

Abutment	That part of the valley side against which the dam is constructed. The left and right abutments of dams are defined with the observer looking downstream from the dam.
Acre-foot	A unit of volumetric measure that would cover 1 acre to a depth of 1 foot. One acre-foot is equal to 1,234 cubic meters.
Berm	A nearly horizontal step (bench) in the upstream or downstream sloping face of the dam.
Boil	A disruption of the soil surface due to water discharging from below the surface. Eroded soil may be deposited in the form of a ring (miniature volcano) around the disruption.
Breach	An opening through the dam that allows draining of the reservoir. A controlled breach is an intentionally constructed opening. An uncontrolled breach is an unintended failure of the dam.
Conduit	A closed channel (round pipe or rectangular box) that conveys water through, around, or under the dam.
Control section	A usually level segment in the profile of an open channel spillway above which water in the reservoir discharges through the spillway.
Cross section	A slice through the dam showing elevation vertically and direction of natural water flow horizontally from left to right. Also, a slice through a spillway showing elevation vertically and left and right sides of the spillway looking downstream.
Dam	A barrier constructed for the purpose of enabling the storage or diversion of water diverted from a stream or an aquifer, or both and other works that are incidental to or necessary for the barrier.
Dam failure	An uncontrolled release of all or part of the water impounded by the dam, whether or not caused by a collapse of the dam.
Dam Owner Representative	The person(s) with responsibility for the operation and maintenance of dam.

Drain	A water collection system of sand and gravel and typically pipes along the downstream portion of the dam to collect seepage and convey it to a safe outlet. The drains can be located in the toe, foundation or drainage blanket.
Drainage area (watershed)	The geographic area on which rainfall flows into the dam.
Drawdown	The lowering or releasing of the water level in a reservoir over time or the volume lowered or released over a particular period of time.
Emergency	A condition that develops unexpectedly, endangers the structural integrity of the dam and/or downstream human life and property, and requires immediate action.
Dam Emergency Plan	A formal document identifying potential emergency conditions that may occur at the dam and specifying preplanned actions to minimize potential failure of the dam or minimize failure consequences including loss of life, property damage, and environmental impacts. (BC *Dam Safety Reg*., Section 9)
Evacuation map	A map showing the geographic area downstream of a dam that should be evacuated if it is threatened to be flooded by a breach of the dam or other large discharge.
Filter	The layers of sand and gravel in a drain that allow seepage through an embankment to discharge into the drain without eroding the embankment soil.
Freeboard	Vertical distance between a stated water level in the reservoir and the top of dam.
Gate	A general term for any mechanical device to control the flow of water in intakes, outlet works and over controlled spillways.
Groin	The area along the intersection of the face of a dam and the abutment.
Consequence classification	A system that categorizes dams (extreme, very high, high, significant, or low) according to the degree of their potential to create adverse incremental consequences such as loss of life, property damage, or environmental impacts of a failure or mis-operation of a dam.
Height of dam	The vertical distance between the crest of the dam and the lowest point at the downstream toe, which usually occurs in the bed of the outlet channel.

Hydrograph	A graphical representation of either the flow rate or flow depth at a specific point above or below the dam over time for a specific flood occurrence. It can include inflow, outflow or a breach flow.
Incident Commander	The highest predetermined official available at the scene of an emergency situation.
Instrumentation	An arrangement of devices installed into or near dams that provide measurements to evaluate the structural behavior and other performance parameters of the dam and appurtenant structures.
Inundation area or map	The geographic area downstream of the dam that would be flooded by a breach of the dam or other large discharge.
Low-Level Outlet	A conduit through a dam to allow for controlled release of the reservoir contents. Also see "Outlet Works"
Notification	To immediately inform appropriate individuals, organizations, or agencies about a potentially emergency situation so they can initiate appropriate actions.
Outlet works	An appurtenant structure that provides for controlled passage of normal water flows through the dam. Combination of intake structure, gates, conduits, tunnels, flow controls and energy dissipation devices to allow the release of water from the dam,
Persons in the immediate vicinity of the dam:	**C**onsidered the persons located immediately downstream and adjacent to the dam where available warning time is very limited (where local emergency authorities could not be expected to respond in time).
Piping	The progressive destruction of an embankment or embankment foundation by internal erosion of the soil by seepage flows.
Probable Maximum Precipitation (PMP) and Prob. Max. Flood (PMF):	The theoretically greatest precipitation (PMP) or resulting flood (PMF) that is meteorologically feasible for a given duration over a specific drainage area or at a particular geographical location.
Reservoir	The body of water impounded or potentially impounded by the dam.
Riprap	A layer of large rock, precast blocks, bags of cement, or other suitable material, generally placed on an embankment or along a watercourse as protection against wave action, erosion, or scour.

Risk	A measure of the likelihood and severity of an adverse consequence.
Seepage	The natural movement of water through the embankment, foundation, or abutments of the dam.
Slide	The movement of a mass of earth down a slope on the embankment or abutment of the dam.
Spillway (main)	The appurtenant structure that provides the controlled conveyance of excess water through, over, or around the dam.
Spillway (emergency)	An additional spillway, which usually has a crest elevation somewhat higher than the main spillway, designed to activate during extreme flood events to avoid overtopping the dam.
Spillway capacity	The maximum discharge the spillway can safely convey with the reservoir at the maximum design elevation.
Spillway crest	The lowest level at which reservoir water can flow over or into the spillway.
Tailwater	The body of water immediately downstream of the embankment at a specific point in time.
Toe of dam	The junction of the upstream or downstream face of an embankment with the ground surface.
Top of dam (crest of dam)	The elevation of the uppermost surface of an embankment which can safely impound water behind the dam.

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