

Emergency Action Plan (EAP)
Lake Tapps Project
Pierce County, Washington

Prepared for
Dam Safety Office
Department of Ecology

NID Numbers: WA00296, WA00418 through 31, and WA00435



Prepared by
GeoEngineers, Inc.
and
Cascade Water Alliance

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Copy of

Contents

| | |
|---|------|
| Purpose..... | 1-1 |
| Basic EAP Data..... | 2-1 |
| Potential Impacted Area | 2-1 |
| Dike Descriptions and Directions..... | 2-2 |
| EAP Overview..... | 3-1 |
| Roles and Responsibilities | 4-1 |
| Emergency Services Contacts/Stakeholders..... | 4-3 |
| The Five-Step EAP Process | 5-1 |
| Step 1 Event Detection..... | 5-1 |
| Step 2 Emergency Level Determination | 5-2 |
| Step 3 Notification and Communication..... | 5-4 |
| Step 4 Expected Actions | 5-13 |
| Step 5 Termination..... | 5-16 |
| Maintenance—EAP Review and Revision | 6-1 |
| Introduction | 6-1 |
| EAP Periodic Test | 6-1 |
| EAP Annual Review..... | 6-2 |
| Revisions | 6-2 |
| Record of Holders of Control Copies of this EAP | 6-3 |
| Record of Revisions and Updates Made to EAP..... | 6-4 |

List of Appendices

Appendix A

- Appendix A-1 Location and Vicinity Maps
- Appendix A-2 Inundation Maps
- Appendix A-3 Resources Available
- Appendix A-4 Dike Plans and Profiles

Appendix B

- Appendix B-1 Examples of Emergency Situations
- Appendix B-2 Contact Checklist
- Appendix B-3 Unusual or Emergency Event Log
- Appendix B-4 Unusual or Emergency Event Report
- Appendix B-5 Dam Hazard Classification Table
- Appendix B-6 Glossary of Terms

Appendix C

- Appendix C-1 Overall Project Description
- Appendix C-2 Preparedness and Preventative Actions

Purpose

This EAP has been prepared in accordance with Washington State Department of Ecology’s Dam Safety Regulations (Chapter 173-175 WAC). These regulations require an EAP for dams/dikes whose failure would endanger human life or cause substantial property damage.

The purpose of this EAP is to define the responsibilities for the timely notification of the appropriate emergency management agencies who are charged with the safety of the public living in the areas that would be inundated by the failure of, or by an emergency condition caused by, one or more of the dikes that make up the Lake Tapps reservoir. The information contained in this document is based on extreme, worst-case conditions, as required by the above regulations and does not reflect, in any way, upon the structural integrity of the Lake Tapps dikes.

1. Basic EAP Data

Potential Impacted Area

See Appendix A-2, Inundation Maps for the inundation areas that may be flooded if one or more dikes should fail. The estimated time for the flood wave to travel from the dike(s) to specific locations on the map is also shown.

The Lake Tapps project consists of 17 individual dikes (Dikes 1, 2A, 2B, 3, 4, 4A and 5 through 15). The Lake Tapps project area, dikes, and other project components are shown in Appendix A-1, Location and Vicinity Maps. The dikes are located around the lake such that breaching of certain dikes will affect a common area. The dikes have been grouped according to the common area of impact as follows:

Dike 1: The inundation area extends to the northeast of the dike through undeveloped areas and in the area of a recent residential development. There is no outlet for water from Dike 1 to flow to the White River. The resulting maximum inundation water elevation for this region is approximately 543 feet. Roadways impacted include 9th Street East and smaller residential roads.

Dikes 2 through 5: Inundation areas extend through low areas to the north of the dikes and impact undeveloped areas, rural properties, and residential properties and developments. Water flows to the White River basin to the north. Major impacted roadways are as follows:

- Dike 2A and 2B: Lake Tapps Parkway SE, 9th Street E, 182nd Avenue E, Kersey Way SE, and Stuck River Drive.
- Dike 3: 9th Street E, 53rd Street SE, Kersey Way SE, and Stuck River Drive.
- Dikes 4, 4A and 5: 9th Street E, Edwards Road, 53rd Street SE, 55th Street SE, Kersey Way SE, and Stuck River Drive.

Dikes 6 through 12: Inundation areas extend through low areas to the east of the dikes and impact undeveloped areas, rural properties, and residential properties and developments. Water flows to the White River basin to the north. Major impacted roadways are as follows:

- Dikes 6 through 10: 12th Street E and Edwards Road.
- Dikes 11 and 12: 210th Avenue E and 214th Avenue E.

Dike 14: The inundation area extends to the north of the dike and impacts primarily undeveloped property and some rural property. Roadways impacted include 230th Avenue E and minor residential access roads.

Note: The inundation area is based on a study that was completed prior to the construction of the backflow prevention structure. The backflow prevention structure is designed to restrict flow from Lake Tapps in the event of Dike 14 failure and is anticipated to significantly reduce the extent of the inundation area for the dike.

Dikes 13 and 15: The inundation area extends to the south and west of the dikes and impacts primarily undeveloped land and rural property. Roadways impacted include Connells Prairie Road, the Old Sumner Buckley Highway, the Sumner Buckley Highway, West Tapps Highway E and Angeline Road. *Note:* The inundation area is based on a study that was completed prior to the construction of the backflow prevention structure. The backflow prevention structure is designed to restrict flow from Lake Tapps in the event of Dike 15 failure and is anticipated to significantly reduce the extent of the inundation area for Dike 15.

Electronic geographically-coordinated shape files are available for use by emergency response personnel to assist with notifications. We understand that emergency response agencies are capable of using electronic mapping to place automated calls to individuals within a pre-defined inundation area.

Dike Descriptions and Directions

The dikes were constructed in 1910 and 1911 using fill transported to the site by rail dump cars from wooden trestles. Large scrapers and donkey engines were used for fill placement. Horse-drawn slip scrapers and wheelers were used to shape and compact the dikes. The dikes (with the exception of Dike 1) are owned and operated by Cascade Water Alliance. The following sections summarize location information and structural details specific to each dike. Note that the directions to each dike described below may not be passable in the event of a breach of one or more dikes. Refer to the evacuation maps in Appendix A-2 for secondary routes. Refer also to Appendix A-1, Location and Vicinity Maps for the general location of dikes with respect to other project features.

Descriptions of the general project setting and other project structures are included in Appendix C. The dike dimension and crest elevation data summarized in the following sections is based on data included in Table 4-13 of the 2006 Engineering Report for the White River Diversion, Conveyance, and Storage Facilities. The hazard classification is based on criteria developed by the Dam Safety Office and defined in Appendix B-5, Dam Hazard Classification Table. The legal description, latitude, longitude and identification numbers are based on tabulated dam inventory data prepared by the Dam Safety Office. Elevations referenced in this report are in the National Geodetic Vertical Datum (NGVD) of 1926.

Dike 1

Maximum Height: 13 ft

Crest Elevation: 550.5 ft

Crest Width: 25 ft

Crest Length: 280 ft

Hazard Classification: High (1A)

Legal Description: Sect. 9, T20N, R5E

Latitude: 47.2413410 Longitude: 122.184884

NID No.: WA00418

State ID: PI 10-418

Location (use for notification): 17th Street E between Channel Road E and 186th Avenue E

Directions: Heading east on Lake Tapps Parkway E, turn right (southeast) on Sumner Tapps Highway E.

Travel 0.6 miles and turn left (east) on 16th Street E. Travel 0.3 miles and turn right (south) onto

180th Avenue E. Travel 480 feet and turn left (east) on 17th Street E. Travel 0.2 miles and turn left (east) to

remain on 17th Street E. 17th Street E crosses the crest of the dike.

Note: Dike 1 is not owned by Cascade Water Alliance. Negotiations are currently in progress for Cascade to continue maintenance of Dike 1.

Dike 2 (2A and 2B)

| | |
|---|--|
| Maximum Height: 10 ft (2A) and 15 ft (2B) | Crest Elevation: 544.9 ft (2A) and 547.6 ft (2B) |
| Crest Width: 20 ft (2A) and 19 ft (2B) | Crest Length: 290 ft (2A) and 280 ft (2B) |
| Hazard Classification: Both High (1C) | |
| Legal Description: Sect. 4 and 5, T20N, R5E | Latitude: 47.2496830 Longitude: 122.187505 |
| NID No.: WA00419 and WA00420 | State ID: PI10-419 and PI10-420 |

Location (use for notification): Southeast of the intersection of Lake Tapps Parkway E and 182nd Avenue E

Directions: Head east on Lake Tapps Parkway E to the intersection with 182nd Avenue E. The dikes are to the southeast of the intersection.

Dike 3

| | |
|---------------------------------------|--|
| Maximum Height: 16 ft | Crest Elevation: 546 ft |
| Crest Width: 22 ft | Crest Length: 650 ft |
| Hazard Classification: High (1B) | |
| Legal Description: Sect. 4, T20N, R5E | Latitude: 47.2493520 Longitude: 122.177817 |
| NID No.: WA00421 | State ID: PI10-421 |

Location (use for notification): South of 9th Street E between 188th Avenue E and 190th Avenue E

Directions: Head east on Lake Tapps Parkway E., which becomes 9th Street E at the intersection with 182nd Avenue E. The dike is to the south of the roadway approximately 0.4 miles past the intersection with 182nd Avenue E.

Dike 4 (4 and 4A)

| | |
|--|---|
| Maximum Height: 15 ft (4) and 46 ft (4A) | Crest Elevation: 545 ft (4) and 545.5 ft (4A) |
| Crest Width: 33 ft (4) and 55 ft (4A) | Crest Length: 2870 ft (4) and 360 ft (4A) |
| Hazard Classification: Both High (1A) | |
| Legal Description: Sect. 9, T20N, R5E | Latitude: 47.2407890 Longitude: 122.170259 |
| NID No.: WA00296 | State ID: PI10-296 |

Location (use for notification): Along the east and south perimeters of Lake Tapps Park.

Directions: Head east on Lake Tapps Parkway E., which becomes 9th Street E at the intersection with 182nd Avenue E. Continue 1.1 miles on 9th Street E and turn right (south) on 198th Avenue E. Continue along 198th Avenue E to Dike Road E. The dike is to the northeast of the intersection of 198th Avenue E and Dike Road E.

Dike 5

Maximum Height: 25 ft

Crest Elevation: 545.5 ft

Crest Width: 65 ft

Crest Length: 518 ft

Hazard Classification: High (1A)

Legal Description: Sect. 9, T20N, R5E

Latitude: 47.2409260 Longitude: 122.167596

NID No.: WA00422

State ID: PI10-422

Location (use for notification): The south end of Lake Tapps Park.*Directions:* Head east on Lake Tapps Parkway E., which becomes 9th Street E at the intersection with 182nd Avenue E. Continue 1.1 miles on 9th Street E and turn right (south) on 198th Avenue E. Continue along 198th Avenue E to Dike Road E. The dike is to the northeast of the intersection of 198th Avenue E and Dike Road E.**Dike 6**

Maximum Height: 26 ft

Crest Elevation: 545.5 ft

Crest Width: 70 ft

Crest Length: 570 ft

Hazard Classification: High (1A)

Legal Description: Sect. 10, T20N, R5E

Latitude: 47.2388390 Longitude: 122.163482

NID No.: WA00423

State ID: PI10-423

Location (use for notification): The south end of Lake Tapps Park.*Directions:* Head east on Lake Tapps Parkway E., which becomes 9th Street E at the intersection with 182nd Avenue E. Continue 1.1 miles on 9th Street E and turn right (south) on 198th Avenue E. Continue along 198th Avenue E toward the lake. The dike is at the end of the road.**Dike 7**

Maximum Height: 7 ft

Crest Elevation: 545.5 ft

Crest Width: 45 ft

Crest Length: 240 ft

Hazard Classification: Low

Legal Description: Sect. 10, T20N, R5E

Latitude: 47.2392050 Longitude: 122.161546

NID No.: WA00435

State ID: PI10-435

Location (use for notification): The south end of Lake Tapps Park.*Directions:* Head east on Lake Tapps Parkway E., which becomes 9th Street E at the intersection with 182nd Avenue E. Continue 1.1 miles on 9th Street E and turn right (south) on 198th Avenue E. Continue along 198th Avenue E toward the lake. At the lake, the road will turn to the east and become County Park Road. The dike is to the south just past the turn.

Dike 8

Maximum Height: 18 ft

Crest Elevation: 545.5 ft

Crest Width: 45 ft

Crest Length: 360 ft

Hazard Classification: Significant

Legal Description: Sect. 10, T20N, R5E

Latitude: 47.2394690 Longitude: 122.160082

NID No.: WA00424

State ID: PI10-424

Location (use for notification): The south end of e Lake Tapps Park.*Directions:* Head east on Lake Tapps Parkway E., which becomes 9th Street E at the intersection with 182nd Avenue E. Continue 1.1 miles on 9th Street E and turn right (south) on 198th Avenue E. Continue along 198th Avenue E toward the lake. At the lake, the road will turn to the east and become County Park Road. The dike is to the south about 1000 feet past the turn.**Dike 9**

Maximum Height: 15 ft

Crest Elevation: 545.5 ft

Crest Width: 55 ft

Crest Length: 285 ft

Hazard Classification: Significant

Legal Description: Sect. 10, T20N, R5E

Latitude: 47.2398940 Longitude: 122.157987

NID No.: WA00425

State ID: PI10-425

Location (use for notification): The south end of Lake Tapps Park.*Directions:* Head east on Lake Tapps Parkway E., which becomes 9th Street E at the intersection with 182nd Avenue E. Continue 1.1 miles on 9th Street E and turn right (south) on 198th Avenue E. Continue along 198th Avenue E toward the lake. At the lake, the road will turn to the east and become County Park Road. The dike is to the south about 1500 feet past the turn.**Dike 10**

Maximum Height: 18 ft

Crest Elevation: 545.5 ft

Crest Width: 45 ft

Crest Length: 965 ft

Hazard Classification: High (1C)

Legal Description: Sect. 10, T20N, R5E

Latitude: 47.2409130 Longitude: 122.155031

NID No.: WA00426

State ID: PI10-426

Location (use for notification): The south end of Lake Tapps Park.*Directions:* Head east on Lake Tapps Parkway E., which becomes 9th Street E at the intersection with 182nd Avenue E. Continue 1.1 miles on 9th Street E and turn right (south) on 198th Avenue E. Continue along 198th Avenue E toward the lake. At the lake, the road will turn to the east and become County Park Road. The dike is at the end of County Park Road.

Dike 11

Maximum Height: 22 ft

Crest Elevation: 545.7 ft

Crest Width: 60 ft

Crest Length: 2115 ft

Hazard Classification: High (1A)

Legal Description: Sect. 10, T20N, R5E

Latitude: 47.2381520 Longitude: 122.147596

NID No.: WA00427

State ID: PI10-427

Location (use for notification): The east end of Lake Tapps, north of Tapps Island.*Directions:* Head east on Lake Tapps Parkway E., which becomes 9th Street E at the intersection with 182nd Avenue E. After 1 mile, 9th Street E becomes 12th Street E. 12th Street E becomes 210th Avenue E after 0.8 miles and then 214th Avenue E after 0.2 miles. Turn right onto 23rd Street Court E. Access to Dike 11 is through gates to the north.**Dike 12**

Maximum Height: 16 ft

Crest Elevation: 544.6 ft

Crest Width: 25 ft

Crest Length: 1250 ft

Hazard Classification: High (1C)

Legal Description: Sect. 10, T20N, R5E

Latitude: 47.2298230 Longitude: 122.14456

NID No.: WA00428

State ID: PI10-428

Location (use for notification): The east end of Lake Tapps, just north of Tapps Island.*Directions:* Head east on Lake Tapps Parkway E., which becomes 9th Street E at the intersection with 182nd Avenue E. After 1 mile, 9th Street E becomes 12th Street E., which becomes 210th Avenue E after 0.8 miles and then 214th Avenue E after 0.2 miles. The dike is to the east just north of Island Parkway E.**Dike 13**

Maximum Height: 15 ft

Crest Elevation: 545.2 ft

Crest Width: 20 ft

Crest Length: 330 ft

Hazard Classification: Significant

Legal Description: Sect. 27, T20N, R5E

Latitude: 47.1907870 Longitude: 122.164775

NID No.: WA00429

State ID: PI10-429

Location (use for notification): Allan Yorke Park at the south end of Lake Tapps.*Directions:* Head east on Highway 410 and turn left (northeast) onto Sumner-Buckley Highway E. Continue 0.4 miles and turn left (north) onto Locust Avenue E. Continue 0.9 miles and turn right (east) onto Bonney Lake Blvd E. Continue 0.7 miles and turn right (southeast) onto W Tapps Highway. The dike is about 0.3 miles along W Tapps Highway at Allan Yorke Park.

Dike 14

Maximum Height: 23 ft

Crest Elevation: 547.5 ft

Crest Width: 60 ft

Crest Length: 1450 ft

Hazard Classification: Low

Legal Description: Sect. 26, T20N, R5E

Latitude: 47.1964890 Longitude: 122.132892

NID No.: WA00430

State ID: PI10-430

Location (use for notification): West of 7205 Barkubine Road*Directions:* From the Sumner Buckley Highway, turn north onto 214th Avenue E. After 0.6 miles turn right (east) onto Connells Prairie Road. After 0.8 miles, veer left (north) onto Barkubine Road. Continue about 0.3 miles to gravel access road on the left.**Dike 15**

Maximum Height: 25 ft

Crest Elevation: 547 ft

Crest Width: 45 ft

Crest Length: 1640 ft

Hazard Classification: Low

Legal Description: Sect. 26, T20N, R5E

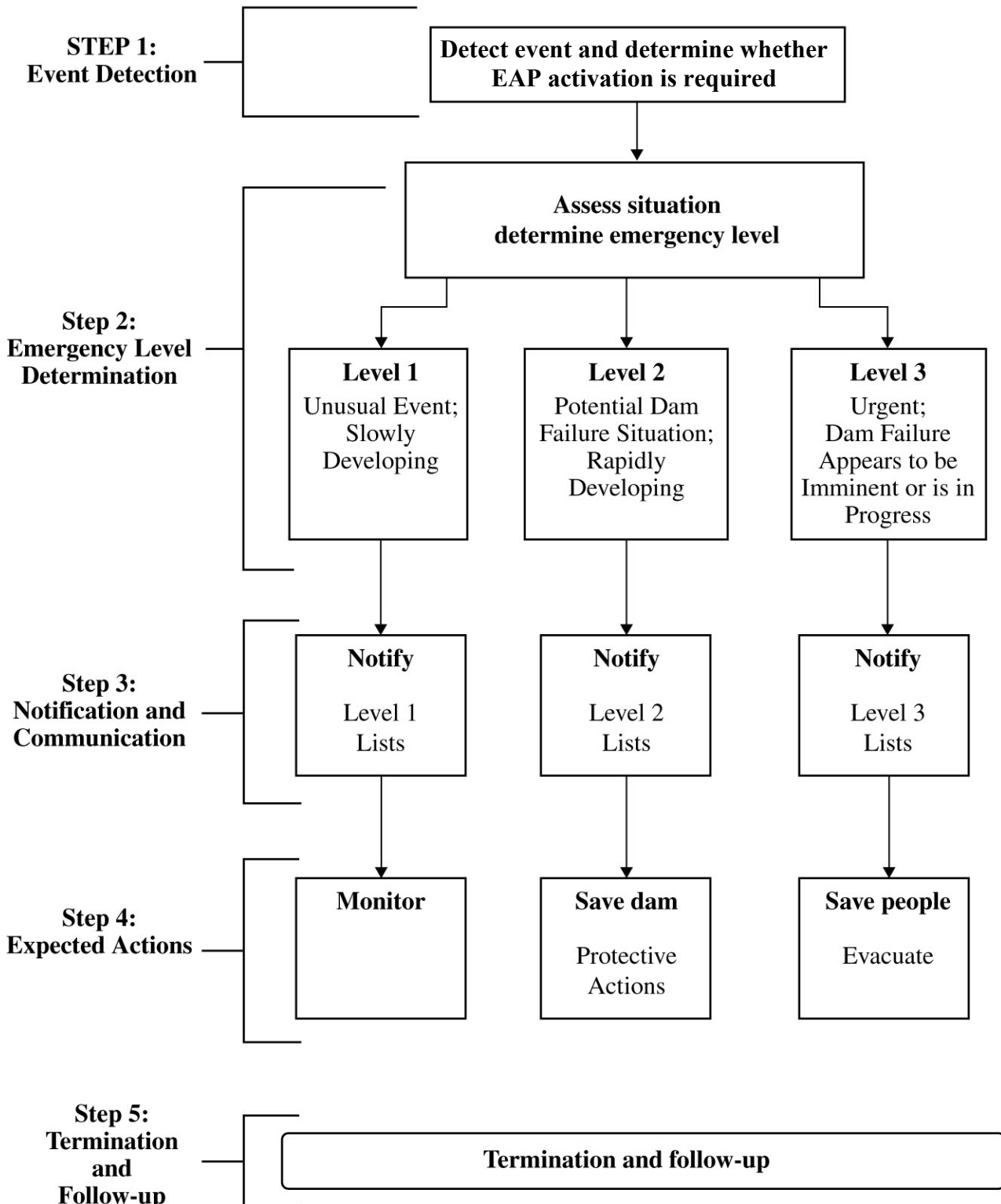
Latitude: 47.1940760 Longitude: 122.13531

NID No.: WA00431

State ID: PI10-431

Location (use for notification): Off of 218th Avenue East, North of 69th Street.*Directions:* From the Sumner Buckley Highway, turn north onto 214th Avenue E (becomes 218th Avenue E after 1 mile). After 1.2 miles turn right (east) onto 69th Street E and follow gravel road to dike.

2. EAP Overview



3. Roles and Responsibilities

Dam Operator’s Representative (Operations Manager and Project Operator)

Cascade Water Alliance Operations Manager: 425-453-0930 (Office Main)
425-283-0368 (Office Direct)
206-930-0211 (Cell)

- As soon as an emergency event is observed or reported, immediately determine the emergency level (see *Emergency Levels* tab).
 - 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 for the appropriate level (see *Notification Charts* tab).
- Provide updates of the situation to the police/sheriff dispatcher to assist them in making timely and accurate decisions regarding warnings and evacuations.
- Work with the Emergency Management Services (or assign designee) to review media communications prior to release for accuracy.
- Provide leadership to assure the EAP is reviewed and updated annually and copies of the revised EAP are distributed to all who received copies of the original EAP.

Project Operator (Veolia Water): 253-590-3035

- As soon as an emergency event is observed or reported, immediately determine the emergency level (see *Emergency Levels* tab).
 - 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 for the appropriate level (see *Notification Charts* tab).
- Help facilitate the emergency response, as needed.

Incident Commander/First Responder

Contact: 911

South Sound 911 – Bonney Lake, Sumner, Puyallup: 844-821-8911

South Sound 911 – Other Pierce County: 253-372-1490

Valley Communications Center (ValleyCom) - South King County: 253-852-2121

See Emergency Services Contacts for Additional Contact Information

- Serve as the primary contact person responsible for coordination of all emergency actions.
- When a Level 2 (potential failure) situation occurs: Prepare emergency management personnel for possible evacuations that may be needed if a Level 3 (imminent or in-progress failure) situation occurs.
- When a Level 3 (imminent or in-progress failure) situation occurs:
 - Initiate warnings and order evacuation of people at risk downstream of the dam.

- Notify local emergency management services to carry out the evacuation of people and close roads within the evacuation area (see *Evacuation Map* tab).
- Decide when to terminate the emergency.
- Participate in an annual review and update of the EAP.

Emergency Management Services (King/Pierce County Emergency Management Offices)

Pierce County Department of Emergency Management: 253-798-6595

King County Office of Emergency Management: 206-926-3830; 24/7 Duty Officer: 206-423-6119

- Maintain communication with media.
- When a Level 2 (potential failure) situation occurs:
 - Prepare emergency management personnel for possible evacuations that may be needed if a Level 3 (imminent or in-progress failure) situation occurs.
 - Alert the public as appropriate.
- When a Level 3 (imminent or in-progress failure) situation occurs:
 - Alert the public.
 - Immediately close roads and evacuate people within the evacuation area (see *Evacuation Map* tab).
- Participate in an annual review and update of the EAP.

Dam Safety Consultant (GeoEngineers, Inc.)

Office Reception: 425-861-6000

24/7 Pager: 206-994-3186 (leave call-back number after the beep)

- Advise the dam operator of the emergency level determination, if time permits.
- Advise the dam operator of remedial actions to take if Level 2 (potential failure) event occurs, if time permits.

State Dam Safety Agency (Washington Dam Safety Office)

Dam Safety Emergency Number: 360-407-6208 (office) or 360-971-6347 (beeper)

Gustavo Ordonez, Geotechnical Engineer: 360-407-6619 (office) or 360-972-7925 (cell)

- Advises the dam operator of the emergency level determination, if time permits.
- Provides advice to the dam operator of remedial actions to take, if time permits.
(360)-407-6619 (w) (360)-972-7925 (c)(253)

Emergency Services Contacts/Stakeholders

| ORGANIZATION | NAME | TITLE | ADDRESS | CITY | ZIP | PHONE NUMBER | EMAIL | # |
|----------------------------------|--------------------|---|--|----------|------------|---|-----------------------------|---|
| Algona Police Dept. | James Schrimpsheer | Sergeant | 402 Warde St | Algona | 98001-8505 | (253) 833-2743 (w) | james@algonawa.gov | 1 |
| Auburn School District #408 | John Lobdell | District Safety Officer & Environmental Manager | Support Services Center 1302 4th Street S.W. | Auburn | 98001 | (253) 931-4955 Ext 1040 (253) 549-6930 | jlobdell@auburn.wednet.edu | 2 |
| Cascade Water Alliance | Ray Hoffman | Chief Executive Officer | 520 112th Avenue NE, Suite 400 | Bellevue | 98004 | (425) 453-1555 (w) (206) 579-6814 (c) | rhoffman@cascadewater.org | 3 |
| Cascade Water Alliance | Ed Cebon | Chief Economist/Treasurer | 520 112th Avenue NE, Suite 400 | Bellevue | 98004 | (425) 283-0543 (w) (425) 239-9339 (c) | ecebron@cascadewater.org | 4 |
| Cascade Water Alliance | Alison Bennett | Intergovernmental Communications Director | 520 112th Avenue NE, Suite 400 | Bellevue | 98004 | (425) 998-5452 (w) (425) 785-0742 (c) | abennett@cascadewater.org | 5 |
| Cascade Water Alliance - vehicle | Joe Mickelson | Operations Manager | 520 112th Avenue NE, Suite 400 | Bellevue | 98004 | (425) 283-0368 (w) (206) 930-0211(c) | jmickelson@cascadewater.org | 6 |
| Cascade Water Alliance | Henry Chen | Engineering and Capital Projects Director | 520 112th Avenue NE, Suite 400 | Bellevue | 98004 | (425) 283-0367 (w) (425) 505-9877 (c) | hchen@cascadewater.org | 7 |
| Cascade Water Alliance | Melina Thung | Chief of Staff | 520 112th Avenue NE, Suite 400 | Bellevue | 98004 | (425) 628-4017 (c) | mthung@cascadewater.org | 8 |

| ORGANIZATION | NAME | TITLE | ADDRESS | CITY | ZIP | PHONE NUMBER | EMAIL | # |
|-------------------------------------|----------------|---|--|-------------|-------|--|---------------------------------|----|
| Central Pierce Fire and Rescue | Keith Wright | Fire Chief | Fire Station 60 17520 22nd Avenue E | Tacoma | 98445 | (253) 538-6400 (w) (253) 337-1030 | kwright@centralpiercefirer.org | 9 |
| City of Auburn Emergency Management | Jerry Thorson | Emergency Manager | 25 West Main Street | Auburn | 98001 | (253) 876-1909 | jthorson@auburnwa.gov | 10 |
| City of Auburn Police Department | Mark Caillier | Assistant Chief | 340 E Main St, Suite 201 | Auburn | 98002 | (253) 931-3080 | mcaillier@auburnwa.gov | 11 |
| City of Bonney Lake | Ryan Johnstone | Superintendent of Public Works | 19306 Bonney Lake Blvd | Bonney Lake | 98391 | (253) 447-4347 (w) (253) 209-6488 (c) | johnstoner@ci.bonney-lake.wa.us | 12 |
| City of Buckley | Alan Predmore | Fire Chief, Emergency Management Director | 611 South Division Street | Buckley | 98321 | (360) 829-1441 (w) | apredmore@cityofbuckley.com | 13 |
| City of Pacific | John Calkins | Public Safety Director | 133 3rd Ave S | Pacific | 98047 | (253) 929-1100 | jcalkins@ci.pacific.wa.us | 14 |
| City of Sumner | Mike Dahlem | Public Works Director | 1104 Maple Street | Sumner | 98390 | (253) 299-5702 | miked@sumnerwa.gov | 15 |
| City of Sumner Police Department | Jeffrey Engel | Deputy Police Chief | 1104 Maple St, Suite 140 | Sumner | 98390 | (253)-226-5677 (c) (253)-299-5644 (o) | jeffe@sumnerwa.gov | 16 |

| ORGANIZATION | NAME | TITLE | ADDRESS | CITY | ZIP | PHONE NUMBER | EMAIL | # |
|---|---------------------------|---|--|-------------|------------|--|--|----|
| City of Tacoma Fire Department | Ute Scofield | Emergency Management Program Manager | 901 S Fawcett Street | Tacoma | 98402 | (253) 594-7980 (o) (253) 973-9214 (c) Emergency 24/7: (253) 973- 0051 | uscofield@cityoftacoma.org | 17 |
| Dieringer School District | Michael Farmer | Superintendent | 1320 178th Avenue East | Lake Tapps | 98391 | (253) 862-2537 | mfarmer@dieringer.wednet.edu | 18 |
| East Pierce Fire & Rescue | James Jaques | Assistant Chief | 18421 Veterans Memorial Drive E Suite F | Bonney Lake | 98391 | (253) 863-1800 (w) (253) 405-2061 (c) | jjaques@eastpiercefirerescue.org | 19 |
| Enumclaw Fire Dept. | Randy Fehr | Fire Chief | 1330 Wells Street | Enumclaw | 98022 | (360) 825-5544 (w) | rfehr@enumclawfire.org | 20 |
| Federal Emergency Mgmt Agency, Region X | Dwight Perkins | Engineer – Risk Analysis Branch | Federal Regional Center, 130 228th Street SW | Bothell | 98021-9796 | Emergency: (425) 487-4647 (425) 487-4684 (w) (425) 301-6247 (c) | Fema-R10-RRCC-Watch@dhs.gov dwight.perkins@fema.dhs.gov | 21 |
| GeoEngineers, Inc | Devon McLay or Lyle Stone | Dam Safety Consultant | 8410 154th Avenue NE | Redmond | 98052 | (425) 861-6000 (w) | dmclay@geoengineers.com lstone@geoengineers.com | 22 |
| King Co. F.P.D. #44 | Greg Smith | Fire Chief | 32316 - 148th Avenue SE | Auburn | 98092 | (253) 735-0284 (w) | info@mvfire.org | 23 |
| King Co. Office of Emergency Management | Jennifer Rosenberger | Senior Emergency Management Program Manager | 3511 NE 2nd Street | Renton | 98056 | (206) 205-4071(w) (206) 296-3830 (o) | Jennifer.rosenberger@kingcounty.gov | 24 |

| ORGANIZATION | NAME | TITLE | ADDRESS | CITY | ZIP | PHONE NUMBER | EMAIL | # |
|---|-------------------|--|-----------------------------|---------|-------|--|----------------------------------|-----|
| King Co. Office of Emergency Management | Brendan McCluskey | Director | 3511 NE 2nd Street | Renton | 98056 | (206) 296-3830 (w) (206) 316-0221 (c) | brendan.mclluskey@kingcounty.gov | 25 |
| King Co. Office of Emergency Management | 24/7 Duty Officer | Duty Officer | 3511 NE 2nd Street | Renton | 98056 | (206) 423-6119 | KC.ECC@kingcounty.gov | 25A |
| King Co. Sheriff 911 Comm Center | Kathy Pompeo | Communications Center Operations Manager | 3511 NE 2nd Street | Renton | 98056 | (206) 296-3311 (24/7) (206) 205-7631 (w) (206)255-4954 | Kathryn.pompeo@kingcounty.gov | 26 |
| King County - River and Floodplain Management Section | Chris Brummer | Cedar/Sammamish/White River Supervising Engineer | 201 S Jackson St, Suite 600 | Seattle | 98104 | (206) 477-4655 (w) | chris.brummer@kingcounty.gov | 27 |
| King County Sheriff's Office | David Mendez | Special Operations | 3511 NE 2nd Street | Renton | 98056 | (206) 391-0769 | david.mendez@kingcounty.gov | 28 |
| King County Water and Land Resources Division | Ken Zweig | Program Manager | 201 South Jackson Street | Seattle | 98104 | (206) 477-4732 | ken.zweig@kingcounty.gov | 29 |
| King County Water and Land Resources Division | Kyle Comanor | Engineer | 201 South Jackson Street | Seattle | 98104 | (206) 477-4076 | kyle.comanor@kingcounty.gov | 30 |
| Muckleshoot Indian Tribe | Ada McDaniel | Emergency Preparedness Manager | 38911 172nd Avenue S.E. | Auburn | 98092 | (253) 876-3247 | Ada.McDaniel@Muckleshoot.nsn.us | 31 |

| ORGANIZATION | NAME | TITLE | ADDRESS | CITY | ZIP | PHONE NUMBER | EMAIL | # |
|---|---------------|---|---------------------------------|-------------|-------|--|----------------------------------|----|
| Muckleshoot Indian Tribe | Steve Keeney | Chief of Police | 38911 172nd Avenue S.E. | Auburn | 98092 | (253) 876-3249 (w) | steve.keeney@kingcounty.gov | 32 |
| National Weather Service - NOAA | Brent Bower | Senior Service Hydrologist | 7600 Sand Point Way NE | Seattle | 98115 | 24hr unlisted: (206) 526-6091 Admin: (206) 526-6095 ext 228 | Brent.Bower@NOAA.gov | 33 |
| Pierce Co. Dept. of Emergency Mgmt. | Kyle Bustad | Operations Manager | 2501 South 35th Street, Suite D | Tacoma | 98409 | (253) 798-6595 (o) (253) 798-2230 (desk) (253) 282-7545 (c) | kyle.bustad@piercecountywa.gov | 34 |
| Pierce Co. Dept. of Emergency Mgmt. | Jody Ferguson | Director | 2501 South 35th Street, Suite D | Tacoma | 98409 | (253) 798-6595 (o) (253) 797-7711 (desk) (253) 882-4402 (c) | jody.ferguson@piercecountywa.gov | 35 |
| Pierce Co. Sheriff's Department | Scott Brown | Sergeant | 11107 214th Avenue East | Bonney Lake | 98390 | (253) 798-4721 (dispatch, Press Option 1) | scott.brown@piercecountywa.gov | 36 |
| Pierce Co. Sheriff's Department | Mark Berry | Sergeant | 11107 214th Avenue East | Bonney Lake | 98390 | (253) 798-4721 (dispatch, Press Option 1) | mark.berry@piercecountywa.gov | 37 |
| Pierce County Dept. of Emergency Mgmt. | Debbie Bailey | Emergency Management Coordinator - Planning | 2501 South 35th Street, Suite D | Tacoma | 98409 | (253) 798-6366 | Debbie.bailey@piercecountywa.gov | 38 |
| Pierce County Planning and Public Works | Jeff Campbell | Maint & Operations Manager 1 | 4812 196th Street East | Spanaway | 98387 | CMF main: (253) 798-6000 (253) 377-5984 (c) | jeff.campbell@piercecountywa.gov | 39 |

| ORGANIZATION | NAME | TITLE | ADDRESS | CITY | ZIP | PHONE NUMBER | EMAIL | # |
|---|--------------------------|---|------------------------|----------|------------|---|---|-----|
| Pierce County Planning and Public Works | Sarah Grice | Maint & Operations Engineering | 4812 196th Street East | Spanaway | 98387 | (1) CMF main: (253) 798-6000 (2) (253) 861-9358 (c) | sarah.grice@piercecountywa.gov | 39A |
| Pierce County Planning and Public Works | Mark Schumacher | Superintendent | 4812 196th Street East | Spanaway | 98387 | (1) CMF main: (253) 798-6000 (2) (253) 514-9917 (c) | mark.schumacher@piercecountywa.gov | 39B |
| Pierce County Planning and Public Works | Bruce Wagner | Maint & Operations Manager 2 | 4812 196th Street East | Spanaway | 98387 | (1) CMF Main (253) 798-6000 (2) (360) 761-8498 (c) | bruce.wagner@piercecountywa.gov | 39C |
| Port of Tacoma | Lou Paulsen | Director, Strategic Operations Projects and Risk Management | P.O. Box 1837 | Tacoma | 98401-1837 | Port Security: (253) 383-9472 (253) 383-9449 (w) | lpaulsen@portoftacoma.com | 40 |
| Port of Tacoma | Alesha Pena | Senior Planner | P.O. Box 1837 | Tacoma | 98401-1837 | Port Security: (253) 383-9472 (253) 383-9449 (w) | apena@portoftacoma.com | 40A |
| Port of Tacoma | Joe O'Brien | Operations and Safety Superintendent | P.O. Box 1837 | Tacoma | 98401-1837 | Port Security: (253) 383-9472 (253) 383-9449 (w) | jobrien@portoftacoma.com | 40B |
| Puyallup Tribal Fisheries | Blake Smith | Enhancement Chief | 6824 Pioneer Way East | Puyallup | 98371 | (253) 680-5561(w) (253) 405-4913 (c) (253) 680-5575 (f) | blake.smith@puyalluptribe-nsn.gov | 41 |
| South Sound 911 | Jodi Maier / Matt Brooks | Supervisor/ Dispatcher | 2415 S. 35th | Tacoma | 98409 | 24/7: (253) 798-4063 | Jodi.Maier@SouthSound911.org Durand.dace@SouthSound911.org | 42 |

| ORGANIZATION | NAME | TITLE | ADDRESS | CITY | ZIP | PHONE NUMBER | EMAIL | # |
|--|----------------|----------------------------------|------------------------------|----------|------------|---|--|----|
| South Sound 911 | Shawn Mahoney | Ops Supervisor | 1102 39th Avenue S.E. | Puyallup | 98374 | (253) 686-3730 | Shawn.mahoney@southsound911.org | 43 |
| Tacoma-Pierce County Health Department | Chrissy Cooley | Water Resources Program Manager | 3629 South D Street, MS 1054 | Tacoma | 98418-6813 | (253) 278-1404 | ccooley@tpchd.org | 44 |
| U.S. Army Corps of Engineers | Ken Brettmann | -- | PO Box 3755 | Seattle | 98124 | (206) 802-8594 (c) (206) 632-0105 (h) | Kenneth.L.Brettmann@usace.army.mil | 45 |
| U.S. Army Corps of Engineers | Kevin Shaffer | -- | PO Box 3755 | Seattle | 98124 | (206) 218-6239 (c) (206) 612-7424 (h) | kevin.p.shaffer@usace.army.mil | 46 |
| Valley Communications Center (911 Call Center) | Angee Bunk | Operations Manager | 27519 108th Ave SE | Kent | 98030 | (253) 372-1454 24/7 com ctr: (253) 852-2121 | supervisors@valleycom.org emergency contact email: --angeeb@valleycom.org | 47 |
| Valley Regional Fire Authority | Sarah Yancey | Emergency Management Coordinator | 2905 C Street SW | Auburn | 98001 | (253) 347-8186 (c) (253) 288-5886 | sarah.yancey@vrfa.org | 48 |
| Veolia Water | John Dickson | O&M Technician | 2111 East Valley Highway | Sumner | 98390 | (253) 268-9970 (w) (253) 307-1758 (c) | john.dickson@veolia.com | 49 |
| Veolia Water | Douglas Dvorak | O&M Technician | 2111 East Valley Highway | Sumner | 98390 | (253) 750-1493 (c) | douglas.dvorak@veolia.com | 50 |

| ORGANIZATION | NAME | TITLE | ADDRESS | CITY | ZIP | PHONE NUMBER | EMAIL | # |
|---|-------------------|---|--------------------------|---------|------------|--|--------------------------|----|
| Veolia Water | Gerald Smart | Project Manager | 2111 East Valley Highway | Sumner | 98390 | (805) 264-9404 (c) (253) 826-3021 (w) | gerald.smart@veolia.com | 51 |
| Veolia Water | Jay Evans | O&M Supervisor | 2111 East Valley Highway | Sumner | 98390 | (253) 861-2110 (c) (253) 826-3022 (w) | jay.evans@veolia.com | 52 |
| Veolia Water | Jeff Rohr | O&M Technician | 2111 East Valley Highway | Sumner | 98390 | (253)861-2121 (w) (253) 826-3023 | Jeffery.rohr@veolia.com | 53 |
| Veolia Water | Michael Bryan | O&M Technician | 2111 East Valley Highway | Sumner | 98390 | (253) 302-0556 (c) | michael.bryan@veolia.com | 54 |
| Veolia Water | --- | On-Call Operator | 2111 East Valley Highway | Sumner | 98390 | (253) 590-3035 | --- | 55 |
| Washington State Dept. of Ecology Dam Safety Office | Gus Ordonez, PE | Geotechnical Specialist | P.O. Box 47600 | Olympia | 98504-7600 | (360)-407-6619 (w) (360)-742-7925 (c) | gord461@ecy.wa.gov | 56 |
| Washington State Dept. of Ecology Dam Safety Office | Tom Satterthwaite | Dam Safety Engineer | P.O. Box 47600 | Olympia | 98504-7600 | (360)-407-6620 (w) (360)-480-1397 (c) | tsat461@ecy.wa.gov | 57 |
| Washington State Dept. of Ecology Dam Safety Office | Joe Witczak | Section Manager - Dam Safety Supervisor | PO Box 47600 | Olympia | 98504-7600 | (360) 407-6603 (o) (360) 972-4426 (c) | jwit461@ecy.wa.gov | 58 |

| ORGANIZATION | NAME | TITLE | ADDRESS | CITY | ZIP | PHONE NUMBER | EMAIL | # |
|---|--------------------|---|----------------------|-------------|------------|--|------------------------------|----|
| Washington State Military Dept. - Emergency Management Division | Brian N. Laughlin | Strategic Plnr & Tech Hazards Program Mgr | Building 20 | Camp Murray | 98430-5122 | (253) 512-7050 (w) (253) 208-4886 © | brian.laughlin@mil.wa.gov | 59 |
| Washington State Patrol | Wesley Vradenburg | Station Manager - Tacoma | 2502 -112th Street E | Tacoma | 98445 | (253) 538-3100 | Wesley.vradenburg@wsp.wa.gov | 60 |
| Cascade – Admin Office | Joe Mickelson (#6) | --- | --- | --- | --- | --- | --- | 61 |
| Cascade – Office | Joe Mickelson (#6) | --- | --- | --- | --- | --- | --- | 62 |
| Veolia - Extra | Gerald Smart (#51) | --- | --- | --- | --- | --- | --- | 63 |

* Back-up to primary contact

4. The Five-Step EAP Process

Step 1 Event Detection

This step describes the detection of an unusual or emergency event and provides information to assist the dam operator in detecting events and determining whether EAP activation is required.

Unusual or emergency events may be detected by:

- Observations at or near the dike(s) by Lake Tapps project operators, government personnel (local, state, or Federal), landowners, visitors to the dike(s), or the public. It is important to evaluate all reports that are received. To facilitate reporting by landowners, visitors, or the public, ecology blocks painted to indicate the dike number are posted at each dike along with signs with instructions to dial 911 in the event of an emergency. These markings and signs should be maintained at all times.
- Evaluation of instrumentation data.
- Earthquakes felt or reported in the vicinity of the dikes. The dikes should be evaluated if an earthquake is felt by project personnel or if an earthquake with a magnitude of 3.0 or greater is reported within a 50-mile radius of the dikes.
- Forewarning of conditions that may cause an unusual event or emergency event at the dike(s) (for example, a severe weather or flash flood forecast).

If an event is non-emergency or slowly developing, the project operator may be unsure whether activation of the EAP is required. In these cases, they may gather additional data and seek input from the Operations Manager, the dam safety consultant, and/or the Washington State Department of Ecology Dam Safety Office (DSO) to determine whether EAP activation is appropriate. Unusual events that are determined not to require EAP activation may require on-going monitoring at the recommendation of the dam safety consultant or the DSO. **The EAP should be activated immediately for events that are rapidly developing or have the potential to lead to dam failure.**

See *Guidance for Determining the Emergency Level* table for assistance in evaluating specific events to determine if they are unusual or potential emergency situations.

Step 2 **Emergency Level Determination**

When an unusual or emergency event is detected or reported and EAP activation is determined to be appropriate, the project Operations Manager or alternate is responsible for classifying the event into one of the following three emergency levels (use the guidance chart on the next page):

Nonemergency (Emergency Level 1)—Nonemergency, unusual event, slowly developing:

This situation is not normal but has not yet threatened the operation or structural integrity of the dike, but possibly could if it continues to develop. The project dam safety consultant or state dam safety officials should be contacted to investigate the situation and to recommend actions. The condition of the dike should be closely monitored, especially during storm events, to detect any development of a potential or imminent dike failure situation. The Sheriff should be informed if it is determined that the condition may possibly develop into a worse condition that may require emergency actions.

Potential Failure (Emergency Level 2)—Potential dam failure situation, rapidly developing:

This situation may eventually lead to dike failure and flash flooding downstream, but there is not an immediate threat of dike failure. The Sheriff should be notified of this emergency situation and placed on alert. The dam operator should closely monitor the condition of the dike and periodically report the status of the situation to the Sheriff. If the dike condition worsens and failure becomes imminent, the Sheriff must be notified immediately of the change in the emergency level to evacuate the people at risk downstream.

If time permits, the project dam safety consultant and state dam safety officials should be contacted to evaluate the situation and recommend remedial actions to prevent failure of the dike. The dam operator should initiate remedial repairs (note local resources that may be available—see Appendix A-3). Time available to employ remedial actions may be hours or days.

Imminent Failure (Emergency Level 3)—Urgent; dam failure appears imminent or is in progress:

This is an extremely urgent situation when a dike failure is occurring or is about to occur and cannot be prevented. Flash flooding will occur downstream of the dike. The Sheriff should be contacted immediately so emergency services can begin evacuations of all people at risk and close roads as needed (see Appendix A-2 – Inundation Maps).

See the following pages for guidance in determining the proper emergency level for various situations.

Guidance for Determining the Emergency Level

| Event | Situation | Emergency Level* |
|-------------------------------------|---|------------------|
| Embankment Overtopping | Reservoir (lake) level is less than 1 foot below the top of one or more dikes. This corresponds to a reservoir level of Elevation 543.6 (1 foot below the Dike 12 crest) or greater. | 2 |
| | Water from the reservoir (lake) is flowing over the top of one or more dikes. | 3 |
| Seepage | New seepage areas in or near one or more of the dikes. | 1 |
| | Seepage with discharge greater than 10 gallons per minute. | 1 |
| | Rapid increase in seepage flow rate and/or seepage or piping causing rapid erosion. Level 2 or 3 determination depends on availability and feasibility of measures to slow or stop the seepage. | 2-3 |
| Non-Rotting Pile Sinkhole | Observation of new non-rotting pile related sinkhole in reservoir area or on embankment. | 1 |
| | Observation of new non-rotting pile related sinkhole in reservoir area or on embankment and observed seepage in the vicinity. | 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 | Earthquake felt or earthquake with a magnitude of 3.0 or above reported within 50 miles of the project | 1-3 |
| | Earthquake resulting in visible damage to one or more dikes or appurtenances | 2 |
| | Earthquake resulting in uncontrolled release of water from one or more dikes | 3 |
| Security Threat | Verified bomb threat that, if carried out, could result in damage to one or more dikes | 2 |
| | Detonated bomb that has resulted in damage to the dam or appurtenances | 3 |
| Sabotage/ vandalism/ accident | Damage to dam or appurtenance with no impacts to the functioning of the dam | 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 |
| Whirlpool | Whirlpool observed in the lake adjacent to one or more dikes | 2 |

* Emergency Level 1: Nonemergency unusual event, slowly developing

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

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

Step 3 Notification and Communication

Notification

After the emergency level has been determined, the people on the following notification charts for the appropriate emergency level shall be notified immediately.

Communication

Emergency Level 1—Nonemergency, unusual event; slowly developing:

The Operations Manager and project Dam Safety Consultant should contact the Washington State Dam Safety Office (DSO), describe the situation, and request technical assistance on next steps to take. A notification chart is not considered necessary for the nonemergency event.

Emergency Level 2—Emergency event, potential dam failure situation; rapidly developing:

The following message may be used to help describe the emergency situation to the Sheriff or emergency management personnel:

“This is _____ (identify yourself – name, position)_____.

We have an emergency condition at The Lake Tapps Project, Dike No. _(provide dike number)_, located _(if needed, refer to Location under Basic EAP Data for specific dike).

We have activated the Emergency Action Plan for this dam and are currently under Emergency Level 2 for a potential dam failure.

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

Please prepare to evacuate the area shown on the inundation maps in your copy of the Emergency Action Plan for a Dike (identify dike) failure. We require emergency response personnel to assist with traffic closures and to provide emergency response representation for additional future actions. The incident command location for this Emergency is: _____

Dike 1: 585 182nd Avenue E

Dikes 2A, 2B, 3, 4, 4A, 5: Pierce County Park at 1538 198th Avenue East

Dikes 6, 7, 8, 9, 10, 11, 12: 585 182nd Avenue E

Dike 13: Allan Yorke Park Boat Launch, 7302 W Tapps Highway E

Dike 14: 7205 Barkubine Road

Dike 15: Backflow Prevention Structure on 218th Avenue E, north of 69th Street East

Please notify all affected emergency management and law enforcement agencies. We will advise you when the situation is resolved or if the situation gets worse.

I can be contacted at the following number (provide your phone number). If you cannot reach me, please call the following alternative number (provide alternative phone number).”

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

Emergency response agencies should be contacted immediately and the area evacuated (see *Evacuation Map* tab). The following actions should be taken:

1. Call the 911 dispatch center. Be sure to say, “This is an emergency.” They will call other authorities and the media and begin the evacuation. The following message may be used to help describe the emergency situation to the Sheriff or emergency management personnel:

“This is an emergency. This is _____ (identify yourself – name, position) _____ .

Lake Tapps Project, Dike No. (identify dike), located (if needed, refer to Location under Basic EAP Data for specific dike), is failing. The downstream area must be evacuated immediately. Repeat, Lake Tapps Project, Dike No. (identify dike), is failing; evacuate the area downstream of Dike No. (identify dike) in accordance with the inundation maps in your copy of the Emergency Action Plan.

We have activated the Emergency Action Plan for this dam and are currently under Emergency Level 3 (imminent or in-progress failure) for an imminent or in-progress dam failure. Reference the inundation and evacuation maps in your copy of the Emergency Action Plan.

I can be contacted at the following number (provide your phone number). If you cannot reach me, please call the following alternative number (provide alternative phone number).

We require emergency response personnel to assist with traffic closures and to provide emergency response representation for additional future actions. The incident command location for this Emergency is: _____

Dike 1: 585 182nd Avenue E

Dikes 2A, 2B, 3, 4, 4A, 5: Pierce County Park at 1538 198th Avenue East

Dikes 6, 7, 8, 9, 10, 11, 12: 18929 9th Street E

Dikes 13 and 15: Backflow Prevention Structure on 218th Avenue E, north of 69th Street East

Dike 14: 7205 Barkubine Road

Please notify all affected emergency management and law enforcement agencies.

2. Do whatever is necessary to help people in immediate danger (anyone on the dike, downstream from the dike, boating on the reservoir, or evacuees) to safety in collaboration with the Sheriff or designee.
3. Keep in frequent contact with the Sheriff and emergency services to keep them up-to-date on the condition of the dike. They will tell you how you can help handle the emergency.
4. 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 well as you can, and periodically try to re-establish contact with the Sheriff and emergency services.

The following optional pre-scripted message may be used as a guide for emergency services personnel and/or the National Weather Service to communicate the status of the emergency to the public:

Dike 1 Sample Public Communication Script

Attention: This is an emergency message from (identify agency). Listen carefully. Your life may depend on immediate action.

Lake Tapps Dike No. 1, located on 17th Street E between Channel Road E and 186th Avenue E, is failing. Repeat. Lake Tapps Dike No. 1, located on 17th Street E between Channel Road E and 186th Avenue E, is failing.

If you are in or near this area, proceed immediately to high ground. Do not travel on:

- *Lake Tapps Parkway between 62nd Drive SE and 182nd Avenue E,*
- *182nd Avenue East between 180th Avenue E and Tacoma Point Drive,*

or return to your home to recover your possessions. You cannot outrun or drive away from the flood wave. Proceed immediately to high ground.

Repeat message.

Dike 2A and 2B Sample Public Communication Script

Attention: This is an emergency message from (identify agency). Listen carefully. Your life may depend on immediate action.

Lake Tapps Dike No. (2A or 2B), located Southeast of the intersection of Lake Tapps Parkway SE and 182nd Avenue E, is failing. Repeat. Lake Tapps Dike No. (2A or 2B), located Southeast of the intersection of Lake Tapps Parkway E and 182nd Avenue E, is failing.

If you are in or near this area, proceed immediately to high ground away from the valley. Do not travel on:

- *Kersey Way SE,*
- *Stuck River Drive,*
- *The intersection of Lake Tapps Parkway SE and 9th Street East,*

or return to your home to recover your possessions. You cannot outrun or drive away from the flood wave. Proceed immediately to high ground.

Dike 3 Sample Public Communication Script

Attention: This is an emergency message from (identify agency). Listen carefully. Your life may depend on immediate action.

Lake Tapps Dike No. 3, located on 9th Street E between 188th Avenue E and 190th Avenue E, is failing. Repeat. Lake Tapps Dike No. 3, located on 9th Street E between 188th Avenue E and 190th Avenue E, is failing.

If you are in or near this area, proceed immediately to high ground away from the valley. Do not travel on:

- *Kersey Way SE north of Evergreen Way,*
- *Stuck River Drive,*
- *53rd Street SE between Pearl Avenue SE and Kersey Way SE,*
- *9th Street E between 188th Avenue E and 190th Avenue E,*

or return to your home to recover your possessions. You cannot outrun or drive away from the flood wave. Proceed immediately to high ground.

Dike 4, 4A, and 5 Sample Public Communication Script

Attention: This is an emergency message from (identify agency). Listen carefully. Your life may depend on immediate action.

Lake Tapps Dike No. (4, 4A or 5), located in the Lake Tapps Park, is failing. Repeat. Lake Tapps Dike No. (4, 4A or 5), located in the Lake Tapps Park, is failing.

If you are in or near this area, proceed immediately to high ground away from the valley. Do not travel on:

- *Kersey Way SE north of Evergreen Way,*
- *Stuck River Drive,*
- *53rd Street SE,*
- *47th Street SE,*
- *Bridget Avenue SE,*
- *55th Street SE,*
- *Edwards Road between 190th Avenue E and 200th Avenue E,*
- *O'Farrell Cutoff Road E,*
- *9th Street E between 198th Avenue E and 190th Avenue E,*

or return to your home to recover your possessions. You cannot outrun or drive away from the flood wave. Proceed immediately to high ground.

Dike 6, 7, 8, 9, 10 Sample Public Communication Script

Attention: This is an emergency message from (identify agency). Listen carefully. Your life may depend on immediate action.

Lake Tapps Dike No. (6, 7, 8, 9 or 10), located in the Lake Tapps Park, is failing. Repeat. Lake Tapps Dike No. (6, 7, 8, 9 or 10), located in the Lake Tapps Park, is failing.

If you are in or near this area, proceed immediately to high ground away from the valley. Do not travel on:

- *208th Avenue E,*
- *Edwards Road E between 10th Street E and 210th Avenue E,*
- *12th Street E between 201st Avenue E and 208th Avenue E,*

or return to your home to recover your possessions. You cannot outrun or drive away from the flood wave. Proceed immediately to high ground.

Dike 11 Sample Public Communication Script

Attention: This is an emergency message from (identify agency). Listen carefully. Your life may depend on immediate action.

Lake Tapps Dike No. 11, located on the east end of Lake Tapps, north of Tapps Island, is failing. Repeat. Lake Tapps Dike No. 11, located on the east end of Lake Tapps, north of Tapps Island, is failing.

If you are in or near this area, proceed immediately to high ground away from the valley. Do not travel on:

- *Edwards Road E between 10th Street E and 210th Avenue E,*
- *26th Street E,*
- *220th Avenue E,*
- *29th Street E,*
- *34th Street E,*
- *214th Avenue E between 21st Street E and 26th Street E,*

or return to your home to recover your possessions. You cannot outrun or drive away from the flood wave. Proceed immediately to high ground.

Dike 12 Sample Public Communication Script

Attention: This is an emergency message from (identify agency). Listen carefully. Your life may depend on immediate action.

Lake Tapps Dike No. 12, located on the east end of Lake Tapps, north of Tapps Island, is failing. Repeat. Lake Tapps Dike No. 12, located on the east end of Lake Tapps, north of Tapps Island, is failing.

If you are in or near this area, proceed immediately to high ground away from the valley. Do not travel on:

- *Edwards Road E between 10th Street E and 210th Avenue E,*
- *26th Street E,*
- *220th Avenue E,*
- *29th Street E,*
- *34th Street E,*
- *214th Avenue E between 21st Street E and 26th Street E,*

or return to your home to recover your possessions. You cannot outrun or drive away from the flood wave. Proceed immediately to high ground.

Dike 13 Sample Public Communication Script

Attention: This is an emergency message from (identify agency). Listen carefully. Your life may depend on immediate action.

Lake Tapps Dike No. 13, located on the south end of Lake Tapps at Allan Yorke Park, is failing. Repeat. Lake Tapps Dike No. 13, located on the south end of Lake Tapps at Allan Yorke Park, is failing.

If you are in or near this area, proceed immediately to high ground away from the valley. Do not travel on:

- *197th Avenue E,*
- *Church Lake Road E at Evergreen Drive,*

or return to your home to recover your possessions. You cannot outrun or drive away from the flood wave. Proceed immediately to high ground.

Dike 14 Sample Public Communication Script

Attention: This is an emergency message from (identify agency). Listen carefully. Your life may depend on immediate action.

Lake Tapps Dike No. 14, located West of 7205 Barkubine Road, is failing. Repeat. Lake Tapps Dike No. 14, located West of 7205 Barkubine Road, is failing.

If you are in or near this area, proceed immediately to high ground away from the valley. Do not travel on:

- *48th Street E,*
- *230th Avenue E between 40th Street E and 56th Street E*

or return to your home to recover your possessions. You cannot outrun or drive away from the flood wave. Proceed immediately to high ground.

Dike 15 Sample Public Communication Script

Attention: This is an emergency message from (identify agency). Listen carefully. Your life may depend on immediate action.

Lake Tapps Dike No. 15, located off of 218th Avenue East, North of 69th Street, is failing. Repeat. Lake Tapps Dike No. 15, located off of 218th Avenue East, North of 69th Street, is failing.

If you are in or near this area, proceed immediately to high ground away from the valley. Do not travel on:

- *Connells Prairie Road between 214th Avenue E and 222nd Avenue,*
- *214th Avenue E in the vicinity of the Sumner-Buckley Highway,*
- *The Sumner-Buckley Highway between 224th Avenue E and Kelly Lake Road E,*
- *The Sumner-Buckley Highway between 198th Avenue E and Church Lake Road E*

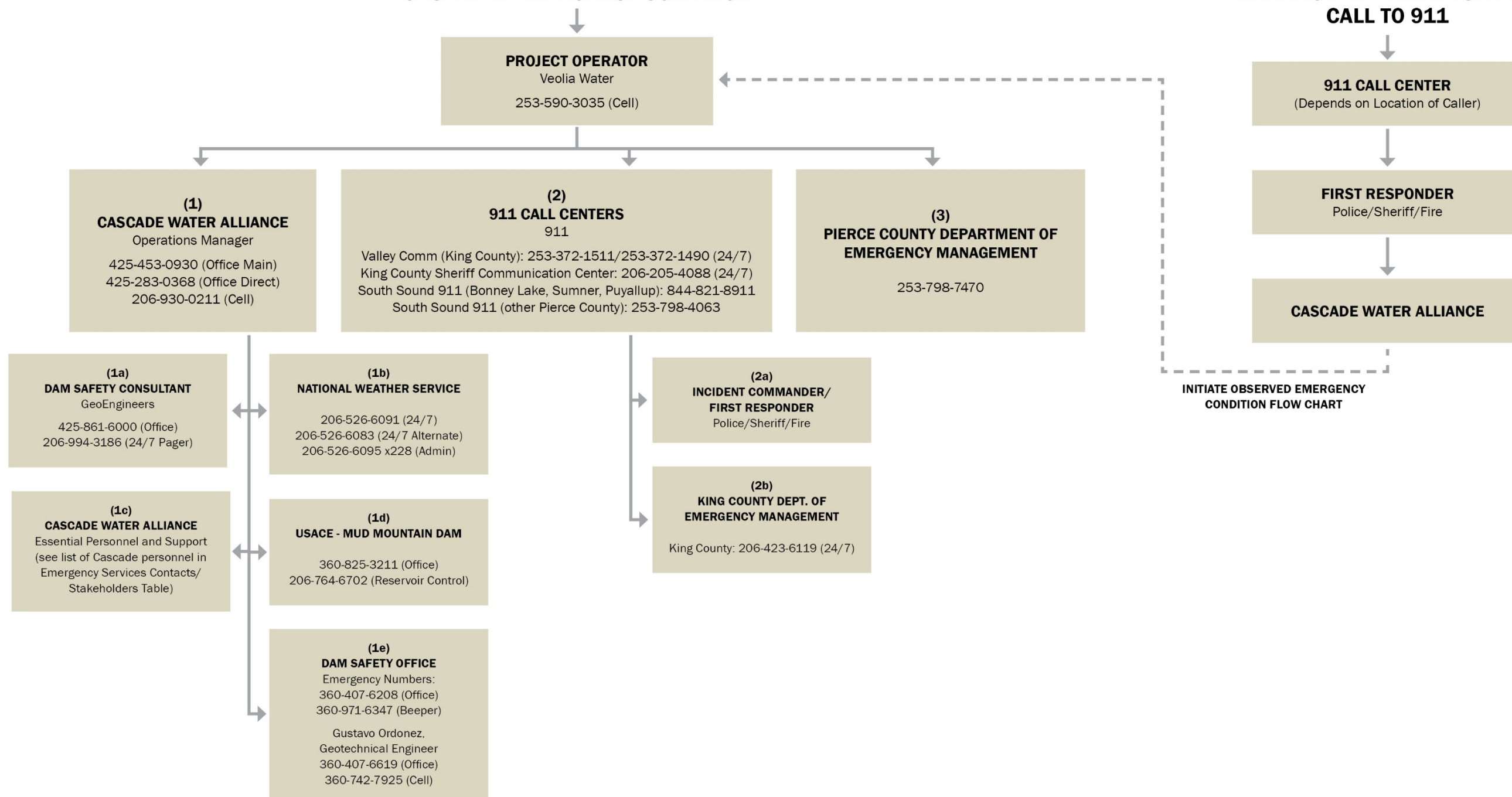
or return to your home to recover your possessions. You cannot outrun or drive away from the flood wave. Proceed immediately to high ground.

Emergency Level 2 – Potential Failure Notifications

Emergency event, potential dam failure situation; rapidly developing

OBSERVED EMERGENCY CONDITION

INITIATION BY PRIVATE CITIZEN CALL TO 911



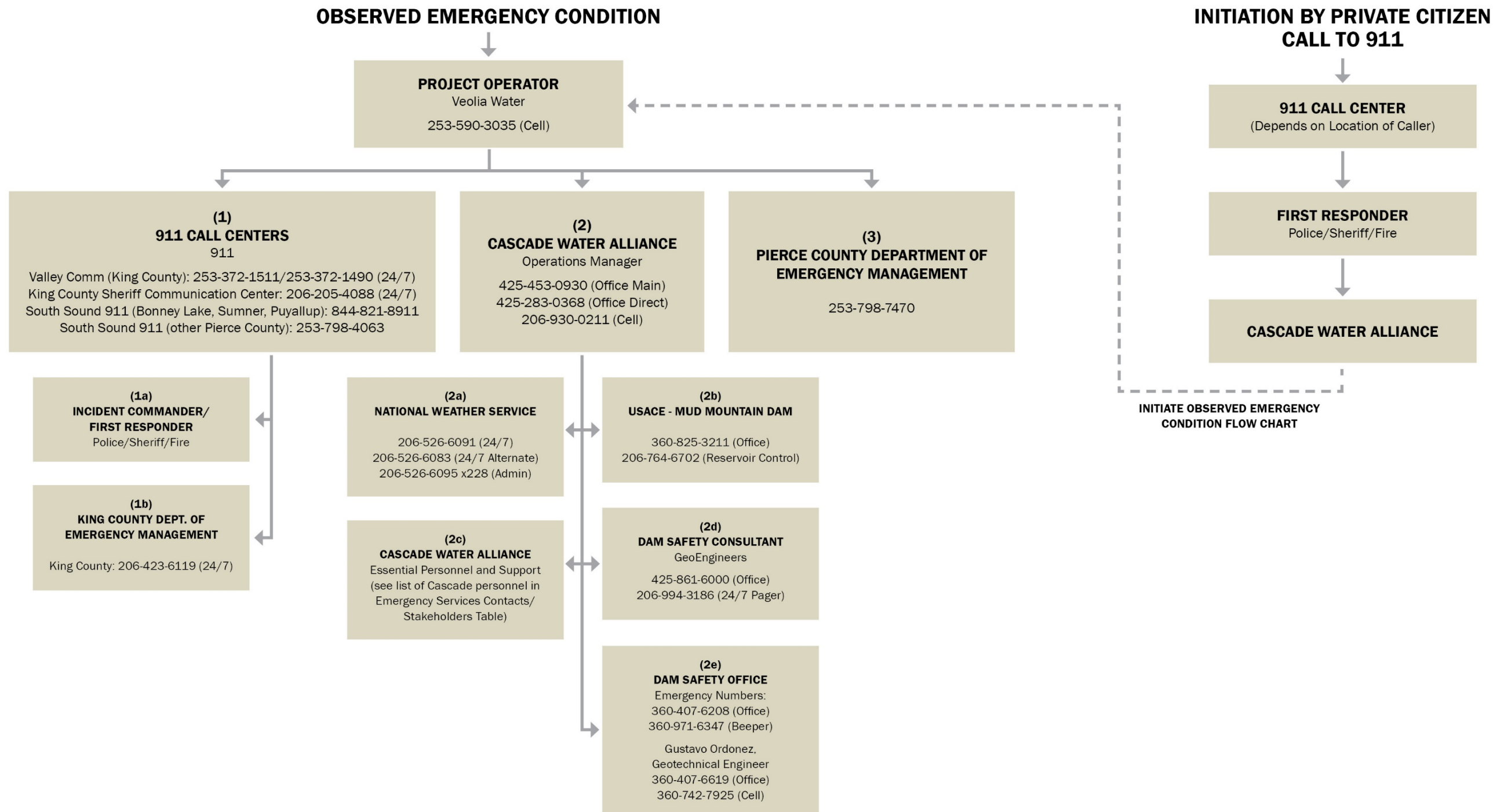
Note:
1, 2, etc., denotes call sequence

See *Communications* tab for prescribed messages.

See *Emer. Services Contacts* tab for contact information for back-ups to the persons shown above and other emergency personnel.

Emergency Level 3 – Imminent or In-Progress Failure Notifications

Urgent event, dam failure appears imminent or is in progress



Note:
1, 2, etc., denotes call sequence

See *Communications* tab for prescribed messages.

See *Emer. Services Contacts* tab for contact information for back-ups to the persons shown above and other emergency personnel.

Step 4 Expected Actions

If the police or Sheriff receives a 911 call from a member of the public regarding observations of an unusual or emergency event at the dam, they should immediately contact Cascade Water Alliance Operations Manager. After the Operations Manager determines the emergency level, the following actions should be taken. If time permits, the Lake Tapps Project dam safety consultant and the Washington State Dam Safety Office should be contacted for technical consultation.

Emergency Level 1—Nonemergency, unusual event; slowly developing:

- A. The Operations Manager/Project Operator should inspect the dike(s) in question. At a minimum, inspect the full length of the inboard slope, crest, outboard toe, and outboard slope. Also, check the reservoir area for signs of changing conditions. **If increased seepage, erosion, cracking, or settlement are observed, immediately report the observed conditions to the Lake Tapps Project Dam Safety Consultant or the Washington State Dam Safety Office; refer to the emergency level table for guidance in determining the appropriate event level for the new condition and recommended actions.**
- B. Record all contacts that were made on the *Contact Checklist* (Appendix B–2). Record all information, observations, and actions taken on the *Unusual or Emergency Event Log* (Appendix B–3). Note the time of changing conditions. Document the situation with photographs and video, if possible.
- C. The Cascade Water Alliance Operations Manager should contact the project Dam Safety Consultant and request technical staff to investigate the situation and recommend corrective actions.

Emergency Level 2—Potential dam failure situation; rapidly developing:

- A. The Operations Manager should contact the Lake Tapps Project dam safety consultant and the Washington State Dam Safety Office to report the situation and, if time permits, request technical staff to investigate the situation and recommend corrective actions.
- B. The Operations Manager should contact the sheriff to inform him/her that the EAP 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 Sheriff and emergency services personnel to assist them in making timely decisions concerning the need for warnings, road closures, and evacuations.
- D. If time permits, the Project Operator and/or Operations Manager should inspect the dike(s). 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 Lake Tapps Project dam safety consultant and the Washington State Dam Safety Office; refer to the emergency level table for guidance in determining the appropriate event level for the new condition and recommended actions.**
- E. Record all contacts that were made on the *Contact Checklist* (Appendix B-2). Record all information, observations, and actions taken on the *Unusual or Emergency Event Log* (Appendix B-3). Note the time of changing conditions. Document the situation with photographs and video, if possible.
- F. If time permits, the following emergency remedial actions should be taken as appropriate.

Emergency remedial actions

If time permits, the following emergency remedial actions should be *considered* for Emergency Level 2 (potential failure) conditions. Immediate implementation of these remedial actions may delay, moderate, or prevent the failure of the dike(s). Several of the listed adverse or unusual conditions may be apparent at the dike(s) at the same time, requiring implementation of several modes of remedial actions. Close monitoring of the dike(s) must be maintained to confirm the success of any remedial action taken at the dike(s). Time permitting, any remedial action should be developed through consultation with the project dam safety consultant and the Washington State Dam Safety Office. See Appendix A-3, Resources Available for sources of equipment and materials to assist with potential remedial actions. Potential remedial actions for various conditions are described below. The order and details of these remedial actions summarized below are not prescriptive and may be modified by the Operations Manager during the emergency.

Embankment overtopping

1. Open outlet(s) (penstocks) to lower the reservoir level as rapidly as possible to a level that stops or decreases the seepage to a non-erosive velocity.
2. Eliminate major inflows to Lake Tapps by closing the two intake gates at the headworks and closing the valves in the valve house. If a risk of overtopping the flowline is apparent, open discharges along the flowline, including the two flowline rock chutes and the 6-foot valve in Wolslegal Basin to divert water from the flowline to the White River.
3. If the water level in the reservoir is no longer rising, place sandbags along the low areas of the top of the dike(s) to control wave action and reduce the likelihood of flow concentration during minor overtopping.
4. Cover the weak areas of the top of the dike(s) and downstream slope with riprap, sandbags, plastic sheets, or other materials to provide erosion-resistant protection.

Seepage and sinkholes

1. Open outlet(s) (penstocks) to lower the reservoir level as rapidly as possible to a level that stops or decreases the seepage to a non-erosive velocity.
2. Eliminate major inflows to Lake Tapps by closing the two intake gates at the headworks and closing the valves in the valve house. If a risk of overtopping the flowline is apparent, open discharges along the flowline, including the two flowline rock chutes and the 6-foot valve in Wolslegal Basin to divert water from the flowline to the White River.
3. Continue lowering the water level until the seepage stops.
4. 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.
5. Cover the seepage exit area(s) with several feet of sand/gravel to hold fine-grained embankment or foundation materials in place. Keep adding sand/gravel until the seepage flow runs free of sediment. 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. Keep raising the ring dike until the seepage flow runs free of sediment.
6. 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) (penstocks) to lower the reservoir to a safe level at a rate considerate of the urgency and severity of the condition of the slide or slump.
2. Eliminate major inflows to Lake Tapps by closing the two intake gates at the headworks and closing the valves in the valve house. If a risk of overtopping the flowline is apparent, open discharges along the flowline, including the two flowline rock chutes and the 6-foot valve in Wolslegal Basin to divert water from the flowline to the White River.
3. Repair settlement of the crest by placing sandbags or earth and rockfill materials in the damaged area to restore freeboard.
4. Stabilize slides by placing a soil or rockfill buttress against the toe of the slide.

Earthquake

1. The Project Operator, Operations Manager, and /or Dam Safety Consultant should immediately conduct a general overall visual inspection of the dikes.
2. Perform a field survey to determine if there has been any settlement and movement of the dikes, and appurtenant structures.
3. Drain the reservoir, if required.

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

- A. The Project Operator shall immediately contact the Sheriff and others shown on the notification chart.
- B. Open outlet(s) (penstocks) to lower the reservoir to a safe level at a rate considerate of the urgency and severity of the condition.
- C. Eliminate major inflows to Lake Tapps by closing the two intake gates at the headworks and closing the valves in the valve house. If a risk of overtopping the flowline is apparent, open discharges along the flowline, including the two flowline rock chutes and the 6-foot valve in Wolslegal Basin to divert water from the flowline to the White River.
- D. The Sheriff shall lead the efforts to carry out warnings, close roads, and evacuate people at risk downstream from the dam (see Inundation Map tab).
- E. Emergency management services personnel shall alert the public and immediately evacuate people at risk and close roads as necessary.
- F. The Operations Manager shall maintain continuous communication and provide the Sheriff with updates of the situation to assist him/her in making timely decisions concerning warnings and evacuations.
- G. The Operations Manager should record all contacts that were made on the Contact Checklist (Appendix B–2). Record all information, observations, and actions taken on the Unusual or Emergency Event Log (Appendix B–3). Note the time of changing conditions. Document the situation with photographs and video, if possible.
- H. The Incident Commander should 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 EAP has been activated, an emergency level has been declared, all EAP actions have been completed, and the emergency is over, the EAP operations must eventually be terminated and follow-up procedures completed.

Termination responsibilities

The Sheriff is responsible for terminating Level 2 (potential failure) and 3 EAP operations and relaying this decision to the Operations Manager. The Operations Manager is responsible for terminating Level 1 EAP operations. 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 Emergency Level 3 (imminent or in-progress failure) event that has not caused actual dam failure, the project dam safety consultant or the Washington State Dam Safety Office 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 that conditions do not pose a threat to people or property, the Sheriff will be advised to terminate EAP operations as described above.

The Operations Manager shall assure that the *Dam Safety Emergency Event Report* (Appendix B-4) is completed to document the emergency event and all actions that were taken. The Operations Manager shall distribute copies of the completed report to the DSO and the project Dam Safety Consultant.

5. Maintenance—EAP Review and Revision

Introduction

Emergency Action Plans should be considered “Living Documents”. This means that:

- They will never be complete.
- They should be reviewed and updated, as necessary, at least once a year.
- The local emergency manager should take part in their annual review.
- All updates should be promptly distributed to all Plan holders, (owners keep the “master” EAP, and record where copies of the EAPs are located).

Dam emergency events and failures are not common events. Therefore, training and exercises are necessary to maintain emergency response readiness, timeliness and effectiveness. The EAP therefore requires periodic maintenance to remain current and as useful and effective as possible.

EAP Periodic Test

Periodic training and exercises are necessary to ensure that people involved are thoroughly familiar with all elements of the plan, as well as their related duties and responsibilities. An appropriate number of people should receive training to ensure adequate coverage at all times.

EAP exercises can include:

- Orientations
- Phone drills
- Tabletop exercises
- Functional exercises

At a minimum, Cascade Water Alliance should conduct an annual orientation and phone drill. The orientation can be a simple meeting where those individuals and entities with a stake in the EAP come together to review the roles and responsibilities described in the EAP. Orientations are especially useful for bringing new staff and leadership within any of the various organizations up to speed with regard to the components of the EAP.

Cascade Water Alliance will host and facilitate a tabletop and functional exercise of the EAP at least once every 5 years. Attendance should include the Operations Manager, key Cascade Water Alliance staff members, the project dam safety consultant, at least one representative of the local law enforcement agency, and others with key responsibilities listed in the EAP. At the discretion of Cascade Water Alliance, other organizations that may be involved with an unusual or emergency event at the dam are encouraged to participate. Before the tabletop exercise begins, meeting participants will visit the dam during the periodic test to familiarize themselves with the dam site.

The tabletop exercise will begin with the facilitator presenting a scenario of an unusual or emergency event at the dam. The scenario will 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 narrator will control the discussion, ensuring realistic responses and developing the scenario throughout the exercise. The Operations Manager should complete an event log as they would during an actual event.

After the tabletop exercise, the five sections of the EAP will be reviewed and discussed. Mutual aid agreements and other emergency procedures can be discussed. Cascade Water Alliance will prepare a written summary of the periodic test and revise the EAP, as necessary.

EAP Annual Review

The Operations Manager, Cascade Water Alliance Capital Projects Director, and Dam Safety Consultant will review and, if needed, update the EAP at least once each year. The EAP annual review will include the following:

- Calling all contacts on the three notification charts in the EAP to verify that the phone numbers and persons in the specified positions are current. The EAP will be revised if any of the contacts have changed.
- Contacting the local law enforcement agencies to verify the phone numbers and persons in the specified positions. In addition, the Operations Manager will ask if the person contacted knows where the EAP is kept and if responsibilities described in the EAP are understood.
- Calling the locally available resources to verify that the phone numbers, addresses, and services are current.
- Review information on the people and structures at risk and incorporate changes in development within the flood inundation area.
- *Any deficiencies found during training and exercises should be noted and the plan revised.*

Revisions

Cascade Water Alliance is responsible for updating the EAP document. The EAP document held by Cascade Water Alliance is the master document. When revisions occur, Cascade Water Alliance will provide the revised pages and a revised revision summary page to all the EAP document holders. The document holders are responsible for revising outdated copy of the respective document(s) whenever revisions are received. Outdated pages shall be immediately discarded to avoid any confusion with the revisions.

Record of Holders of Control Copies of this EAP

| Copy Number | Organization | Person receiving copy |
|-------------|--------------|-----------------------|
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | | |
| 6 | | |
| 7 | | |
| 8 | | |

Record of Revisions and Updates Made to EAP

| Revision Number | Date | Revisions made | By whom |
|-----------------|-----------|---|---|
| 1 | 7/28/2014 | <ul style="list-style-type: none"> - <i>Replace Title Page and Table of Contents.</i> - Revised EAP Overview (Section 3) to include determination as to whether EAP activation is required as part of the “Event Detection Step”. <p>Several revisions to Roles and Responsibilities (Section 4) including clarification of Project Operator roles, updates to Emergency Services Contacts/Stakeholders list.</p> <p>Several revisions to The Five Step EAP Process (Section 5) including clarification of event detection step and guidance for determining whether EAP activation is needed, guidance for earthquake magnitude and distance thresholds requiring EAP activation, updates to notification charts, and additional guidance for expected actions to reduce inflows and lower lake levels for various potential emergency events.</p> <p>Minor text edit to Maintenance – EAP Review and Revision (Section 6).</p> <p><i>Replace pages 1 through 33 with pages 1-1 through 6-4.</i></p> | GeoEngineers and Cascade Water Alliance |
| 2 | 8/12/2015 | <ul style="list-style-type: none"> - <i>Replace Title Page and Table of Contents.</i> - Revisions to Basic EAP Data (Section 2) including noting that Dike 14 and 15 mapped inundation zones do not consider backflow prevention structure and updates to Dike 3 geometry. <p><i>Replace Section 2.</i></p> <p>Revisions to Contact List in Roles and Responsibilities (Section 4).</p> <p><i>Replace Emergency Service Contacts/Stakeholders.</i></p> | |

| | | | |
|----------|-------------------|--|--|
| | | <p>Revisions to contacts in Notification Charts in the Five Step EAP Process (Section 5). Replace Notifications Charts.</p> <ul style="list-style-type: none"> - Revisions to Appendix A-1 to include updated vicinity maps. Replace Figures A-1.2 through A-1.3. - Revisions to Appendix A-2 to include updated inundation and evacuation map backgrounds as available. Replace Appendix A-2 cover page and Figures A-2.1 through A-2.10 - Revisions to Appendix A-4 to include updated dike plans and sections, as available. Replace Appendix A-4 - Revisions to Appendix B-6, Glossary of Terms Replace Appendix B-6 - Revisions to Appendix C-1, Overall Project description to incorporate flume replacement. Replace Appendix C-1. - Updates to Record of Revisions and Updates Made to EAP. Replace page 6-4 with new pages 6-4 and 6-5. <p>Complete reprint and binder re-issue</p> | |
| <p>3</p> | <p>6/9/2017</p> | | |
| <p>4</p> | <p>10/18/2019</p> | <ul style="list-style-type: none"> - Replace Title Page - Revisions to hazard classifications and state dam IDs of the Lake Tapps dikes based on the 2017 DSO 5-year inspection report. Replace pages 2-2 through 2-7. - Revisions to Contact List in Roles and Responsibilities (Section 4). Replace pages 4-3 through 4-11. - Minor text revision to page 5-1. Replace page 5-1 - Revisions to the Emergency Level Definitions. Replace page 5-3 | |

| | | | |
|---|------------|--|--|
| 5 | 10/26/2023 | <ul style="list-style-type: none">- Minor text revisions to page 5-15 Replace page 5-15- Minor text revisions to page 6-1 replace page 6-1- Updates to Record of Revisions and Updates Made to EAP. <i>Replace page 6-5 with new pages 6-5 and 6-6.</i> <p><i>Complete reprint and binder re-issue</i></p> | |
|---|------------|--|--|

Appendix A–1

Location and Vicinity Maps

Appendix A–2

Inundation and Evacuation Maps

The following two definitions pertain to the scenarios applied to the corresponding maps.

Fair Weather Failure

A dike failure that occurs with minimum or no precipitation at the project, sometimes referred to as a “sunny-day” failure. The inundation areas for this failure scenario are shown on Figures A-2.1 through A-2.10: Flood Inundation and Evacuation Maps for Dikes 1 through 15.

Note: The inundation areas presented on these maps can be made available electronically to first responding agencies for use with mapping tools and automated notification systems.

Probable Maximum Flood

A dike failure coincident with the probable maximum precipitation in the Lake Tapps Basin. The inundation areas for this failure scenario are shown on Figures A-2.11 through A-2.14: Area Inundation Maps.

Appendix A–3

Resources Available

Locally available equipment, labor, and materials:

Cascade Water Alliance has the following resources that can be utilized in the event of an emergency:

- Trackhoe with 20-foot reach
- 50 to 100 yards of pit run sandy gravel (City of Seattle Standard Specification Type 15, 9-03.16) stockpiled near Dike 4 and Dike 11
- Visqueen plastic rolls
- Portable lighting units for dike repairs during hours of darkness

Other locally available resources include:

- **Fill material:** Corliss Resources – (253) 891-6680
- **Contractors:** Frank Coluccio Construction – 206-722-5306
Johansen Excavating Civil Contractors – 360-829-6493

Appendix A-4

Dike Plans and Profiles

This section includes available dike plan and profile drawings from various sources as indicated on the drawings, including:

- Topographic survey by PEI Consulting Engineers and Surveyors, 1990.
- Topographic survey by AHBL, 2010.
- Interpreted cross-sections for stability study by Squier Associates, 1999.
- Construction drawing excerpts from Dike 3 Seepage and Seismic Mitigation by GeoEngineers, Inc., 2014.
- As-surveyed final grading drawings for White River Seismic Remediation, Lake Tapps Dikes 4A, 5, 6 and 11 by Hammond Collier Wade Livingston, 2003.
- Construction drawing excerpts from White River Seismic Remediation, Lake Tapps Dikes 4A, 5, 6 and 11 by Squier Associates, 2003.
- Construction drawing excerpt from Dike 13 Improvements project by GeoEngineers, Inc., 2014.

Appendix B–1

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 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 at project dikes: Seepage at the toe of dikes 4A, 5, 6, 8, 9, 10, 11, 12 and 15 is monitored weekly or monthly by v-notch weirs situated at the toe of the outboard slope of each dike. In addition, seepage at the toe of dike 3 has also been observed and is monitored visually and with a staff gauge situated near in a drainage ditch between the toe of the dike and the adjacent roadway (9th Street East).

Embankment Overtopping

Emergency Level 2—Potential dam failure situation; rapidly developing:

1. The reservoir level is within 1 foot from the top of one of more dikes.

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

1. The reservoir level has exceeded the top of one or more dikes, and flow is occurring over the embankment.

Seepage and Non-Rotting Pile-Related Sinkholes

Emergency 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 outboard slope of one or more dikes, and there is an easily detectable and unusual increase in volume of seepage.
3. Significant new or enlarging sinkhole(s) near one or more dikes or settlement of one or more dikes is observed.
4. Reservoir (Lake Tapps) level is falling without apparent cause.
5. The following known dike defects are or will soon be inundated by a rise in the reservoir:
 - Sinkhole(s) located on the outboard slope or crest of one or more dikes; or
 - Transverse cracks extending through one or more dikes.

Emergency 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 seepage to the extent that failure appears imminent or is in progress.
3. Water flowing out of holes in the outboard slope of one or more dikes 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 one or more dikes.
5. Reservoir (Lake Tapps) level is falling without apparent cause.
6. Rapidly enlarging sinkhole(s) are forming on one or more dikes to the extent that failure appears imminent or is in progress.
7. Rapidly increasing flow through crack(s) eroding materials to the extent that failure appears imminent or is in progress.

Embankment Movement and Cracking**Emergency Level 2—Potential dam failure situation; rapidly developing:**

1. Settlement of the crest and/or slopes of one or more dikes that may eventually result in breaching of the dike(s) in question.
2. Significant increase in length, width, or offset of cracks in the crest and/or slopes of one or more dikes that may eventually result in breaching of the dike(s) in question.

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

1. Sudden or rapidly proceeding slides, settlement, or cracking of the embankment crest and/or slopes of one or more dikes, and breaching of the dike(s) in question appears imminent or is in progress.

Appendix B–2 Contact Checklist

Lake Tapps Project, Dike No. ____

Pierce County, Washington

Date _____

The following contacts should be made immediately after the emergency level is determined. The person making the contacts should initial and record the time of the call and who was notified for each contact made. See the *Notification Charts* tab for critical contact information and *Emer. Services Contacts* tab for contact information for other possible emergency services.

| Emergency Level 1 | Person Contacted | Time Contacted | Contacted by |
|-----------------------------------|---------------------|-------------------|-----------------|
| ____ CWA Operations Manager | _____ | _____ | _____ |
| ____ Washington Dam Safety Office | _____ | _____ | _____ |
| ____ Dam Safety Consultant | _____ | _____ | _____ |

| Emergency Level 2 (potential failure) | Person Contacted | Time Contacted | Contacted by |
|---|---------------------|-------------------|-----------------|
| ____ CWA Operations Manager | _____ | _____ | _____ |
| ____ 911 Call Center | _____ | _____ | _____ |
| ____ Washington Dam Safety Office | _____ | _____ | _____ |
| ____ Dam Safety Consultant | _____ | _____ | _____ |
| ____ Mud Mountain Dam and/or Army Corps of Engineers | _____ | _____ | _____ |

| Emergency Level 3 (imminent or in-progress failure) | Person Contacted | Time Contacted | Contacted by |
|---|---------------------|-------------------|-----------------|
| ____ 911 Call Center | _____ | _____ | _____ |
| ____ CWA Operations Manager | _____ | _____ | _____ |
| ____ Washington Dam Safety Office | _____ | _____ | _____ |
| ____ Dam Safety Consultant | _____ | _____ | _____ |

Mud Mountain Dam

Appendix B–3

Unusual or Emergency Event Log

(to be completed during the emergency)

Dam name: Lake Tapps Project Dike No. County: Pierce County

When and how was the event detected?

Weather conditions: _____

General description of the emergency situation:

Emergency level determination: _____ Made by: _____

Actions and Event Progression

| Date | Time | Action/event progression | Taken by |
|------|------|--------------------------|----------|
| | | | |
| | | | |
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| | | | |
| | | | |
| | | | |

Report prepared by: _____ Date: _____

Appendix B-4

Unusual or Emergency Event Report

(to be completed following the termination of the emergency)

Dam name: Lake Tapps Project Dike No.

National Inventory of Dams (NID) No.: _____

Dam location: _____

Date: _____ Time: _____

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 B–5

Dam Hazard Classification Table

The downstream hazard classification for your dam will be determined by the Dam Safety Office and is provided to the dam owner. The table below is one of the tools that are used to assess the risk of a dam failure on downstream areas. Each hazard classification level is an estimation of the damage that would occur from a hypothetical dam failure occurring with the reservoir at normal storage elevation and maximum storage elevation.

| Downstream Hazard Potential | Downstream Hazard Classification | Population at Risk | Economic Loss Generic Descriptions | Environmental Damages |
|-----------------------------|----------------------------------|--------------------|---|---|
| Low | 3 | 0 | Minimal No inhabited structures Limited agricultural development | No deleterious materials in water |
| Significant | 2 | 1 to 6 | Appreciable 1 to 2 inhabited structures. Notable agriculture or work sites. Secondary highway and/or rail lines. | Limited water quality degradation from reservoir contents and only short-term consequences. |
| High | 1C | 7 to 30 | Major 3 to 10 inhabited structures. Low density suburban area with some industry and work sites. Primary highways and rail lines. | Severe water quality degradation potential from reservoir contents and long-term effects on aquatic and human life. |
| High | 1B | 31-300 | Extreme 11 to 100 inhabited structures. Medium density suburban or urban area with associated industry, property and transportation features. | Severe water quality degradation potential from reservoir contents and long-term effects on aquatic and human life. |
| High | 1A | More than 300 | Extreme More than 100 inhabited structures. Highly developed, densely populated suburban or urban area with associated industry, property, transportation and community lifeline features. | Severe water quality degradation potential from reservoir contents and long-term effects on aquatic and human life. |

Appendix B–6

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 43,560 cubic feet or 325,850 gallons. |
| Berm | An earth mass placed against the toe of a slope to increase slope stability. |
| 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. |
| Dam | An artificial barrier generally constructed across a watercourse for the purpose of impounding or diverting water. |
| Dam failure | The uncontrolled release of a dam’s impounded water. |
| Dam Operator | The person(s) or unit(s) of government with responsibility for the operation and maintenance of dam. |
| Drain, toe or foundation, or blanket | 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. |
| Drainage area (watershed) | The geographic area on which rainfall falls and then 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. |
| Emergency Action Plan (EAP) | 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. |

| | |
|--|---|
| 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 a drain without eroding the embankment soil. |
| Freeboard | Vertical distance between the water level in the reservoir and the top of dam. |
| Gate, slide or sluice, or regulating | An operable, watertight valve to manage the discharge of water from the dam. |
| Groin | The area along the intersection of the face of a dam and the abutment. |
| Hazard classification | A system that categorizes dams (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 misoperation of a dam. |
| Height, dam | The vertical distance between the lowest point along the top of the dam and the lowest point at the downstream toe, which usually occurs in the bed of the outlet channel. |
| Hydrograph, inflow or outflow, or breach | 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. |
| 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. |
| Notification | To immediately inform appropriate individuals, organizations, or agencies about a potentially emergency situation so they can initiate appropriate actions. |
| Outlet works (principal spillway) | An appurtenant structure that provides for controlled passage of normal water flows through the dam. |
| Piping | The progressive erosion of a flowpath through an earth mass by seepage starting at the downstream face and progressing to the upstream face. |
| Probable Maximum Precipitation (PMP) or Flood (PMF) | The theoretically greatest precipitation or resulting flood that is meteorologically feasible for a given duration over a specific drainage area 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 an embankment slope or abutment of the dam. |
| Spillway (auxiliary or emergency) | The appurtenant structure that provides the controlled conveyance of excess water through, over, or around 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 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 top of an embankment which impounds water behind the dam. |

Water Equivalents Table

An acre-foot covers one acre of land one foot in depth

| | | |
|------------------------------------|-------------------------|-------------------|
| 1 cubic foot..... | 7.48 gallons..... | 62.4 lbs of water |
| 1 acre foot..... | 43,640 cu ft..... | 325,851 gallons |
| 1 cubic foot per second (cfs)..... | 7.48 gallons per second | |
| 1 cfs | 444.8 gpm..... | 646,272 gpd..... |
| | | 1.98 acre-ft/day |
| 1,000 gpm..... | 2.23 cfs..... | 4.42 acre-ft/day |
| 1 million gallons/day | 694 gpm | 1.55 cfs |

Appendix B-7

Concurrences

By my signature, I acknowledge that I, or my representative, have reviewed this plan and concur with the tasks and responsibilities assigned herein for me and my organization.

1. _____
Signature *Organization* *Date*

Printed name and title: _____

2. _____
Signature *Organization* *Date*

Printed name and title: _____

3. _____
Signature *Organization* *Date*

Printed name and title: _____

4. _____
Signature *Organization* *Date*

Printed name and title: _____

5. _____
Signature *Organization* *Date*

Printed name and title: _____

6. _____
Signature *Organization* *Date*

Printed name and title: _____

7. _____
Signature *Organization* *Date*

Printed name and title: _____

Appendix C-1

Overall Project Description

General Project Setting

Originally, Lake Tapps served as a reservoir for the hydroelectric operation called the White River Project. This project ceased to operate as a generating facility on January 15, 2004. The former project utilized the waters of the White River in Pierce County, Washington. Lake Tapps and the former powerhouse are located approximately 20 miles east-southeast of the City of Tacoma. A general project vicinity map is shown in Figure A-1.1.

The White River proper is formed by the junction of the east fork and west fork of the White River at a point 20 miles north of Mt. Rainier. Downstream of the junction, the river follows a westerly course for 35 miles, then south where it empties into Puyallup River about one mile above the City of Puyallup. A barrier dam and headworks at river mile (RM) 24.26, at the City of Buckley, divert water into an 8-mile long series of a flume, canals, settling basins, and pipelines, to the former project reservoir, Lake Tapps. The diverted water flows from the Lake Tapps reservoir by means of a tunnel and penstocks to the powerhouse and down a tailrace back to White River at RM 3.6.

Project Structures

Barrier Dam and Intake. The barrier dam is located in the City of Buckley in Lot 2, Section 2, T19N, R6E, and Section 35, T20N, R6E, Willamette Meridian. The barrier dam is an 11-foot high structure consisting of concrete and rock-filled crib structure with 7-foot high wooden sections supported by “hinged” posts anchored to concrete. Several sections of the dam consist of steel plates, some with outlet works for minimum flow requirement. The crib structure is 352 feet long. To facilitate installation and removal of the sections, a cable tramway is suspended over the dam. The understructure of the dam is protected on both the upstream and downstream faces by a heavy, wide-sloping timber deck. The riverbanks are protected by concrete wing-walls flanking the dam.

At the headworks the concrete intake structure includes two Stoney gates, each 13 feet high by 15.5 feet wide, separated by a concrete pier.

The original design capacity of the diversion system was about 2,000 cfs, but currently there is a 1,000 cfs maximum flow allowed. Flows diverted into the flowline are permitted only when the minimum flow requirements in the White River are met or exceeded (as measured at the USGS gage 12099200). River flows in excess of the present hydraulic capacity pass over the barrier dam to continue down the White River.

Flowline. The flowline from the White River diversion to Lake Tapps drops 130 feet in elevation over a distance of approximately 8 miles through a flume and five settling basins connected by canals and a dual pipeline. A concrete flume conveys the water from the headworks to the first settling basin (Wolslegal Basin). A series of three unlined channels conveys water from Wolslegal Basin to Wickersham, McHugh

and Dingle Basins, respectively. An unlined canal and dual pipelines drain Dingle Basin conveying the water to Printz Basin. Inflow to Lake Tapps at the southeast corner of the reservoir is provided by an unlined canal, which drains Printz Basin.

Project Reservoir and Dikes. Lake Tapps is approximately 4.5 miles long and 2.5 miles wide. Water diverted from the White River through the diversion system flows into the lake at the south end. The main outlet from the lake is through the White River powerhouse. This outlet, located on the northwestern side of the lake, begins as a 12-foot diameter, concrete lined tunnel that leads to a forebay from which the penstocks extend. The only other outlet from the lake is a 2-foot diameter pipe which is used to satisfy a 1 cfs downstream water right, but which can discharge 5 to 10 cfs if fully opened. The reservoir has no spillway.

Lake Tapps originally consisted of several natural lakes: Lake Tapps, Lake Kirtley, Crawford Lake and Church Lake. By constructing 15 earthen dikes that vary in height from 6 to 45 feet and total 2.5 miles in length, the water level was raised 35 feet from the original elevation. This created the present reservoir, Lake Tapps, having a surface area of approximately 2,700 acres and an active storage capacity of 46,700-acre-feet at a nominal recreational pool of 542.2 feet. The active storage is based on the usable storage volume between elevation 515 feet and 543.0 feet.

Tunnel. The concrete-lined tunnel, located on the northwest shore of the reservoir, is 12 feet in diameter and 2,842 feet in length. The invert elevation is 490 feet at the tunnel intake and drops to elevation 477 feet at the forebay well.

The portal to the main tunnel at the outlet of Lake Tapps reservoir is screened with a vertical bar rack screen, 50 feet high and 45 feet wide. The bars are provided with motor-operated cleaning devices. Debris is deposited on the tunnel intake deck and disposed of manually. The tunnel entrance is provided with a Stoney gate, 12.5 feet high by 12 feet wide. A 24-inch square Stoney bypass gate is provided in the face of the main gate for filling the tunnel. The main gate and the auxiliary gate are motor-operated.

Forebay and Penstocks. The forebay well, 30 feet in diameter and 73 feet deep, is located at the brow of the hill above the powerhouse. A collection basin is provided at the top of the forebay well to accept surges at this point.

Four 96-inch steel penstocks, each controlled by a 96-inch diameter standard coffin sluice gate, direct the flow from the west side of the forebay well to the powerhouse below.

Powerhouse. The powerhouse is retired. The bypass piping around the four units may be used to assist in an emergency drawdown of the reservoir, if required.

Tailrace. The tailrace canal is approximately 0.5 mile in length and extends from the powerhouse to the White River at RM 3.6. The discharge enters a section of the White River referred to locally as the Stuck River. The tailrace is approximately rectangular in section, having a width of 34 feet and a containment height of about 9-10 feet. Immediately downstream from the powerhouse the tailrace is concrete-lined for

a distance of about 45 feet. The tailrace is then timber-lined for a distance of about 65 feet and unlined the remainder of the distance.

Appendix C-2

Preparedness and Preventative Actions

Project Surveillance

None of the Lake Tapps dikes are manned or monitored remotely. However, Cascade Water Alliance maintains a periodic visual surveillance program, as well as a review of information received from instrumentation related to dike safety.

The earthen dikes forming Lake Tapps are patrolled on a monthly basis when the lake level is below an elevation of 540 feet. This generally occurs during winter and spring months. When the lake level is between an elevation of 540 feet and the maximum reservoir operating level of 543 feet, the dikes are visually inspected on at least a weekly basis. A visual surveillance procedure typically involves checking the downstream toe of the dikes for abnormally high seepage or extensive wetted areas and observing the condition of the crest and slopes of the dikes for erosion, fissures or damage. Following the visual inspection, findings are addressed immediately as appropriate. As the dikes are located in residential areas or adjacent to the Pierce County Park, unusual conditions may be noted by the public and reported to Cascade Water Alliance or emergency first-responders.

In addition to the visual inspection program, results from dam safety instrumentation, which has been installed on most of the dikes, are carefully reviewed on a regular basis. Piezometers have been installed in many of the dikes to detect any unusual trends in the water level within each dike. Weirs have also been installed immediately downstream of many dikes to monitor changes in the rate of seepage of water through each dike.

Cascade Water Alliance and the Dam Safety Consultant review the piezometer and weir readings. Piezometer readings are plotted and inspected to identify trends in the water level within each dike. In addition the readings are archived in a spreadsheet that includes a record of the water level measurements.

Water level gauges are located at a variety of sites around the project and can be used to determine various flows or water levels at project features in the event of an emergency occurrence. Water level gauges are installed at the following locations: the White River, fish screens, Project Flume and unlined canal, pipeline intake, Lake Tapps, former Project forebay and Project tailrace gauges are provided to the Project powerhouse.

Appendix C-3

Dam Failure Inundation Study Summary

Appendix C-3 presents an inundation study summary prepared by PSE for the July 22, 2010 EAP. The inundation study summary comprised Appendix A of the July 22, 2010 EAP and includes a description of past inundation studies. Appendix C-3 is only issued to CWA stakeholders.