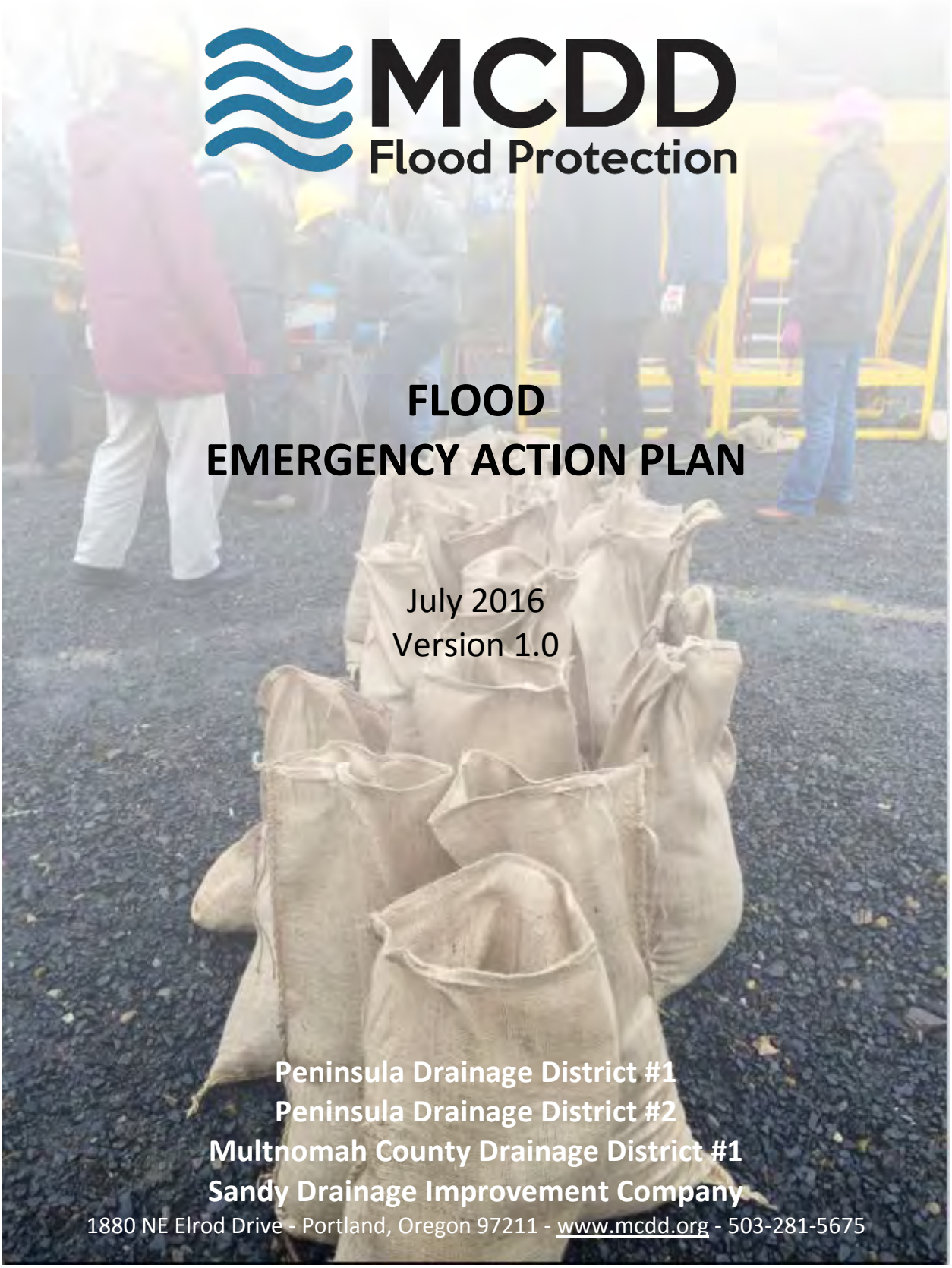

MCDD
Flood Protection

FLOOD
EMERGENCY ACTION PLAN

July 2016
Version 1.0

Peninsula Drainage District #1
Peninsula Drainage District #2
Multnomah County Drainage District #1
Sandy Drainage Improvement Company
1880 NE Elrod Drive - Portland, Oregon 97211 - www.mcdd.org - 503-281-5675

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Record of Distribution

This Plan has been distributed to the following parties:

1. Multnomah County Emergency Management
2. Multnomah County Department of Community Services
3. Multnomah County Sheriff's Office
4. City of Portland Bureau of Emergency Management
5. Port of Portland Emergency Manager
6. Port of Portland Water Quality Division
7. US Army Corps of Engineers Readiness Division
8. City of Gresham Emergency Manager
9. City of Fairview Public Works
10. City of Troutdale Emergency Manager
11. Riverside Golf Course and Country Club
12. Graphic Packaging
13. Oregon Department of Transportation, Region 1 Emergency Management
14. Oregon Department of Transportation, Region 1, Section 2B, North Portland Precinct
15. Oregon Department of Transportation, Region 1, Section 2B, East Portland Precinct
16. Portland Bureau of Transportation
17. Portland Water Bureau Emergency Management
18. Portland Bureau of Environmental Services, Columbia Slough Watershed
19. Portland Parks and Recreation, Heron Lakes Golf Club
20. Portland Parks and Recreation, Portland International Raceway
21. National Weather Service Portland Forecast Office
22. Metro Emergency Manager
23. Expo Center Operations Manager
24. Peninsula Terminal Company
25. Union Pacific
26. Burlington Northern Santa Fe
27. Amtrak
28. Oregon Department of Environmental Quality
29. Oregon Office of Emergency Management
30. Trimet
31. FedEx
32. Jubitz Corporation
33. Columbia Edgewater Country Club
34. Special Districts Association of Oregon
35. Columbia Corridor Association
36. Columbia Slough Watershed Council
37. Pacific Power
38. Portland General Electric
39. Bonneville Power Administration
40. Boeing
41. Toyo Tanso USA
42. East Columbia Neighborhood Association
43. Bridgeton Road Neighborhood
44. Fairview Lake Property Owners Association

Record of Changes

When changes are made to the Flood Emergency Action Plan, a record will be made to maintain version control. The following procedures should be followed immediately upon updating:

1. Any and all changes shall be recorded in the Change Log below.
2. The change will be distributed to partners and stakeholders on Page 2 under Record of Distribution.

Version #	Description of Change (Section #)	Date	Change by:
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Table of Contents

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1. Introduction

1.1. Purpose

The purpose of this Flood Emergency Action Plan ("Plan") is to establish protocols and responsibilities for Multnomah County Drainage District #1 (MCDD) as first responders in the event of a Columbia River or Columbia Slough high water threat or flood emergency to the flood management system managed by MCDD in the Columbia Corridor. This Plan does not cover the recovery phase of emergency management.

This Plan uses United States Army Corps of Engineers (USACE) manuals as a guide and employs the concepts of the National Incident Management System (NIMS). The Emergency Preparedness Guidelines for Levees (Department of Homeland Security, 2012), Comprehensive Preparedness Guide 101 (Federal Emergency Management Agency, 2010), Sample Flood Safety Plan (California Department of Water Resources, 2011), and Emergency Action Plan Guidebook (Minnesota USACE Silver Jackets, 2015) were also used as guides.

1.2. Scope

MCDD manages four special districts and their flood management systems: MCDD, Peninsula Drainage District #1 (PEN 1), Peninsula Drainage District #2 (PEN 2), and Sandy Drainage Improvement Company (SDIC) (collectively, "Districts"). The Districts were founded separately in 1917 by local agricultural interests. After the 1936 and 1950 federal Flood Control Acts were passed, USACE rehabilitated the flood management systems to be federally authorized systems. USACE has also repaired the systems after certain high water events. These complex flood management systems consist of levees and a network of conveyance channels. The levees divert Columbia River and Lower Columbia Slough floodwaters away from properties within the Districts' boundaries. The stormwater channels convey stormwater to a series of pump stations, which remove the water from the interior of the low, leveed area.

The flood management of the four Districts stretches between Smith and Bybee Lakes to the west and the Sandy River to the east. Details on each individual District can be found in Appendix A. This Plan covers the Columbia River and Columbia Slough flood response for all the Districts. Parts, or all, of this Plan may be activated with or without emergency declaration.

The Districts

Acreage	12,745
Landowners (2013)	2,792
Pump Stations	13*
Miles of Levee	27
Miles of Ditches & Slough	45.1

*Nine pump stations are owned by the Districts, while four additional pump stations are owned by others, but operated and maintained by MCDD.

1.3. Flood Management System Design

The Districts' levees were first constructed by local interests, but overtime the majority of the system was converted to federally engineered levees by USACE. The levees are made of Columbia River alluvium, or silty sand dredged from the base of the river, as well as material borrowed from within the original floodplain. Some of the flood barriers in the system are not federally engineered levees, and these stretches will be referred to as embankments throughout this Plan. These silty, sandy levees are designed to seep and drain to balance the pressure of the river on the levee. Some level of seepage should be expected during high water as a result. Some stretches of the system have toe drains, or an underdrain that catches water seeping through and under the levee helping to control seepage and uplift pressure, which may otherwise cause sand boils and piping of foundation materials. Toe drain laterals release the water into a ditch near the levee toe. There are toe drains in MCDD, PEN 1, and SDIC. Relief wells are also used to relieve uplift pressures. There are five relief wells in PEN 2 and two in SDIC. Though the pump stations are primarily used to manage stormwater, they also pump out the levee seepage that makes it into the interior drainage system, and should be operational during a river incident.

The PEN 1 flood management system has a floodwall that is an I-wall design atop an earthen berm. The wall consists of hot rolled steel sheet piles capped with a concrete wall. The landward side is flat, while the waterward side slopes from the base of the wall. The floodwall includes two stop log closure structures that can close traffic openings on North Marine Drive and at a railroad underpass along North Portland Road. Along Marine Drive there are two pedestrian access openings in the floodwall, one of which is usually open and will need to be closed during certain high water events (see Appendix B for a map of opening and closure storage locations). An intergovernmental agreement with the City of Portland frames coordination of the stop log closure installations. These openings in the floodwall allow business and industry to continue during non-flooding conditions, as when they are closed it highly impacts transportation and operations in and around PEN 1.

The Districts have a total of 17.3 miles of levee along the Columbia River (in SDIC the levee continues to snake south to manage part of the Sandy River) and 4.5 miles of levee on the Columbia Slough (as well as 1.2 miles of railroad embankment); these are primary levees as they are the first line of defense in a high water event. The Districts also have 4.1 miles of cross levees. A cross levee is a levee that is lateral to the primary levees to create basins within the leveed area. If the primary levees breach, water will only fill a sub basin surrounded by cross levees and high ground, instead of filling all four Districts. There are four cross levees in the Districts:

- An embankment separates PEN 1 and PEN 2, which aligns with the Interstate 5. Some portions of this is federally engineered levee.
- PEN 2 is separated from MCDD by a cross levee which follows the Peninsula Drainage Canal.
- MCDD is split into two basins by a cross levee in the middle of the District at 142nd Avenue. The two basins are referred to as MCDD-west and MCDD-east.
- MCDD and SDIC are separated by a cross levee at approximately NE 223rd Avenue in Fairview.

Figure 1: The Drainage Districts. Red-dotted lines indicate levees or embankments.

The PEN 1 levee system is authorized for the 1876 flood, meaning it was designed to withstand the magnitude of the 1876 flood. The PEN 2 is also authorized for the 1876 flood, but some modifications make certain portions of the system authorized for the Levee Design Flood, or the 1894 flood, but accounting for floodwater storage since dam construction (a modeled flood). MCDD and SDIC levees are both authorized for the Levee Design Flood. Depending on the location within the Districts, the segment of levee nearest may be designed to withstand higher water elevations, as depicted in Table 1. Table 1 includes elevations for the 1-percent-annual-chance flood event (an event that has a 1-percent chance of happening within any given year) and the 0.2-percent-annual-chance flood event (an event that has a 0.2-percent chance of happening within any given year) for corresponding river miles for comparison. Please note, elevations in this Plan is are NAVD88 datum, unless otherwise noted.

Table 1 – Water Elevations on the Columbia River Levees – Feet NAVD88

Location	USGS River Mile	1% Annual[1]	0.2% Annual[1]	Authorized Elevation [2]
PEN 1: Railroad & N Marine Dr.	105.58	31.38	34.93	34.76
PEN 1: N Force Ave / W Delta Park & N Marine Dr.	106.14	31.53	34.98	34.82
PEN 1-PEN 2: I-5 River Crossing	106.50	31.62	35.02	34.86
PEN 2: N Gantenbein Ave & N Bridgeton Rd.	107.10	31.81	35.21	35.00
PEN 2: NE Marine Drive & NE Bridgeton Rd.	107.71	31.90	35.36	35.15
MCDD-PEN 2: Cross Levee	108.27	31.90	35.47	36.28
MCDD: NE Marine Dr & NE 33rd	108.56	31.89	35.52	36.40
MCDD: Gleason Boat Ramp Trail Crossing	109.42	31.89	35.68	36.78
MCDD: Ramp to Sea Scouts & NE Marine Dr.	110.93	32.55	35.95	37.45
MCDD: I-205 River Crossing	113.46	33.05	36.37	38.59
MCDD: 142nd Cross Levee	114.15	33.25	36.47	38.87
MCDD: PS #4 Outfalls @ Marine Dr.	116.57	33.92	37.02	39.95
MCDD: NE Blue Lake Rd. & Marine Dr.	118.04	34.29	37.39	40.59
MCDD-SDIC: Cross Levee (~223rd)	118.90	34.48	37.63	40.94
SDIC: NE Sundial @intersection next to Company Lake	119.99	34.72	37.92	41.20
SDIC: NE Graham Rd. & NE Harlow Rd.	120.44	34.81	38.01	41.29
SDIC: Where levee ends, near I-84	120.44	34.81	38.01	41.29

1. 1% and 0.2% event data source: FEMA's Flood Insurance Studies for Multnomah County (2013) and the City of Portland (2010)
2. Levee Design Event data source: From spreadsheet by Jeff Tilton, USACE; based on profiles in USACE document CL-03-117, June 1952.

Though we have a well maintained levee system, there are still known areas with risk drivers that should be given special attention during emergency response. Recent levee engineering assessments (2014) have identified specific areas in PEN 1 and PEN 2 in which the levee may not meet all requirements to withstand a 1-percent-annual-chance flood event or a 0.2-percent-annual-chance flood event. There are also areas that are known to have boils or high saturation during higher water. Appendix C shows a general map covering known issue areas relating to the levee system. These concerns are also described in more detail in Section 5.1.2. Maps depicting potential inundation of the Districts for the 1-percent-annual-chance, 0.2-percent-annual-chance, and levee design events are attached as Appendix D.

1.4. Situation Overview

This plan outlines response to the threat of a flood. A flood is overflow of inland or tidal waters or unusual and rapid accumulation or runoff of surface waters from any source. District facilities, or the flood management system of the Districts, were constructed to reduce the risk of these types of events. This Plan only addresses emergency response to a flood event on the Columbia River or Lower Columbia Slough; it does not cover response to stormwater emergencies.

Stormwater emergencies create isolated inundation in the Districts when conveyance is impeded, creating localized impacts, whereas a Columbia River or Slough flood could potentially flood large basins within the Districts, impacting a much larger area. The main modes of failure for a levee system are breaching before overtopping, overtopping without breaching, overtopping with a breach, or system malfunction (see Appendix E for more information on levee failure). Interim risk reduction measures will be made to reduce the risk of system failure. Consequences of flooding include loss of human life, damage to property, destruction of crops, loss of livestock, disruption of business operations, hazardous material releases, and deterioration of health conditions owing to waterborne diseases. The Districts must work closely with Multnomah County, the Cities of Portland, Gresham, Fairview and Troutdale, USACE, and the Port of Portland during a flood event.

1.4.1. Assumptions

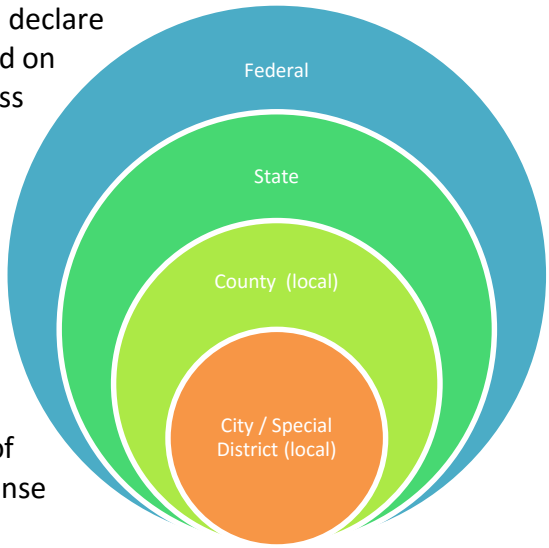
The phases outlined in this Plan assume high water as the primary threat. If there are other factors creating a greater risk, the phase may be raised prior to reaching the phase trigger. Some of the factors that could cause a phase trigger during a high water event include natural disaster, availability of personnel and supplies, weather and river predictions, communications, terrorist threats, and anything else adversely affecting flood fighting capabilities. MCDD has no control over the dams upstream of the Districts, which may impact flooding conditions. There may be a need for evacuation, and MCDD will coordinate with the City of Portland and Multnomah County if evacuation is necessary.

1.4.2. Authority

MCDD will lead incident operations for the Districts. Documentation and tracking should carefully track resources and time distinctively between all the Districts, as this will aid in potential Federal Emergency Management Agency (FEMA) reimbursement later.

To obtain State of Oregon assistance during a flood fight, it is necessary for a local municipality, tribe, or county to first declare an emergency. This can be done in advance of a flood based on issued forecasts or other information. The Districts' process for declaring an emergency will be enumerated in Appendix F (content to be developed). If federal assistance is needed, such as from USACE, the State and local governments must declare that they have committed or anticipate committing all of their resources. The State requests this assistance from USACE under Public Law 84-99 (see Appendix G for a legal memorandum further clarifying USACE's emergency assistance capabilities). USACE District commanders will issue a Declaration of Emergency in order to implement their flood response operations authorities.

Figure 2



Historical Flood Events – Background Information

June 1894 Flood Event

Heavy precipitation throughout the Columbia River basin during the 1893-94 winter led to heavy snowpack. This was followed by a dry, warm spring resulting in a massive snowmelt. There was continued heavy rainfall in the lower basin, contributing to the flooding. Water levels remained at current major flood levels (currently designated by the National Weather Service (NWS) as 31.3+ feet NAVD88) for 38 days. The Districts had not yet formed at this time. There were no dams on the Columbia River at this point.

May 1948 Flood Event

Heavy precipitation in the Columbia River basin throughout the winter led to heavy snowpack. Early spring had little precipitation and few warm days. May brought heavy rainfall and warm temperatures, which created a heavy snowmelt in late May causing flooding throughout the entire basin. Water levels remained at current major flood levels for 26 days. The railroad embankment in PEN 1 breached. The cross levee between PEN 1 and PEN 2 breached, as well as the cross levee between PEN 2 and MCDD. The flood destroyed the City of Vanport within PEN 1, where at least fifteen people died. This flood is often referred to as the Vanport Flood. This regional event triggered construction of more dams on the Columbia River that retain water for flood management.

June 1956 Flood Event

Persistent heavy precipitation in the Columbia River basin started in October of 1955 through February of 1956. Heavy rainfall in the northern Columbia River basin continued in March. Snowpack in higher elevations started by the end of October, and by springtime snowpack was much higher than usual. Warm temperatures in late spring augmented the snowmelt. Water levels remained at current major flood levels for 12 days.

December 1964 Flood Event

Unusually cold weather in early December was followed by heavy snowfall. Subsequently there were warm, persistent, heavy rains later in the month. December rainfall that year was more than 3.5 inches above average for the Portland area. Water levels remained at current major flood levels for two days. The Districts performed well. This flood is often called the Christmas Flood.

February 1996 Flood Event

The season had heavy snowfall, ice, and warmer temperatures earlier in the season. Floodwaters were fed by heavy rains and melting snow. The Portland International Airport recorded about seven inches of rain in a four-day period. The Willamette River reached 33.6 feet (NAVD88) in height and crested the downtown Portland seawall (33.8 ft. NAVD88). The Columbia River crested at 32.5 feet (NAVD88). The Districts performed well. Erosion and Seepage were the main concerns. This is the last large event the Districts experienced, and the last time incident command and management was established by the Districts. The Districts were not all managed by MCDD at the time.

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2. Safety and Security

Safety of responding personnel is of utmost importance and comes first during emergency response. Security of response sites is also critical during an emergency.

2.1. Safety

The safety of workers and volunteers should always be the highest priority during a flood fight. All personnel are to exercise extreme caution when working in the vicinity of the levee system during a storm event and are to avoid any situation which may place personnel and/or equipment in danger. All personnel should follow Occupational Safety and Health Administration (OSHA) regulations for storm emergency operations. OSHA has many flood-specific safety resources here: https://www.osha.gov/dts/weather/flood/response.html.

Personal floatation devices (PFD) are recommended and should be worn at all times when working near the riverward crest of the levee, on the waterward slope, or near fast moving water. Floodwaters can quickly sweep a person downstream, and hypothermia can set in quickly in cold water conditions. When walking close to the water, be especially observant of floating objects. The limbs and roots of a floating tree that have been uprooted can extend above the water surface and strike anyone walking along the edge of the water. To increase the chance of identifying floating objects, it is best to walk upstream when patrolling the waterside of the levee. When patrolling floodwalls, the patrol should not attempt to walk along the top of the wall, but rather concentrate on potential problem areas on the landside (inside) of the wall. Ladders should be used to observe the waterside of the floodwall when the river elevation nears the pathway north of the floodwall. Last, patrollers will be required to check into the Incident Command Post (ICP) throughout their shift to ensure their safety. At night, levee monitoring will focus on the crest and landward slope and toe of the levee for safety of the patrollers. The waterward slope will only be monitored during the day.

Each person on patrol should thoroughly review and be familiar with the community evacuation plans and signals. If evacuation is necessary, the patrolling organization should move to an agreed upon predetermined location and keep the team intact. When returning to the levees and floodwalls, physical conditions may be considerably different from those observed prior to the evacuation, especially if the levee was overtopped. If overtopping occurs during nightfall, it is recommended that the patrols not resume until daylight, though there may be cases where this recommendation cannot be followed.

2.2. Security

Patrols should also be watchful for anyone that seems out of place, or any activity that seems suspicious. Some individuals, terrorists or otherwise, may try to take advantage of already dangerous situations on levees or floodwalls. Any suspicious activities observed by the patrol should be reported immediately to the local law enforcement agency. Security at staging areas, work sites, the command post, or any other site related to emergency operations should be in place to ensure safety of personnel, prevent interruptions to operations, and prevent unassigned personnel trying to come on site.

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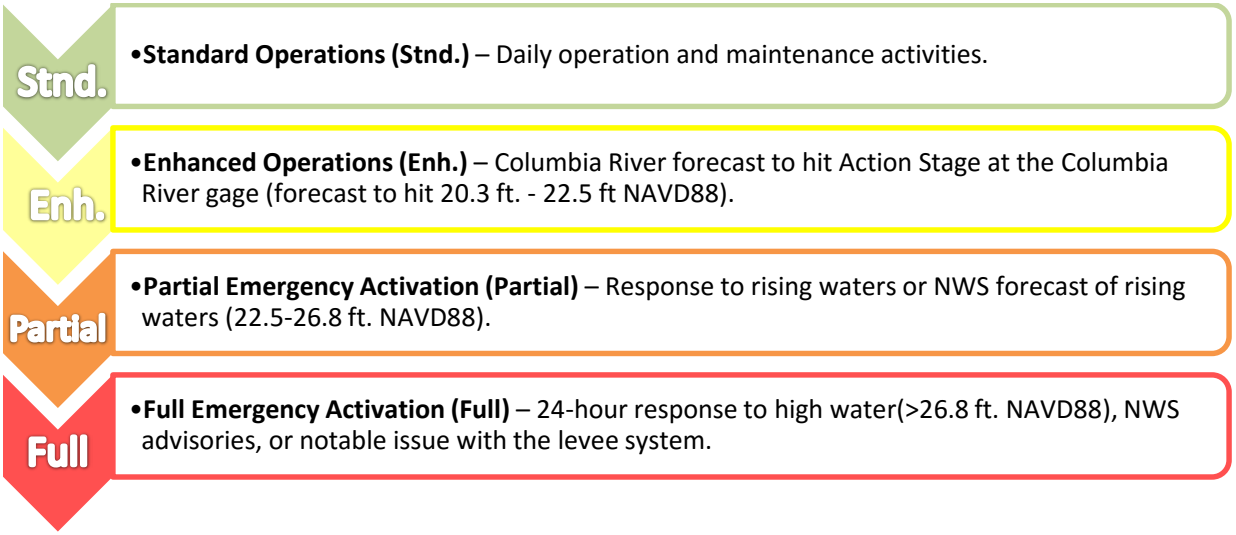
3. Concept of Operations

This Plan may be activated by the Flood Control Director or Executive Director because of adverse weather projections, increased water flows, potential or actual levee breaches, or other emergency events that warrant emergency response to high water. Parts, or all, of this Plan may be activated whether or not an emergency has been declared.

Emergency response for a flood at the Districts can be defined by the categories as indicated below:



River Levels and Weather Service Resource Links

The Vancouver Gage on the Columbia determines the flood categories issued by the NWS and MCDD will use this data to make flood emergency related decisions. Though we have a portion of levee on the Sandy River, the Columbia River gage is still the best gage to use when considering response to the stretch of levee on the Sandy River (FEMA 2010 Multnomah County FIS).

River Forecasts at Vancouver Gage

http://www.nwrfc.noaa.gov/river/station/flowplot/flowplot.cgi?lid=VAPW1

Additional Information

http://water.weather.gov/ahps2/hydrograph.php?wfo=pqr&gage=vapw1

Northwest River Forecast Center:

http://www.nwrfc.noaa.gov/

Portland, OR Weather Forecast:

http://www.wrh.noaa.gov/pqr/

MCDD used NWS flood categories to help develop the Plan's concept of operations. The NWS flood categories are provided in Table 2 as a reference.

Table 2: NWS Flood Categories Compared to MCDD Operational Phases

NWS Flood Category	Gage datum	NAVD88	MCDD Operational Phase
Major Flood Stage:	25'	30.3'	Full Emergency Activation
Moderate Flood Stage:	20'	25.3'	Partial – Full Emergency Activation
Flood Stage:	16'	21.3'	Enhanced Operations – Partial Emergency Activation
Action Stage:	15'	20.3'	Enhanced Operations
Low Stage (in feet):	1'	6.3'	Standard Operations

Elevations are frequently referred to throughout this Plan, especially in this section. To aid interpretation of this plan, refer to Table 3 for a datum conversion chart.

Table 3: Columbia River Gage at Vancouver Datum Conversion Chart (in feet)

Gage Datum	MSL / NGVD29	City of Portland	NAVD88
0	+1.8	+3.2	+5.3
-1.8	0	+1.4	+3.5
-3.2	-1.4	0	+2.1
-5.3	-3.5	-2.1	0

3.1. Flood Emergency Triggers and Actions

MCDD will respond to high water in the Columbia River or the Lower Columbia Slough when triggered by particular events, or when deemed necessary as the situation requires. The event triggers (Table 4) outline monitoring requirements and known or recommended actions related to levees and levee infrastructure. For Procedures listed as an action in Table 4, see Appendix H. See emergency contacts in Appendix I.

Table 4: Emergency Triggers and Actions

Trigger (Vancouver Gage datum)	NWS Flood Category	NAVD88	MCDD Cat.	Action	Impact
<15', no forecast of high water	None	<20.3'	Stnd.	-Routine operations -No situational reports	
Forecast to hit 15'	Forecast to hit Action Stage	20.3'	Enh.	*Procedure:* Pre-Event Actions	
15'	Action Stage	20.3'	Enh.	-Begin 24-hour frequency situational reports (see Appendix J for guidance and contacts) -Begin weekly surveillance of levee system with MCDD staff. May be done via motor patrols where able.	-Watch for signs of slope stability problems. -Island Moorage (189th and Marine Dr) lower level parking lot starting to get inundated.
16’	Flood Stage	21.3’	Enh.	NWS has changed flood categories, continue actions from above.	
Forecast to hit 17.2’	Within Flood Stage	22.5'	Enh.	Contact other agencies, including Graphic Packaging, to confirm they have closed their outfall gates.	
17.2’ and forecast to continue to rise	Within Flood Stage	22.5’	Partial	Begin daily levee surveillance.	
20’	Moderate Flood Stage	25.3’	Partial	-Issue landowner communications on how to watch for boils, where sandbagging locations are, how to contact the Districts during the emergency, and any other pertinent information. -If 24-hour surveillance of levee system is deemed necessary, contact Port of Portland	

				point of contact or Communication Center, Portland ECC / Duty Officer, and Riverside Golf asking for additional labor for 24-hour surveillance once river hits 26.8' NAVD88. -Do daily levee surveillance at a minimum.	
Forecast to hit 21.5'	Within Moderate Flood Stage	26.8'	Full	If not yet started, begin 24-hour surveillance.	Some riverside facilities will be flooded, including Chinook Landing and some marina parking lots.
21.8'	Within Moderate Flood Stage	27.1'	Full	-*Procedure:* Emergency Activation Actions -Begin 12-hour frequency situational reports	
Forecast to hit 23'	Within Moderate Flood Stage	28.3'	Full	*Procedure:* Install PEN 1 Floodwall Stop Log Closures	-Marine Drive in PEN 1 is closed. -COP to begin PEN 1 mandatory evacuation: Hazmat, additional needs populations, and properties impacted by stop logs. -COP to begin PEN 1 voluntary evacuation.
25'	Major Flood Stage	30.3'	Full	NWS has changed flood categories, continue actions from above.	

25.6' *Nearing 1-percent-annual-chance flood at gage*	Within Major Flood Stage	30.9'	Full	-Recommend reduced speeds/no barge traffic in the Columbia River (Coast Guard/River Patrol) through the County -Recommend reduced speeds or closure of Marine Drive, if not already done yet (Portland ECC / Duty Officer) -*Procedure:* Construct PEN 2 NE Corner temporary floodwall. -Special Watch: PEN 1 Railroad Embankment -Recommend voluntary evacuation for PEN 2, if not already started. Recommend mandatory evacuation for HAZMAT businesses and additional needs populations for PEN 2 and MCDD, if not already started – direct to start evacuation in PEN 2 first.	-Gleason boat ramp parking area will be under water; North Portland Road will be under water; Railroad embankment will start to be loaded. -COP begins 20 mph Marine Drive restriction. -COP begins PEN 2, then MCDD, Mandatory evacuation: HAZMAT and additional needs populations.
29.7' *Nearing 0.2-percent-annual-chance flood at gage*	Within Major Flood Stage	35.0'	Full	-*Procedure:* Construct PEN 2 Columbia River levee temporary floodwall -Recommend mandatory evacuation of PEN 1 and 2 from Portland ECC / Duty Officer if they have not already started evacuation. At minimum, evacuation around temporary floodwall site in PEN 2 will be necessary. -Recommend voluntary evacuation for MCDD west of the 142nd cross levee, if not already started.	-Elevation is above PEN 1's design elevation, and at PEN 2's design elevation, w/minimal freeboard at this point. -COP begins PEN 1 and PEN 2 mandatory evacuation. -Potential MCDD evacuation. -MCDD and SDIC will still have 9-13 feet of freeboard.
Forecast to hit 32.7'	Within Major Flood Stage	38'	Full	-Recommend mandatory evacuation for MCDD west of the 142nd cross levee, if not already started.	-PEN 1 and 2 levees at risk of overtopping; elevation above design

				-Recommend voluntary evacuation for MCDD east of the 142nd cross levee (COP and Multnomah County Sheriff coordination) -Recommend mandatory evacuation of HAZMAT and additional needs populations in SDIC (Multnomah County Sheriff). -Recommend voluntary evacuation of SDIC (Multnomah County Sheriff).	elevation for west MCDD. -River elevation at or nearing design elevation for east MCDD. -Potential MCDD evacuations. -Potential SDIC evacuations.
Forecast to hit 36.7'	Within Major Flood Stage	41'	Full	Recommend SDIC mandatory evacuation (Multnomah County Sheriff).	River elevation is at the SDIC design elevation.
Forecast to hit 39.7'	Within Major Flood Stage	45'	Full	*Procedure:* Construct SDIC Levee tie-in to I-84	-I-84 off ramp closed. -Parts of MCDD east may be at risk of overtopping.
Governor-declared emergency			Full	Work with US Army National Guard for potential infrared surveillance of levees	
PEN 1 inundation is possible			Full	-Recommend Evacuation of PEN 1 (Portland ECC / Duty Officer) -*Procedure:* Construct PEN 1 I-5 Ring Levee temporary floodwall	Closures at I-5 on ramp
PEN 2 inundation is possible			Full	-Recommend Evacuation of PEN 2 (Portland ECC / Duty Officer) -Reinforce MCDD-PEN 2 cross levee -*Procedure:* Construct PEN 1 I-5 Ring Levee temporary floodwall	Closures at I-5 on ramp
MCDD-west inundation is possible			Full	-Recommend Evacuation of MCDD-west (Portland ECC / Duty Officer) -Relocate ICP out of Districts -Reinforce MCDD-PEN 2 cross levee	Road closures: NE Airport Way & NE 142nd Ave

				If forecast to hit 34.7' gage datum: *Procedure:* Construct MCDD 142nd Cross Levee temporary floodwall	
MCDD-east inundation is possible			Full	-Recommend evacuation of MCDD-east (Multnomah County Sheriff and Portland ECC / Duty Officer) -If forecast to hit 34.7' gage datum: *Procedure:* Construct MCDD 142nd Cross Levee and 223rd Cross Levee temporary floodwalls	Road closures: NE Airport Way & NE 142nd Ave; NE Marine Dr. on and off ramps at NE 223rd Ave.
SDIC inundation is possible			Full	-Recommend Evacuation of SDIC (Multnomah County Sheriff) -If forecast to hit 34.7' gage datum: *Procedure:* Construct 223rd Cross Levee temporary floodwall	Road closures: NE Marine Dr. on and off ramps at NE 223rd Ave.
PEN 1 inundates			Full	-Notify partners immediately -Evacuate PEN 1 response personnel -Relocate ICP out of Districts -*Procedure:* Construct PEN 1 I-5 Ring Levee temporary floodwall	-Closures at I-5 on ramp. -Increased safety risks for responders.
PEN 2 inundates			Full	-Notify partners immediately -Evacuate PEN 2 response personnel -Relocate ICP out of Districts (if not yet done) -Reinforce MCDD-PEN 2 cross levee (if not yet done) -*Procedure:* Construct PEN 1 I-5 Ring Levee temporary floodwall (if not yet done)	-Closures at I-5 on ramp. -Increased safety risks for responders.
MCDD-west inundates			Full	-Notify partners immediately -Evacuate MCDD-west response personnel -Reinforce MCDD-PEN 2 cross levee (if not yet done)	-Road closures: NE Airport Way & NE 142nd Ave.

				-If forecast to hit 34.7' gage datum: *Procedure:* Construct MCDD 142nd Cross Levee temporary flood wall (if not yet done)	-Increased safety risks for responders.
MCDD-east inundates			Full	-Notify partners immediately -Evacuate MCDD-east response personnel -Relocate ICP out of Districts (if not yet done) -If forecast to hit 34.7' gage datum: *Procedure:* Construct MCDD 142nd Cross Levee and 223rd Cross Levee temporary floodwalls (if not yet done)	-Road closures: NE Airport Way & NE 142nd Ave; NE Marine Dr. on and off ramps at NE 223rd Ave. -Increased safety risks for responders.
SDIC inundates			Full	-Notify partners immediately -Evacuate SDIC response personnel -If forecast to hit 34.7' gage datum: *Procedure:* Construct 223rd Cross Levee temporary floodwall (if not yet done)	-Road closures: NE Marine Dr. on and off ramps at NE 223rd Ave. -Increased safety risks for responders.

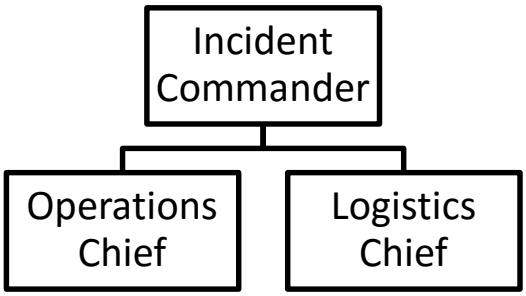
4. Organization, Roles, and Responsibilities

As MCDD provides staff for all four Districts, MCDD may not be able to provide enough emergency response personnel during a flood event. Levee monitoring and ICP staffing will require MCDD to activate mutual aid agreements and request staffing support.

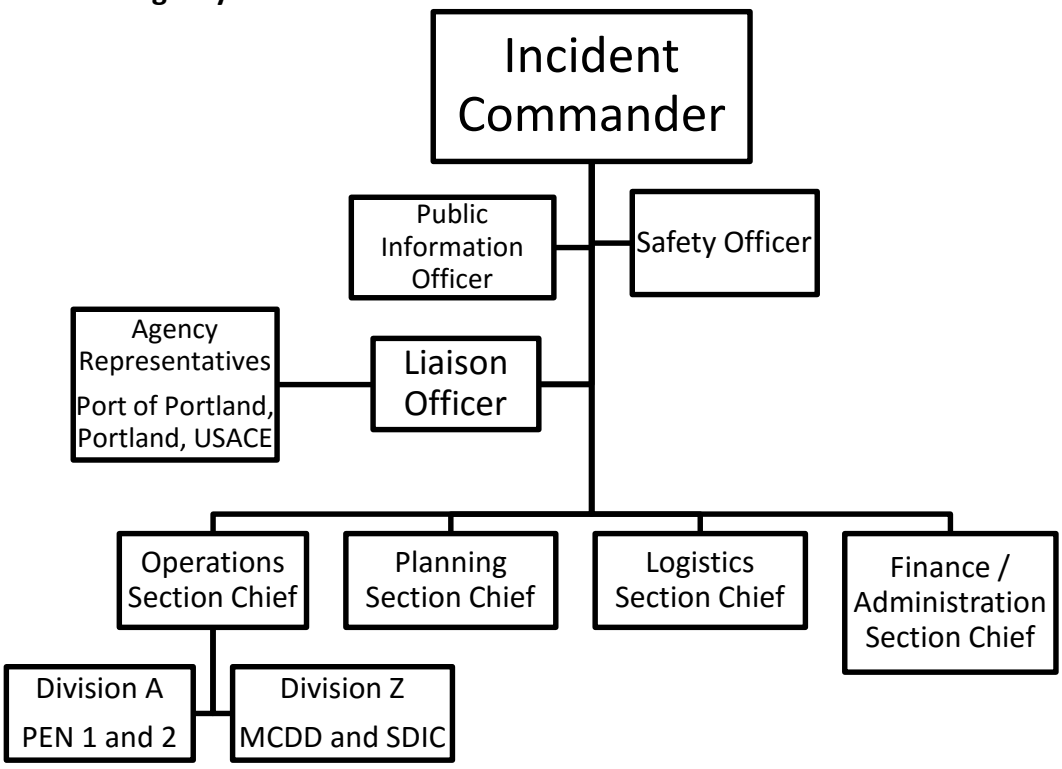
4.1. Organization

The following organizational charts are examples of how personnel may be organized at MCDD during a flood event. These charts show example foundations for the response and coordination teams, and should be adapted for the event. Position Action Sheets, which include brief position descriptions, can be found in Appendix K.

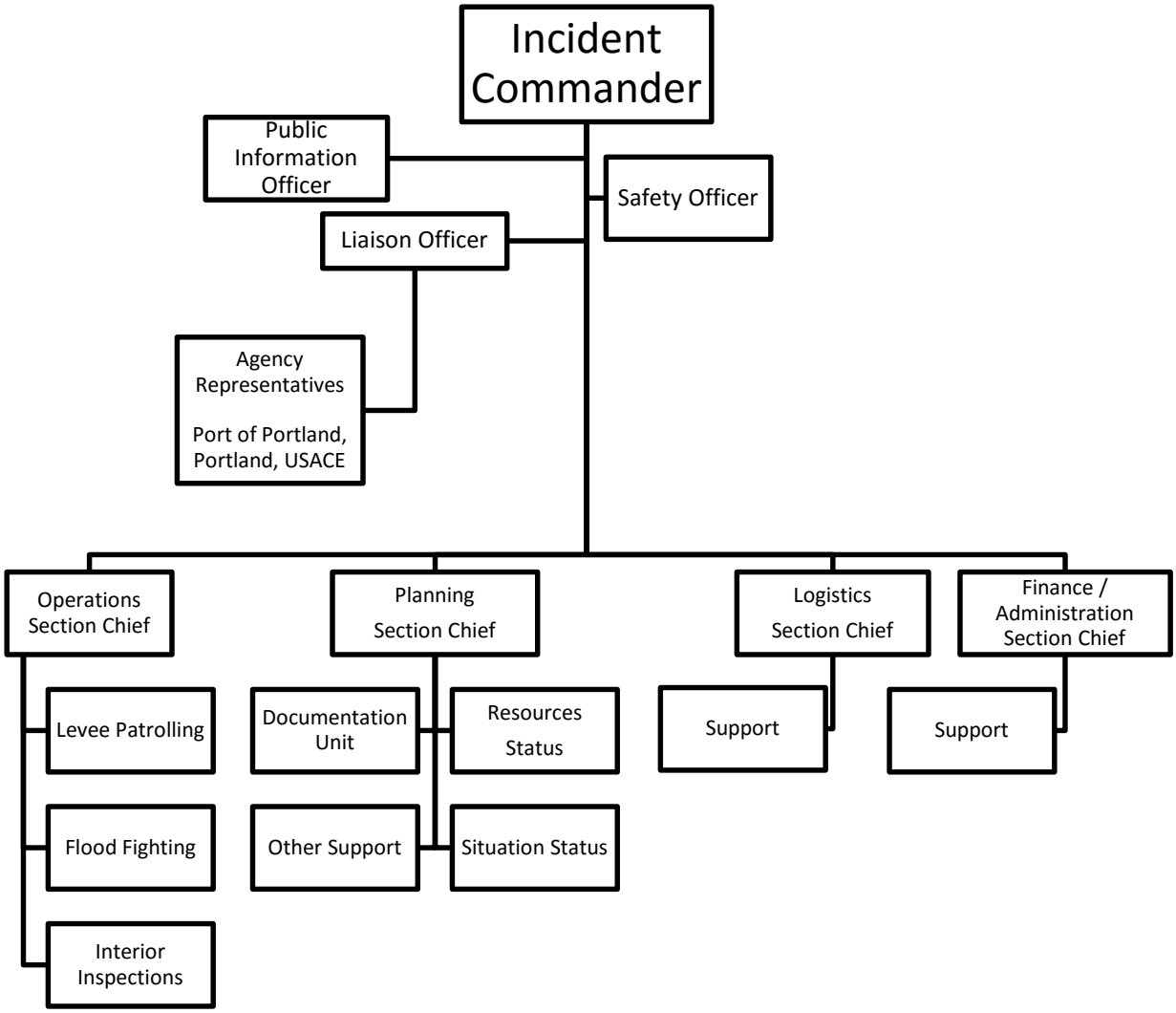
4.1.1. Enhanced Operations



4.1.2. Partial Emergency Activation



4.1.3. Full Emergency Activation



4.2. Emergency Response Staffing

Only positions that are required for an adequate response need to be filled, and organizations should be kept as small as possible to accomplish incident objectives and monitor progress. All assigned staff should be briefed at the start of their shift and appropriate position information packets should be handed out. Emergency response personnel's mental and physical health is very important during an emergency and must be considered throughout the event.

Brief position descriptions:

Incident Commander – The individual responsible for the overall management of the flood response. Responsible for directing and/or controlling resources.

Liaison Officer – The individual assigned to the flood incident to be the contact for assisting and/or cooperating Agency Representatives, such as the port, cities, and county.

Public Information Officer – The individual responsible for managing and coordinating communications with the public and with media.

Safety Officer – Responsible for monitoring incident operations and advising the Incident Commander on all matters relating to operational safety, including responder health.
Operations Section – Responsible for tactical operations (flood fighting), including levee patrolling and monitoring and constructing interim flood risk reduction measures (e.g. sandbag wall or ring). This section organizes, assigns, and supervises all of the tactical field resources assigned to an incident.
Planning Section – Responsible for information gathering, analysis, and dissemination. This section manages the planning process and compiles the Incident Action Plan using input from the other sections and officers. This section is also responsible for tracking and demobilizing resources, maintaining incident documentation, and working with technical specialists, such as GIS specialists or engineering specialists from USACE, to aid in planning.
Logistics Section – Responsible for providing the resources (e.g. sand, sandbags, rip rap) and services required to support the flood incident activities. Logistics and Finance and Administration work closely together for contracting and procurement.
Finance and Administration Section – Responsible for financial and cost analysis aspects of the flood incident. These include contract negotiation, tracking personnel and equipment time, documenting and processing claims for accidents and injuries occurring at the incident, and keeping a running tally of the costs associated with the flood incident. This section does not have financial veto authority during an emergency.

Shift Staffing Requirements:

During Partial Emergency Activation, key positions will be on 12-hour shifts. Once MCDD is in full emergency activation, or once 24-hour levee monitoring has begun, key positions will have two 12-hour shifts with one hour operational briefings pre- and post-shift. The recommended shifts will be from 08:00 to 20:00 and 20:00 to 08:00. Oregon wage and hour laws require non-exempt employees to receive breaks and meal periods. If an employee is not relieved of all duties for 30 continuous minutes during the meal period (because of unforeseen circumstances, like flooding), the employer must pay the employee for the entire 30-minute meal period. There are no exceptions for rest breaks during emergencies, and employees must receive the required rest breaks, which is three breaks when someone works between 10 and 14 hours. Per MCDD's employee handbook, rest breaks will be 15 minutes long (Oregon law requires 10 minutes, minimum).

Duties of positions that are not staffed will be the responsibility of the Incident Commander. Depending on the size and duration of the event, additional positions may be staffed with outside personnel. If the Districts cannot provide two personnel per position to maintain 24-hour operations, then Logistics will request additional personnel through the command chain via Multnomah County.

4.3. Partnering Agency Assumptions and Responsibilities

Coordinating and cooperating agencies are critical to an effective response to a flood incident. In a large scale incident, it is anticipated that Unified Command will need to be established, and

would most likely include Incident Commanders from the Portland Police Bureau and Multnomah County Sheriff's River Patrol, with agency representation from MCDD, the Portland Water Bureau, utilities, and others. Close coordination will still be necessary before Unified Command is established. This Plan works off of the following assumptions about partner agencies roles, responsibilities, and authorities:

Multnomah County
Multnomah County is MCDD's nexus to the Oregon Office of Emergency Management. Multnomah County will be available to help with resource requests once we have exhausted our internal resources and sources for mutual aid. MCDD will report damage assessments to Multnomah County. Multnomah County also issues public alerts, warnings, or other emergency notifications to areas in the County, but outside of the City of Portland. The County's Department of Community Services Roads division is responsible for traffic control of Marine Drive from 223rd east. When the County partially or fully activates their EOC, they will notify MCDD. They may assign MCDD a point of contact within Emergency Support Function 3 (Public Works) that we can communicate through instead of through the County's duty officer.

The Districts may work with the Multnomah County Sheriff's Office in certain situations, such as evacuation. This includes Multnomah County Sheriff's River Patrol, located at the Gleason Memorial Boat Ramp on the waterward side of the MCDD levee. The Districts may have to work with River Patrol in the event that any water rescue needs arise during a flood, as River Patrol is responsible for law enforcement on waterways in the county. River Patrol has many boating resources and may have outside teams helping them during a flood, as they manage 110 miles of river and stream for the County.

City of Portland
City of Portland flood response is led by the Bureau of Transportation (PBOT). Portland Bureau of Emergency Management (PBEM) is the point of contact for partnering agencies, and MCDD will go through the PBEM Duty Officer or Emergency Coordination Center to coordinate with any City bureau. Additional assistance for levee patrollers may be requested from the City of Portland Water Bureau, PBOT, Parks and Recreation, or Bureau of Environmental Services. The City of Portland is responsible for evacuation in their jurisdiction and will make flood-related evacuation decisions using situational reports provided by MCDD, where MCDD can recommend evacuation. PBEM is responsible for general public alerts regarding emergency incidents for Portland. The Bureau of Transportation installs the stop log closure structures in PEN 1 when notified by MCDD, per an intergovernmental agreement (see section 6.2.3. Mutual Aid for further details). PBOT is also responsible for traffic control of Marine Drive in Portland, and MCDD will coordinate with the City when Marine Drive closure is anticipated.

Port of Portland
In the event of a flood, the Port of Portland will call for a stakeholder meeting to coordinate observation, monitoring, and other tasks, and MCDD will attend either via conference call or in person. A point of contact will be assigned to MCDD to liaise between the agencies. Before a point of contact is made, or if the point of contact becomes unavailable for any reason, MCDD

may contact the PDX Communications Center when reporting or requesting assistance. Port of Portland is responsible for interior drainage within the PDX area. They may be able to support levee patrolling from within the PDX perimeter fence, depending on their level of response operations. They also may be able to assist MCDD with GIS capabilities, depending on their level of response operations. If we need assistance connecting with the Troutdale Airport in SDIC, we may use the Port Emergency Manager as a liaison to initiate communications (see emergency contact information in Appendix I).

US Army Corps of Engineers (USACE)
USACE will provide technical assistance in the form of civil engineers, as they are able, upon request by MCDD. USACE may offer direct assistance once all local and state resources have been exhausted and the State has declared an emergency. USACE also has some emergency supplies stockpiled which we may access when local and state resources run out. USACE personnel are authorized to respond to the Districts in an emergency event as set forth in 33 CFR Part 203, the implementing regulation of Public Law 84-99.

> Response Activities: PL 84-99 allows [USACE] to supplement state and local entities in flood fighting urban and other non-agricultural areas under certain conditions (Engineering Regulation 500-1-1 provides specific details). All flood fight efforts require a Project Cooperation Agreement (PCA) signed by the Public Sponsor (the Districts) and a requirement for the Sponsor to remove all flood fight material after the flood has receded. PL 84-99 also authorizes emergency water support and drought assistance in certain situations and allows for "advance measures" assistance to prevent or reduce flood damage conditions of imminent threat of unusual flooding. *USACE Portland District*

Appendix G goes into further detail regarding USACE emergency assistance. See Engineering Regulation 500-1-1 for full details regarding USACE's involvement.

Oregon Department of Transportation (ODOT)
ODOT is responsible for the traffic control on Interstate 5, Interstate 205 and Interstate 84. They are responsible for ramp closures at I-5 and I-84 when temporary floodwalls would be needed in those locations due to low levee elevations. These requests will go through ODOT dispatch. If there are any impacts to the state highways, MCDD is to notify ODOT through their dispatch. ODOT may be involved with evacuations.

US Coast Guard
The US Coast Guard is responsible for all river traffic.

National Oceanic and Atmospheric Administration (NOAA) – National Weather Service (NWS)
NOAA is federally charged with providing weather and river elevation forecasts to the public and to emergency responders. MCDD receives notifications from the NWS Portland Weather Forecast Office. MCDD staff will also participate in NWS weather conference calls as needed to make sound decisions during emergency events. NWS also maintains a 24/7 hotline for emergency responders to ask questions concerning the weather, which MCDD may utilize.

City of Gresham
The City of Gresham is responsible for evacuation in their jurisdiction and will make flood-related evacuation decisions using situational reports provided by MCDD, where MCDD can recommend evacuation.

City of Fairview
The City of Fairview is responsible for evacuation in their jurisdiction and will make flood-related evacuation decisions using situational reports provided by MCDD, where MCDD can recommend evacuation.

City of Troutdale
The City of Troutdale is responsible for evacuation in their jurisdiction and will make flood-related evacuation decisions using situational reports provided by MCDD, where MCDD can recommend evacuation. The City of Troutdale has sewer treatment facilities within SDIC, which may need to be prioritized in flood fighting if it is at risk of flooding. Troutdale contracts with the Multnomah County Sheriff's Office for their law enforcement.

5. Communications

MCDD will use a mix of communications methods to ensure timely communication and effective coordination among parties. The Districts have invested in systems that are interoperable with many of our emergency response partners. The Logistics Section is responsible for maintaining most communication methods. The Public Information Officer (PIO) will be responsible for outward communications to the public.

5.1. Internal Communication Network

The following modes of communication are available at MCDD.

First line of communication, available during routine operations:

- MCDD main phone line (7 lines total available)
- Fax (503-281-0392)
- Email
- Company/work cell Phones
- City of Portland 800mhz radio system (10 units), with access to the following talk groups:
    - Portland Bureau of Environmental Services (spill response, tactical)
    - Portland Bureau of Maintenance (tactical, main dispatch)
    - Oregon Department of Transportation
    - Port of Portland (Aviation Maintenance and EOC, Corporate)
    - Multnomah County Sheriff's Office (including River Patrol)
    - Portland Fire and Rescue (Dispatch, operations)
    - National Oceanic and Atmospheric Administration (NOAA - weather)
    - US Forest Service (they have many Incident Management Teams that may be utilized in a large scale emergency)
    - Portland General Electric
    - US Coast Guard
    - National Public Safety talk groups
    - General talk groups (talk groups every person on the radio system can access)

Second line of communication, to use when first line communications are down:

- Government Emergency Telecommunication System (GETS) and the Wireless Priority Service (WPS)
    - MCDD will ensure that two operational staff and two administrative staff will be registered for these services at all times.
- Verizon Cell Tower Drop (per MCDD request)
- Two Iridium Satellite Phones (one at front desk in administrative office, one near front door of the shop)

Additional means of communication, helpful for outward communication to the public, to be used as needed:

- MCDD website
- Mailchimp

- Social Media (Twitter, Facebook)

The PIO should also monitor social media outlets to identify public misconceptions to address throughout the event. The PIO may also work with partners to reach landowners through their messaging outlets or contacts. The Port of Portland may be able to send messaging to their tenants through the property managers, for example.

6. Flood Fighting and Resources

6.1. Inspection

Inspection during high water events is critical to ensure proper operation of the flood management system. By identifying problems early on, issues can be prevented or slowed down. Guidelines for inspection of the flood management system is built upon information from the 2006 USACE Levee Owner's Manual. The California Water Resource Department's 2012 Emergency flood Fighting Methods and 2012 Levee Threat Monitoring Guidelines were also used as guidance for this section of the Plan. These materials should be referenced during emergency events as needed to inform incident response. Printed copies of these documents are kept with the Flood Control Director.

6.1.1. Levee Monitoring

During a flood emergency, monitoring the levee system condition is necessary to ensure that emergency risk reduction measures are initiated quickly to avoid adverse impacts of delayed response. Monitoring assignments will be conducted as described in this Plan, or as otherwise recommended by the Incident Commander. Levee Monitoring falls under the Operations Section.

The levee monitoring schedule was developed considering NWS flood categories, levee design, recent crests, and observed levee performance. Recent crests at the Vancouver Gage are listed in Table 5 for reference.

Table 5: Recent Crests at the Vancouver Gage

Date	Elevation, Gage Datum / NWS Flood Category	Elevation, NAVD88
06/02/2011	17.43' / Flood Stage	22.73'
11/26/1999	12.32' / Low Stage	17.62'
12/30/1998	15.00' / Action Stage	20.30'
06/05/1997	19.03' / Flood Stage	24.33'
02/02/1997	16.80' / Flood Stage	22.10'

Data from the National Weather Service.

Levee monitoring will follow the schedule below, in the NWS gage datum, as outlined in Table 4 in Section 3.1.

- Forecast to hit 15', do a general levee system inspection to establish baseline conditions.
- 15', begin weekly surveillance of levee system.
- 17.2' *and* forecast to keep rising, begin daily surveillance of levee system.
- 20', begin 24-hour surveillance of levee system, if deemed necessary. Continue daily levee surveillance at minimum.
- 21.5', begin 24-hour surveillance of levee system if not yet started.

The primary source of monitoring personnel will be Portland Water Bureau (PWB) crews and Port of Portland (POP) crews, if available. Monitoring of main levee sections, topped by roadways and or paved bike paths, will be done by PWB maintenance crews. POP crews are able to monitor the levee landward side within the Portland International Airport perimeter fence.

If PWB and POP crews are not available or insufficient, the Logistics Section will request assistance through the County. The resources obtained will be organized and directed under the MCDD incident command chain.

All monitoring crews will be trained by the Operations Section for:

- What to look for (see inspection guide in Appendix L)
- How and to whom to report (through MCDD incident command)
- How to construct emergency stabilization and containment for sloughing, seepage, boils, etc. (See Appendix M for Levee Threat Monitoring Guidelines).
- Safety (See Section 2)

Levee patrolling will happen in teams of two. Patrollers should report immediate concerns to their supervisor, but otherwise must report back hourly on their status. Radio communication will be used to report between the field and the ICP. Cross levees or embankments will not be patrolled unless a basin on either side of the cross levee gets flooded by a primary levee breach. Patrollers are encouraged to take photos of issues as they arise and change throughout the incident to help document the incident for reporting, which will also later help with potential FEMA reimbursements.

Levee Patrol Areas have been pre-designated and patrollers will be split among the patrol areas. See Appendix N for levee patrol maps. The maps highlight the areas with risk drivers discussed in Section 6.1.2., below.

Levee Repairs
Repairs will be directed according to priorities established by MCDD incident command. Communication with USACE technical assistance representatives will be necessary, especially to ensure the levee system's structural integrity.

6.1.2. Areas with Risk Drivers

In general, encroachments on or through the levee can increase risk during a flood, but there are certain components of the Districts' flood management system which have been pre-identified as risk drivers. When conducting surveillance, patrollers must pay special attention to these areas so potential issues can be remediated in a timely manner. Some of these areas are triggers in Table 4. All of the pre-identified areas are listed below in Table 6, and are also identified on a map in Appendix C. Please note, this list is not all inclusive of the system's risk drivers, but captures many primary risks. This list should be updated after any significant changes to the levee system or after any flood incidents to continue to reflect the system's current conditions.

Table 6: Levee Risk Drivers

#	Location	Issue	Action
PEN 1			
1	SW Corner of PEN 1	1996 Issue: boils were an in issue during the '96 flood, some remediation was done by USACE after the flood, but area should still be inspected at the next high water event.	Special Watch: boils
2	SE Corner of PEN 1	Rumor: Potential saturation of levee here. Unsure if it is a spring or ground water.	Special Watch: seepage
3	Columbia Slough Levee along PIR	Existing Issue: This reach of levee was identified as having a lower factor of safety for stability than required by USACE during a 0.2-percent-annual-chance event. Sloughing on the riverward side will worsen the issue.	Special Watch: seepage and sloughing
4	Railroad Embankment	Existing Issue: The embankment was identified as having a lower factor of safety for stability than required by USACE during a 1-percent-annual-chance event. This is a high risk reach of the flood management system, and is the location that breached first in the 1948 Vanport flood.	If forecast to go near or above 25.6' NAVD88, increase surveillance. Engineering fix may be needed.
5	Floodwall Closures	Will need Engineering fix: Will need to address the joints on the floodwall and stop log closures before water elevation reaches base of wall/closures.	Address joints immediately after installing closures.
6	Levee along PIR Pump Station	1996 Issue: High level seepage in '96 flood, should be carefully inspected again at next high water event.	Special Watch: seepage
7	Interstate 5 interchange and on ramps, NE corner of PEN 1	1996 Issue: ODOT gate was not properly closed in '96 flood and caused some flooding at the I-5 ramp. Must be closed during a high water event, though it is more of an issue if there is also rain. Not clear if the gate works properly today. Follow up with ODOT after '96 flood is fuzzy. There was a handshake agreement that MCDD would inspect the gate. There may be a tide gate below the main gate, which the crew currently does not inspect. Existing Issue: not enough freeboard at the interchange ramps for the 1-percent-annual-chance event, per FEMA. Temporary floodwall must be built to the 1-percent-annual-chance elevation plus 3 feet.	Locate and inspect gate as soon as possible. Contact ODOT for help. Temporary floodwall construction may be needed in the event of PEN 1 or 2 flooding.
PEN 2			
8	Oregon Slough levee between I-5 and Bridgeton	1996 Issue: Boils and high seepage in '96. A lot of development has happened in this area since '96. Grading was done for construction and it is unknown how it impacted the levee.	Special Watch: boils and seepage

9	Oregon Slough levee, field west of Bridgeton	Rumor: pump station or pipe going through the levee here in the past that was not removed properly.	Special Watch
10	Columbia Slough Levee near Portland Meadows	1996 Issue: thought it was a boil in '96. Only clear outlet of toe drain here. If toe drain is working, we should expect clear water coming out of this outlet, like they saw in '96.	Special Watch
11	North Columbia Slough levee, between MLK and MCDD office	Existing Issue: steep slopes, no rip rap, high potential for sloughing. There is also a pump station outfall here that we are not sure if it is an issue. Lots of animal burrows in this area of levee, too.	Special Watch: seepage
12	Area north of 13th St. PS	1996 Issue: Boils observed in '96.	Special Watch: boils
13	Near Children's Arboretum	1996 Issue: Boil in '96 is still found here today. We should inspect it during high water events, though it is not a large concern. It may be groundwater and may flow more during a high water event.	Special Watch: boils
14	SW Corner of PEN 2	Existing Issue: There are relief wells here. High seepage area. Will need high level and frequent inspections during high water events.	Special Watch
15	Peninsula Drainage Canal south plug	1996 Issue: Boils on either side of the plug in '96. Could potentially breach PEN 2 and MCDD if it has trouble. Should be frequently inspected during a high water event.	Special Watch: boils
16	MCDD / PEN 2 cross levee	Existing Issue: Cross levee has lots of animal dens in it and has seepage and stability issues. Must be inspected and reinforced if inundation of MCDD and PEN 2 seem possible or occurs.	Special Watch
17	NE Corner of PEN 2, gated Port property	Existing Issue: Not enough freeboard here for the 1-percent-annual-chance event, per FEMA. Floodwall must be built to the 1-percent-annual-chance elevation plus 3 feet.	If forecast to near or go above 30.9' NAVD88, build temporary floodwall
18	Just north of Canal plug	Rumor: Garbage buried in cross levee in the past.	Special Watch
19	Columbia River Levee, between 13th and the MCDD/PEN 2 cross levee	Existing Issue: Not enough freeboard here for the 0.2-percent-annual-chance event, per USACE. Floodwall must be the 0.2-percent-annual-chance elevation plus 3 feet.	If forecast to near or go above 35' NAVD88, build temporary floodwall

MCDD			
20	Levee along PDX runway	1996 Issue: Boil noticed in '96 flood. It could be a toe drain outlet and would be an expected seepage area, in that case. Should still be monitored in next high water event.	Special Watch: boils and seepage
21	Levee south of river in NE corner of MCDD	Existing Issue: Beaver dens, trees, and holes are known in the levee in this area. Should be highly monitored once the levee is loaded.	Special Watch
SDIC			
22	Levee along Company Lake	Suspected/Existing Issue: High inspection for sloughing is needed. Bricks have been found in this stretch of levee.	Special Watch: sloughing
23	Sandy Gravity Outfalls / Pump Station	Existing/1996 Issue: Unsure about levee here. There are gravity outfalls that may need to be decommissioned. Flap gate doesn't close, and pipe may be broken. If river elevation is high, water may be pushed into the District through these pipes. There are also relief wells near this location that will need to be monitored. Should be high watch area.	Special Watch: seepage, high water level at pump station
24	Levee tie-in with I-84	Existing Issue: The levee is low where the end of the system ties into Interstate 84. Temporary floodwall will need to be constructed.	If forecast to reach or near 45' NAVD88, build temporary floodwall
25	Most eastern point of levee	Existing Issue: high inspection is needed here as there is currently high saturation here.	Special Watch: seepage

6.2. Resources and Supplies

The Logistics Section is responsible for obtaining resources, the Operations Section will utilize the resources, and the Planning Section will track and demobilize the resources during a flood. Resource management is critical during an emergency so potential federal reimbursement can be achieved after the event.

Once MCDD has expended all available resources, including mutual aid agreements (see Section 6.2.3), Logistics may request resources through the regional incident command chain. MCDD will request resources from Multnomah County through their EOC. All resource requests to Multnomah County Emergency Management must be done with "ECC Form 213 – Assistance Request" (Appendix O). The County will find resources and assign them to us, as they are able, within their priorities. This section of the Plan outlines resources commonly needed for emergency flood response.

6.2.1. Personnel Requirements

Volunteers for levee monitoring will need the following equipment, at a minimum:

- Self-equipped with:
  - Rain gear

    - Safety vest
    - Steel toed boots
    - Hard hat
    - Cell phone, and camera if phone doesn't have a camera
    - Vehicle for every pair of patrollers
    - 800 MHz radio- if they are able to use their normal work radios
- Provided by MCDD:
    - Head lamp with extra batteries
    - Handheld spot light
    - Water bottle
    - Sand, sand bags, and shovel
    - Stakes and nylon ribbon
    - Hammer/mallet (for stakes)
    - Levee Inspection Guide (Appendix L)
    - Levee Threat Monitoring Guide (includes flood fight instructions - Appendix M)
    - Map of the area to be patrolled (Appendix N)

If volunteers do not have all of the appropriate equipment, Logistics will obtain the resources needed for them to achieve their assigned task.

6.2.2. Stockpiled Supplies and Available Equipment

MCDD will have the following supplies available for the Districts (all-together) at all times:

- 10,000 sand bags
- 10 cubic-yards of sand for sand bags (1 dump truck load)
- Machine to make sand bags (e.g. Sandbagger)
- Plastic sheeting (e.g. Visqueen, 6mm thickness minimum)

MCDD owned equipment:

- 5 inspection vehicles
- 4 transportation vehicles
- 2 dump trucks
- Excavator
- Back hoe
- Walking excavator (Spyder)
- 21-foot Columbia River inspection boat
- 16-foot Columbia Slough inspection boat
- Bulldozer

6.2.3. Mutual Aid

The Districts have multiple mutual aid agreements in place to assist emergency operations during an incident. These resources are to be used after the Districts have exhausted their own internal resources, or as prescribed by the agreement as otherwise noted. All mutual aid agreements are filed with the District's contract files, as well in a binder in the District's ICP.

1. *PBOT-MCDD-PEN 1 Stop Log Closure Installation Coordination.* This agreement is triggered at MCDD's discretion for floodwall opening closure in PEN 1, or at a certain Columbia River water elevation forecast, as identified in Table 4.
2. *Oregon Water/Wastewater Agency Response Network (ORWARN).* This network provides MCDD access to the resources of others who are also part of the network, which consists of water and wastewater entities.
3. *Oregon Public Works Emergency Response Cooperative Assistance Agreement*. This agreement provides MCDD access to resources of public work government entities throughout Oregon who have signed the agreement as well.

6.2.4. Contractors and Vendors

The following entities have active contracts with MCDD which may be used during an emergency event. See contact information in Appendix I.

- Structured Communications Systems Inc. – IT services
- EC Company – Electrical
- Alarm Central Station – Fire Alarm
- Tyco ADT – Security Alarm
- Industrial Systems, Inc. – SCADA
- Comcast – Broadband and cable television
- Engineering contracts
    - Parametrix
    - WEST Consultants
    - Cornforth Consultants
    - CES NW
    - APEX Companies, LLC
    - OTAK, Inc.
    - Peterson Structural Engineers, Inc.

The following companies may be available as vendors during an emergency event. See contact information in Appendix I.

- Teledigit – Phone and data cabling

The Logistics Section should utilize existing relationships and vendors to obtain resources if a contract is not in place.

6.2.5. Volunteer Management

During an incident, the Districts may want to use volunteers and volunteers may present themselves without a call for service. Managing volunteers is critical during an emergency event. The County and the Cities overlaying the Districts may be managing volunteers, and the Districts may be able to coordinate with them. Otherwise, the Finance and Administration Section will be responsible for in-taking volunteers and may use Appendix P for a Volunteer Sign-In Sheet. The Operations Section will assign and use the volunteers, while planning will track and demobilize the volunteers. All volunteers must be trained on safety. Liability should be considered.

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7. Evacuation

Evacuation of the Districts is the responsibility of local municipalities. MCDD partners with these local entities to ensure the evacuation plan for the Districts' does not impede flood fighting during high water events. MCDD also provides situational updates to regional partners which will inform their decision to evacuate the area. Sheltering is also not the responsibility of the Districts, but coordination with sheltering agencies (such as the Red Cross) should be considered prior to evacuation beginning.

7.1. City of Portland

The City of Portland's evacuation plan for the Districts is in the Portland Citywide Evacuation Plan Annex as Attachment 5. This evacuation plan is specific to flooding of the Districts. MCDD worked with the City to update this plan last in the fall of 2014. The evacuation plan is attached to this Plan as Appendix Q. Portland carries out its own evacuation, and the Bureau of Emergency Management issues notifications.

7.2. City of Gresham

The City of Gresham's basic Emergency Operations Plan explains basic evacuation procedures to be applied to any hazard incident. The Gresham Police Department is the lead on evacuations for the city. Multnomah County Emergency Management issues notifications for evacuation on behalf of Gresham.

7.3. City of Fairview

The City of Fairview's basic Emergency Operations Plan explains basic evacuation procedures to be applied to any hazard incident. Multnomah County Emergency Management issues notifications for evacuation on behalf of Fairview.

7.4. City of Troutdale

The City of Troutdale's basic Emergency Operations Plan explains basic evacuation procedures to be applied to any hazard incident. Multnomah County Emergency Management issues notifications for evacuation on behalf of Troutdale, and the Multnomah County Sheriff is contracted to do law enforcement for Troutdale, which includes evacuation responsibilities.

7.5. Unincorporated Multnomah County

Multnomah County's basic Emergency Operations Plan explains basic evacuation procedures to be applied to any hazard incident for unincorporated county areas (in MCDD and SDIC; Interlachen is a residential area in unincorporated county in MCDD). The County Sheriff carries out evacuation for unincorporated areas, and Multnomah County Emergency Management issues notifications for evacuation. The River Patrol unit of the Sheriff's Office is responsible for any work needed to be done from the water, which may include aiding in evacuation, but also covers water rescue.

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8. Appendices

A. Drainage District Information
B. PEN 1 Floodwall Openings Map
C. Levee System Areas with Risk Drivers
D. Inundation Maps
E. Levee Modes of Failure Information
F. District Emergency Declaration Process
G. Legal Memorandum Regarding USACE Emergency Assistance
H. Triggered Action Procedures
I. Emergency Contacts
J. Situational Reporting
K. Position Action Sheets
L. Levee Inspection Guide
M. Levee Threat Monitoring Guidelines
N. Levee Patrol Area Maps
O. Multnomah County ECC Form 213 – Assistance Request
P. Volunteer Sign-In Sheet
Q. City of Portland District Evacuation Plan
R. Glossary

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Appendix A: Drainage District Details

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Appendix A: Drainage District Details

Peninsula Drainage District #1

PEN 1 is the furthest west district managed by MCDD. It is bound by the Columbia River (more specifically, the Oregon Slough) on the north, Interstate 5 on the east, the Columbia Slough on the south, and a railroad embankment on the west.

Jurisdictions within PEN 1: City of Portland, Multnomah County

Land Use: Primarily open space and industrial.

PEN 1 Information

=Acreage	Landowners (2013)	Pump Stations	Miles of Levee	Miles of Ditches and Slough
986	15	2	5*	5

*The levee system includes 1 mile of floodwall along N. Marine Drive.

Sampling of Landowners and Properties:

- City of Portland – Heron Lakes Golf Course, Portland International Raceway (PIR)
- Port of Portland – Vanport Wetlands
- State of Oregon – Interstate 5
- Metro – Expo Center
- Graphic Packaging
- Harsch Investment Properties
- Trimet – Yellow Line light rail

Critical Infrastructure:

- Interstate 5
- North Marine Drive
- Railroads: Burlington Northern Santa Fe, Union Pacific, Peninsula Terminal Company

Peninsula Drainage District #2

PEN 2 is the District east of PEN 1 and west of MCDD. It is bound by the Columbia River and Oregon Slough on the north, the Peninsula Drainage Canal on the east, the Columbia Slough on the south, and Interstate 5 on the west.

Jurisdictions within PEN 2: City of Portland, Multnomah County

Land Use: Mixed between residential, open space, commercial, and industrial.

PEN 2 Information

Acreage	Landowners (2013)	Pump Stations	Miles of Levee	Miles of Ditches and Slough
1,612	913	2	5.5	6

Sampling of Landowners and Properties:

- Columbia Edgewater Country Club
- Hayden Meadows
- Portland Yacht Club
- City of Portland – Delta Park
- State of Oregon – Interstate 5
- Jubitz Travel Center
- Fazio family
- Bridgeton Neighborhood
- East Columbia Neighborhood
- Deltawood Housing Association
- Fox Run Mobile Home Park

Critical Infrastructure:

- Interstate 5
- North and Northeast Marine Drive
- Martin Luther King Boulevard

Multnomah County Drainage District #1

MCDD is the largest of the Districts, lying between PEN 2 on the west and SDIC on the east. It is approximately bound by the Columbia River on the north, 223rd Avenue on the east, the Union Pacific railroad tracks on the southeast, Columbia Boulevard on the southwest, and the Peninsula Drainage Canal on the west.

Jurisdictions within MCDD: Cities of Portland, Gresham, and Fairview; Multnomah County

Land Use: Mixed between open space, industrial, commercial, residential, and some residential agriculture.

MCDD Information

Acreage	Landowners (2013)	Pump Stations	Miles of Levee	Miles of Ditches and Slough
8,591	1,768	8	13	26.1

Sampling of Landowners and Properties:

- Port of Portland – Portland International Airport (PDX), Cascade Station, Portland International Center, air cargo facilities, and more
- City of Portland – South Shore Well Fields, Colwood Golf Center, Portland Police facilities, and more
- Metro – Blue Lake Park, Gleason Memorial Boat Ramp
- State of Oregon – Interstate 205 and more
- Multiple golf courses
- Owens-Brockway Glass
- Iverness Jail and Columbia River Correctional Institute
- Trimet – Red Line light rail
- Fairview Lake Property Owners Association
- Interlachen community

Critical Infrastructure:

- City of Portland's South Shore Well Fields
- Portland International Airport
- Army National Guard
- National Weather Service Forecast Center
- Federal Bureau of Investigation Portland Division
- Interstate 205
- Northeast Marine Drive
- Multnomah County River Patrol (waterside of levee)
- Railroad: Union Pacific
- Northeast 82nd Drive

Sandy Drainage Improvement Company

SDIC is the furthest east of the Districts. It is approximately bound by the Sandy River on the east, the Union Pacific railroad to the south, and 223rd Avenue on the west. To the north of SDIC lies Chinook Landing and Company Lake, as the district doesn't extend to the Columba River's bank, like the other three districts.

Jurisdictions within SDIC: Cities of Fairview and Troutdale, Multnomah County

Land Use: Primarily industrial and open space, with some commercial use.

SDIC Information

Acreage	Landowners (2013)	Pump Stations	Miles of Levee	Miles of Ditches and Slough
1,556	96	1	3.5	8

Sampling of Landowners and Properties:

- Port of Portland – Troutdale Airport, Troutdale Reynolds Industrial Park (TRIP)
- Fedex
- Nacco Materials Handling Group Inc.
- State of Oregon – Interstate 84

Critical Infrastructure:

- Troutdale Airport
- Interstate 84
- NW Marine Drive
- Troutdale Water Pollution Control Facility
- Troutdale Sewer Pump Stations
- Substations: BPA, PP&L, and PGE
- Williams Northwest Pipeline natural gas line (primary artery for the transmission of natural gas to region)

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Appendix B: PEN 1 Floodwall Openings

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FEAP - Appendix B

Flood Control Stop Log Locations

July 2016

Legend

Stop Logs

- storage location
- closure location

Levee Center Line

Taxlots

PEN 1 Flood Protection

0 50 100 200 Feet

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Appendix C: Levee System Areas with Risk Drivers

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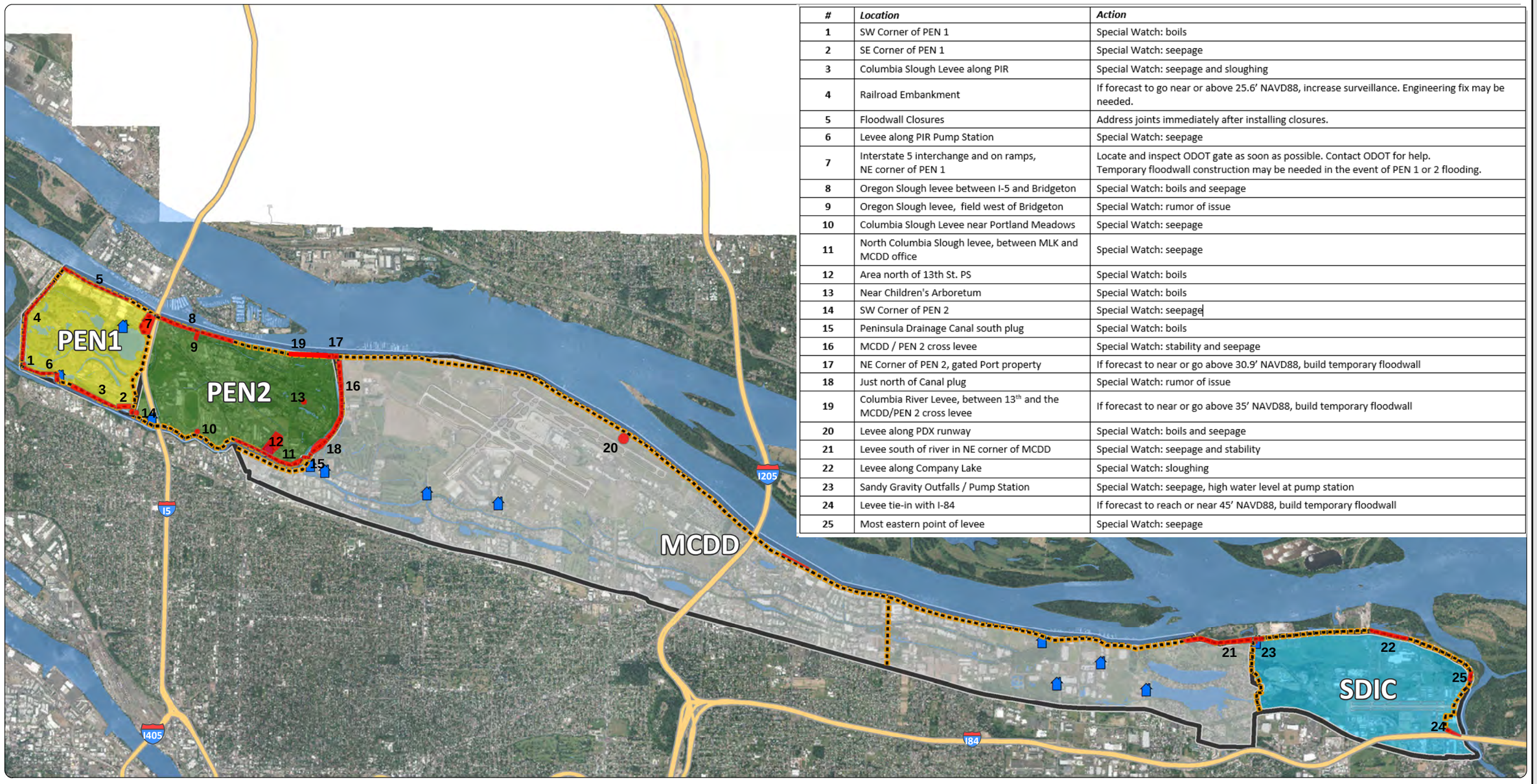
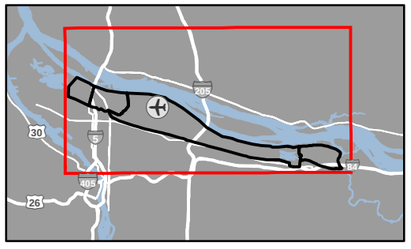


#	Location	Action
1	SW Corner of PEN 1	Special Watch: boils
2	SE Corner of PEN 1	Special Watch: seepage
3	Columbia Slough Levee along PIR	Special Watch: seepage and sloughing
4	Railroad Embankment	If forecast to go near or above 25.6' NAVD88, increase surveillance. Engineering fix may be needed.
5	Floodwall Closures	Address joints immediately after installing closures.
6	Levee along PIR Pump Station	Special Watch: seepage
7	Interstate 5 interchange and on ramps, NE corner of PEN 1	Locate and inspect ODOT gate as soon as possible. Contact ODOT for help. Temporary floodwall construction may be needed in the event of PEN 1 or 2 flooding.
8	Oregon Slough levee between I-5 and Bridgeton	Special Watch: boils and seepage
9	Oregon Slough levee, field west of Bridgeton	Special Watch: rumor of issue
10	Columbia Slough Levee near Portland Meadows	Special Watch: seepage
11	North Columbia Slough levee, between MLK and MCDD office	Special Watch: seepage
12	Area north of 13th St. PS	Special Watch: boils
13	Near Children's Arboretum	Special Watch: boils
14	SW Corner of PEN 2	Special Watch: seepage
15	Peninsula Drainage Canal south plug	Special Watch: boils
16	MCDD / PEN 2 cross levee	Special Watch: stability and seepage
17	NE Corner of PEN 2, gated Port property	If forecast to near or go above 30.9' NAVD88, build temporary floodwall
18	Just north of Canal plug	Special Watch: rumor of issue
19	Columbia River Levee, between 13th and the MCDD/PEN 2 cross levee	If forecast to near or go above 35' NAVD88, build temporary floodwall
20	Levee along PDX runway	Special Watch: boils and seepage
21	Levee south of river in NE corner of MCDD	Special Watch: seepage and stability
22	Levee along Company Lake	Special Watch: sloughing
23	Sandy Gravity Outfalls / Pump Station	Special Watch: seepage, high water level at pump station
24	Levee tie-in with I-84	If forecast to reach or near 45' NAVD88, build temporary floodwall
25	Most eastern point of levee	Special Watch: seepage

This map depicts known risk drivers throughout the Columbia River levee system managed by Multnomah County Drainage District. This map was developed for the Flood Emergency Action Plan.

MCDD Flood Protection
p. 503.281.5675
www.mcdd.org



Basemap provided by Esri Online Maps.
Service Later Credits: City of Portland, Oregon.
All other data generated by Multnomah County Drainage District.

Legend

- Risk Driver
- Levee
- Pump Stations
- Freeway
- MCDD District Boundaries

District Boundaries

District

- MCDD
- PEN1
- PEN2
- SDIC

Flood Emergency Action Plan

Appendix C: Levee System Risk Drivers

0 3,000 6,000
Feet

N

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Appendix D: Inundation Maps

These maps are not included as they contain sensitive information.

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Appendix E: Levee Modes of Failure Information

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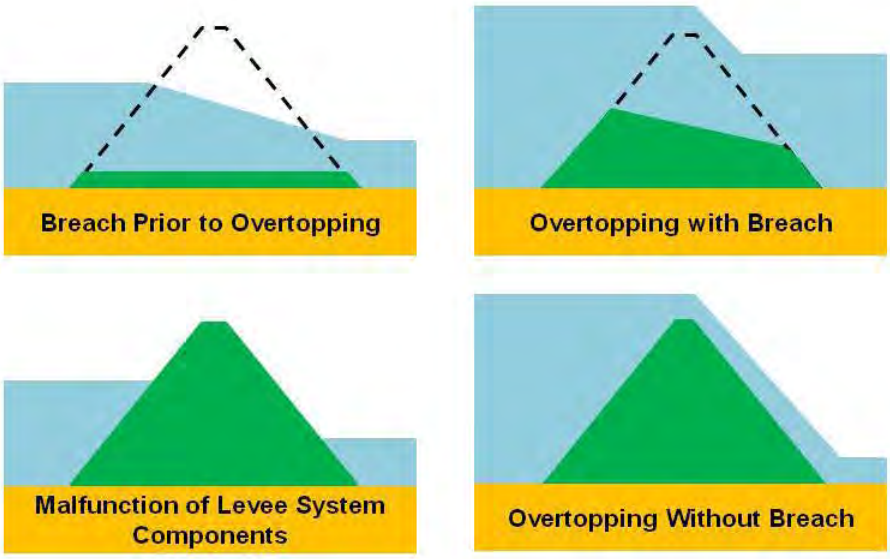
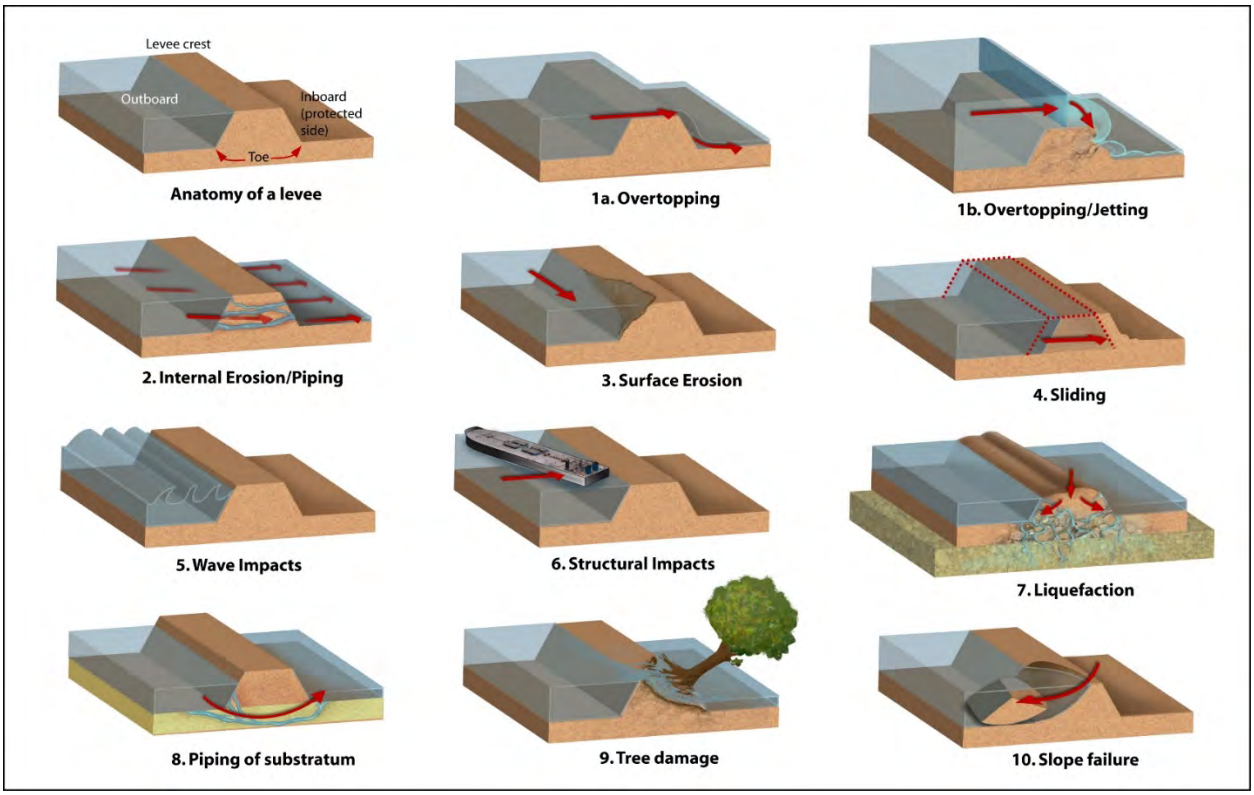
Levee Modes of Failure

There are many ways to think of modes of levee failure. The four graphics below simply depict levee failure possibilities, though they may be caused by various issues. All four failure modes should be considered in determining interim risk reduction measures.



Graphic obtained from USACE, Portland District

The graphics below depict failure modes and impacts that strongly impact levee integrity.



Zina Deretsky, National Science Foundation. Accessed online March 9, 2016: http://www.nsf.gov/news/mmg/media/images/levee2_h1.jpg

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Appendix F: District Emergency Declaration Process

To be developed.

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Appendix G: Legal Memorandum Regarding USACE Emergency Assistance

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Memorandum To:	Sara Morrissey, MCDD
	Angela Carkner, MCDD
From:	Hong N. Huynh
Subject:	Emergency Assistance of USACE
Date:	May 26, 2016

This memorandum discusses the flood emergency assistance that the United States Corps of Engineers ("USACE") would provide to drainage districts that are also "local sponsors" of federally authorized flood control projects.

In sum, and aside from the Clean Water Assistance, USACE's assistance can be delineated based on a continuum of events related to high water levels that could lead to flooding: pre-flood, imminent flood, during flood, and post-flood. They are generally known as:

- Pre-Flood: Disaster Preparedness Assistance
- Imminent Flood: Advance Measures Assistance
- During Flood: Emergency Flood Response Assistance
- Post-Flood: Post Flood Assistance and Rehabilitation Assistance

Background

The 1936 Flood Control Act (the "FCA") gives USACE general authority over floods and flood control works in the United States. 33 USC §§ 701a, 701a-1. Around 1917, landowners in the Multnomah County Drainage District ("MCDD") Peninsula Drainage District #1 ("PEN 1"), Peninsula Drainage District #2 ("PEN 2"), and Sandy Drainage Improvement Company ("SDIC") (collectively, the ("Districts") used local funds to construct their own levee and drainage systems. Collectively, these portions operate as a single flood control system spanning the Districts' jurisdiction.

In 1936, the Districts' system came within USACE's jurisdiction by having accepted federal funding for construction to improve the flood control system, including strengthening the levees. By accepting federal funding, the Districts' flood control system became a federally authorized project and is subject to the FCA. The FCA imposes on the Districts, as local sponsors of federally authorized projects, three "local cooperation requirements," the most relevant of which is the

requirement to "maintain and operate all the works after completion in accordance with regulations prescribed by [USACE]." 33 USC § 701c.

In addition to the statutory basis, MCDD and PEN 1 are contractually obligated to provide local cooperation to USACE. In 1996, MCDD signed a Project Cooperation Agreement for Rehabilitation of Flood Control Works as part of USACE's repair of its portion of the levee after the 1996 flood. For Pen 1, in 1961 it signed a Resolution of Formal Assurances for Local Cooperation, and in 1996 and 1997, a Project Cooperation Agreement for Rehabilitation of Flood Control Works for similar levee repair work performed by USACE. Under these agreements, MCDD and PEN 1 gave assurances to USACE that they would operate and maintain ("O&M") the system after USACE's flood control repair work, as well as provide to USACE the necessary lands, easements, rights-of-way, relocations, and disposal sites ("LERRD") necessary for USACE to conduct the repair work. To date, no similar agreement has been found for PEN 2 or SDIC.

Under Section 5 of the FCA, USACE has the discretion to fund certain emergency-related and response actions. *See*, 33 USC § 701n (commonly known as "Public Law 84-99"). *See also* 33 CFR pt 203. The emergency and response actions are offered to local sponsors of federally authorized flood control works that participate in the Rehabilitation and Inspection Program ("RIP"). The assistance includes the following:

- Preparing for the natural disasters;
- Providing advance measures necessary to protect life and improve property from a threat resulting from a major flood;
- Fighting floods and conducting rescue operations;
- Repairing or restoring flood control works threatened, damaged, or destroyed by a flood; and
- Providing emergency supplies of clean water when a contaminated source threatens the public health and welfare of a locality.

To implement these mandates, USACE promulgated regulations at 33 CFR pt 203, issued Engineering Regulation No. 500-1-1 (ER 500-1-1)[1] and USACE Engineering Pamphlet No. 500-1-1 (EP 500-1-1),[2] and published the Levee Owner's Manual for Non-Federal Flood Control Works in 2006 ("2006 Guidance"),[3] as well as other guidance materials incorporated in this memorandum as Attachments A and Attachment B.[4] Note that the regulations and ER & EP 500-1-1 are being evaluated for proposed changes by USACE.[5]

In addition to the FCA, the Stafford Act (42 USC § 5121 et seq.) also has an impact on USACE's emergency assistance responsibility. The Stafford Act authorizes the U.S. President to issue a major disaster declaration, which allows federal agencies, like FEMA and USACE, to move resources to overwhelmed states affected by natural disasters or other catastrophes. The Presidential disaster declaration process begins with a request from the Governor of the affected state, but the response is ultimately determined by the President. Under the Stafford Act, FEMA is responsible for administering assistance to individuals, families, state and local governments, and certain nonprofit organizations.[6] The extent of the Stafford Act's applicability to USACE's emergency-response activities is discussed below.

Discussion

The following discusses the scope of assistance, conditions of assistance, and steps to take to invoke the assistance. The discussion is generally based on PL 84-99, 33 CFR pt 203, and the 2006 Guidance. It does not address regulatory changes USACE is proposing to the assistance

[1] http://www.publications.usace.army.mil/Portals/76/Publications/EngineerRegulations/ER_500-1-1.pdf (last viewed May 17, 2016).

[2] http://www.publications.usace.army.mil/portals/76/publications/engineerpamphlets/ep_500-1-1.pdf (last viewed May 18, 2016).

[3] http://www.nfrmp.us/docs/USACE_NonFed%20Levee%20Owner's%20Manual_Mar06.pdf (last viewed May 17, 2016). *See* general 33 CFR § 203.51.

[4] http://www.sjgov.org/Oes/forms/PL84-99_brochure.pdf (last viewed May 17, 2016).

[5] 80 Fed Reg 8015 (Feb. 13, 2015). USACE expected to finalize these proposed changes in August 2016, which is unlikely to happen as USACE has missed other rulemaking milestones. *See*, http://www.iwr.usace.army.mil/Portals/70/docs/frmp/2015_Workshop/Presentations/Thursday/0845%20-%2003%20-%20Jensen%20-%20Policy%20Revisions.pdf (last viewed May 18, 2016)

[6] An overview and guidance on FEMA Stafford Act emergency response activities can be viewed at http://training.fema.gov/emiweb/downloads/is7unit_3.pdf (last viewed May 23, 2016).

program. Where applicable, the discussion tracks a continuum of events related to floods: pre-flood, during flood, and post-flood assistance.

I. Pre-Flood: Disaster Preparation Assistance

A. Scope of Federal Disaster Preparedness Assistance

USACE can provide certain technical Disaster Preparedness Assistance to an impacted state and local entities, like the Districts. USACE's primary efforts are focused on short-term technical assistance for related flood fight preparedness and training activities. Assistance can be provided any time and does not need to be triggered by a flooding event.

1. **What Disaster Preparedness Assistance Includes**

   Specific assistance could include the following:

   - Providing USACE personnel to inspect the flood control project and recommend emergency construction methods;
   - Providing USACE personnel to develop and train the Districts in flood fighting techniques;
   - Providing hydraulic or hydrologic analysis, geotechnical evaluations, topography and available stream data, maps, and historic flood or storm information;
   - Helping the Districts prepare local evacuation and/or contingency flood plans; and
   - Acquiring, renting, or purchasing equipment, facilities, and supplies for a fully functional emergency operation center ("EOC"), the cost of which the Districts would share.

2. **What Disaster Preparedness Assistance Does Not Include**

Under this authority, USACE cannot provide specialized studies, project development, and related activities, and requirements for long-term assistance.[7] Furthermore, USACE's disaster preparedness assistance is intended to supplement, not replace, the maximum efforts of the state or the Districts.

B. Conditions of Federal Disaster Preparedness Assistance

[7] 33 CFR 203 subpt B details requirements of USACE's disaster preparedness responsibilities and activities.

In order for the USACE to provide the short-term technical assistance related to flood fight preparedness and training activities, certain regulatory conditions must be met by the Districts (as the local sponsor) and the state and local governments. Chapter 3 of the 2006 Guidance details the flood preparedness responsibilities delineated between USACE and the Districts. Specifically, the Districts are expected to have prepared flood fight plans, conducted necessary training, and stockpiled needed materials.

A summary of the non-federal entities and the Districts' conditions are as follows:

1. Exhaust State and Local Resources

A key condition is that all non-federal interests, such as state, county, local governments, and Districts, are required to make full use of their own resources before requesting federal assistance.

2. Comply with O&M Obligations

The Districts must meet their O&M obligations as mandated by the FCA. The regulations specify that these would include both short-term activities (normally done on an annual cycle, or more frequently) such as vegetation control and control of burrowing animals, and longer term activities such as repair or replacement of structural components (e.g., culverts) of the project.

3. Have Active RIP Status

The Districts must be in the RIP program and have attained or maintained an "Active" status.

4. Stockpile Flood Fighting Supply and Equipment

The Districts are responsible for the procurement and stockpiling of sandbags, pumps, and/or other materials or equipment that might be needed during flood situations. USACE will only provide such materials as a last resort. To the extent USACE provides such material and equipment, the Districts must reimburse USACE either in kind or in cash for expendable flood fight supplies and materials, and return items such as pumps. When a flood is of sufficient magnitude to receive a Stafford Act emergency or disaster declaration, then USACE Portland District Office may waive reimbursement of expendable supplies.

5. Train Personnel

The Districts must have trained personnel to operate, maintain, and patrol flood control projects during crisis situations. Specific plans should be developed and in place to address known problem areas. For instance, if the Districts have a levee reach prone to boils, then they should have personnel specifically trained in flood fighting boils. In addition, the Districts must prepare contingency plans to address short-term situations. For instance, if a culvert through a levee is being replaced, then the Districts' contingency plan should address all actions needed should a flood event occur during the construction period when levee integrity is lacking.

C. Steps to Invoke Federal Disaster Preparedness Assistance

In order to trigger Disaster Preparedness Assistance, the Districts can make a request of the USACE Portland District any time before a flood event. In the request, the Districts should make clear that it has meet their local sponsors' obligations and have exhausted all applicable state, local, and Districts' resources.

II. Imminent Flood: Advance Measures Assistance

A. Scope of Advance Measures Assistance

USACE also provides advance emergency assistance in anticipation of an imminent flood to protect against loss of life or significant damages to improved property due to flooding.[8]

1. What Advance Measures Assistance Includes

Based on availability of funding, and approval from the headquarter, USACE can either be technical assistance or direct assistance (such as supplies and equipment) or emergency construction work to repair, strengthen, or temporarily raise the flood control project. It is triggered when there are imminent threats of predicted, but unusual, floods.

These Advance Measures must be justified from an engineering and economic standpoint and must be completed in time to meet the anticipated threat. Advance Measures construction projects are typically temporary, for which USACE pays 100 percent of the project cost. For those

[8] USACE's Advance Measures requirements are codified at 33 CFR 203 subpt F. An example of advance measures deployed by USACE occurred out of the Walla Walla District in December 2015 to address imminent flood risks caused by post-wildfire conditions. *See*, http://www.nww.usace.army.mil/Media/NewsReleases/tabid/2614/Article/632419/15-078-corps-responds-to-idahos-advance-measures-request-technical-assistance-t.aspx (last viewed May 24, 2016).

unusual occasions where permanent construction Advance Measures projects are employed, the local sponsor will be required to pay 25 percent of the project cost.

USACE will prepare a project investigation report before Advance Measures assistance is provided. This report is needed to evaluate and justify the construction of an Advance Measures project. The Advance Measures must also be technically feasible, designed to deal effectively and efficiently with the specific threat, and capable of construction in time to prevent anticipated damages.

2. **What Advance Measures Assistance Does Not Include**

Advance Measures assistance would not be provided in cases where there would be insufficient time to complete this investigation before the flooding is expected.

USACE's Advance Measures efforts are intended to complement the maximum efforts already taken by state and local authorities. Therefore, Advance Measures authorities may not be used to correct deferred or deficient maintenance on the flood control system, for which the Districts, as the local sponsors, are responsible. Such Districts' responsibilities include restoring normal levee height after subsidence, replacing deteriorated components such as outlet structures and pipes, removing debris and new construction items such as protection against erosion. This restriction, however, does not preclude USACE from furnishing necessary flood fight assistance during an emergency.

B. Conditions Required to Invoke Advance Measures Assistance

There are several conditions to USACE's Advance Measure Assistance. They are as follows:

1. Exhaustion of State and Local Resources

A key condition is that all non-federal interests, state, county, and local governments (such as the Districts), are required to make full use of their own resources before requesting federal assistance.

2. Imminent Threat of Unusual Flooding

Advance Measure Assistance will only be provided if it is requested by the Governor of Oregon when confronted with an imminent threat of unusual flooding.[9] A threat may be established by

[9] An "imminent threat" is a "subjective statistical evaluation of how quickly a threat scenario can develop, and how likely that threat is to develop in a given geographical location. Implicit in the timing aspect can be considerations of available time (when the next flood or storm event is likely to occur), season (e.g., a snowpack that will melt in the

National Weather Service predictions, or by USACE's determinations of unusual flooding from adverse or unusual conditions. The threat must be clearly defined to the extent that it is readily apparent that damages will be incurred if preventive action is not taken immediately.

3. Economic Justification

All Advance Measures work must have a favorable benefit-to-cost ratio as calculated under USACE economic guidelines.

4. **Removal Obligation**

If the Districts become the local sponsor of the Advance Measures project, the Districts must be responsible for removing any such temporary Advance Measures projects constructed by USACE.

C. Steps to Invoke Advance Measures Assistance

The following steps are necessary to invoke Advance Measures Assistance:

1. Exhaust State and Local Resources

Non-federal entities, which include state, county, and local governments (such as the Districts) must exhaust all local resources before seeking assistance.

2. **Oregon Governor Writes Request to USACE Portland District Commander**

USACE Portland District Commander must receive a written request from the Governor of Oregon,[10] identifying the problem, verifying that all available state and local resources have been committed, and requesting Advance Measures Assistance. All requests should identify the following information:

- Describe the non-federal efforts undertaken and verify that all available resources have been committed.
- Identify the specific needs and the required Advance Measures Assistance.
- Identify additional commitments to be accomplished by the non-federal entities; and

coming spring runoff), or of known cyclical activities." 33 CFR § 203.72(g)(1). An "unusual flooding" is a "subjective determination that considers potential ability to approach an area's flood of record, a catastrophic level of flooding, or a greater than 50-year level of flooding." 33 CFR § 203.72(g)(2).

[10] ORS Chapter 401 governs the Oregon Governor's state emergency authorities, including emergency declaration. It also establishes the Oregon Office of Emergency Management to provide assistance to the Governor on emergency issues.

- Identify the Districts as the non-federal sponsors of the subject flood control works.

3. Enter into a Cooperative Agreement

Based on the record of USACE, USACE may require the local sponsor of the particular Advance Measures construction project (which is likely going to be the Districts because of their flood control obligations) to enter into a Cooperative Agreement before USACE can provide the assistance. Conditions of that agreement are similar to those that MCDD and PEN 1 have entered into with USACE. They include the following: local sponsor's acquisition of LERRD necessary for the work (particularly if permanent Advance Measures projects were constructed by USACE); release and hold harmless the United States from damages resulting from Advance Measures work; and have O&M responsibilities over any permanent Advance Measures projects.

III. During Flood: Emergency Flood Response

A. Scope of Emergency Flood Response Assistance

USACE provides emergency Flood Response Assistance to fight floods and conduct rescue operations, which is intended to supplement state and local emergency response efforts.[11] These authorities allow USACE to offer assistance in order to preserve life, properties, and public facilities. All USACE activities will be coordinated with the State Emergency Management Agency or its equivalent.[12]

1. What Flood Response Assistance Includes

Assistance is temporary to meet the immediate threat and is not intended to provide permanent solutions. USACE's assistance will be terminated when the flood waters recede below bankfull, absent a short-term threat that would likely cause additional flooding (e.g., a significant storm front expected to arrive within a day or two).

Under this authority, USACE will provide flood fighting, rescue operations, and protection of the federally authorized Districts' flood control project. USACE assistance may include the following:

- Technical advice and assistance;

[11] 33 CFR 203 subpt C details the emergency operations assistance.
[12] For Oregon, this would be the Oregon Office of Emergency Management as authorized under ORS Chapter 401.

- Conducting EOC operations, including sending field representatives and liaison officers to support emergency activities;
- Providing flood fight supplies (e.g., sandbags, lumber, polyethylene sheeting, stone), and lending USACE-owned equipment;
- Retaining equipment and hiring equipment operators for flood fighting operations; and
- Providing emergency contracting.

USACE assistance may include operational control of flood response activities, if requested by the responsible state or local official. However, legal responsibility over the operation remains with the state and local officials.

USACE covers 100 percent of the Flood Response Assistance cost. The state or local governments are not required to reimburse those costs. Receiving the authorized Flood Response for work performed under Public Law 84-99 will not prevent the state or local governments from receiving other federal assistance for which they are eligible, such as FEMA assistance under the Stafford Act.

2. What Flood Response Assistance Does Not Include

Flood Response measures (except technical assistance) are not appropriate for flood control works protecting strictly agricultural lands. Also, USACE has no authority to protect flood control works constructed, previously repaired, or maintained by other federal agencies, where such agencies have emergency flood fighting authority.

B. Conditions to Flood Response Assistance

There are several conditions to USACE's emergency Flood Response Assistance. They are as follows:

1. Exhaust State and Local Resources

Non-federal entities, which include state, county, local governments, and the Districts, are required to make full use of their resources before seeking federal assistance. USACE will provide government-owned equipment or supply materials to non-federal interests only after local resources have been fully committed.

2. Enter into a Cooperative Agreement

The local sponsor receiving Flood Response Assistance, likely the District, must enter into Cooperation Agreements with the USACE for flood fight direct assistance. A sample of such an agreement is in Appendix H of the 2006 Guidance. The agreement conditions are similar to those that MCDD and PEN 1 have entered into with USACE, including releasing and holding harmless the United States from damages resulting from the Flood Response Assistance.

3. Return Equipment or Reimburse USACE Supplies

Immediately after the flood operation ceases, any equipment USACE lent must be returned in fully maintained condition, or with funds to pay for such maintenance. Expendable supplies that were provided, such as sandbags, will be replaced in kind, or paid for by local interests. All unused expendable supplies will be returned to USACE when the operation is terminated. The local sponsor's responsibility for lent equipment maintenance or for replacing or paying for flood fighting supplies would be waived if the flood event caused a Presidential emergency or disaster declaration under the Stafford Act, and the waiver is feasible and reasonable.

C. Steps to Invoke Flood Response Assistance

The following steps are necessary to invoke emergency Flood Response Assistance:

1. Exhaust State and Local Resources

Non-federal entities, which include state, county, local governments (including the Districts) must exhaust all local resources before seeking assistance.

2. State, Local, or District's Writes Request to USACE

An appropriate state or local official, or their authorized representative, must make a request to USACE Portland District Commander for the emergency Flood Response Assistance. As a local government and local sponsor of a federally authorized project, the Districts may make the request to USACE Portland District. This request does **not** need to come from the Governor of Oregon.

When time does not permit a written request, a verbal request from a responsible state or local official will be accepted, followed by a written confirmation. In such urgent situations, the USACE Portland District Commander may respond to oral requests from the Districts. However, all oral requests must be confirmed in writing, but assistance can be provided before the written statement is received.

3. Comply with Districts' Preparedness Responsibilities

The Districts must be in compliance with their local sponsors' emergency-response duties (see Districts' Disaster Preparedness obligations above). During emergency operations, the Districts must commit available resources, to include work force, supplies, equipment, and funds.

4. Enter into a Cooperative Agreement

The sponsor of the Flood Response Assistance, likely the Districts, must sign a Cooperation Agreement before direct assistance can be provided.

IV. Post-Flood: Post Flood Assistance

A. Scope of Post Flood Assistance

Immediately following a major flood, the Oregon Governor may request Post Flood Assistance from USACE Portland District.

This request must be made concurrently with or immediately after the Governor's request to FEMA for a disaster declaration under the Stafford Act. USACE "will deny any Governor's request for Post Flood Response if it is received subsequent to a Stafford Act Presidential disaster declaration, or denial of such a declaration." 33 CFR § 203.32(b)

1. What Post Flood Assistance Includes

Post Flood Recovery activities include certain activities intended to prevent imminent loss of life or significant damage to public property, or to protect against significant threats to public health and welfare, and are intended to bridge the time frame between the occurrence of a disaster and the provision of FEMA disaster relief efforts under authority of The Stafford Act. Specific assistance may include:

- Providing technical advice and assistance;
- Cleaning of drainage channels, bridge openings, or structures blocked by debris deposited during a flood event, where the immediate threat of flooding of or damage to public facilities has not abated;
- Removing of debris blockages of critical water supply intakes, sewer outfalls, etc.;
- Clearing minimum amounts of debris necessary to reopen critical transportation routes or public services/facilities; and

- Providing any other assistance required to prevent imminent loss of life or significant damage to public property, or to protect against significant threats to public health and welfare.

2. What Post Flood Assistance Does Not Include

The Post Flood Assistance cannot be provided directly to individual homeowners, businesses, or agricultural property. Also, USACE cannot use the Post Flood Recovery authorities to correct deferred or deficient maintenance on the flood control facility. The Districts are responsible for such corrections, which may include restoring normal levee or dune height after subsidence, replacing deteriorated components such as outlet structures and pipes, and removing debris and new construction items such as protection against erosion. This restriction, however, does not preclude USACE from furnishing flood fight assistance during an emergency.

Post Flood Assistance does not include efforts to collect post-flood data.

3. In Addition to FEMA Hazard Mitigation Assistance

USACE's Post Flood Assistance is not the same as the hazard mitigation assistance that FEMA can provide. Under the hazard mitigation authority of the Stafford Act, FEMA can identify long-term post-flood mitigation opportunities and provides recovery to the impacted community. USACE can be a part of this FEMA-led effort by providing their resources.

The trigger of FEMA hazard mitigation assistance is also the Presidential emergency declaration after the Oregon Governor has made the request.

Under hazard mitigation authority, FEMA will not provide emergency or permanent repair of federally-authorized flood control work that is already under USACE's jurisdiction.[13] FEMA may, however, provide the following assistance to avoid conditions that present an immediate threat to life, public safety, or improved property: remove debris from flood control works; remove flood fighting measures on the flood control work (sandbags etc.); and dewater from behind the levee.

B. Conditions to Post Flood Assistance

There are several conditions to USACE's emergency Post Flood Assistance. They are as follows:

[13] 42 USC § 5172; 44 CFR § 206.226(a). *See also*, https://www.fema.gov/pdf/government/grant/pa/9524_3.pdf (last view May 26, 2016).

1. 10-Day Limitation

USACE can only provide Post Flood Assistance for a period of up to ten days from the date of the Governor's request to FEMA/President for an emergency or disaster declaration under authority of the Stafford Act. After a Governor's request has triggered the 10-day period, subsequent request(s) for additional assistance resulting from the same flood will not extend the 10-day period, or trigger a new 10-day period.

2. **Exhaustion of State and Local Resources**

Non-federal entities, which include state, county, local governments, and the Districts are required to make full use of their own resources before federal assistance can be furnished. Issuance of federal government-owned equipment or materials to non-federal entities is authorized only after local resources have been fully committed.

3. **Cooperative Agreement**

The local sponsor receiving Post Flood Assistance, likely the District, must enter into Cooperation Agreements with the USACE for flood fight direct assistance. A sample of such an agreement is in Appendix G of the 2006 Guidance, which includes releasing and holding harmless the United States from damages resulting from Post Flood Assistance.

4. Removal Obligation

Following Post Flood Assistance, the Districts have the responsibility to remove expedient flood control structures and similar works installed by USACE.

5. Return Equipment or Reimburse USACE Supplies

Immediately after the flood operation ceases, any equipment USACE lent must be returned in fully maintained condition, or with funds to pay for such maintenance. Expendable supplies that were provided, such as sandbags, will be replaced in kind, or paid for by local interests. All unused expendable supplies will be returned to USACE when the operation is terminated. The local sponsor's responsibility for lent equipment maintenance or for replacing or paying for flood fighting supplies would be waived if the flood event caused a Presidential emergency or disaster declaration under the Stafford Act, and the waiver is feasible and reasonable.

C. Steps to Invoke Post Flood Assistance

The following steps are necessary to invoke Post Flood Assistance:

1. Exhaust State and Local Resources First

Non-federal entities, which include state, county, and local governments (including the Districts) must exhaust all local resources before seeking assistance;

2. Governor Writes Request to US President/FEMA

The Governor of Oregon must submit a written request to the U.S. President, through FEMA, requesting emergency or disaster declaration;

3. Governor Writes Concurrent Request to USACE

The Governor of Oregon must submit a written request to USACE Portland District Commander concurrently of the request to FEMA asking for the assistance. The Governor's request must include the following:

- A verification that the FEMA has been requested to make an emergency or disaster declaration;
- A statement that Post Flood Assistance required is beyond the state's capability; and
- Specific damage locations.

V. Post-Flood: Rehabilitation Assistance

A. Scope of Federal Rehabilitation Assistance

USACE RIP serves many purposes: it provides disaster preparedness activities; it inspects flood control works; it provides Rehabilitation Assistance to those projects with Active status that are damaged in a flood; and it provides a status determination, i.e. the inspection-based determination for potential Rehabilitation Assistance.[14] Therefore, RIP's Rehabilitation Assistance is available to qualified federally authorized flood control projects,[15] such as those operated by the Districts.

Additional information on the Rehabilitation Assistance can be found in Section 8 of the 2006 Guidance.

[14] 33 CFR 203, subpt D details Rehabilitation Assistance and the RIP program of the USACE.

[15] A project is considered "non-Federal" if it has been constructed with non-federal funds or by a state, local or private entity. 33 CFR § 203.15. Based on this definition, to the extent there are portions of the Districts' levees that have not received federal funding for improvement, that portion would be considered a non-federal project for which the limited modifications assistance is provided as part of the Rehabilitation Assistance.

1. What Federal Rehabilitation Assistance Includes

For locally operated and maintained federally authorized projects, USACE will provide 100 percent of the rehabilitation and repair work. For non-federal projects, USACE covers 80 percent while the local sponsor pays for 20 percent of the work in a cost-sharing arrangement. At the earliest opportunity prior to commencement of or during authorized Rehabilitation work, the Corps will inform the Rehabilitation project sponsor of any work that must be accomplished at non-federal cost.

The Rehabilitation Assistance consists of repair and restoration of the qualified federally authorized flood control project, but does not generally cover modification of such a project to increase the level of protection or to provide protection to a larger area. But, if modifications are necessary to preserve the structural integrity of an existing flood control project, then RIP may fund the modification within the context of an approved Rehabilitation work. See below for conditions to modification work related to Rehabilitation Assistance.

2. What Federal Rehabilitation Assistance Does Not Include

USACE will not rehabilitate any non-federal project constructed or modified without the appropriate local, state, tribal, or federal permits, or waivers thereof.

Rehabilitation work does not include repairs to structures built primarily for any purpose other than protection in preventing damage from irregular and unusual rises in water levels. Those non-flood purposes include channel alignment, navigation, recreation, fish and wildlife enhancement, land reclamation, habitat restoration, drainage, bank protection, or erosion protection.

Rehabilitation authorities may not be used to correct deferred or deficient maintenance because such corrections are the responsibilities of the local sponsor. This includes any deficiencies noted by USCE during the RIP eligibility inspections. This may include restoring normal levee height after subsidence, replacing deteriorated components such as outlet structures and pipes, and removing debris and new construction items such as protection against erosion. This restriction on use of these authorities does not preclude furnishing flood fight assistance during an emergency. If the Rehabilitation Assistance work by USACE also corrects such deferred or deficient maintenance, the portion of the deferred or deficient maintenance

cost will be attributable to the Districts in the Cooperation Agreement and cannot be considered a non-federal contribution for purposes of the federal and local cost-sharing requirement.

3. Alternative to Rehabilitation

In lieu of repair and restoration, USACE may also construct Nonstructural Alternative Projects ("NSAPs") upon request by the flood control works local sponsor. See below for details.

B. Conditions of Federal Rehabilitation Assistance

There are numerous conditions to USACE's Rehabilitation Assistance. They are as follows:

1. Exhaustion of State and Local Resources

Non-federal entities, which include state, county, local governments (including the Districts) must exhaust all local resources before seeking assistance.

2. Damaged by the Flood

A flood event must cause damage to the levee. There will be no repair of structures damaged by occurrences other than floods.

3. Economic Justification

USACE Rehabilitation work must be economically justified. Rehabilitation will be provided when USACE satisfies the criteria for a favorable benefit-to-cost ratio, and the construction cost of the work required exceeds $15,000. However, construction costs greater than $15,000 do not necessarily preclude USACE from making a determination that the required work is a maintenance responsibility of the non-federal sponsor and not eligible for Rehabilitation Assistance.

4. Active RIP Status

The Districts must be participants in the RIP program, be subject to inspection requirements, and have attained an Active status in a RIP inspection at the time of the flood event.[16]

5. Cooperation Agreement

[16] It is beyond the scope of this memorandum to detail the steps of RIP inspection requirements and to attain or retain RIP Active status. *See generally* 33 CFR §§ 203.42, 203.43.

As determined by and required by USACE, the local sponsor of the Rehabilitation project, likely the Districts, may need to enter into a Cooperation Agreement with USACE in some circumstance prior to assistance.

In the event that USACE cannot locate a Project Cooperation Agreement[17] that addresses the original construction of the levee,[18] and prior to providing the Rehabilitation work, the local sponsor must sign a Cooperation Agreement. Requirements of the agreement include the local sponsors' acquisition of LERRDs, share in the cost of applicable Rehabilitation work, and responsibility for costs attributable to deficient or deferred maintenance. This is similar to the agreements MCDD and PEN 1 entered into with USACE in 1996 and 1997.

In the event there is an existing Project Cooperation Agreement currently, and in lieu of requiring a new Project Cooperation Agreement prior to providing the Rehabilitation work, USACE will notify the sponsor of the sponsor's standing requirements, and may require the following: additional LERRDs; payment of costs attributable to deficient or deferred maintenance; removal of temporary works; cost-share in the required Rehabilitation work; and modifications to the existing O&M manual.

6. Conditions on Modification

When the Rehabilitation of the flood control system must include some modifications to provide protection to additional areas that are not currently authorized but that are necessary to preserve the structural integrity of an existing flood control system, the following conditions must be met:

a) The additional federal cost to cover the modification work will be limited to not more than one-third of the estimated federal Rehabilitation construction cost to achieve pre-flood level of protection, or $100,000, whichever is less.

b) The modification work must be economically justified. Non-federal interests are required to contribute a minimum of 25 percent of the total construction costs of the modification,

[17] A Project Cooperation Agreement may also be referred to as a local cooperation agreement, cooperation and participation agreement, or similar terms.

[18] MCDD's records show that both MCDD and PEN 1 have such agreements with the USACE, but they were not for the original construction of the levee, but for the repair of it as a result of subsequent flood events in 1996 and 1997. Therefore, it is likely that PEN 1, PEN 2, MCDD, and SDIC will need to have another Cooperative Agreement with USACE for any potential future Rehabilitation Assistance.

LERRD's, and any additional funds necessary to support the remaining cost of the modification beyond what the Corps can provide. USACE will provide at its cost engineering and designing of the modification work.

c) Local sponsors may not offer in-kind services for modification work.

C. Steps to Invoke Federal Rehabilitation Assistance

The following steps are necessary to invoke Post Flood Assistance:

1. Exhaust State and Local Resources First

Districts must ensure that all state and local governments' (including the Districts') resources have been fully utilized.

2. USACE Declares Emergency and Issues Notice to Sponsors

In the event of a significant flood, USACE Portland District Commander will declare the flood an emergency. Immediately after the declared flood subsides (when the river goes back down to its bankfull condition and is not predicted to rise again), USACE Portland District will issue a "Notice to Public Sponsors," which informs those like the Districts that USACE is accepting requests for Rehabilitation Assistance.

3. District Writes a Request to USACE

As the local sponsor, the Districts must make a request for Rehabilitation Assistance to USACE within 30 days of the Notice to Public Sponsors. A sample request form can be found in Appendix E of the 2006 Guidance.

4. Enter into Cooperation Agreement

Enter into a Cooperation Agreement with USACE if the Districts currently do not have on file with USACE a Project Cooperation Agreement for the original construction of the project. A sample of the agreement is in Appendix F of the 2006 Guidance.

5. Active RIP Status

Have an Active status in the RIP at the time of the damage from a flood event.

D. Nonstructural Alternative Projects In Lieu of Rehabilitation

In some cases, the local sponsor of a flood control system may not want the flood control work to be rehabilitated or repaired, but instead may want to return the floodplain to natural

functions. In this case, the local sponsor may request USACE to construct a NSAP in lieu of a structural repair or restoration.

The NSAP must have the principal purpose of restoring floodplain and floodways. While habitat restoration is a benefit, it is not considered a principal purpose of a NSAP. NSAP activities include: acquiring of land or interests in land; removing and demolishing structures, including manufactured homes, for salvage and/or reuse purposes, and utility connections; removing or reducing debris; removing, protecting, or relocating highways, roads, utilities, cemeteries, and railroads; constructing or modifying water flows through, or around the nonstructural project area; providing nonstructural habitat restoration (native planting and native species nesting site enhancements); removing or razing of existing reaches of levee, bank protection features, or riprap; and protecting or floodproofing of essential structures and facilities.

USACE may decline a request to construct the NSAP if the project results in an increase of flood protection expenses; threatens to have a significant adverse impact on adjacent or nearby flood control works; or leads to increased risk of loss of life or property during flood events.

The Districts can make a request of the USACE Portland District to undertake an NSAP in lieu of Rehabilitation of the flood control work. The request must identify the NSAP sponsor. If the Districts are not the NSAP sponsor, the Districts must: divest themselves of the O&M responsible over the flood work involved in the NSAP; and provide to the NSAP sponsor such lands or interests in lands as they may have, which USACE determines are necessary to implement the NSAP.

VI. Federal Clean Water Supply

A. Scope of Federal Clean Water Supply Assistance

USACE has authority to provide emergency supplies of clean water to any locality confronted with a source of contaminated water causing, or likely to cause, a substantial threat to the public health and welfare of the inhabitants of the locality.[19]

1. What Clean Water Supply Includes

USACE will provide 100 percent of the cost to supply the minimum amount of water required to maintain the health and welfare requirements of the affected population. The quantity of water and the means of distribution will be at the discretion of USACE, who will

[19] 33 CFR 203 subpt E details the criteria of USACE's Clean Water Supply program.

consider the needs of the individual situation, the needs of the affected community, and the cost effectiveness of providing water by various methods.

2. **What Clean Water Supply Does Not Includes**

Loss of water supply is not a basis for assistance under this authority. The permanent restoration of a safe supply of drinking water is the responsibility of local interests. Also, water will not be furnished for commercial processes, except as incidental to the use of existing distribution systems. This does not prohibit the furnishing of water for drinking by employees and on-site customers. Water for preparing retail meals and similar personal needs may be provided to the extent that it would be furnished to individuals.

B. Conditions of Federal Clean Water Supply Assistance

There are several conditions to USACE's emergency Clean Water Supply Assistance. They are as follows:

1. Exhaustion of State and Local Resources

Non-federal interests, which include state, county, and local governments, are required to make full use of their own resources before federal assistance can be furnished. This includes National Guard capabilities. If a locality has multiple sources of water, assistance will be furnished only to the extent that the remaining sources, with reasonable conservation measures, cannot provide adequate supplies of drinking water.

2. 30-Day Limitation

USACE water assistance is limited to 30 days, and requires the local interests to provide a Cooperative Agreement between the state and USACE. An extension of this 30-day period requires an amendment to the Cooperative Agreement. This agreement must cover specified services and responsibilities of each party, and provision of a firm schedule for local interests to provide normal supplies of water.

3. Threat to Public Health and Welfare

The locality must face a threat to public health and welfare from a contaminated source of drinking water. Eligibility for assistance will be based on one or more of the following:

a) The maximum contaminant level *or* treatment technique for a contaminant, as established by the Environmental Protection Agency pursuant to the Safe Drinking Water Act, is exceeded.

b) The water supply has been identified as a source of illness by a state or federal public health official. The specific contaminant does not have to be identified.

c) An emergency (e.g., a flood or chemical spill) has occurred that has resulted in either: one or more contaminants entering the source on a sufficient scale to endanger health, or; the emergency has made inoperable the equipment necessary to remove known contaminants.

d) The presence of a contaminant is indicated on the basis of other information available.

C. Steps to Invoke Federal Clean Water Supply Assistance

The following steps are necessary to invoke Clean Water Supply Assistance:

1. Exhaust State Resources

First, seek emergency water assistance through the Governor of Oregon.

2. Governor Writes a Request to USACE

If the state is unable to provide the needed assistance, then the Governor, or the Governor's authorized representative on emergency water issues, must make a written request to USACE Portland District Commander. A letter must include the following:

- The state's commitments and capabilities in response to the emergency situation.
- A description of the local and state efforts undertaken.
- Verification that all reasonably available resources have been committed.
- Identification of the specific needs of the state and the required USACE Federal Clean Water Supply.
- Identification of additional commitments to be accomplished by the state.
- Identification of the project sponsor(s).

Emergency Assistance Under PL 84-99

CATEGORY	FEATURE	CLASS	TYPE OF ASSISTANCE	CRITERIA AND COMMENTS
DISASTER PREPAREDNESS CLASS 100	All Hazard Planning Activities	110	• Preparation of plans and SOP's for quick and effective response to emergencies	• Division and district disaster preparedness programs are funded annually according to organizational requirements and funding parameters.
	All Hazard Training and Exercise	120	• Development of and participation in, exercises and training in the inter- and intra-agency arena.	• Training and exercises for emergency operations for which division and/or district personnel are participating.
	Equipment, Facilities, Supplies	130	• Acquisition, rent, utilities and purchases necessary for a fully functional EOC and alternate EOC.	• The costs associated with this expense is shared with O&M Gen, Class 530. Facilities are to be IAW USACE standards.
	National or Regional Centers of Expertise	140	• Support by the Readiness/Emergency Management National or Regional Centers of Expertise.	• Support must be determined by HQ USACE. • Funds RSC.

EMERGENCY OPERATIONS CLASS 200	Response Operations	210	• EOC Operations, to include field representatives and LNO's in support of emergency activities (All Hazard)
			• Technical assistance (All Hazard)
			• Rescue Operations (All Hazard)
			• Flood Fight Operations:
			  • Loan of flood fight materials and equipment
			  • Emergency Contracting
				• Commander must declare emergency.
				• USACE assistance is supplemental to state and local efforts.
				• No assistance to individuals or individual businesses.
				• No reimbursement to local interests.
				• Reimbursement required for supplies and equipment (e.g., sandbags and pumps) loaned to states and local sponsors. If a FEMA disaster declaration has been made, DE may waive reimbursement requirement for loaned sandbags.

	After Action Report	220	• Provides for the preparation and publication of After Action Reports at all levels.	• Class 210 funds must have been used. Summarizes disaster operations. • Evaluates strengths and weaknesses, recommends corrective action.
	Post Flood Response	230	• Response to a Governor's request for assistance following a flood.	• Limited to 10 days following receipt of Governor's request. • Governor's request must be concurrent with or subsequent to State request for Stafford Act emergency or disaster declaration.
	Operational Supplies and Equipment	240	• Maintenance of equipment and replenishment of supplies used during emergency operations.	• Corps of Engineers use only. Cannot be used to replace supplies or equipment for State and Local governments.
	Support From Others	250	• Support received from other Federal agencies in response to a flood or coastal storm emergency.	• Can only be used during a flood related emergency for reimbursable under PL 84-99.
	Operational Support	260	• Support provided by USACE Labs, and non-Corps organizations.	• Applicable for use by HQ USACE **ONLY**.
REHABILITATION AND INSPECTION PROGRAM CLASS 300	Rehabilitation Project – Federal FCW	310	• Rehabilitation of active Federal Flood Control Works.	• Written request from public sponsor responsible for operation and maintenance of project. • Must be damaged by flood or coastal storm. • Restoration to pre-disaster level of protection (physical height). • Rehab must be economically justified. Repair of maintenance deficiencies is local responsibility/cost. • Cost share: 100% Federal (Current).
	Rehabilitation Project – Non-Federal FCW	320	• Rehabilitation of active non-Federal flood control works.	• See criteria and comments for Federal rehab, Class 310. • Cost share: 80% Federal / 20% non-Federal (Current).
	Rehabilitation Project – Hurricane/Shore Protection Project	330	• Rehabilitation of eligible Federally authorized and constructed Hurricane/Shore Protection Projects	• Restoration to lesser of (1) pre-storm condition, or (2) level needed for adequate functioning of the project. • Normally requires CG/public sponsor cost share per PCA.
	Field Investigation	340	• This is to conduct the investigation and the preparation of the Project Information Report (PIR) for flood control works.	• Flood control works must be active in the RIP, and have been damaged by a flood or coastal storm.

	Initial Eligibility Inspections (IEI)	350	• Initial Eligibility Inspection is conducted on an inactive flood control project based on established criteria. Inspection determines if:
			  • The public sponsor is qualified.
			  • The project meets engineering and maintenance criteria
				• Project was constructed using non-Federal funds, or WPA/CCC
				• Sponsor must be a public entity with financial authority.
				• Minimum level of protection required:
				  • Ag levee: 5 year with 1 foot of freeboard
				  • Urban, Ag with infrastructure: 10 year with 2 feet of freeboard
				• Active maintenance program that ensures levee viability
				• Adequate maintenance of structures and fixtures.

	Continuing Eligibility Inspections (CEI)	360	• Periodic inspection of active non-Federal FCW's to ensure the project is being maintained in accordance with USACE criteria.	• Refer to ER 500-1-1 for inspection criteria.
	Interagency Levee Task Force (ILTF)	370	• Funding, beyond what FEMA provides via a mission assignment, to manage operations of an ILTF.	• HQ USACE-approved, Division-led task force formed following a major event where numerous levees need rehab.
WATER ASSISTANCE CLASS 400	Emergency Water Supplies (Contaminated Source of Water)	410	• Provide emergency water to a locality.	• Contaminated source of water causing threat to public health and welfare. Human consumption only. 100% Federal cost. • Supplemental to state and local resources. • Governor's written request. • 30 day limitation (extendable under certain conditions)
	Drought Assistance	420	• Transportation of water at Federal expense. • Well drilling on a reimbursable basis.	• Designation by ASACW of drought distressed area. • Water for human consumption only. 100% Federal cost. • Applicants may be farmers, ranchers or political subdivisions. • All requests must come through the State.
	Field Investigations	430	• PIR preparation. • Technical assistance.	• Preparation of report for either emergency water or drought assistance.
ADVANCED MEASURES CLASS 500	Advanced Measures Assistance	510	• Preventive work performed due to *imminent threat of unusual flooding.* • District may provide technical assistance upon receipt of funds from HQ USACE. • Advanced Measures projects or direct assistance requires HQ USACE approval.	• Prediction of unusual flooding by NWS or Corps (imminent threat) • Threat to life or improved property. • Complements maximum state and local efforts. • Work completable in time to prevent damages. • Work must be technically feasible and economically justified. • Removal or upgrades performed by sponsor at no cost to USACE.
	Field Investigations	520	• Investigate eligibility and prepare Project Information Report.	• Request from Governor for assistance.
HAZARD MITIGATION CLASS 600	Hazard Mitigation	600	• USACE participation in FEMA-led hazard mitigation effort intended to identify post-disaster mitigation opportunities, and establish framework for recovery.	• Presidentially declared major disaster • Activation of Hazard Mitigation Team by FEMA
OTHER EMERGENCY ASSISTANCE AUTHORITIES				
INSPECTION OF COMPLETED WORKS (ICW)	Inspection of Federal flood control works and certain other Corps-constructed projects	O&M Gen	• Periodic inspection of active Federal FCW's to determine if the project is being maintained in accordance with USACE criteria. • Permitting of alterations to Federal FCW's.	• Correlates to Class 360 for non-Federal FCW's. • Refer to ER 1130-2-530 for specifics.
ARMY REGULATION 500-60	Emergency Response to Any Disaster	NA	• Limited emergency relief efforts (e.g., route clearance for emergency vehicles, etc.) • Search and Rescue (for life saving purposes).	• Life saving activities and/or protection of significant infrastructure using USACE equipment and personnel. • Funded from overhead account. No contracting allowed using USACE funds. • No reimbursement, unless DA makes funds available.
STAFFORD ACT	Emergency Response and Recovery per the Federal Response Plan	NA	• ESF #3 Public Works and Engineering (Requires FEMA mission assignment and FEMA funding). • DOD/DOMS directed mission (non-ESF-3)	• Presidentially declared major disaster or emergency declaration, or activation by FEMA Regional Director. • Division Responsibility to staff ROC and DFO. • Mission Assignments through ESF #3 Team.

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Overview

The first responsibility for protecting homes and property from flood damage rests with the individual. Non-federal interests which include local governments, levee and drainage districts, and federally recognized Indian Tribes (hereinafter referred to as "local interests"), and the state share the responsibility and together they form the community's first line of defense in preventing flood damage.

Occasionally, however, local resources are not able to contain or control a flood emergency situation. The U.S. Army Corps of Engineers' (USACE) flood disaster assistance program is intended to supplement and support local interests upon their request for assistance.

The information contained in this brochure provides a summary of the USACE Flood Emergency Assistance Program. A more detailed discussion may be obtained by reviewing Engineer Regulation 500-1-1 available on the web at http://www.usace.army.mil/publications/eng-regs/er500-1-1/toc.htm .

Flood Emergency Assistance Available

The USACE is authorized to provide flood emergency assistance under three categories:

- Emergency Operations, Flood Fight Assistance
- Rehabilitation of Damaged Flood Damage Reduction Projects
- Advance Measures

When flood conditions exceed, or are predicted to exceed the response capability of levee and drainage districts and local or state governments, the USACE has the authority under Public Law 84-99 to provide emergency flood response assistance without further specific authorization of Congress. The USACE can furnish assistance for flood emergency preparation, flood fighting and the repair and restoration of certain flood damage reduction projects damaged or destroyed by flood. Assistance also includes providing flood fight personnel for technical advice, sandbags, plastic sheeting, pumps, or other materials and equipment for an imminent or actual flood emergency to protect against substantial loss of life and property.

The USACE assistance is intended to be **supplemental** and not a replacement for local interests' self-help, and requires a written request for assistance from a public sponsor or entity. No assistance can be provided directly to **individuals or businesses**.

The sponsoring agency/local interests must be fully authorized to provide requirements of local cooperation and to pay a local share of the costs. Since most emergency work provides protection for an immediate situation, USACE authority does not extend to the **reimbursement** of flood fighting expenditures incurred by local interests, flood and debris cleanup, or the removal of temporary flood control structures.

Participation by the USACE in emergency operations may extend to operational control of emergency forces only upon a written request by local interests. This action will be exercised only when the situation exceeds the non-federal capability to execute.

Emergency Operations and Flood Fight Assistance

The USACE is authorized to lend/issue emergency flood fighting supplies. The USACE role is to provide **"supplemental"** support to local interests and the state during flood fight operations. The local interests have the primary responsibility for expending sufficient resources to ensure effective flood fight preparedness. Maximum use of **local resources** and **state resources** must be made before assistance in the form of supplies and equipment can be provided by the Federal Government.

Typical preparedness activities by local interests should include the stockpiling of flood fight supplies such as sandbags and polyethylene sheeting, and advance rental or procurement of equipment such as pumps, generators, boats, and motors.

Also included are the preparation of flood response plans and proper maintenance of any existing flood damage reduction projects. Flood fighting supplies should be stockpiled to meet the total needs of flash floods and lesser floods of longer duration as well as the initial requirements of a major flood occurrence.

Expendable supplies provided by USACE, such as sandbags will be replaced in kind or paid for by local interests to the extent considered feasible and practicable by the Division or District Commander. District Commanders may waive replacement of supplies when a Presidential Disaster Declaration is made.

Rehabilitation of Damaged Flood Damage Reduction Projects

The USACE will provide assistance in the rehabilitation of flood damage reduction projects only when the federal or non-federal project is in "Active" status in the USACE Rehabilitation and Inspection Program, the damage has been caused by a recent high water event, and repairs are clearly beyond the normal, physical, and financial capabilities of the project sponsor. The urgency of the work is considered when determining local interest capability. Flood damage reduction projects must be designed and constructed to provide appreciable and dependable protection in preventing damage from irregular and unusual rises in water levels to be considered flood damage reduction projects.

Rehabilitation under Public Law 84-99 will not be applied to projects which, as a result of poor maintenance or deterioration, require substantial reconstruction. All deficient or deferred maintenance outstanding when damage occurs will be accomplished by or at the expense of the responsible public sponsor either prior to or concurrently with the authorized rehabilitation work. No project will be repaired unless the work satisfies the USACE criteria for a favorable benefit-to-cost ratio.

Structures built primarily for the purpose of channel alignment, navigation, recreation, fish and wildlife enhancement, land reclamation, drainage, or erosion protection are **ineligible** for Public Law 84-99 rehabilitation.

The USACE requires that requests for rehabilitation work be submitted within 30 days after the floodwaters recede to bank full. The public sponsor should request a rehabilitation investigation from the appropriate USACE District as soon as possible after the flood damage occurs.

Advance Measures

Advance Measures consists of those activities performed prior to flooding or flood fighting to protect against loss of life and damages to urban areas and/or public facilities.

Emergency work under this category will be considered **when requested by the Governor** of a state confronted with an immediate threat of unusual flooding. USACE assistance will complement the maximum efforts of local interests.

Projects will be designed for a specific threat and, unless specifically excepted, **will be temporary in nature**.

Requirements for USACE Assistance

The public sponsor must execute a standard Cooperation Agreement with USACE to include:

(a) **Furnishing of lands, easements, rights-of-way, relocations and disposal sites (LERRD).** This item provides for sites of structures, for borrow and disposal areas, and for access; also, for all other rights in, upon, through or over private property as needed by the United States in connection with the authorized work. Performance by the public sponsor under their assurance to furnish LERRD will normally not be considered a contribution. If more advantageous to the Federal Government, borrow and disposal areas may be assumed as federal responsibility. Easements must be provided for future federal inspection of maintenance or removal.

(b) **Hold and save clause to indemnify the government for certain damages.**
(c) The sponsor's agreement to operate, maintain, repair/ replace, and rehabilitate the completed work in a manner satisfactory to the Government.
(d) **Compliance.** The sponsor must comply with applicable provisions of the "Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970" (Public Law 91-646, 84 stat 1894).

Funding/Cost Share

- Emergency Operations Flood Fight Assistance
  - 100% federal
  - LERRD provided by public sponsor
- Rehabilitation of Damaged Flood Damage Reduction Projects
  - Federally authorized projects operated and maintained by public sponsor – 100% federal
  - Non-federal projects – 80% federal / 20% public sponsor
  - LERRD provided by public sponsor
- Advance Measures
  - 100% federal for temporary measures
  - 75% federal / 25% public sponsor for permanent measures
  - LERRD provided by public sponsor

Major Disaster Recovery

The Federal Emergency Management Agency (FEMA) under the authority of the Robert T. Stafford Disaster "Relief and Emergency Assistance Act" (Public Law 93-288 as amended) administers disaster recovery work under the National Response Framework. USACE assistance under this authority is provided only upon mission assignment from FEMA.

How to Request Public Law 84-99 Flood Emergency Assistance

- **Emergency Operations, Flood Fight Assistance**
  If a flood situation is beyond local interests' capabilities, they may request flood fight assistance by calling the California State-Federal Flood Operations Center at (916) 574-2619, who will then contact the appropriate USACE District office. The local interests should also follow up the phone call with a request letter similar to the example provided. When the request is received, local interests will be contacted and promptly advised on the USACE ability to provide assistance.
- **Rehabilitation of Damaged Flood Damage Reduction Projects**
  Following major flood events the USACE will notify all levee sponsors/owners that requests for assistance to repair damaged flood damage reduction projects are being accepted. Project sponsors may request USACE Rehabilitation assistance by letter providing the following information:
  - Name and telephone number of public sponsor point of contact
  - Legal name of flood damage reduction project
  - Date and result of last USACE inspection
  - Project location by Township, Section, Range, city and county
  - Location of damaged section(s), and extent of damage at each
  - Name of waterway causing the damage
- **Advance Measures**
  Requests for Advance Measures assistance must be submitted to the appropriate USACE District Commander by letter signed by the Governor of the state, and containing the following information:
  - A description of the state and/or local efforts undertaken
  - A statement that the state has committed all available resources
  - The specific locations(s) and types of assistance needed
  - Name of the project sponsor
  - Additional commitments to be accomplished by the state

Example Assistance Request Letter

(letterhead of sponsoring political subdivision)
District Commander
U.S. Army Engineer District, _____
Address of USACE District

Dear Sir:

The existing high water conditions constitute a flood threat to the safety of persons and property of _____ located in the County of _____, State of _____.

The potential threat is beyond our capability to address. It is requested that the U.S. Army Corps of Engineers provide emergency assistance in the form of temporary protection.

Sincerely,

_____
(signature) (public official)

_____
(print name)

_____
(title)

2010

US Army Corps of Engineers®

FLOOD EMERGENCY ASSISTANCE

Appendix H: Triggered Action Procedures

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Appendix H: Triggered Action Procedures

Pre-Event Procedures

- Operations Section must conduct a thorough Pre-event System Inspection to identity existing conditions.
- Incident Commander should review 1996 Incident Reports.
- Review last year of levee inspection records and create a one-pager for reference.
- Incident Commander should identify immediate risks to start addressing.
- Planning should map out areas with risk drivers identified by the Incident Commander and Operations.
- Public Information Officer will send out an update to the Districts' Boards.
- Public Information Officer will notify moorages and houseboats to secure their moored/floating items.
- Logistics Section will request from the Portland ECC that No Parking signs be placed on Bridgeton Road overbuilds. If the City is not able to do this right away, then the Public Information Officer is to notify Bridgeton Road landowners and residents, including floating home residents, that the slopes could become unstable, sloughing may occur in the overbuild, and parked vehicles may fall into the river, potentially also damaging houseboats.
- A debrief with the Port of Portland should be initiated if the river elevation is forecast to reach Partial-Activation elevations (22.5'+ NAVD88).

Emergency Activation Procedures

- Logistics Section is to set up the Incident Command Post (ICP): turn LRC program office into a command post.
- Liaison Officer is to request agency representatives, if they are able, or points of contact from Portland, Port of Portland, the County and USACE.
- Operations Section is to begin 24-hour surveillance of system, with 24-hour support from Command and General staff as directed by the Incident Commander.
- Logistics Section is to set up facilities for staff: lodging, food, restrooms, etc.
- Review evacuation plans.

PEN 1 Floodwall Stop Log Closure Procedures

- Logistics to contact Portland ECC to request PEN 1 stop log closures are installed.
    - Duty Officer
    - Back up Duty Officer
- Operations Section to monitor installation.
- Liaison / Public Information Officer to Contact landowners in PEN 1 notifying them of stop log closure and how this impacts them:
    - Graphics Packaging
    - Peninsula Terminal Railroad
    - Ralph Dunnington, Shop owner

- Operations Section must prepare floodwall for high water immediately: fill joints and inspect for deflection.

NE Corner of PEN 2 Levee Procedures

1-percent-chance-event elevation: 30.9 feet NAVD88

This stretch of levee was identified as having lower freeboard than required by FEMA for a 1-percent-annual-chance event. When the river is forecast to hit or near 30.9' NAVD88, a temporary floodwall will need to be constructed to ensure the levee reaches 30.9' plus 3 feet freeboard (33.9'), at minimum. A two-foot floodwall is sufficient to close this gap. Contact the Port of Portland to coordinate this work, as they are the landowners.

Required materials for these temporary floodwalls include:

- 600 sandbags
- Necessary plastic sheeting and base aggregate (as needed)

PEN 2 Columbia River Levee Procedures

Levee design elevation: approximately 35.1+ feet NAVD88

From approximately Portland Yacht Club to the Peninsula Drainage Canal cross-levee, the northern PEN 2 levee is at design height, but not does have the required freeboard by USACE. When the river is forecast to hit 35' NAVD88, a 3 foot temporary floodwall will need to be constructed along this reach of levee. This reach of levee has many encroachments, primarily large residential structures, which will increase the challenge of this action and the amount of time to erect the floodwall. This reach also includes the NE Corner of PEN 2 temporary floodwall (see above), which will need to be incorporated or removed when building this floodwall, as it should already be erected.

Interstate 5 Ring Levee Procedures

1-percent-chance-event elevation: 31.7 feet NAVD88
Cross levee low spot lowest elevation: 29 feet NAVD88

If PEN 1 or PEN 2 is at risk of being flooded, *and* the river elevation is nearing or projected to near or reach 35 feet NAVD88, then the I-5 ring levee will need to be raised with a temporary floodwall to the 1-percent-annual-chance flood elevation plus three feet freeboard, at minimum. At the segment of Interstate 5 entering the clover leaf interchange from the south as it dips under the overpass for MLK Boulevard, the freeboard only reaches 1.7 feet. The freeboard again falls to 2.7 feet at the segment that

crosses N Pier 99 Street. Three feet of freeboard is required by FEMA. Coordination with Portland for traffic impacts to Marine Drive will be necessary. Coordination with ODOT will be necessary for I-5; MCDD should directly call ODOTs dispatch line for partner agencies to request closures of I-5 ramps. If the a breach in PEN 1 or PEN 2 is anticipated, and the river elevation is projected to reach 35 feet NAVD88 or higher, then PEN 1 and PEN 2 should be immediately evacuated, as construction of a temporary floodwall to this elevation at this site is not feasible given materials and time required.

Required materials for these temporary floodwalls include:

- 65 ecology blocks (2'x2'x6')
- 990 sandbags
- Necessary plastic sheeting and base aggregate to level ecology blocks (as needed)

MCDD 142nd Cross Levee Raising Procedures

Cross levee design elevation: approx. 41 feet NAVD88
Cross levee top of levee elevation: approx. 46 feet NAVD88
Cross levee low spot lowest elevation: approx. 40 feet NAVD88

If MCDD is at risk of being flooded, *and* the river elevation is nearing 40 feet NAVD88, then the 142nd cross levee needs to have the low spot where Airport Way goes over the levee raised with a temporary floodwall to the cross levee's design elevation plus three feet of freeboard, at minimum. The road will need to be closed and traffic diverted. PBOT is responsible for this. If we do not have a direct agency representative for PBOT, we will request this through the Portland ECC.

Required materials for the temporary floodwall could include:

- 85 ecology blocks (2'x2'x6')
- 1,700 sandbags
- Necessary plastic sheeting and base aggregate to level ecology blocks (as needed)

223rd Cross Levee Raising Procedures

Cross levee design elevation: approx. 41 feet NAVD88
Cross levee top of levee elevation: approx. 48 feet NAVD88
Cross levee low spot lowest elevation: approx. 39.4 feet NAVD88

If MCDD or SDIC are at risk of being flooded, *and* the river elevation is nearing 39.4 feet NAVD88, temporary floodwalls should be erected where Marine Drive entrance and exit ramps cross over the MCDD / SDIC cross levee to the design elevation, plus three feet, at minimum. The road will need to be closed and traffic diverted. Multnomah County Roads is responsible for this. If we do not have a direct agency representative for County Roads, we will request this through the County ECC (it may be the duty officer, or we may have been assigned a Public Works contact).

Required materials for temporary floodwalls at this site could include:

- 180 ecology blocks (2'x2'x6')
- 970 sandbags
- Necessary plastic sheeting and base aggregate to level ecology blocks (as needed)

Levee Tie-in at I-84 Procedures

Levee design elevation: approx. 41.3 feet NAVD88
Top of levee elevation: approx. 52 feet NAVD88
Levee low spot lowest elevation: approx. 42.7 feet NAVD88

If SDIC is at risk of being flooded, *and* the river elevation is nearing 45 feet NAVD88, a temporary floodwall should be erected at the west-bound exit ramp of I-84, at the Graham Road/Exit 17 interchange, to the design elevation plus three feet, at minimum. This would complete the levee system to raised roadway section of I-84. The road will need to be closed and traffic diverted. MCDD should directly call ODOT's dispatch line for partner agencies to request closures of the I-84 off ramp. MCDD should work with Troutdale Public Works to address any other potential road closure or detour concerns. If we do not have an agency representative for Troutdale, we can coordinate through the Multnomah County EOC.

Required materials for temporary floodwalls at this site include:

- 20 ecology blocks (2'x2'x6')
- 1,306 sandbags
- Necessary plastic sheeting and base aggregate to level ecology blocks (as needed)

Note: *Downstream of the Troutdale city limits, Sandy River flood elevations are controlled by Columbia River stages (FEMA 2010 Multnomah County FIS). That is why we will use the Columbia River gage to trigger this procedure.*

Appendix I: Emergency Contacts

This appendix is not included as it contains emergency contact information meant to be used for public agency coordination.

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Appendix J: Situational Reporting

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Appendix J: Situational Reporting

To ensure accurate and timely information reaches the right parties, the Planning Section will issue situational reports to partner entities throughout an emergency event. MCDD will issue reports on the following basis:

- Standard Operations: No situational reports needed, routine operations.
- Enhanced Operations: Notify partner agencies of status at opening and close of the flood, issue reports as deemed appropriate by the IC.
- Partial Emergency Activation: Situational Reports on a 24-hour minimum basis, and additionally as needed.
- Full Emergency Activation: Situational Reports on a 12-hour minimum basis, and additionally as needed.

To provide all relevant information, please use the Situational Report form (next page) when sending reports to partners. Send the reports by email unless the partner requests reports by phone or if an email contact is not available.

In a very large scale emergency, we may request an Incident Management Team (IMT), in which case situational reporting may change. Situational reports will be done by completing ICS form 209 for IMT reporting directly into an Emergency Support Function (ESF) at the County or State. The ESF that supports the Districts is ESF 3, Public Works, and the IMT will most likely aid in completing the form.

Situational Report Distribution List:

- City of Portland ECC. Request they distribute the report to the following bureaus as well:
  - BES
  - PBOT
  - PWB
- Port of Portland Emergency Manager
  - Or through a designated point of contact we were given.
- Multnomah County Emergency Operations Center (EOC)
  - Notify Duty Officer while County EOC is not activated or while in enhanced awareness.
  - Notify ESF 3 contact once County EOC is in partial or full activation, of which we will be notified.
- Multnomah County Sheriff's River Patrol Unit
- Troutdale Emergency Manager
- Fairview Public Works
- USACE Portland District ICP

- National Weather Service
- Metro Emergency Manager

Situtional Report

Multnomah County Drainage District

also on behalf of Peninsula Drainage Districts #1 and 2 and the Sandy Drainage Improvement Company

Date:	Time:	Staff Completing Form:
Agency Contact (name, #, email):		
Geographic scope (within Districts)		
Priorities and Objectives:		
Operational status		
Resource status		
Essential Elements of Information for Floods:		
Inundation maps attached?		
Current Elevation, Vancouver Gage (in gage's datum):		
Projected Elevation, Vancouver Gage (in gage's datum):		
Weather forecasts with predicted precipitation impacts:		
Status of flood protection system:		
Synergistic impacts:		
Impacts of similar recent flooding events:		
Other, including projections		
Electronic Geospatial Data Attached:		

Instrucutions / Defintions:

Geographic scope (within Districts)

Which Districts and which parts are getting impacted?

Inundation zones

Provide levee inundation maps with first sit-rep.

Current and forecasted river levels

Use NOAA/NWS Vancouver Gage and report it in gage datum

Weather forecasts with predicted precipitation impacts

Brief description of weather forecast for next 24 hours

Status of flood protection system

Brief description of issue areas throughout the levee system

Synergistic impacts

List complicating issues created by flood waters
(e.g., clogged drains, public health hazards generated by standing water, etc.)

Appendix K: Position Action Sheets

Incident Commander Position Action Sheet
Liaison Officer Position Action Sheet
Public Information Officer Position Action Sheet
Safety Officer Position Action Sheet
Operations Section Chief Position Action Sheet
Planning Section Chief Position Action Sheet
Logistics Section Chief Position Action Sheet
Finance and Administration Chief Position Action Sheet

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Incident Commander Position Action Sheet

The Incident Commander is responsible for determining if the emergency preparedness plan should be activated. This could be based on potential flooding, sudden structural break, request from the State or local emergency management agency, or a number of other situations that, in management's judgment, requires activation of the plan. Once the emergency preparedness plan is activated, the Incident Commander will be in charge of the overall emergency response effort, and will coordinate activities to identify and implement a response strategy, establish priorities, and resolve any issues within the emergency management structure.

If the Liaison/Public Information Officer is not activated or available, the Incident Commander will be responsible for coordinating and communicating the response with the State and local emergency management agency, other government entities, adjacent levee systems, etc. When the Liaison/Public Information Officer is not activated or available, the Incident Commander will be the primary points of contact to the public for the levee system during an emergency, and it is essential that messages are both accurate and timely.

Furthermore, employee and public safety is critical during an emergency. Therefore, it is important that responsibility for safety issues be given to a designated person who reports to the Incident Commander.

The following task list should be considered as the minimum requirements for this position. Note that some of the tasks are one-time actions; others are ongoing or repetitive for the duration of the incident.

1. Ensure welfare and safety of incident personnel.

2. Supervise Command and General Staff.

3. Obtain initial briefing from current Incident Commander and agency administrator.

4. Assess incident situation:

    a) Review the current situation status and initial incident objectives.
    b) Ensure that all local, State and Federal agencies impacted by the incident have been notified.

5. Authorize protective action statements, as necessary.

6. Activate appropriate Command and General Staff positions. Safety Officer must be appointed on hazardous materials incidents:

    a) Confirm dispatch and arrival times of activated resources.
    b) Confirm work assignments.

7. Brief staff:

    a) Identify incident objectives and any policy directives for the management of the incident.
    b) Provide a summary of current organization.
    c) Provide a review of current incident activities.
    d) Determine the time and location of first Planning Meeting.

8. Determine information needs and inform staff of requirements.

9. Determine status of disaster declaration and delegation of authority. Work with agency staff to declare state of emergency according to agency protocol.

10. Establish parameters for resource requests and releases:

a) Review requests for critical resources.
b) Confirm who has ordering authority within the organization.
c) Confirm those orders that require Command authorization.

11. Authorize release of information to the media. *If operating within a Unified Command, ensure all Incident Commanders approve release.*

12. Establish level of planning to be accomplished:

a. Written Incident Action Plan (IAP).
b. Contingency planning.
c. Formal Planning Meeting.

13. Ensure Planning Meetings are conducted as indicated:

Sample Planning Meeting Agenda

	Agenda Item	Responsible Party
1	Briefing on situation/resource status.	Planning/Operations Section Chiefs
2	Discuss safety issues.	Safety Officer
3	Set/confirm incident objectives.	Incident Commander
4	Plot control lines & Division boundaries.	Operations Section Chief
5	Specify tactics for each Division/Group.	Operations Section Chief
6	Specify resources needed for each Division/Group.	Operations/Planning Section Chiefs
7	Specify facilities and reporting locations.	Operations/Planning/Logistics Section Chiefs
8	Develop resource order.	Logistics Section Chief
9	Consider communications/medical/ transportation plans.	Logistics/Planning Section Chiefs
10	Provide financial update.	Finance/Administration Section Chief
11	Discuss interagency liaison issues.	Liaison Officer
12	Discuss information issues.	Public Information Officer
13	Finalize/approve/implement plan.	Incident Commander/All

14. Approve and authorize implementation of the IAP:

a) Review IAP for completeness and accuracy.
b) Verify that objectives are incorporated and prioritized.
c) Sign off on incident objectives.

15. Ensure Command and General Staff coordination:

a) Periodically check progress on assigned tasks of Command and General Staff personnel.
b) Approve necessary changes to strategic goals and IAP.
c) Ensure that Liaison Officer is making periodic contact with participating agencies.

16. Keep Executive Director informed on incident-related problems and progress.

Liaison Officer Position Action Sheet

This position is responsible for inward communications to responding partners. The Liaison Officer (LNO) is responsible for coordinating and communicating the response with the State and local emergency management agencies, other government entities, adjacent levee systems, and other coordinating or cooperating entities. Agency Representatives from partnering entities will report to this position.

The following task list should be considered as the minimum requirements for this position. Note that some of the tasks are one-time actions; others are ongoing or repetitive for the duration of the incident.

1. Obtain briefing from Incident Commander:

    a. Obtain summary of incident organization (ICS Forms 201 and 203).
    b. Determine companies/agencies/non-governmental organizations already involved in the incident, and whether they are assisting (have tactical equipment and/or personnel assigned to the organization), or cooperating (operating in a support mode "outside" the organization).

2. Obtain cooperating and assisting agency information, including:

    a. Contact person(s).
    b. Radio frequencies.
    c. Phone numbers.
    d. Cooperative agreements.
    e. Resource type.
    f. Number of personnel.
    g. Condition of personnel and equipment.
    h. Agency constraints/limitations.

3. Establish workspace for Liaison function and notify agency representatives of location.

4. Contact and brief assisting/cooperating agency representatives and mutual aid cooperators.

5. Interview agency representatives concerning resources and capabilities, and restrictions on use-provide this information at planning meetings.

6. Connect with agency representatives to help carry out interim risk reduction measures as outlined in the Plan's Trigger and Action Table.

7. Work with Public Information Officer and Incident Commander to coordinate media releases associated with inter-governmental cooperation issues.

8. Monitor incident operations to identify potential inter-organizational problems. Keep Command apprised of such issues:

    a. Bring complaints pertaining to logistical problems, inadequate communications, and strategic and tactical direction to the attention of Incident Management Team (IMT).

9. Attend and participate in Planning Meetings.

10. Document all activity on Unit Log (ICS Form 214).

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Public Information Officer Position Action Sheet

This position is responsible for outward communications to the public. The Public Information Officer (PIO) will be the primary points of contact to the public for the levee system during an emergency, and it is essential that messages are both accurate and timely. The PIO will work with coordination and partnering agencies' PIOs to ensure accurate and timely information is being sent out to the public from any source during a flood incident.

The following task list should be considered as the minimum requirements for this position. Note that some of the tasks are one-time actions; others are ongoing or repetitive for the duration of the incident.

1. Obtain briefing from Incident Commander:

    a. Determine current status of Incident (ICS Form 209 or equivalent).
    b. Identify current organization (ICS Forms 201 and 203, resource lists, etc.).
    c. Determine point of contact for media (scene or Command Post).
    d. Determine current media presence.

2. Participate in Administrative Officer's briefing:

    a. Determine constraints on information process.
    b. Determine pre-existing agreements for information centers, Joint Information Centers (JICs), etc.

3. Assess need for special alert and warning efforts, including the hearing impaired, non-English speaking populations, and industries especially at risk for a specific hazard, or which may need advance notice in order to shut down processes.

4. Coordinate the development of door-to-door protective action statements with Operations.

5. Prepare initial information summary as soon as possible after activation. If no other information is available, consider the use of the following general statement:

    Sample Initial Information Summary

    We are aware that an [accident/incident] involving [type of incident] occurred at approximately [time], in the vicinity of [general location]. [Agency personnel] are responding, and we will have additional information available as we are able to confirm it. We will hold a briefing at [location], and will notify the press at least ½ hour prior to the briefing. At this time, this briefing is the only place where officials authorized to speak about the incident and confirmed information will be available. Thank you for your assistance.

6. Arrange for necessary work space, materials, telephones, and staff for your position.

7. Establish contact with local and national media representatives, as appropriate.

8. Establish location of Information Center for media and public away from Command Post.

9. Establish schedule for news briefings.

10. Coordinate, with Logistics, the activation and staffing of message center "rumor control" lines to receive requests and answer questions from the public. Provide statement to operators.

11. Obtain current incident status reports from Planning Section; coordinate a schedule for updates.

12. Observe constraints on the release of information imposed by the Incident Commander and according to agency guidance.

Public Information Officer Position Action Sheet

13. Obtain approval for information release from Incident Commander:

    a. Confirm details to ensure no conflicting information is released.
    b. Identify site and time for press briefings, and confirm participation by other Incident Management Team (IMT) members.

14. Provide District Board updates by using the following template as a guide:

    Sample Notice (fill in the highlighted areas)

    For official emergency warnings please see www.publicalerts.org.
    FLOOD CONDITIONS UPDATE?
    MULTNOMAH COUNTY DRAINAGE DISTRICT
    TIME AND DATE

    Board Members,
    The region is currently experiencing flooding. The NOAA Vancouver Gage elevation reading indicates Major Flood Stage/Moderate Flood Stage/Flood Stage/Action Stage/Low Stage. MCDD is currently at an Emergency Phase 2 – Increased Awareness/ 3 – Emergency Activation.
    Currently we are experiencing CURRENT CONDITIONS. Based off of current conditions and NOAA predictions, we expect CONDITION FORECAST over TIME FRAME.
    MCDD will send out a flood conditions update in TIME FRAME at TIME on DATE.
    Please check television, radio, and other outlets for updates on the event as well.
    To contact MCDD during the event, please contact STAFF NAME at APPROPRIATE MEANS OF COMMUNICATION CONSIDERING THE EVENT.

15. Release news to media, and post information in Command Post and other appropriate locations.

16. Record all interviews and copy all news releases:

    a. Contact media to correct erroneous or misleading information being provided to the public via the media.

17. Update off-incident agency personnel on a regular basis:

    a. Email the agency updates.
    b. Establish phone line in the Command Post dedicated to internal communications to update agency personnel.
    c. Provide standard statement which can be given to general requests for information.

18. Coordinate information releases with information staff from other impacted agencies and jurisdictions:

    a. Ensure that information provided to the public is consistent across jurisdictional boundaries, when appropriate.

19. Attend and participate in Planning Meetings.

20. Respond to special requests for information.

21. Provide all news releases, bulletins, and summaries to the Planning Section to be included in the final incident package.

22. Confirm the process for the release of information concerning incident-related injuries or deaths.

23. Document all activity on Unit Log (ICS Form 214).

Safety Officer Position Action Sheet

This position is charged with operational safety. The job is to ensure we are doing the mission in the safest possible manner by inspecting the area to check on the welfare of all of the staff involved and to stop any form of unsafe behavior. Without direction from the IC, they may halt unsafe behavior, actions, and response. If this position is not filled, these tasks will be the responsibility of the IC.

The following task list should be considered as the minimum requirements for this position. Note that some of the tasks are one-time actions; others are ongoing or repetitive for the duration of the incident.

1. Obtain briefing from Incident Commander and/or from initial on-scene Safety Officer.

2. Identify hazardous situations associated with the incident. Ensure adequate levels of protective equipment are available, and being used.

3. Staff and organize function, as appropriate:

    a. In multi-discipline incidents, consider the use of an Assistant Safety Officer from each discipline.
    b. Multiple high-risk operations may require an Assistant Safety Officer at each site.
    c. Request additional staff through incident chain of command.

4. Identify potentially unsafe acts.

5. Identify corrective actions and ensure implementation. Coordinate corrective action with Command and Operations.

6. Ensure adequate sanitation and safety in food preparation.

7. Debrief Assistant Safety Officers prior to Planning Meetings.

8. Prepare Incident Action Plan Safety and Risk Analysis (USDA ICS Form 215A).

9. Participate in Planning and Tactics Meetings:

    a. Listen to tactical options being considered. If potentially unsafe, assist in identifying options, protective actions, or alternate tactics.
    b. Discuss accidents/injuries to date. Make recommendations on preventative or corrective actions.

10. Attend Planning meetings.

11. Participate in the development of Incident Action Plan (IAP):

    a. Review and approve Medical Plan (ICS Form 206).
    b. Provide Safety Message (ICS Form 202) and/or approved document.
    c. Assist in the development of the “Special Instructions” block of ICS Form 204, as requested by the Planning Section.

12. Investigate accidents that have occurred within incident areas:

    a. Ensure accident scene is preserved for investigation.
    b. Ensure accident is properly documented.
    c. Coordinate with incident Compensation and Claims Unit Leader, agency Risk Manager, and Occupational Safety and Health Administration (OSHA).
    d. Prepare accident report as per agency policy, procedures, and direction.
    e. Recommend corrective actions to Incident Commander and agency.

Safety Officer Position Action Sheet

13. Coordinate critical incident stress, hazardous materials, and other debriefings, as necessary.
14. Document all activity on Unit Log (ICS Form 214).

Operations Section Chief Position Action Sheet

The Operations section is responsible for activities directly associated with responding to the emergency. These commonly include assessing the impact to the levee system and other facilities, dispatching repair crews and equipment, identifying materials and contractor resource requirements, and moving toward full restoration of normal operations.

This section is typically headed by the person responsible for day-to-day operations, maintenance, and/or construction activities for the levee system. As is the case with all emergency management positions, a number of alternates should be designated to ensure someone is always available and to provide relief as the emergency continues.

Depending on the size of the levee system, the Operations section can consist of a single person or a number of people separated by function (e.g., maintenance, construction, water supply), by geographical segments (e.g., North and South levee operations), or in any manner that works within the organizational structure of the levee system.

The following task list should be considered as the minimum requirements for this position. Note that some of the tasks are one-time actions; others are ongoing or repetitive for the duration of the incident.

1. Obtain briefing from Incident Commander:

    a. Determine incident objectives and recommended strategies.
    b. Determine status of current tactical assignments.
    c. Identify current organization, location of resources, and assignments.
    d. Confirm resource ordering process.
    e. Determine location of current Staging Areas and resources assigned there.

2. Organize Operations Section to ensure operational efficiency, personnel safety and adequate span of control.

3. Establish operational period.

4. Establish and demobilize Staging Areas.

5. Attend Operations Briefing and assign Operations personnel in accordance with Incident Action Plan (IAP):

    a. Brief Staging Area Manager on types and numbers of resources to be maintained in Staging.
    b. Brief tactical elements (Branches, Divisions/Groups, Task Force/Strike-Team Leaders) on assignments, ordering process, protective equipment, and tactical assignments.

6. Develop and manage tactical operations to meet incident objectives.

7. Assess life safety:

    a. Adjust perimeters, as necessary, to ensure scene security.
    b. Evaluate and enforce use of appropriate protective clothing and equipment.
    c. Implement and enforce appropriate safety precautions.

8. Evaluate situation and provide update to Planning Section:

    a. Location, status, and assignment of resources.
    b. Effectiveness of tactics.
    c. Desired contingency plans.

9. Determine need and request additional resources.

Operations Section Chief Position Action Sheet

10. Direct and carry out tactical aspects of interim risk reduction measures as outlined in the Plan's Trigger and Action Table.

11. Coordinate with cities on protecting sewer lift / pump stations.

12. Notify Logistics Section of Section Branches, Divisions/Groups, Strike Teams/Task Forces, and single resources which are staffed, including location of resources and names of leaders.

13. Keep Logistics Section up to date on changes in resource status.

14. Write formal Operations portion of IAP with the Planning Section Chief, if so directed by the Incident Commander:

    a. Identify assignments by Division or Group.
    b. Identify specific tactical assignments.
    c. Identify resources needed to accomplish assignments.

15. Ensure coordination of the Operations Section with other Command and General Staff:

    a. Ensure Operations Section time-keeping, activity logs, and equipment use documents are maintained and passed to Planning, Logistics, and Finance/Administration Sections, as appropriate.
    b. Ensure resource ordering and logistical support needs are passed to Logistics in a timely fashion-enforce ordering process.
    c. Notify Logistics of communications problems.
    d. Keep Planning up-to-date on resource and situation status.
    e. Notify Liaison Officer of issues concerning cooperating and assisting agency resources.
    f. Keep Safety Officer involved in tactical decision-making.
    g. Keep Incident Commander apprised of status of operational efforts.
    h. Coordinate media field visits with the Public Information Officer.

16. Attend the Tactics Meeting with Planning Section Chief, Safety Officer, and Incident Commander prior to the Planning Meeting to review strategy, discuss tactics, and outline organization assignments.

17. Attend Planning Meetings.

18. Hold Section meetings, as necessary, to ensure communication and coordination among Operations Branches, Divisions, and Groups.

19. Assist the Planning Section in creating damage assessment documentation after an incident.

Planning Section Chief Position Action Sheet

The Planning section collects, evaluates, and disseminates information regarding the nature of the emergency. This information is used to provide status reports within the emergency management organization so that all members are informed of the nature of the emergency and the progress being made. This could include manpower requirements, facilities impacted, materials requirements, etc. Documentation and status reports will greatly assist levee personnel in maintaining a record of actions taken during the course of the emergency.

Under the NIMS/ICS structure, the Planning section, in coordination with other parts of the management team, develops an overall strategy for responding to the emergency. However, that responsibility can be assigned elsewhere such as with the Incident Commander or the Operations section.

The person responsible for the Planning section will vary depending on the size and complexity of the levee system. One possibility is the person responsible for engineering support, due to their close working relationship with operations staff and technical knowledge of the levee system. In a smaller system, this function could be combined into the Operations section.

The following task list should be considered as the minimum requirements for this position. Note that some of the tasks are one-time actions; others are ongoing or repetitive for the duration of the incident. Tasks may be delegated to the appropriate Unit Leader.

1. Obtain briefing from Incident Commander:

    a. Determine current resource status (ICS Form 201).
    b. Determine current situation status/intelligence (ICS Form 201).
    c. Determine current incident objectives and strategy.
    d. Determine whether Incident Commander requires a written Incident Action Plan (IAP).
    e. Determine time and location of first Planning Meeting.
    f. Determine desired contingency plans.

2. Activate Planning Section positions, as necessary, and notify Resources Unit of positions activated.

3. Establish and maintain resource tracking system.

4. Complete ICS Form 201, if not previously completed, and provide copies to Command, Command Staff, and General Staff.

5. Send situational reports to agencies as described in the Plan (see Appendix I for more details).

6. Advise Incident Command Post (ICP) staff of any significant changes in incident status.

7. Compile and display incident status summary information. Document on ICS Form 209, Incident Status Summary (or other approved agency forms):

    a. Forward incident status summaries to Agency Administrator and/or other designated staff once per operational period, or as required.
    b. Provide copy to Public Information Officer.

8. Obtain/develop incident maps.

9. Establish information requirements and reporting schedules for ICP and field staff.

10. Prepare contingency plans:

    a. Review current and projected incident and resource status.
    b. Develop alternative strategies.
    c. Identify resources required to implement contingency plan.

d. Document alternatives for presentation to Incident Commander and Operations, and for inclusion in the written IAP.

11. Meet with Operations Section Chief and/or Command, prior to Planning Meetings, to discuss proposed strategy and tactics and diagram incident organization and resource location.

12. Conduct Planning Meetings according to following agenda:

Sample Planning Meeting Agenda

	Agenda Item	Responsible Party
1	Briefing on situation/resource status.	Planning/Operations Section Chiefs
2	Discuss safety issues.	Safety Officer
3	Set/confirm incident objectives.	Incident Commander
4	Plot control lines & Division boundaries.	Operations Section Chief
5	Specify tactics for each Division/Group.	Operations Section Chief
6	Specify resources needed for each Division/Group.	Operations/Planning Section Chiefs
7	Specify facilities and reporting locations.	Operations/Planning/Logistics Section Chiefs
8	Develop resource order.	Logistics Section Chief
9	Consider communications/medical/ transportation plans.	Logistics/Planning Section Chiefs
10	Provide financial update.	Finance/Administration Section Chief
11	Discuss interagency liaison issues.	Liaison Officer
12	Discuss information issues.	Public Information Officer
13	Finalize/approve/implement plan.	Incident Commander/All

13. Supervise preparation and distribution of the written IAP, if indicated. Minimum distribution is to all Command, Command Staff, General Staff, and Operations personnel to the Division/Group Supervisor level:

    a. Establish information requirements and reporting schedules for use in preparing the IAP.
    b. Ensure that detailed contingency plan information is available for consideration by Operations and Command.
    c. Verify that all support and resource needs are coordinated with Logistics Section prior to release of the IAP.
    d. Include fiscal documentation forms in written IAP as requested by the Finance/Administration Section.
    e. Coordinate IAP changes with General Staff personnel and distribute written changes, as appropriate.

14. Coordinate development of Incident Traffic Plan with Operations and the Ground Support Unit Leader.

15. Coordinate preparation of the Safety Message with Safety Officer.

16. Coordinate preparation of the Incident Communications Plan and Medical Plan with Logistics.

17. Instruct Planning Section Units in distribution of incident information

18. Provide periodic predictions on incident potential.

19. Establish a weather data collection system, when necessary.

Planning Section Chief Position Action Sheet

20. Identify need for specialized resources; discuss need with Operations and Command; facilitate resource requests with Logistics.

21. Ensure Section has adequate coverage and relief.

22. Hold Section meetings as necessary to ensure communication and coordination among Planning Section Units.

23. Ensure preparation of demobilization plan, if appropriate.

24. Ensure preparation of final incident package and route to Agency Administrator for archiving or follow-up after Incident Management Team (IMT) demobilization.

25. Provide briefing to relief on current and unusual situations.

26. Ensure that all staff observe established level of operational security.

27. Ensure all Planning functions are documenting actions on Unit Log (ICS Form 214).

28. Submit all Section documentation to Documentation Unit.

29. With help from Operations, Planning will submit damage assessment information to Multnomah County Emergency Management after an incident.

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Logistics Section Chief Position Action Sheet

This section is responsible for meeting emergency support requirements. These needs will vary greatly, particularly in a sustained emergency situation. Examples include obtaining or contracting for critical equipment and construction materials, fuel, transportation, emergency communications, food services, medical services, and other items needed by the responding individuals.

This section should be led by the person responsible for general support services. While the makeup of this section will vary depending on the size and complexity of the levee system, input will be needed from personnel knowledgeable in the areas of warehouse operations, purchasing, facilities management, vehicle operations, telecommunications, and IT support.

The following task list should be considered as the minimum requirements for this position. Note that some of the tasks are one-time actions; others are ongoing or repetitive for the duration of the incident. Tasks may be delegated to the appropriate Branch Director or Unit Leader.

1. Obtain briefing from Incident Commander:

    a. Review situation and resource status for number of personnel assigned to incident.
    b. Review current organization.
    c. Determine which incident facilities have been/should be activated.

2. Ensure Incident Command Post and other incident facilities are physically activated, as appropriate.

3. Confirm resource ordering process. Use Multnomah County's form for resource requests when unable to acquire necessary resources (Appendix O).

4. Ensure adequate supplies are available for pre-determined interim risk reduction measures, as outline in the Procedures associated with the Plan's Trigger and Action Table. Identify gaps in resources for these measures.

5. Assess adequacy of current Incident Communications Plan (ICS Form 205).

6. Maintain communication methods as well as track and allocate the communications resources.

7. Organize and staff Logistics Section, as appropriate, and consider the need for facility security, and Communication and Supply Units.

8. Assemble, brief, and assign work locations and preliminary work tasks to Section personnel:

    a. Provide summary of emergency situation.
    b. Provide summary of the kind and extent of Logistics support the Section may be asked to provide.

9. Track names and location of assigned personnel.

10. Attend Planning Meetings.

11. Participate in preparation of Incident Action Plan (IAP):

    a. Provide input on resource availability, support needs, identified shortages, and response time-lines for key resources.
    b. Identify future operational needs (both current and contingency), in order to anticipate logistical requirements.

12. Review IAP and estimate section needs for next operational period; order relief personnel if necessary.

Logistics Section Chief Position Action Sheet

13. Research availability of additional resources.

14. Hold Section meetings, as necessary, to ensure communication and coordination among Logistics Branches and Units.

15. Ensure coordination between Logistics and other Command and General Staff.

16. Ensure general welfare and safety of Section personnel.

17. Provide briefing to relief on current activities and unusual situations.

18. Ensure that all personnel observe established level of operational security.

19. Ensure all Logistics functions are documenting actions on Unit Log (ICS Form 214).

20. Submit all Section documentation to the Planning Section.

Finance / Administration Section Chief Position Action Sheet

This section is responsible for providing financial and general administrative support during an emergency. The Finance/Administrative section is particularly responsible for capturing the costs associated with the emergency and ensuring that there are sufficient financial resources to manage the incident. This includes ensuring that payroll and vendor payment obligations are met, obtaining additional cash or lines of credit to support emergency expenses, managing claims issues, etc. This section is also responsible for providing general administrative support such as clerical staffing. The leader of this section should be the person responsible for financial matters for the levee system. Other individuals who could take on this role are those responsible for payroll, vendor payments, and claims management.

The following task list should be considered as the minimum requirements for this position. Note that some of the tasks are one-time actions; others are ongoing or repetitive for the duration of the incident. Tasks may be delegated to the appropriate Unit Leader.

1. Obtain briefing from Incident Commander:

    a. Incident objectives.
    b. Participating/coordinating agencies.
    c. Anticipated duration/complexity of incident.
    d. Determine any political considerations.
    e. Obtain the names of any agency contacts the Incident Commander knows about.
    f. Possibility of cost sharing.
    g. Work with Incident Commander and Operations Section Chief to ensure work/rest guidelines are being met, as applicable.

2. Obtain briefing from agency administrator:

    a. Determine level of fiscal process required.
    b. Delegation of authority to Incident Commander, as well as for financial processes, particularly procurement.
    c. Assess potential for legal claims arising out of incident activities.
    d. Identify applicable financial guidelines and policies, constraints and limitations.

3. Obtain briefing from agency Finance/Administration representative:

    a. Identify financial requirements for planned and expected operations.
    b. Determine agreements are in place for land use, facilities, equipment, and utilities.
    c. Confirm/establish procurement guidelines.
    d. Determine procedure for establishing charge codes.
    e. Important local contacts.
    f. Agency/local guidelines, processes.
    g. Copies of all incident-related agreements, activated or not.
    h. Determine potential for rental or contract services.
    i. Is an Incident Business Advisor (IBA) available, or the contact information for an agency Financial/Administration representative?
    j. Coordinate with Command and General Staff and agency Human Resources staff to determine the need for temporary employees.
    k. Ensure that proper tax documentation is completed.
        i. Determine whether hosting agency will maintain time records, or whether the incident will document all time for the incident, and what forms will be used.

4. Ensure all Sections and the Supply Unit are aware of charge code.

5. Attend Planning Meeting:

    a. Provide financial and cost-analysis input.
    b. Provide financial summary on labor, materials, and services.

c. Prepare forecasts on costs to complete operations.
d. Provide cost benefit analysis, as requested.
e. Obtain information on status of incident; planned operations; changes in objectives, use of personnel, equipment, aircraft; and local agency/political concerns.

6. Gather continuing information:

a. Equipment time – Ground Support Unit Leader and Operations Section.
b. Personnel time – Crew Leaders, Unit Leaders, and individual personnel.
c. Accident reports – Safety Officer, Ground Support Unit Leader, and Operations Section.
d. Potential and existing claims – Operations Section, Safety Officer, equipment contractors, agency representative, and Compensation/Claims Unit Leader.
e. Arrival and demobilization of personnel and equipment – Planning Section.
f. Daily incident status – Planning Section.
g. Injury reports – Safety Officer, Medical Unit Leader, and Compensation/Claims Unit Leader.
h. Status of supplies – Supply Unit Leader and Procurement Unit Leader.
i. Guidelines of responsible agency – Incident Business Advisor, local administrative personnel.
j. Use agreements – Procurement Unit Leader and local administrative personnel.
k. What has been ordered? – Supply Unit Leader.
l. Unassigned resources – Resource Unit Leader and Cost Unit Leader.

7. Meet with assisting and cooperating agencies, as required, to determine any cost-share agreements or financial obligation.

8. Coordinate with all cooperating agencies and specifically administrative personnel in hosting agency.

9. Initiate, maintain, and ensure completeness of documentation needed to support claims for emergency funds, including auditing and documenting labor, equipment, materials, and services:

a. Labor - with breakdown of work locations, hours and rates for response personnel, contract personnel, volunteers, and consultants.
b. Equipment - with breakdown of work locations, hours and rates for owned and rented aircraft, heavy equipment, fleet vehicles, and other equipment.
c. Materials and supplies purchased and/or rented, including equipment, communications, office and warehouse space, and expendable supplies.

10. Initiate, maintain, and ensure completeness of documentation needed to support claims for injury and property damage. (Injury information should be kept on contracted personnel formally assigned to the incident, as well as paid employees and mutual aid personnel).

11. Ensure that all personnel time records reflect incident activity and that records for non-agency personnel are transmitted to home agency or department according to policy:

a. Notify incident management personnel when emergency timekeeping process is in effect and where timekeeping is taking place.
b. Distribute time-keeping forms to all Sections-ensure forms are being completed correctly.

12. Ensure that all obligation documents initiated by the incident are properly prepared and completed.

13. Assist Logistics in resource procurement:

a. Identify vendors for which open purchase orders or contracts must be established.
b. Negotiate ad hoc contracts.

14. Ensure coordination between Finance/Administration and other Command and General Staff.

Finance / Administration Section Chief Position Action Sheet

15. Coordinate Finance/Administration demobilization.
16. Provide briefing to relief on current activities and unusual events.
17. Ensure all Logistics Units are documenting actions on Unit Log (ICS Form 214).
18. Submit all Section documentation to Documentation Unit.

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Appendix L: Levee Inspection Guide

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MCDD Flood Protection

LEVEE INSPECTIONS

For use during emergency events

Inspector:

Date and Time:

Levee Patrol Area:

Vancouver Gage Reading
(in gage datum):

Item	What to look for	Observations / Areas of Concern / Notes
GENERAL		
Water distance from levee crest estimate	0-2 feet? 2-5'? 5-10'? 10-15'?	
Access roads/ramps	Usable and safe?	
Debris dams	Any debris catching in the river blocking flow?	
LEVEES		
Saturated areas / Sand boils	Any present on landside?	
Slides / sloughs	Any present?	
Wave wash / erosion	Any present?	
Low areas in crest	Any present?	
Relief wells	Flowing vs. not flowing	
Flap/Sluice Gates	Closed properly?	
Temporary floodwalls?	Closed properly?	
Toe Drains	Water flowing? Gushing or trickling? Clear or has sediment? Are drains nearby doing similar things?	
FLOODWALLS		
Saturated areas/ sand boils	Any present landward of wall?	
Settlement (movement)	Any observed?	
Bank caving	Any observed?	
Landward toe wet/soft areas, seeps, and or sink holes	Any observed?	
Stop log closures	Appropriate seepage?	

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Appendix M: Levee Threat Monitoring Guidelines

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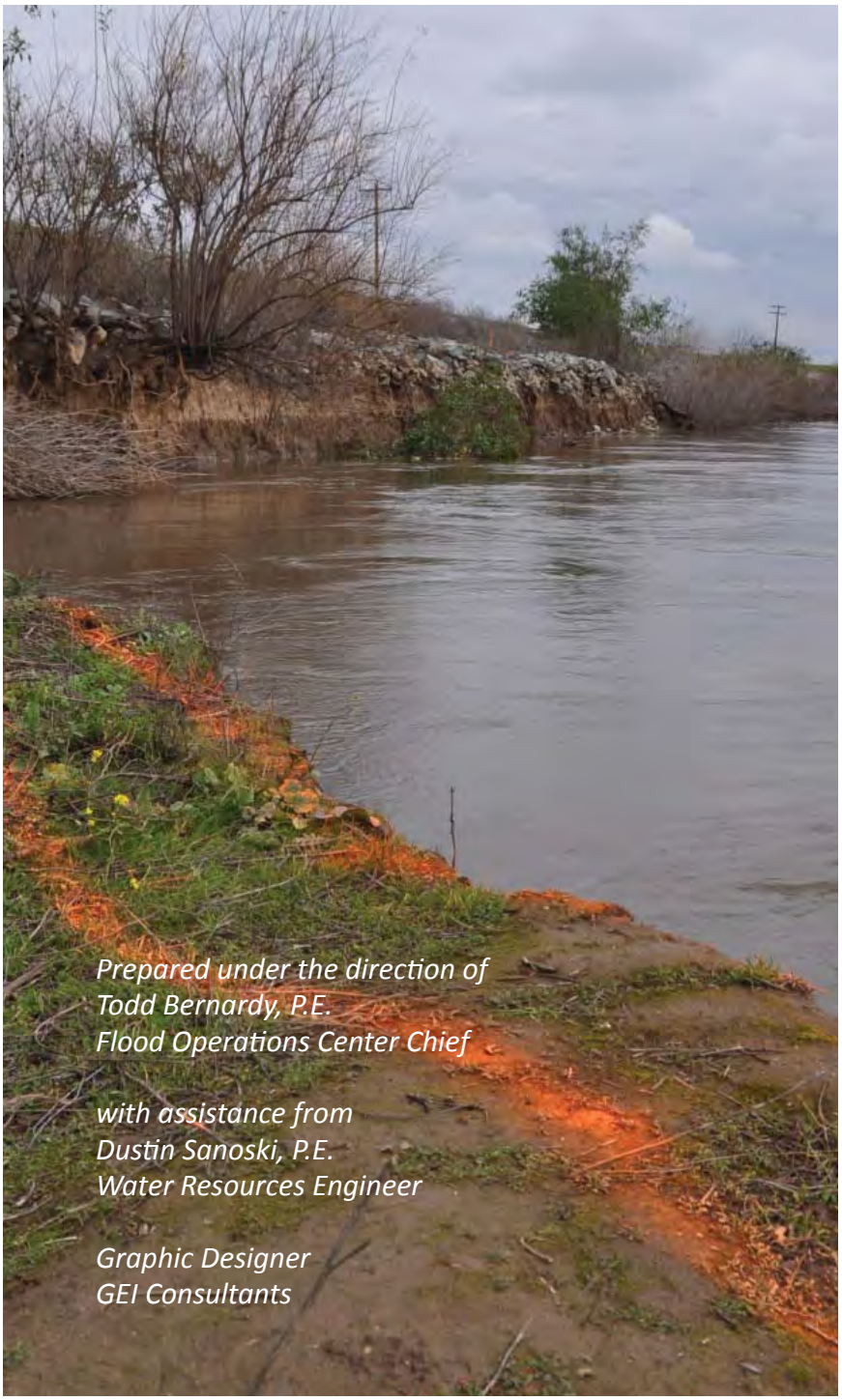
Levee Threat Monitoring Guidelines

State of California
Department of Water Resources
2012 Edition

Levee Threat Monitoring Guidelines

State of California
California Natural Resources Agency
Department of Water Resources

Division of Flood Management
Flood Operations Branch
April 2012



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Introduction

The purpose of the Levee Threat Monitoring Guidelines is to establish a set of "Best Practices" based on field-tested techniques used by levee maintaining agencies, their engineers, flood fight specialists, and levee inspectors to mark and monitor a levee threat.

These guidelines seek to "standardize" levee threat monitoring techniques and are NOT to be taken as requirements. This standardization will help ensure the threat is properly communicated to the appropriate groups, such as emergency responders and the Flood Operations Center. Particularly when there are multiple threats during a high water event, the ability to communicate effectively becomes especially important when the number of potential threats exceeds the available (limited) resources to respond, and a priority must be placed on which threat to mitigate first.

The Levee Threat Monitoring Guidelines presented in this field book were developed by the Department of Water Resources (DWR) Division of Flood Management in cooperation with the local maintaining agencies, experienced consultant engineers, and DWR maintenance yards.

Levee and Embankment Threats

The main causes of levee failure or flood related problems due to high water are:

- **Seepage** of water carrying material through or under the levee heavy enough to cause a “boil”.
- **Erosion** of the levee or embankment due to swift moving water or wave action.
- **Overtopping** resulting from water-surface elevations higher than the levee or embankment.

Patrolling

The best defense against flood related issues or levee failure is to identify problems early and repair them immediately. Levee inspections and effective high water patrolling make this possible. The following suggestions will help in organizing patrol teams for this work:

- Operate under the SEMS/ICS system and report to the appropriate section chief.
- Provide a sufficient number of workers for two 12-hour shifts.
- Provide each worker with a copy of the DWR “Flood Fighting Methods” handbook.
- Assign two people to each mobile patrol.
- Advise the officials of the district or agency responsible for emergency assistance in the area, and if necessary request the help from their Operational Area.

Terminology

Boil	Also known as “sand boil”, is caused by water flowing through or under a levee, possibly carrying eroded levee material, and surfacing on the land side of the levee.
Cracking	Fracture on the top or slope of a levee caused by displacement of the embankment material. Excessive cracking can lead to slipping/sliding (clay soils) or sloughing (silty or sandy soils).
Erosion	Removal of levee material from the toe or slope of the levee due to swift moving water or wave action possibly resulting in bank caving, section loss, or levee break.
Flood Fighting	An effort made to prevent or mitigate the effects of flood waters.
Hub	A wooden stake (1-1/2”x1-1/2”x8”) that is pounded into the ground as a place-holder (optional) for lath with only a few inches exposed and sprayed at the top with high visibility marking paint.
Lath	Long, narrow wooden stakes (1/4”x1-1/2”x33”) used to mark problem areas during high water patrolling. A brief description of the problem along with the date, time, and patroller’s initials are written on the lath with a permanent ink marker. Brightly colored survey ribbon is attached to the lath for easy identification.
Levee	An earthen structure that parallels a river or stream designed to prevent high water flows from inundating urban and/or agricultural land.
Levee Break	A point in the levee system that has failed to perform its designed function, has eroded away and is allowing water to inundate land.

Levee Breach	The same as “Levee Break” but can sometimes describe a section of levee that has been intentionally broken. If intentional, also known as a relief cut.
Overtopping	When water has risen higher than the banks of a waterway or the top of a levee.
Plastic Sheeting	Made of polyethylene; these 100’x20’x10-mil rolls are sometimes referred to as visquine and are commonly used for erosion control.
Relief Cut	Intentionally removed section of levee to relieve hydrologic pressure upstream and downstream of the levee section.
Sack Ring	Multiple sandbags used to encircle a boil, slow the flow of water, and stop the erosion of levee material.
Sandbag	An 18”x30” bag (burlap or plastic) filled with sand or other appropriate material intended for use as a temporary flood fighting measure.
Scarp	A steep slope or long cliff that occurs from erosion or faulting and separates two relatively level areas of differing elevations.
Seepage	Water traveling under or through a levee in the void spaces of the soil.
Slope Instability	Soil movement or slip/slides often caused by over-saturated levee slopes or hillside slopes. Can also be referred to as “sloughing” or “mud slides”.
“U” Shaped Sack Ring	A sandbag structure used on levee slopes to control boils.

Material Supplies Checklist:

- □ Lath (1/4”x1-1/2”x33”)(25)
- □ Stakes (3/4”x1-1/2”x17”)(25)
- □ Hubs (1-1/2”x1-1/2”x8”)(10)
- □ 6’ Rebar w/ Plastic Caps (2 No. 4 Rebar)
- □ Tie Wire
- □ Survey Ribbon (Bright Colors, Multiple Rolls)
- □ Sandbags (approximately 50 empty)
- □ Plastic Sheeting (Visquine) (1 roll)
- □ Box Twine (250lb tensile strength)
- □ Tie Down Buttons (approximately 100)
- □ Barricade or Safety Cones (Fluorescent Orange)
- □ Permanent Ink Markers
- □ High Visibility Marking Paint (17.0 oz)

Gear Checklist:

- □ First Aid Kit
- □ Personal Flotation Device
- □ Throw Rope
- □ Directory of Flood Officials & Flood Emergency Phone Card
- □ Log Book
- □ GPS
- □ Phone or Radio
- □ Rain Gear
- □ Boots or Rubber Boots
- □ Hard Hat
- □ Safety Glasses or Goggles
- □ Gloves
- □ Hip Waders
- □ Spot Light
- □ Pliers
- □ Tape Measure (100’)
- □ Bolt Cutter
- □ Tow Chain
- □ Chain Saw or Axe
- □ Flashlight w/ Batteries
- □ Shovels, Long Handle (#2 Mud Shovel)
- □ Sledge Hammer (5 or 8 lb)
- □ Camera

Lath Labeling Example

High Visibility Marking Paint
(top 6" minimum)

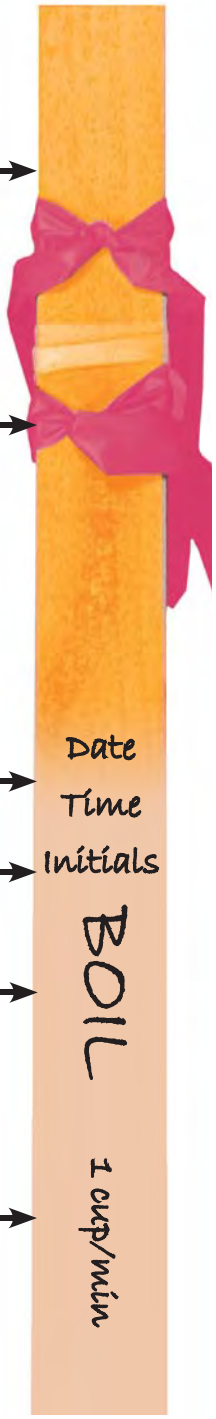
Survey Ribbon – use bright colors and double-up for extra visibility and redundancy (Tie it, wrap it around, and tie it again)

Provide Date and Time (24-hr) as reference for determining rates (i.e. rate of decay, flow rate, etc.)

Provide Initials to reference patroller

Threat being monitored

Pertinent information being used to describe threat (i.e. flow rate, offset distance, horizontal/vertical displacement, etc.)



7

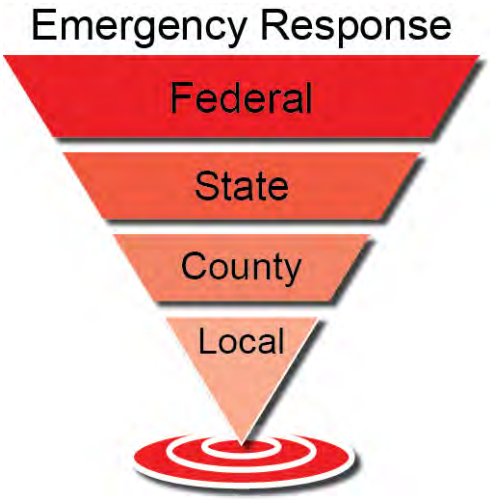
Field Safety Measures

- **Check Weather Patterns**: Always know weather forecasts and how it affects the vulnerable areas.
- **Changing Water Patterns**: The rise and fall of water can occur gradually or very quickly. Knowledge of high water and how it relates to your sites/levees is essential. Continuous monitoring and communication of water level influences, (i.e. reservoir releases, tides, and drainage inflow) is very important. Always know your area and its flood history.
- **Swift Water**: High velocities of water are common during high water events. Extreme caution should be used when anyone is exposed to high water. Workers must have personal flotation devices, throw ropes, and lifelines in the immediate area. Each staking crew must be composed of at least two individuals when staking swift water areas. Use common sense and sound judgment around swift water. Know your resources and how to activate them prior to the event. Swift water rescue teams may be available.
- **Temperature Related Illness**: Weather patterns can change constantly. Changes in temperature present the potential for hypothermia and heat exhaustion/stroke. Levee monitors should know the signs of distress for these types of illnesses and how to treat them. During cold, wet weather, it is recommended that workers layer clothing to stay warm and dry. A dry blanket and warm clear fluids should be on the work site for emergency use. In warm/hot weather lightweight clothing is recommended. If skin is exposed, a sun block agent may need to be applied. Plenty of drinking water should be on site and consumed regularly. Headgear is recommended in both hot and cold situations.
- **Insect/Animal Exposure**: Flooded areas force a variety of animals to evacuate to high ground. Workers in these areas should be aware of these animals and not handle them. If animal removal is needed, contact a local professional. Stinging and biting insects are prominent in certain flood-prone areas. Chemical repellents can be useful as a deterrent. A complete first aid kit should be on site.

- **Vegetation**: Noxious plants such as star thistle, stinging nettle, and poison oak are commonly found along rivers, streams, and levees. Avoid direct contact with this type of vegetation to prevent itching and rash. Consult medical personnel if symptoms persist. Individuals with history of allergic reaction should consider carrying an EpiPen.
- **Contamination**: Flooded areas can potentially carry high levels of contaminants. Common contaminants include fuel, sewage, and pesticides. Local Haz-Mat teams should be contacted if needed. Always wear protective clothing to help limit contact with water. Carry antibacterial hand soap and wash thoroughly after working around flood water.
- **Construction Equipment**: There are times when equipment and people will occupy the same work area. Workers should wear safety vests and hard hats and be aware of their surroundings. Safety warning devices (i.e. backup alarms and lights) should be intact and working on all equipment. Keep a battery-operated flashlight and radio on hand. Communication and alertness are vital! All operators must be certified for their equipment.
- **Boat Travel**: Materials and/or personnel will sometimes need to be transported to work sites by boat. Operators of the watercraft must be certified. Personal flotation devices must be available for every passenger. Extreme care should be taken while loading and off loading.
- **Patrolling**: Patrols will identify, mark, and monitor trouble spots in affected areas. Vehicle patrols should travel in two person teams with dependable communication devices. Lifelines, personal flotation devices, and a blanket should be in the vehicle for possible water-related accidents. Foot patrols should also have the same considerations. Extreme caution should be exercised when travelling saturated, cracked, or sloughing areas. Learn first-aid and have a first-aid kit with you at all times. Never turn your back on the water - work facing the water whenever possible or have a spotter monitor it for you if necessary. Do not take actions that would put an individual in harm's way.

- **Structure Considerations**: When working around structures be aware of downed power lines, natural gas or propane leaks, and unstable structure supports. Communicate with the structure owner if possible.
- **Vehicle Considerations**: Vehicles along the levee should remain parked on high ground; this is usually the crown of the roadway. Vehicles should also be parked facing their access point to allow for a quick exit (if possible). An escape plan should be communicated to all flood workers prior to heading out into the field. Do not drive through floodwaters during high water events. Remember, two feet or less of water can cause a car to be swept away.

10



Every emergency begins at the local level. Be prepared and have an emergency action plan!

- Patrol plan & schedule
- Emergency contacts & calling tree
- Emergency response protocols for monitor, flood, danger stage, and incident
- Location and quantities of flood fight materials
- Location and type of equipment available
- Evacuation plan and rally point
- List of critical sites that need extra attention
- Location & contact information for county Emergency Operations Center (EOC)

Share your emergency action plan with your local county Office of Emergency Services and DWR Flood Operations Center.

SEEPAGE

Considerations Around Seepage

1. Do not park directly above the area of seepage.
2. Do not tread unnecessarily near the area of seepage.
3. The sensitive zone may be saturated–do not walk directly from the road straight down to the area of seepage.
4. Confirm the seepage is NOT caused by an irrigation pipe.

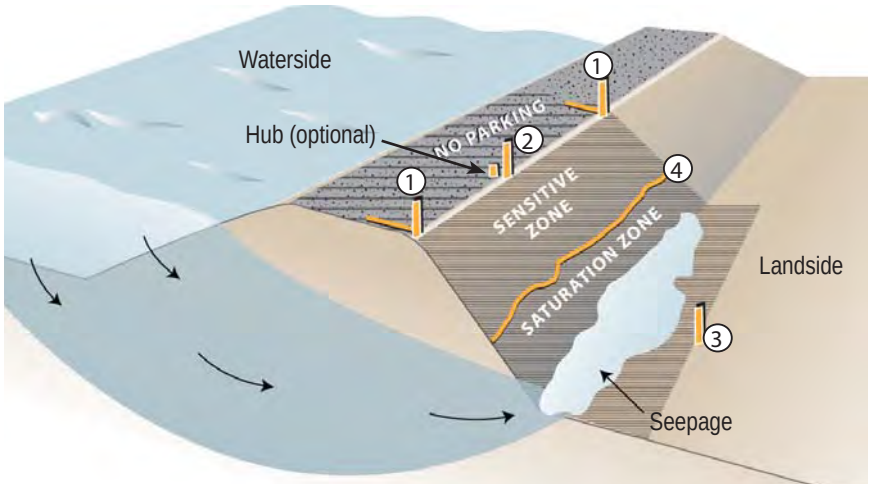
What to Measure and Record in Log Book

Monitor changes in the extent of seepage and transport of material.

- Date, Time, Person's Name
- Location along levee (GPS coordinates, levee mile, or approximate description) – use lath ② for reference
- Description of threat:
  - » Offset distances from lath
  - » Approximate longitudinal length along levee
  - » Approximate pond width into field
  - » Material transport: flowing clear or carrying material
  - » Note if the water appears to be ponded or is flowing
  - » Extent of soil saturation up the levee toe
  - » Note signs of slope instability
  - » Approximate water surface elevation relative to crown
  - » Note forecast point staff gage reading
  - » Note past performance history of site
- Note surrounding ground conditions & signs of poor drainage
- Take photos or draw schematic for records

12

How to Mark Seepage



① Place one lath at the beginning of the ponding location and one at the end. Mark each lath with an arrow pointing inwards toward the location of ponding. Mark whether the water appears to be clear or carrying material. Add lath as the threat grows (do NOT remove old lath). Paint can be used as an alternative to placing lath.

② Mark the longitudinal length and width of the ponding along the levee. Place an optional hub at the base of the lath to identify the location of the threat in case the lath becomes lost or stolen.

③ Lath alternative: Place an additional lath in the landside field at the extent of ponding.

④ Saturation zone (if weather permits): Draw a line up and along the levee slope using high visibility marking paint to display the edge of the saturation zone. Paint date next to line.

Replace lath if lost or stolen

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BOIL

Considerations Around Boil

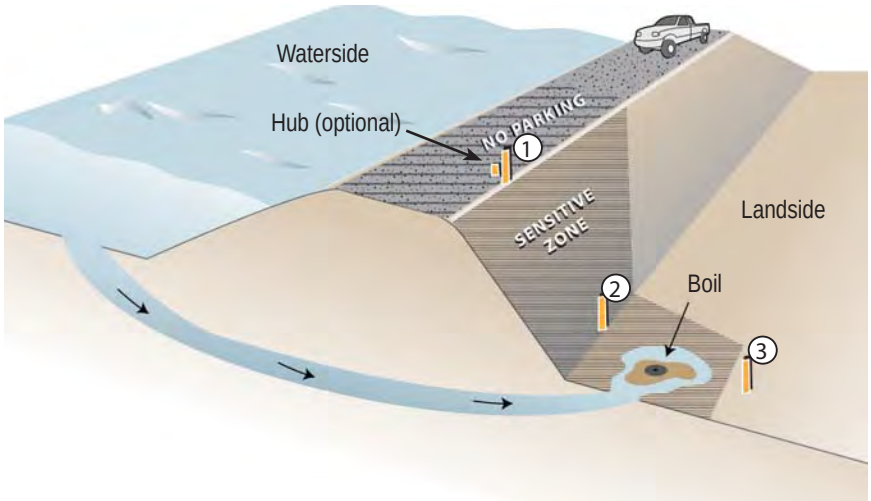
1. Do not park directly above the boil.
2. Do not tread unnecessarily near the boil.
3. The sensitive zone may be saturated–do not walk directly from the road straight down to the boil.
4. Confirm the boil is NOT caused by an irrigation pipe.

What to Measure and Record in Log Book

Monitor changes in water flow rate and transport of material.

- Date, Time, Person's Name
- Location along levee (GPS coordinates, levee mile, or approximate description) – use lath ① for reference
- Description of threat:
  - » Located on levee slope or ground adjacent to slope
  - » Offset distances from lath
  - » Distance from levee toe
  - » Diameter of boil(s) & total number of boils
  - » Material transport: water flowing clear or carrying material
  - » Approximate flow rate (i.e. 1 cup/min, 1 coffee can/min, 5-gallon bucket/min)
  - » Approximate water surface elevation relative to crown
  - » Note forecast point staff gage reading
  - » Note past performance history of site
- Note surrounding ground conditions & signs of poor drainage
- Take photos or draw schematic for records

How to Mark a Boil



① Mark the diameter of the boil and the approximate flow rate. Place an optional hub at the base of the lath to identify the location of the threat in case the lath becomes lost or stolen.

② Measured from the levee toe, mark the distance to the edge and to the center of the boil. Place this lath when boil is located far from toe.

③ Lath alternative: Place an additional lath in the landside field at a minimum distance of 10' from the boil edge to show extent of ponding.

Optional measure: If there is a question about source of boil, use environmentally safe dye in adjacent irrigation channels to confirm water flow is from river.

*****Replace lath if lost or stolen*****

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SINK HOLE

Considerations Around Sink Hole

1. Do not park directly adjacent to sink hole.
2. Be cautious of collapse around sink hole.
3. Be cautious around toe of levee slope.
4. Confirm the sink hole is NOT caused by an irrigation pipe.

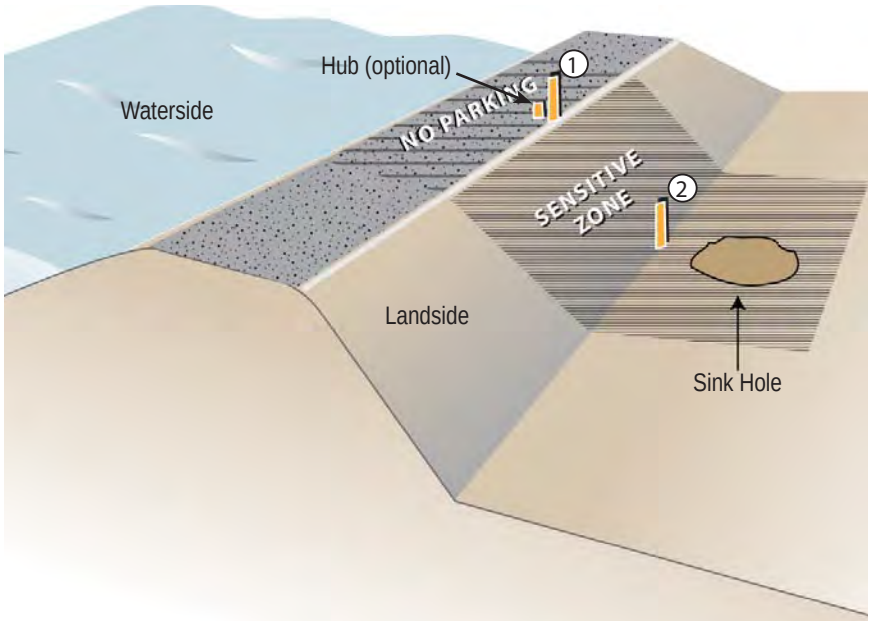
What to Measure and Record in Log Book

Monitor changes in diameter, depth of sink hole, and water level.

- Date, Time, Person's Name
- Location along levee (GPS coordinates, levee mile, or approximate description) – use lath ① for reference
- Description of threat:
  - » Location of threat (landside, waterside, crown, slope, toe)
  - » Offset distances from lath
  - » Diameter of sink hole
  - » Note if sink hole is dry or filled with water
  - » Use a lath to approximate the depth of water
  - » Note if pipes, risers, valves or other appurtenances are present.
  - » Approximate water surface elevation relative to crown
  - » Note forecast point staff gage reading
  - » Note past performance history of site
- Take photos or draw schematic for records

16

How to Mark Sink Hole



① Mark the diameter of the sink hole. Place an optional hub at the base of the lath to identify the location of the threat in case the lath becomes lost or stolen.

② Measured from the levee toe, mark the distance to the edge and to the center of the sink hole. Place this lath when sink hole is located far from toe.

Replace lath if lost or stolen*

CRACKING

Considerations Around Cracking

1. Do not park directly on the cracks.
2. Place lath 1' offset from cracks (typical).

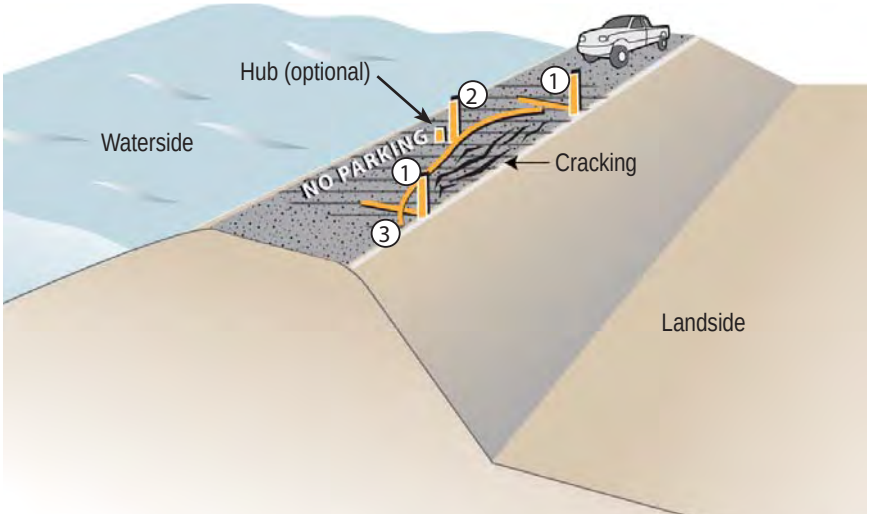
What to Measure and Record in Log Book

Monitor change in length, width, depth, and extent into crown.

- Date, Time, Person's Name
- Location along levee (GPS coordinates, levee mile, or approximate description) - use lath ② for reference
- Description of threat:
  - » Location of threat (landside, waterside, crown, slope)
  - » Offset distances from lath or paint
  - » Longitudinal length of cracking
  - » Width of cracking into crown
  - » Largest crack width
  - » Largest depth in crack
  - » Note bulging or instability on levee slope
  - » Approximate water surface elevation relative to crown
  - » Note forecast point staff gage reading
  - » Note past performance history of site
- Take photos or draw schematic for records

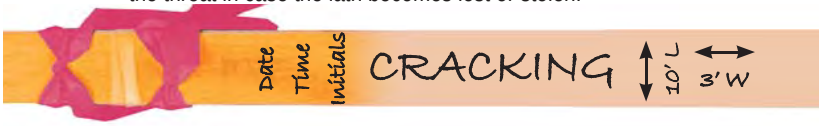
18

How to Mark Cracking



① Place one lath at the beginning of the cracking and one at the end. Mark each lath with an arrow pointing inwards toward the location of the threat. Mark the largest width and depth of cracking. Add lath as the threat grows (do NOT remove old lath). Paint can be used as an alternative to placing lath.

② Place one lath at the center location of cracking- beyond the area of cracking and adjacent to the affected area of the levee. Mark the longitudinal length of cracking; also mark the extent onto the crown if the cracking is occurring on the crown. Place an optional hub at the base of the lath to identify the location of the threat in case the lath becomes lost or stolen.



③ Paint alternative (if weather permits): Draw a line adjacent to the cracking using high visibility marking paint. This will aid in visually displaying the area of cracking. Paint date next to line. Use in addition to the placing and marking of lath.

*****Replace lath if lost or stolen*****

19

SLOPE INSTABILITY

Considerations Around Slope Instability

1. Do not park directly above unstable slope.
2. Barricade/cone the area if more than ¼ crown width (horizontally) or more than 2' of vertical displacement has occured (severe case). Place lath 2' offset from threat (typical).
3. Tread lightly in sensitive zone to prevent causing additional levee damage or injury to individual.

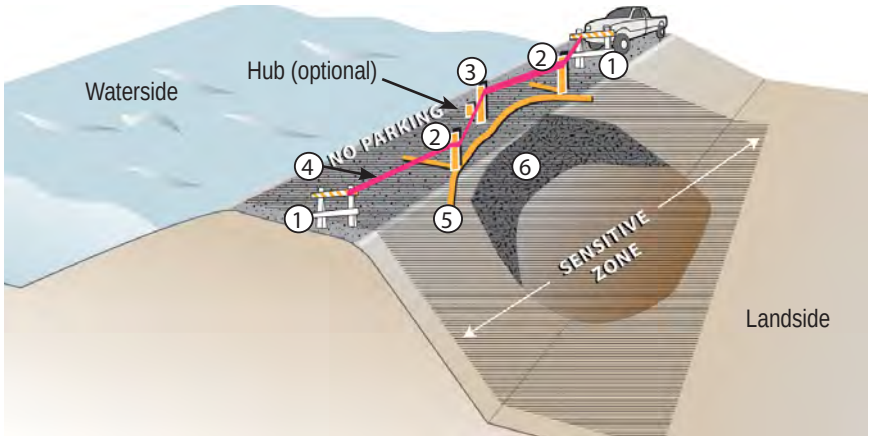
What to Measure and Record in Log Book

Monitor movement of levee slope and record changes in horizontal and vertical displacement.

- Date, Time, Person's Name
- Location along levee (GPS coordinates, levee mile, or approximate description) – use lath ③ for reference
- Description of threat:
  - » Location of threat (landside crown, slope, toe)
  - » Offset distances from lath
  - » Longitudinal length
  - » Extent into crown
  - » Vertical displacement
  - » Horizontal displacement
  - » Note any bulging on levee slope
  - » Approximate water surface elevation relative to crown
  - » Note forecast point staff gage reading
  - » Note past performance history of site
- Take photos or draw schematic for records

20

How to Mark Slope Instability



① Place barricade/cones 8' offset (minimum) from lath ②. Barricade/cones prevent vehicles from entering "danger zone" and are to be used in severe cases of horizontal and vertical displacement.

② Place one lath at the beginning of the slope instability (write "slip" on lath as a generic term to describe slope instability) and one at the end. Mark each lath with an arrow pointing inwards toward the location of the threat. Add lath as the threat grows (do NOT remove old lath). Paint can be used as alternative to placing lath.

③ Place a lath at the center location of slope instability. Mark the longitudinal length of the threat. Place an optional hub at the base of the lath to identify the location of the threat in case the lath becomes lost or stolen.

④ Ribbon connects the barricades to lath and encloses the "danger zone" from one side of the slope instability site to the other. Use bright colored ribbon to help make the site more visible.

⑤ Paint alternative (if weather permits): Draw a line adjacent to the edge of displacement using high visibility marking paint. This will aid in visually displaying the unstable site. Paint date next to line. Use in addition to the placing and marking of lath.

⑥ See page 22 for marking horizontal and vertical displacement.

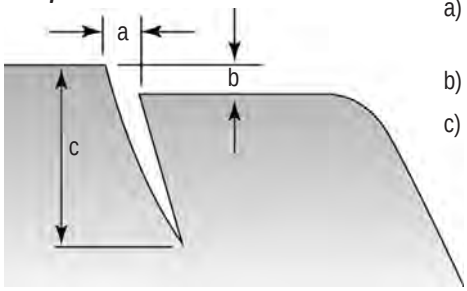
Replace lath if lost or stolen

SLOPE INSTABILITY

How to Monitor Horizontal & Vertical Displacement

1. Pound two laths vertically into stable section at a 1' offset from the moving section, 6" deep minimum, and space them 6" apart.
2. Secure one lath horizontally to the two lath on the stable section (as shown on next page) using tie wire or a comparable alternative. Stabilize lath using ground surface.
3. Pound one lath vertically into moving section approximately 6" deep, and offset 6" from the stable section. Place lath so that it rests against horizontal lath.
4. Draw a line on the vertical lath at the bottom of where it intersects with the horizontal lath. [This identifies the "baseline" for where to begin measuring vertical displacement]. Mark the date and time below this line.
5. Draw a line on the horizontal lath at the bottom of where it intersects with the vertical lath. [This identifies the "baseline" for where to begin measuring horizontal displacement]. Mark the date and time below this line.
6. Come back (some time later) and mark on the horizontal lath where it intersects with the vertical lath, and mark on the vertical lath where it intersects with the horizontal lath. Repeat this step over time as slope continues to displace.
7. Rate of horizontal & vertical displacement is the distance measured between observations divided by time.

Early Stage Horizontal and Vertical Displacement

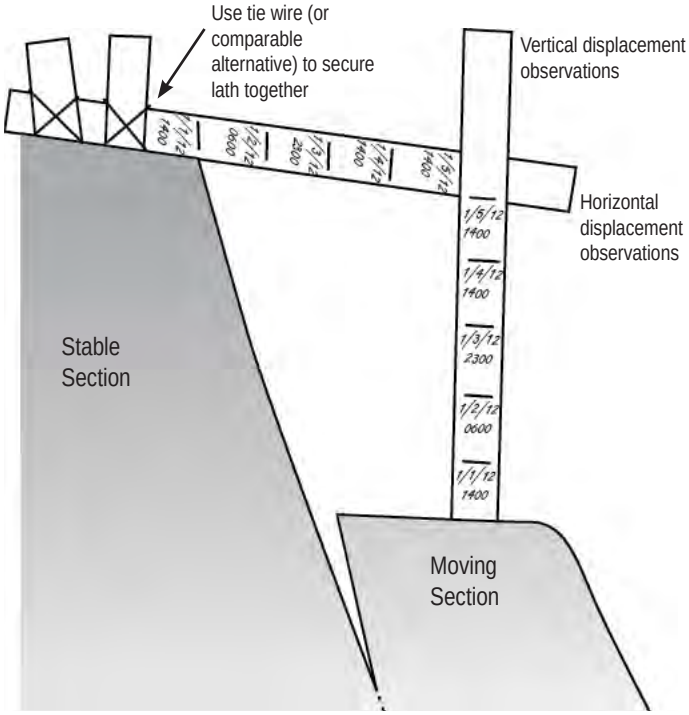


a) Horizontal displacement

b) Vertical displacement

c) Crack depth

Late Stage Horizontal and Vertical Displacement



23

WAVE WASH

Considerations Around Wave Wash

1. Walk and drive carefully around areas subject to wave wash.
2. If wave wash results in erosion that encroaches into the levee prism it could lead to rapid levee failure.

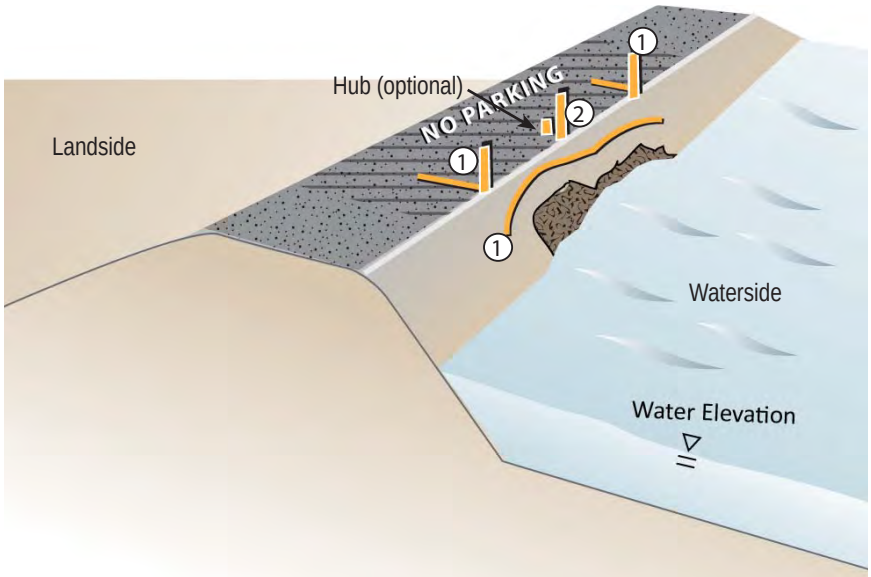
What to Measure and Record in Log Book

Monitor changes in length and expansion of erosion toward crown.

- Date, Time, Person's Name
- Location along levee (GPS coordinates, levee mile, or approximate description) – use lath ② for reference
- Description of threat:
  - » Distance down slope relative to crown
  - » Length and width(s) of erosion
  - » Height and depth of scarp
  - » Approximate water surface elevation relative to crown
  - » Note forecast point staff gage reading
  - » Note past performance history of site
- Take photos or draw schematic for records

24

How to Mark Wave Wash



① Place one lath at the beginning of the area experiencing wave wash and one at the end. Mark each lath with an arrow pointing inwards toward the location of the threat. Add lath as the threat grows (do NOT remove old lath). Paint can be used as an alternative to placing lath.

② Mark the longitudinal length and width of the wave wash extent. Place an optional hub at the base of the lath to identify the location of the threat in case the lath becomes lost or stolen.

Replace lath if lost or stolen

EROSION

Considerations Around Erosion

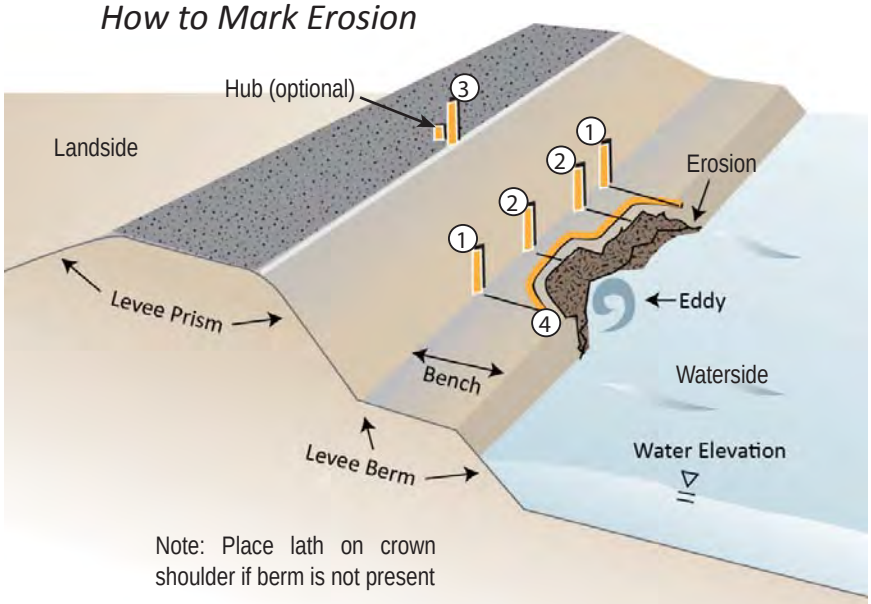
1. Walk and drive carefully around erosion site–loose soil could collapse and cause injury to person and/or vehicle.
2. If erosion encroaches into levee prism (see diagram) it could lead to rapid levee failure.
3. Be cautious near edge of erosion; eddy may have undermined bank integrity and may cave in unexpectedly.

What to Measure and Record in Log Book

Monitor changes in length and expansion of erosion toward crown.

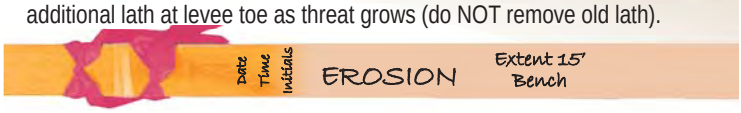
- Date, Time, Person's Name
- Location along levee (GPS coordinates, levee mile, or approximate description) – use lath (3) for reference
- Description of threat:
  - » Site relative to bend (straight, inside/outside)
  - » Offset distances from lath or paint
  - » Length and width(s) of erosion
  - » Height and depth of scarp
  - » Note if eddy has formed
  - » Approximate water surface elevation relative to crown
  - » Note forecast point staff gage reading
  - » Note past performance history of site
- Take photos or draw schematic for records

How to Mark Erosion

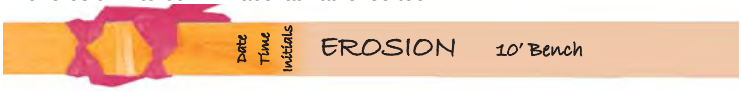


Note: Place lath on crown shoulder if berm is not present

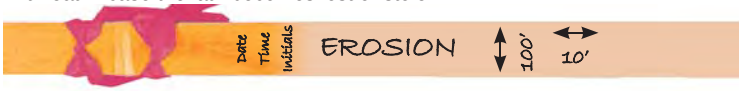
① Mark offset distance from levee toe to edge of berm where no erosion has occurred – shows "normal" bench width and the extent of erosion. Place additional lath at levee toe as threat grows (do NOT remove old lath).



② Mark offset distance from levee toe to edge of erosion – shows depth of erosion into berm. Place lath at levee toe.



③ Place lath at levee crown shoulder and center it longitudinally across erosion site. Mark the longitudinal length of erosion. Place an optional hub at the base of the lath to identify the location of the threat in case the lath becomes lost or stolen.



④ Paint alternative (if weather permits): Draw a line adjacent to the erosion, and several more in 4' increments away from the erosion, using high visibility marking paint. This will aid in visually displaying the rate of the erosion over time. Paint date next to line. Use in addition to the placing and marking of lath.

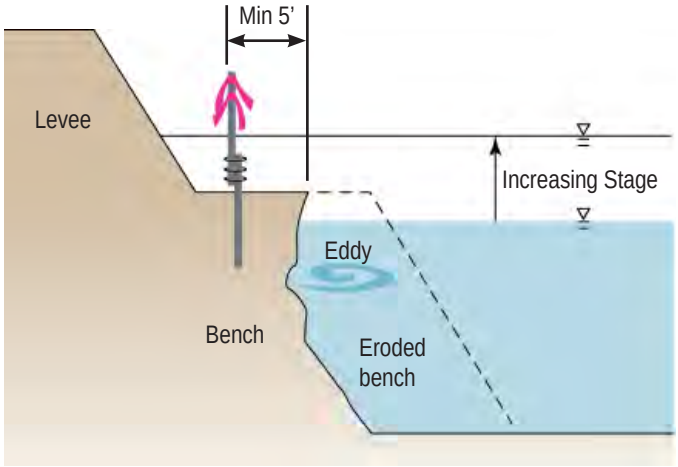
*****Replace lath if lost or stolen*****

EROSION

Monitor Erosion When Berm is Obscurred

If there is concern that the erosion site may be obscurred due to water surface/stage increase, the berm can be monitored by placement of rebar. If rebar is gone, there is high likelihood that the erosion has grown to rebar location. One technique to monitor erosion when berm is obscurred by water surface is described below:

1. Drive No. 4 rebar 2'-3' into ground no closer than 5' from current erosion edge.
   - » Be aware of potential for undercutting by eddys.
   - » Note location of rebar relative to levee toe and erosion edge.
2. Attach second No. 4 rebar to first rebar using tie wire so that the combined height of the two rebar are at least 6' above bench surface.
3. Attach 2 survey ribbons at the top of the second rebar.
4. To help protect the monitoring rebar against debris floating downstream, place three rebar upstream of monitoring rebar in a diagonally staggered line so to best deflect debris.
5. Document rebar location and distance from rebar to edge of erosion in log book.
6. Take photos or draw schematic for records.



28

A Special Thank You to:

Flood Maintenance Office
- Phil Carey
- Russ Eckman
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- Eric McGrath
- Brian Murphy
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- Jeff Van Gilder

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- Rick Burnett
- Patricia Clark
- Nova Clemenza
- William Croyle
- Sean de Guzman
- Greg Harvey
- John Paasch
- Wendy Stewart
- Ally Wu

Flood Project Integrity & Inspection Branch
- Amy Bindra
- Tariq Chechi
- David Chen
- Bob Duffey
- Jim Eto
- Tasmin Eusuff
- Pavel Kazi
- Jaime Matteoli
- David Pesavento
- Herman Phillips
- Clay Thomas
- John Williamson

Flood Risk Assessment and Mitigation Office
- Vincent Rodriguez

National Weather Service
- Cindy Matthews

Reclamation District 900
- Tony Schwall

San Joaquin County
- Eric Ambriz
- John Nelson

Reference Guide:

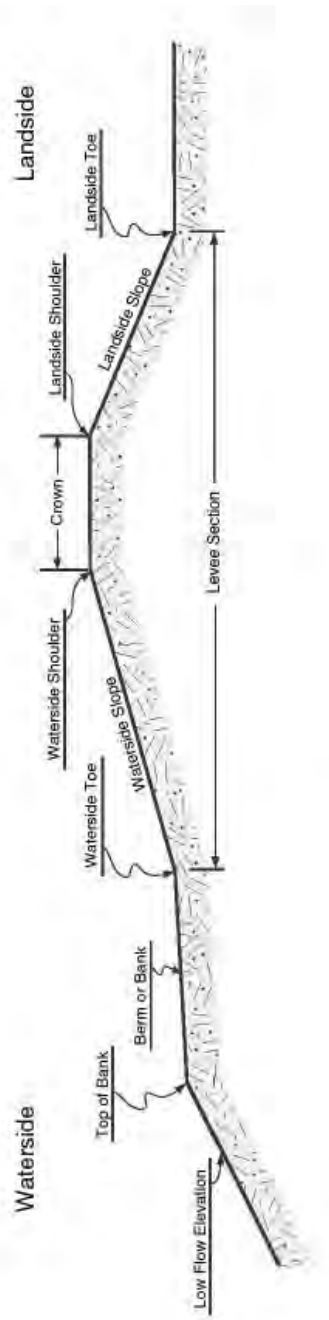
DWR Division of Flood Management:
www.water.ca.gov/floodmgmt

California Data Exchange Center (CDEC)
http://cdec.water.ca.gov

California Emergency Management Agency (CalEMA)
www.calema.ca.gov

National Weather Service
www.weather.gov

To request a copy of the Directory of Flood Officials or Flood Emergency Phone Card, contact the DWR Flood Operations Center at (916) 574-2619.



Levee Cross Section

State of California
Department of Water Resources
Division of Flood Management
Flood Operations Branch

FLOOD
EMERGENCY RESPONSE

For all flood emergencies, questions, or
for additional information, please contact:

State-Federal Flood Operations Center
(916) 574-2619
(800) 952-5530
flood_center@water.ca.gov

FloodSAFE CALIFORNIA DEPARTMENT OF WATER RESOURCES

version 1.1

Appendix N: Levee Patrol Area Maps

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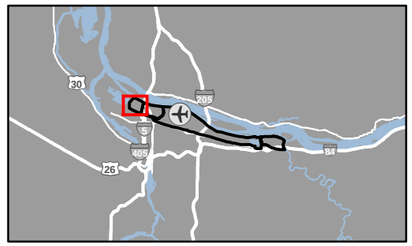
FEAP Appendix N: Levee Patrol Area 1 PEN 1

for levee monitoring during a high water event

Legend

- Cross Levee/Embankment
- Levee
- Levee Pipe System
- Levee System Wells/ Drains/ Inverts
- Gate
- Areas of Concern
- Emergency Transportation Routes
- Pump Stations
- Freeway
- Arterial
- Levee Parol Area
- Floodwall Closure Locations



MCDD Flood Emergency Action Plan. This map shows the patrol areas for levee monitoring that will be used during a high water event in the Districts.

0 680 1,360
Feet

N

Streets basemap provided by ESRI ArcGIS Online. Freeways and waterway data provided by Metro RLIS. Emergency Transportation Routes data provided by Multnomah County. All other data generated by MCDD.

MCDD Flood Protection
p. 503.281.5675
www.mcdd.org

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Produced By: ACarkner

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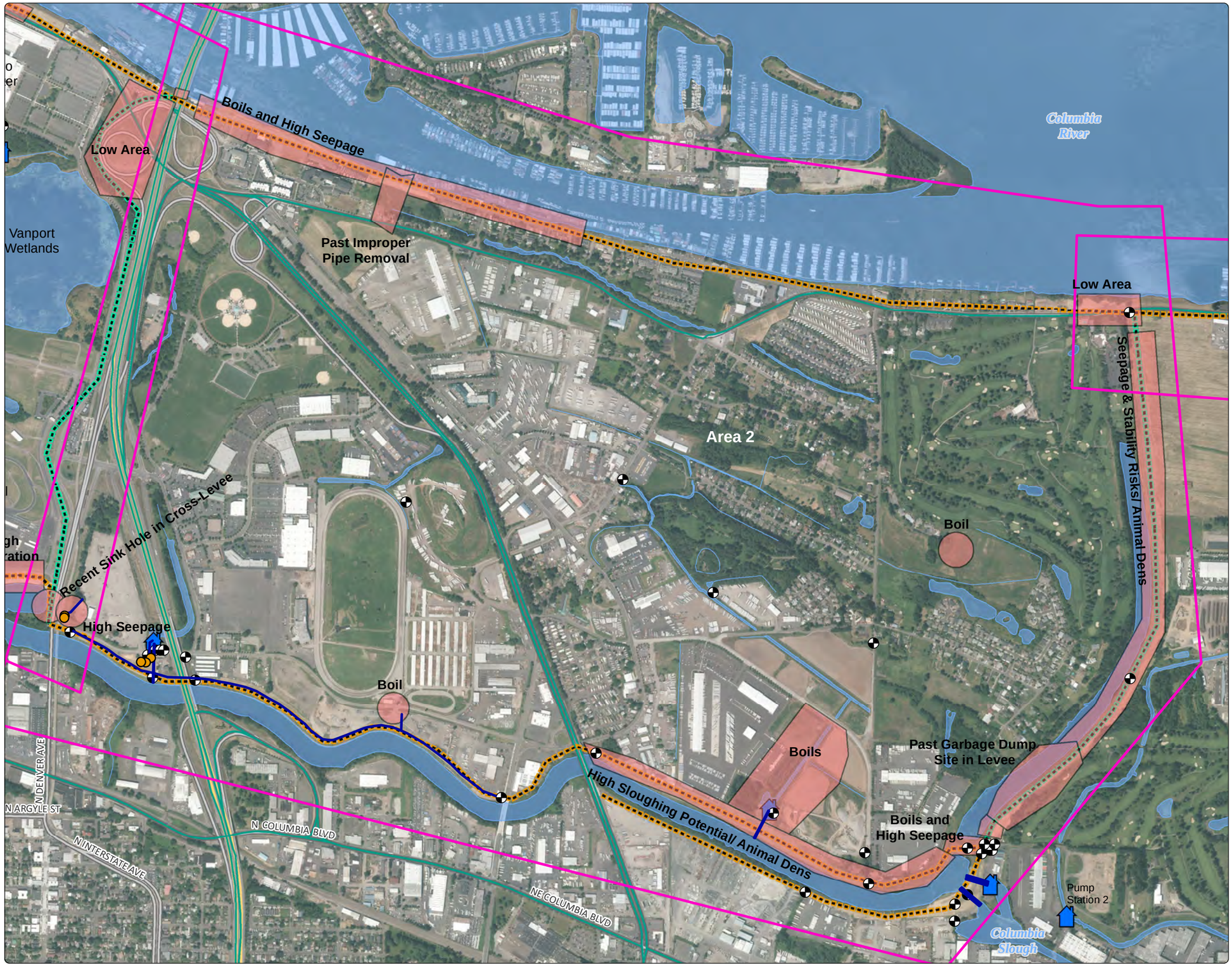
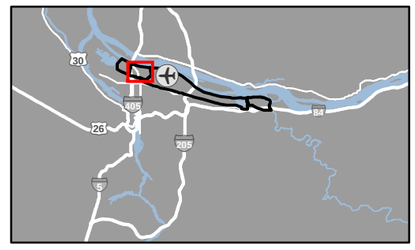
FEAP Appendix N: Levee Patrol Area 2 PEN 2

for levee monitoring during a high water event



Legend

- Levee System Wells/ Drains/ Inverts
- Levee Pipe System
- Gate
- Risk Driver
- Pump Stations
- Cross Levee/Embankment
- Levee
- Emergency Transportation Routes
- Freeway
- Arterial
- Levee Parol Area



MCDD Flood Emergency Action Plan.
This map shows the patrol areas for levee monitoring that will be used during a high water event in the Districts.

0 720 1,440
Feet

N

Streets basemap provided by ESRI ArcGIS Online. Freeways and waterway data provided by Metro RLIS. Emergency Transportation Routes data provided by Multnomah County. All other data generated by MCDD.

MCDD Flood Protection
p. 503.281.5675
www.mcdd.org

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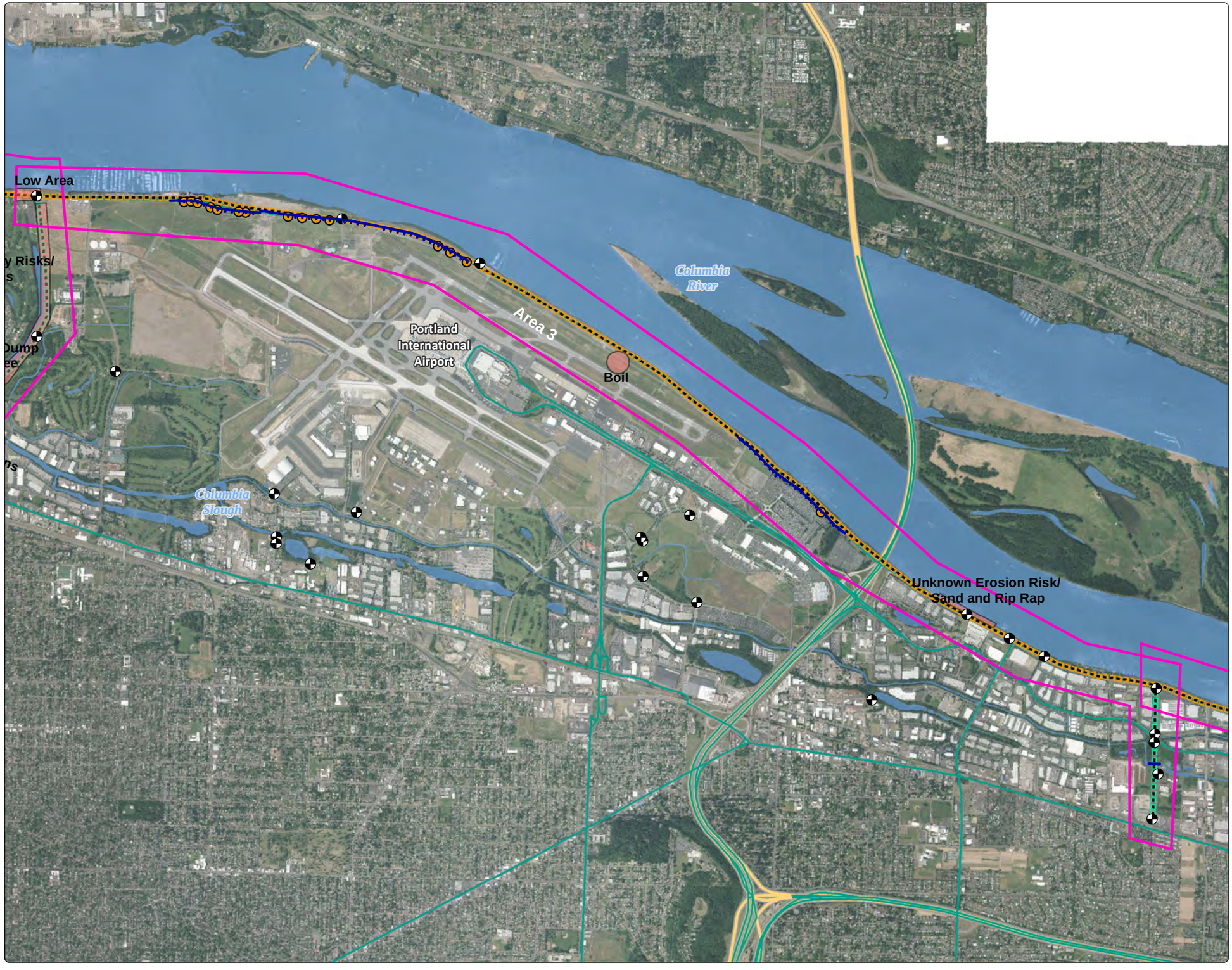
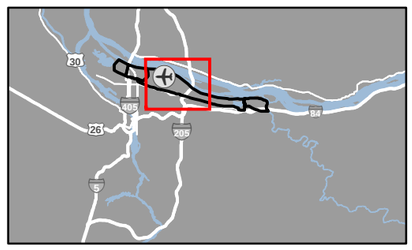


FEAP Appendix N: Levee Patrol Area 3 MCDD-West

for levee monitoring during a high water event

Legend

- Levee Pipe System
- Levee System Wells/ Drains/ Inverts
- Gate
- Risk Driver
- Cross Levee/Embankment
- Levee
- Emergency Transportation Routes
- Freeway
- Levee Parol Area



MCDD Flood Emergency Action Plan. This map shows the patrol areas for levee monitoring that will be used during a high water event in the Districts.

0 1,800 3,600

Feet

N

Streets basemap provided by ESRI ArcGIS Online. Freeways and waterway data provided by Metro RLIS. Emergency Transportation Routes data provided by Multnomah County. All other data generated by MCDD.

MCDD Flood Protection

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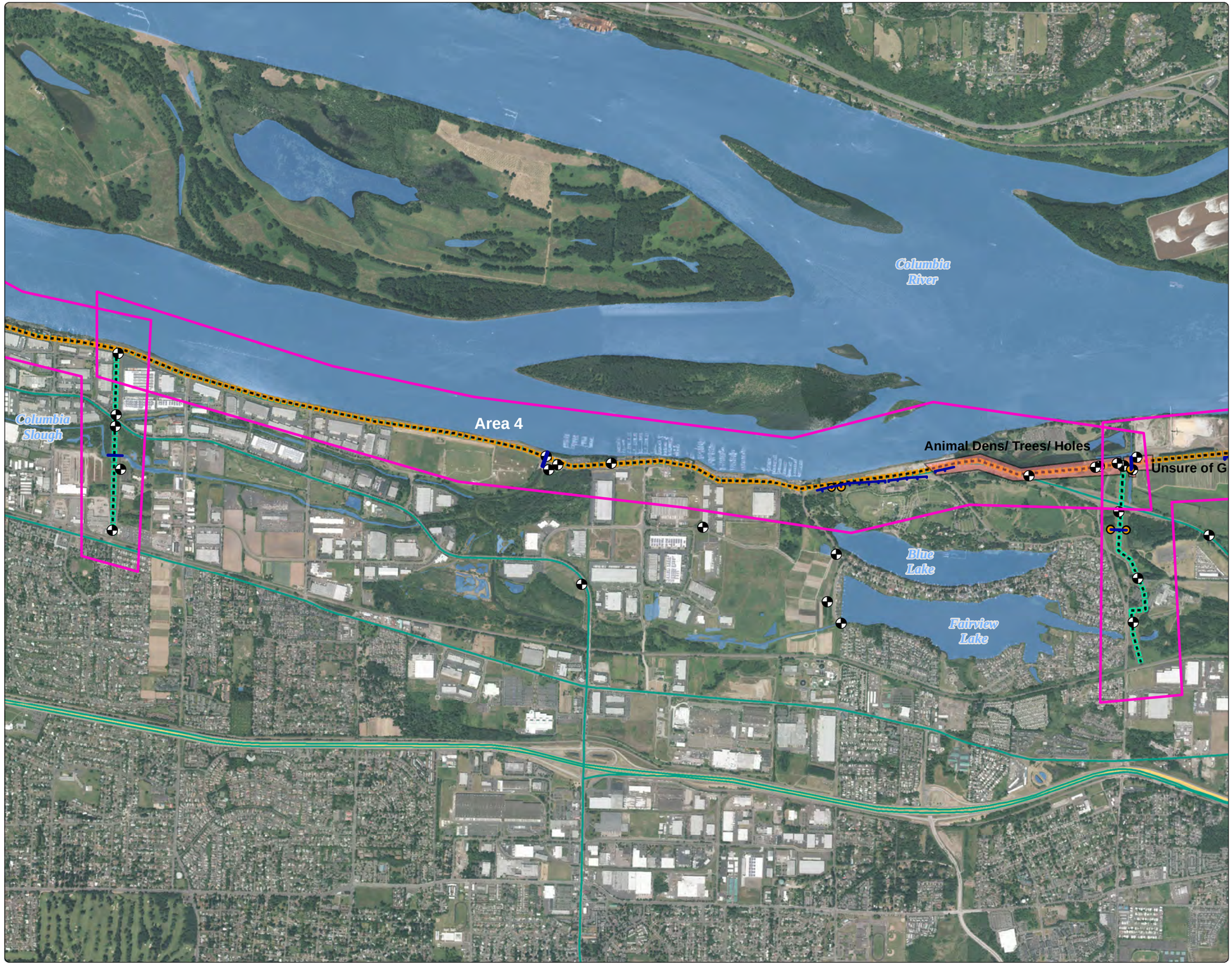
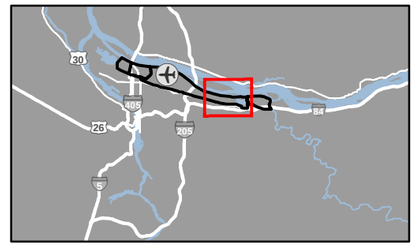


FEAP Appendix N: Levee Patrol Area 4 MCDD-East

for levee monitoring during a high water event

Legend

- Levee Pipe System
- Levee System Wells/ Drains/ Inverts
- Gate
- Risk Driver
- Cross Levee/Embankment
- Levee
- Emergency Transportation Routes
- Freeway
- Levee Parol Area



MCDD Flood Emergency Action Plan.
This map shows the patrol areas for levee monitoring that will be used during a high water event in the Districts.

0 1,300 2,600
Feet

N

Streets basemap provided by ESRI ArcGIS Online. Freeways and waterway data provided by Metro RLIS. Emergency Transportation Routes data provided by Multnomah County. All other data generated by MCDD.

MCDD Flood Protection
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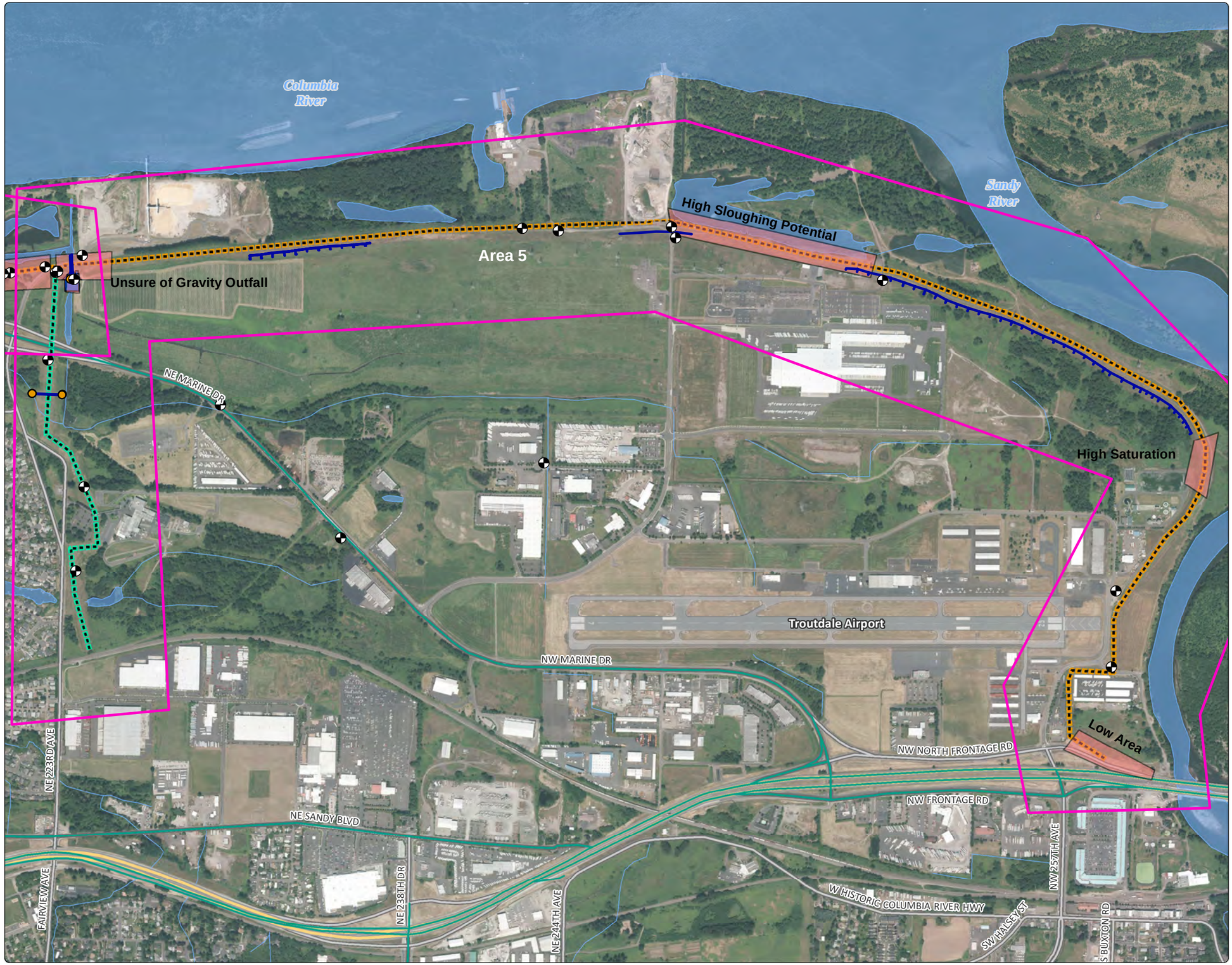
Produced By: ACarlsner

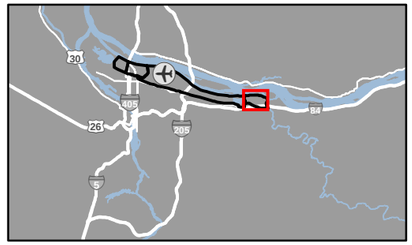
FEAP Appendix N: Levee Patrol Area 5 SDIC

for levee monitoring during a high water event



Legend

- Gate
- Levee System Wells/ Drains/ Inverts
- Levee Pipe System
- Risk Driver
- Cross Levee/Embankment
- Levee
- Pump Stations
- Emergency Transportation Routes
- Freeway
- Arterial
- Levee Parol Area



MCDD Flood Emergency Action Plan.
This map shows the patrol areas for levee monitoring that will be used during a high water event in the Districts.

0 720 1,440
Feet

N

Streets basemap provided by ESRI ArcGIS Online. Freeways and waterway data provided by Metro RLIS. Emergency Transportation Routes data provided by Multnomah County. All other data generated by MCDD.

MCDD Flood Protection
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www.mcdd.org

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Appendix O: Multnomah County ECC Form 213 – Assistance Request

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OERS #_____ WBS #_____ Time received_____ Assistance Request Tracker Initials _____

ASSISTANCE REQUEST (ECC 213 AR), Adapted for Multnomah County

1. Incident Name:	2. Date/Time:	3. Requesting Entity:	4. Assistance Request Number:

Requestor

5. Order (Use additional forms when requesting assistance from different ESFs if known)**:**

Mission Request	Qty.	Type/ Kind	Detailed Description: (Vital characteristics, brand, specs, experience, size, ESF, etc.)	6. When needed			7. Request Status	
				Need date	Need time	Duration	ETA	Cost
☐								

8. Comments (Describe objectives, need, activity being supported):

9. Requested Delivery/Reporting Location:	10. Point of contact info:
11. Suitable Substitutes and/or Suggested Sources:	12. Special delivery instructions:

13. Requested by Name/Position/Phone/Email:	14. Priority: ☐ High ☐ Medium ☐ Low	15. Command/Coordination Approval:

Coords

16. Coordination position assigned: Coordination Section Chief Group Supervisor_____ ESF Lead_____ Other _____	17. Coordination Section Action:
	18. Coordination Section Chief Approval to route to Logistics:

Logistics

19. Logistics Order Number:	20. Supplier Phone/Fax/Email:
21. Name of Supplier/POC:	
22. Logistics notes:	
23. Ordered Date and Time:	24. Order placed by:
25. PO#:	26. Logistics Chief Approval:

Fin

27. Finance notes:	
28. Finance Section Approval:	29. Date/Time:

Pln

30. Resource Unit (Date/Time):	31. Documentation Unit (Date/Time):

ECC 213 AR, Page 1

ECC 213 AR, Adapted for Multnomah County
Assistance Request

Purpose. The Assistance Request (ECC 213 AR) is utilized to request mission and resource assistance.

Preparation. The ECC 213 AR is initiated by a requesting entity being supported by the Emergency Coordination Center and must be approved by an Incident Commander or authorized EOC/ECC/DOC manager. Staff members in the Emergency Coordination Center also complete pertinent sections of this form.

Distribution. This form is maintained in order to track resource request status and assist with determining incident costs.

Block Number	Block Title	Instructions
Completed by Requestor		
1	**Incident Name**	Enter the name assigned to the incident.
2	**Date/Time**	Self explanatory.
3	**Requesting Entity**	Enter the command or coordination entity making request.
5	**Order**	Specify if request is for specific resources or mission. When requesting a mission, coordination with assigned ESF may be required to develop a statement of work.
6	**When needed**	Enter date & time assistance is needed & estimated duration.
8	**Comments**	Requester should provide background info and detail sufficient enough for County to request State/Federal assistance. Attach more information if necessary.
9	**Requested Delivery/Reporting Location**	Enter location where resource should be delivered or report to.
10	**Point of contact info**	Provide adequate contact info for person responsible for receiving resource/assistance.
11	**Suitable Substitutes and/or Suggested Sources**	Enter possible substitute items if exact requested resource is not available. Provide supplier information if known.
12	**Special delivery instructions**	Provide information regarding transport, access and any other logistical consideration.
13	**Requested by Name/Position/Phone**	Requestor's name, position and phone number.
14	**Priority**	Select High, Medium or Low priority.
15	**Command/Coordination Approval**	Enter name of approving incident commander/manager.
Completed by Emergency Coordination Center		
4	**Assistance Request #**	Assistance request tracker assigns identification number to request.
7	**Request Status**	Staff person working request enters cost and ETA information once sourcing solution is determined.
16	**Coordination Section Review**	Assistance request tracker routes request to the appropriate Coordination Section personnel.
17	**Coordination Section Action**	Assigned Coordination staff describes action being taken to address assistance request through Coordination Section. If assistance is not attainable through local mutual aid, the ESF attains CSC approval to route request to Logistics.
18	**Coordination Section routing approval to Logs**	Coordination Section Chief (CSC) confirms request cannot be sourced through the Coordination Section.
19	**Logs order number**	Logistics assigns order number for all incoming requests.
20	**Supplier Phone/Fax/Email**	Logistics staff person sourcing request enters supplier information.
21	**Name of Supplier/POC**	Self explanatory.
22	**Logistics Notes**	Logistics enters information regarding sourcing solution for future reference including OpsCenter order number if applicable.
23	**Ordered date and time**	Self explanatory.
24	**Order placed by**	Self explanatory.
25	**Purchase Order #**	Document purchase order number if assigned or different from Logs order number.
26	**Logs Chief approval**	LSC confirms that procurement method meets current emergency standards.
27	**Finance notes**	Finance enters information regarding procurement solution for future reference.
28	**Finance section approval**	FSC confirms that procurement method meets current emergency standards.
29	**Date/Time**	Self explanatory.
30	**Resource Unit**	Confirms receipt of resource information and begins tracking resources appropriately.
31	**Documentation Unit**	Collects, organizes, and files assistance request documentation for future reference.

Updated by MCEM 4/2015

Appendix P: Volunteer Sign-In Sheet

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Emergency Volunteer Sign In Sheet
Mutlnomah County Drainage District

Date:
Incident Number:

Name (Last, First)	Phone	Email	Time In	Time Out	Job Assignment	Staff Initials

Emergency Volunteer Sign In Sheet
Mutlnomah County Drainage District

Date:
Incident Number:

Name (Last, First)	Phone	Email	Time In	Time Out	Job Assignment	Staff Initials

Appendix Q: City of Portland Evacuation Plan

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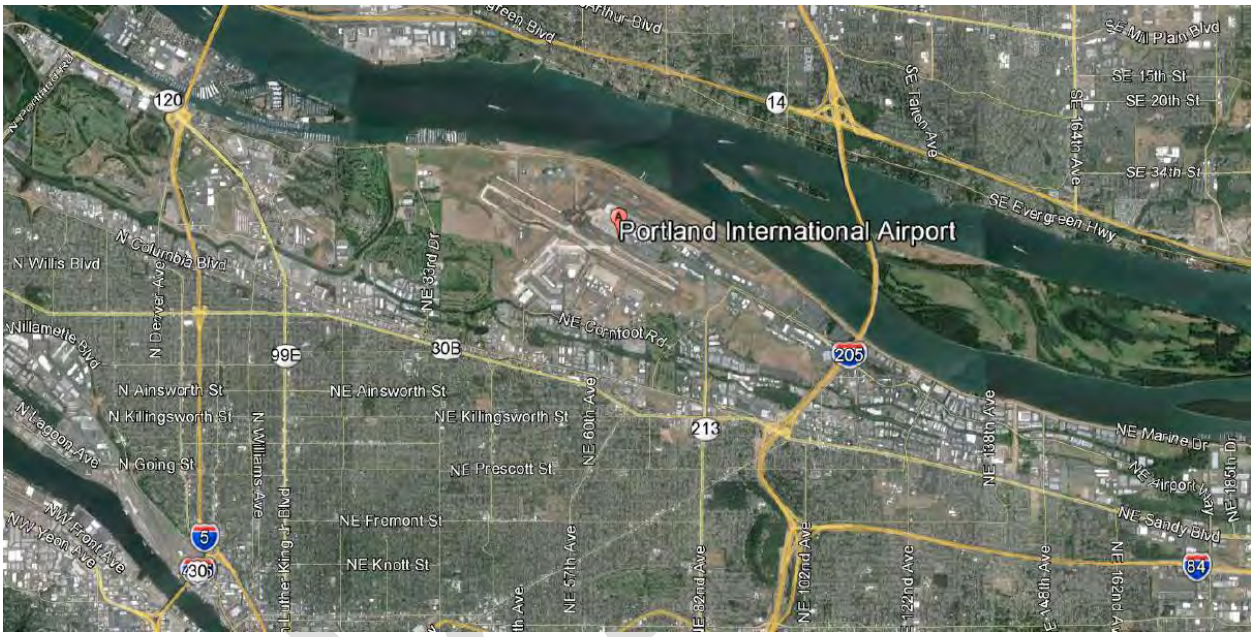
PORTLAND BUREAU OF EMERGENCY MANAGEMENT
Steve Novick, Commissioner-in-Charge • Carmen Merlo, Director
9911 SE Bush Street, Portland, OR, 97266-2562
(503) 823-4375 • Fax (503) 823-3903 • TDD (503) 823-3947

Multnomah County Drainage District



Hazards:

- Flooding
- Levee breach or failure
- Hazardous material spill or release
- Transportation Accident or Incident
    - Aircraft
    - Railroad
    - Pipeline
- Terrorism

Situation:

This plan addresses the area within the Columbia River levee system from Smith and Bybee Lakes on the west, to the City limits at NE 185th Avenue on the east. Eighty percent of this area is used for industrial purposes. While the area east of 185th to Troutdale is also within the levee system and falls under Multnomah County's jurisdiction, evacuation efforts will be coordinated with Multnomah County but not specifically identified in this, the City of Portland's plan.

Citizen and Resident Responsibilities:

- Know your building's emergency procedures.
- Before an emergency occurs, identify (pre-designate) routes for leaving the downtown area. Know your surroundings, become familiar with the street names and buildings in the vicinity.
- If you cannot use your pre-identified route, adhere to the evacuation instructions and follow the general flow of traffic away from the danger area.
- Be prepared to walk to a transportation point or temporary evacuation point.
- Have a plan: a personal plan, a family plan, an office plan, and a car pool plan that includes communicating your status with family members, and getting home in the event of an evacuation.
- Heed evacuation recommendations and follow instructions issued.

Concerns:

Area consists of:

- 27 miles of levees (About 16 miles along the south side of the Columbia River)
- 45 miles of sloughs and ditches
- Over 12,500 acres
- Columbia Industrial Corridor – Oregon's single largest industrial area
    - $20 billion in commercial property
    - 2,000 businesses including light and heavy industry, warehouse and distribution companies, business parks, corporate operation centers, hotel and motel facilities, restaurants, and retail establishments
    - 60,000 jobs
- Transportation infrastructure including I-205, I-5 and Marine Drive truck corridors
- Hundreds of homes
- Port of Portland
    - Portland International Airport
- Portland International Raceway
- Portland Expo Center
- Multnomah County Sheriff's Office
- Portland Meadows
- Delta Park
- Several Golf Courses
- Recreational Trails
- Union Pacific Railroad travels east-west parallel to Columbia Boulevard
- BNSF Railroad – West
- City of Portland Columbia South Shore well field groundwater aquifers
- Cascade Station – a large outdoor shopping venue
- Columbia River Correctional Institution
- Sunderland Yard (PBOT)
- Dignity Village non-profit housing community (approximately 60 residents)

MCDD provides proactive flood plain management through a system of levees and pumping facilities designed to handle the modeled 1-percent-annual-chance flood event. During high water events, the District implements Emergency Response plans to keep levees and facilities functioning to protect life,

property, and the environment. MCDD has the ability to seal off sections of the district as well as utilize pumping capability to limit inundation.

Major roadways such as Marine Drive are constructed on top of the levee system. During high water events, it may be necessary for MCDD and USACE to close Marine Drive to all traffic except emergency vehicle as heavy repair equipment and materials will dominate ingress and egress needs. North Marine Drive and North Portland Road are also subject to high water and will be closed by the installation of stop log closures when the Columbia River is expected to reach 24.8' NGVD/MSL.

Sequence of Evacuation Actions:

In a high water/flood event requiring protective actions in this area, a sequenced evacuation strategy has been developed with MCDD. This plan may be modified based upon flood predictions or status during the incident.

The **first steps** will be completed when the Columbia River reaches 23.6'-27.3' NGVD/MSL. This corresponds with MCDD activation level 3. This is a 2-percent-annual-chance event. The steps are listed in order, but would need to happen as quickly as the situation allows.

Mandatory evacuation of businesses affected by the stop log closures (boat manufacturing, metal plating). Mandatory evacuation of affected mobile homes on the North side of Hayden Island.
Mandatory evacuation of HAZMAT materials and additional needs populations within Peninsula Drainage District #1 (PEN 1).
PEN 1 voluntary evacuation. Restrict vehicular and pedestrian access to local traffic within PEN 1.
Close Portland Road and N Marine Drive W of NE 33rd Drive.
Install PEN 1 stop log closure (beams designed to restrict or stop water flow into a certain area).

Once the stop log closure is in place I-5 and N Martin Luther King Jr Blvd will be the best evacuation routes. N Union Court may need to be used as a bypass.

The **next steps** will be completed when the Columbia River reaches 27.4'-28.9' NGVD/MSL. This corresponds with MCDD activation level 4. This is a 1-percent-annual-chance event.

Restrict trucks from using all of Marine Drive, with limited exceptions for industry evacuating HAZMAT.
Restrict the speed limit on Marine Drive to 20 mph.
Coordinate with ODOT to have variable message signs placed appropriately.
Restrict vehicular and pedestrian access to local traffic within MCDD.
Mandatory evacuation of HAZMAT and additional needs populations within MCDD.
Request mass transit and para-transit resources for Dignity Village and other individuals who may require it if mandatory evacuations are ordered.
Request volunteers and government employees to assist with levee monitoring and surveillance.

Coordinate Columbia River restrictions and/or evacuation with the U.S. Coast Guard. In coordination with the Coast Guard, determine if houseboats must be evacuated based upon the amount of debris.
Incorporate information into one coherent public message.

The **final steps** will be completed when the Columbia River reaches 29' + NGVD/MSL or there is an imminent threat of levee breach or overtopping.

Mandatory evacuation of MCDD protected area and Hayden Island.
Request volunteers and government employees to fill sandbags.

Possible Evacuation Routes:

Determining strategies and identifying evacuation routes will be dependent on the location and type of incident, weather conditions, time of day and the population involved. Traffic will be directed to the most effective route(s) available. As a last resort, it may be necessary for citizens to walk from the area to assigned transportation points/temporary evacuation points.

East and West on Marine Drive (primarily a two lane road with turn out lanes) on the north border (*not an option during high water events*)
East on NE Airport Way
East on Cornfoot to Alderwood to Columbia
Alderwood to 82nd south on 82nd
East on Alderwood under I205 to 105th to Prescott Elementary @ 105/Prescott
West on Cornfoot to 47th to Columbia
East and West on NE Sandy
East and West on NE Columbia Boulevard on the southern border
North or South on I-205
North or South on I-5
South on NE 33rd
South on NE 82nd Ave
South on 99E (Martin Luther King Jr Blvd)
South on NE 122nd
South on NE 138th
South on NE 148th
South on NE 158th
South on NE 185th

Via maritime vessels on the Columbia River

Bike and Walk Routes mapped by PBOT

Potential Transportation Points/Temporary Evacuation Points:
Woodlawn Park (NE 11th/NE Claremont
Wilshire Park (NE 33rd/NE Skidmore)
Fernhill Park (NE 37th/NE Simpson)
Sacajawea Park (Dog off leash area) (NE Killingsworth/79th)
Parkrose High School, Middle School 122nd/Sandy area
Farragut Park (N Vancouver/Farragut Street)
East Vancouver, Washington

Modes of Transportation for Evacuees:
TriMet Buses and MAX Red Line on East, Yellow Line on the West

Privately owned vehicles
Hotel/Airport Shuttles
Taxis
By foot, bicycle
Maritime vessels moored in the Columbia

Resources:
Fire Station 2 – Parkrose 4800 NE 122nd Avenue
Fire Station 12 – Sandy Boulevard – 8645 NE Sandy Boulevard
Fire Station 14 – Alberta Park – 1905 NE Killingsworth
Fire Station 17 – Hayden Island
Columbia Corridor Association – POB 55651 Portland www.columbiacorridor.org
Port of Portland Public Safety

Population:

Transient population – Portland International Airport, numerous hotel/motels

The 2008 CH2MHill report estimated that approximately 3,160 citizens live in the area west of 33rd; and an additional migrant population occupied the area during the day. The area also contained approximately 6,200 vehicles, but may contain up to 18,100 vehicles depending on migrant populations visiting the commercial, industrial, and recreational facilities in the area.

Additional Populations Concerns:

Business – employees, customers, service providers, vendors

Tourists

- Columbia River events and activities
- Large influx during special events (Portland Airport, Expo Center, Portland Meadows, Portland International Raceway)
- Unfamiliar with the area

Homeless and transient populations.

Recreationalists (paddlers, cyclists, trail users, nature enjoyers etc.)

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Appendix R: Glossary

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Appendix R: Glossary

1-percent-annual-chance event: A statistical event that has a 1% chance of occurring each year in a given area. Also referred to as the 100-year flood, since its annual exceedance probability is 1%, or as having a return period of 100-years. During the span of a 30-year mortgage, a home in the 1-percent-annual-chance floodplain has a 26-percent chance of being flooded at least once during those 30 years (the value of 26 percent is based on probability theory that accounts for each of the 30 years having a 1-percent chance of flooding).

0.2-percent-annual-chance event: A statistical event that has a 0.2% chance of occurring each year in a given area. Also referred to as the 500-year flood, since its annual exceedance probability is 0.2%, or as having a return period of 500-years.

Chain of Command: A series of management positions in order of authority.

Critical infrastructure: Publicly and privately controlled systems and assets, including the natural environment, built environment and personnel, essential to the sustained function of the five county area consisting of the counties of Clackamas, Clark, Columbia, Multnomah and Washington. In particular, those systems and assets which are essential to maintain or restore continuity of services providing security, safety, health, sanitation, public confidence, or economy of the area and its residents. Incapacitation or destruction of any of these systems or assets would have a debilitating impact on the five-County area directly, through interdependencies and/or cascading effects.

Cross levee: A levee that runs perpendicular to the main levee system that compartmentalizes the leveed area. These levees only contain, control, or divert water if the primary levee system breaches, filling one of the compartmentalized leveed areas.

Emergency Operations Centers (EOCs): The physical location at which the coordination of information and resources to support domestic incident management activities normally takes place.

Evacuation: The organized, phased, and supervised withdrawal, dispersal, or removal of civilians from a designated flood area where a threat to life and property exists or is likely to exist in the immediate future. An evacuation can be voluntary or mandatory depending on the imminence of the flood threat.

> This document has been reviewed and accepted by Oregon State Sheriffs' Association, Oregon State Fire Marshal's Office, Oregon Office of Emergency Management, Oregon Fire Chief's Association and Oregon Department of Forestry. This document should be considered an official document for use to the public on All Hazards Evacuations.
> **Final Approved Oregon Evacuation Levels**
> **June, 2014**
> **LEVEL 1**: A Level 1 Evacuation means "**BE READY**" for potential evacuation.

Residents should be aware of the danger that exists in their area, monitor emergency services websites and local media outlets for information. This is the time for preparation and precautionary movement of persons with special needs, mobile property and (under certain circumstances) pets and livestock. If conditions worsen, emergency services personnel may contact you via an emergency notification system.

LEVEL 2: A Level 2 Evacuation means "**BE SET**" to evacuate.

YOU MUST PREPARE TO LEAVE AT A MOMENTS NOTICE

This level indicates there is significant danger to your area, and residents should either voluntarily relocate to a shelter or with family/friends outside of the affected area, or if choosing to remain, to be ready to evacuate at a moment's notice.

Residents MAY have time to gather necessary items, but doing so is at their own risk.

THIS MAY BE THE ONLY NOTICE THAT YOU RECEIVE

Emergency services cannot guarantee that they will be able to notify you if conditions rapidly deteriorate. Area media services will be asked to broadcast periodic updates.

LEVEL 3: A Level 3 Evacuation means "**GO**" Evacuate NOW

LEAVE IMMEDIATELY!

Danger to your area is current or imminent, and you should evacuate immediately. If you choose to ignore this advisement, you must understand that emergency services may not be available to assist you further. DO NOT delay leaving to gather any belongings or make efforts to protect your home.

THIS WILL BE THE LAST NOTICE THAT YOU RECEIVE

Entry to evacuated areas may be denied until conditions are safe.

Area radio and TV stations have been asked to broadcast periodic updates.

Federal Emergency Management Agency (FEMA): The agency within the Emergency Preparedness and Response Directorate of the U.S. Department of Homeland Security. FEMA facilitates coordination of Federal dam safety programs and administers the NFIP and several flood mitigation planning and grant programs.

Flood: A general and temporary condition of partial or complete inundation of normally dry land areas from overflow of inland or tidal waters, unusual or rapid accumulation or runoff of surface waters, or mudslides/mudflows caused by accumulation of water.

Gate: A device used to close an engineered opening in the levee system; the openings commonly accommodate roadways, railways, etc. The term is also used for an operable, watertight device used to regulate the discharge of interior drainage from the flood management system.

Incident Command Post (ICP): The field location at which the primary tactical-level, on-scene incident command functions are performed. The ICP may be collocated with the incident base or other incident facilities.

Levee: A man-made structure, usually an earthen embankment or concrete floodwall, designed and constructed in accordance with sound engineering practices to contain, control, or divert the

flow of water so as to provide reasonable assurance of excluding temporary flooding from the leveed area.

Levee Segment: A discrete portion of a levee system that is operated and maintained by a single entity.

Levee System: One or more levee segments and other features such as floodwalls and pump stations, which are interconnected and necessary to ensure exclusion of the design flood from the associated leveed area.

Leveed Area: The lands from which floodwater is excluded by the levee system.

Pump Station: Facilities including pumps and equipment for pumping fluids from one place to another. The Districts own, operate, and maintain pump stations for stormwater removal for the low land within the leveed area.

Relief wells: Relief wells are in place to provide underseepage relief during high water events. They accomplish this by tapping into the substratum, and provide pressure relief in a controlled manner, with low flow resistance and prevent uncontrolled piping and erosion of the foundation soils.

Seepage: Seepage is the movement of groundwater through the soil in response to a hydraulic gradient (the height of the water behind the levee relative to the height of the toe of levee).

Toe of levee: The point where the side slopes of the embankment (the levee) meet the natural ground level at a given location (station on a cross section)

Toe Drain: An underdrain that catches water seeping through and under the levee helping to control seepage and hydrostatic uplift pressures, which may otherwise cause sand boils and piping of foundation materials.

Top/Crown of levee: The highest point of the flood wall (top) or embankment (crown) at a given location (station on a cross section)