

US Army Corps of Engineers Feasibility Study of the Portland Metro Levee System

ALTERNATIVE MAPS

This document is not an official part of the USACE Draft Integrated Feasibility Report. This information has been assembled by Multnomah County Drainage District (MCDD) on behalf of the four Columbia Corridor Drainage Districts in order to summarize key points of the study and highlight issues of local interest. The Corps' Draft Integrated Feasibility Report & Environmental Assessment is available for review at www.nwp.usace.army.mil/levees/pmls/



ALTERNATIVE #3

Alternative #3 focuses on measures that prioritize public health and safety.

The following maps only indicate where structural (physical) measures have been considered as they can be associated with a specific location within the system. Each alternative also includes a set of non-structural measures, which are listed in the table below and described in more detail in USACE's full report.

No.	Measure	Alternative 3	Alternative 4	Alternative 5
5	Improve Levee Performance and Reliability	•	•	•
6	Flood Warning in Residential/PAR areas	•	•	•
7	Increase Levee Heights	•	•	•
10	Add Pump Capacity		•	•
14	Improve Flood Fight		•	•
15	Automate Systems		•	
20A	Add Redundant power source; Replace SDIC PS		•	•
20B	Replace SDIC Pump Station	•	•	•
22	Debris Removal (trash in water and trees/limbs)			•
30	Build Additional Levee/Floodwall		•	•
32	Rehab/Replace Mechanical Structures (gates, etc.)		•	
36	Education	•	•	•
37	Signage for Evacuation	•		•
41	Safe Zones	•	•	•

ALTERNATIVE #3 - PEN 1

Build floodwall along

railroad embankment

to Marine Dr. (Measure 30: Build additional levee

Portland Rd from

or floodwall)

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Add to the existing seepage berm on the railroad embankment. Requires railroad cooperation. ~10 acres affected (Measure 5: Improve levee reliability & performance)

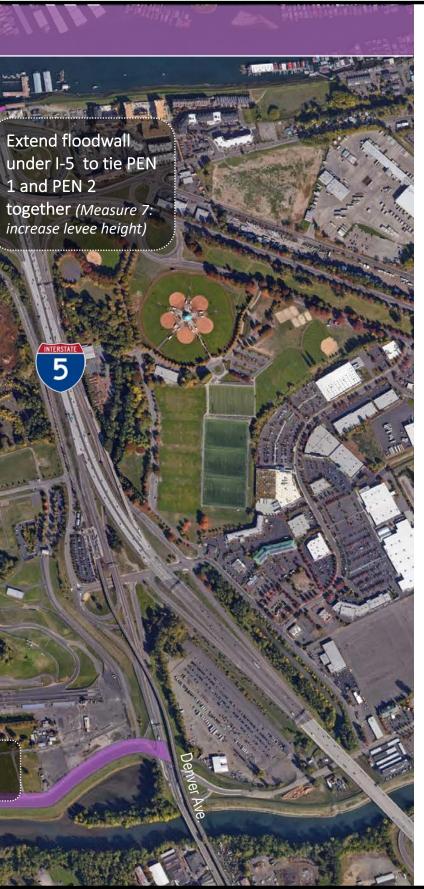
Widen levee 10-15 feet on landward side only (Measure 5: Improve levee reliability & performance)

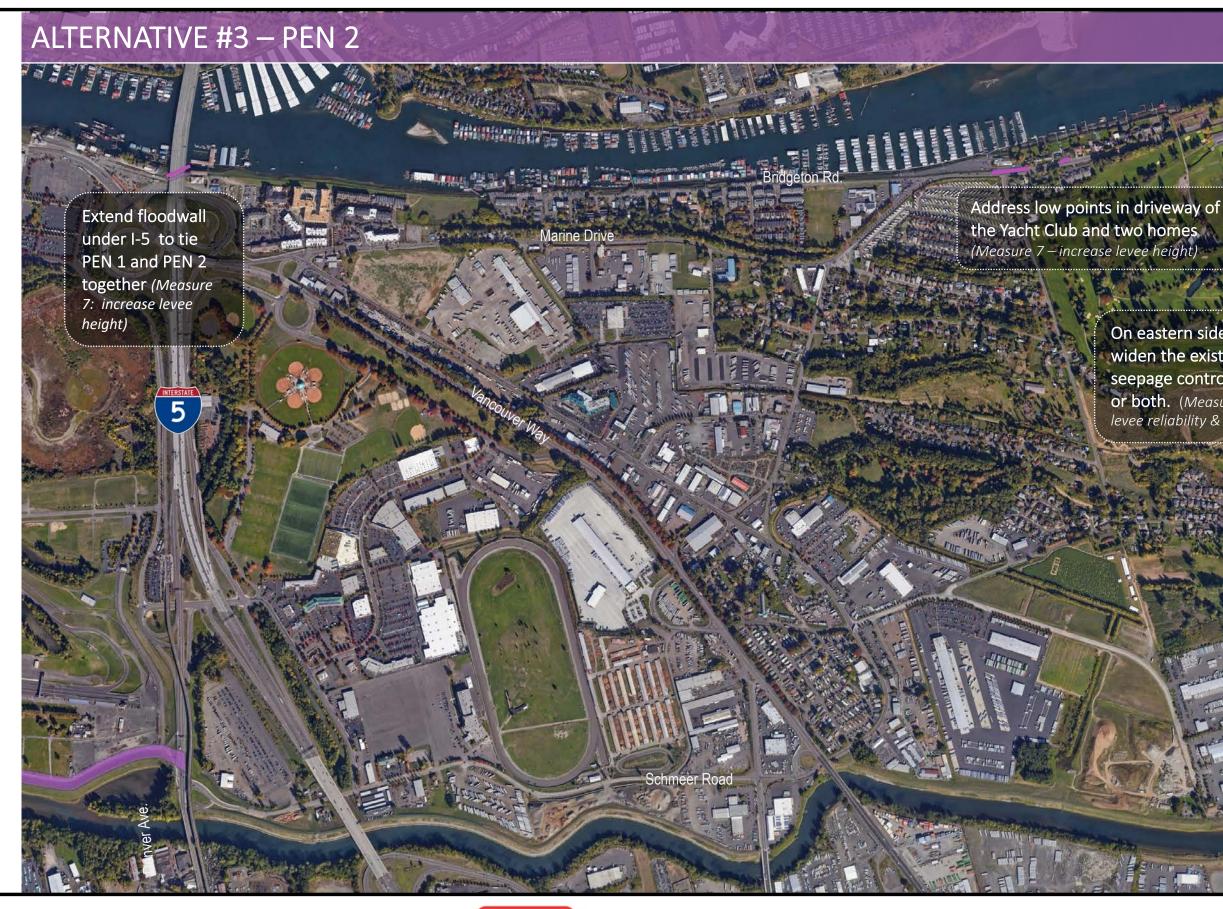


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arine Drive









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On eastern side of the canal, widen the existing levee, add seepage controls (toe drains), or both. (Measure 5: improve levee reliability & performance)

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ALTERNATIVE #3 – MCDD West

On eastern side of the canal, widen the existing levee, add seepage controls (toe drains), or both. (Measure 5: improve levee reliability & performance)



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ALTERNATIVE #3 – MCDD East





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as of Jan. 6, 2020

Elevate and replace SDIC's one pump station, including installing redundant power supply (Measure 20B: replace pump station)

Blue Lake

Fairview Lake

ALTERNATIVE #3 - SDIC

Elevate and replace SDIC's one pump station, including installing redundant power supply (Measure 20B: replace pump station)

ne Drive

Raise levee at the upstream end of SDIC south of I-84 near the Troutdale outlet mall (Measure 7 – increase levee height: raise)



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Sundial Road



ALTERNATIVE #4

Alternative #4 prioritizes structural and non-structural measures that maximize resiliency, reliability, and redundancy in the event of a failure in one part of the system.

The following maps only indicate where structural (physical) measures have been considered as they can be associated with a specific location within the system. Each alternative also includes a set of non-structural measures, which are listed in the table below and described in more detail in USACE's full report.

No.	Measure	Alternative 3	Alternative 4	Alternative 5
5	Improve Levee Performance and Reliability	•	•	•
6	Flood Warning in Residential/PAR areas	•	•	•
7	Increase Levee Heights	•	•	•
10	Add Pump Capacity		•	٠
14	Improve Flood Fight		•	•
15	Automate Systems		•	
20A	Add Redundant power source; Replace SDIC PS		•	•
20B	Replace SDIC Pump Station	•	•	•
22	Debris Removal (trash in water and trees/limbs)		•	•
30	Build Additional Levee/Floodwall		•	•
32	Rehab/Replace Mechanical Structures (gates, etc.)		•	
36	Education	•	•	•
37	Signage for Evacuation	•	•	•
41	Safe Zones	•	•	•

ALTERNATIVE #4 - PEN 1

Build floodwall along Portland Rd from railroad embankment to Marine Dr. (Measure 30: Build additional levee or floodwall)

Automate flood wall closures - see white above (Measure 15: automate svstems



Extend floodwall under I-5 to tie PEN 1 and PEN 2 together (Measure 7: Increase levee height)

Construct a levee alongside the railroad embankment. Limited cooperation by railroads needed. ~12 acres affected (Measure 30: Build additional levee or floodwall)

Add a four-season maintenance path on set-back levee (Measure 14: Improve flood fight)

> Replace pump #2 in PIR Pump Station and install a back-up source of power (Measure 10 : Add pump capacity & Measure 20A: Create redundant power source)

Widen the levee 10-15 feet on landward side (Measure 5: Improve levee reliability & performance)



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as of Jan. 6, 2020







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On eastern side of the canal, widen the existing levee, add seepage controls (toe drains), or both. (Measure 5: improve levee reliability & performance)

ALC: NOTE:

Add a four-season maintenance path on eastern side of canal (Measure 14: Improve flood fight)

ALTERNATIVE #4 – MCDD West

On eastern side of the canal, widen the existing levee, add seepage controls (toe drains), or both. (Measure 5: improve levee reliability & performance)

Install redundant power source at Pump Station 1 (Measure 20A: redundant power source) Add capacity to 2 pumps & discharge lines at Pump Station 2, install redundant power source. (Measure 10: add pump capacity & Measure 20A: redundant power source) Replace trash rake & install redundant power source at Broadmoor Pump Station (Measure 22: debris removal & Measure 20A: redundant power source) Replace trash rake & install redundant power source at AirTrans Pump Station (Measure 22: debris removal & Measure 20A: redundant power source)



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Raise elevation of Airport Way so a closure structure is no longer required during high-water (Measure 30: build

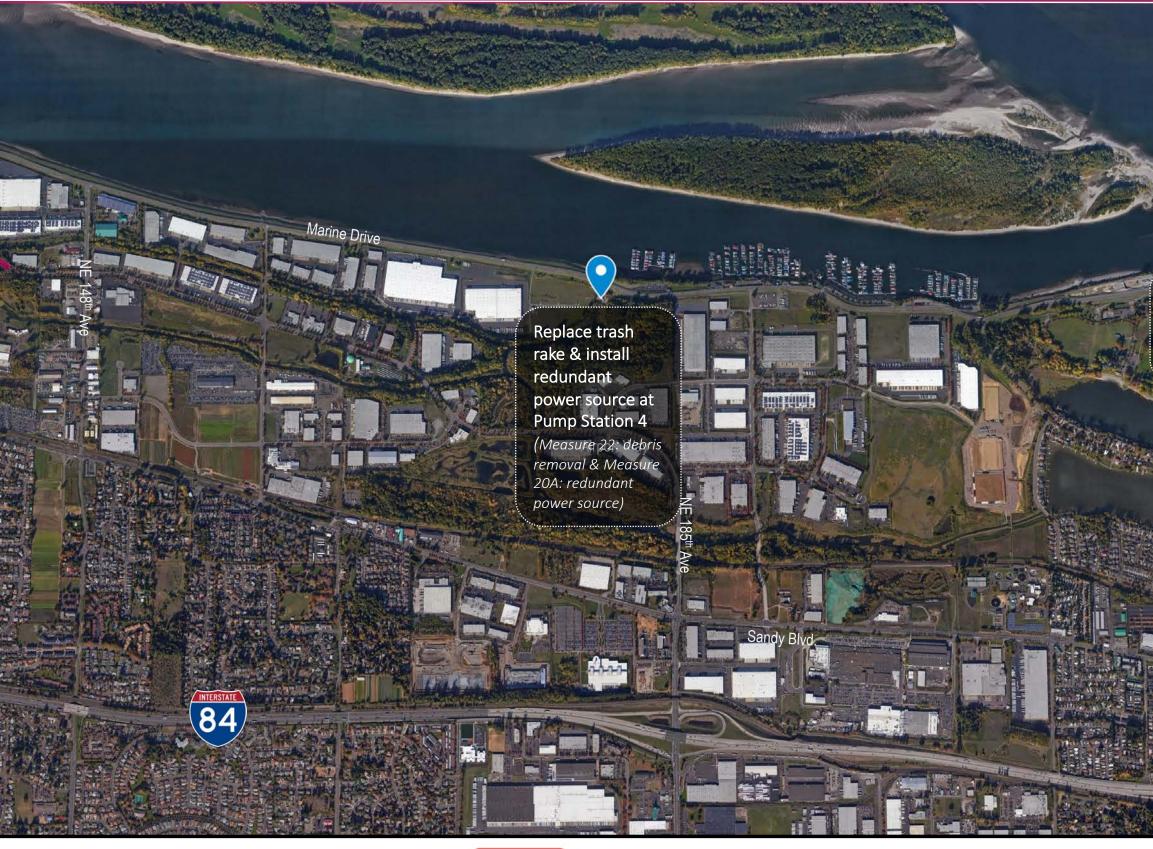
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additional levee or floodwall)

84

Rehab or replace and automate 142nd street valve and culverts (Measure 32: rehab or replace mechanical structure & Measure 15: automate systems)

ALTERNATIVE #4 – MCDD East





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Elevate and replace SDIC's one pump station, including installing redundant power supply (Measure 20B: replace pump station)

Raise levee along MCDD & SDIC cross-levee at Marine Dr on & off ramps (Measure 7: increase levee height)

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Blue Lake

Fairview Lake

Rehab or replace and automate Gate Tower Structure (Measure 32: rehab or replace mechanical structure & Measure 15: automate systems)

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ALTERNATIVE #4 – SDIC

Elevate and replace SDIC's one pump station, including installing redundant power supply (Measure 20B: replace pump station)

> Rehab or replace and automate **Gate Tower** Structure (Measure 32: rehab or replace mechanical structure & Measure 15: automate systems)

Raise low spot in levee 4 feet (Measure 7: Increase levee heights)

Raise levee along MCDD/SDIC cross levee at Marine Dr on and off ramps (Measure 7: increase levee height)

Address fragility by widening levee (Measure 5: improve levee reliability & performance)



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Statisticality

levee height)



ALTERNATIVE #5

Alternative #5 focuses on internal and external sources of flooding and seeks to address inconsistencies by providing a more uniform level of protection across the whole system. As the alternative with the highest level of protection and net annual benefit, the Corps is currently considering Alternative 5 the "Tentatively Selected Plan"

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10	Add Pump Capacity		•	•
14	Improve Flood Fight		•	•
15	Automate Systems		•	
20A	Add Redundant power source; Replace SDIC PS		•	•
20B	Replace SDIC Pump Station	•	•	•
22	Debris Removal (trash in water and trees/limbs)		•	•
30	Build Additional Levee/Floodwall		•	•
32	Rehab/Replace Mechanical Structures (gates, etc.)		•	
36	Education	•	•	•
37	Signage for Evacuation	•	•	•
41	Safe Zones	•	•	•

ALTERNATIVE #5 - PEN 1

Build floodwall along Portland Rd from railroad embankment to Marine Dr. Raise existing flood closures to new level of protection. (Measure 30: Build additional levee or floodwall)

Build ~3 ft floodwall along Columbia mainstem (Measure 7: Increase levee height)

Construct a levee next to the railroad embankment that is ~3 ft. taller than the current level of protection. Does not require railroad cooperation. ~16 acres affected (Measure 30: Build additional levee or floodwall).

Add a four-season maintenance path on setback levee (Measure 14: Improve flood fight)

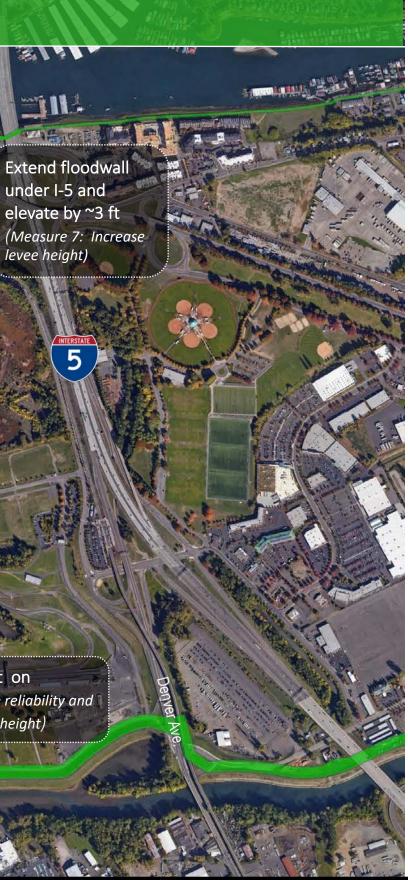
> Add redundant power source to PIR pump station (Measure 20A: redundant power)

Elevate levee and widen by 15-20 feet on landward side (*Measure 5: Improve levee reliability and performance & Measure 7: Increase levee height*)



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as of Jan. 6, 2020

On eastern side of the canal, widen the existing levee, add seepage controls (toe drains), or both. (Measure 5: improve levee reliability & performance)

Add a four-season maintenance path on eastern side of canal (Measure 14: Improve flood fight)

Install redundant power source at 13th Avenue Pump Station (Measure 20A: redundant power source)

ALTERNATIVE #5 – MCDD West

Increase levee height by 1 foot to address low spot near Gleason Boat Ramp parking lot. (*Measure 7: increase levee height*)

On eastern side of the canal, widen the existing levee, add seepage controls (toe drains), or both. (Measure 5: improve levee reliability & performance)

Install redundant power source at Pump Station 1 (Measure 20A: redundant power source)

Install redundant power source at Pump Station 2 (Measure 20A: redundant power source) Replace trash rake and install redundant power source at Broadmoor Pump Station (Measure 22: debris removal & Measure 20A: redundant power source)

Replace trash rake and install redundant power source at AirTrans Pump Station (Measure 22: debris removal & Measure 20A: redundant power source)



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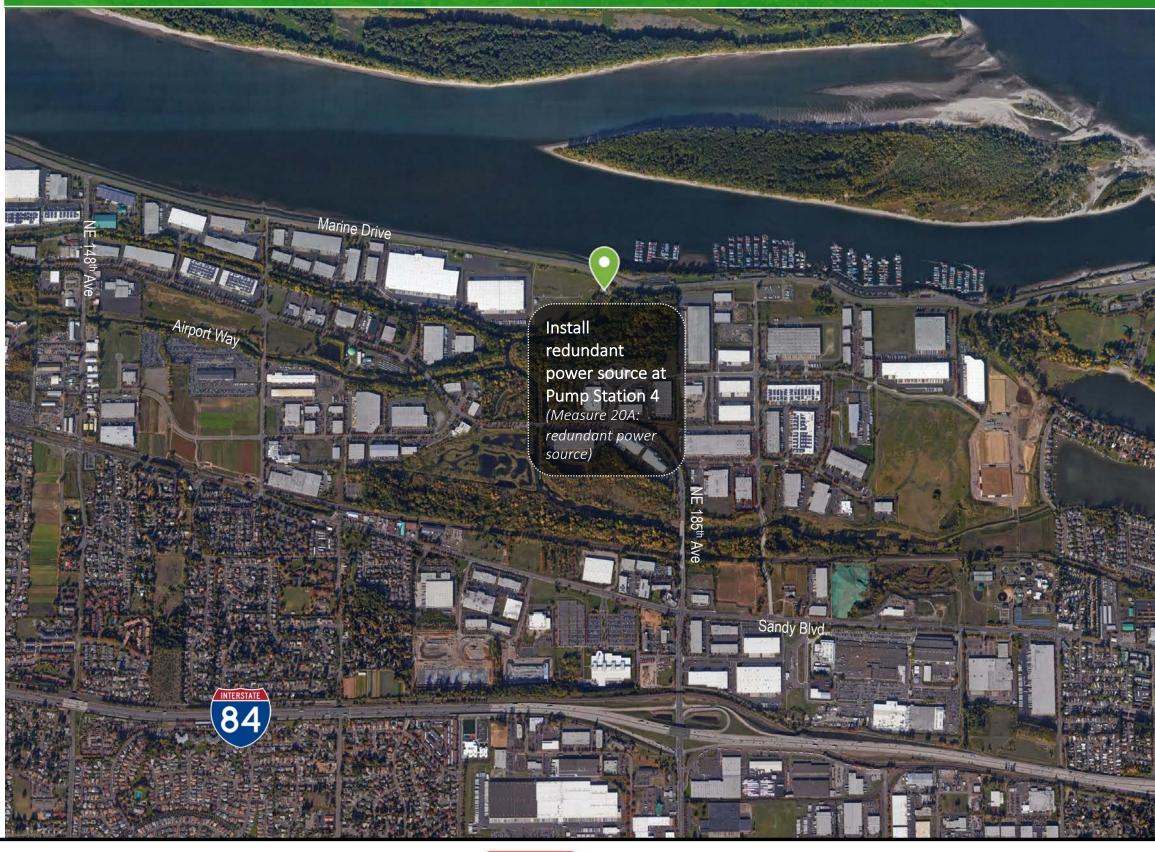


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ALTERNATIVE #5 – MCDD East





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ALTERNATIVE #5 – SDIC

Elevate and replace SDIC's one pump station, including installing redundant power supply (Measure 20B: replace pump station)

> Raise low spot in levee 4 feet (Measure 7: Increase levee heights)

Address fragility by widening levee (Measure 5: improve levee reliability & performance)

> Raise levee at the upstream end of SDIC south of I-84 near the Troutdale outlet mall (Measure 7 – increase levee height:



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