

Multnomah County Drainage District #1

USACE WRRDA Project Proposal

December 2, 2014

Project Background

The Columbia Corridor stretches along the south shore of the Columbia River in the Portland Metropolitan area, and includes over 12,000 acres of land across four cities. Twenty seven miles of levee, which are maintained and operated as separate systems by four local drainage entities, protect the majority of this area from flooding. Collectively, these levees protect the Portland International Airport, a regional Exposition Center, thousands of homes, and three major interstates. The area is also home to hundreds of businesses, and ten percent of Multnomah County's employment base. The 27 miles of levees managed by the Districts are essential to the protection of the daily life of 7,500 residents and the nearly 13,000 acres of land amounting to over \$5 billion in assessed property; providing significant life-safety protection. In a region that promotes wise use of land (as mandated by State law), the activity in the Columbia Corridor has a significant impact on regional and statewide economic vitality.

The four local drainage entities that protect these assets are Peninsula Drainage District #1 (PEN 1), Peninsula Drainage District #2 (PEN 2), Multnomah County Drainage District # 1 (MCDD), and Sandy Drainage Improvement Company (SDIC) (collectively "the Districts").

All four levee systems in the Columbia Corridor are federally-authorized by the 1936 Flood Control Act and are active in the Rehabilitation and Inspection Program (RIP) of the U.S. Army Corps of Engineers (USACE). Additionally, the levee system currently has two certified levee systems (MCDD and SDIC) and two systems (PEN 1 and PEN 2) that are pursuing certification. USACE's certification of the PEN 1 and PEN 2 levee systems expired in August of 2013 after USACE policy changes were adopted in 2012. This situation puts these levees systems at risk of losing their accredited status when the Federal Emergency Management Agency (FEMA) issues new Federal Insurance Rate Maps (FIRM) for the area. The MCDD and SDIC levee systems have certifications that will expire in 2017, which will create a similar vulnerability.

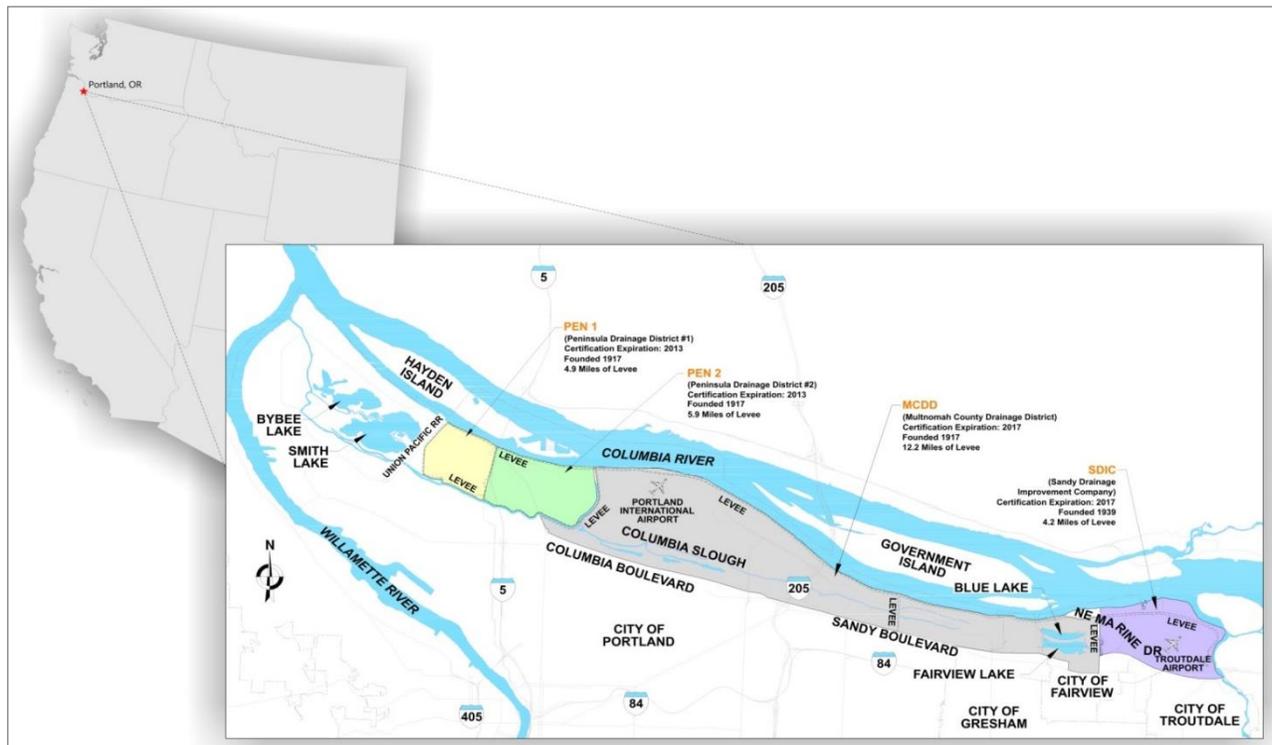
The Districts and National Flood Insurance Program participating communities are working together to secure professional certification and uninterrupted accreditation for the four levee systems. The engineering analysis from the certification investigation will be evaluated against RIP criteria and any deficiencies identified will be further analyzed and discussed with USACE to ensure that the Districts remain in good standing within the program.

Early results from the engineering analysis indicate that the Districts will need to address multiple concerns in partnership with USACE. These issues include, but are not limited to the following: encroachments, vegetation, culverts, toe drains, utility lines, re-alignment, and potential new levee design sections. The Districts will work with the communities within the Columbia Corridor, USACE, and other associated local and state agencies to address these challenges and ensure the entirety of the levee system continues to protect public safety and economic prosperity along the Columbia River.

In order to address concerns identified in the engineering assessment, the Districts entered into an agreement with USACE under the Planning Assistance to States (PAS) program in September 2014.

USACE has authorized \$249,208 to develop preliminary design for repair alternatives for the railroad embankment located at the western most boundary of PEN 1. This embankment was the breach location during the 1948 Vanport Floods. USACE’s work on this project will include repair alternatives, pre-design cost estimate, summary of anticipated mitigation and environmental compliance, a summary of acreages and potential real estate needs for the alternative and potential utility and encroachments. This project is structured as a 50 percent cost share with the Districts.

Because of the potential impact to public safety and the economy in the Columbia Corridor, Governor Kitzhaber has given the Columbia River Levee Repair and Accreditation high state priority status by designating it an Oregon Solutions project to identify collaborative solutions to ensure that the levees remain safe and effective. The Oregon Solutions project team has helped to secure resources to complete engineering assessments of the levees in the PEN 1 and PEN 2 districts as a first step in this process. Oregon Solutions recognizes the historical significance of the levee system and will work to engage all communities with current or historical ties to the system in a collaborative discussion about how to address the technical and community based implications of levee maintenance and improvements. More than twenty jurisdictions and other regional partners are working together through the Oregon Solutions process convened by Portland Mayor Charlie Hales and Multnomah County Commissioner Jules Bailey, to ensure that the Columbia Corridor levee system protects lives and property and meets all federal safety standards.



Vicinity Map of the Existing Drainage Districts along the Columbia Corridor – Portland, Oregon

Project Description

As the administrator of the entire Columbia Corridor levee system, and in response to USACE's request pursuant to Section 7001 of the Water Resources Reform and Development Act of 2014 (79 FR 45430 (Aug. 5, 2014)), MCDD proposes a feasibility study for Congressional consideration. The study falls into the USACE's mission of creating and developing flood control projects that intend to reduce riverine storm damage while simultaneously protecting the environment, providing recreation opportunities, and protecting critical infrastructure. This study will ensure the Districts continue to plan for the future in addressing flood risk while simultaneously taking community values into consideration.

The Feasibility Study

The Feasibility Study proposed would determine the appropriate level of authorization for the consolidated levee system in the Columbia Corridor. The four districts (Peninsula Drainage District #1, Peninsula Drainage District #2, Multnomah County Drainage District #1, and Sandy Drainage Improvement Company) are currently governed independently but are managed by MCDD. However, all four districts are currently in the process of exploring the potential of consolidation. Additionally, none of the districts are currently authorized to the same design level and flood event on the Columbia River. It is time to re-evaluate the existing level of authorization as the value of the properties and economic development opportunities within the levee system have changed over the past few decades and in light of the potential impacts of consolidation, climate change and the Columbia River Treaty. As aforementioned, the levees reduce risk to critical infrastructure, such as the Portland International Airport, as well as 10% of the jobs in Multnomah County.

If selected, MCDD will partner with the USACE Portland District to assist in the development of alternative plans, and provide background information regarding engineering feasibility. MCDD will also provide necessary information to the USACE to establish a baseline for the benefit-cost analyses, and environmental impact assessment under the National Environmental Policy Act (NEPA). The results from this study will ensure the resiliency and reliability of the system based on 21st century land use patterns and economic factors. The feasibility analysis will determine whether or not the project of the consolidated Districts warrants further federal investment or if it already meets the appropriate authorized levels of protection.

The Districts are currently involved in a detailed engineering investigation in PEN 1 and PEN 2 to better understand the strength and stability of the existing levee system against the authorized water surface elevation. Geotechnical explorations were conducted at increments of 1,000 feet across the entirety of the PEN 1 and PEN 2 system with a boring in the landward toe, the waterward toe, and the centerline of the existing levee (with the exclusion of the railroad embankment on the west side of PEN 1, which will be discussed in further detail below). The engineering evaluation has examined the following disciplines of the levee: strength, stability, erosion, freeboard, wave run-up, and scour. This engineering analysis will be complete in PEN 1 and PEN 2 by early 2015 and is expected to begin in MCDD and SDIC in late 2015.

In conjunction with this geotechnical modeling, the Districts have invested resources to survey the full levee system and develop as-builts, both as plans and cross-sections. It is expected that this engineering evaluation and survey data will provide the USACE Portland District with detailed information to begin

the feasibility study. While there are no cost estimates for the project at this time, because of all of the advanced work that the Districts have completed, the study is expected to be finalized in less than 3 years and for less than \$3 million, meeting the SMART planning guidelines.

Furthermore, and as noted above, both PEN 1 and PEN 2 are currently going through an engineering analysis to obtain certification and examine the structural integrity of the existing levee system through a private engineering firm against USACE design standards for purposes of FEMA accreditation. While geotechnical explorations have been completed for all of the levee segments in PEN 1 and PEN 2, they are not complete on the railroad levee segment of PEN 1, which makes up the western boundary of the PEN 1 levee system.

Completing this work required approval from two railroad companies (Burlington Northern and Santa Fe and Union Pacific) that own the land where drilling or excavation needed to occur. However, MCDD was unable to obtain approval for the work. Historical information indicates that the construction methods used for the original embankment may not be compatible with modern levee design standards. Thus, while access to investigate the area is an issue, the actual makeup of the embankment itself may be as well. Additionally, both railroad companies would be required to sign an operations and maintenance agreement in order for the system to be certified, and both have stated that this would be against their national policy. Therefore, the Levee Engineering Assessment for PEN 1, found that the railroad embankment that runs along its western perimeter did not meet certification requirements for FEMA accreditation.

More significantly, this railroad embankment includes an authorized USACE project that provides protection against the 1-percent-chance flood event. This project was constructed in 1997 after seepage was observed at the southern end of the embankment during a high water event in 1996. Any alternative pursued to address this deficiency will result in a modification to the existing USACE authorized project and will result in an extensive permitting and planning process.

As this embankment has already been identified as a deficiency in the engineering report, the Oregon Solutions team has tasked a Technical Advisory Committee (TAC) to provide recommendations and guidance to the team on alternatives along this segment of levee system. The TAC, which has representation from key entities impacted by the project, has been tasked to evaluate alternatives holistically. As with the rest of the study area, alternatives will need to address not only flood protection and engineering but other community values including impacts to recreation, opportunities for ecological restoration, effects on economic resources, and recognition of the 1948 Vanport Floods.

Additionally, the Districts have partnered with the USACE Portland District and other members of Oregon Solutions to begin developing alternatives to address this deficiency. In September 2014, MCDD and the USACE entered into an agreement for \$249,208 to develop conceptual design alternatives for this modification work through the PAS program. These designs will be guided by the recommendations of the TAC. This agreement demonstrates the existing partnership between MCDD and the USACE Portland District and that there is forward movement in addressing this deficiency.

Existing USACE Studies

The four Districts along the Columbia Corridor were organized between 1915 and 1917. They were organized primarily by local interests to provide primary flood protection against a flood equal to that of

1876. However, since that time, USACE has partnered with each district and has worked to strengthen, understand, and improve the existing system. The following section lists the existing USACE studies that have occurred in each district.

Peninsula Drainage District #1

- 1957 Design Memorandum – Improvement to Existing Works
- 1962 Design Memorandum – Bank Protection
- 1978 Drainage District Condition Study on Safe Water Surface Levels
- 1989 Columbia River and Tributaries Study: Oregon and Washington – Lower Columbia River Flood Control Study (River Miles 0 to 145)
- 1994 Section 205: Feasibility Study for Proposed Levee Improvements
- 1996 Section 205: Detailed Project Report
- 2007 Phase II I-Wall Inspection & Evaluation

Peninsula Drainage District #2

- 1957 Design Memorandum – Improvement to Existing Works
- 1969 Design Memorandum – Bank Protection
- 1973 Subsurface Investigation and Stability Analysis – Denver Avenue Dike
- 1978 Drainage District Condition Study on Safe Water Surface Levels
- 1987 Design Memorandum – Bank Protection
- 1997 Limited Reevaluation Report – Bank Protection

Multnomah County Drainage District #1

- 1957 Design Memorandum – Improvement to Existing Works
- 1959 Design Memorandum – Pumping Station – Improvement to Existing Works
- 1963 Design Memorandum – Bank Protection
- 1973 Design Memorandum – Bank Protection
- 1983 Design Memorandum – Bank Protection
- 1986 Design Memorandum – Bank Protection

Sandy Drainage Improvement Company

- 1953 Design Memorandum – Improvement to Existing Works

Anticipated Monetary and Non-Monetary Benefits

The 27 miles of levees managed by the Districts are essential to the protection of the daily life of 7,500 residents and the nearly 13,000 acres of land amounting to over \$5 billion in assessed property. The levees managed by the Districts make possible a unique multi-modal transportation corridor that includes two major railroads, three interstate highways, a deep water channel, and an international airport. The economic opportunities represented in the Districts have been recognized in both regional planning such as Metro’s 2040 Growth Concept and city planning such as The City of Portland’s Comprehensive Plan which designates most of the land inside the Districts as “industrial sanctuary” or “mixed employment”. As a result, the corridor is home to 10% of the jobs in the most populous county in the state. Finally, a study sponsored by NAIOP, Business Oregon, Metro, Portland Business Alliance,

and the Port of Portland, found that nearly 20% of all land available for large lot industrial development in the region was within the Districts' boundaries (Land Availability: Limited Options). The economic significance of this corridor has also been recognized in the Brookings Metropolitan Export Initiative which noted that the Portland region is the second fastest growing export economy among the 100 largest metropolitan areas in the country.

The special economic importance of the region depends, to a large degree, on several critical pieces of infrastructure that are either protected by or are part of the levee system. One such asset is the Portland International Airport (PDX). Currently serving over 9 million passengers a year, PDX is expected reach 12 million passengers a year and increase cargo transport by 5% in the next five years (Airport Futures, 2000 Regional Air Transportation Demand Study). In addition to its economic importance, PDX plays an important role in national security as host to the 142nd Fighter Wing of the Air National Guard.

The significant economic advantages of the leveed area are matched by recreational opportunities and environmental benefits provided by successful management of the system. For example, the District have partnered with the City of Portland to provide 14 miles of multi-use paths directly on the levees. These paths are an integral piece of the 40-Mile-Loop Trail, originally proposed by the Olmstead brothers a century ago and now near completion as a result of regional recreational planning and partnerships such as the Intertwine. The work of the Districts and its partners also provides

- The 19 miles Columbia Slough Water trail with six canoe and kayak launches (Columbia Slough Watershed Council),
- Access to the Colombia River at the Gleason Memorial Boat Ramp and Broughton Beach
- Seasonal boating at Fairview Lake
- Access and maintenance improvements at the Columbia Children's Arboretum.

While these recreational assets are significant in themselves, they are given additional value through the Districts innovative approaches to balancing stormwater conveyance, flood protection, and habitat restoration. For example, the Districts help manage the Columbia Slough, the drainage system for a watershed that provide habitat for over 175 bird species, a variety of fish and other mammals (Columbia Slough Watershed Council) including endangered or threatened species such as the Western Painted Turtle and the Streaked Horned Lark. One of the Districts most recognized projects was the creation of a method to dredge conveyance channels from water-based equipment to protect sensitive banks. Other steps the Districts take to protect the environment include:

- Working with partners to manage invasive species
- Using pumping stations to manage water levels and temperatures for fish habitat
- Expansion, management, and improvement of riparian areas
- Conversion of linear conveyance ditches to meandering channels
- Expanding habitat areas through islands in conveyance channels
- Benching and bank slope improvement and stabilization
- Tree planting
- Using only EPA certified herbicides for levee and slough maintenance

Another critical asset located within the leveed area is the Columbia South Shore Well Field. This system of 27 wells accesses three distinct aquifers and is the second largest source of drinking water in the

state. As the backup water source for 800,000 Oregonians, the system can provide 100,000 million gallons of drinking water a day and meets or exceeds all federal standards.

The provision of non-economic benefits is particularly important for the Districts given that that the area is dominated by industrial land uses which may pose environmental justice risks to residents in, or adjacent to, the leveed areas. The Districts are especially cognizant of the lasting impact that the 1948 Vanport Floods had on the region. The inundation, and resulting devastation, of the City of Vanport disproportionately impacted the minority residents who had fewer choices and opportunities for relocation. Though there are no longer any homes or residences immediately adjacent to the railroad embankment that failed in 1948, the known problems with this embankment have never been adequately addressed. As a result, any investment, construction, or alteration of the railroad embankment will draw a great deal of community interest.

Equally important today is recognizing that communities in or adjacent to the leveed areas may be disproportionately exposed to the impacts of the industrial uses in the Districts when compared to other areas of the city. There are higher noise levels associated with the airports and trains, higher exposure to industrial spills, and high levels of air pollution associated with both major transportation arteries.

As a result of the Districts' recent work in providing economic and community benefits, they have a strong reputation among many of their constituents. However, there are populations of people and clusters of residential properties in the Districts and in adjacent neighborhoods that have been disproportionately exposed to the negative consequences of a highly industrialized and levee protected area.

Proper maintenance of the levee system, through the proposed projects, ensures that that leveed areas continue to have a reduced risk of flood. Monetary and non-monetary benefits of these projects include:

- Expansion of the national economy as a major economic exporter
- Protection of national security as home to an Air National Guard Base
- Contribution to environmental sustainability through maintenance and creation of habitat
- Flood risk reduction for 7,500 residents and \$5 billion in assessed property value

Estimated Project Costs

The proposed Feasibility Study is estimated to be less than \$3 million dollars due to two streamlining efforts. First, while exact project costs are not known at this time, an extensive amount of investigative work is on-going for the Districts within the Columbia Corridor through the Oregon Solutions process, as stated above. This investigative work will provide information about the existing structure and stability of the levee system at both the 1% water surface elevation as well as the USACE's authorized water surface elevation. The information developed from the engineering work that is currently being conducted can be relied upon as part of the feasibility study in the future. Additionally, the Districts are partnering with the Port of Portland to develop an economic study to provide an up-to-date understanding of the existing economic impact of the infrastructure located within the levee system on the local, regional, and state economy. Because this economic study will be completed in advance of the feasibility study, it will generated additional background information to be used in the feasibility study, which can further reduce the expected cost of the study to be less than \$3 million.

Local Support and Stakeholder Engagement

As aforementioned, the Districts' levee improvement project was deemed an Oregon Solutions project in late 2013. Since this partnership has been established, the level of participation and collaboration has resulted in a multifaceted approach to address the system's deficiencies. Though engineering investigations on the system have not yet been finalized, participants in the process are focused on developing a 'Declaration of Cooperation' to guide stakeholders and agencies through the allocation of responsibilities and in the selection of preferred solutions. This guidance aims to balance the varied community goals including flood protection, environmental justice and ecological sustainability, recreation, and economic resiliency. It will also take into consideration impacts from variables such as climate change and the Columbia River Treaty. The timeline for the Oregon Solutions process follows a phased approach and the partnership will continue as needed. If either proposal is selected it is assumed that the Oregon Solutions process will have already laid the groundwork for information sharing and stakeholder engagement. The list of participating agencies and stakeholders who are participating in the Oregon Solutions process is as follows:

- City of Portland
 - Bureau of Transportation
 - Bureau of Environmental Services
 - Water Bureau
 - Office of Government Relations
 - Emergency Management
 - Parks and Recreation Department
 - Bureau of Planning and Sustainability
 - Bureau of Development Services
- City of Gresham
- City of Fairview
- City of Troutdale
- Metro
- Port of Portland
- Multnomah County
- Federal Emergency Management Agency
- Business Oregon – Infrastructure Finance Authority
- Oregon Department of Fish and Wildlife
- US Army Corps of Engineers
- Oregon Department of Transportation
- Oregon Department of Land Conservation
- Oregon Department of Land Conservation
- Non-profit Associations
 - Audubon Society
 - Columbia Watershed Council
 - Columbia Riverkeeper
 - Friends of Trees
 - Urban Greenspaces Initiative
 - Willamette Riverkeeper
- Neighborhood Associations
 - East Columbia
 - Bridgeton
- Columbia Corridor Business Association
- Various Utility Companies
 - NW Natural
 - CenturyLink
 - PacifiCorp
 - Pacific Power
 - Comcast

Non-Federal Sponsor Financial Ability

The Districts have a total annual operating budget of \$11.4 million and have demonstrated the ability to partner with other non-federal agencies to acquire additional funding for levee improvement. In 2014 the Districts faced a large cost associated with levee analysis for certification in both PEN 1 and 2. While

the initial investigation work was funded solely by PEN 1 and PEN 2, the Districts engaged other public entities within the jurisdiction of the leveed area and asked them to acknowledge the importance of a continually accredited levee system to the region. This acknowledgment included a financial contribution to complete the levee analysis and develop preliminary options for remediation during fiscal year 2014-15. This contribution is in the form of a \$1.4 million low-interest loan provided by the Business Oregon Infrastructure Finance Authority. Under an approved Intergovernmental Agreement (IGA) between the City of Portland, Port of Portland, Metro, PEN 1, and PEN 2 each entity has committed to repaying a portion of the loan over seven years beginning in 2017. Additionally, in October 2014, MCDD signed an agreement with the USACE to participate in the Planning Assistance to State Program. This agreement provided \$249,208 to develop conceptual design alternatives along the existing railroad embankment on the western edge of PEN 1. The Districts are also working with other agencies to explore legislation that would identify potential state funding or contributions for flood control projects in the future.

The Districts are committed to continuing their partnership with local, regional, and state interests through the Oregon Solutions process and is confident that it will have the resources and partnerships to cost share future USACE projects within the Districts.

Letters of Support

Letters of support will be acquired from the following agencies and jurisdictions and will be sent later in December 2014 as a separate attachment:

- City of Portland
- Port of Portland
- Multnomah County
- The Oregon Governor's Regional Solutions Team
- Metro
- Columbia Corridor Association
- Columbia Slough Watershed Council

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