Annex I: Tualatin Hills Park & Recreation District

1. Introduction

1.1. Planning Process Contact

The point of contact during the Washington County Natural Hazard Mitigation Plan (NHMP) planning process for the Tualatin Hills Park & Recreation District (THPRD) was the Safety Services Manager.

1.2. Annex Organization

This annex has six sections that satisfy mitigation requirements in the Code of Federal Regulations (CFR) Title 44, Part 201 (44 CFR §201):

- **Section 1:** Introduction
- **Section 2:** Planning Process
- **Section 3:** Hazard Identification and Risk Assessment
- **Section 4:** Capability Assessment
- **Section 5:** Mitigation Strategy
- **Section 6:** Action Items

The information provided in this annex applies to THPRD (the District) alone. All pertinent information that is not identified in this annex is identified in other sections of this NHMP or within the respective appendices.

1.3. NHMP Adoption Process

Once the Washington County NHMP has received the designation “Approvable Pending Local Adoption” from the Federal Emergency Management Agency (FEMA), the District will take the plan to its Board of Directors for final public comment and local adoption. A copy of the resolution will be inserted into the NHMP and held on file in Washington County and the headquarters of THPRD.

2. Planning Process

(In compliance with 44 CFR §201.6(c)(1))

2.1. Development and Adoption Process

To apply for certain types of federal aid, technical assistance, and most post-disaster funding, local jurisdictions and special districts must comply with 44 CFR §201.3, which sets forth the requirement that communities develop a plan outlining their present and proposed efforts to mitigate risks from natural hazards.

While THPRD historically has implemented measures to reduce vulnerability to some hazards, passage of the Disaster Mitigation Act of 2000 (DMA 2000) helped District officials recognize the benefits of having a long-term, all-hazards approach to mitigation. This approach is achieved by a gradual decrease of hazard-associated impacts through the implementation of an NHMP. The District's involvement in the Washington County NHMP represents the collective efforts of the NHMP Steering Committee members, all participating local Technical Committee members, the public, and stakeholders.

The District developed this annex in accordance with guidance outlined in 44 CFR §201.6(c)(5) of DMA 2000. The complete NHMP and this annex identify hazards and mechanisms to minimize damages associated with these hazards as they occur in the geographical region of the District.

2.2. Organizing the Planning Effort

A comprehensive approach was taken in developing this NHMP. An open involvement process was established for the public and all stakeholders, which provided an opportunity for everyone to be involved in the planning process and make their views known.

Two teams worked simultaneously on this mitigation plan:

1. **Hazard Mitigation Steering Committee:** This committee consisted of points of contact from each planning participant. The group met to discuss countywide topics, including hazards and mitigation strategies. The points of contact were the leads of their local Technical Committee.
2. **Local Technical Committee:** Each plan participant created a Technical Committee that consisted of the Steering Committee representative for that jurisdiction or special district as well as designated representatives from within the organization. This team met to assess capabilities, hazards, and mitigation strategies within the planning area.

2.2.1. Tualatin Hills Park & Recreation District's Technical Committee

This annex within the NHMP was developed by the local THPRD Technical Committee with support from consulting firm IEM. The committee's efforts, which took place throughout 2022, were led by the Safety Services Manager.

Table 259: Tualatin Hills Park & Recreation District Technical Committee Members for the 2023 NHMP

Position	Division	Role in Committee and Planning Process
Safety Services Manager	Communications Division, Safety Services	General oversight, hazard identification, and plan development
Grant Specialist	Finance Services Division	Hazard identification and plan development
Support Services Manager	Park Services Division, Nature & Trails Department	Hazard identification and plan development
Administrative Specialist	Communications Division, Community Events	Hazard identification and plan development

Position	Division	Role in Committee and Planning Process
Web Specialist, Geographic Information System (GIS)	Communications Division, Information Services	Hazard identification and plan development
Nature & Trails Manager	Park Services Division, Nature & Trails Department	Hazard identification and plan development
Risk Manager	Human Resources Division, Risk & Contract Management	Hazard identification and plan development
Information Services Manager	Communications Division, Information Services	Hazard identification and plan development
IS Systems Administrator	Communications Division, Information Services	Hazard identification and plan development
Maintenance Manager	Park Services Division, Maintenance Coordination	Hazard identification and plan development

IEM also supported or led the following activities associated with the development, approval, and adoption of the plan:

1. Prepared, based on committee direction and stakeholder and community input, the first draft of the plan and provided technical writing assistance for plan review, editing, and formatting.
2. Submitted the proposed plan to the Oregon Department of Emergency Management (OEM) and FEMA for review and approval and completed edits or revisions requested by these organizations.
3. Coordinated plan adoption processes with the District, OEM, and FEMA.

2.3. Public Participation

Public participation is an important component of this NHMP. Public participation offers community members the chance to voice their ideas, interests, and opinions. In addition to FEMA's public participation requirement, Oregon's land use system addresses the need for public participation in Statewide Land Use Planning Goal 1, Citizen Involvement, which ensures the opportunity for community involvement in the planning process.

A survey regarding community perceptions of natural hazards and priorities was administered, and the results were used to help the Steering and Technical Committees update their risk assessments and mitigation strategies. Community members were also provided an opportunity to comment on a draft of the NHMP. See Volume III, Appendix B for additional information about the survey and opportunities for public comment.

3. Hazard Identification and Risk Assessment

(In compliance with 44 CFR §201.6(c)(2)(i), §201.6(c)(2)(ii), §201.6(c)(2)(ii)(A), §201.6(c)(2)(ii)(B), §201.6(c)(2)(ii)(C), §201.6(c)(2)(iii), and §201.6(c)(3)(ii))

The following information serves to assist the District in determining and prioritizing appropriate mitigation action items to reduce losses from identified hazards.

3.1. Tualatin Hills Park & Recreation District Profile

This section provides information about District-specific characteristics. Additional community characteristics of the planning area are included in Volume III, Appendix A.

Many special District characteristics may affect how natural hazards impact the District and how THPRD chooses to plan for natural hazard mitigation. Considering the District-specific assets during the planning process assisted in identifying appropriate measures for natural hazard mitigation.

The mission of THPRD is to provide high-quality park and recreation facilities, programs, services, and natural areas that meet the needs of the diverse communities it serves. The District is a system of indoor and outdoor resources, including more than 200 park sites, 75 miles of trails, 1,300 acres of natural areas, 27 miles of streams, 3 lakes, 8 swim centers, and 6 recreation centers (see Figure 39). The organization serves a population of 270,297 and has 600 employees over a 50-square-mile area.

The critical and vulnerable facilities listed in Table 260 are in the hazard area for all or some of the hazards identified by the District.

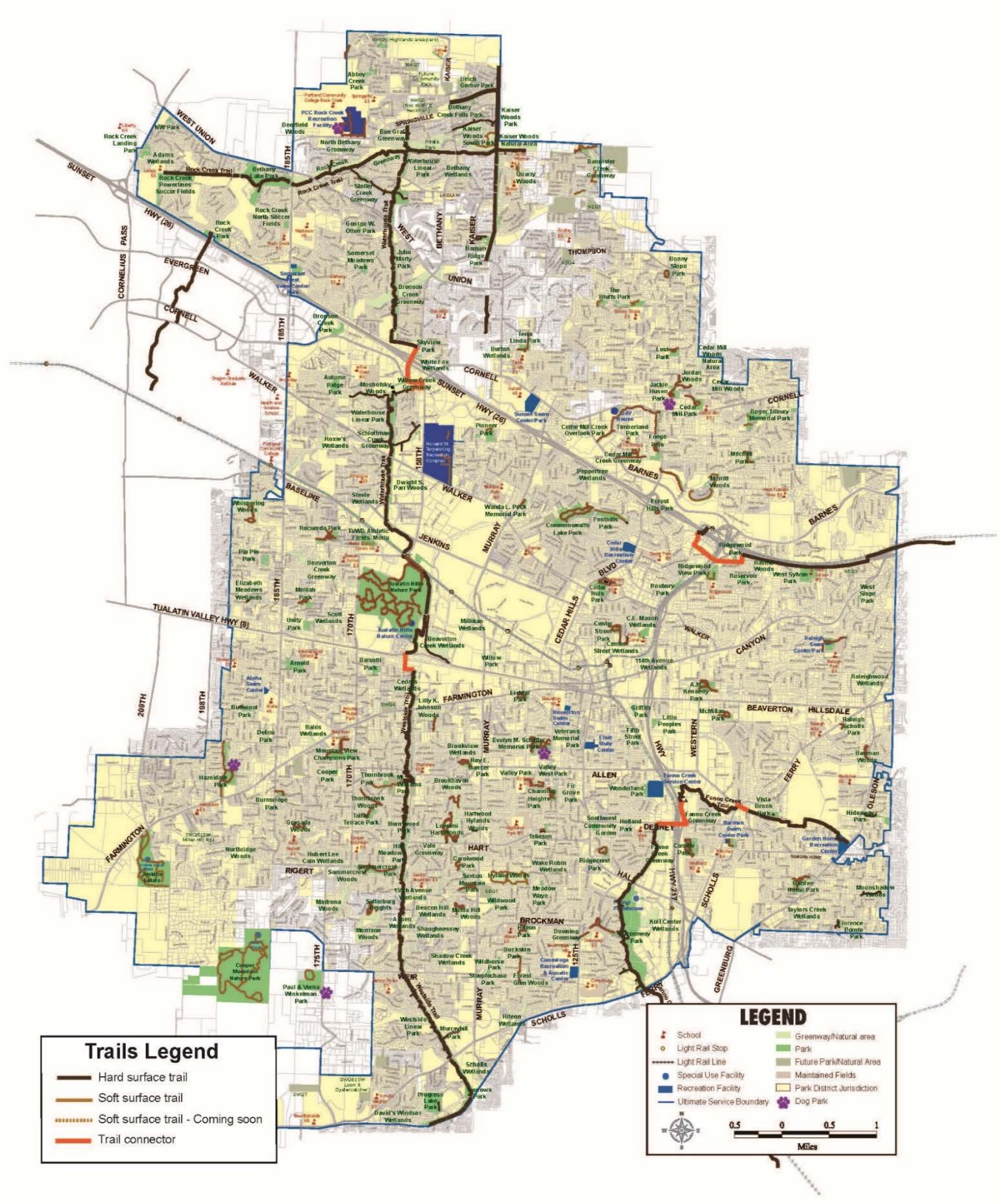

Figure 39: THPRD Parks, Recreation Facilities, Maintained School Grounds, and Natural Area

Table 260: Critical Facility and Asset Inventory

Name of Infrastructure, Facility, or Resource	Type of Asset	Address	Latitude	Longitude	Comments
114th Avenue Wetlands Natural Area	Natural Resource	S of Center Street between 114th Avenue and Highway 217	45.4927397	-122.793208	Not vulnerable to dam failure or earthquake.
155th Avenue Wetlands Natural Area	Natural Resource	SW corner of Satterburg Road and 155th Avenue	45.458007	-122.836842	Not vulnerable to dam failure or earthquake.
A.M. Kennedy Park	Infrastructure or Facility	10200 SW Kennedy Street	45.4885424	-122.78061	Not vulnerable to dam failure.
Abbey Creek Park	Infrastructure or Facility	7284 NW 170th Avenue	45.57245	-122.852	Not vulnerable to dam failure.
Adams Wetlands Natural Area	Natural Resource	South of Rock Creek Road/East of Wahkeena	45.5590548	-122.895156	Not vulnerable to dam failure or earthquake.
Aloha Swim Center	Infrastructure or Facility	18650 SW Kinnaman Road	45.4860435	-122.869723	Not vulnerable to dam failure or drought.
Arnold Park	Infrastructure or Facility	4155 SW 182nd Avenue	45.4897848	-122.863592	Not vulnerable to dam failure or earthquake.
Aspen Wetlands Natural Area	Natural Resource	Access off Flagstone Drive/W of 155th Avenue	45.4550456	-122.838735	Not vulnerable to dam failure.
Autumn Ridge Park	Infrastructure or Facility	Access off Autumn Ridge Drive and Fall Avenue	45.5286419	-122.857869	Not vulnerable to dam failure.
Bales Wetlands Natural Area	Natural Resource	N of Rosa Road at Farmington Road	45.4792182	-122.860269	Not vulnerable to dam failure or earthquake.
Bannister Creek Greenway	Infrastructure or Facility	NW Laidlaw Road and NW Bannister Drive	45.557301	-122.807364	Not vulnerable to dam failure.
Barlow Square Path	Infrastructure or Facility	S of Barlow Road between 126th Street and Juniper Terrace	45.4696524	-122.806453	Not vulnerable to dam failure.
Barrows Park	Infrastructure or Facility	Intersection of SW Barrows Road and SW Horizon Boulevard	45.430323	-122.828457	Not vulnerable to dam failure.

Name of Infrastructure, Facility, or Resource	Type of Asset	Address	Latitude	Longitude	Comments
Barsotti Park	Infrastructure or Facility	16610 SW Blanton Street	45.4894018	-122.848021	Not vulnerable to dam failure.
Bauman Woods Natural Area	Natural Resource	Corner of Ames Way and Oleson Road	45.4796285	-122.748804	Not vulnerable to dam failure.
Beacon Hill Wetlands Natural Area	Natural Resource	East of 154th Avenue between Sexton Mountain Drive and Turquoise Loop	45.4566269	-122.833771	
Beaverton Creek Greenway	Natural Resource	175th Avenue and Oakwood Drive	45.501281	-122.856728	Not vulnerable to dam failure.
Beaverton Creek Wetlands Natural Area	Natural Resource	North of Tualatin Valley Highway/W of 153rd Avenue	45.4924571	-122.835927	
Beaverton Swim Center	Infrastructure or Facility	12850 SW Third Street	45.4849028	-122.809182	Not vulnerable to dam failure or drought.
Ben Graf Greenway	Natural Resource	South of Springville Road/East of Sickle Terrace	45.5621204	-122.839827	Not vulnerable to dam failure.
Bethany Creek Greenway	Natural Resource	865 SW Pheasant Drive			Not vulnerable to dam failure.
Bethany Creek Park	Infrastructure or Facility	E of Greenway between Hall Boulevard and SW Scholls Ferry Road			Not vulnerable to dam failure.
Bethany Lake Park	Natural Resource	Access off Neakahnie Avenue and 185th Avenue	45.5567056	-122.873385	Not vulnerable to dam failure.
Bethany Wetlands Natural Area	Natural Resource	5391 NW Kaiser Road	45.5583585	-122.833639	Not vulnerable to dam failure.
Bonny Slope Park	Infrastructure or Facility	Access off Thompson Road and South Road	45.5454804	-122.79136	Not vulnerable to dam failure.

Name of Infrastructure, Facility, or Resource	Type of Asset	Address	Latitude	Longitude	Comments
Bronson Creek Greenway	Natural Resource	NE corner of Bethany Boulevard and West Union Road	45.5440223	-122.840663	Not vulnerable to dam failure.
Bronson Creek Park	Natural Resource	Access off Cornell Road between Evergreen Street and 173rd Avenue	45.536346	-122.857887	Not vulnerable to dam failure.
Brookhaven Woods Natural Area	Natural Resource	Access off Daphne Street, Ivy Glen Street, Kilchis Street, and Barcelona Way	45.4712431	-122.829769	Not vulnerable to dam failure.
Brookview Wetlands Natural Area	Natural Resource	NE corner of 150th Avenue and Glenbrook Road	45.4780377	-122.831492	Not vulnerable to dam failure.
Buckskin Park	Infrastructure or Facility	Access off SW Buckskin Terrace/S of SW Harness Lane	45.452368	-122.809596	Not vulnerable to dam failure.
Burnsridge Park	Infrastructure or Facility	E of SW 185th between SW Broad Oak Boulevard and SW Monte Verdi Boulevard	45.4718712	-122.866309	Not vulnerable to dam failure.
Burntwood Park	Infrastructure or Facility	North of SW Burntwood Way between SW 158th Avenue and SW 160th Avenue	45.4675827	-122.840934	Not vulnerable to dam failure.
Burton Wetlands Natural Area	Natural Resource	Access off NW Wheatfield Way/S of NW Burton Street	45.5345083	-122.822336	Not vulnerable to dam failure.
Butternut Park	Infrastructure or Facility	SW corner of SW 192nd Avenue and SW Butternut Street	45.4835157	-122.873593	Not vulnerable to dam failure.
C.E. Mason Wetlands Natural Area	Natural Resource	Access North of SW Sunnyhill Lane/West of Highway 217	45.4969532	-122.79276	Not vulnerable to dam failure.

Name of Infrastructure, Facility, or Resource	Type of Asset	Address	Latitude	Longitude	Comments
Camille Park	Infrastructure or Facility	Access at west end of SW Marjorie Lane/S end of SW 105th Avenue	45.4657908	-122.783653	Not vulnerable to dam failure.
Carolwood Park	Infrastructure or Facility	East of SW 149th Avenue between SW Hart Road and SW Vulcan Court	45.4625285	-122.8297	Not vulnerable to dam failure.
Cedar Hills Park	Infrastructure or Facility	2300 SW Cedar Hills Boulevard	45.502031	-122.802386	Not vulnerable to dam failure. Property includes restrooms and concessions.
Cedar Hills Recreation Center	Infrastructure or Facility	11640 SW Park Way	45.5073781	-122.797622	Not vulnerable to dam failure or drought. Recreation facility with outdoor park and fields. Designated shelter site.
Cedar Mill Creek Greenway	Infrastructure or Facility	NW Cornell Road at NW 114th Avenue	45.5251537	-122.800509	Not vulnerable to dam failure.
Cedar Mill Creek Overlook Park	Infrastructure or Facility	Stone Mountain Lane	45.5234879	-122.8013	Not vulnerable to dam failure.
Cedar Mill Park	Infrastructure or Facility	10385 NW Cornell Road	45.5275223	-122.784461	Not vulnerable to dam failure.
Cedar Mill Woods Natural Area	Natural Resource	Access off NW Priscilla Court/E of NW 102nd Avenue	45.5300979	-122.781657	Not vulnerable to dam failure.
Cedar Park Tennis Courts	Infrastructure or Facility	11100 SW Park Way	45.5066305	-122.795878	Not vulnerable to dam failure.
Cedars Wetlands Natural Area	Natural Resource	Access off SW Shelton Street, West of 162nd Place	45.4867767	-122.844071	Not vulnerable to dam failure.
Center Street Park	Infrastructure or Facility	11895 SW Center Street	45.4960817	-122.799697	Not vulnerable to dam failure.

Name of Infrastructure, Facility, or Resource	Type of Asset	Address	Latitude	Longitude	Comments
Center Street Wetlands	Natural Resource	Access North of SW Center Street			Not vulnerable to dam failure.
Channing Heights Park	Infrastructure or Facility	Access off SW Hyland Way/SSW of Valley Circle	45.4740569	-122.814137	Not vulnerable to dam failure.
Commonwealth Lake Park	Infrastructure or Facility	SW Foothill Drive and SW Huntington Avenue	45.5118792	-122.808931	Not vulnerable to dam failure.
Conestoga Recreation and Aquatic Center	Infrastructure or Facility	9985 SW 125th Avenue	45.4484469	-122.80637	Not vulnerable to dam failure or drought. Recreation and aquatic facility with an outdoor park area and restrooms. Designated shelter site.
Conestoga Tennis Courts	Infrastructure or Facility	12250 SW Conestoga Drive	45.4464968	-122.804878	Not vulnerable to dam failure.
Cooper Mountain Nature Park	Infrastructure or Facility	18892 SW Kemmer Road	45.447871	-122.8727	Not vulnerable to dam failure. Park has extensive number of buildings and trails.
Cooper Park	Infrastructure or Facility	Access off SW Oak Street between 172nd Avenue and 176th Avenue	45.4750701	-122.856017	Not vulnerable to dam failure.
David's Windsor Wetlands Natural Area	Natural Resource	Access off SW Harlequin Drive, E of SW Sheldrake Way	45.4287907	-122.837764	Not vulnerable to dam failure.
Deerfield Woods Natural Area	Natural Resource	18079 NW Chemetka Lane	45.5624525	-122.862981	Not vulnerable to dam failure.
Deline Park	Infrastructure or Facility	Southeast corner of SW Deline Street and SW 187th Avenue	45.4796599	-122.869654	Not vulnerable to dam failure.

Name of Infrastructure, Facility, or Resource	Type of Asset	Address	Latitude	Longitude	Comments
Downing Greenway	Natural Resource	Access off SW 125th Avenue between SW Greenway and SW Longhorn Lane	45.45345	-122.804087	Not vulnerable to dam failure.
Dwight S. Parr Woods Natural Area	Natural Resource	16000 SW Regatta Lane	45.5164909	-122.842217	Not vulnerable to dam failure.
Eichler Park	Infrastructure or Facility	13710 SW Farmington Road	45.4863952	-122.817994	Not vulnerable to dam failure.
Elizabeth Meadows Wetlands Natural Area	Natural Resource	No Access	45.4980082	-122.873646	Not vulnerable to dam failure.
Elsie Stuhr Center	Infrastructure or Facility	5550 SW Hall Boulevard	45.4798178	-122.804157	Not vulnerable to dam failure or drought. Designated shelter site.
Fanno Creek Greenway	Infrastructure or Facility	Access off SW Denney Road	45.4629935	-122.792359	Not vulnerable to dam failure.
Fanno Creek Service Center	Infrastructure or Facility	6220 SW 112th Avenue	45.474145	-122.790788	Not vulnerable to dam failure or drought. Emergency Operations Center.
Fanno Farmhouse	Historical Property	8405 SW Creekside Place	45.4588719	-122.793476	Not vulnerable to dam failure or drought.
Fifth Street Park	Infrastructure or Facility	Southwest corner of SW 5th Street and SW Alger Avenue	45.4826282	-122.797148	Not vulnerable to dam failure.
Fir Grove Park	Infrastructure or Facility	Northwest corner of SW 22nd Street and SW 130th Avenue	45.4728946	-122.811417	Not vulnerable to dam failure.
Five Oaks Tennis Courts	Infrastructure or Facility	1600 NW 173rd Avenue	45.5312079	-122.84947	Not vulnerable to dam failure.
Florence Pointe Park	Infrastructure or Facility	7484 SW Florence Lane	45.4560712	-122.753467	Not vulnerable to dam failure.

Name of Infrastructure, Facility, or Resource	Type of Asset	Address	Latitude	Longitude	Comments
Foege Park	Infrastructure or Facility	11320 NW Cornell Road	45.5197522	-122.792826	Not vulnerable to dam failure.
Foothills Park	Infrastructure or Facility	Southeast corner of SW Lanewood Street and SW Huntington Avenue	45.5116761	-122.801445	Not vulnerable to dam failure.
Forest Glen Woods Natural Area	Natural Resource	Access off SW Weir Road and SW 130th Avenue	45.4470229	-122.811391	Not vulnerable to dam failure.
Forest Hills Park	Infrastructure or Facility	Access off SW Portola Avenue, S of NW Sunset Highway at Cedar Hills Boulevard	45.5125916	-122.792911	Not vulnerable to dam failure.
Future Community Park	Infrastructure or Facility	18110 SW Farmington Road, 6255 SW 179th Avenue	45.4762475	-122.862839	Not vulnerable to dam failure.
Future North Bethany East Community Park	Infrastructure or Facility				Not vulnerable to dam failure.
Future North Bethany Neighborhood Park	Infrastructure or Facility				Not vulnerable to dam failure.
Future Neighborhood Park Northeast Quadrant	Infrastructure or Facility				Not vulnerable to dam failure.
Future Neighborhood Park Southwest Quadrant	Natural Resource				Not vulnerable to dam failure.
Future Park South Cooper Mountain – Gorman	Infrastructure or Facility				Not vulnerable to dam failure.
Garden Home Park	Infrastructure or Facility	8020 SW 83rd Avenue	45.4612949	-122.761628	Not vulnerable to dam failure.
Garden Home Recreation Center	Infrastructure or Facility	7475 SW Oleson Road	45.4672921	-122.752878	Not vulnerable to dam failure or drought. Designated shelter site.
George W. Otten Park	Infrastructure or Facility	Northeast corner of NW Laidlaw Road and NW Emerald Canyon Drive	45.5505854	-122.853869	Not vulnerable to dam failure.

Name of Infrastructure, Facility, or Resource	Type of Asset	Address	Latitude	Longitude	Comments
Granada Woods Natural Area	Natural Resource	Northwest corner of SW Bany Road and SW 179th Avenue	45.4674106	-122.862278	Not vulnerable to dam failure.
Greenway Park	Infrastructure or Facility	East of SW Greenway between SW Hall Boulevard and SW Scholls Ferry Road	45.45396	-122.795863	Not vulnerable to dam failure.
Griffith Park	Infrastructure or Facility	Access off SW Griffith Drive, S of Beaverton-Hillsdale Highway	45.4850683	-122.795863	Not vulnerable to dam failure.
Howard M. Terpenning Recreation Complex	Infrastructure or Facility	15707 SW Walker Road	45.5197221	-122.836632	Not vulnerable to dam failure. Recreation complex with a variety of fields, facilities, courts, and trails. Designated shelter site and backup Emergency Operations Center.
Hansen Ridge Park	Infrastructure or Facility	4075 NW 147th Avenue	45.5500663	-122.82703	Not vulnerable to dam failure.
Harman Swim Center	Infrastructure or Facility	7300 SW Scholls Ferry Road	45.4672254	-122.775764	Not vulnerable to dam failure or drought.
Hart Meadows Park	Infrastructure or Facility	Power line corridor between SW Hart Road and SW Bridle Hills Drive	45.4615761	-122.841255	Not vulnerable to dam failure.
Hartwood Hylands Woods Natural Area	Natural Resource	Access W off SW Murray Boulevard between SW Tierra Del Mar Drive and SW Hart Road	45.4682989	-122.826658	Not vulnerable to dam failure.
Hazeldale Park	Infrastructure or Facility	Access off SW 196th Avenue, N of SW Farmington Road	45.4739427	-122.877179	Not vulnerable to dam failure.

Name of Infrastructure, Facility, or Resource	Type of Asset	Address	Latitude	Longitude	Comments
Hideaway Park	Infrastructure or Facility	Access off SW 67th Avenue, E of SW Oleson Road	45.4712187	-122.746746	Not vulnerable to dam failure.
Hiteon Park	Infrastructure or Facility	13800 SW Brockman Street	45.454306	-122.816237	Not vulnerable to dam failure.
Hiteon Wetlands Natural Area	Natural Resource	Access off SW Davies Road between SW Otter Lane and SW Scholls Ferry Road	45.4423049	-122.816438	Not vulnerable to dam failure.
Holland Park	Infrastructure or Facility	7087 SW Queen Lane	45.468348	-122.796043	Not vulnerable to dam failure.
Hubert Lee Cain Wetlands Natural Area	Natural Resource	Northeast corner of SW 175th Avenue and SW Rigert Road	45.4622683	-122.856524	Not vulnerable to dam failure.
Hyland Woods Natural Area	Natural Resource	Access off SW 135th Avenue or SW Sexton Mountain Drive, E of SW Murray Boulevard	45.4611424	-122.819463	Not vulnerable to dam failure.
Jackie Husen Park	Infrastructure or Facility	10955 NW Reeves Street	45.5291579	-122.789979	Not vulnerable to dam failure.
Jenkins Estate	Infrastructure or Facility and Historical Property	8005 SW Grabhorn Road	45.4602651	-122.891418	Not vulnerable to dam failure. Historical property with multiple facilities, structures, trails, open space, gardens, natural areas, and restrooms.
John Marty Park	Infrastructure or Facility	Power line corridor between Charlais Street and Joscelyn Street	45.545664	-122.846601	Not vulnerable to dam failure.
John Quincy Adams Young House	Historical Property	12050 NW Cornell Road	45.526538	-122.800514	Not vulnerable to dam failure or drought.

Name of Infrastructure, Facility, or Resource	Type of Asset	Address	Latitude	Longitude	Comments
Jordan Woods Natural Area	Natural Resource	Access N end of NW 107th Avenue, N of NW Cornell Road	45.5301529	-122.787379	Not vulnerable to dam failure.
Kaiser Woods Natural Area	Natural Resource	Power line corridors east of NW Kaiser Road	45.5620835	-122.829054	Not vulnerable to dam failure.
Kaiser Woods Park	Infrastructure or Facility	NW Wenmarie Drive and NW Mcgregor Terrace	45.5655183	-122.826621	Not vulnerable to dam failure.
Kaiser Woods South Park	Infrastructure or Facility	NW Wenmarie Drive and NW 145th Place	45.565518	-122.826621	Not vulnerable to dam failure.
Koll Center Wetlands Natural Area	Natural Resource	Access via Greenway Park	45.4561672	-122.791337	Not vulnerable to dam failure.
La Raiz Park	Infrastructure or Facility	SW Baker Street and SW Lombard Avenue	45.4688452	-122.79600	Not vulnerable to dam failure.
Lawndale Park	Infrastructure or Facility	Access off E end of SW Wright Street at SW 176th Avenue	45.4773223	-122.856751	Not vulnerable to dam failure.
Lilly K. Johnson Woods Natural Area	Natural Resource	Access off SW Division Street, W of SW 153rd Avenue	45.4823618	-122.835519	Not vulnerable to dam failure.
Little Peoples Park	Infrastructure or Facility	Northeast corner of Highway 217 and SW 5th Street	45.4834858	-122.791313	Not vulnerable to dam failure.
Lost Park	Infrastructure or Facility	2120 NW 111th Avenue	45.5345957	-122.789498	Not vulnerable to dam failure.
Lowami Hart Woods Natural Area	Natural Resource	14895 SW Hart Road	45.4674501	-122.831782	Not vulnerable to dam failure.
Madrona Woods Natural Area	Natural Resource	Northeast and southwest corners of SW Arbutus Drive and SW Ravine Drive	45.4575976	-122.853092	Not vulnerable to dam failure.

Name of Infrastructure, Facility, or Resource	Type of Asset	Address	Latitude	Longitude	Comments
Matrix Hill Woods Natural Area	Infrastructure or Facility	Access off SW 149th Place, North of SW Ruby Street	45.45727	-122.830766	Not vulnerable to dam failure.
McMillan Park	Infrastructure or Facility	Access off SW Chestnut Place, N of SW Cypress Street	45.4844946	-122.777165	Not vulnerable to dam failure.
Meadow Park Tennis Courts	Infrastructure or Facility	14100 SW Downing Street	45.514859	-122.82398	Not vulnerable to dam failure.
Meadow Waye Park	Infrastructure or Facility	13275 SW Davies Road	45.460654	-122.813534	Not vulnerable to dam failure.
Melilah Park	Infrastructure or Facility	Access off SW Arborcrest Court or SW 180th Place, east of SW 182nd Avenue	45.4984831	-122.862617	Not vulnerable to dam failure.
Merritt Woods Natural Area	Natural Resource	Access south of NW 101st Avenue or SW 102nd Avenue, south of SW Washington Street	45.517021	-122.78213	Not vulnerable to dam failure.
Millikan Wetlands Natural Area	Natural Resource	North of SW Tualatin Valley Highway, west of SW 153rd Drive			Not vulnerable to dam failure.
Mitchell Park	Infrastructure or Facility	Access off NW 93rd Place, west of NW Leahy Road	45.5197968	-122.773468	Not vulnerable to dam failure.
Moonshadow Woods Natural Area	Natural Resource	Access off SW Alden Street, east of SW 71st Avenue	45.4607204	-122.746848	Not vulnerable to dam failure.
Morrison Woods Natural Area	Natural Resource	Trailhead access off SW Muledeer Drive	45.4557119	-122.847524	Not vulnerable to dam failure.
Moshofsky Woods Natural Area	Infrastructure or Facility	1001 NW Winged Foot Terrace	45.527363	-122.848287	Not vulnerable to dam failure.

Name of Infrastructure, Facility, or Resource	Type of Asset	Address	Latitude	Longitude	Comments
Mountain View Champions Park	Infrastructure or Facility	5915 SW 170th Avenue	45.4783433	-122.854339	Not vulnerable to dam failure. Sports complex with restrooms, concessions, open space, and gardens.
Mountain View Tennis Courts	Infrastructure or Facility	17500 SW Farmington Road	45.4796849	-122.854303	Not vulnerable to dam failure.
Mt. Williams Park	Infrastructure or Facility	Trail access from SW 160th Avenue and SW Sumac Street	45.473844	-122.841289	Not vulnerable to dam failure.
Murrayhill Park	Infrastructure or Facility	Access from SW Teal Boulevard	45.4388602	-122.832206	Not vulnerable to dam failure.
NE Neighborhood Park	Natural Resource	4950 NW Saltzman Road	45.5547179	-122.807511	Not vulnerable to dam failure.
North Bethany Greenway	Infrastructure or Facility	17700 NW Springville Road	45.5612815	-122.859032	Not vulnerable to dam failure.
North Bethany Park Blocks	Infrastructure or Facility	15224 NW Marie Way			Not vulnerable to dam failure.
North Bethany Trail C1.1	Infrastructure or Facility	South of NW West Union Road, E of NW 185th Avenue			Not vulnerable to dam failure.
Northridge Woods Natural Area	Natural Resource	No Access	45.4632231	-122.872232	Not vulnerable to dam failure.
Northwest Park	Infrastructure or Facility	NW Landing Drive, South of NW West Union Road	45.5648474	-122.892679	Not vulnerable to dam failure.
PCC Rock Creek Recreational Facility	Infrastructure or Facility	17705 NW Springville Road	45.5652215	-122.855374	Not vulnerable to dam failure. Sports complex with restrooms, concessions, trails, and a dog park.
Parivar Park	Infrastructure or Facility	7765 NW 167th Avenue			Not vulnerable to dam failure.

Name of Infrastructure, Facility, or Resource	Type of Asset	Address	Latitude	Longitude	Comments
Peppertree Wetlands Natural Area	Natural Resource	Access off SW 121st Place, S of Sunset Highway	45.5168974	-122.804468	Not vulnerable to dam failure.
Pioneer Park	Infrastructure or Facility	14545 NW Pioneer Road	45.5223628	-122.826102	Not vulnerable to dam failure.
Pirate Park	Infrastructure or Facility	Near NW Energia Street between NW Brandberry Drive and NW Graf Street	45.5615449	-122.843772	Not vulnerable to dam failure.
Progress Lake Park	Infrastructure or Facility and Natural Resource	Intersection of SW Barrows Road and SW Mallard Drive	45.42972	-122.833757	Not vulnerable to dam failure.
Pío Park	Infrastructure or Facility	2135 SW 187th Avenue	45.504435	-122.870823	Not vulnerable to dam failure.
Quarry Woods Natural Area	Natural Resource	Access off NW Skycrest Parkway, N of Jacob Wismer Elementary School	45.5593896	-122.821657	Not vulnerable to dam failure.
Raleigh Scholls Park	Infrastructure or Facility	Off SW Scholls Ferry Road	45.4833343	-122.753178	Not vulnerable to dam failure.
Raleigh Swim Center/Park	Infrastructure or Facility	3500 SW 78th Avenue	45.494555	-122.75531	Not vulnerable to dam failure.
Raleighwood Wetlands Natural Area	Natural Resource	Access off SW Dogwood Lane, N of SW Scholls Ferry Road	45.4904802	-122.748422	Not vulnerable to dam failure.
Ravine Woods Natural Area	Natural Resource	No Access	45.5048469	-122.769346	Not vulnerable to dam failure.
Recuerdo Park	Infrastructure or Facility	Intersection of SW 174th Avenue and SW Biles Lane	45.50733	-122.858675	Not vulnerable to dam failure.
Reflections Plaza	Infrastructure or Facility	13400 NW Cornell Road	45.5257202	-122.813974	Not vulnerable to dam failure.

Name of Infrastructure, Facility, or Resource	Type of Asset	Address	Latitude	Longitude	Comments
Reservoir Park	Infrastructure or Facility	Access off SW Inglewood Street, N of SW Imperial Drive	45.5035787	-122.774468	Not vulnerable to dam failure.
Ridgecrest Park	Infrastructure or Facility	Access off SW Cresmoor Drive, W of SW Hillcrest Place	45.4651513	-122.800959	Not vulnerable to dam failure.
Ridgewood Park	Infrastructure or Facility	Southeast corner of Highway 217 and SW Wilshire Street	45.5062783	-122.77661	Not vulnerable to dam failure.
Ridgewood View Park	Infrastructure or Facility	10001 SW Ardenwood Street	45.5036081	-122.781047	Not vulnerable to dam failure.
Rock Creek Greenway	Infrastructure or Facility	Southwest and southeast corner of NW West Union Road and NW Kahneeta Drive	45.562359	-122.823801	Not vulnerable to dam failure.
Rock Creek Landing Park	Infrastructure or Facility	Northeast corner of NE Cornelius Pass Road and NW Rock Creek Boulevard	45.5610985	-122.897101	Not vulnerable to dam failure.
Rock Creek North Soccer Fields	Infrastructure or Facility	4125 NW 185th Avenue	45.5507633	-122.86947	Not vulnerable to dam failure.
Rock Creek Park	Infrastructure or Facility	20107 NW Rock Creek Boulevard	45.5491282	-122.883483	Not vulnerable to dam failure.
Rock Creek Powerlines Soccer Fields	Infrastructure or Facility	Access off NW Rock Creek Boulevard between NW Ponderosa Drive and NW Salishan Drive	45.5570086	-122.890443	Not vulnerable to dam failure.
Roger Tilbury Memorial Park	Infrastructure or Facility	965 NW 93rd Avenue	45.5261118	-122.772242	Not vulnerable to dam failure.
Roxbury Park	Infrastructure or Facility	Southeast corner of SW Berkshire Street and SW Roxbury Avenue	45.5024295	-122.787724	Not vulnerable to dam failure.

Name of Infrastructure, Facility, or Resource	Type of Asset	Address	Latitude	Longitude	Comments
Roxie's Wetlands Natural Area	Natural Resource	Access off NW 173rd Avenue, N of NW Elaine Court	45.5216483	-122.855303	Not vulnerable to dam failure.
Roy E. Dancer Park	Infrastructure or Facility	5915 SW Murray Boulevard	45.4768343	-122.828998	Not vulnerable to dam failure.
Sato Trail	Infrastructure or Facility	7700 NW Kaiser Road			Not vulnerable to dam failure.
Satterberg Heights Park	Infrastructure or Facility	Northeast and southeast corners of SW Sexton Mountain Drive and SW 160th Avenue	45.456497	-122.843688	Not vulnerable to dam failure.
Schiffler Park	Infrastructure or Facility	Access off SW Bonnie Brae Street, SW Erickson Avenue, or SW Berthold Avenue	45.479527	-122.814288	Not vulnerable to dam failure.
Schlottman Creek Greenway	Natural Resource	Access off NW Blueridge Drive or NW Foxborough Circle, W of NW 158th Avenue	45.5223491	-122.841354	Not vulnerable to dam failure.
Scholls Wetlands Natural Area	Natural Resource	Northeast corner of SW Barrows Road and SW Walnut Lane	45.4341032	-122.825239	Not vulnerable to dam failure.
Scott Wetlands Natural Area	Natural Resource	Access off SW Eirwen Street at SW 174th Avenue	45.4971271	-122.85712	Not vulnerable to dam failure.
Sexton Mountain Park	Infrastructure or Facility	14700 SW Sexton Mountain Drive	45.4597461	-122.827882	Not vulnerable to dam failure.
Shadow Creek Wetlands Natural Area	Natural Resource	Access off SW Opal Drive, E of SW 151st Avenue	45.4518871	-122.829366	Not vulnerable to dam failure.

Name of Infrastructure, Facility, or Resource	Type of Asset	Address	Latitude	Longitude	Comments
Shaughnessey Wetlands Natural Area	Natural Resource	Access off SW Graphite Terrace between SW Ivory Street and SW Turquoise Loop	45.4536354	-122.833905	Not vulnerable to dam failure.
Skyview Park	Infrastructure or Facility	15780 NW Bronson Road	45.5328914	-122.841226	Not vulnerable to dam failure.
Somerset Meadows Park	Infrastructure or Facility	3400 NW Parkview Drive	45.5450333	-122.852599	Not vulnerable to dam failure.
Somerset West Swim Center/Park	Infrastructure or Facility	18300 NW Parkview Boulevard	45.5444019	-122.866142	Not vulnerable to dam failure.
Steele Wetlands Natural Area	Natural Resource	Access off SW 170th Avenue, North of SW Cashew Way	45.5145217	-122.85147	Not vulnerable to dam failure.
Steeplechase Park	Infrastructure or Facility	14300 SW Weir Road	45.448027	-122.82381	Not vulnerable to dam failure.
Stoller Creek Greenway	Infrastructure or Facility	Access via NW Laidlaw Road	45.55708	-122.85235	Not vulnerable to dam failure.
Summercrest Park	Infrastructure or Facility	East of SW Rigert Terrace and SW 170th Avenue	45.461944	-122.850387	Not vulnerable to dam failure.
Summercrest Woods Natural Area	Natural Resource	Access off SW 171st Place, South of SW Juliann Lane	45.4609646	-122.853463	Not vulnerable to dam failure.
Sunset Swim Center/Park	Infrastructure or Facility	13707 NW Science Park Drive	45.5269072	-122.817965	Not vulnerable to dam failure. Park is a sports complex with restrooms.
Tualatin Valley Water District Athletic Fields- Merlo	Infrastructure or Facility	1700 SW 170th Avenue	45.5074061	-122.850591	Not vulnerable to dam failure.
Taliesen Park	Infrastructure or Facility	Access off SW Heath Place, South of SW Barlow Road	45.4683158	-122.812937	Not vulnerable to dam failure.

Name of Infrastructure, Facility, or Resource	Type of Asset	Address	Latitude	Longitude	Comments
Tallac Terrace Park	Infrastructure or Facility	East of SW 167th Place on SW Timberland Drive	45.4691841	-122.848496	Not vulnerable to dam failure.
Taylors Creek Wetlands Natural Area	Natural Resource	Northeast corner of SW Taylors Ferry Road and NE 78th Avenue	45.4554144	-122.75613	Not vulnerable to dam failure.
Tenax Woods Natural Area	Natural Resource	11680 SW Eider Avenue	45.435448	-122.843022	Not vulnerable to dam failure.
Terra Linda Park	Infrastructure or Facility	Access South of NW Burton Street, East of NW 139th Place	45.5346635	-122.819856	Not vulnerable to dam failure.
The Bluffs Park	Natural Resource	Access on NW South Drive, NW 177th Drive, NW Blackhawk Drive, or NW Haskell Court	45.5415428	-122.803296	Not vulnerable to dam failure.
Thornbrook Park	Infrastructure or Facility	Access off SW Taft Court, East of SW 166th Avenue	45.47316	-122.847167	Not vulnerable to dam failure.
Thornbrook Woods Natural Area	Natural Resource	Access off SW Timberland Place between SW Ivy Glenn Street and SW Heceta Court	45.4707597	-122.847827	Not vulnerable to dam failure.
Timberland Park	Infrastructure or Facility	11600 NW Stone Mountain Lane	45.5223933	-122.798234	Not vulnerable to dam failure.
Tualatin Hills Nature Park	Infrastructure or Facility and Natural Resource	15655 SW Millikan Way	45.4961399	-122.841698	Not vulnerable to dam failure. Park has extensive number of buildings and trails.
Ulrich Gerber Park	Infrastructure or Facility	14730 NW Shackelford Road	45.571	-122.8286	Not vulnerable to dam failure.
Unity Park	Infrastructure or Facility	17915 SW Alexander Street	45.4951059	-122.862206	Not vulnerable to dam failure.

Name of Infrastructure, Facility, or Resource	Type of Asset	Address	Latitude	Longitude	Comments
Vale Greenway	Natural Resource	15260 SW Hart Road	45.4638399	-122.834919	Not vulnerable to dam failure.
Valley Park	Infrastructure or Facility	Access off Valley Avenue, North of SW 17th Street	45.4757827	-122.81395	Not vulnerable to dam failure.
Valley West Park	Infrastructure or Facility	Access off SW Valley Avenue, North of SW 17th Street	45.4755528	-122.815542	Not vulnerable to dam failure.
Veterans Memorial Park	Infrastructure or Facility	Intersection of SW Washington Avenue, SW Watson Avenue, and SW 7th Street	45.4815525	-122.806574	Not vulnerable to dam failure.
Vista Brook Park	Infrastructure or Facility	6697 SW 88th Avenue	45.4709832	-122.767213	Not vulnerable to dam failure.
Wake Robin Wetlands Natural Area	Natural Resource	Access off SW 131st Avenue, North of SW Bluebell Lane	45.4618277	-122.812546	Not vulnerable to dam failure.
Wanda L. Peck Memorial Park	Infrastructure or Facility	Access off SW Murray Boulevard, South of SW Butner Road	45.5132491	-122.818876	Not vulnerable to dam failure.
Waterhouse Linear Park	Infrastructure or Facility	Power line corridor, accessible via Walker Road	45.5189	-122.847332	Not vulnerable to dam failure.
Waterhouse Park	Infrastructure or Facility	16405 SW Walker Road	45.5244023	-122.846185	Not vulnerable to dam failure.
West Slope Park	Infrastructure or Facility	2560 SW 73rd Avenue	45.5014176	-122.751219	Not vulnerable to dam failure.
West Sylvan Park	Infrastructure or Facility	8111 SW West Slope Drive	45.5036951	-122.761209	Not vulnerable to dam failure.
Westside Linear Park	Infrastructure or Facility	Access off Galena Way, Weir Road, and SW 155th Avenue	45.4458225	-122.839244	Not vulnerable to dam failure.

Name of Infrastructure, Facility, or Resource	Type of Asset	Address	Latitude	Longitude	Comments
Westview High School Tennis Courts	Infrastructure or Facility	4200 NW 185th Avenue	45.5521336	-122.864388	Not vulnerable to dam failure.
Whispering Woods Natural Area	Natural Resource	East of SW 192nd Avenue, South of Chantal Village Park	45.5094897	-122.873627	Not vulnerable to dam failure.
White Fox Wetlands Natural Area	Natural Resource	Access off NW White Fox Drive or NW 156th Avenue, North of NW Bronson Road	45.5336222	-122.836548	Not vulnerable to dam failure.
Wildhorse Park	Infrastructure or Facility	Access off SW Wildhorse Way, West of SW Davies Road	45.4500341	-122.821667	Not vulnerable to dam failure.
Wildwood Park	Infrastructure or Facility	8545 SW Maverick Terrace	45.4579968	-122.824243	Not vulnerable to dam failure.
Willard Bike Path	Infrastructure or Facility	Access off SW Abbott Lane and SW 158th Avenue	45.4818877	-122.840149	Not vulnerable to dam failure.
Willow Creek Greenway	Infrastructure or Facility	South of NW Autumn Ridge Drive between NW 173rd Avenue and NW 176th Avenue	45.5274335	-122.852632	Not vulnerable to dam failure.
Willow Park	Infrastructure or Facility	Access off SW 144th Avenue, South of SW Millikan Way	45.4922228	-122.824354	Not vulnerable to dam failure.
Winkelman Park	Infrastructure or Facility	10139 SW 175th Avenue	45.447	-122.857	Not vulnerable to dam failure.
Wonderland Park	Infrastructure or Facility	Access off SW King Boulevard, North of SW Imperial Drive	45.4738794	-122.793059	Not vulnerable to dam failure.
Yoshihara Trail	Infrastructure or Facility	Northwest corner of NW Eleanor Avenue and NW Delia Street	45.5685	-122.8315	Not vulnerable to dam failure.

3.2. Natural Hazard Profiles

The THPRD Technical Committee utilized the Oregon OEM's Hazard Analysis Methodology to examine hazard risk by collecting information about the four rating criteria of history, vulnerability, maximum threat, and probability. This methodology does not compare hazards to each other or rank hazards against each other. Instead, this process provides a sense of hazard priorities or relative risk and allows comparison of the same hazard across participants.

Each of the hazards examined by this analysis was scored using a formula that incorporates the four rating criteria, a weight factor, and three levels of severity: low, medium, and high. The score range for this methodology is 24 (lowest possible) to 240 (highest possible). For additional detail about the OEM risk and hazard analysis methodology, see Volume I, Section 2.

The scores for each hazard that impacts the District are presented below. All natural hazards included in the NHMP have the potential to impact the District; however, due to its geographic location and topography, the District cannot be directly impacted by dam failure and landslides. The District assigned relatively low scores to these hazards and identified their potential impacts as secondary and not direct.

Table 261: Natural Hazard Risk Scores

Natural Hazard	History	Vulnerability	Maximum Threat	Probability	Score
Dam failure	Low	Low	Low	Low	24
Drought	Low	High	Low	High	166
Earthquake	Low	Medium	High	Medium	161
Extreme heat	High	High	High	High	199
Flooding, including channel migration and streambed erosion	High	Medium	Low	High	143
Landslide	Low	Low	Low	Medium	72
Volcanic ash	Low	Medium	High	Medium	152
Wildland fire	Low	Medium	Medium	High	143
Windstorm, including tornado	High	High	Medium	High	198
Winter storm	High	High	High	High	208

Full descriptions of each hazard are provided in Volume I, Section 2. The potential effects of climate change on the magnitude and frequency of natural hazard events are described in each hazard description in this annex and in Volume I, Section 2.

The timeframe of data collected during the planning process for THPRD was from when the District was formed in 1955 to February 22, 2022. Hazard events that occurred during this period and were deemed significant by the County's Technical Committee are included in this annex's hazard profiles.

The following hazard profiles are in alphabetical order and include a brief hazard description, significant events since 1955, if applicable, and potential impacts and vulnerabilities. The potential impacts for each hazard are presented in the same order, as applicable: populations, economies, structures, improved

property, critical facilities and infrastructure, historical properties and cultural resources, and natural environments.

3.2.1. Dam Failure

Due to its geographic location and topography, the District cannot be directly impacted by dam failure. The District has not developed mitigation action items for this hazard because it is considered to have no impact. Any impacts in the District due to dam failure are identified as secondary and minimal.

3.2.1.1. Potential Impacts and Vulnerabilities

The potential impacts of and vulnerabilities to a dam failure event are identified below. The type, magnitude, and extent of impacts can vary based on the scale of the event; however, all impacts and vulnerabilities are considered minimal to negligible.

- A failure of Scoggins Dam is not expected to flood or destroy any THPRD property; however, Scoggins Dam does hold water used for irrigation and drinking. THPRD would be affected if dam failure impacted its ability to irrigate and maintain its properties or provide drinking water to patrons.

3.2.2. Drought

Drought typically occurs as a regional event and often affects more than one county and district simultaneously. Drought may occur in THPRD's service area and may primarily affect natural hazard environments. Previous significant events and the potential impacts of and vulnerabilities to drought are identified below.

3.2.2.1. Significant Events

THPRD identified six significant drought events that have occurred in the District's service area since it was formed in 1955.

- **1976–1981, 1986, 1992, and 1999:** Countywide drought conditions.
- **2000–2001:** Countywide drought conditions. Hagg Lake fell to a record low of 9%, but water conservation averted a water crisis. The driest water year on record in the Willamette Valley and warmer than normal temperatures combined with dry conditions.
- **2005:** Drought conditions led to water rationing in some agricultural areas of the County.

3.2.2.2. Potential Impacts

The potential impacts of a drought event are identified below. The type, magnitude, and extent of impacts can vary based on the scale of the event. Impacts may include:

- Reduction or loss of water supply.
- Water use restrictions and lack of drinkable water supply.
- Health effects, including increased heat-related, waterborne, and cardiorespiratory illnesses, as well as mental health conditions.
- Reduced economic productivity or business closures in such industries as agriculture, livestock, recreation, energy, and tourism.
- Supply chain restrictions, including food shortages.
- Loss of power or reduced availability of electricity due to infrastructure damage and high demand.
- Property and infrastructure damage due to expansive soils.
- Damage to natural environments, including low water levels in lakes, rivers, and other water bodies, reduced plant growth, local species reduction or extinction, increased water temperature, and deteriorated water quality, which may result in fish kills and increased waterborne pollutants.
- Concurrent hazards, including extreme heat, wildfires, flooding, and landslides.

3.2.2.3. Vulnerabilities

All populations, economies, improved property, historical properties and cultural resources, and natural environments in the District are vulnerable to drought. These include:

- Staff and those using District facilities who have preexisting health conditions, those without access to clean water, children, pregnant women, and older adults.
- Those employed in water-dependent sectors, such as agriculture and recreation, who may experience a reduction in income.

- THPRD, which is one of the largest consumers of the City of Beaverton and the Tualatin Valley Water District's water supply. THPRD draws water for irrigation at the Jenkins Estate property and holds several water rights at properties across the District.
  - Diversions and/or interruptions of water supplies to the District could stem from failed reservoirs or wells, ruptured pipelines, or contaminated water sources.
- Zoning areas within the District that are designated for agricultural uses.
- THPRD properties, which can institute "brown-out" measures such as stopping the watering of select sports fields, shutting down splash pads, stopping the washing of District vehicles, and educating staff on water-saving practices.
- No structures, critical facilities, or infrastructure are expected to be vulnerable to drought.
- Natural environments such as all District acreage, parks, trails, and outdoor facilities.

3.2.3. Earthquake

The District could experience earthquakes that originate from the Cascadia Subduction Zone, Portland Hills Fault Zone, and Gales Creek Fault Zone. It could also experience liquefaction and coseismic landslides as the result of an earthquake. Previous significant events and the potential impacts of and vulnerabilities to earthquake are identified below.

3.2.3.1. Significant Events

THPRD identified nine significant earthquake events that have occurred in the District's service area since it was formed in 1955.

- **November 1961:** 5.0 magnitude earthquake in the Portland area.
- **November 1962:** 5.5 magnitude earthquake in the Portland area.
- **December 1963:** 4.5 magnitude earthquake in the Portland area.
- **March 25, 1993:** The first significant earthquake in recorded history to originate close enough to Beaverton to be felt. Beaverton experienced minor damage.
- **February 28, 2001:** The 6.8 magnitude Nisqually earthquake was felt in the City of Beaverton but did very little damage.
- **2003:** Although too small to be felt, a small earthquake was detected under Cooper Mountain in the southern part of Beaverton on a fault that had been previously designated by geologists as "inactive."
- **2013, 2014, and 2015:** Numerous small quakes occurred in the Portland Metro area. Most of these earthquakes were not strong enough to be felt.

3.2.3.2. Potential Impacts

The potential impacts of an earthquake event are identified below. The type, magnitude, and extent of impacts can vary based on the scale of the event. Impacts may include:

- Injuries or deaths.
- Mental health impacts, including post-traumatic stress disorder.
- Widespread public health issues stemming from failing or damaged infrastructure, such as lack of clean water and sanitation.
- Need for widespread search and rescue operations.
- Displaced residents in need of sheltering, or the need for facility users to shelter in place at the facility being used.
- Delayed emergency response times due to debris, blocked transportation routes, and damaged infrastructure and vehicles.
- Economic impacts to the District, including reduced future revenues, increased costs resulting from response activities, and increased future costs resulting from recovery and reconstruction activities.
- Commerce losses from power interruptions, damaged buildings and assets, and road closures. The District may also sustain direct losses to buildings, personnel, and other vital equipment.

- Personal and household economic impacts to staff from loss of income, increased medical costs, and property damage that may not be covered by insurance.
- Collapsed buildings and destruction to the District's many outdoor assets, such as swimming pools, which would be expensive to rebuild or replace.
- Damage to underground utilities; residential, public, and private buildings; and transportation systems.
- Blocked roads and rail transportation routes due to debris from trees and damaged property, ground deformation, and liquefaction.
- Downed or damaged power lines that can lead to wildfires.
- Power outages.
- Harm to ecosystems from loss of habitat, and death and destruction of vegetation and animals in Districtwide natural areas.
- Damage to vegetation and the District's parks, trails, natural areas, and natural systems.
- Change in water flows, including the paths of rivers and streams.
- Concurrent hazards, including floods, wildland fires, and landslides.

3.2.3.3. Vulnerabilities

All populations, economies, structures, improved property, critical facilities and infrastructure, historical properties and cultural resources, and natural environments in the District are vulnerable to earthquakes. These include:

- Staff and patrons at District facilities during an earthquake event.
- THPRD structures including the Aloha Swim Center, Beaverton Swim Center, Conestoga Recreation & Aquatics Center, Harman Swim Center, Sunset Swim Center, Raleigh Swim Center, Somerset West Swim Center, Cedar Hills Recreation Center, Garden Home Recreation Center, Elsie Stuhr Center, Howard M. Terpenning Recreation & Aquatic Complex, Cooper Mountain Nature House (owned in partnership with Metro), Tualatin Hills Nature Center, PCC-Rock Creek Sports Campus (land leased from Portland Community College), and Sunset Sports Complex.
- Critical THPRD facilities, including the Howard M. Terpenning (HMT) Athletic, Tennis, and Aquatic Center; HMT Dryland Center, Conestoga Recreation Center, Cedar Hills Recreation Center, Garden Home Recreation Center, Elsie Stuhr Center, and Fanno Creek Service Center (designated Emergency Operations Center site).
- The District's current and future regional and community active transportation network, including the Rock Creek, Crescent Park, Westside, Beaverton Creek, Tualatin Valley, Reedville, Fanno Creek, McKernan Creek, and South Cooper Loop Regional Trails; as well as the North Bethany, Bethany Creek, Bronson Creek, Bonny Slope West, Cedar Mill Creek, Willow Creek, Waterhouse, North Johnson Creek, Beaverton Wetlands, South Johnson Creek, and South Cooper Mountain Community Trails.
- Areas near the epicenter of an earthquake event, which are likely to incur a significant amount of damage to all buildings, infrastructure, facilities, historical properties, and natural environments.

  - Any unreinforced masonry structures in the District are more vulnerable to potentially substantial damage during an earthquake compared to other nearby structures built to modern standards.[505]
  - Any wood frame buildings with sill plates not bolted to foundation, cripple wall perimeter systems, and buildings on steep slopes, partially supported on "stilts" in the District are generally more vulnerable to major seismic damage compared to other nearby structures built to modern standards.[506, 507]
- Buildings with very high or high collapse potential, including facilities constructed prior to 1990.
  - Two recreation center buildings are at least 75 years old, and the Red Cross and Washington County have designated both as disaster shelters.
  - The District's historical structures and properties, including the Fanno Farmhouse, Jenkins Estate, Schlottman House, and John Quincy Adams Young House.
- Underground infrastructure, such as pipelines and utility lines, buildings, and roads, which are vulnerable to damage from liquefaction due to the silt-type soil throughout the District.
- Natural environments such as all District acreage, parks, trails, and outdoor facilities.

[505] Oregon Department of Geology and Mineral Industries. (2022). Open-File Report O-22-04: Natural Hazard Risk Report for Washington County. https://www.oregongeology.org/pubs/ofr/O-22-04/p-O-22-04.htm
[506] Oregon Department of Geology and Mineral Industries. (2022). Open-File Report O-22-04: Natural Hazard Risk Report for Washington County. https://www.oregongeology.org/pubs/ofr/O-22-04/p-O-22-04.htm
[507] Washington County Natural Hazard Mitigation Plan. (2017). https://www.co.washington.or.us/EmergencyManagement/plans-and-agreements.cfm

3.2.4. Extreme Heat

Due to a rise in frequency, severity, and impacts from extreme heat events, the NHMP Steering Committee chose to include this hazard for the first time in the Washington County NHMP. Previous significant events and the potential impacts of and vulnerabilities to extreme heat are identified below.

3.2.4.1. Significant Events

Extreme heat was not included in previous NHMPs. THPRD identified 12 significant extreme heat events that have occurred in the District's service area since it was formed in 1955.

- **Summer 2015:** Extreme heat occurred June 7–9, June 26–28, July 1–5, July 28–30, and August 18–19. Heat-related illnesses and deaths were markedly greater during these periods, and cooling shelters were opened. High temperatures were 10 ˚F to 20 ˚F above normal.
- **August 1–4, 2017:** Record breaking heat was caused by a strong high-pressure system.
- **July 12–17, 2018:** Extreme heat was caused by a strong high-pressure system.
- **June 23–29, 2021:** The National Weather Service issued an Excessive Heat Watch for multiple days.
- **July 16, 2021:** The heat index reached over 80 ˚F, and THPRD implemented Level 1 of Increased Heat Procedures for staff and patrons.
- **July 26–30, 2021:** The heat index reached over 80 ˚F, and THPRD implemented Level 1 of Increased Heat Procedures for staff and patrons.
- **July 31, 2021:** The heat index reached over 90 ˚F, and THPRD implemented Levels 1 and 2 of Increased Heat Procedures for staff and patrons.
- **August 2–4, 2021:** THPRD implemented Levels 1 and 2 of Increased Heat Procedures for staff and patrons due to excessive heat.
- **August 13–15, 2021:** THPRD implemented Levels 1 and 2 of Increased Heat Procedures for staff and patrons due to excessive heat.
- **August 16–19, 2021:** THPRD implemented Level 1 of Increased Heat Procedures for staff and patrons, and there was an air quality advisory for wildfire smoke.
- **August 20–27, 2021:** THPRD implemented Level 1 of Increased Heat Procedures for staff and patrons.
- **September 2–9, 2021:** THPRD implemented Level 1 of Increased Heat Procedures for staff and patrons.

3.2.4.2. Potential Impacts

The potential impacts from an extreme heat event are identified below. The type, magnitude, and extent of impacts can vary based on the scale of the event. Impacts may include:

- Injuries or deaths, especially for those working or using THPRD's indoor and outdoor facilities.
- Heat illnesses, including heat rashes, heat cramps, heat exhaustion, and heat stroke, and death.
- Extended operational hours of District staff and additional resources needed for response to the event, including the operation of daytime cooling centers and overnight cooling shelters.
- Strain on or loss of water supply due to increased demand.

- Commerce losses from power interruptions, damaged buildings and assets, and road closures. The District may also sustain direct losses to buildings, personnel, and other vital equipment.
- Supply chain and personal economic impacts, such as the increased cost of food, goods, and services, including energy.
- Economic losses from less overall worker efficiency and effectiveness and time lost on the job when people need to take more frequent or longer breaks to avoid overheating; short-term economic impacts from the closure of outdoor activities and events, such as those held at many District locations.
- Property damage, such as roof expansion, leading to warped, cracked, and leaking shingles; dry, cracked, and leaking caulking around flashing and joints; cracked foundations; excessive drying of wood structures; and melted siding. This may be of particular concern to the District's historic structures and older infrastructure.
- Disruption of essential infrastructure systems from overheated and damaged utilities, including power, water, transportation, and communication systems.
- Impacts to roadways as heat expands concrete or causes cracking and buckling.
- Damage to vegetation, parks, natural systems, and the District's many outdoor environmental assets.
- Impacts to greenspaces, such as scorch and sunscald of new foliage, branches or tops of trees dying due to cavitation, and significant stress and die-off of native trees, particularly Douglas Firs and cedars. These impacts are intensified during times of drought.
- Concurrent hazards, including drought and wildland fire.

3.2.4.3. Vulnerabilities

All populations, economies, structures, improved property, historical properties and cultural resources, and natural environments in the District are vulnerable to extreme heat. These include:

- Populations vulnerable to extreme heat include those working or using THPRD's indoor and outdoor facilities.
    - In 2021, two patrons suffered from extreme heat-related illness while on THPRD property. Both cases were able to be treated on-site.
- People who work in buildings without air conditioning or cooling equipment and users of these THPRD's facilities. Only 20% of the District's buildings have air conditioning.
    - THPRD facilities without air conditioning include all six indoor swim centers, Cedar Hills Recreation Center, Garden Home Recreation Center, Cooper Mountain Pole Barn, HMT Pole Barn, HMT Maintenance Shop Bays and Tool room, Portland Community College Rock Creek Maintenance Shop, Camp Rivendale, and the Fanno Creek Service Center Warehouse, Tool Room, and Vehicle Maintenance Bays.
- People living, working, or spending time in heat islands within the District.
- Populations with higher heat sensitivity, including older adults, infants and children, pregnant women, people with preexisting or chronic diseases, and those who take certain medications that affect thermoregulation or block nerve impulses. This may include users of District facilities and District program participants.
- People with limited mobility and no access to cooling systems who may not be able to travel to cooling centers or shelters.

- Structures (existing and future): Cedar Hills Recreation Center, Garden Home Recreation Center, Cooper Mountain Pole Barn, HMT Pole Barn, HMT Maintenance Shop Bays and Tool room, Portland Community College Rock Creek Maintenance Shop, Camp Rivendale, the Raleigh Swim Center, the Somerset West Swim Center, and the Fanno Creek Service Center Warehouse, Tool Room and Vehicle Maintenance Bays.
- No critical facilities or infrastructure are expected to be vulnerable to extreme heat.
- The overall region includes a limited number of cooling centers and shelters. District facilities may be seen as a place for residents to come to escape extreme heat.
    - In 2021, THPRD ran two cooling centers: one at the HMT Recreation Complex Athletic Center and another at the Conestoga Recreation and Aquatic Center.
- The District must ensure that its electrical, water, and sewage hookups and roads and trails are maintained to accommodate a potential extreme heat event.
- Vehicles, including District maintenance vehicles, are vulnerable to engine overheating and tire deterioration.
- Aboveground utility and power lines can droop or sag and create a heightened fire risk for staff and visitors to District facilities.
- Natural environments such as all District acreage, parks, trails, and outdoor facilities. Plants, animals, ecosystems, and natural environments are vulnerable to high rates of mortality due to excessive heat.

3.2.5. Flooding, Including Channel Migration and Streambed Erosion

Flooding to a greater or lesser degree is fairly common in the County, and events typically occur from October through April. As a planning participant whose assets are widely dispersed, vulnerability may vary from site to site. The District experiences occasional localized flooding, but historically, events have not been significant or severe. Previous significant events and the potential impacts of and vulnerabilities to flooding are identified below.

3.2.5.1. Significant Events

THPRD identified 17 significant flooding events that have occurred in the District's service area since it was formed in 1955.

- **December 1964–January 1965:** Record flooding throughout Willamette Basin due to two intense storms and near-record early season snow depths. This was the largest flood in Oregon since dam construction on the upper Willamette in the 1940s–1950s. Federal disaster declaration FEMA-184-DR-OR was issued.
- **January 1972:** Record flows in rivers. Federal disaster declaration FEMA-319-DR-OR was issued.
- **January 1974:** Flooding followed heavy wet snow and freezing rain. Federal disaster declaration FEMA-413-DR-OR was issued.
- **December 1978:** Intense heavy rain and snowmelt saturated the ground.
- **February 1986:** Severe statewide flooding due to rain and melting snow.
- **February 1987:** Willamette River and its tributaries flooded.
- **February 1996:** Deep snowpack in conjunction with warm temperatures and record-breaking rains. Many rivers and creeks throughout the Willamette River watershed rose to flood levels and power outages occurred. Federal disaster declaration FEMA-1099-DR-OR was issued.
- **November 1996:** Record-breaking precipitation. Washington County suffered almost $10 million in damage from the event; statewide damages surpassed $280 million. National Flood Insurance Program claims from the event surpassed $2.3 million for the County alone. Federal disaster declaration FEMA-1107-DR-OR was issued.
- **December 2007:** Torrential rain caused flooding, landslides, and mudslides in the region. Federal disaster declaration FEMA-1733-DR-OR was issued.
- **December 2008:** Severe winter storm, record or near record snowfall, landslides, and mudslides occurred. Federal disaster declaration FEMA-1824-DR-OR was issued.
- **December 2012:** A 25-year flood event caused road closures throughout the County.
- **December 2015:** Flood levels on the Tualatin River reached major flood stage on two occasions. Flooding caused many landslides, the inundation of dozens of homes and businesses, restricted or closed over 70 roads, damaged miles of roads and numerous culverts, and caused power outages for thousands of residents. Federal disaster declaration FEMA-4258-DR-OR was issued.
- **November 2016:** A moist Pacific front moving slowly across the area produced heavy rainfall, resulting in flooding of several rivers across Northwest Oregon.
- **February 2019:** Excess precipitation flooded roads throughout the County.
- Additional flood events in the County identified by the National Weather Service include March 20, 2012, February 9–10, 2017, and January 12–14, 2021.

3.2.5.2. Potential Impacts

The potential impacts from a flooding event are identified below. The type, magnitude, and extent of impacts can vary based on the scale of the event. Impacts may include:

- Injuries or deaths, especially to those trying to drive through flooded areas and become trapped in their vehicles while driving to or from District facilities.
- Public health concerns, such as the spread of infectious diseases, exposure to chemicals, hazardous materials, and debris, and water quality issues.
- Need for widespread search and rescue operations, including high-water rescues.
- Displaced residents in need of sheltering, including those who are “stuck” at a facility because water outside rose unexpectedly and rapidly.
- Delayed emergency response times due to high water, debris, blocked transportation routes, and damaged infrastructure and vehicles.
- Mobility or access issues due to the surrounding water.
- Economic impacts to the District, including reduced future revenues, increased costs resulting from response activities, and increased future costs resulting from recovery and reconstruction activities.
- Commerce losses from power interruptions, damaged buildings and assets, and road closures. The District may also sustain direct losses to buildings, personnel, and other vital equipment.
    - Facility closures because roads leading to buildings, fields, parks or trails are not open.
- Personal and household economic impacts to staff from loss of income, increased medical costs, and property damage that may not be covered by insurance.
- Damage to underground utilities; residential, public, and private buildings; and transportation systems.
- Disruption of essential infrastructure systems, such as power systems, public utilities, telecommunications, and transportation routes.
- Disruption of traffic due to flooded, damaged, or destroyed transportation systems.
- Harm to ecosystems from loss of habitat, and death and destruction of vegetation and animals in Districtwide natural areas.
- Damage to vegetation and the District’s parks, trails, natural areas, and natural systems.

3.2.5.3. Vulnerabilities

Population, economic, built environment, infrastructure, and natural environment vulnerabilities to a flooding event include the following:

- Those without access to private transportation for the purpose of evacuation from floodwaters.
- Staff working at all District locations, including indoor and outdoor facilities. Personal safety of staff may be vulnerable, and staff may be unable to get to worksites, move between different locations, and access impeded parking lots.
- No critical facilities are expected to be vulnerable to flooding.
- Portions of THPRD’s current and future regional and community active transportation network including the Rock Creek, Crescent Park, Westside, Beaverton Creek, Tualatin Valley, Reedville,

Fanno Creek, McKernan Creek, and South Cooper Loop Regional Trails; as well as the North Bethany, Bethany Creek, Bronson Creek, Bonny Slope West, Cedar Mill Creek, Willow Creek, Waterhouse, North Johnson Creek, Beaverton Wetlands, South Johnson Creek, and South Cooper Mountain Community Trails.

- THPRD has experienced several instances of minor flood-related environmental damage at the Raleigh Swim Center and Park site when the unnamed stream running through the park overflowed.
- The Tualatin Hills Nature Park, Greenway Park, and Fanno Creek Greenway experience seasonal flooding, which can erode trails and deposit sediment on trails and sports courts.
- Flooding at the Bannister Creek Greenway, Commonwealth Park, and Foothills Park sites wash away engineered wood fibers at the playgrounds, causing trail damage and the need for cleaning operations.
- THPRD sees localized flooding or other small-scale damage and the need for cleaning at points on various regional trails.
- Many of the 90 park sites include a water resource, such as a stream or lake. Beaverton Creek, Rock Creek, North Johnson and Cedar Mill Creeks, Fanno Creek, and Butternut Creek repeatedly flood, making surrounding areas vulnerable. Commonwealth Lake experiences occasional flooding and is connected to North Johnson Creek, which has repeatedly flooded.
- Natural environments such as all District acreage, parks, trails, and outdoor facilities, including Raleigh Swim Center and Park, Tualatin Hills Nature Park, Greenway Park, Fanno Creek Greenway, Bannister Creek Greenway, Commonwealth Park, and Foothills Park.

3.2.6. Landslide

There are several steep slopes in the District's service area; however, they are located outside of THPRD's authority. As such, the District Technical Committee identified potential landslide impacts to be minimal and secondary.

3.2.6.1. Potential Impacts and Vulnerabilities

The potential impacts of and vulnerabilities to a landslide event are identified below. The type, magnitude, and extent of these can vary based on the scale of the event.

- Portions of THPRD's current and future regional and community active transportation network including the Rock Creek, Crescent Park, Westside, Beaverton Creek, Tualatin Valley, Reedville, Fanno Creek, McKernan Creek, and South Cooper Loop Regional Trails; as well as the North Bethany, Bethany Creek, Bronson Creek, Bonny Slope West, Cedar Mill Creek, Willow Creek, Waterhouse, North Johnson Creek, Beaverton Wetlands, South Johnson Creek, and South Cooper Mountain Community Trails.
- Steeper sloped areas within the District such as Cooper Mountain Nature Park and areas of Tualatin Hills Nature Park, Matrix Hill Woods, Morrison Woods Natural Area, Madrona Woods Natural Area, Jenkins Estate, Northridge Woods Natural Area, Mount Williams Park, Jordan Woods Natural Area, The Bluffs Park, and Bannister Creek Greenway.

3.2.7. Volcanic Ash

Volcanic activity is possible from mountains near Washington County. It is anticipated that ashfall from a volcanic eruption from Mount St. Helens or Mount Hood has the potential to impact the District. The scale and types of impacts and vulnerabilities may differ depending on which volcano erupts, the level of eruption, the wind direction during and after eruption, and other weather conditions. A previous significant events and the potential impacts of and vulnerabilities to volcanic ash are identified below.

3.2.7.1. Significant Event

The District identified one previous significant event that impacted the area.

- **May 18, 1980:** THPRD experienced light volcanic ashfall from Mount St. Helens' eruption. Parks and outdoor swimming pools were particularly hard hit, requiring pool drainage and frequent filter cleaning. Ash also worked its way into equipment, causing premature failures or requiring unscheduled maintenance.

3.2.7.2. Potential Impacts

Though it is unlikely that an event of this type will occur, the impacts of a significant ashfall could be substantial. Impacts may include:

- Indirect injuries and deaths, such as those sustained during ash cleanup operations or in traffic accidents.
- Short-term health effects, including respiratory effects.
- Widespread public health issues stemming from failing or damaged infrastructure, such as lack of clean water and sanitation.
- Displaced residents in need of sheltering, or the need for facility users to shelter in place at the facility being used.
- Delayed emergency response times due to debris, blocked transportation routes, and damaged infrastructure and vehicles.
- Extended operational hours of District staff and resources needed for response to the event.
- Economic impacts to the District, including reduced future revenues, increased costs resulting from response activities, and increased future costs resulting from recovery and reconstruction activities.
- Commerce losses from power interruptions, damaged buildings and assets, and road closures. The District may also sustain direct losses to buildings, personnel, and other vital equipment.
- Personal and household economic impacts to staff from loss of income, increased medical costs, and property damage that may not be covered by insurance.
- Extensive need for cleaning of District facilities and outdoor assets, such as pools and tennis courts.
- Damage to underground utilities; residential, public, and private buildings; and transportation systems.
- Disruption of essential infrastructure systems, such as power systems, public utilities, drainage systems, telecommunications, and transportation routes.
- Blocked roads and rail transportation routes due to debris and ash accumulation.

- Downed or damaged power lines that can lead to wildfires.
- Harm to ecosystems from loss of habitat, and death and destruction of vegetation and animals in Districtwide natural areas.
- Damage to vegetation and the District's parks, trails, natural areas, and natural systems.

3.2.7.3. Vulnerabilities

All populations, economies, structures, improved property, critical facilities and infrastructure, historical properties and cultural resources, and natural environments in the District are vulnerable to volcanic ash. These include:

- Staff and patrons using District facilities who have chronic lung problems and/or preexisting health conditions, children, pregnant women, and older adults.
- People without access to effective dust masks, eye protection, and drinking water and food uncontaminated by ash.
- Staff working at all District locations, including indoor and outdoor facilities. Personal safety of staff may be vulnerable, and staff may be unable to get to worksites, move between different locations, and access impeded parking lots.
- THPRD structures including the Aloha Swim Center, Beaverton Swim Center, Conestoga Recreation & Aquatics Center, Harman Swim Center, Sunset Swim Center, Raleigh Swim Center, Somerset West Swim Center, Cedar Hills Recreation Center, Garden Home Recreation Center, Elsie Stuhr Center, Howard M. Terpenning Recreation & Aquatic Complex, Cooper Mountain Nature House (owned in partnership with Metro), Tualatin Hills Nature Center, PCC-Rock Creek Sports Campus (land leased from Portland Community College), and Sunset Sports Complex.
- Critical THPRD facilities, including the HMT Athletic, Tennis, and Aquatic Center and the HMT Dryland Center.
- The District's current and future regional and community active transportation network, including the Rock Creek, Crescent Park, Westside, Beaverton Creek, Tualatin Valley, Reedville, Fanno Creek, McKernan Creek, and South Cooper Loop Regional Trails; as well as the North Bethany, Bethany Creek, Bronson Creek, Bonny Slope West, Cedar Mill Creek, Willow Creek, Waterhouse, North Johnson Creek, Beaverton Wetlands, South Johnson Creek, and South Cooper Mountain Community Trails.
- Natural environments such as all District acreage, parks, trails, and outdoor facilities.
- All THPRD water supplies.
- Areas of higher elevation, including South Cooper Mountain, Cooper Mountain, West Slope, Raleigh West, Bonny Slope West, Cedar Hills, Cedar Mill, Bethany, and North Bethany.

3.2.8. Wildland Fire

Although the District could experience a wildland–urban interface event, historically it is more likely for the District to be affected by smoke and poor air quality due to wildland fires outside its boundaries. Previous significant events and the potential impacts of and vulnerabilities to wildland fire are identified below.

3.2.8.1. Significant Events

The District has not been directly impacted by a wildland fire event; however, THPRD identified two times wildfire smoke has impacted the District's service area since it was formed in 1955.

- **September 1, 2020:** Wildfires south and east of the County caused the Oregon Department of Environmental Quality to issue an air quality advisory.
- **August 15–16, 2021:** Wildfires outside of the County caused the Oregon Department of Environmental Quality to issue an air quality advisory.

3.2.8.2. Potential Impacts

The potential impacts from a wildfire event are identified below. The type, magnitude, and extent of impacts can vary based on the scale of the event. Impacts may include:

- Injuries or deaths.
- Exposure to wildfire smoke, which can lead to eye, nose, and throat irritation and the worsening of chronic heart and lung diseases.
- Widespread public health issues stemming from failing or damaged infrastructure, such as lack of clean water and sanitation.
- Need for widespread search and rescue operations.
- Displaced residents in need of sheltering or the need for facility users to shelter in place at the facility being used.
- Delayed emergency response times due to debris, blocked transportation routes, and damaged infrastructure and vehicles.
- Extended operational hours of District staff and resources needed for response to the event.
- Strain on or loss of water supply due to increased demand.
- Economic impacts to the District, including reduced future revenues, increased costs resulting from response activities, and increased future costs resulting from recovery and reconstruction activities.
- Economic impacts, including loss of local revenue due to business and property tax losses and reduced recreation and tourism activity.
- Industry and commerce losses from power interruptions, damaged buildings and assets, and road closures. The District may also sustain direct losses to buildings, personnel, and other vital equipment.
- Damage to the District's extensive structures, particularly historical assets; parks and trails; and furnishings/equipment located both indoors and outdoors.
- Damage to underground utilities; residential, public, and private buildings; and transportation systems.

- Disruption of essential infrastructure systems, such as power systems, public utilities, telecommunications, and transportation routes.
- Debris from trees and damaged property causing blocked roads and rail transportation routes.
- Downed or damaged power lines that can lead to additional wildfires.
- Harm to ecosystems from loss of habitat, and death and destruction of vegetation and animals in Districtwide natural areas.
- Damage to vegetation and the District's parks, trails, natural areas, and natural systems.
- Concurrent hazards, including flood, landslide and erosion, and air and water quality issues.

3.2.8.3. Vulnerabilities

Given the dynamic nature of wildland fires, all populations, economies, structures, improved property, infrastructure, historical properties and cultural resources, and natural environments in the District are vulnerable to this hazard. These include:

- Staff and patrons using District facilities who experience chronic lung problems and/or preexisting health conditions, children, pregnant women, and older adults.
    - In 2020, one staff member experienced asthma symptoms as a result of poor air quality due to smoke. Also in 2020, THPRD closed parks, trails, and natural areas to staff and the public for approximately 7 days due to poor air quality; it also closed its buildings and facilities for approximately 3 days.
- Staff employed at Cooper Mountain Nature House, Tualatin Hills Nature Center, and Jenkins Estate, who are more vulnerable to wildfire events due to the geographic location of these facilities. These structures are also vulnerable to wildfire events.
- Populations without access to private transportation.
- First responders and other personnel working directly on fire protection, suppression, and patrols or near a wildfire can experience burns, smoke exposure, heat-related impacts such as heat stroke, heat exhaustion, dehydration, physical fatigue, mental health challenges, injuries, and death.
- Potential for damage to heating, ventilation, and air-conditioning (HVAC) systems in public and private buildings and emergency generators.
- THPRD follows Tualatin Valley Fire & Rescue (TVF&R) protocols and has closed parks during high fire danger periods. During regular conditions, fires are only allowed within dedicated BBQ stations to reduce vulnerability to wildfires.
- No critical facilities are expected to be vulnerable to wildland fire.
- Portions or all of THPRD's current and future regional and community active transportation network including the Rock Creek, Crescent Park, Westside, Beaverton Creek, Tualatin Valley, Reedville, Fanno Creek, McKernan Creek, and South Cooper Loop Regional Trails; as well as the North Bethany, Bethany Creek, Bronson Creek, Bonny Slope West, Cedar Mill Creek, Willow Creek, Waterhouse, North Johnson Creek, Beaverton Wetlands, South Johnson Creek, and South Cooper Mountain Community Trails.
- Natural environments such as all District acreage, parks, trails, and outdoor facilities.
- Steeper sloped areas within the District such as Cooper Mountain Nature Park and areas of Tualatin Hills Nature Park, Matrix Hill Woods, Morrison Woods Natural Area, Madrona Woods

Natural Area, Jenkins Estate, Northridge Woods Natural Area, Mount Williams Park, Jordan Woods Natural Area, The Bluffs Park, and Bannister Creek Greenway.

3.2.9. Windstorm, Including Tornado

Across the 50-square-mile District, there are 117 parks and 70 miles of trails operated by THPRD, so wind damages can be significant. Previous significant events and the potential impacts of and vulnerabilities to windstorms and tornadoes are identified below.

3.2.9.1. Significant Events

There have been 268 high-wind events recorded in the District's service area since it was founded in 1955. The most impactful events include:

- **October 12, 1962:** The most destructive storm to ever occur in Oregon in recorded history, both in loss of life and property damage. The storm killed 38 people and did upwards of $200 million in damage. Hundreds of thousands of homes were without power for short periods of time, while others were without power for 2 to 3 weeks. More than 50,000 homes were seriously damaged, and nearly 100 were completely destroyed. Entire fruit and nut orchards were destroyed, and livestock was killed as barns and trees blew over onto animals. Intense wind speeds were recorded in the metropolitan areas, with gusts of 116 mph on the Portland Morrison Bridge.
- **December 18, 1992:** The District filed an insurance claim for wind damage.
- **December 12, 1995:** A large low-pressure system hit Washington County. Gusts of over 100 mph occurred along the coast, while gusts in the Willamette Valley exceeded 60 mph. Hundreds of thousands of people in the state lost power, and there was widespread damage to homes, buildings, and boats. The damage resulted in a presidential disaster declaration. Four Oregonians lost their lives during the storm.
- **January 17, 1996:** The District filed an insurance claim for wind damage.
- **October 23–26, 2014:** A windstorm caused $8,282.50 in damages at 22 THPRD sites. Impacts included downed trees, fence damage, and a damaged tractor shed.
- **November 11, 2014:** A windstorm caused $1,310 in damages at 11 THPRD sites. Impacts included downed trees, railing knocked off a bridge, and fence and vehicle damage.
- **December 11, 2014:** A windstorm caused $500 in damages at 10 THPRD sites. Impacts included downed trees and damage to a boardwalk.
- **April 7, 2017:** A windstorm caused impacts at 35 THPRD sites. The Aloha Swim Center, Beaverton Swim Center, Conestoga Recreation and Aquatic Center, and Harman Swim Center were closed due to damage that resulted in cancelled events and lost revenue. Facilities experienced power outages, blown-off shingles, a bent doorframe, and a broken main circulation water pump. Fifty-two trees were felled, and the District had to spend $10,000 to hire contractors to remove them.

3.2.9.2. Potential Impacts

The potential impacts from a windstorm event are identified below. The type, magnitude, and extent of impacts can vary based on the scale of the event. Impacts may include:

- Injuries or deaths of staff or those coming to or leaving from District facilities.
- Need for widespread search and rescue operations.
- Displaced residents in need of sheltering, or the need for facility users to shelter in place at the facility being used.

- Delayed emergency response times due to debris, blocked transportation routes, and damaged infrastructure and vehicles.
- Extended operational hours of District staff and resources needed for response to the event.
- Economic impacts to the District, including reduced future revenues, increased costs resulting from response activities, and increased future costs resulting from recovery and reconstruction activities.
- Commerce losses from power interruptions, damaged buildings and assets, and road closures. The District may also sustain direct losses to buildings, personnel, and other vital equipment.
- Personal and household economic impacts to staff from loss of income, increased medical costs, and property damage that may not be covered by insurance.
- Damage to underground utilities; residential, public, and private buildings; and transportation systems. Significant damage could lead to the complete loss of structures or totaled vehicles.
- Disruption of essential infrastructure systems, such as power systems, public utilities, telecommunications, and transportation routes.
- Debris from trees and damaged property causing blocked roads and rail transportation routes.
- Downed or damaged power lines Districtwide that may lead to wildfires.
- Harm to ecosystems from loss of habitat, and death and destruction of vegetation and animals in Districtwide natural areas.
- Damage to vegetation and the District's parks, trails, natural areas, and natural systems.

3.2.9.3. Vulnerabilities

All populations, economies, structures, improved property, critical facilities and infrastructure, historical properties and cultural resources, and natural environments in the District are vulnerable to windstorms, including tornadoes. These include:

- Staff working at all District locations, including indoor and outdoor facilities. Personal safety of staff may be vulnerable, and staff may be unable to get to worksites, move between different locations, and access impeded parking lots.
- THPRD structures including the Aloha Swim Center, Beaverton Swim Center, Conestoga Recreation & Aquatics Center, Harman Swim Center, Sunset Swim Center, Raleigh Swim Center, Somerset West Swim Center, Cedar Hills Recreation Center, Garden Home Recreation Center, Elsie Stuhr Center, Howard M. Terpenning Recreation & Aquatic Complex, Cooper Mountain Nature House (owned in partnership with Metro), Tualatin Hills Nature Center, PCC-Rock Creek Sports Campus (land leased from Portland Community College), and Sunset Sports Complex.
- Older buildings and infrastructure in the District not built to withstand high winds.
    - Two recreation center buildings are at least 75 years old, and the Red Cross and Washington County have designated both as disaster shelters.
    - The District's historical structures and properties, including the Fanno Farmhouse, Jenkins Estate, Schlottman House, and John Quincy Adams Young House.
- Critical THPRD facilities, including the HMT Athletic, Tennis, and Aquatic Center and the HMT Dryland Center.
- The District's current and future regional and community active transportation network, including the Rock Creek, Crescent Park, Westside, Beaverton Creek, Tualatin Valley, Reedville, Fanno

Creek, McKernan Creek, and South Cooper Loop Regional Trails; as well as the North Bethany, Bethany Creek, Bronson Creek, Bonny Slope West, Cedar Mill Creek, Willow Creek, Waterhouse, North Johnson Creek, Beaverton Wetlands, South Johnson Creek, and South Cooper Mountain Community Trails.

- When high winds combine with rain, blowing leaves and debris can clog catch basins, contributing to localized inundation flooding.
- Damage from high winds has generally resulted in many downed utility lines and trees. Trees have also fallen from THPRD property onto a third-party private owner's property.
- Natural environments such as all District acreage, parks, trails, and outdoor facilities.
- Areas at higher elevations, including South Cooper Mountain, Cooper Mountain, West Slope, Raleigh West, Bonny Slope West, Cedar Hills, Cedar Mill, Bethany, and North Bethany.
- Areas within the District that are more vulnerable to windstorms, including tornadoes, than other areas include Cooper Mountain Nature Park, Howard M. Terpenning Recreation Complex, and the Tualatin Hills Nature Park.

3.2.10. Winter Storm

Heavy snowfall rarely occurs within the District. When it does, many of the subsequent issues are directly related to the older infrastructure elements. Previous significant events and the potential impacts of and vulnerabilities to winter storms are identified below.

3.2.10.1. Significant Events

There have been 42 winter storm events recorded in the District's service area since it was founded in 1955. The most impactful events include:

- **January 2017:** The District filed two insurance claims for damage due to snow and ice and one insurance claim due to frozen pipes. Fourteen THPRD sites received damage, including felled trees, washed away gravel and wood chips, and broken gutters.
- **February 11–14, 2021:** Freezing rain and heavy snow came down, and wind gusts up to 50 mph occurred, resulting in an ice storm. The District experienced snowy and icy roads, downed tree limbs, localized power outages, and travel impacts.
- **December 26–30, 2021:** THPRD buildings were closed or had modified openings due to winter weather. On December 29, the HMT Complex had a delayed partial opening while other facilities remained closed. Facilities had delayed and partial openings on December 30.

3.2.10.2. Potential Impacts

The potential impacts from a winter storm event are identified below. The type, magnitude, and extent of impacts can vary based on the scale of the event. Impacts may include:

- Because many District assets are outdoors, residents utilize parks, trails, gardens, and other assets that, when icy, may cause a staff member or visitor to trip and fall.
- Injuries or deaths, including from carbon monoxide poisoning and falls from slick or icy conditions on trails or other outdoor areas throughout the District.
- Frostbite or hypothermia among District staff or facility users.
- Delayed emergency response times due to debris, blocked transportation routes, damaged infrastructure and vehicles, and difficulty using fire hydrants because of frozen or damaged water system components.
- Extended operational hours of District staff who may be needed for response to the event.
- Stranded travelers due to ice, snow, and transportation impacts.
- Economic impacts to the District, including reduced future revenues, increased costs resulting from response activities, and increased future costs resulting from recovery and reconstruction activities.
- Commerce losses from power interruptions, damaged buildings and assets, and road closures. The District may also sustain direct losses to buildings, personnel, and other vital equipment.
- Personal and household economic impacts to staff from loss of income, increased medical costs, and property damage that may not be covered by insurance.
- Damage to underground utilities; residential, public, and private buildings; and transportation systems.
- Increased number of building fires due to improper use of heating methods.

- Significant property damage or loss of water due to thawing of frozen pipes.
- Disruption of essential infrastructure systems, such as power systems, public utilities, telecommunications, and transportation routes.
- Debris from trees and damaged property causing blocked roads and rail transportation routes.
- Downed or damaged power lines that may lead to wildfires and tree debris that has the potential to create fuel load for wildfire.
- Harm to ecosystems from loss of habitat, and death and destruction of vegetation and animals in Districtwide natural areas.
- Damage to vegetation and the District's parks, trails, natural areas, and natural systems.
- Concurrent hazards, including drought, wildfire, and flooding.

3.2.10.3. Vulnerabilities

All populations, economies, structures, improved property, critical facilities and infrastructure, historical properties and cultural resources, and natural environments in the District are vulnerable to winter storms. These include:

- People who do not have access to sufficient heating, insulated clothing, or dry living conditions, including unhoused populations. Such persons may make use of District facilities as heating centers.
- Older adults and infants, people who take certain medications, people who have certain medical conditions, and people who have been drinking alcohol are at increased risk for hypothermia. This may include users of District facilities and District program participants.
- People improperly using generators and heating devices.
- Staff working at all District locations, including indoor and outdoor facilities. Personal safety of staff may be vulnerable, and staff may be unable to get to worksites, move between different locations, and access impeded parking lots.
- THPRD structures including the Aloha Swim Center, Beaverton Swim Center, Conestoga Recreation & Aquatics Center, Harman Swim Center, Sunset Swim Center, Raleigh Swim Center, Somerset West Swim Center, Cedar Hills Recreation Center, Garden Home Recreation Center, Elsie Stuhr Center, Howard M. Terpenning Recreation & Aquatic Complex, Cooper Mountain Nature House (owned in partnership with Metro), Tualatin Hills Nature Center, PCC-Rock Creek Sports Campus (land leased from Portland Community College), Fanno Creek Service Center, and Sunset Sports Complex.
- Older buildings and infrastructure in the District. Snow events typically cause building ingress/egress issues, roof snow load concerns, water pipe leaks, and roof leaks.
  - Two recreation center buildings are at least 75 years old, and the roof systems are not built to withstand heavy snow loads. The Red Cross and Washington County have designated both as winter and disaster shelters.
  - The District's historical structures and properties, including the Fanno Farmhouse, Jenkins Estate, Schlottman House, and John Quincy Adams Young House.
- Critical THPRD facilities, including the HMT Athletic, Tennis, and Aquatic Center and the HMT Dryland Center.

- The District's current and future regional and community active transportation network, including the Rock Creek, Crescent Park, Westside, Beaverton Creek, Tualatin Valley, Reedville, Fanno Creek, McKernan Creek, and South Cooper Loop Regional Trails; as well as the North Bethany, Bethany Creek, Bronson Creek, Bonny Slope West, Cedar Mill Creek, Willow Creek, Waterhouse, North Johnson Creek, Beaverton Wetlands, South Johnson Creek, and South Cooper Mountain Community Trails.
- Natural environments such as all District acreage, parks, trails, and outdoor facilities.
- Areas at higher elevations, including South Cooper Mountain, Cooper Mountain, West Slope, Raleigh West, Bonny Slope West, Cedar Hills, Cedar Mill, Bethany, and North Bethany.

3.3. Historical Events

Hazard events that have affected the entire planning area since the adoption of the 2017 NHMP are detailed in Volume I, Section 2. This is the first time THPRD has had an NHMP. Hazard events that have impacted the District are described in the hazard profiles above. These occurrences include earthquake, drought, extreme heat, flooding, windstorm, and winter storm events. They have also impacted the cities of Portland and Beaverton, which are within the District's service area.

3.4. Overall Vulnerability

Based on the analysis completed by the Technical Committee, the greatest relative risks to the District include winter storm, extreme heat, windstorm, including tornado, drought, and earthquake present the highest relative risk to the District. These hazards may become widespread events, and all populations, economies, structures, improved property, critical facilities and infrastructure, historical properties and cultural resources, and natural environments in the District can be vulnerable to these hazards.

Areas of greatest vulnerability to these hazards within the District include:

- Populations with higher vulnerability, such as those with preexisting health conditions, older adults, children, and pregnant women. This may include THPRD staff, users of District facilities, and District program participants.
- Populations that are unhoused, do not have access to private transportation, and/or are without access to air conditioning, cooling equipment, sufficient heating, or clean water.
- People working or spending time in heat islands within the District.
- Commerce losses from power interruptions, damaged buildings and assets, and road closures. The District may also sustain direct losses to buildings, personnel, and other vital equipment.
- Economic impacts to the District, including reduced future revenues, increased costs resulting from response activities, and increased future costs resulting from recovery and reconstruction activities.
- Critical THPRD facilities, including the HMT Athletic, Tennis, and Aquatic Center, Fanno Creek Service Center, and HMT Dryland Center.
- THPRD structures including the Aloha Swim Center, Beaverton Swim Center, Conestoga Recreation & Aquatics Center, Harman Swim Center, Sunset Swim Center, Raleigh Swim Center, Somerset West Swim Center, Cedar Hills Recreation Center, Garden Home Recreation Center, Elsie Stuhr Center, Howard M. Terpenning Recreation & Aquatic Complex, Cooper Mountain Nature House (owned in partnership with Metro), Tualatin Hills Nature Center, PCC-Rock Creek Sports Campus (land leased from Portland Community College), and Sunset Sports Complex.
- The District's current and future regional and community active transportation network, including the Rock Creek, Crescent Park, Westside, Beaverton Creek, Tualatin Valley, Reedville, Fanno Creek, McKernan Creek, and South Cooper Loop Regional Trails; as well as the North Bethany, Bethany Creek, Bronson Creek, Bonny Slope West, Cedar Mill Creek, Willow Creek, Waterhouse, North Johnson Creek, Beaverton Wetlands, South Johnson Creek, and South Cooper Mountain Community Trails.
- Older buildings and infrastructure not built to current building codes or seismic standards may be more vulnerable. Two recreation center buildings are at least 75 years old, and the Red Cross and Washington County have designated both as disaster shelters. The District's historical structures and properties include the Fanno Farmhouse, Jenkins Estate, Schlottman House, and John Quincy Adams Young House.

- Natural environments such as all District acreage, parks, trails, and outdoor facilities. Plants, animals, ecosystems, and natural environments can be vulnerable to high rates of mortality due to hazard events.
- Areas at higher elevations, including South Cooper Mountain, Cooper Mountain, West Slope, Raleigh West, Bonny Slope West, Cedar Hills, Cedar Mill, Bethany, and North Bethany.
- Water supply from the City of Beaverton and the Tualatin Valley Water District, the District's water suppliers. THPRD draws water for irrigation at the Jenkins Estate property and holds several water rights at properties across the District that could be vulnerable to hazard events.

4. Capability Assessment

(In compliance with 44 CFR §201.6(c)(3))

The following capability assessment and safe growth analysis examine the ability of the District to implement and manage a comprehensive mitigation strategy. Strengths, opportunities, and resources of the jurisdiction are identified to develop an effective hazard mitigation action plan. The capabilities identified in this assessment were evaluated collectively to develop feasible recommendations, which support the implementation of effective mitigation activities.

A capability questionnaire was distributed to the District's Technical Committee to initiate this assessment. The survey included questions regarding existing plans, policies, and regulations that contribute to or hinder the ability to implement hazard mitigation activities, including legal and regulatory capabilities, administrative and technical capabilities, education and outreach capabilities, and fiscal capabilities. The Technical Committee also completed a safe growth analysis to identify potential gaps in growth guidance instruments and improvements that could be made to reduce vulnerability to future development.

4.1. Planning and Regulatory Assessment

Planning and regulatory capabilities include plans, policies, codes, and ordinances used by the District, the City of Beaverton, and Washington County that can prevent and reduce the impacts of hazards.

The District does not maintain plans that cover activities falling under the auspices of the City of Beaverton or Washington County, such as land use mapping and transportation management. However, its own properties and assets are well mapped, and the District's environmental policies address best practices in maintaining and restoring protective ecosystems. This is an essential part of operating an organization with unique structural and natural assets. Safety is explicitly included in the District's growth and development policies as Goal 3, and City and County development regulations require development outside of sensitive areas.

The safety of District staff, users of its facilities, and the general community is of considerable importance. The nine-member Safety Services team works with all staff to develop and implement operational safety measures. Plans developed for large and small areas address the need to avoid or mitigate natural hazards, and an evacuation and shelter plan is in place to deal with emergencies from natural hazards.

4.1.1. Types of Plans

The District's 2013 Comprehensive Plan tangentially addresses natural hazards through site and facility maintenance and building standards. It includes no explicit mitigation strategy other than to assess site

maintenance and use energy-efficient building standards, but it may be used to implement mitigation actions and may later be revised to include a larger mitigation focus.

The Capital Improvement Plan includes the preservation and restoration of multiple natural areas, wetlands, and floodplains. It also includes the re-routing and daylighting of streams, enhancing vegetation, modifying hazard trees into wildlife trees, and removing non-native plants and trees.

The Washington County Economic Development Plan includes measures related to the District, as does the County's Transportation Plan.

The District recognizes the need for revisions and updates to the Local Emergency Operations Plan, written in 2007, given the region's significant growth in the past 15 years. The plan is currently being reviewed for updates, and this effort is projected to be completed in 2023. The District does not currently have in place a Continuity of Operations Plan but has begun writing a first draft.

The District follows the 2020 Design and Construction Standards of their water services provider, Clean Water Services, for stormwater management planning and development. The standards set water quality and quantity goals for new construction. The goals may also include efforts to lessen flooding but do not target specific natural hazards.

In 2021, THPRD worked with TVF&R to develop a wildfire management strategy, priorities, and actions to minimize the risk of wildfire in District parks and natural areas, and to mitigate against fire hazards. The District's wildfire planning efforts are complementary and subsidiary to the Washington County Community Wildfire Protection Plan.

The District is in the process of developing a climate action plan that will include mitigation actions, such as shade and cooling in open public spaces, and additional adaptations implemented in parks that may address future climate conditions.

4.1.2. Land Use Planning and Ordinances

The City of Beaverton and Washington County Zoning Ordinances, Subdivision Ordinances, Floodplain Ordinances, and use of FEMA Flood Insurance Rate Maps are administered and enforced by the respective entities. THPRD adheres to these regulations because the District's properties and facilities are within these jurisdictional boundaries. The District follows specific code or ordinance requests from the City, County, and TVF&R, as applicable and appropriate.

The District has a Willing Seller Program for the acquisition of land for open space and public recreation uses. The District acquires several acres of land each year, which may help maintain and increase accessibility to water quantity, cool the local landscape, and serve as emergency gathering areas in the event of an accident or hazard incident.

4.1.3. Building Code, Permitting, and Inspections

The District does not have its own Building Code, Building Codes Effectiveness Grading Schedule (BCEGS) score, or fire department ISO rating and instead uses Washington County ratings. THPRD does not conduct its own site plan review program but requests conditions of approval on City and County projects moving through the development review process.

4.2. Administrative and Technical Assessment

This portion of the assessment includes staff and their skills and tools that can be used for mitigation planning and implementing specific mitigation actions.

The District's Technical Committee will continue to act in the capacity of a planning committee after the conclusion of the NHMP planning process.

THPRD administers maintenance programs to reduce risk, including tree trimming, clearing drainage systems, and landscape maintenance of open spaces and rights of way. An active tree health and hazard program helps reduce the likelihood of damage due to natural hazards. Brush is maintained, and there is a constant effort to eradicate invasive species. Staff conducts a drain check in anticipation of predicted large storm events to prevent unintended water diversion and small-scale flooding.

The District maintains multiple effective mutual aid agreements and planning partnerships, including equipment-sharing agreements with other Washington County agencies, a Red Cross Shelter Agreement, and participation in the Washington County Emergency Management Cooperative.

District staff possesses a strong knowledge of land development and land management practices and have undergone hazard mitigation training. Training efforts for staff will be ongoing after the conclusion of the NHMP planning process. Other assets include an engineer trained in construction practices related to buildings and infrastructure, staff with an understanding of natural hazards, and an ongoing cooperative relationship with the Washington County and Clean Water Services floodplain management staff. The THPRD's Nature & Trails and Design & Development department staff are the primary liaisons to the County and CWS when District projects are in, or may impact, a floodplain.

The Safety Services Manager serves part time as the District Emergency Manager, and staff also work with City of Beaverton and Washington County staff who have expertise in assessing hazard vulnerability. As needed, staff collaborates with Washington County and Clean Water Services on floodplain management efforts to re-meander and straighten streams in order to slow water flow and reduce erosion. District geographic information system (GIS) staffing is adequate, but personnel are not trained in hazard mitigation.

Users of District facilities are able to hear warning signals issued by the City of Beaverton and Washington County. Staff have written and managed grants from local, state, federal, and private funding sources, including grants used for mitigation purposes. Grant-writing capabilities can be utilized as needed to fund mitigation activities.

4.3. Education and Outreach Assessment

The District already has a number of education and outreach programs and methods that could be used to implement mitigation activities and communicate hazard-related information. THPRD's partnerships with other entities may also be leveraged to communicate mitigation-related information and initiatives to its stakeholders and those of partner organizations.

The District collaborates with groups such as the Tualatin Soil & Water Conservation District and the Tualatin Watershed Enhancement Coalition. The latter's Watershed Navigator website and program provide information to the District staff and users of its facilities. The District's website includes a Connect page with links to the Park Watch Report, an e-newsletter, and social media, as well as an Emergency Management page—all vehicles for communicating with District supporters and the greater community. Likewise, all of these communication channels offer opportunities to disseminate messages about the importance of hazard mitigation.

THPRD partner Clean Water Services occasionally holds public meetings at which utility-related improvements that affect the District are discussed. For example, a meeting was held for neighbors and patrons of Tualatin Hills Nature Park to discuss a sanitary sewer line improvement project along Cedar Mill Creek that would run through the park. The meeting offered an opportunity for attendees to provide feedback to Clean Water Services and THPRD staff about detours required for project completion and

possible post-construction trail improvements. These measures were considered mitigation efforts to improve water quality and improve park resilience.

Outreach efforts reach people of all ages when staff from the Tualatin Hills Nature Center deliver a host of environmental education programs for adults, families, and children. This is done at many parks throughout the District, as well as via the traveling Nature Mobile. Preschool and after-school programs Districtwide provide safety-related programs on a regular basis. All of these outreach efforts offer avenues through which mitigation information or actions could be taught and promoted.

While the District is not certified as StormReady, its partner, the City of Beaverton, is.

The District itself is not a Firewise Community but recognizes the importance of fire safety education and mitigation. THPRD works closely with TVF&R to promote fire safety materials and classes. Partnerships with the organizations mentioned above and with Washington County, the City of Beaverton, the American Red Cross, Portland General Electric, the City of Beaverton School District, and the Tualatin Valley Water District have enabled the District to develop a number of avenues for communication about hazards and how to mitigate them, as well as ways each household and business might work with the community to foster resiliency.

4.4. Financial Assessment

The District has access to, or is eligible to potentially use, the following funding resources for hazard mitigation initiatives, many of which have been previously used:

4.4.1. Capital Improvements Project Funding

In 2009, voters approved a measure to raise $4,682,050 in bond capital funds for seismic upgrades at 16 facilities. An additional $18,827 of capital funds were spent to purchase and install gas meter valves at 23 different gas valves in case of an earthquake. Numerous wetland, floodplain, and natural area projects have also been funded.

4.4.2. Property Taxes

Property taxes support THPRD's general fund. This funding could be used to implement future mitigation measures; however, these funds are typically constrained.

4.4.3. Impact Fees for New Development

System development charges support capital improvements to increase program capacity. This money could be used to support future mitigation actions that are part of capacity-increasing capital projects.

4.4.4. Incurrence of Debt Through General Obligation Bonds and/or Special Tax Bonds

THPRD has issued six bond measures since the District's formation in 1955. Funds could be used to fund future mitigation efforts, assuming those efforts were a part of the bond's formal project list approved by voters.

4.4.5. Community Development Block Grant

The District is eligible for these funds; however, THPRD has never received Community Development Block Grant (CDBG) funds because the types of infrastructure built by THPRD are not those that CDBG programs typically fund.

4.4.6. Federal and State Funding Sources

These funding sources are generally limited to park- and trail-specific projects. Mitigation work could be included if it is a necessary piece of the park or trails project.

4.4.7. Public or Private Partnership Funding Sources

Joint funding sources are common, and mitigation work could be included as part of a project's scope of work.

4.5. Capability Expansion and Improvement

Actions that may expand and improve existing authorities, plans, polices, and resources for mitigation include: continuing to update District plans as necessary to ensure they are current and reflect the needs of the community; continuing partnerships with the City of Beaverton and Washington County on planning, codes, and ordinances; adding a part-time emergency manager to devote their full attention to emergency management concerns; adding emergency, natural disaster, and safety-related information to the District's website and social media channels; and collaborating with other NHMP agencies to deliver unified messaging. The District will also ensure there is a mitigation lens on every project undertaken, regardless of funding source.

5. Mitigation Strategy

(In compliance with 44 CFR §201.6(c)(3)(i), §201.6(c)(3)(ii), §201.6(c)(3)(iv), §201.6(c)(3)(iii), and §201.6(c)(4)(ii))

The mitigation strategy serves as the long-term blueprint for reducing the potential losses identified in the risk assessment. The Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act) directs local mitigation plans to describe hazard mitigation actions and establish a strategy to implement those actions. Therefore, all other requirements for a local mitigation plan lead to and support the mitigation strategy.

5.1. Mitigation Goals

THPRD did not participate in the 2017 Washington County NHMP; therefore, the Steering Committee reviewed and evaluated goals from the 2017 Washington County NHMP, 2020 City of Beaverton NHMP, 2011 Cities of Cornelius and Forest Grove NHMPs, and 2020 State of Oregon NHMP. The goals from each plan were grouped by topic and then synthesized to create the seven goals detailed in Volume I, Section 3. These goals are the basis of this plan and summarize what the Steering Committee will accomplish by implementing this plan.

5.2. Mitigation Successes

5.2.1. Addressing Flooding and Channel Migration

Throughout 2020 and 2021, the District partnered with Clean Water Services (CWS) to realign the portion of Fanno Creek that runs through Greenway Park and address issues related to flooding and channel migration.

Channel migration was completed over the previously mentioned two-year period, but another flooding issue arose in 2022. Fanno Creek's overflow occurs naturally during the region's wetter months of winter. The wet period was extended because record-level amounts of rain fell well into the summer of 2022. CWS initially worked on a short-term solution to reduce flooding impacts by lowering the beaver-made dam downstream from Scholls Ferry Road twice in July, but the beavers quickly rebuilt the dam.

THPRD and the City of Tigard worked with CWS to quickly prepare the Greenway Park path area for construction using taxpayer dollars from the District and the City, and CWS used in-house construction crews to leverage ratepayer dollars. Work on trail improvement began in August 2022 and was completed in late September 2022. The trail is once again open for public use under Scholls Ferry Road.[508]

5.2.2. Seismic and Compliance Upgrades to THPRD Facilities

A THPRD bond measure was approved by voters in 1994 for District improvements. Additionally, in 2008, the District issued a bond for seismic retrofits for 16 District assets and measures to better protect those who may be using facilities at the time an earthquake occurs. Because District sites are located in and used by residents of multiple communities, as well as those of unincorporated Washington County, upgrades issued by the District improve cross-jurisdictional resiliency.

Since the 1994 bond measure was approved, the District's population has grown by 48,000 residents, or 28%. Another 65,000 residents—30% more than today—are forecast to arrive by 2026. That growth has translated into increased use of THPRD facilities and services. In the last 10 years alone, usage of THPRD programs has increased by 66.7%.

Certain buildings have been expanded to ease crowding and accommodate new services for users of every age across the District. Parks bonds also renovated and rehabilitated facilities, including play structures, bridges, and boardwalks, and made critical safety, seismic, and Americans with Disabilities Act (ADA) access improvements. Improvements funded by the 2008 bond measure were, and are now, being made on an ongoing basis. A special district such as THPRD continually assesses program use and available assets to ensure its programs are optimally meeting community needs.

In 2021, Parks Bond Measure 34-156 to preserve additional natural areas (such as wetlands, forests, and stream corridors) through land acquisition and restoration/enhancement work was passed. Natural areas provide habitat for fish and wildlife and improve water quality.[509] The Park District's Natural Resources Management Plan provides a vision of a network of connected parks that provide for wildlife habitat and migration as well as environmental and recreational needs.[510]

[508] Cortez, J. (2022, September 20). Rainwater Management, Addressing Flooding on the Fanno Creek Trail. https://cleanwaterservices.org/2022/09/20/addressing-flooding-on-the-fanno-creek-trail/
[509] Tualatin Hills Park and Recreation District. (n.d.). Providing for Our Future, Natural Area and Wildlife Habitat Preservation. https://d1vk06ypimt5f2.cloudfront.net/district-information/bond-measure-history/future.cfm
[510] Tualatin Hills Park and Recreation District. (n.d.). Natural Area and Wildlife Habitat Preservation. https://d1vk06ypimt5f2.cloudfront.net/district-information/bond-measure-history/preservation.cfm

5.3. Plan Incorporation and Integration into Existing Planning Mechanisms

Based on mitigation plan requirement 44 CFR §201.6(c)(4)(ii), the vulnerability and capabilities assessments for the District were carefully reviewed and considered when developing the mitigation actions for this plan. The District's Technical Committee will establish a process by which the mitigation strategy, goals, objectives, and actions outlined in this plan will be incorporated into the existing local planning strategies.

Once the plan is adopted, the committee will coordinate implementation with the responsible parties in the District and with external stakeholders as needed. The primary means for integrating mitigation strategies will be through the revision, update, and implementation of plans and regulations such as the comprehensive plan, capital improvement plan, and land development regulations, as feasible.

The District's Technical Committee members will be charged with ensuring the goals and strategies of new and updated local planning documents are consistent with the goals and actions in the NHMP and will not contribute to increased hazard vulnerability.

5.3.1. Comprehensive Plan

Updates to the District's strategic and functional plans will consider and include mitigation strategies, as applicable and appropriate.

5.3.2. Public Engagement, Education, and Outreach

THPRD has established practices for notifying and educating the public, and closing sites due to hazards, such as wildfire smoke, that will be updated as needed. The District will renew its focus on National Preparedness Month to increase opportunities to work with the public.

5.3.3. Day-to-Day Special District Functions

Mitigation strategies and procedures will be considered during the routine update of the District's site functional plans and maintenance procedures when appropriate.

5.3.4. Floodplain Management Program and/or National Flood Insurance Program

The District works to ensure its efforts are in compliance with National Flood Insurance Program (NFIP) standards.

5.3.5. Economic Development Plans and Policies

Actions related to THPRD's financial sustainability plans include future bond measures that can fund District improvements and mitigation initiatives.

5.3.6. Emergency Plans That Address Evacuation and Sheltering

The District has communication plans to inform the public and staff about how to respond to hazards. Staff will ensure proper HVAC systems are in place, emergency power is accessible, and buildings are retrofitted for earthquake resilience. District policies and plans include one for evacuation and sheltering. The District is in the process of developing an emergency management page for its website to further information-sharing capabilities.

5.3.7. Enforcement of Existing Policies

District staff will continue to receive training on how to enforce standards for maintaining THPRD sites and compliance with best practice initiatives.

5.3.8. Day-to-Day Development, Review, and Prioritization of Policies

Functional plan standards that dictate THPRD design standards are included in the routine District policy development, review, and prioritization processes.

6. Action Items

Action items for the 2023 NHMP were determined by the District's Technical Committee based on the review of its risk assessment, its existing capabilities, and the status of its previous action items. This comprehensive range of actions includes local plans and regulations, structure and infrastructure projects, natural systems protections, and education and awareness programs. A summary of these actions and full action item planning worksheets are provided in Sections 6.1 and 6.2 below. Additional information about how these actions were developed, evaluated, and prioritized is in Volume I, Section 3.

6.1. Tualatin Hills Park & Recreation District Action Items: 2023 Washington County NHMP

Table 262: Tualatin Hills Park & Recreation District Action Items

Action Item Number	Action Item Description	Hazard(s) Addressed	Priority
1	Park landscaping, turf, and trees require a great deal of water and irrigation equipment. This project will evaluate current irrigation systems to ensure they meet each park's goals, and also determine how to reduce water usage at each site, while maintaining current services. To preserve important shade trees as the climate warms, new irrigation will be considered. Computer-related control systems, as well as new irrigation heads/systems, will be installed.	Drought	High
2	With climate change concerns, unpredictable droughts, and high energy prices across the country, the District will look for ways to conserve resources, cut costs, and minimize programmatic environmental impacts.	Drought	Medium
3	Consider the feasibility and infrastructure requirements of seismic upgrades at the Fanno Creek Service Center, which would serve as the emergency operations center for THPRD in the event of an earthquake or other major disaster.	Earthquake	High

Action Item Number	Action Item Description	Hazard(s) Addressed	Priority
4	Consider the feasibility of adding solar panels at the Fanno Creek Service Center, which would serve as the emergency operations center for THPRD in the event of an earthquake or other major disaster. Should power lines be damaged during an earthquake, the Center would turn to backup solar power in order to continue functioning as an emergency operations center.	Earthquake	High
5	Prepare and equip THPRD facilities to serve as cooling centers during extreme heat events. This includes adding air conditioning capacity and air filtration units, as well as additional equipment.	Extreme Heat	Medium
6	Update THPRD's Athletic Facility Functional Plan to assess current conditions, investigate best practices, and outline future action to address extreme heat.	Extreme Heat	High
7	Install detention and retention facilities such as vegetated parking lot swales, rain gardens near buildings, and green roofs to reduce water from impervious areas that contribute to flooding.	Flooding	Medium
8	Conduct stream bank stabilization projects, including grading, adding large wood, placing soil lifts, re-meandering straightened streams, and planting banks with native trees, shrubs, and herbs.	Flooding	Medium
9	Revegetate steep slopes to treat seepage zones and control surface erosion. These bioengineering techniques fit well with natural ecological restoration.	Landslide	Medium
10	Expand public knowledge of the risks and dangers of unstable steep slopes through the website and public event engagement.	Landslide	Low
11	Develop guidelines and best practices for staff on how to prevent or minimize facility impacts if there is a volcanic ash event.	Volcanic Ash	Low
12	Develop plans and protocols to do the following during a hazard event: shut down filtration at all outdoor pools and splash pads for THPRD, cover pools with winter covers to prevent ash from entering the pool water, remove covers only when the event is over, use cleaning flocculant in pools and vacuum pools prior to restarting circulation, and clean all surfaces with a power washer.	Volcanic Ash	Low
13	Regular mowing, pruning, and chipping of fine fuels such as grasses, branches, and yard debris piles at residential and natural area interfaces.	Wildland Fire	High

Action Item Number	Action Item Description	Hazard(s) Addressed	Priority
14	Increase the District's ability to transfer data among its numerous sites via wireless technology (public 5G, private LTE/5G, and/or long-range 5GHz WiFi).	Wildland Fire, Windstorm, including tornado, and Winter Storm	Medium
15	Establish a tree response equipment pool to proactively prune trees and clear those that fall during a windstorm or tornado. Equipment includes a spider lift, chipper, chainsaws, safety equipment, trailers, and hand tools.	Windstorm, including tornado	High
16	Prepare and equip THPRD facilities to serve as warming centers during extreme cold events. This includes evaluations of boilers and heating systems at the five facilities designated as warming centers.	Winter Storm	High
17	This project would consider the feasibility study and condition of asset analysis of the roof at the HMT Athletic Center, which would serve as a community shelter and warming center during extreme winter storm events.	Winter Storm	Medium

Note: THPRD is not vulnerable to dam failure and therefore does not have action items to address this hazard.

6.2. 2023 Mitigation Action Information Worksheets

Table 263: Park Water Resource Conservation

Mitigation Action Information			
Title of action	Park Water Resource Conservation		
Type of action	Plans/regulations ☐ Structure and infrastructure project ☒		Natural systems protection ☒ Public education/awareness ☐
Action description	Park landscaping, turf, and trees require a lot of water and irrigation equipment. This project will evaluate current irrigation systems, to ensure they meet each park's goals and to determine how to reduce water usage at each site, while maintaining current services. To preserve important shade trees as the climate warms, new irrigation will be considered. Computer related control systems as well as new irrigation heads/systems will be installed.		
Hazard(s) addressed	Dam failure ☐ Drought ☒ Earthquake ☐ Extreme heat ☐	Flood ☐ Landslide ☐ Volcanic ash ☐ Wildland fire ☐	Windstorm, incl. tornado ☐ Winter storm ☐
How does the action address identified current or future risks and vulnerabilities?	Properly functioning irrigation provides critical means to use water to maintain turf and woody vegetation. This provides important community health and recreation benefits, as well as water conservation.		
Area of action impact	Two hundred different properties in THPRD's service area.		
Is the action related to a critical facility or facilities?	Yes ☐ No ☒ If yes, what facility(ies)?		
Mitigation Action Integration			
Alignment with NHMP goals	Goal 1 ☒ Goal 2 ☐ Goal 3 ☐	Goal 4 ☐ Goal 5 ☐ Goal 6 ☐	Goal 7 ☐
Integration into other initiatives	Meets goals in THPRD's Parks and Athletic Facilities Functional Plans.		
Alignment with existing plans and policies	See above.		

Mitigation Action Implementation Plan			
Priority	Low ☐ Medium ☐ High ☒		
Lead position, office, department, or division responsible for implementation	Park Maintenance Department		
Supporting Partners			
Internal Partners		**External Partners, Including Community Partners**	
Nature & Trails department, Parks Services department		Water conservation agencies	
Potential Funding Sources			
Non-Federal Funding Sources		**Federal Funding Sources**	
THPRD operating funds, bond funds, capital improvement funds		Funding & Technical Assistance for Climate Adaption, Environmental Quality Incentives Program	
Estimated Cost	$250,000.00		
Estimated Benefit			
Primary Benefit(s)	**Secondary Benefit(s)**	**Financial Benefit(s)**	
Saving water means it can be used for other purposes. Using water wisely protects park landscapes and enhances community health needs.		$1,500,000.00	
Project Timeline			
Expected Timeline for Completion	**Potential Start Date**	**Potential Completion Date**	
Short-term ☐ Mid-term ☐ Long-term ☒ Ongoing ☐			
Implementation Benchmarks: How Will Success Be Measured?			
Potential Challenges to Implementation			
Resources and References, if Applicable			

Three Alternatives Considered, Including No Action			
Alternative #1	**Action description**	**Estimated Cost**	**Evaluation**
Alternative #2			
Alternative #3			

Implementation Progress Report for Plan Maintenance	
Date	
What progress in implementation has been made to date?	
What challenges in implementation have been experienced?	
What are the next steps in implementation?	

Table 264: Drought-Tolerant Plant Program

Mitigation Action Information	
Title of action	Drought-Tolerant Plant Program
Type of action	Plans/regulations ☐ Natural systems protection ☒ Structure and infrastructure project ☐ Public education/awareness ☐
Action description	With climate change concerns, unpredictable droughts, and high energy prices across the country, it is time to look for ways to conserve resources, cut costs, and minimize environmental impacts.
Hazard(s) addressed	Dam failure ☐ Flood ☐ Windstorm, incl. tornado ☐ Drought ☒ Landslide ☐ Winter storm ☐ Earthquake ☐ Volcanic ash ☐ Extreme heat ☐ Wildland fire ☐
How does the action address identified current or future risks and vulnerabilities?	Planting new or replacing dead plants with those that are drought tolerant is critical to maintaining balanced and viable eco-systems. As our area's climate continues to warm, droughts have become commonplace.
Area of action impact	Two hundred different properties in THPRD's service area.
Is the action related to a critical facility or facilities?	Yes ☐ No ☒ If yes, what facility(ies)?
Mitigation Action Integration	
Alignment with NHMP goals	Goal 1 ☒ Goal 4 ☐ Goal 7 ☐ Goal 2 ☐ Goal 5 ☐ Goal 3 ☐ Goal 6 ☐
Integration into other initiatives	Meet goals in THPRD's Parks Functional Plans.
Alignment with existing plans and policies	See above
Mitigation Action Implementation Plan	
Priority	Low ☐ Medium ☒ High ☐
Lead position, office, department, or division responsible for implementation	Park Maintenance Department

Supporting Partners	
Internal Partners	**External Partners, Including Community Partners**
Design and Development, Nature and Trails Dept.	
Potential Funding Sources	
Non-Federal Funding Sources	**Federal Funding Sources**
THPRD operating funds, Capital Improvement funds, bond funds	Aquatic Ecosystem Restoration, Urban Waters Small Grants Program, Emergency Watershed Protection, Landscape Planning Programs Environmental Quality Incentives Program
Estimated Cost	$150,000.00

Estimated Benefit		
Primary Benefit(s)	**Secondary Benefit(s)**	**Financial Benefit(s)**
Drought-tolerant plants have built-in features to minimize water loss and maximize water uptake.		$900,000.00

Project Timeline		
Expected Timeline for Completion	**Potential Start Date**	**Potential Completion Date**
Short-term ☐ Mid-term ☐ Long-term ☐ Ongoing ☒		

Implementation Benchmarks: How Will Success Be Measured?

Potential Challenges to Implementation

Resources and References, if Applicable

Three Alternatives Considered, Including No Action			
	Action Description	**Estimated Cost**	**Evaluation**
Alternative #1			
Alternative #2			
Alternative #3			

Implementation Progress Report for Plan Maintenance	
Date	
What progress in implementation has been made to date?	
What challenges in implementation have been experienced?	
What are the next steps in implementation?	

Table 265: Feasibility Study and Analysis of Seismic Upgrades at THPRD Fanno Creek Service Center

Mitigation Action Information	
Title of action	Feasibility Study and Analysis of Seismic Upgrades at THPRD Fanno Creek Service Center
Type of action	Plans/regulations ☐ Natural systems protection ☐ Structure and infrastructure project ☒ Public education/awareness ☐
Action description	This project would consider the feasibility and infrastructure requirements of seismic upgrades at the Fanno Creek Service Center, which would serve as the emergency operations center for THPRD in the event of an earthquake or other major disaster.
Hazard(s) addressed	Dam failure ☐ Flood ☐ Windstorm, incl. tornado ☐ Drought ☐ Landslide ☐ Winter storm ☐ Earthquake ☒ Volcanic ash ☐ Extreme heat ☐ Wildland fire ☐
How does the action address identified current or future risks and vulnerabilities?	Allows THPRD to remain a critical communications partner during earthquake or other natural disasters. Key operational staff in maintenance, IS, fleet services, and facilities would report to the center in order to develop response plans for the community. The district currently does not have a resilient emergency operation center.
Area of action impact	Entire THPRD service area.
Is the action related to a critical facility or facilities?	Yes ☒ No ☐ If yes, what facility(ies)? Fanno Creek Service Center: 6220 SW 112th Ave. Suite 100, Beaverton, OR 97008
Mitigation Action Integration	
Alignment with NHMP goals	Goal 1 ☒ Goal 4 ☐ Goal 7 ☒ Goal 2 ☐ Goal 5 ☒ Goal 3 ☐ Goal 6 ☐
Integration into other initiatives	Potentially integrated with future capital improvement program and bond measure planning.
Alignment with existing plans and policies	This project would align with and inform THPRD's internal emergency operations plan.
Mitigation Action Implementation Plan	
Priority	Low ☐ Medium ☐ High ☒
Lead position, office, department, or division responsible for implementation	THPRD's Design & Development and Maintenance Operations departments would coordinate contracting and consulting efforts. Communications and Risk & Safety departments would play support roles.

Supporting Partners	
Internal Partners	**External Partners, Including Community Partners**
Design & Development, Maintenance Operations, IS, and Communications	Washington County, City of Beaverton
Potential Funding Sources	
Non-Federal Funding Sources	**Federal Funding Sources**
THPRD Capital Improvement Plan, Bond, EMPG program	BRIC Grant, Hazard Mitigation Grant Program, Homeland Security Grant
Estimated Cost	$100,000

Estimated Benefit		
Primary Benefit(s)	**Secondary Benefit(s)**	**Financial Benefit(s)**
Protection of life and safety	Ensuring an operational emergency operations center for THPRD. Sustained communication to the public and other local agencies during natural hazards. Could serve as temporary shelter (housing) for impacted staff and/or those who need to report in an emergency situation.	$600,000.00

Project Timeline		
Expected Timeline for Completion	**Potential Start Date**	**Potential Completion Date**
Short-term ☒ Mid-term ☐ Long-term ☐ Ongoing ☐	2023	2025

Implementation Benchmarks: How Will Success Be Measured?
• Securing funding and project buy-in • Hiring consultants/engineering firm to conduct assessment • Use study to secure future funding
Potential Challenges to Implementation
• Securing funding, hiring consulting/engineering firm
Resources and References, if Applicable

Three Alternatives Considered, Including No Action			
	Action Description	**Estimated Cost**	**Evaluation**
Alternative #1			
Alternative #2			
Alternative #3			

Implementation Progress Report for Plan Maintenance	
Date	
What progress in implementation has been made to date?	
What challenges in implementation have been experienced?	
What are the next steps in implementation?	

Table 266: Feasibility Study of Solar Power Installation at THPRD Fanno Creek Service Center

Mitigation Action Information	
Title of action	Feasibility Study of Solar Power Installation at THPRD Fanno Creek Service Center
Type of action	Plans/regulations ☐ Natural systems protection ☐ Structure and infrastructure project ☒ Public education/awareness ☐
Action description	This project would consider the feasibility of adding solar panels at the Fanno Creek Service Center, which would serve as the emergency operations center for THPRD in the event of an earthquake or other major disaster. Should powerlines be damaged during an earthquake this center would turn to back-up solar power in order to continue functioning as an EOC.
Hazard(s) addressed	Dam failure ☐ Flood ☐ Windstorm, incl. tornado ☐ Drought ☐ Landslide ☐ Winter storm ☐ Earthquake ☒ Volcanic ash ☐ Extreme heat ☐ Wildland fire ☐
How does the action address identified current or future risks and vulnerabilities?	Allows THPRD to remain a critical communications partner during earthquake or other natural disasters. Key operational staff in maintenance, IS, fleet services, and facilities would report to the center in order to develop response plans for the community.
Area of action impact	Entire THPRD service area.
Is the action related to a critical facility or facilities?	Yes ☒ No ☐ If yes, what facility(ies)? Fanno Creek Service Center: 6220 SW 112th Ave. Suite 100, Beaverton, OR 97008
Mitigation Action Integration	
Alignment with NHMP goals	Goal 1 ☒ Goal 4 ☐ Goal 7 ☒ Goal 2 ☐ Goal 5 ☐ Goal 3 ☐ Goal 6 ☐
Integration into other initiatives	Potentially integrated with future capital improvement program and bond measure planning.
Alignment with existing plans and policies	This project would align with and inform THPRD's internal emergency operations plan.
Mitigation Action Implementation Plan	
Priority	Low ☐ Medium ☐ High ☒
Lead position, office, department, or division responsible for implementation	THPRD's Design & Development and Maintenance Operations departments would coordinate contracting and consulting efforts. Communications and Risk & Safety departments would play support roles.

Supporting Partners	
Internal Partners	**External Partners, Including Community Partners**
Design & Development, Maintenance Operations, IS, and Communications	Washington County, City of Beaverton
Potential Funding Sources	
Non-Federal Funding Sources	**Federal Funding Sources**
THPRD Capital Improvement Plan, Bond, EMPG program	BRIC Grant, Hazard Mitigation Grant Program, Homeland Security Grant
Estimated Cost	$100,000

Estimated Benefit		
Primary Benefit(s)	**Secondary Benefit(s)**	**Financial Benefit(s)**
Protection of life and safety	Ensuring an operational emergency operations center for THPRD. Sustained communication to the public and other local agencies during major disasters. Alternate source of power at any time traditional electric power is interrupted.	$600,000.00

Project Timeline		
Expected Timeline for Completion	**Potential Start Date**	**Potential Completion Date**
Short-term ☐ Mid-term ☒ Long-term ☐ Ongoing ☐	2023	2025

Implementation Benchmarks: How Will Success Be Measured?

- Securing funding and project buy-in
- Hiring consultants/engineering firm to conduct assessment
- Use study to secure future funding for installation project

Potential Challenges to Implementation

- Securing funding, hiring consulting/engineering firm

Resources and References, if Applicable

Three Alternatives Considered, Including No Action			
	Action Description	**Estimated Cost**	**Evaluation**
Alternative #1			
Alternative #2			
Alternative #3			

Implementation Progress Report for Plan Maintenance	
Date	
What progress in implementation has been made to date?	
What challenges in implementation have been experienced?	
What are the next steps in implementation?	

Table 267: Cooling Centers for Extreme Heat Events

Mitigation Action Information			
Title of action	Cooling Centers for Extreme Heat Events		
Type of action	Plans/regulations ☐ Structure and infrastructure project ☒		Natural systems protection ☐ Public education/awareness ☐
Action description	Prepare and equip THPRD facilities to serve as cooling centers during extreme heat events. This includes added air conditioning capacity and added air filtration units as well as additional equipment.		
Hazard(s) addressed	Dam failure ☐ Drought ☐ Earthquake ☐ Extreme heat ☒	Flood ☐ Landslide ☐ Volcanic ash ☐ Wildland fire ☐	Windstorm, incl. tornado ☐ Winter storm ☐
How does the action address identified current or future risks and vulnerabilities?	With rising temperatures during the summer months and many community members without the means or ability to access locations to temporarily cool down, these community centers will serve as a free option for respite from the heat.		
Area of action impact	Entire THPRD service area, Washington County		
Is the action related to a critical facility or facilities?	Yes ☒ No ☐ If yes, what facility(ies)? THPRD Athletic Center, THPRD Tennis Center, Cedar Hills Recreation Center, Garden Home Recreation Center, Conestoga Recreation & Aquatic Center		
Mitigation Action Integration			
Alignment with NHMP goals	Goal 1 ☒ Goal 2 ☐ Goal 3 ☐	Goal 4 ☐ Goal 5 ☐ Goal 6 ☒	Goal 7 ☐
Integration into other initiatives	Statewide Planning Goals 8 & 11		
Alignment with existing plans and policies	THPRD Climate Action Plan		
Mitigation Action Implementation Plan			
Priority	Low ☐ Medium ☒ High ☐		
Lead position, office, department, or division responsible for implementation	THPRD's Recreation department, Sports & Inclusion department, Risk & Safety department, Communications department		

Supporting Partners	
Internal Partners	**External Partners, Including Community Partners**
Recreation, Sports & Inclusion, Risk & Safety, Communications	Washington County, City of Beaverton
Potential Funding Sources	
Non-Federal Funding Sources	**Federal Funding Sources**
THPRD Capital Improvement Plan, Bond funds	Funding & Technical Assistance for Climate Adaption, HMA, BRIC, Community Development Block Grants, FEMA HMAG, Oregon HMA
Estimated Cost	$500,000.00

Estimated Benefit		
Primary Benefit(s)	**Secondary Benefit(s)**	**Financial Benefit(s)**
Protection of life and safety		$3,000,000.00

Project Timeline		
Expected Timeline for Completion	**Potential Start Date**	**Potential Completion Date**
Short-term ☐ Mid-term ☒ Long-term ☐ Ongoing ☐	2024	2026

Implementation Benchmarks: How Will Success Be Measured?

- Securing funding and project buy-in
- Implementation of cooling center plan, in partnership with Washington County
- Communication to public regarding availability
- Execution of plan during heat-related events
- Additional air-conditioned buildings

Potential Challenges to Implementation

- Funding, staffing, coordination with other local agencies

Resources and References, if Applicable

Three Alternatives Considered, Including No Action			
	Action Description	**Estimated Cost**	**Evaluation**
Alternative #1	Do nothing.	0	Doing nothing will cause increased problems over time.
Alternative #2			
Alternative #3			

Implementation Progress Report for Plan Maintenance	
Date	
What progress in implementation has been made to date?	
What challenges in implementation have been experienced?	
What are the next steps in implementation?	

Table 268: Athletic Facilities Functional Plan Updates

Mitigation Action Information	
Title of action	Athletic Facilities Functional Plan Updates
Type of action	Plans/regulations ☒ Natural systems protection ☐ Structure and infrastructure project ☐ Public education/awareness ☐
Action description	Update THPRD's Athletic Facility Functional Plan to assess current conditions, investigate best practices, and outline future action to address extreme heat.
Hazard(s) addressed	Dam failure ☐ Flood ☐ Windstorm, incl. tornado ☐ Drought ☐ Landslide ☐ Winter storm ☐ Earthquake ☐ Volcanic ash ☐ Extreme heat ☒ Wildland fire ☐
How does the action address identified current or future risks and vulnerabilities?	District athletic facilities are heavily used during the summer months, when extreme heat events are becoming increasingly more common. The district's Athletic Facilities Functional Plan is out of date and does not currently address extreme heat at these facilities. Updating the Athletic Facilities Functional Plan and including extreme heat guidance will help ensure those people who use district facilities continue to be able to do so safely. Will also ensure continued use as county-wide cooling centers.
Area of action impact	Entire THPRD service area, Washington County
Is the action related to a critical facility or facilities?	Yes ☒ No ☐ If yes, what facility(ies)? THPRD Athletic Center, THPRD Tennis Center, Cedar Hills Recreation Center, Garden Home Recreation Center, Conestoga Recreation & Aquatic Center, PCC Rock Creek Complex
Mitigation Action Integration	
Alignment with NHMP goals	Goal 1 ☒ Goal 4 ☐ Goal 7 ☐ Goal 2 ☐ Goal 5 ☐ Goal 3 ☐ Goal 6 ☒
Integration into other initiatives	Oregon Statewide Planning Goals 8 & 11
Alignment with existing plans and policies	THPRD's Comprehensive Plan & Climate Action Plan
Mitigation Action Implementation Plan	
Priority	Low ☐ Medium ☐ High ☒
Lead position, office, department, or division responsible for implementation	THPRD's Planning Department

Supporting Partners	
Internal Partners	**External Partners, Including Community Partners**
Recreation, Sports & Inclusion, Risk & Safety, Maintenance Operations, Design & Development	Washington County, City of Beaverton
Potential Funding Sources	
Non-Federal Funding Sources	**Federal Funding Sources**
THPRD Capital Improvement Plan, System Development Charge Funds	State of Oregon Technical Assistance Grants, Community Development Block Grants, FEMA HMAG Grant, Oregon OEM HMA Grant
Estimated Cost	$75,000.00

Estimated Benefit		
Primary Benefit(s)	**Secondary Benefit(s)**	**Financial Benefit(s)**
Protection of life and safety		$450,000.00

Project Timeline		
Expected Timeline for Completion	**Potential Start Date**	**Potential Completion Date**
Short-term ☒ Mid-term ☐ Long-term ☐ Ongoing ☐	2023	2025

Implementation Benchmarks: How Will Success Be Measured?

- Securing funding and project buy-in
- Studying existing conditions
- Developing goals and objectives
- Drafting an updated plan
- Board adoption of the updated plan

Potential Challenges to Implementation

- Funding, staffing, coordination with other local agencies

Resources and References, if Applicable

Three Alternatives Considered, Including No Action			
	Action Description	**Estimated Cost**	**Evaluation**
Alternative #1	Do nothing.	0	Doing nothing will cause increased problems over time.
Alternative #2			
Alternative #3			

Implementation Progress Report for Plan Maintenance	
Date	
What progress in implementation has been made to date?	
What challenges in implementation have been experienced?	
What are the next steps in implementation?	

Table 269: Green Infrastructure

Mitigation Action Information			
Title of action	Green Infrastructure		
Type of action	Plans/regulations ☐ Structure and infrastructure project ☐		Natural systems protection ☒ Public education/awareness ☐
Action description	Install detention and retention facilities such as vegetated parking lot swales, rain gardens near buildings, and green roofs to reduce waters from impervious areas that contribute to flooding.		
Hazard(s) addressed	Dam failure ☐ Drought ☐ Earthquake ☐ Extreme heat ☐	Flood ☒ Landslide ☐ Volcanic ash ☐ Wildland fire ☐	Windstorm, incl. tornado ☐ Winter storm ☐
How does the action address identified current or future risks and vulnerabilities?	Adding green infrastructure to existing facilities that aren't treated can capture, infiltrate, or slow water to reduce contributions to streams and rivers. By slowing flows during heavy rain events, flooding can be reduced or avoided downstream.		
Area of action impact	Improve facilities at Fanno Creek Service Center, HMT Recreation Complex, Cedar Hills Recreation Center, Harman Swim Center, Conestoga Rec & Aquatic Center, Cedar Hills Rec Center, PCC Rock Creek, Garden Home Rec.		
Is the action related to a critical facility or facilities?	Yes ☐ No ☒ If yes, what facility(ies)?		
Mitigation Action Integration			
Alignment with NHMP goals	Goal 1 ☒ Goal 2 ☐ Goal 3 ☐	Goal 4 ☐ Goal 5 ☐ Goal 6 ☐	Goal 7 ☐
Integration into other initiatives	THPRD Community Visioning Plan, THPRD Parks Functional Plan, Natural Resources Functional Plan, Statewide Planning Goal 6, Clean Water Services Design & Construction Standards		
Alignment with existing plans and policies	These actions fit Clean Water Services' Healthy Streams Plan and THPRD's Natural Resources Functional Plan.		
Mitigation Action Implementation Plan			
Priority	Low ☐ Medium ☒ High ☐		
Lead position, office, department, or division responsible for implementation	THPRD's Design & Development Department		

Supporting Partners	
Internal Partners	**External Partners, Including Community Partners**
THPRD's Nature & Trails Department	Clean Water Services
Potential Funding Sources	
Non-Federal Funding Sources	**Federal Funding Sources**
THPRD capital improvement funds, bond funds, Clean Water Services Surface Water Management Funds	Water Grants, Urban Waters Small Grants Program, Climate Adaption Funding & Tech Asst., 319 Clean Water Program, EPA Green Infrastructure
Estimated Cost	$50,000 to $400,000 per project. Average of $200,000 per project – four projects = $800,000

Estimated Benefit		
Primary Benefit(s)	**Secondary Benefit(s)**	**Financial Benefit(s)**
Reduced water run-off leaving sites.	Mitigates downstream flooding	$4,800,000

Project Timeline		
Expected Timeline for Completion	**Potential Start Date**	**Potential Completion Date**
Short-term ☐ Mid-term ☐ Long-term ☒ Ongoing ☐		

Implementation Benchmarks: How Will Success Be Measured?
• Each project will have a planning, design, and installation phase. Completion of phases shows success.

Potential Challenges to Implementation
• Lack of funding, complex permitting requirements.

Resources and References, if Applicable

Three Alternatives Considered, Including No Action			
	Action Description	**Estimated Cost**	**Evaluation**
Alternative #1			
Alternative #2			
Alternative #3			

Implementation Progress Report for Plan Maintenance	
Date	
What progress in implementation has been made to date?	
What challenges in implementation have been experienced?	
What are the next steps in implementation?	

Table 270: Stream Bank Restoration

Mitigation Action Information			
Title of action	Stream Bank Restoration		
Type of action	Plans/regulations ☐		Natural systems protection ☒
	Structure and infrastructure project ☐		Public education/awareness ☐
Action description	Conduct stream bank stabilization projects including grading, adding large wood, placing soil lifts, re-meandering straightened streams, and planting banks with native trees, shrubs, and herbs.		
Hazard(s) addressed	Dam failure ☐	Flood ☒	Windstorm, incl. tornado ☐
	Drought ☐	Landslide ☐	Winter storm ☐
	Earthquake ☐	Volcanic ash ☐	
	Extreme heat ☐	Wildland fire ☐	
How does the action address identified current or future risks and vulnerabilities?	Improving stream banks prevents erosion, slows water, adds storage capacity, and can allow streams to spread into natural floodplains, which lessen water impacts or developed assets.		
Area of action impact	Rock, Bronson, Willow, Beaverton, Butternut, Fanno, Cedar Mill, Johnson Creeks and their tributaries.		
Is the action related to a critical facility or facilities?	Yes ☐ No ☒ If yes, what facility(ies)?		
Mitigation Action Integration			
Alignment with NHMP goals	Goal 1 ☒	Goal 4 ☐	Goal 7 ☐
	Goal 2 ☐	Goal 5 ☐	
	Goal 3 ☐	Goal 6 ☐	
Integration into other initiatives	City of Beaverton and Washington County flood control plans; Statewide Planning Goal 6		
Alignment with existing plans and policies	These actions fit Clean Water Services' Healthy Streams Plan, THPRD's Natural Resources Functional Plan, and the Tualatin Watershed Enhancement Coalition's vision for Cedar Mill/Johnson Creek.		
Mitigation Action Implementation Plan			
Priority	Low ☐	Medium ☒	High ☐
Lead position, office, department, or division responsible for implementation	THPRD's Nature & Trails Department		

Supporting Partners	
Internal Partners	**External Partners, Including Community Partners**
Planning, Design & Development, and Communications departments	Clean Water Services
Potential Funding Sources	
Non-Federal Funding Sources	**Federal Funding Sources**
THPRD capital improvement and bond funds, Clean Water Services Surface Water Management Funds	Aquatic Ecosystem Restoration, NFIP, FMA, EPA 319 Clean Water Act Non-Point Source Program, OR Watershed Enhancement Board Restoration
Estimated Cost	$100,000–$500,000 per project, 10 projects, up to $5,000,000

Estimated Benefit		
Primary Benefit(s)	**Secondary Benefit(s)**	**Financial Benefit(s)**
Reduced flooding of infrastructure.	Improved natural eco-systems.	$30,000,000

Project Timeline		
Expected Timeline for Completion	**Potential Start Date**	**Potential Completion Date**
Short-term ☐ Mid-term ☐ Long-term ☒ Ongoing ☐		

Implementation Benchmarks: How Will Success Be Measured?
• Implementation of projects, visual observation of stream access to natural flood plains, reduced erosion/bank sloughing of creeks, increase in native plant cover in streamside areas.

Potential Challenges to Implementation
• Lack of funding, complex permitting requirements.

Resources and References, if Applicable

Three Alternatives Considered, Including No Action			
	Action Description	**Estimated Cost**	**Evaluation**
Alternative #1	Do nothing.	$0	Doing nothing will cause increased problems over time.
Alternative #2			
Alternative #3			

Implementation Progress Report for Plan Maintenance	
Date	
What progress in implementation has been made to date?	
What challenges in implementation have been experienced?	
What are the next steps in implementation?	

Table 271: Steep Slope Revegetation

Mitigation Action Information	
Title of action	Steep Slope Revegetation
Type of action	Plans/regulations ☐ Natural systems protection ☒ Structure and infrastructure project ☐ Public education/awareness ☐
Action description	Revegetate steep slopes to treat seepage zones and control surface erosion. The bioengineering techniques used fit well with natural ecological restoration.
Hazard(s) addressed	Dam failure ☐ Flood ☐ Windstorm, incl. tornado ☐ Drought ☐ Landslide ☒ Winter storm ☐ Earthquake ☐ Volcanic ash ☐ Extreme heat ☐ Wildland fire ☐
How does the action address identified current or future risks and vulnerabilities?	Mitigates areas district-wide where unstable steep slopes may endanger buildings, roadways, trails, and natural areas.
Area of action impact	Entire THPRD service area
Is the action related to a critical facility or facilities?	Yes ☐ No ☒ If yes, what facility(ies)?
Mitigation Action Integration	
Alignment with NHMP goals	Goal 1 ☒ Goal 4 ☐ Goal 7 ☐ Goal 2 ☒ Goal 5 ☐ Goal 3 ☐ Goal 6 ☐
Integration into other initiatives	State of Oregon & Washington County NHMP
Alignment with existing plans and policies	THPRD Visioning Plan, Nature & Trails Comprehensive Plan
Mitigation Action Implementation Plan	
Priority	Low ☐ Medium ☒ High ☐
Lead position, office, department, or division responsible for implementation	Nature & Trails department

Supporting Partners	
Internal Partners	**External Partners, Including Community Partners**
Design & development department, Communications department	Tualatin Valley Soil Conservation District

Potential Funding Sources	
Non-Federal Funding Sources	**Federal Funding Sources**
Capital improvements plan, bond funding, Soil Conservation District grants	Aquatic Eco-System Restoration, Landscape Planning Programs
Estimated Cost	$100,000.00

Estimated Benefit		
Primary Benefit(s)	**Secondary Benefit(s)**	**Financial Benefit(s)**
Stable slopes provide for safe and secure natural areas	Potential damage to structures/infrastructure is minimized.	$600,000.00

Project Timeline		
Expected Timeline for Completion	**Potential Start Date**	**Potential Completion Date**
Short-term ☐ Mid-term ☒ Long-term ☐ Ongoing ☐	2024	2027

Implementation Benchmarks: How Will Success Be Measured?
• Number of slopes mitigated

Potential Challenges to Implementation

Resources and References, if Applicable

Three Alternatives Considered, Including No Action			
	Action Description	**Estimated Cost**	**Evaluation**
Alternative #1			
Alternative #2			
Alternative #3			

Implementation Progress Report for Plan Maintenance	
Date	
What progress in implementation has been made to date?	
What challenges in implementation have been experienced?	
What are the next steps in implementation?	

Table 272: Public Education for Landslide Prevention

Mitigation Action Information			
Title of action	Public Education for Landslide Prevention		
Type of action	Plans/regulations ☐ Structure and infrastructure project ☐	Natural systems protection ☐ Public education/awareness ☒	
Action description	Expand public knowledge of the risks and dangers of unstable steep slopes through the website and public event engagement.		
Hazard(s) addressed	Dam failure ☐ Drought ☐ Earthquake ☐ Extreme heat ☐	Flood ☐ Landslide ☒ Volcanic ash ☐ Wildland fire ☐	Windstorm, incl. tornado ☐ Winter storm ☐
How does the action address identified current or future risks and vulnerabilities?	Expands public knowledge of risk/dangers of unstable steep slopes through website and public event engagement.		
Area of action impact	Entire service area, including City of Beaverton and Washington County.		
Is the action related to a critical facility or facilities?	Yes ☐ No ☒ If yes, what facility(ies)?		
Mitigation Action Integration			
Alignment with NHMP goals	Goal 1 ☒ Goal 2 ☐ Goal 3 ☒	Goal 4 ☐ Goal 5 ☐ Goal 6 ☐	Goal 7 ☐
Integration into other initiatives			
Alignment with existing plans and policies			
Mitigation Action Implementation Plan			
Priority	Low ☒	Medium ☐	High ☐
Lead position, office, department, or division responsible for implementation	Communications department		
Supporting Partners			
Internal Partners		**External Partners, Including Community Partners**	
Nature & Trails department		City of Beaverton, Washington County	

Potential Funding Sources	
Non-Federal Funding Sources	**Federal Funding Sources**
General Fund	Aquatic Ecosystem Restoration, The Nature Conservancy
Estimated Cost	$50,000.00

Estimated Benefit		
Primary Benefit(s)	**Secondary Benefit(s)**	**Financial Benefit(s)**
Public safety/education	Preservation of critical infrastructure such as facilities and roads.	$300,000.00

Project Timeline		
Expected Timeline for Completion	**Potential Start Date**	**Potential Completion Date**
Short-term ☐ Mid-term ☐ Long-term ☐ Ongoing ☒	2026	

Implementation Benchmarks: How Will Success Be Measured?

Potential Challenges to Implementation

Resources and References, if Applicable

Three Alternatives Considered, Including No Action			
	Action Description	**Estimated Cost**	**Evaluation**
Alternative #1			
Alternative #2			
Alternative #3			

Implementation Progress Report for Plan Maintenance	
Date	
What progress in implementation has been made to date?	
What challenges in implementation have been experienced?	
What are the next steps in implementation?	

Table 273: Increase Resilience for Volcanic Ashfall

Mitigation Action Information			
Title of action	Increase Building Resilience for Volcanic Ashfall		
Type of action	Plans/regulations ☐		Natural systems protection ☐
	Structure and infrastructure project ☐		Public education/awareness ☒
Action description	To develop guidelines and best practices for staff on how prevent or minimize facility impacts if there is a volcanic ash event.		
Hazard(s) addressed	Dam failure ☐	Flood ☐	Windstorm, incl. tornado ☐
	Drought ☐	Landslide ☐	Winter storm ☐
	Earthquake ☐	Volcanic ash ☒	
	Extreme heat ☐	Wildland fire ☐	
How does the action address identified current or future risks and vulnerabilities?	It would allow THPRD facilities to continue to operate after the volcanic ash event, with no, or minimal damage to infrastructure.		
Area of action impact	Entire service area boundary		
Is the action related to a critical facility or facilities?	Yes ☒ No ☐ If yes, what facility(ies)? All THPRD buildings.		
Mitigation Action Integration			
Alignment with NHMP goals	Goal 1 ☒	Goal 4 ☐	Goal 7 ☐
	Goal 2 ☐	Goal 5 ☐	
	Goal 3 ☐	Goal 6 ☒	
Integration into other initiatives	Potential to integrate with future capital improvement program (outdoor pools) and district Best Practices.		
Alignment with existing plans and policies	THPRD's internal emergency operation plan.		
Mitigation Action Implementation Plan			
Priority	Low ☒	Medium ☐	High ☐
Lead position, office, department, or division responsible for implementation	Maintenance operations, Facilities maintenance, Aquatic maintenance.		
Supporting Partners			
Internal Partners		**External Partners, Including Community Partners**	
Maintenance operations, Facilities maintenance, Aquatic maintenance.		Washington County	

Potential Funding Sources			
Non-Federal Funding Sources		**Federal Funding Sources**	
THPRD capital improvement plan		Hazard Mitigation Grant Program	
Estimated cost	$25,000.00		
Estimated Benefit			
Primary Benefit(s)	**Secondary Benefit(s)**	**Financial Benefit(s)**	
Minimize property damage, and disruption of essential infrastructure		$150,000.00	
Project Timeline			
Expected Timeline for Completion	**Potential Start Date**	**Potential Completion Date**	
Short-term ☐ Mid-term ☒ Long-term ☐ Ongoing ☐	2024	2026	
Implementation Benchmarks: How Will Success Be Measured?			
Potential Challenges to Implementation			
Resources and References, if Applicable			

Three Alternatives Considered, Including No Action			
Alternative #1	**Action Description**	**Estimated Cost**	**Evaluation**
Alternative #2			
Alternative #3			

Implementation Progress Report for Plan Maintenance	
Date	
What progress in implementation has been made to date?	
What challenges in implementation have been experienced?	
What are the next steps in implementation?	

Table 274: Outdoor Pools and Volcanic Ash

Mitigation Action Information			
Title of action	Outdoor Pools and Volcanic Ash		
Type of action	Plans/regulations ☒ Structure and infrastructure project ☐		Natural systems protection ☐ Public education/awareness ☐
Action description	Develop plans & protocols to do the following: shut down filtration to all outdoor pools & splash pads for THPRD; cover pools with winter covers to prevent ash from entering the pool water, only remove covers when event is over, use flocculant in pool and vacuum pool prior to restarting circulation; clean all surfaces will power washer.		
Hazard(s) addressed	Dam failure ☐ Drought ☐ Earthquake ☐ Extreme heat ☐	Flood ☐ Landslide ☐ Volcanic ash ☒ Wildland fire ☐	Windstorm, incl. tornado ☐ Winter storm ☐
How does the action address identified current or future risks and vulnerabilities?	It would prevent THPRD outdoor pools and splash pads filter systems from being damaged during ash events.		
Area of action impact	Outdoor pools and splash pads		
Is the action related to a critical facility or facilities?	Yes ☐ No ☒ If yes, what facility(ies)?		
Mitigation Action Integration			
Alignment with NHMP goals	Goal 1 ☒ Goal 2 ☐ Goal 3 ☐	Goal 4 ☐ Goal 5 ☐ Goal 6 ☐	Goal 7 ☐
Integration into other initiatives	Potential to integrate with future capital improvement program		
Alignment with existing plans and policies	This project would align with and inform THPRD's internal emergency operation plan.		
Mitigation Action Implementation Plan			
Priority	Low ☒	Medium ☐	High ☐
Lead position, office, department, or division responsible for implementation	Maintenance operations, Aquatic Maintenance, Facilities Maintenance		

Supporting Partners	
Internal Partners	**External Partners, Including Community Partners**
Maintenance operations, Aquatic Maintenance, Facilities Maintenance	Washington County
Potential Funding Sources	
Non-Federal Funding Sources	**Federal Funding Sources**
THPRD capital improvement plan	Hazard Mitigation Grant Program
Estimated Cost	$5,000.00

Estimated Benefit		
Primary Benefit(s)	**Secondary Benefit(s)**	**Financial Benefit(s)**
Minimize property damage and disruption of essential infrastructure		$30,000.00

Project Timeline		
Expected Timeline for Completion	**Potential Start Date**	**Potential Completion Date**
Short-term ☐ Mid-term ☒ Long-term ☐ Ongoing ☐	2024	2025

Implementation Benchmarks: How Will Success Be Measured?

Potential Challenges to Implementation

Resources and References, if Applicable

Three Alternatives Considered, Including No Action			
	Action Description	**Estimated Cost**	**Evaluation**
Alternative #1			
Alternative #2			
Alternative #3			

Implementation Progress Report for Plan Maintenance	
Date	
What progress in implementation has been made to date?	
What challenges in implementation have been experienced?	
What are the next steps in implementation?	

Table 275: Wildland Fire Fuel Reduction

Mitigation Action Information	
Title of action	Wildland Fire Fuel Reduction
Type of action	Plans/regulations ☐ Natural systems protection ☒ Structure and infrastructure project ☐ Public education/awareness ☐
Action description	Mowing, pruning, and chipping of fine fuels such as grasses, branches, and yard debris piles at residential/natural area interfaces.
Hazard(s) addressed	Dam failure ☐ Flood ☐ Windstorm, incl. tornado ☐ Drought ☐ Landslide ☐ Winter storm ☐ Earthquake ☐ Volcanic ash ☐ Extreme heat ☐ Wildland fire ☒
How does the action address identified current or future risks and vulnerabilities?	By removing fine fuels from primary ignition sources (people), the likelihood of a wildfire is significantly reduced. These actions are consistent with the Tualatin Valley Fire & Rescue (TVF&R)/THPRD Wildfire Reduction Plan.
Area of action impact	Approximately 50 urban natural areas district-wide.
Is the action related to a critical facility or facilities?	Yes ☐ No ☒ If yes, what facility(ies)?
Mitigation Action Integration	
Alignment with NHMP goals	Goal 1 ☒ Goal 4 ☐ Goal 7 ☐ Goal 2 ☐ Goal 5 ☐ Goal 3 ☐ Goal 6 ☐
Integration into other initiatives	TVF&R Wildfire Reduction Plan
Alignment with existing plans and policies	THPRD Natural Area Wildfire Management Strategy
Mitigation Action Implementation Plan	
Priority	Low ☐ Medium ☐ High ☒
Lead position, office, department, or division responsible for implementation	Nature & Trails department

Supporting Partners	
Internal Partners	**External Partners, Including Community Partners**
Parks Maintenance	TVF&R, Washington County, City of Beaverton

Potential Funding Sources	
Non-Federal Funding Sources	**Federal Funding Sources**
General Fund	HMGP, HMA, NFP
Estimated Cost	$150,000.00

Estimated Benefit		
Primary Benefit(s)	**Secondary Benefit(s)**	**Financial Benefit(s)**
Reduction in the number of fires spreading off of THPRD property	Healthy forests and natural areas	$900,000.00

Project Timeline		
Expected Timeline for Completion	**Potential Start Date**	**Potential Completion Date**
Short-term ☐ Mid-term ☐ Long-term ☐ Ongoing ☒	Fall 2022	Ongoing

Implementation Benchmarks: How Will Success Be Measured?
• Implement funded plan • Seek funding/continue partnership with TVF&R

Potential Challenges to Implementation
• Securing ongoing funding and staff availability

Resources and References, if Applicable

Three Alternatives Considered, Including No Action			
	Action Description	Estimated Cost	Evaluation
Alternative #1	No action/allow natural processes to continue	$0	
Alternative #2			
Alternative #3			

Implementation Progress Report for Plan Maintenance	
Date	
What progress in implementation has been made to date?	
What challenges in implementation have been experienced?	
What are the next steps in implementation?	

Table 276: Increase Wireless Capabilities District-Wide

Mitigation Action Information	
Title of action	Increase Wireless Capabilities District-Wide
Type of action	Plans/regulations ☐ Natural systems protection ☐ Structure and infrastructure project ☒ Public education/awareness ☒
Action description	Increase the District's ability to transfer data among its numerous sites via wireless technology (Public 5G, Private LTE/5G, and/or Long Range 5Ghz Wi-Fi)
Hazard(s) addressed	Dam failure ☐ Flood ☐ Windstorm, incl. tornado ☐ Drought ☐ Landslide ☐ Winter storm ☒ Earthquake ☐ Volcanic ash ☐ Extreme heat ☐ Wildland fire ☒
How does the action address identified current or future risks and vulnerabilities?	During wildfire and heavy wind events, data communication lines that run on poles as well at underground can be affected by the natural hazard. The ability to transmit data between our sites ensures business continuity in such a disaster and allows us to act in an emergency ops/response capacity. Also permits seamless communication with the entire service area.
Area of action impact	Entire service area
Is the action related to a critical facility or facilities?	Yes ☒ No ☐ If yes, what facility(ies)? Admin Building, Fanno Creek Service Center, Warming/Cooling Shelters, designated long-term shelters
Mitigation Action Integration	
Alignment with NHMP goals	Goal 1 ☒ Goal 4 ☐ Goal 7 ☒ Goal 2 ☐ Goal 5 ☐ Goal 3 ☐ Goal 6 ☐
Integration into other initiatives	City of Beaverton & Washington County Emergency Operations Plans
Alignment with existing plans and policies	THPRD Emergency Operations Plans
Mitigation Action Implementation Plan	
Priority	Low ☐ Medium ☒ High ☐
Lead position, office, department, or division responsible for implementation	Information Services/Facilities Maintenance

Supporting Partners	
Internal Partners	**External Partners, Including Community Partners**
Information Services Dept, Facilities Maintenance Teams, Trades Team	City of Beaverton, Washington County
Potential Funding Sources	
Non-Federal Funding Sources	**Federal Funding Sources**
General Fund, MACC Grant	Hazard Mitigation Grant Program, Building Resilient Infrastructure and Communities
Estimated Cost	$75,000.00 for equipment, and $25,000.00 for implementation support. Ongoing licensing and equipment replacement is estimated at $15,000 annually

Estimated Benefit		
Primary Benefit(s)	**Secondary Benefit(s)**	**Financial Benefit(s)**
Limit disruption of essential infrastructure Enhance the ability of the District to assist in emergency operations	Build resilience in our network infrastructure and add capacity/bandwidth at our hard-to-reach locations. For example, facilities that do not currently have fiber connectivity and don't exist near current infrastructure to support such connectivity.	$600,000

Project Timeline		
Expected Timeline for Completion	**Potential Start Date**	**Potential Completion Date**
Short-term ☐ Mid-term ☒ Long-term ☐ Ongoing ☐	Winter 2026	Winter 2027

Implementation Benchmarks: How Will Success Be Measured?

- Securing funding and project buy-in
- Procuring equipment
- Implementation complete
- Staff training
- Transmit data between key District sites wirelessly

Potential Challenges to Implementation

- The technology is new to the District, and there will need to be some education in this area in order for the staff to be able to support the installation and ongoing maintenance of such technology.
- Additionally, the full adoption of 5G has been delayed, and as the technology matures, we will need to be prepared to adapt to those changes.
- Finally, as this is something the district has never done before, securing funding may be a challenge.

Resources and References, if Applicable

Three Alternatives Considered, Including No Action			
Alternative #1	**Action Description**	**Estimated Cost**	**Evaluation**
Alternative #2			
Alternative #3			
Implementation Progress Report for Plan Maintenance			
Date			
What progress in implementation has been made to date?			
What challenges in implementation have been experienced?			
What are the next steps in implementation?			

Table 277: Tree Evaluation/Remediation

Mitigation Action Information	
Title of action	Tree Evaluation/Remediation
Type of action	Plans/regulations ☐ Natural systems protection ☒ Structure and infrastructure project ☐ Public education/awareness ☐
Action description	After a windstorm, trees can fail, leading to blocked infrastructure and damage to buildings and park facilities. This project will set up a tree response equipment pool to both proactively prune trees as well as to clear them if they fall during a storm. The equipment will include a spider lift, chipper, chainsaws, safety equipment, trailers, and hand tools.
Hazard(s) addressed	Dam failure ☐ Flood ☐ Windstorm, incl. tornado ☒ Drought ☐ Landslide ☐ Winter storm ☐ Earthquake ☐ Volcanic ash ☐ Extreme heat ☐ Wildland fire ☐
How does the action address identified current or future risks and vulnerabilities?	The tools identified will allow staff to prevent some tree failures in advance, reducing damage and risk. It will also enable staff to clear downed trees or abate dangerous trees after a storm event quickly and safely.
Area of action impact	Entire service area.
Is the action related to a critical facility or facilities?	Yes ☐ No ☒ If yes, what facility(ies)?
Mitigation Action Integration	
Alignment with NHMP goals	Goal 1 ☒ Goal 4 ☐ Goal 7 ☒ Goal 2 ☐ Goal 5 ☐ Goal 3 ☐ Goal 6 ☐
Integration into other initiatives	Cooperative Public Agencies of Washington County (countywide equipment sharing)
Alignment with existing plans and policies	THPRD's Vision Action Plan
Mitigation Action Implementation Plan	
Priority	Low ☐ Medium ☐ High ☒
Lead position, office, department, or division responsible for implementation	Nature & Trails Department

Supporting Partners	
Internal Partners	**External Partners, Including Community Partners**
Park Maintenance Department	All Washington County government agencies
Potential Funding Sources	
Non-Federal Funding Sources	**Federal Funding Sources**
THPRD operating funds, bond funds	USDA, NRCS – maybe Emergency Watershed Protection Program
Estimated Cost	$250,000

Estimated Benefit		
Primary Benefit(s)	**Secondary Benefit(s)**	**Financial Benefit(s)**
Increased safety, tree preservation, improved speed of recovery after an event.		$1,500,000

Project Timeline		
Expected Timeline for Completion	**Potential Start Date**	**Potential Completion Date**
Short-term ☒ Mid-term ☐ Long-term ☐ Ongoing ☐	2023	

Implementation Benchmarks: How Will Success Be Measured?
• Acquisition and use of equipment.

Potential Challenges to Implementation
• Lack of funds.

Resources and References, if Applicable

Three Alternatives Considered, Including No Action			
	Action Description	**Estimated Cost**	**Evaluation**
Alternative #1			
Alternative #2			
Alternative #3			

Implementation Progress Report for Plan Maintenance	
Date	
What progress in implementation has been made to date?	
What challenges in implementation have been experienced?	
What are the next steps in implementation?	

Table 278: Warming Shelters During Extreme Cold Events

Mitigation Action Information	
Title of action	Warming Shelters During Extreme Cold Events
Type of action	Plans/regulations ☐ Natural systems protection ☐ Structure and infrastructure project ☒ Public education/awareness ☐
Action description	Prepare and equip THPRD facilities to serve as warming centers during extreme cold events. This includes evaluations of boilers and heating systems at the five facilities designated as warming centers.
Hazard(s) addressed	Dam failure ☐ Flood ☐ Windstorm, incl. tornado ☐ Drought ☐ Landslide ☐ Winter storm ☒ Earthquake ☐ Volcanic ash ☐ Extreme heat ☐ Wildland fire ☐
How does the action address identified current or future risks and vulnerabilities?	When temperatures drop below freezing during the winter months, there are many community members without the means or ability to access locations to temporarily warm themselves. These community centers will serve as a free option for respite from the freezing temperatures.
Area of action impact	Entire THPRD service area, Washington County
Is the action related to a critical facility or facilities?	Yes ☒ No ☐ If yes, what facility(ies)? THPRD Athletic Center, Cedar Hills Recreation Center, Garden Home Recreation Center, Elsie Stuhr Center, Conestoga Recreation & Aquatic Center
Mitigation Action Integration	
Alignment with NHMP goals	Goal 1 ☒ Goal 4 ☐ Goal 7 ☐ Goal 2 ☐ Goal 5 ☐ Goal 3 ☐ Goal 6 ☒
Integration into other initiatives	THPRD Emergency Shelter Plan
Alignment with existing plans and policies	Washington County & City of Beaverton Shelter Plan
Mitigation Action Implementation Plan	
Priority	Low ☐ Medium ☐ High ☒
Lead position, office, department, or division responsible for implementation	THPRD Recreation department & Sports & Inclusion department

Supporting Partners	
Internal Partners	**External Partners, Including Community Partners**
Recreation, Sports & Inclusion, Risk & Safety, Communications	American Red Cross, Washington County
Potential Funding Sources	
Non-Federal Funding Sources	**Federal Funding Sources**
Capital Improvement funds, bond measure funding	Funding & Technical Assistance for Climate Adaption, HMA, BRIC
Estimated Cost	$100,000.00

Estimated Benefit		
Primary Benefit(s)	**Secondary Benefit(s)**	**Financial Benefit(s)**
Protection of life and safety		$600,000.00

Project Timeline		
Expected Timeline for Completion	**Potential Start Date**	**Potential Completion Date**
Short-term ☒ Mid-term ☐ Long-term ☐ Ongoing ☐	2024	2025

Implementation Benchmarks: How Will Success Be Measured?
• Securing funding and project buy-in • Implementation of warming center plan, in partnership with Washington County • Communication to public regarding availability • Execution of plan during extreme cold weather events

Potential Challenges to Implementation

Resources and References, if Applicable

Three Alternatives Considered, Including No Action			
	Action Description	**Estimated Cost**	**Evaluation**
Alternative #1			
Alternative #2			
Alternative #3			

Implementation Progress Report for Plan Maintenance	
Date	
What progress in implementation has been made to date?	
What challenges in implementation have been experienced?	
What are the next steps in implementation?	

Table 279: Feasibility Study and Analysis of Roof at THPRD Athletic Center

Mitigation Action Information	
Title of action	Feasibility Study and Analysis of Roof at THPRD Athletic Center
Type of action	Plans/regulations ☐ Natural systems protection ☐ Structure and infrastructure project ☒ Public education/awareness ☐
Action description	This project would consider the feasibility study, and condition of asset analysis of the roof at the HMT Athletic Center, which would serve as a community shelter/warming center during extreme winter storm events.
Hazard(s) addressed	Dam failure ☐ Flood ☐ Windstorm, incl. tornado ☐ Drought ☐ Landslide ☐ Winter storm ☒ Earthquake ☐ Volcanic ash ☐ Extreme heat ☐ Wildland fire ☐
How does the action address identified current or future risks and vulnerabilities?	Allows THPRD Athletic Center to remain a critical partner in having warming shelter available to many community members that do not have the means or ability to access locations during extreme cold weather winter storm events.
Area of action impact	Entire THPRD service area, Washington County
Is the action related to a critical facility or facilities?	Yes ☒ No ☐ If yes, what facility(ies)? THPRD Athletic Center
Mitigation Action Integration	
Alignment with NHMP goals	Goal 1 ☒ Goal 4 ☐ Goal 7 ☐ Goal 2 ☐ Goal 5 ☐ Goal 3 ☐ Goal 6 ☒
Integration into other initiatives	Potentially integrated with future capital improvement program and bond measure planning.
Alignment with existing plans and policies	This project would align with and inform THPRD's internal emergency operations plan, as well as American Red Cross and Washington County Shelter Plans.
Mitigation Action Implementation Plan	
Priority	Low ☐ Medium ☒ High ☐
Lead position, office, department, or division responsible for implementation	Design and Development, Maintenance Operations

Supporting Partners	
Internal Partners	**External Partners, Including Community Partners**
Recreation, Sports & Inclusion, Risk & Safety, Communications	American Red Cross, City of Beaverton, Washington County
Potential Funding Sources	
Non-Federal Funding Sources	**Federal Funding Sources**
THPRD Capital Improvement Plan, Bond, EMPG program	BRIC Grant, Hazard Mitigation Grant Program, Homeland Security Grant, HMA
Estimated Cost	$50,000.00

Estimated Benefit		
Primary Benefit(s)	**Secondary Benefit(s)**	**Financial Benefit(s)**
Protection and safety from extreme cold weather	Ensuring an operational emergency operations center for community members during extreme cold weather events.	$300,000.00

Project Timeline		
Expected Timeline for Completion	**Potential Start Date**	**Potential Completion Date**
Short-term ☐ Mid-term ☐ Long-term ☒ Ongoing ☐	2026	2028

Implementation Benchmarks: How Will Success Be Measured?

Potential Challenges to Implementation
• Securing funding and project buy-in • Hiring consultants/engineering firm to conduct assessment • Use study to secure future funding

Resources and References, if Applicable
• Securing funding, hiring consultant/engineering firm

Three Alternatives Considered, Including No Action			
	Action Description	**Estimated Cost**	**Evaluation**
Alternative #1			
Alternative #2			
Alternative #3			

Implementation Progress Report for Plan Maintenance	
Date	
What progress in implementation has been made to date?	
What challenges in implementation have been experienced?	
What are the next steps in implementation?	