



Central Oregon Irrigation District Pilot Butte Canal EIS Draft Parks and Recreation Technical Report Deschutes County, Oregon

Prepared for

Central Oregon Irrigation District



May 2024

Prepared by

Parametrix

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Central Oregon Irrigation District Pilot Butte Canal EIS Draft Parks and Recreation Technical Report

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CITATION

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CERTIFICATION

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ACRONYMS, INITIALISMS, AND ABBREVIATIONS

ac	acre
COID	Central Oregon Irrigation District
District	Central Oregon Irrigation District
EIS	environmental impact statement
GIS	geographic information system
LWCF	Land and Water Conservation Fund
NRHP	National Register of Historic Places
OAR	Oregon Administrative Rules
PBC	Pilot Butte Canal

EXECUTIVE SUMMARY

There are 11 park and recreation facilities identified within the Study Area, including parks, trails, school athletic fields, a golf course, and open space areas. These resources are primarily located within the urbanized areas of Bend and Redmond. No Land and Water Conservation Fund properties were identified within the Project Area.

Long-term adverse impacts to these park and recreation resources range from negligible to moderate. Long-term impacts are primarily indirect and associated with the removal of the open canal as a visual and aesthetic resource at the impacted park and recreation areas. Long-term moderate adverse impacts would occur at the Lava Ridges Natural Area Trail, the Yew Avenue Nature Trail, and the Homestead Canal Trail, where piping of the canal would remove a prominent visual and aesthetic resource at these facilities.

Temporary construction impacts would include visual, noise, and vibration impacts to park and recreation resources caused by construction equipment and activities, including blasting. Due to the need to construct the Modernization Alternative outside of the irrigation season, impacts to school-owned facilities would occur during the school year. Some park access points would be temporarily impacted during construction. There would likely be one temporary closure of park facilities, at Homestead Park in Redmond, where the only vehicular access to the park would be closed for the duration of adjacent construction.

Mitigation measures would include revegetation and recontouring of all disturbed areas and restoration of trails or other recreation features disturbed during construction. If the Modernization Alternative is selected, mitigation of the removal of the Pilot Butte Canal as a visual and aesthetic feature may incorporate measures to enhance the ground above the buried pipe where the canal formerly ran, such as seeding with native plants or creating a trail along the alignment. Temporary impacts would be mitigated by notification of construction, identification of alternative access routes, and implementation of measures to reduce noise during construction, including blasting plans.

1. INTRODUCTION

As a part of the preparation of the Environmental Impact Statement (EIS) for the Pilot Butte Canal (PBC) Piping Project (Project), this technical report has been prepared to identify and evaluate park and recreation resources within the project's Study Area.

1.1 Project Location

The Central Oregon Irrigation District (COID or District) is analyzing piping approximately 18 to 21 miles of the PBC from NE 17th Street in Redmond, Oregon, to the diversion point from the Deschutes River in Bend, Oregon (Figure 1). The piping would extend from the piped section of the PBC approved under the 2020 *Smith Rock-King Way Infrastructure Modernization Project Final Watershed Plan-Environmental Assessment* (NRCS, USDA 2020). Additional portions along the existing alignment that have been piped or converted to box culverts during previous construction projects include the following:

- Major freeway or roadway crossings of US 97, Hwy 20, and Hwy 126, in Bend and Redmond (0.2 miles)
- Within the City of Bend and Deschutes County for the Juniper Ridge hydroelectric facility (3.3 miles)
- Within Deschutes County north of the Juniper Ridge hydroelectric plant (0.1 miles)
- Within urbanized Redmond (1.5 miles)

The portions to be piped for this Project are shown in Figure 1.

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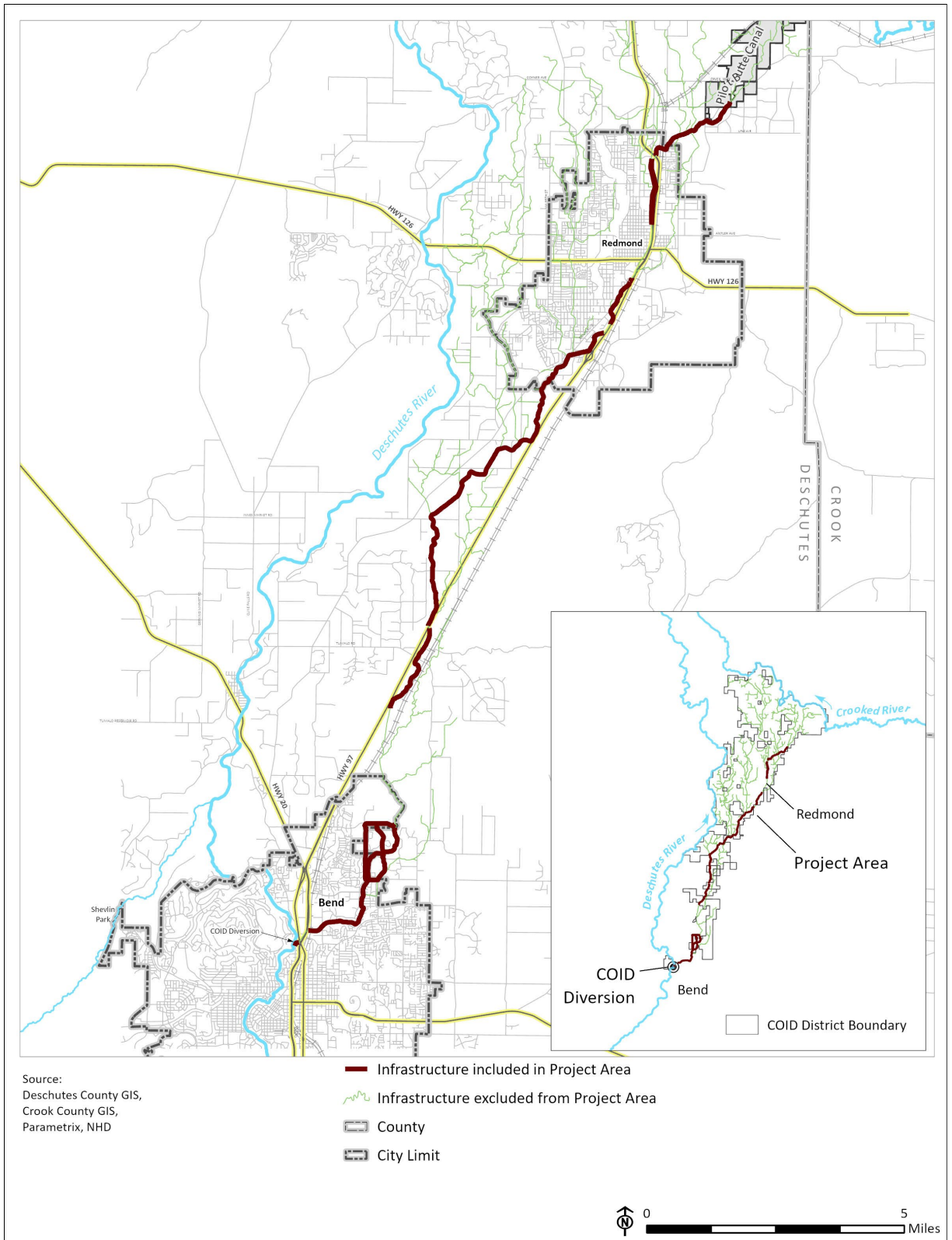


Figure 1. Project Area

1.2 Project Purpose and Need

The purpose of this Project is Agricultural Water Management through irrigation water conservation in District-owned infrastructure, improvement of water delivery reliability to District patrons, and reduction of long-term operation and maintenance costs on approximately 21 miles of the District-owned PBC. The Project is needed to address the following watershed problems and resource concerns: water loss in District conveyance systems and water delivery and operation and maintenance inefficiencies. Implementation of the proposed action would address the sponsors' objectives and goals to reduce seepage loss and provide better-managed water diversions for farm use; support agricultural land use; improve streamflow for fish, aquatic, and riparian habitat; and increase public safety.

2. PROJECT ALTERNATIVES

2.1 No Action (Future without Federal Investment)

Under the No Action Alternative, the District would continue to operate and maintain the existing delivery system within the Project Area in its current condition. This alternative assumes that modernization of the District's infrastructure would not be reasonably certain to occur, as funding at the scale necessary to modernize District infrastructure is not anticipated from other sources. The No Action Alternative would be a continuation of the District's current operations and maintenance.

The No Action Alternative would not meet the project purpose and need. Water would continue to be lost to seepage and evaporation in District infrastructure. Inefficiencies in water delivery reliability for farmers; streamflow and habitat conditions for fish and aquatic species; public safety; and sediment levels in irrigation water would not improve. The No Action Alternative would fail to achieve the goal of maximizing sustainable economic development, as identified in the Federal Objective to protect the environment. It would not resolve current water supply problems stemming from the loss of water from District infrastructure. Further, it would not foster the economic well-being of present and future generations through sustainable use and management of water resources to provide water supply and water quality for irrigated agriculture in the Deschutes Basin.

2.2 Modernization Alternative (Future with Federal Investment)

The Modernization Alternative would focus on a single priority infrastructure modernization project: the District would replace the existing open PBC within the Project Area with a pressurized, closed conduit pipeline system (see Figure 2). When completed, the pipe would extend over approximately 18 to 21 miles of the COID system from the diversion point from the Deschutes River in Bend, Oregon, to NE 17th Street in Redmond, Oregon. Pipeline construction would begin in the northern portion of the Project Area at the piped section of the PBC that was approved under the 2020 *Smith Rock-King Way Infrastructure Modernization Project Final Watershed Plan-Environmental Assessment* (NRCS, USDA 2020), and progress south to the North Canal Dam. Construction of the Modernization Alternative would occur over the course of 3 years; two project groups would be constructed each construction season. The six project groups are described in Table 1.

Table 1. Project Group and Construction Sequence

Project Groups	Project Group Length (feet)	Construction Year	Construction Start	Construction End
1 – King Way	11,000	0	October 2026	April 2027
2 – Redmond				
Pilot Butte Canal Alignment Option	13,500	1	October 2027	April 2028
Watermaster Road Alignment Option	13,500	1	October 2027	April 2028
NW Canal Boulevard Alignment Option	13,500	1	October 2027	April 2028
3 – Veterans Way	16,700	2	October 2028	April 2029
4 – Canal	13,900	2	October 2028	April 2029
5 – Deschutes Market	22,000	1	October 2027	April 2028
6 – Rivers Edge				
Pilot Butte Canal Alignment Option	18,100	0	October 2026	April 2027
18th Street Alignment Option	19,300	0	October 2026	April 2027
Old Deschutes Road Alignment Option	19,800	0	October 2026	April 2027

Construction would occur during the non-irrigation season (October to April), with Project Group 1 (King Way) and Project Group 6 (Rivers Edge) construction beginning as early as the 2026–2027 non-irrigation season. The construction sequencing may be changed to provide flexibility for the construction contractor. Construction of each project group is anticipated to require one non-irrigation season to complete, and all six project groups would be completed over the course of three construction seasons. Two project groups—Redmond and Rivers Edge—each contain a segment with multiple alignment options. The alignment options are discussed below. Under the Modernization Alternative, federal funding through Public Law 83-566 would be available and would be expected to cover approximately 75% of total costs. The District would cover the remaining 25% of total costs.

A section of the PBC in Deschutes County just south of the Juniper Ridge hydroelectric facility, in the Rivers Edge project group, and another section in the downtown area of Redmond, in the Redmond project group, include historic features listed in the National Register of Historic Places (NRHP). In 2019, a Section 106 programmatic agreement was signed by COID, the Oregon State Historic Preservation Office, and the Bureau of Reclamation. The Natural Resources Conservation Service (NRCS) was added as a signatory in 2023. The programmatic agreement identified that COID will maintain the downtown Redmond reach “such that the historic integrity of and identification of the historic property as representative of an irrigation conveyance system will not be adversely affected.” The alignment options for the Deschutes County/North Bend (in the Rivers Edge project group) and the City of Redmond (in the Redmond project group) NRHP-listed historic sections of the Project Area are described in Section 2.2.1 and Section 2.2.2, respectively.



2.2.1 Deschutes County/North Bend Alignment Options

The Modernization Alternative has four options for piping between Yeoman Road and Cooley Road in Deschutes County and north Bend (see Figure 3).

- No Modernization within this Segment (no piping)
- Pilot Butte Canal Alignment (existing canal alignment)
- NE 18th Street Alignment
- Old Deschutes Road Alignment

2.2.1.1 No Modernization within this Segment (No Piping)

This alignment option would keep the 7,800-foot NRHP-listed stretch of the PBC between Yeoman and Cooley Roads in its current configuration and functionality as an open canal. This option would require a pressure reducing station south of Yeoman Road to slow the flow velocity as it exits the pressurized pipe so that the existing open canal can function as currently designed.

2.2.1.2 Pilot Butte Canal Alignment (Existing Canal Route)

This alignment option would replace the open channel with pipe directly within the existing open channel alignment. This alignment option would be built wholly within the section of canal that is listed in the NRHP. This option would not pipe the open channel section immediately south of the Juniper Ridge hydroelectric facility (approximately 170 feet), and it would require installing a pressure reducing station prior to where flow enters the hydroelectric facility.

2.2.1.3 NE 18th Street Alignment

This option would pipe the PBC within a new alignment beginning at the intersection of the existing alignment and Yeoman Road. It would travel west and then north to follow NE 18th Street to its intersection with Cooley Road. At Cooley Road, the alignment option would make an approximately 90-degree turn to follow an alignment extending from near the eastern terminus of Cooley Road to the existing PBC. This option would avoid impacts to a portion of the PBC that is listed in the NRHP. The historic section of canal would be left in place, but it would no longer receive irrigation water from the COID system.

2.2.1.4 Old Deschutes Road Alignment

The Old Deschutes Road Alignment option would place pipe in a new alignment beginning at Yeoman Road. It would travel east along Yeoman Road and then northeast to follow Old Deschutes Road. The alignment would travel generally north, cross the existing PBC, then continue north to Cooley Road. The alignment would make an approximately 90-degree turn to follow Cooley Road to the existing the PBC. This option would avoid impacts to the NRHP-listed portion of PBC. The historic section of canal would be left in place, but it would no longer receive irrigation water from the COID system.

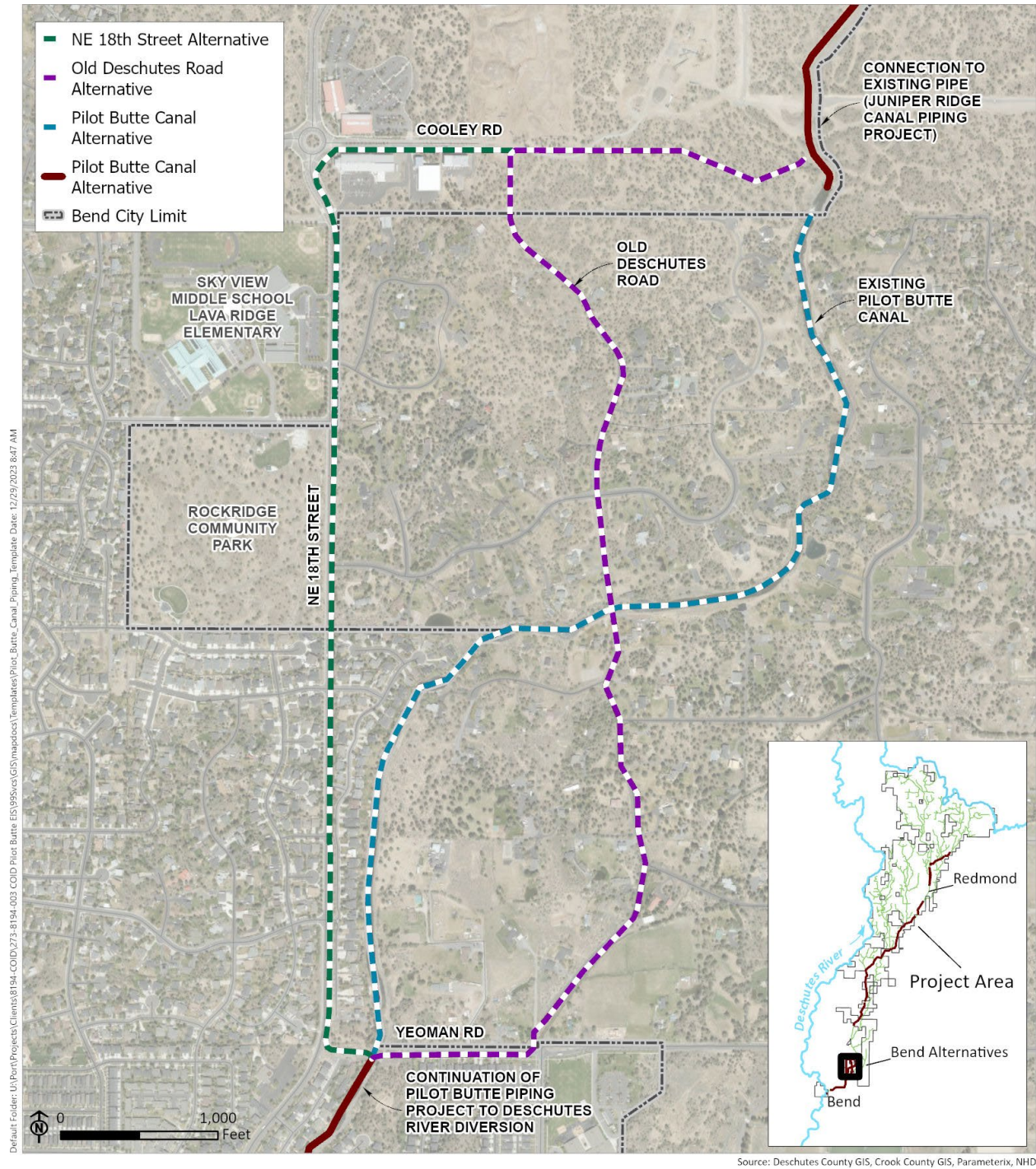


Figure 3. Deschutes County/North Bend Alignment Options

2.2.2 City of Redmond Alignment Options

The Modernization Alternative has four options for piping within the NRHP-listed historic Downtown Redmond section between NW Dogwood Avenue and NW Quince Avenue (see Figure 4).

- No Modernization within this Segment (no piping)
- Pilot Butte Canal Alignment (existing canal alignment)
- Piping to the east in the Watermaster's Access Road
- Piping to the west within Northwest Canal Boulevard

2.2.2.1 No Modernization within this Segment (No Piping)

This alignment option would keep the 6,800-foot NRHP-listed stretch of the PBC in Redmond in its current configuration and functionality as an open canal. This option would require installing a pressure reducing station near the intersection of SW Veteran's Way and US 97 to slow the flow velocity as it exits the pressurized pipe so that the existing open canal can function as currently designed.

2.2.2.2 Pilot Butte Canal Alignment (Existing Canal Route)

This alignment option would replace the open channel with pipe directly within the existing open channel alignment. This alignment option would be built wholly within the section of canal that is listed in the NRHP.

2.2.2.3 Piping to the east in the Watermaster's Access Road

This alignment option would install pipe to the east of the existing PBC and avoid impacts to the section of canal that is listed in the NRHP. The historic section of canal would be left in place, but it would no longer receive irrigation water from the COID system.

2.2.2.4 Piping to the west within Northwest Canal Boulevard

This alignment option would pipe to the west of the existing PBC, primarily within NW Canal Boulevard, and avoid impacts to the section of canal that is listed in the NRHP. The historic section of canal would be left in place, but it would no longer receive irrigation water from the COID system.

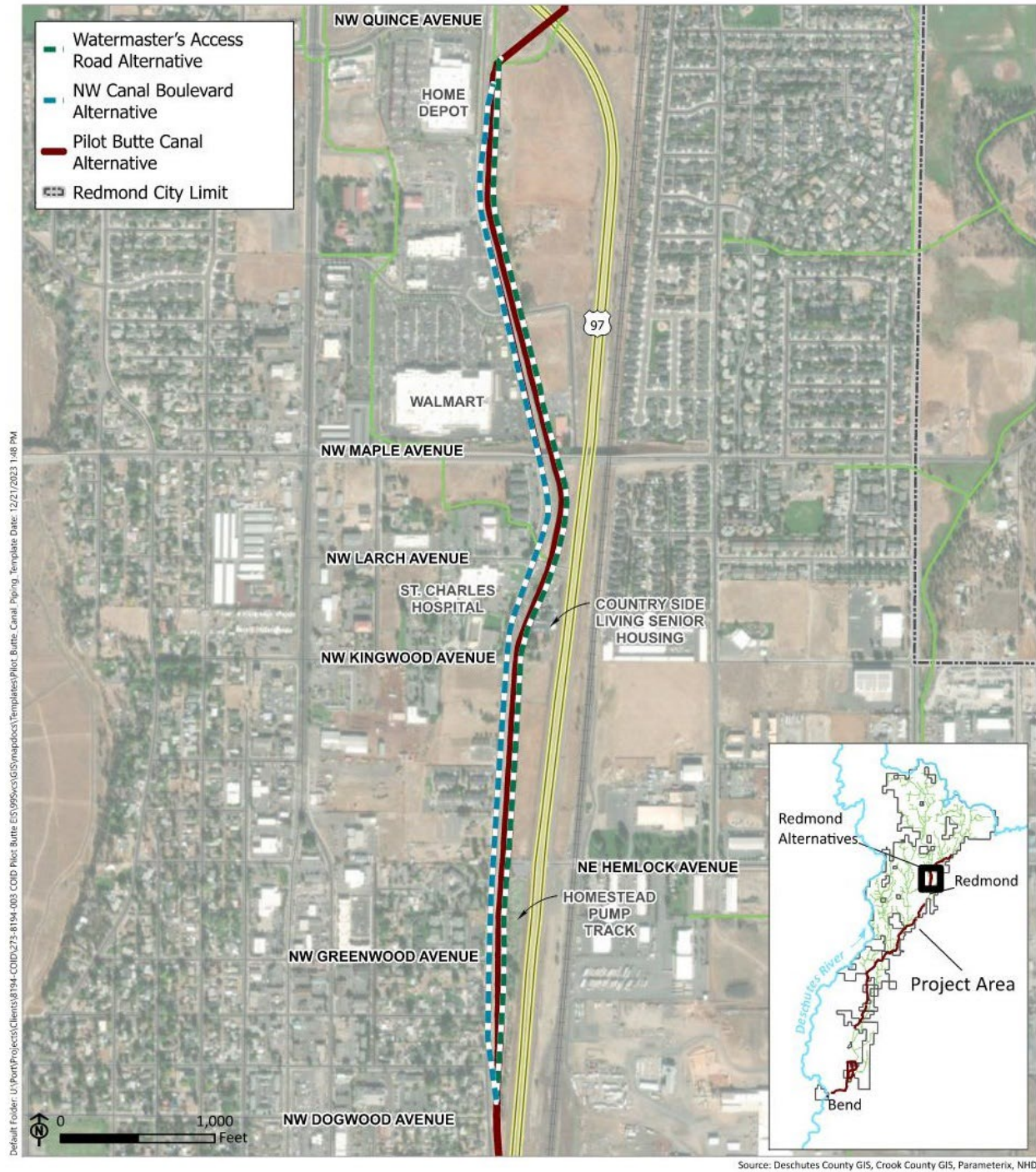


Figure 4. Redmond Alignment Options

3. DEFINITIONS

The following terminology is used when discussing geographic areas in this technical report.

Project Area. The area within which improvements associated with the project alignment options would occur and the area needed to construct these improvements. The Project Area includes the area needed to construct all permanent infrastructure, including adjacent parcels where modifications would be required for associated work such as utility realignments or upgrades.

Study Area. This is the general geographic area within which physical impacts to the environment could occur with the project alternatives. The Study Area is resource-specific and differs depending on the environmental topic being addressed. For all topics, the Study Area encompasses the Project Area, and for some topics (such as for utilities), the geographic extent of the Study Area is the same as that for the Project Area. For other topics (such as transportation) the Study Area is substantially larger to account for impacts that could occur outside of the Project Area. The Study Area for parks and recreation is defined in Section 5.1.

Project vicinity. The environs surrounding the Project Area. The project vicinity does not have a distinct geographic boundary but is used in general discussion to denote the larger area.

4. LEGAL REGULATIONS AND STANDARDS

Park and recreation facilities in the Project Area are supported and regulated by a number of state, local, and regional laws, plans, policies, and regulations.

4.1 Laws, Plans, Policies, and Regulations

4.1.1 Federal

4.1.1.1 Section 6(f) of the Land and Water Conservation Fund Act

Section 6(f) of the Land and Water Conservation Fund (LWCF) Act prohibits the conversion of park and recreational areas developed with LWCF funding to a non-recreation use without the approval of the National Park Service and provision of replacement property.

4.1.2 State of Oregon

4.1.2.1 Statewide Land Use Planning Goals

OAR 660-015 establishes 19 statewide planning goals that express the state's policies on land use planning, which are enacted on a local level by comprehensive planning and zoning ordinances. The following goals are especially relevant to the Project and the park and recreation impacts analysis:

- Goal 5: Natural Resources, Scenic and Historic Areas, and Open Spaces. Goal 5 protects a range of natural and cultural resources, including riparian corridors, wetlands, wildlife habitat, scenic rivers and waterways, groundwater resources, recreation trails, natural and wilderness areas, mineral resources, energy sources, and cultural and historic areas and resources.

- Goal 8: Recreational Needs. Goal 8 requires local governments to plan for the recreation needs of their residents and visitors, with an emphasis on nonmotorized forms of recreation, recreation accessibility in high-density population areas and for those with limited transportation options, and free and/or low-cost recreation opportunities.

4.1.3 Deschutes County

4.1.3.1 Comprehensive Plan

The Deschutes County Comprehensive Plan (Deschutes County 2011), adopted in 2011, contains issues, goals, and policies to guide the County's land use planning decisions and public investments over a 20-year planning horizon, including goals and policies for recreational needs.

4.1.3.2 Development Code

Open Space and Conservation

This code is intended to protect designated areas of scenic and natural resources; to restrict development in areas with fragile, unusual, or unique qualities; to protect and improve the quality of the air, water, and land resources and to plan development that will conserve open space.

4.1.4 City of Bend

4.1.4.1 Comprehensive Plan

The City of Bend Comprehensive Plan (City of Bend 2021), most recently updated in 2021, is a long-range planning guide for making land use decisions regarding future development and growth within Bend's urban growth boundary. Chapter 2 of the Comprehensive Plan includes goals and policies for Natural Features and Open Space.

4.1.4.2 Bend Park and Recreation District Comprehensive Plan

Adopted in 2018, the Bend Park and Recreation District Comprehensive Plan (City of Bend 2018) guides the Park and Recreation District's investment in public parks, trails, and recreation facilities over a 10-year planning horizon.

4.1.5 City of Redmond

4.1.5.1 Comprehensive Plan

Adopted in 2020, Redmond's 2040 Comprehensive Plan (City of Redmond 2020) is a guide to future growth, development, and redevelopment of the Redmond urban area. The Comprehensive Plan includes goals and policies for Recreational Needs and Open Spaces, Scenic and Historic Areas, and Natural Resources.

4.1.5.2 Citywide Park Master Plan

Adopted in 2018, the Redmond Citywide Park Master Plan (City of Redmond 2018) guides the City in making decisions or taking actions regarding planning, acquiring, developing, or implementing parks, open space, or recreational facilities.

4.2 Design Standards

The Project Area is within a wide range of zoning designations in the city of Bend, city of Redmond, and Deschutes County throughout its existing alignment and the proposed alignment alternatives. These zones are discussed in further detail in the Land Use Technical Report. Further guidance regarding development in or alongside COID canal alignments is available in the Central Oregon Irrigation District Development Handbook. The City of Redmond has established design guidelines for parks, trails, and recreation facilities in its Citywide Park Master Plan. All relevant design standards will be reviewed in detail during the permitting process for the piping project.

5. AFFECTED ENVIRONMENT

5.1 Study Area

The Study Area for the parks and recreation analysis includes all land adjacent to or intersected by the existing PBC alignment and all alignment options, including a 50-foot buffer on either side of the canal alignment to account for potential construction impacts. The Study Area also includes park and recreation resources from which the PBC alignment is visible, or where the existing canal is a visual or aesthetic feature of a park or recreation area.

5.2 Resource Identification and Evaluation Methods

5.2.1 Published Sources and Databases

Sources used to conduct this parks and recreation analysis include the following:

- Deschutes County GIS
- City of Bend GIS
- City of Redmond GIS
- Oregon Parks and Recreation Department Oregon Parkland Map Application
- Oregon Parks and Recreation Department Land Ownership/LWCF Map Application
- Deschutes County Comprehensive Plan
- Bend Comprehensive Plan
- Bend Park and Recreation District Comprehensive Plan
- Redmond 2040 Comprehensive Plan
- Redmond Citywide Park Master Plan

5.2.2 Field Visits and Surveys

No field visits or surveys were conducted to identify existing parks and recreation resources.

5.3 Existing Conditions

A number of parks, trails, and recreation facilities are traversed by or adjacent to the existing PBC alignment or proposed alignment options. See Figure 5 through Figure 8. Note that park and recreation facilities shown on the figures include those that fall outside of the Study Area. These are not discussed in this analysis.

A review of the Oregon Parks Land Ownership/LWCF Map Application indicates none of the recreation resources within the Study Area have received LWCF monies (OPRD 2023a).

5.3.1 Riverview Park

Riverview Park is a half-acre park within the Bend Park and Recreation District. The park is located adjacent to the PBC point of diversion at the Deschutes River. Riverview Park features a river overlook with accessible river access and a handicap-accessible fishing area. Limited off-street parking is available, and a restroom on-site is open seasonally. The PBC point of diversion is visible from the park. There is no access to the point of diversion or the PBC within the park.

5.3.2 Canal Row Park

Canal Row Park is an approximately 3.75-acre park within the Bend Park and Recreation District. The park features grass fields, a playground, swing set, nature play area, paved and unpaved trails, an interactive water play feature, a picnic shelter, water fountains, and natural areas. Canal Row Park has seasonal public restroom facilities and is wheelchair accessible. The PBC is located within close proximity to the park, but the North Unit Canal and North Unit canal access road is between the park and the PBC. There is no direct view of or access to the PBC from the park.

5.3.3 Lava Ridges Natural Area

Lava Ridges Natural Area is a series of open spaces owned by the Bend Park and Recreation District within the Lava Ridges subdivision. The COID operation and maintenance road is directly adjacent to the PBC for approximately 1 mile in this open space between Empire Avenue and Old Deschutes Road. The operation and maintenance road is used as an informal trail by community members; there is not currently a formal easement or use agreement in place for use of the road as a trail. Entrances to the access road are located on its intersections with Empire Avenue, Yeoman Road, and Old Deschutes Road.

5.3.4 Rock Ridge Park

Rock Ridge Park is a 36.6-acre park in the Bend Park and Recreation District; the park is located south of Lava Ridge Elementary School. Amenities include a bike skills course, nine-hole disc golf course, a fitness loop, natural areas, paved and unpaved paths, picnic shelter, playground, rental facilities, skatepark, and water play feature. The park has seasonal public restroom facilities and is wheelchair accessible. Only the NE 18th Street alignment option would run adjacent to Rock Ridge Park. The area of the proposed

NE 18th Street alignment is visible from the park. Access to the proposed PBC alignment is independent from the park.

5.3.5 Sky View Middle School and Lava Ridge Elementary School (Bend, 18th St Alternative)

Sports fields for Sky View Middle School and Lava Ridge Elementary School are located adjacent to the proposed NE 18th Street alignment option. Both schools are within the Bend-La Pine School District. The area of the proposed NE 18th Street alignment option is visible from the sports fields. Access to the proposed PBC alignment is independent from the fields.

5.3.6 Ponderosa Elementary School

Sports fields for Ponderosa Elementary School are located across Purcell Road from the Old Deschutes Road alignment option. The school is located within the Bend-La Pine School District. The area of the proposed PBC alignment is visible from the sports fields. Access to the proposed PBC alignment is independent from the fields.

5.3.7 Redmond-Bend Juniper State Scenic Corridor

This scenic corridor along US 97 consists of 10 parcels managed by the Oregon Parks and Recreation Department. The existing PBC alignment between Bend and Redmond crosses two of these parcels. The parcels are undeveloped with no plans for trails or amenities. The area is intended to preserve the old growth western juniper found in the area.

5.3.8 Greens at Redmond

The Greens at Redmond is a public 18-hole golf course located in southern Redmond. The existing PBC alignment runs adjacent to the west side of the course and is advertised as a scenic amenity on the course. Access to the PBC in this portion of the alignment is independent of the golf course.

5.3.9 Yew Avenue Nature Trail (Redmond)

The Yew Avenue Nature Trail runs adjacent to the PBC alignment in Redmond for approximately 0.8 miles from approximately SW Ben Hogan Drive to SW Yew Avenue in The Greens at Redmond Subdivision. The trail is unpaved but well maintained. Access to the PBC in this portion of the alignment is available via the trail, as well as by a maintenance road on the opposite bank of the canal.

5.3.10 Homestead Park (Redmond)

Homestead Park is a 2.86-acre park in the City of Redmond Parks Division. It is located between the existing PBC alignment and US 97. The park features a bike pump track, picnic tables, and interpretive kiosk. A segment of the Homestead Canal Trail Runs through the park. The only vehicle access point to the park is the N Hemlock Avenue bridge that passes over the existing PBC alignment, though the park may be accessed by foot or bike via the Homestead Canal Trail from the north or south.

5.3.11 Homestead Canal Trail (Redmond)

The Homestead Canal Trail is a 5.3-mile trail built along the PBC alignment between NW Maple Avenue and SW Odem Medo Way. The City of Redmond acquired easements from COID and the Oregon Department of Transportation for construction of the trail. The trail is paved, and it will ultimately include amenities such as trash cans, benches, interpretive signage, and drinking fountains. The trail provides important connections between neighborhoods, jobs, shopping, a regional transit hub, and medical facilities in Redmond. In addition, it passes through the historically significant homestead site of Frank and Josephine Redmond.

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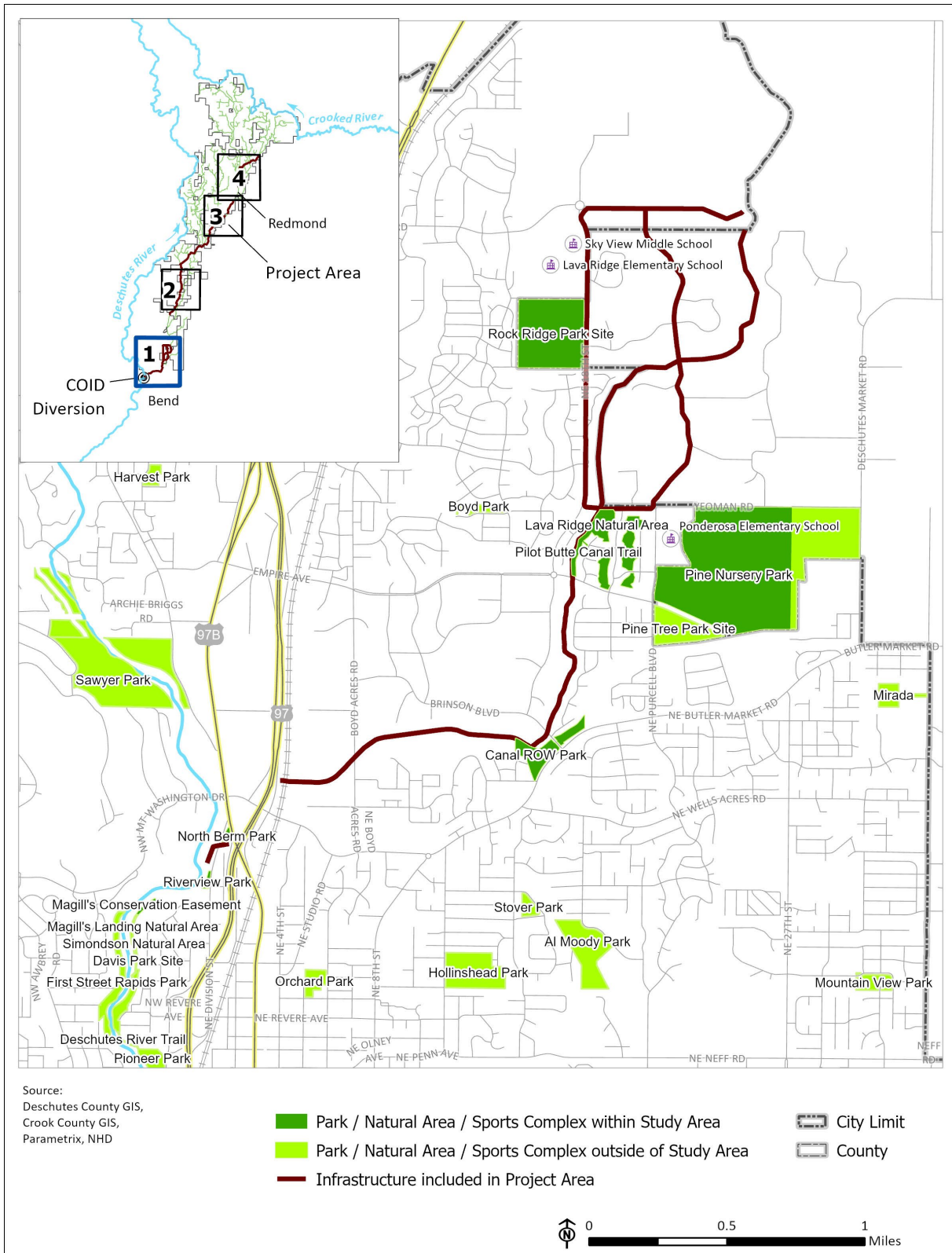


Figure 5. Existing Facilities – Tile 1

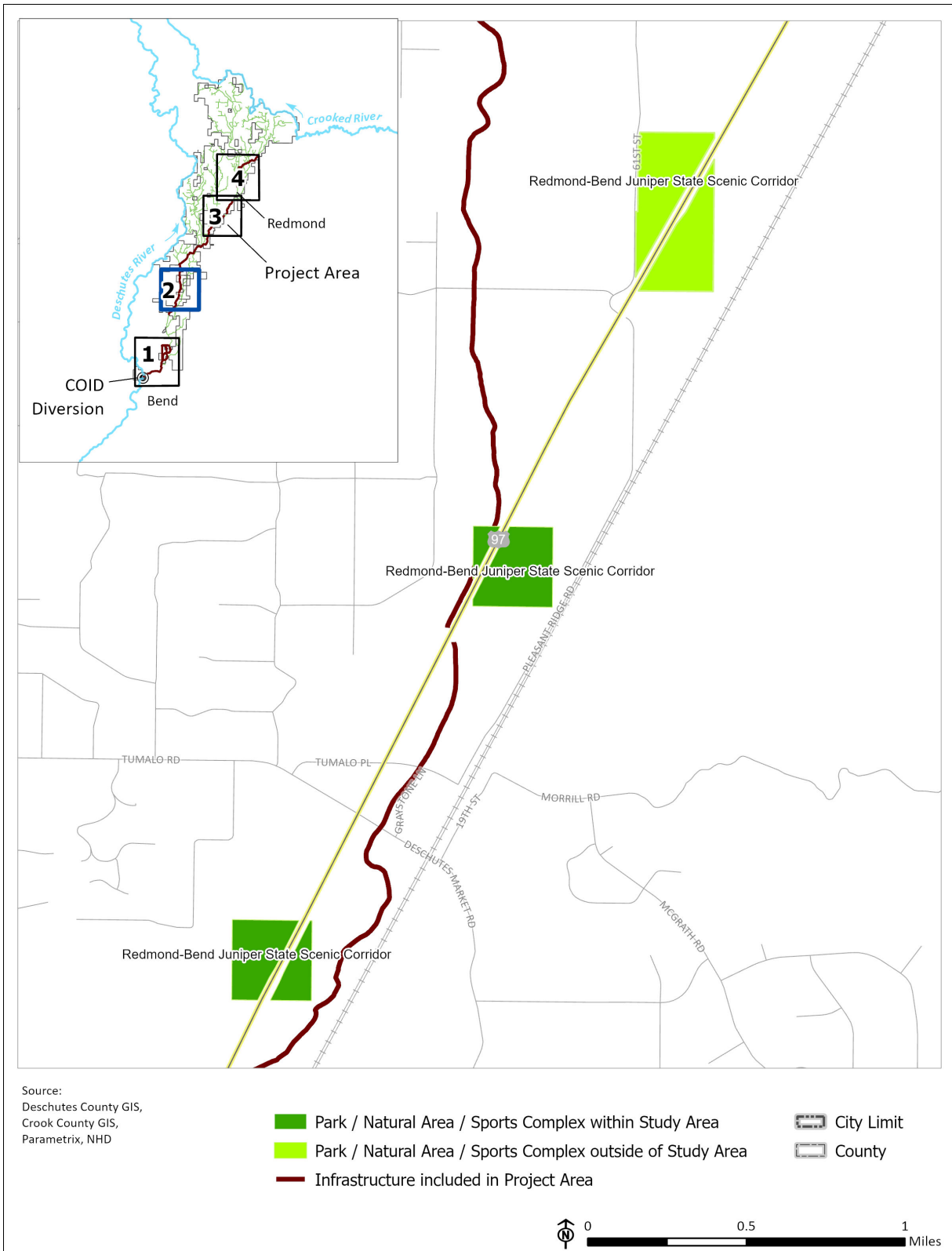


Figure 6. Existing Facilities – Tile 2

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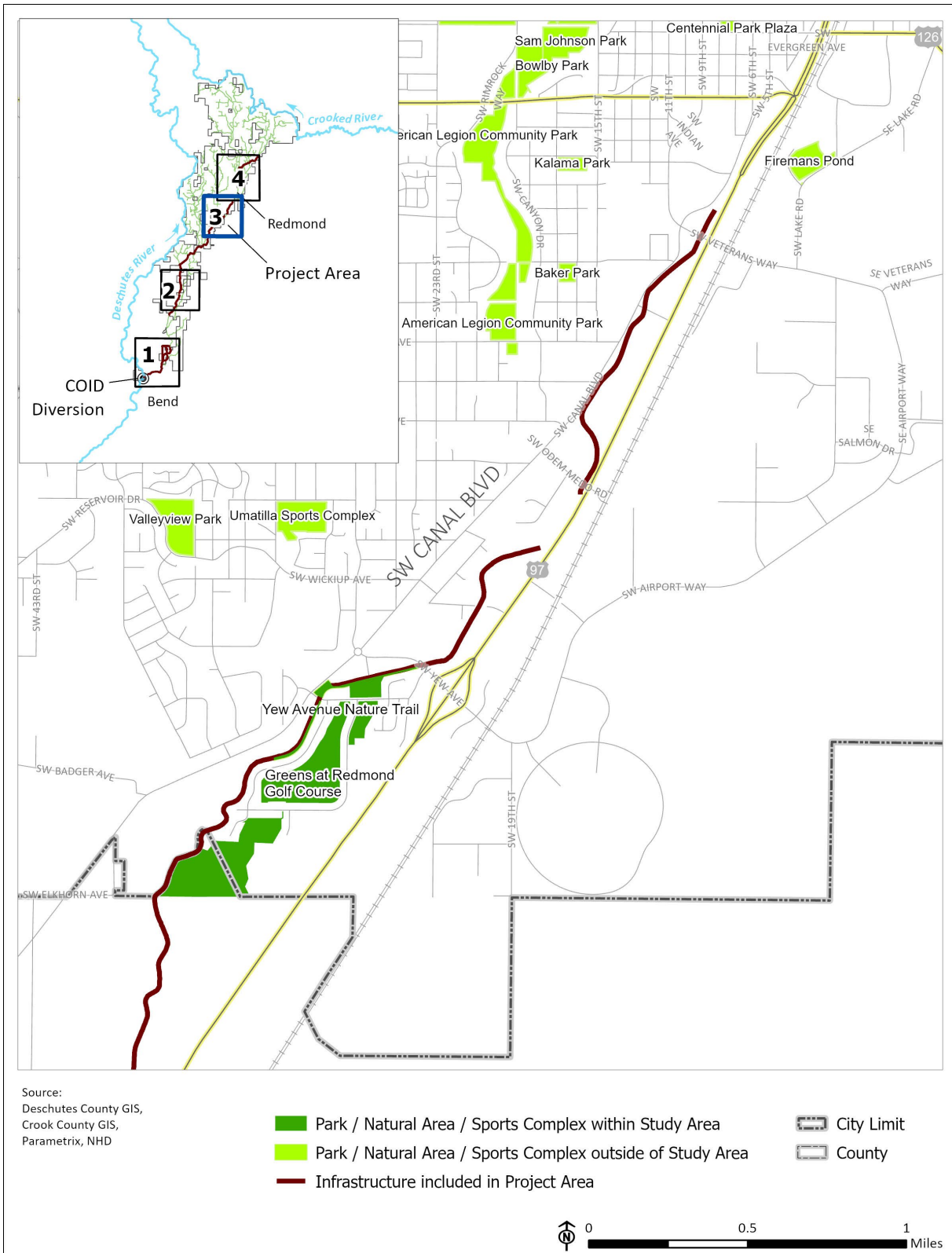


Figure 7. Existing Facilities – Tile 3



6. IMPACT ASSESSMENT METHODOLOGY AND DATA SOURCES

6.1 Long-Term Impact Assessment Methods

All identified park and recreational resources within the Project Area are evaluated for potential long-term impacts. Project design and engineering and anticipated acquisitions are evaluated alongside park property maps to determine potential physical impacts. Additional impacts to other topic areas such as visual resources, vegetation, wildlife, and noise are also considered. The analysis of long-term impacts considers the permanent conversion of park and recreation lands and facilities to irrigation uses and permanent changes that would either improve or decrease access to park and recreation facilities.

6.2 Short-Term Impact Assessment Methods

Short-term impacts are primarily related to the effects of construction during the PBC piping project that would be temporary in nature. These impacts may include changes in the accessibility of parks, noise or visual impacts that affect the aesthetic quality of park and recreation resources, or temporary reductions in park size, function, or availability during construction. Impacts may also occur due to detours or increased traffic due to construction disruptions, or the locations of construction staging areas on or adjacent to park and recreation facilities.

6.3 Indirect Impact Assessment Methods

Indirect impacts to park and recreation resources resulting from the Project include changes to the surrounding environment that may not have a direct impact on the resource, but could affect long-term access to, use of, or enjoyment of the resource. Assessment of these indirect impacts considers how the long-term changes resulting from the Project could influence noise, visual, or other factors affecting park, trail, and recreational facility use.

6.4 Cumulative Impact Assessment Methods

The cumulative impacts analysis addresses the long-term and short-term cumulative impacts of the project alternatives. Other projects considered in the analysis include major transportation, development, utility infrastructure, and environmental enhancement projects recently constructed, under development, or scheduled for construction, as well as the planned projects that are reasonably likely to be constructed.

7. ENVIRONMENTAL CONSEQUENCES

7.1 Long-Term Impacts

7.1.1 No Action Alternative

Under the No Action Alternative, there would be no conversion of park and recreation facilities to another use, and there would be no changes in access to park and recreation facilities.

7.1.2 Modernization Alternative (Full Piping)

Piping under the Modernization Alternative would remove the existing open canal that runs through or adjacent to several parks and recreation facilities in the Study Area.

Riverview Park

Riverview Park is within view of the PBC diversion at the Deschutes River. With the implementation of the Modernization Alternative, there would be a negligible long-term impact to the view from the park as the currently open canal point of diversion would be converted to an underground, piped facility. However, the view of the point of diversion is not a prominent feature of the park, and the park setting is currently surrounded by industrial uses and existing irrigation system infrastructure.

Canal Row Park

The existing PBC is located across from the North Unit Canal and canal access road from Canal Row Park. There would be a negligible long-term impact to the view of the canal from this park, as the visibility of the PBC from the park is currently limited. The North Unit Canal is located immediately adjacent to the park and is a more prominent visual feature.

Redmond-Bend Juniper State Scenic Corridor

The PBC crosses through the Redmond-Bend Juniper State Scenic Corridor. Piping of the canal would remove the view of the canal from the scenic corridor. However, as there are no existing formal trails or amenities in the area, long-term impacts from piping of the canal would be negligible.

Greens at Redmond

Piping of the PBC would alter the appearance of the existing canal adjacent to the west side of the golf course, which is currently advertised as a scenic amenity of the golf course. The Modernization Alternative would alter the setting of the golf course, by removing the canal as a visual resource and seasonal water feature which would have a long-term minor impact to the user experience of the facility. While the Project would remove the canal as a visual amenity, the golf course features other vegetation, landscaping, and water features that add visual interest to the course.

Yew Avenue Nature Trail

The Yew Avenue Trail runs adjacent to the existing PBC. Piping of the canal would alter the setting of the trail by removing the canal as a visual resource and seasonal water feature. A primary feature of the trail is its location immediately adjacent to the canal, as there is little vegetation and no other prominent

visual features along the trail's alignment. Removal of the canal would create a long-term moderate impact to the trail.

7.1.2.2 Deschutes County/North Bend Options

No Modernization within this Segment (No Piping)

Under this option, the PBC in this area would continue to function as an open canal, carrying irrigation water along its alignment during the irrigation season. At Yeoman Road, this option would require an energy dissipation structure to slow the flow velocity such that the existing open canal can function as currently designed. The location of the pond is currently undetermined; if it is located at the southeastern portion of the PBC intersection with Yeoman Road, it may impact the Lava Ridges Natural Area.

Pilot Butte Canal Alignment (Existing Canal Route)

Lava Ridges Natural Area

This option would pipe the canal in its existing alignment. Piping would remove and fill in the open canal running adjacent to the Lava Ridges Natural Area and the entirety of the 1-mile informal trail along this portion of the alignment. This would create a moderate long-term impact to the visual and aesthetic features of these park and recreation facilities, as the primary feature of the trail is its location immediately adjacent to the canal.

NE 18th Street Option

Lava Ridges Natural Area

Under the NE 18th Street alignment option, the historic section of the existing PBC would remain in its current state in this portion of its alignment, but it would no longer receive irrigation water from COID facilities. While the canal is currently dry outside of the irrigation season, this alternative would create a long-term minor impact by removing water from the canal on a permanent basis, altering the setting of the trail and natural area.

Rock Ridge Park, Sky View Middle School, and Lava Ridge Elementary School

The NE 18th Street alignment option would realign this section of the PBC, with irrigation water being carried through a buried pipeline adjacent to Rock Ridge Park, Sky View Middle School, and Lava Ridge Elementary School within NE 18th Street. The pipe would be located underground, and it would not have long-term noise, visual, access, or other impacts to these park and recreation resources.

Old Deschutes Road Option

Lava Ridges Natural Area

Under the Old Deschutes Road alignment option, the existing PBC would remain in its current state in this portion of its alignment, but it would no longer receive irrigation water from COID facilities. While the canal is currently dry outside of the irrigation season, this alternative would create a long-term minor impact by removing water from the canal on a permanent basis, altering the setting of the trail and natural area.

Ponderosa Elementary School

The Old Deschutes Road alignment option would realign this section of the PBC through a buried pipeline across Purcell Street from Ponderosa Elementary School. The pipe would be located underground, and it would not have long-term noise, visual, access, or other impacts to the school's recreation resources.

7.1.2.3 City of Redmond Options**No Modernization within this Segment (No Piping)**

Under this option, the PBC in this area would continue to function as an open canal, carrying irrigation water along its alignment during the irrigation season. At Dogwood Avenue, this option would require an energy dissipation structure to slow the flow velocity such that the existing open canal can function as currently designed. The location of the pond is currently undetermined; if it is located at the eastern portion of the PBC intersection with Dogwood Avenue, it may impact the Homestead Canal Trail.

Pilot Butte Canal Alignment (Existing Canal Route)***Homestead Park***

Piping within the existing PBC alignment would result in a long-term minor impact to Homestead Park. Piping would remove and fill in the open canal running adjacent to the park removing a visual and aesthetic feature of the park. However, the main feature of the park, the bicycle pump track, would remain as is.

Homestead Canal Trail

Piping within the existing PBC alignment would result in a long-term moderate impact to Homestead Canal Trail. Piping would remove and fill in the open canal running adjacent to the trail, removing the primary visual and aesthetic feature of the trail, as there is little vegetation or landscaping to provide visual or aesthetic interest along the alignment.

Piping to the East in the Watermaster's Access Road or Piping to the West within Northwest Canal Boulevard***Homestead Park and Homestead Canal Trail***

Both piping to the east in Watermaster's Access Road and piping to the west within NW Canal Boulevard would result in a long-term minor impact to Homestead Park and Homestead Canal Trail. While the canal structure would remain as is, piping of the PBC would permanently dewater the canal, removing a visual and aesthetic feature of the facilities.

7.2 Short-Term (Construction) Impacts**7.2.1 Modernization Alternative (Full Piping)**

For the Modernization Alternative and all piping options, construction activities would include vegetation clearing, trenching, equipment mobilizing and staging, and backfill of trenches after pipe installation. Blasting may be required in areas of shallow bedrock. Vegetation clearing would be minimized to the extent practicable, and reseeding would be completed after construction. Tree

removal would be avoided as much as possible and would only occur in instances when there is no other alternative to access the construction site, or if the tree poses a safety threat to construction crews or property.

Riverview Park

Construction impacts to Riverview Park would include visual and noise impacts from construction activities and equipment. No physical impacts to the park are anticipated during construction.

Canal Row Park

Construction impacts to Canal Row Park would include visual and noise impacts from construction activities and equipment. No physical impacts to the park are anticipated during construction.

Redmond-Bend Juniper State Scenic Corridor

Construction of the Modernization Alternative would occur within portions of the Redmond-Bend Juniper State Scenic Corridor, where the PBC crosses through the area.

Other construction impacts in the area would include visual and noise impacts from construction activities and equipment. As there are currently no developed trails or other recreation facilities within the parcels that make up the Corridor, no usage impacts are anticipated.

Greens at Redmond

Construction of the Modernization Alternative would occur immediately adjacent to portions of the Greens at Redmond golf course, including Hole 1 and Hole 11. Portions of the landscaping at these holes are within the 50-foot PBC easement and could be directly impacted during construction. Portions of the course could need to be closed during construction activities.

Other construction impacts to the golf course would include visual and noise impacts from construction activities and equipment.

Yew Avenue Nature Trail

Construction of the Modernization Alternative would occur immediately adjacent to the Yew Avenue Nature Trail. The trail alignment is within the 50-foot PBC easement and would be directly impacted during construction. The trail would be closed during construction activities along its alignment. The trail surface and access would be restored after the completion of construction.

7.2.1.2 Deschutes County/North Bend Option

No Modernization within this Segment (No Piping)

While the final location is yet to be determined, construction of the energy dissipation pond could restrict access to Lava Ridges Natural Area or portions of the trail. Other construction impacts to the natural area would include visual and noise impacts from construction activities and equipment.

Pilot Butte Canal Alignment (Existing Canal Route)

Lava Ridges Natural Area

Construction of this option would occur immediately adjacent to the Lava Ridges Natural Area and trail. The trail alignment is within the 50-foot PBC easement and would be directly impacted during

construction. The trail would be closed during construction activities along its alignment. The trail surface and access would be restored after the completion of construction.

Other construction impacts to the natural area would include visual and noise impacts from construction activities and equipment.

NE 18th Street Option

Rock Ridge Park, Sky View Middle School, and Lava Ridge Elementary School

Construction of the NE 18th Street alignment option would occur immediately adjacent to Rock Ridge Park, Sky View Middle School, and Lava Ridge Elementary School. Portions of the eastern edge of the park and school sports fields, including several trees, are located within the 50-foot construction buffer. These areas may be impacted during construction of this option.

Other construction impacts to the park and school would include visual and noise impacts from construction activities and equipment. Access to the park and school from NE 18th Street would be closed during construction. One parking lot at the school along NE 18th Street would be completely inaccessible during construction activities. This closure would primarily impact access to the baseball field at the northeast corner of the property.

Due to the need to complete construction during the non-irrigation season, construction activities would likely occur during the school year. COID could coordinate with the school district to determine how to minimize impacts to students and school staff.

Old Deschutes Road Option

Ponderosa Elementary School

Construction near the school would include visual and noise impacts from construction activities and equipment. Access to the park and school from Yeoman Road to the west would be removed during construction. Access from Yeoman Road to the east and from Purcell Boulevard would not be impacted during construction.

7.2.1.3 City of Redmond Option

No Modernization within this Segment (No Piping)

While the final location is yet to be determined, construction of the energy dissipation pond could restrict access to the Homestead Canal Trail. Other construction impacts to the natural area would include visual and noise impacts from construction activities and equipment. Other construction impacts to the trail would include visual and noise impacts from construction activities and equipment.

Pilot Butte Canal Alignment (Existing Canal Route)

Homestead Park

Construction of this option would occur immediately adjacent to Homestead Park. No physical impacts to the park are expected, but access to the park from NW Canal Boulevard would be closed during construction of this segment of the Project. There are no other vehicle access points to the park, and the park may need to be closed for the duration of construction, especially if the Homestead Canal Trail is closed as well. Other construction impacts to the park would include visual and noise impacts from construction activities and equipment.

Homestead Canal Trail

Construction of this option would occur immediately adjacent to Homestead Canal Trail. Portions of the trail alignment are within the 50-foot PBC easement and would be directly impacted during construction. The trail would be closed during construction activities along its alignment. The trail surface and access would be restored after the completion of construction. Other construction impacts to the trail would include visual and noise impacts from construction activities and equipment.

Piping to the East in Watermaster's Access Road

Homestead Park

Construction of this option would occur immediately adjacent to Homestead Park. No physical impacts to the park are expected, but access to the park from NW Canal Boulevard would be closed during construction of this segment of the Project. There are no other vehicle access points to the park, and it could be necessary to close the park for the duration of construction, especially if the Homestead Canal Trail is closed as well. Other construction impacts to the park would include visual and noise impacts from construction activities and equipment.

Homestead Canal Trail

Under this option, portions of the trail would be within the project alignment and would be directly impacted during construction. The trail would be closed during construction activities along its alignment. The trail surface and access would be restored after the completion of construction. Other construction impacts to the trail would include visual and noise impacts from construction activities and equipment.

Piping to the West in Northwest Canal Boulevard

Homestead Park and Homestead Canal Trail

Construction of this option would occur to the west of Homestead Park and Homestead Canal Trail. No physical impacts to the park or trail are anticipated. Access to the park and trail from NW Canal Boulevard would be closed during construction of this segment of the Project. There are no other vehicle access points to the park, and it could be necessary to close the park for the duration of construction, especially if the Homestead Canal Trail is closed as well. Visual and noise impacts from the close proximity of construction activities and equipment would occur.

7.2.2 Potential Off-Site Staging Areas

The construction contractor may use one or more off-site staging areas outside the Study Area to store or assemble materials that would then be transported by truck to the construction site. Off-site staging could occur with any of the alternatives. Whether, where, and how to use such sites would be the choice of the contractor; therefore, the actual site or sites cannot be known at this time. Given this uncertainty, detailed analysis of impacts is not possible at this time. It is assumed that because of regulatory and time constraints on the contractor, any site they choose would need to be already developed with road access. It is also assumed that the contractor would be responsible for relevant permitting or mitigation that could be required for use of a chosen site. The EIS identifies the types of impacts that could occur from off-site staging, based on the above assumptions. This analysis is not intended to "clear" any specific site, but rather to ensure disclosure of the general types of impacts.

The following types of impacts could occur from off-site staging:

- If off-site staging areas are selected in the future within or adjacent to parks and recreation sites, temporary disturbance of recreation use from construction activities would be likely.
- The same federal and local jurisdiction regulations for open space and recreation would apply to staging areas if they occur within park and recreation lands.

7.3 Cumulative Effects

This Project, when combined with other current or future projects is not expected to cause short- or long-term cumulative effects to park and recreation resources.

7.4 Compliance with Laws, Regulations, and Standards

7.4.1 Federal

7.4.1.1 Section 6(f) of the Land and Water Conservation Fund Act

A review of the Oregon Parks Land Ownership/LWCF Map Application indicated that there are no LWCF-assisted properties within the Study Area. Section 6(f) regulations likely do not apply to the Project.

7.4.2 State

7.4.2.1 Statewide Land Use Planning Goals

The Project would comply with the open space focus of Oregon Statewide Planning Goal 5, Natural Resources, Scenic and Historic Area, and Open Spaces, as well as Goal 8, Recreation Needs. The Project would not permanently reduce open space or inhibit the development of future recreation areas.

7.4.3 Local

7.4.3.1 Deschutes County

Comprehensive Plan

The Project is consistent with the Open Spaces, Scenic Views and Sites goals and policies of the Deschutes County Comprehensive Plan. No portion of the PBC falls within inventoried Areas of Special Concern. Existing and future trails along the PBC alignment support the policy to create a comprehensive system of connected open spaces.

Development Code

Open Space and Conservation

Portions of the PBC alignment fall within the Open Space and Conservation Zone, including those parcels that are a part of the Redmond-Bend Juniper State Scenic Corridor. Operation, maintenance, and piping

of existing irrigation systems operated by an irrigation district are uses permitted outright within the Open Space and Conservation Zone.

7.4.3.2 City of Bend

Comprehensive Plan

The Project is consistent with the Natural Features and Open Space goals and policies of the City of Bend Comprehensive Plan. The plan identifies irrigation canals as an example of “corridor or linear” open space that is found within the city. While piping of the PBC would remove the canal as a linear open space, the land above the piped canal alignment would remain a vegetated, undeveloped open space feature. Per Policy 2-10, the City would coordinate with COID to protect open space within the city.

Bend Park and Recreation District Comprehensive Plan

The Project would comply with the policies and planned projects within the Bend Park and Recreation District Comprehensive Plan. The plan includes policies to pursue easements along ditch rider roads alongside irrigation canals to provide east-west connections within the community. The planned Pilot Butte Canal Trail alignment runs adjacent to the PBC from north of Butler Market Road and north to the city limits and depends upon the formalization of an easement or use agreement so the community may use the trail. COID could coordinate with the Bend Park and Recreation District to ensure that the planned trail may still be constructed along its proposed alignment.

7.4.3.3 City of Redmond

Comprehensive Plan

The Project would comply with the City of Redmond Comprehensive Plan Recreational Needs goals, policies, and principles. The plan includes policies to utilize canals as recreation linkages for trails throughout the city and to coordinate with COID to provide a connected trail network; it also includes a principle that multiuse trails shall be provided adjacent to canals and laterals, subject to COID review and approval. Piping of the canal would create additional linear space that could potentially be used for a future trail alignment, dependent on an easement or use agreement from COID. COID could coordinate with the City of Redmond to determine whether the Project could allow for construction of future trails within their easements after completion of the piping project.

City of Redmond Citywide Park Master Plan

The Project would comply with the City of Redmond Citywide Park Master Plan. COID is identified as a recreation provider in the plan, which notes that the District has been supportive of utilizing canal ways for trail connections.

7.5 Conclusion

The PBC is in proximity or adjacent to many park and recreation resources in the Study Area. The canal acts as a visual and aesthetic amenity at these locations, and piping of the canal would remove this feature from these resources, creating long-term negligible to moderate adverse effects.

Temporary adverse impacts to some park and recreation facilities would occur due to ground disturbance of areas within the resources during construction. Additional temporary adverse effects to park and recreation resources would be caused by visual and noise impacts caused by nearby

construction activities and equipment, as well as impacts to access to resources caused by construction activities.

8. MITIGATION MEASURES

Mitigation of the removal of the PBC as a visual and aesthetic feature at park and recreation facilities could incorporate measures to enhance the ground above the buried pipe where the canal formerly ran, such as seeding with native plants or creating a trail along the alignment. For additional details, see the Visual Resources Technical Report.

Mitigation of potential construction impacts may include measures to reduce construction noise, limiting construction activities to certain times, and creating blasting plans. For more information on noise impacts and potential mitigation measures, see the Noise and Vibration Technical Report.

Nearby landowners and residents should be notified of all planned construction activities affecting parks and recreation areas. When there are impacts to access to park and recreation resources, an alternative route shall be determined and communicated with the public.

Any landscaping or vegetation removed from a park or recreation facility shall be replaced in kind at the conclusion of construction. Trails or other recreation amenity disturbed during construction shall be restored to their previous state upon completion of construction.

9. CONTACTS AND COORDINATION

No individuals or organizations were contacted as part of the preparation of this technical report.

10. PREPARERS

Name	Professional Affiliation	Education	Years of Experience
Cassandra Dobson	Parametrix	MURP, Land Use Specialization B.A. Political Science	6

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