2. DESCRIPTION OF ALTERNATIVES

2.1. DEVELOPMENT OF PROJECT ALTERNATIVES

The State Environmental Policy Act (SEPA) requires that an EIS evaluate a reasonable range and number of alternatives that could accomplish the project's purpose. A foundational basis for the development of alternatives is the purpose and need for the project that was used in gathering formal SEPA EIS scoping comments (see Section 1.7 in Chapter 1, Introduction).

The alternatives development process was also driven in part by the presence of a former dumpsite that lies beneath the 18.6-acre Pacific City Park. The former dumpsite is the subject of a King County-led investigation and feasibility study for clean up under the Washington State Department of Ecology's (Ecology) Voluntary Cleanup Program.

The work to identify and evaluate potential alternatives considered comments received in the formal SEPA EIS scoping process. The scoping process and comments are discussed in Appendix A. Additionally, the alternatives development work included coordination with several agencies and tribes.

For the project alternatives development process, the project team considered SEPA requirements, river hydraulics and geomorphology, Pacific City Park uses and park design, natural resources (such as wetlands and riverine habitats), dumpsite characteristics, utilities potentially affected in the project area, roadway and traffic analysis and design, and neighborhood character. The project team first developed project elements and concepts and then developed a draft framework for evaluating the concepts. The framework included evaluation criteria and a list of information needs to enable reasonable evaluation of various conceptual elements, some of which could then be advanced to SEPA alternatives to be analyzed in an EIS. The project team also gathered additional information on equity and social justice considerations included in the King County Equity and Social Justice Strategic Plan 2016–2022 to factor into evaluation of conceptual project elements.

Geomorphology is the study of landforms, with an emphasis on the processes responsible for their origin, evolution, and distribution across the landscape, including sediment movement in rivers.

To meet the project purpose and need, the project team determined that a setback levee and at least one floodwall would be needed. The project team also determined that the project would include replacing the City of Pacific's existing mobile pumping system in Government Canal with a new, permanent pump station in approximately the same location, with more capacity than the existing system. The new pump station would connect with a levee and floodwall(s) that would extend southward from the BNSF Railway bridge to Government Canal.

The project team developed four proposed action alternatives that incorporate the considerations described above and that would meet the project purpose and need under SEPA.

This EIS considers a no project action (Alternative 1: No Action) and the four action alternatives (Alternative 2: Riverward, Alternative 3: Middle East, Alternative 4: Middle West, and Alternative 5: Landward) for removing the existing levee, revetment, and HESCO barriers on the right bank of the White River and installing a new flood protection facility. All of the action alternatives would incorporate a new pump station to prevent flooding upstream along Government Canal, and the dumpsite beneath Pacific City Park would be remediated. Each action alternative is paired with a dumpsite waste cleanup option and a Government Canal pump station option to enable thorough analysis of the range of potential impacts that could occur. Any of the cleanup and pump station options may be paired with any of the new flood protection facility alternatives, except for Alternative 5. Only Cleanup Option D, full dumpsite waste removal, may be paired with Alternative 5. Details on the area layout and operational characteristics of various pump station options are provided in Appendix D, Government Canal Pump Station Alternatives Analysis Report. South of Government Canal, the pump station would connect to a flood protection facility maintained by Pierce County.

HESCO barriers are collapsible wire mesh containers lined with heavy-duty geotextile fabric and filled with sand.

2.2. Description of Project Alternatives

Table 2-1 lists the combinations of project components that comprise the EIS alternatives.

Table 2-1. Summary of Major Project Components Comprising the EIS Alternatives

Draft EIS Alternative	Flood Protection Facility Alignment	Dumpsite Cleanup Option	Government Canal Pump Station and White River Estates Stormwater Management Options
Alternative 1	No Action	A – No Action	No Change
Alternative 2	Riverward	C – Remove solid waste, with solid waste relocated on-site and off-site and cap	• Canal north bank pump station location • T fish screens • Three vertical submersible axial flow pumps • Rectangular wet pit intake structure • Side-hinged gate • White River Estates stormwater discharge to river via a small lift station after StormFilter treatment
Alternative 3	Middle East	B – Remove solid waste with off-site disposal and cap	• Canal north bank pump station location • Cone fish screens • Three vertical submersible axial flow pumps • Open bottom can intake structure • Sluice gate • White River Estates stormwater discharge to river via a small lift station after StormFilter treatment
Alternative 4	Middle West	C – Remove solid waste with solid waste relocated on-site and off-site and cap	• Canal north bank pump station location • T fish screens • Four submersible solids handling pumps • Rectangular wet pit intake structure • Top-hinged flap gate • White River Estates stormwater discharge to pump station wet well after StormFilter treatment
Alternative 5	Landward	D – Full solid waste removal with off-site disposal and clean backfill	• Canal south bank pump station location • Cone fish screens • Three vertical axial flowline pumps • Standard trench intake structure • Sluice gate • White River Estates stormwater discharge to river via a small lift station after StormFilter treatment

2.2.1. Alternative 1: No Action

A SEPA EIS requires analysis of a No Action Alternative, against which the effects of proposed action alternatives can be evaluated and compared. Under the No Action Alternative, the current level of flood protection provided by the existing right bank levee and revetment and the 5,740 feet of HESCO barriers would be maintained through support from the King County Flood Control District and continued operation of the mobile pumping system at Government Canal. The No Action Alternative assumes that no new infrastructure would be constructed. Figure 1-1 in Chapter 1, depicting existing conditions in the project area, also represents this alternative.

Maintenance and repair of the existing levee, revetment, and HESCO barriers would occur as needed to continue serving as a means of flood protection. The King County Department of Natural Resources and Parks, as a service provider to the Flood Control District, would continue to remove and replace the HESCO barriers at the Pacific City Park entrance and exit driveways each year to allow access to the park in the summer and to provide contiguous flood protection along the park perimeter in the wet season.

The existing mobile pumping system on Government Canal would remain in place, and the City of Pacific would continue operating this system. The system would likely be activated one or more times per wet season and run for a period of several hours to a few days each time it is activated. Frequent maintenance would be required to ensure the pumping system continues to function and perform adequately because the mobile pumping system was installed with the expectation that a larger-capacity, permanent pump station would ultimately be constructed in its place. This mobile pumping system does not have sufficient pumping capacity to prevent backwater flooding along Government Canal even when the White River is at less than a 100-year flood level.

No dumpsite waste would be removed or capped (see Section 2.2.2.4 later in this chapter). King County would work with Ecology to monitor and maintain the safety of the former dumpsite.

2.2.1.1. Area Layout and Uses

Listed below is a summary of the project area layout and any changes in major features currently in the project area under the No Action Alternative. Figure 1-1 in Chapter 1 shows the current flood protection facility alignment.

- HESCO barriers would remain in the existing configuration, with seasonal opening of gaps for park access when there is negligible potential for river flooding. Modifications to the HESCO barriers would be needed as they degrade over time, or comparable temporary flood protection measures would need to be installed, to maintain flood protection in the project area.

- The existing Pacific City Park configuration and park uses, and the open space where homes were purchased and demolished by King County to the northeast and south of the park in preparation for the project, would be retained.

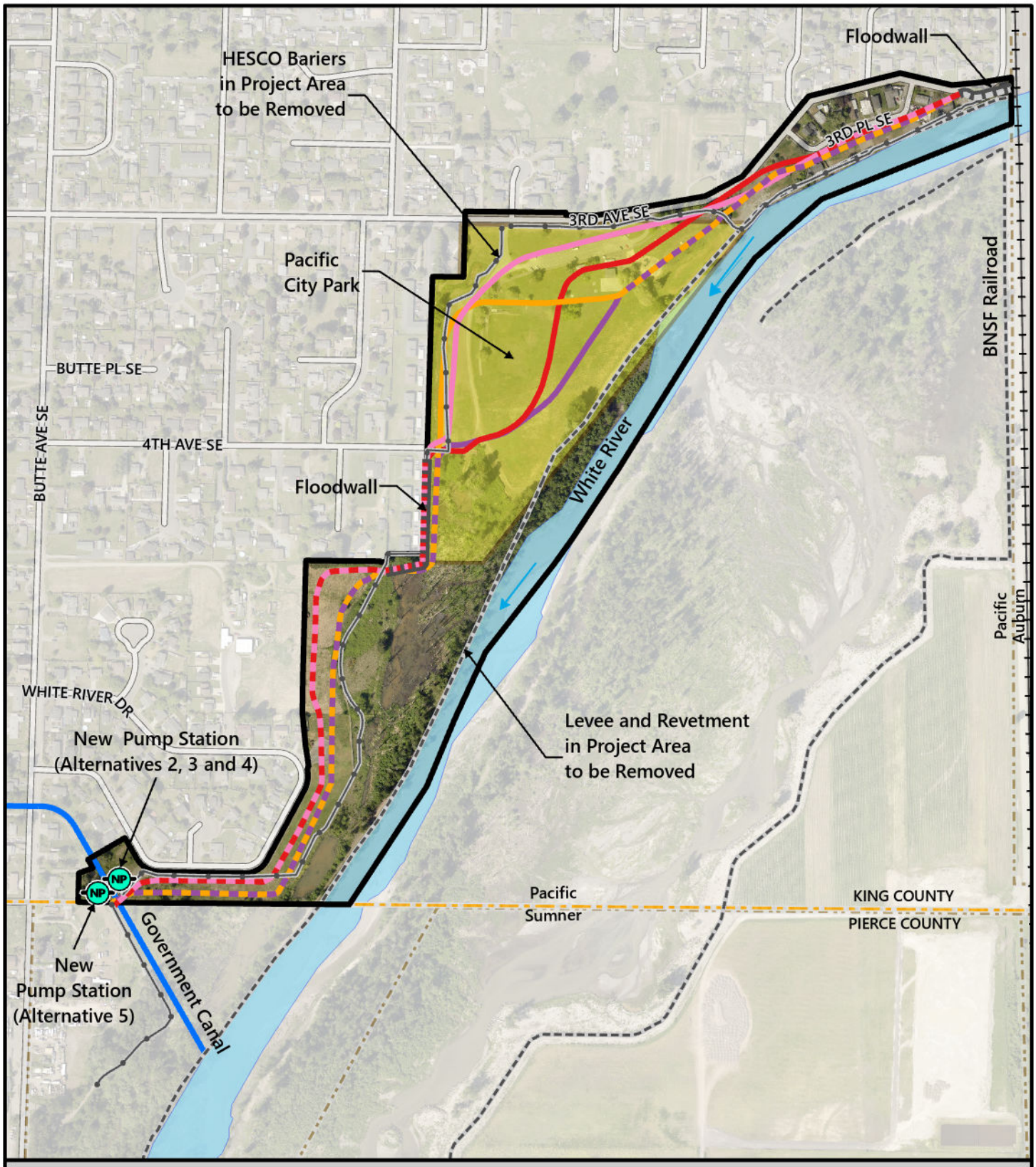
- Pacific City Park would be accessible to the public in the dry season (approximately May to October each year).
- No dumpsite waste would be removed.
- No actions to improve habitat would occur except those potentially resulting from mitigation associated with routine levee and revetment maintenance.
- Aggradation of the river channel and low-lying floodplain areas (via deposition of sediment carried in the flow from upriver) would continue, which would increase the frequency of flooding and thereby result in increased conversion of upland, non-wetland areas to wetland habitat in the long term, including some additional park areas.
- The existing mobile pumping system in Government Canal would remain in place.

2.2.2. Features Common to All Action Alternatives

Figure 2-1 shows the general alignment of a new flood protection facility under each of the action alternatives. Figure 2-2 shows a side-by-side comparison of each action alternative's footprint (the width of the facility and space it would occupy). The flood protection facility under all of the action alternatives would extend from the existing BNSF Railway embankment at the northeast edge of the project area to a new pump station on Government Canal at the south end of the project area. A culvert associated with the pump station would be installed in Government Canal; this culvert would include a floodgate and connect with a flood protection facility operated and maintained by Pierce County south of the canal (either the existing HESCO barriers located there or a new facility) to provide continuous flood protection across the county line.

A **culvert** is a structure that channels surface water past an obstacle or to channel an underground waterway. Culverts are typically embedded and surrounded by soil and made from a pipe, reinforced concrete, or other material.

Dumpsite waste would be removed and disposed of off-site and/or capped in place under any of the action alternatives in accordance with Washington State Model Toxics Control Act (MTCA) requirements (see Section 2.2.2.4). Methods for managing the dumpsite waste would differ under the various action alternatives. All dumpsite waste beneath and riverward of a setback flood protection facility would need to be removed and disposed of off-site, to ensure that the river cannot flood or erode waste in the future. Landward of a setback levee, the waste could be capped in place rather than removed.


HESCO Bariers
in Project Area
to be Removed
Floodwall
3RD PL SE
3RD AVE SE
Pacific
City Park
BNSF Railroad
BUTTE PL SE
BUTTE AVE SE
4TH AVE SE
Floodwall
White River
Pacific
Auburn
WHITE RIVER DR
New Pump Station
(Alternatives 2, 3 and 4)
Levee and Revetment
in Project Area
to be Removed
NP
NP
Pacific
Sumner
KING COUNTY
PIERCE COUNTY
New
Pump Station
(Alternative 5)
Government Canal
Legend
New Pump Station*
Alternative 2: Riverward Levee
Alternative 3: Middle East Levee
Alternative 4: Middle West Levee
Alternative 5: Landward Levee
Alternatives 2 and 4 Levees
Alternatives 3 and 5 Levees
Pacific City Park Area
Floodwall Common to All Alternatives
Floodwall Common to Alternatives 3 and 5
Rail
Levees and Revetments
HESCO Barriers
Government Canal
Project Area
County Boundary
City Boundary
*Pump station replaces an existing mobile pumping system
Figure 2-1.
Proposed Action Alternative Alignments.
Note: Alignments not to scale - for display purposes only
N
0
250
500
1,000
Feet
HERRERA
Science + Planning + Design
King County, Aerial (2019)
K:\Projects\Y2017\17-06520-000\ArcPro\EIS_Technical_Reports\PRB_EIS_Chapter2\PRB_EIS_Chapter2.aprx

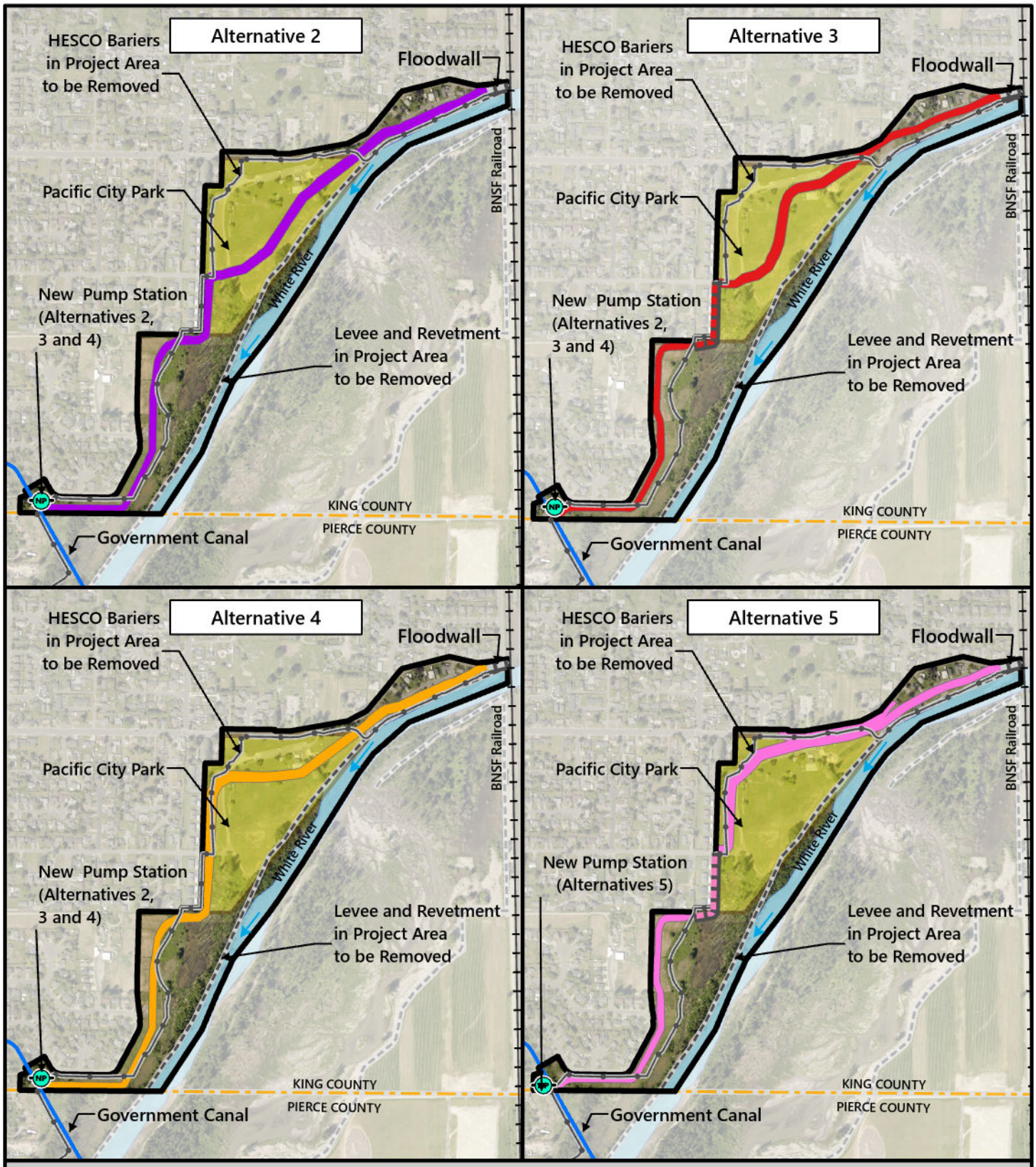


Figure 2-2.
Comparison of Action Alternatives Footprints.

2.2.2.1. Area Layout and Uses

Listed below is a summary of the project layout under the action alternatives and any changes in major features that are currently in the project area (see Figure 1-1 in Chapter 1).

- The excavation and construction process for removing the existing levee and revetment, managing dumpsite waste, installing the setback flood protection facility, and constructing the pump station would take 2 years to 5 years to complete depending on the alternative. The time needed to complete construction would be dependent mainly upon how much of the dumpsite waste would be removed in a careful, time-consuming process.

- Some project construction staging would take place within Pacific City Park, and the contractor would likely also use additional staging areas near the park for heavy equipment and materials storage, temporary construction office space, temporary worker restroom facilities, and other purposes. It is likely that the park would be closed to public access prior to construction work.

- All the existing HESCO barriers would be removed in the project area.

- The top elevation of the new flood protection facility would provide a level of flood protection similar to the Lower White River Countyline Levee Setback Project (Countyline Levee Setback Project) flood protection on the opposite side of the river.

- Dumpsite waste would be contained, disposed of, and/or capped via a method described in Section 2.2.2.4. All identified Dangerous Waste would be removed and disposed off-site at an approved facility.

- Floodplain habitats would be reconnected to the existing river channel, and riverine and riparian buffer habitat would be improved. Opportunities for habitat enhancement would be greater under action alternatives where the proposed flood protection facility alignment would be more landward (farther inland) from the existing riverbank.

- On the right bank of the river near what is currently the northeast edge of Pacific City Park, one or more areas of higher ground made from graded soil, wood, and/or rock would be added to encourage continued river flow into the Countyline Levee Setback Project floodplain area on the east side of the river. This would maximize the flood storage and environmental benefits provided in the Countyline Levee Setback Project area.

- The top of the setback levee would have a gravel surface for maintenance vehicle access. This surface would be usable for pedestrians (such as for walking or viewing the river) along the length of the levee. Figure 2-3 depicts the constructed levee and its accessibility for pedestrians.

- Pedestrian access to restored floodplain areas east of (riverward) the new levee would be available, although no pathways would be built in these areas. This is the same as for the Countyline Levee Setback Project area on the opposite side of the river.

- Areas riverward of the flood protection facility could be used for passive recreation (activities that do not require prepared facilities like sports fields). Areas landward of the setback levee could be designed for active or passive uses or a mixture of both.

- Some wetland habitat currently in Pacific City Park would be filled or displaced.

Figure 2-3. Example of a Pedestrian Path on Top of a Levee

2.2.2.2. Existing Levee and Revetment Removal

The entire 4,250-foot length of the existing river bank revetment and levee extending from the BNSF Railway bridge on the north to the King County-Pierce County boundary on the south would be removed—down to the existing river bed for the revetment and to the adjacent ground level for the levee. Prior to excavation, the edge of the river channel would be isolated from active flow in the river to prevent excavation work from harming fish and other aquatic species and to contain sediment-laden water generated by construction activity within the isolated area.

Excavators would most likely operate from the top of the river bank and reach downward along the bank to remove revetment and levee material. The large rock material in the revetment and levee could be salvaged for reuse elsewhere within the project area. The removed soil could potentially be stockpiled and reused for setback levee construction if it meets construction specifications for the setback levee embankment fill. Concrete panels used to armor the river banks adjacent to the revetment and levee would be encountered during excavation. Attempts would be made to remove as much of the concrete as possible, but aggradation in the river bed has likely made that difficult to accomplish. All of the excavated concrete debris and excess rock and soil material that cannot be reused within the project site would be loaded on trucks and hauled off-site.

2.2.2.3. New Government Canal Pump Station

Under all the action alternatives, a new pump station would be built to replace the existing undersized mobile pumping system; the pump station design would be incorporated into the overall project design. The pump station would prevent high river water levels from causing backwater that could lead to flooding along Government Canal, as was observed in 2009. In addition, the pump station would connect to the existing Pierce County flood barrier system or a future flood protection facility south of Government Canal in Pierce County. The pump station would include a flood gate that would close when the river water level rises close to an elevation that could cause overbank flooding along the canal. The pump station design would accommodate fish passage when the flood gate is open.

The pump station was originally planned to be a separate project implemented by the City of Pacific. However, a decision was made to include the pump station in this project because (1) the Flood Control District is providing funding for the new pump station design as well as the White River Pacific Right Bank Flood Protection Project, (2) the pump station would also need to be reviewed under SEPA if it were implemented as a separate project, and (3) the proposed pump station location coincides with the southern terminus of a new setback levee under all proposed action alternatives.

King County completed a pump station alternatives analysis to inform selection of preferred pump station features, such as pump operational attributes, culvert and flow control gate options, and fish screens. The analysis is documented in a report provided in Appendix D. Figure 2-4 depicts the anticipated size of a permanent pump station building adjacent to Government Canal.

The pump station would be designed to have a total pump capacity of 38,600 gallons per minute (gpm) (86 cubic feet per second [cfs]) using four pumps, each with a peak operating capacity of 9,650 gpm (21.5 cfs), which would be sufficient to prevent water from overtopping the banks of Government Canal between Butte Avenue SE and the pump station.

The pump station alternatives analysis also included options for collecting, treating stormwater to current standards (for pollutant removal), and discharging stormwater runoff from the White

River Estates neighborhood to the river. Two distinct configurations for stormwater management were evaluated:

- Treating the runoff and then routing it into the Government Canal pump station
- Treating the runoff and then pumping it over or through the new levee to the river using a small lift (pump) station that would be north of the Government Canal pump station.

Figure 2-4. Example of Pump Station Building Comparable to what Would Be Constructed at Government Canal

A large culvert with a gate(s) would be installed in Government Canal to allow closure of the culvert and subsequent activation of the pump station when the White River water level is running high. When the water surface elevation in the White River exceeds 74 feet (based on North American Vertical Datum 88) during a flood event, which happens occasionally during flood season, the flow control gate(s) would close.

An analysis of high river water levels, based on U.S. Geological Survey flow gage records (2010–2020) and using 2019 channel bathymetry conditions, indicates that under the action alternatives, gate closure to prevent flooding in Government Canal would occur on average 4.8 percent of the time during the flood season (October 1 through April 30) and 2.8 percent of the time during the juvenile salmon spring rearing period (February 1 through July 31) (Appendix D). Under 2019 bathymetric conditions, the analysis indicated that the gate at the pump station culvert would close when the flow rate in the river at R Street in Auburn is

approximately 5,000 cubic feet per second. Gate closure operations would be adapted over time as needed in relation to ongoing river channel aggradation, potential increases in flood flows due to climate change, and potential changes in Mud Mountain Dam operations. Pump intake pipes extending into Government Canal would include fish screens to prevent fish from being drawn into the pumps.

Government Canal Pump Station Options

Five pump station options were analyzed (see Appendix D); these options' features are summarized in Table 2-2. Although each action alternative is paired with a distinct pump station option, as described in Sections 2.2.3 through 2.2.6, any of the pump station options (2 through 5) could be constructed under any of the proposed action alternatives. Pump station option 5 would locate the station on the south bank of Government Canal, while options 2 through 4 would locate the station on the north bank of the canal. As described in the preceding paragraphs, each of the pump station options would include collection and treatment of stormwater runoff originating in the White River Estates neighborhood to current standards (for pollutant removal), with the treated stormwater runoff routed to the river via the new pump station or using a small, separate lift station located north of the Government Canal pump station. Potential impacts from the pump station options are discussed in Chapter 3, Existing Conditions and Potential Impacts and Mitigation.

Table 2-2. Summary of Government Canal Pump Station Options

Option	Location	Fish Screen	Intake Structure	Pump Type	Culvert/ Flow Control Gate	Stormwater Conveyance	Stormwater Treatment
1	**No Action**						
2	North bank	T-screen	Rectangular wet pit	Vertical submersible axial flow	Side-hinged gate	White River discharge via a small lift station	StormFilter
3	North bank	Cone screen	Open-bottom can	Vertical submersible axial flow	Sluice gate	White River discharge via a small lift station	StormFilter
4	North bank	T-screen	Rectangular wet pit	Submersible solids handling	Top-hinged flap gate	Wet well discharge	StormFilter
5	South bank	Cone screen	Standard trench	Vertical axial flowline shaft	Sluice gate	White River discharge via a small lift station	StormFilter

Regardless of the location and the various operational components, the pump station would be contained within a low-rise building comparable to the image shown in Figure 2-4.

2.2.2.4. Dumpsite Waste Removal, Containment, and Disposal

Waste from the former dumpsite located under present-day Pacific City Park would be removed and/or capped in place under any of the action alternatives. To meet the general requirements of MTCA, the selected remedy must satisfy the following criteria:

1. Protect human health and the environment.
2. Comply with cleanup standards (Washington Administrative Code [WAC] 173-340-700 through WAC 173-340-760).
3. Comply with applicable local, state, and federal laws (WAC 173-340-710).
4. Prevent or minimize present and future releases and migration of hazardous substances in the environment.
5. Provide resilience to climate-change impacts that have a high likelihood of occurring and severely compromising its long-term effectiveness.
6. Provide for compliance monitoring (WAC 173-340-410 and WAC 173-340-720 through WAC 173-340-760).
7. Not rely primarily on institutional controls and monitoring at a site, or portion thereof, if it is technically possible to implement a more permanent cleanup action.
8. Not rely primarily on dilution and dispersion unless the incremental costs of any active remedial measures over the costs of dilution and dispersion grossly exceed the incremental degree of benefits of active remedial measures over the benefits of dilution and dispersion. Determine the benefits and costs using six criteria established in WAC 173-340-360: Protectiveness, permanence, effectiveness over the long term, management of implementation risks, technical and administrative implementability, and costs.
9. Provide for a reasonable restoration time frame.
10. Use permanent solutions to the maximum extent practicable.

Cleanup options for managing the waste to satisfy MTCA requirements are similar for the various alternatives, while differing in the spatial extents of waste removal and/or capping based on the alignment of the setback flood protection facility. The cleanup options would also meet a specific MTCA requirement to classify different types of waste as "solid (or non-dangerous)" and "dangerous."

King County assumes that all solid waste and Dangerous Waste excavated beneath and riverward of a setback flood protection facility would be removed to 15 feet below the ground surface. Dangerous waste would be disposed of at an off-site facility licensed to accept that type

of waste. Excavated solid waste could either be retained on-site landward of a new levee and capped or disposed off-site at an approved facility. Three dumpsite waste cleanup options are evaluated in this EIS:

- Cleanup Option B would dispose off-site all excavated solid and Dangerous Waste and cap the remaining solid waste in place landward of the new levee. Depending on the capping technology, backfill landward of the levee could be up to 40 inches deep.

- Cleanup Option C would dispose off-site all excavated Dangerous Waste and relocate solid waste landward of the new levee. The solid waste landward of the levee would be capped. Backfilled and capped solid waste landward of the levee would not exceed the height of the levee and would maintain 3:1 side slopes.

- Cleanup Option D would remove all dumpsite waste to 15 feet below the ground surface and dispose all excavated dangerous and solid waste off-site. Areas landward of the new levee would be backfilled with clean material to existing grades.

Although each of the action alternatives are paired with a distinct waste cleanup option, as described in Sections 2.2.3 through 2.2.6, any of these options could ultimately be chosen under Alternatives 2, 3, and 4. Under Alternative 5, only Cleanup Option D (full removal) would be feasible. Impacts assessed for Alternatives 2 through 4 may change slightly if a different cleanup option were selected for each alternative flood protection facility alignment.

Dumpsite Waste Capping Options

The presumptive cleanup remedy for landfills recommended for CERCLA Municipal Landfill Sites is containment of waste on site and in perpetuity through technologies like capping (U.S. Environmental Protection Agency 1993). The project team assumed that certain areas landward of the setback flood protection facility would be capped where solid waste is left in place. The project team identified four different capping options (Table 2-3), each of which would provide protection to prevent exposure to humans, wildlife, and vegetation. All four capping options could be implemented with Cleanup Options B and C. Capping would not be necessary if all waste is removed under Cleanup Option D. Among the capping options, it is expected that the selected option(s) would be compatible with recreational uses of the areas landward of the setback flood protection facility, as is the case at other cleanup sites in Western Washington such as the Point Ruston multi-use development in Tacoma, on the site of a former Asarco Smelter, and the Cornwall Avenue Landfill in Bellingham.

Table 2-3. Dumpsite Waste Capping Options

Option	Description
Ballasted or Non-Ballasted Membrane with Vegetative Cover	Geotextile or composite drainage net placed over a geomembrane, potentially held firmly in place by a layer of quarry spalls (which are nominally 4-inch- to 8-inch-diameter quarry rock pieces, depth varies), and overlain by 1 foot to 2 feet of vegetated soil cover functioning as a drainage swale or cap area that might be saturated due to runoff or surface water conveyance.
Clean Soil Cover with Vegetation	Minimum 40-inch depth of vegetated clean soil cover, with an underlying indicator warning layer (for example, high-visibility snow fencing to warn future utility installation or excavation contractors against digging deeper).
Asphalt Concrete Pavement	Minimum 3-inch-thick asphalt concrete pavement underlain by aggregate base and 1 foot of foundation fill soil.
Concrete Pavement	Minimum 3-inch-thick concrete underlain by aggregate base and 1 foot of foundation fill soil.

2.2.2.5. Habitat Enhancement

The action alternatives would convert existing upland or wetland areas to floodplain or riparian habitat. Restored native floodplain and riparian forest vegetation and wood purposely placed along the river shoreline would improve habitat function, and removal of the existing revetment and levee would restore natural river processes and promote development of a functional floodplain that would have beneficial effects on vegetation, fish, and wildlife. Figure 2-5 depicts restored floodplain habitat adjacent to a new setback levee, at a future point in time when planted vegetation is maturing. All of the action alternatives would include design elements to encourage continued flow splitting into the Countyline Levee Setback Project across the river.

Figure 2-5. Conceptual Depiction of Restored White River Floodplain Habitat Riverward of a Setback Levee

2.2.2.6. Flood Protection Facility

Most of the length of the new flood protection facility would be an earthen levee, constructed primarily with compacted soil. The levee would have gradual slopes on the riverward and landward sides. The height of this facility would range between 4 feet and 12 feet above existing ground level, with the variation in height associated with differences in existing ground levels through the length of the facility and the differences in alignments under the action alternatives. The facility top (crest) elevation would contain the 100-year flood flow, with at least 3 feet of freeboard (additional height above the 100-year flood level) when construction is completed. The facility crest elevation would offer a comparable level of flood protection as the Countyline levee crest elevations. The crest of the levee would be flat, with gravel or other non-erodible surfacing material suitable for a truck to drive on for inspection and maintenance purposes. The driving surface would enable the levee crest to also serve as a pedestrian path.

In locations where the flood protection facility footprint needs to be minimized, the facility would be a floodwall, which would consist of a vertical reinforced concrete wall with a buried foundation. All of the action alternatives include a floodwall approximately 150 feet long at the northeast end of the project to connect into the existing tall railroad embankment, as depicted in Figure 2-6. The wall thickness above ground would likely be 1 foot to 2 feet. The floodwall height above ground would match the height of the adjacent setback levee it ties into.

Figure 2-6. Conceptual Depiction of Floodwall Connecting to Existing Railroad Embankment at Third Avenue SE and Skinner Road

2.2.2.7. Stormwater Management

Under all of the action alternatives, existing storm drainage systems in the northern part of the project area would be modified. An existing stormwater treatment pond at the northwest edge of Pacific City Park would be retained in place or shifted to a nearby location. A biofiltration swale that extends south of this pond would be retained under all of the action alternatives, but where the swale currently exits the southwest edge of the park, its flow would be conveyed in a pipe sleeved through the new levee. A gate or valve would be placed on the south end of this pipe to prevent flood water from flowing back through the levee into the swale to the north. The City of Pacific operates a temporary storm drainage pumping system when the river is running high to prevent flooding of Third Avenue SE and crawl spaces beneath homes at the northeast edge of the project area, close to its intersection with Skinner Road S. The project would be designed to enable this local drainage to be conveyed through the new floodwall, with a gate or valve on the south side of the wall that prevents river water from getting into the storm drainage system.

Storm drainage from the White River Estates neighborhood north of Government Canal is often compromised by high river water; therefore, the neighborhood drainage system would be modified in combination with the new pump station. The peak 100-year stormwater runoff from White River Estates is estimated to be approximately 1,800 gpm (4 cfs). As described previously for the new pump station, White River Estates stormwater runoff could be collected, treated to current standard, and either routed to the pump station or to a small lift station (a smaller, permanent pumping facility) and discharged over or through the levee to the White River.

2.2.3. Alternative 2: Riverward

Under Alternative 2, a new 5,020-foot-long flood protection facility (in total) would be built. It would be 200 feet landward from the current river bank through Pacific City Park. The flood protection facility alignment, including the setback levee footprint and setback floodwall components, is shown in Figure 2-7.

Northeast of the park, the new levee would be located between Third Place SE and the river bank, with Third Place SE and the utilities within the road right-of-way retained. At the southwest edge of the park, the new levee would fill in the western boundary of the large wetland. In the White River Estates neighborhood, the setback levee would be close to the edge of the large wetland, thus enabling creation of a permanent open space area between White River Drive and the levee.

This alternative would include the new pump station option 2 (see Table 2-2). Dumpsite waste would be managed using Cleanup Option C, as described in Section 2.2.2.4.

2.2.3.1. Area Layout and Uses

The following list summarizes the project layout under Alternative 2 and changes in existing major features in the project area.

- A new levee would be located approximately 200 feet landward (west) from the existing river bank, except where a floodwall would need to be much closer to the existing river bank at the northeast end.

- At the north end of the project site, the new levee would be located between the river bank and Third Place SE, which would enable the Third Place SE roadway to remain in its existing condition and existing utilities in the road right-of-way to remain in their current location.

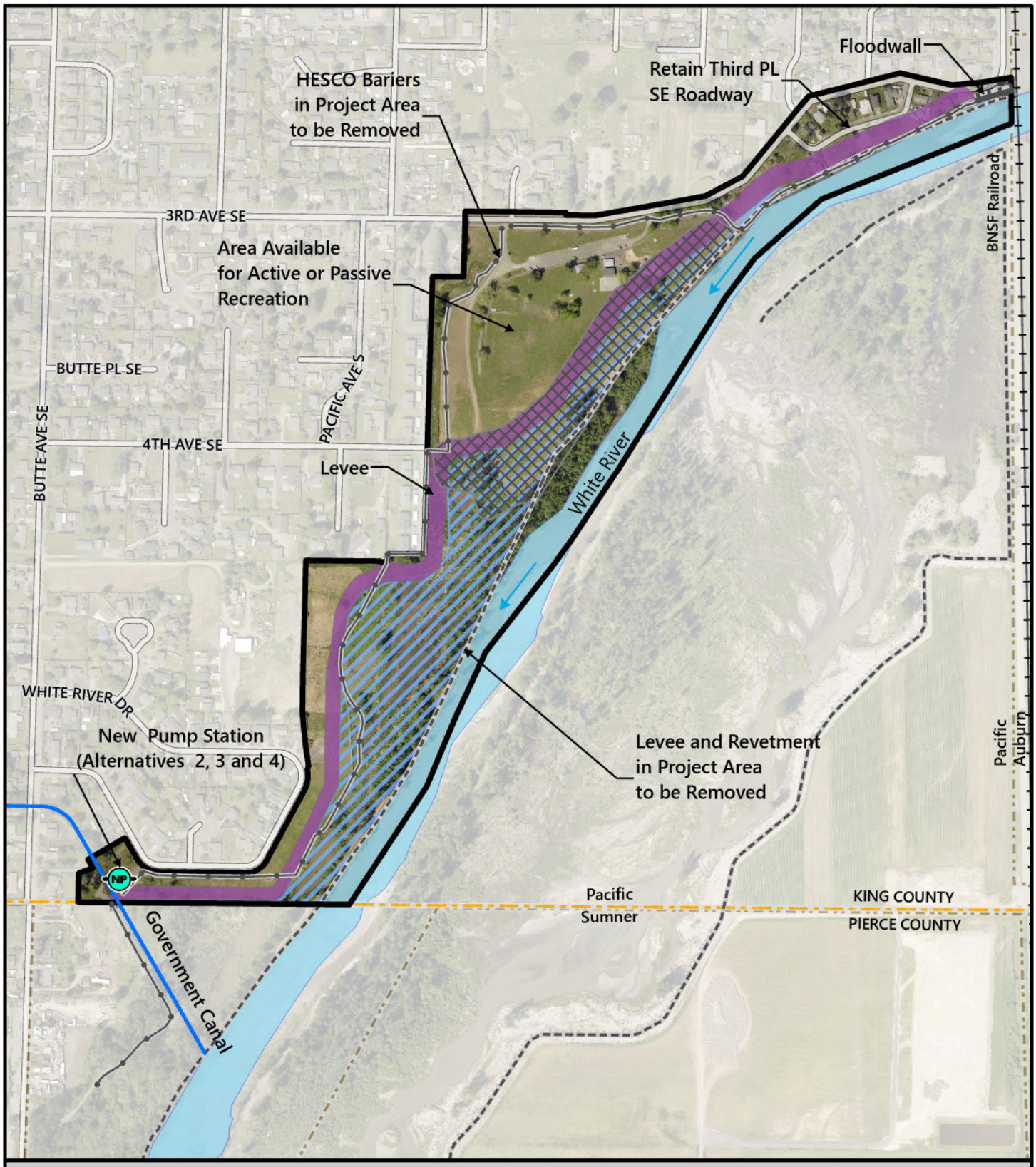
- The remaining area available for park use, approximately 11.5 acres, would be available throughout the year and the largest among the action alternatives. This equates to an increase of 7.4 acres that could be used for active recreation compared to what is currently available. This would be sufficient to allow for comparable active park amenities following construction such as currently exist at Pacific City Park. Riverward of the flood protection facility, the increased area available for passive use (in the form of floodplain and riparian buffer) would be the least among the action alternatives.

- After construction, the ground surface landward of the new levee in areas that are currently within the park would be similar to the top of the levee. This elevation gain would result from relocation of dumpsite waste and the installation of a 40-inch-thick cap on the dumpsite waste that would remain in place there. This would allow the ground to be drier than under existing conditions.

- Large events such as Pacific Days could be held in the area landward of the new levee, but there could be a need for off-site parking depending on the size of the event.

- The alignment of the new levee east of White River Drive would allow for potential recreational uses in the open space area between the levee and the street, such as a dog walking/play area.

- Opportunities for riverine and adjacent shoreline habitat improvement under Alternative 2 would be the least among the action alternatives. The floodplain area riverward of the new flood protection facility, from the top of the levee and floodwall, would provide approximately 19.6 acres, including riparian habitat, reconnected floodplain, and enhanced aquatic habitat.



Legend

- New Pump Station*
- Government Canal
- Dumpsite Clean-up Area: Riverward Footprint
- Project Area
- Alternative 2: Riverward Levee Footprint
- Floodwall Common to All Alternatives
- Rail
- Levees
- HESCO Barriers
- County Boundary
- City Boundary
- Restored Floodplain: Riverward Footprint

*Pump station replaces an existing mobile pumping system

Figure 2-7.
Alternative 2: Riverward.

N

0 250 500 1,000 Feet

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2.2.4. Alternative 3: Middle East

Under Alternative 3, a new 5,270-foot-long flood protection facility would be located midway through Pacific City Park, with a north-south segment relatively easterly toward the White River. The flood protection facility alignment, including the setback levee footprint and setback floodwall components, is shown in Figure 2-8.

Within the park, the new flood protection facility would be approximately 400 feet landward of the existing river bank. Northeast of the park, the new levee would be located on top of what is currently Third Place SE, thus eliminating most of the roadway that provides access to, and on-street parking for, several homes from their south side (see Appendix E, Design Criteria and Feasibility for Third Avenue SE Roadway Relocation Memorandum).

The northern toe of the levee would be located approximately 10 feet south of the Third Place SE road edge to allow for relocation of existing utilities in a maintenance access corridor between the levee embankment and private properties to the north. At the southwest edge of the park, a new floodwall segment would skirt the western boundary of the large wetland to minimize placement of permanent fill in the wetland that lies east of the facility. A walkway would be integrated into the floodwall design to enable through-access for pedestrians on the setback levee to the north and south. Farther south in the White River Estates neighborhood, the setback levee would be closer to White River Drive than under Alternative 2.

This alternative would include pump station option 3 (see Table 2-2). Dumpsite waste would be managed using Cleanup Option B, as described in Section 2.2.2.4.

2.2.4.1. Area Layout and Uses

The layout of the project under Alternative 3 and changes in major features currently in the project area are summarized in the list below:

- The segment of the new levee through Pacific City Park would be closer to the river than under Alternative 4 but farther from the river than under Alternative 2. A segment of the levee would be built in the current location of Third Place SE.

- Within the park, the flood protection facility would be between 200 feet and 800 feet landward of the existing river bank.

- The remaining area available for park use, approximately 8.7 acres, would be roughly rectangular in shape, available throughout the year, and longer in the north-south direction. This equates to an increase of 4.6 acres that could be used for active recreation compared to what is currently available. This would be sufficient to allow for comparable active park amenities following construction such as currently exist at Pacific City Park. This alternative would result in less remaining area landward of the flood protection facility than Alternative 2 and more than Alternatives 4 and 5. There would be more

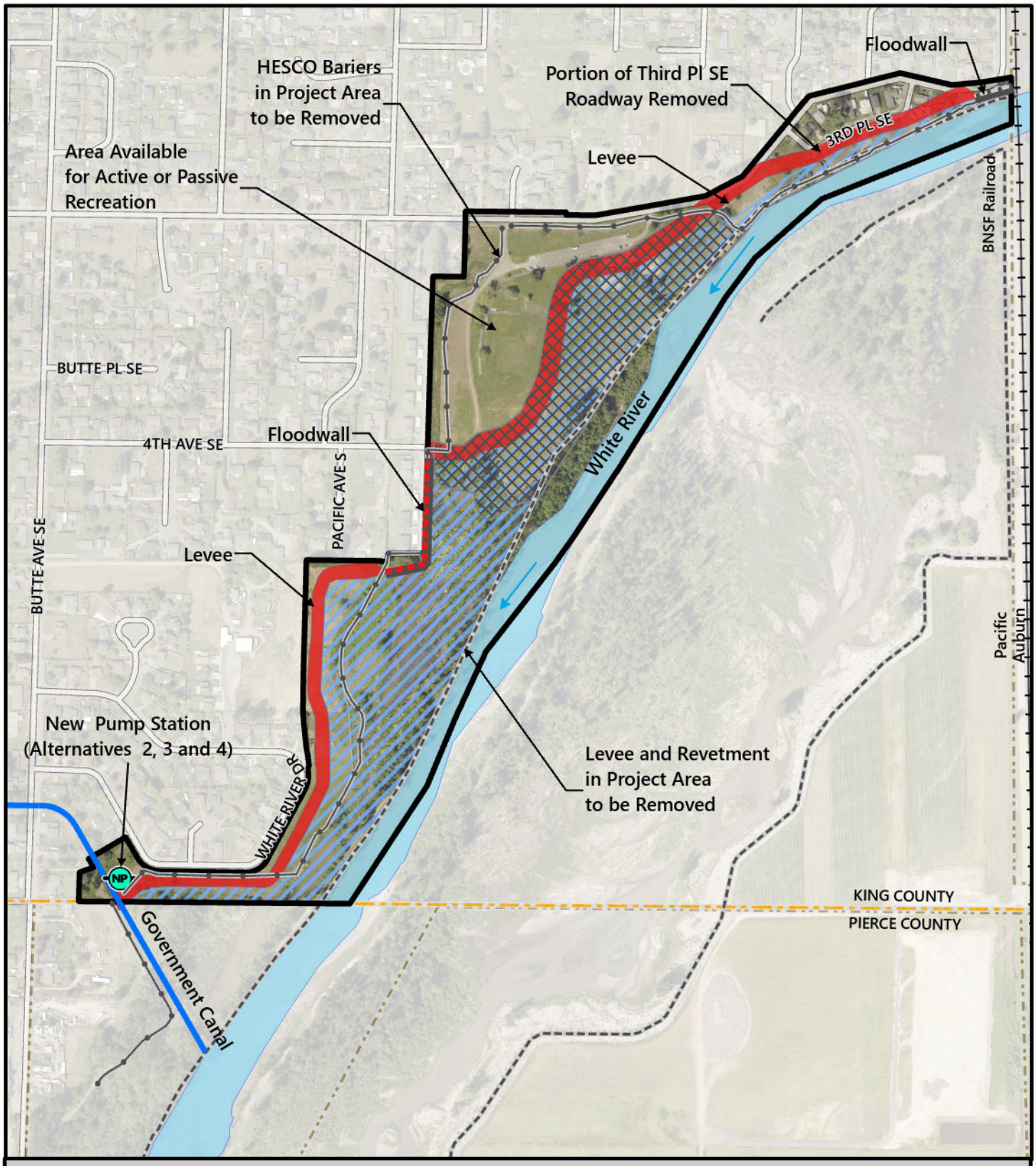
opportunities for passive recreation use than under Alternative 2 but less than under Alternatives 4 or 5.

- After construction, the ground surface landward of the new levee would be equal to or close to the elevation of the top of the levee as a result of relocating and capping dumpsite solid waste in those areas. The ground would be drier than current conditions.

- Some large events such as Pacific Days could still be held in the area landward of the new flood protection facility. Depending on the size of the event, it could be held in the area landward of the levee.

- In the south end of the project area, the new levee would be immediately east of White River Drive. The open space area in White River Estates would be limited to passive recreation along the top of the new flood protection facility. Opportunities for habitat improvement would be greater than under the No Action Alternative and Alternative 2, similar to Alternative 4, and less than under Alternative 5.

- The floodplain area riverward of the flood protection facility, from the top of the levee and floodwalls, would provide approximately 25.7 acres of riparian habitat, reconnected floodplain, and enhanced aquatic habitat. The floodplain with Alternative 3 would be expected to evolve, with riparian vegetation growth and floodplain channels forming over time, and could provide greater opportunities for passive recreation than the No Action Alternative and Alternatives 2 and 4.



Legend

- New Pump Station*
- Levees
- Government Canal
- City Boundary
- Project Area
- Alternative 3: Middle East Levee Footprint
- Floodwall: Alternative 3
- Floodwall Common to All Alternatives
- HESCO Barriers
- Rail
- Restored Floodplain: Alternative 3
- Dumpsite Clean-up Area: Alternative 3
- County Boundary

*Pump station replaces an existing mobile pumping system

Figure 2-8.
Alternative 3: Middle East.

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2.2.5. Alternative 4: Middle West

Under Alternative 4, a new 5,230-foot-long flood protection facility would be located midway through Pacific City Park, with a north-south segment located more westerly compared to Alternative 3, toward the western park boundary. The flood protection facility alignment, including the setback levee and setback floodwall components, is shown in Figure 2-9.

The project improvements northeast of the park would be the same as described for Alternative 2. The project improvements southwest of the park to Government Canal would be the same as described for Alternative 2, with the exception of a levee rather than a floodwall along Fourth Avenue SE.

This alternative would include Government Canal pump station option 4 (see Table 2-2). Dumpsite waste would be managed using Cleanup Option C, as described in Section 2.2.2.4.

2.2.5.1. Area Layout and Uses

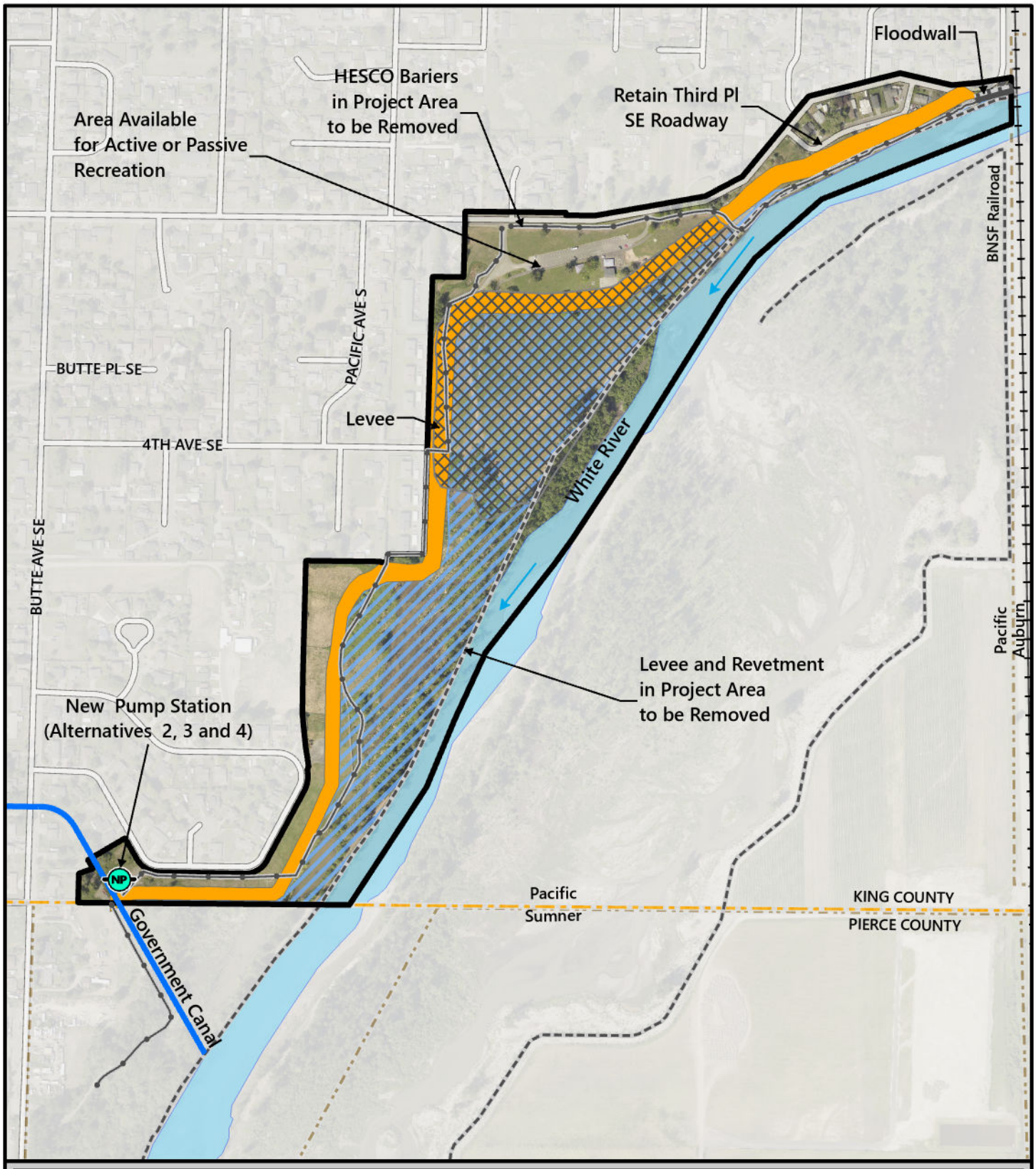
The layout of the project under Alternative 4 and changes in major features currently in the project area are summarized below:

- The segment of the new levee through the park would be farther from the White River than under Alternatives 2 and 3.
- Within Pacific City Park, the flood protection facility would be between 200 feet and 800 feet landward of the existing river bank.
- The remaining area available for park use, approximately 5.3 acres, would be roughly rectangular in shape and longer in the east-west direction. This equates to an increase of 1.2 acres that could be used for active recreation compared to what is currently available. This would be sufficient to allow for comparable active park amenities following construction such as currently exist at Pacific City Park. Alternative 4 would result in less remaining area than with Alternatives 2 and 3 and more than with Alternative 5. There would be more opportunities for passive use than under Alternatives 2 or 3 but less than under Alternative 5.
- After construction, the ground surface landward of the new levee would be a few feet higher than it is now in some or all of the remaining area. This would result from the installation of a 40-inch-thick cap on the dumpsite waste that would remain in place there. The space would thus be drier than current conditions.
- Some large events such as Pacific Days could continue to be held in the area landward of the new flood protection facility. Depending on the size of the event, large gatherings could be held in the area landward of the levee.

- In the south end of the project area, the open space area in White River Estates would be the same as under Alternative 2.

- Opportunities for habitat improvement with Alternative 4 would be similar to Alternative 3. However, permanent wetland impacts would also be greater with the inclusion of a new levee, which would have a much larger footprint than a floodwall, along the eastern and southern edges of the apartment complex parking lot south of Fourth Avenue SE.

- The floodplain area riverward of the flood protection facility, from the top of the levee and floodwall, would provide approximately 25.2 acres of riparian habitat, reconnected floodplain, and enhanced aquatic habitat. The floodplain would be expected to evolve, with riparian vegetation growth and floodplain channels forming over time, and could provide greater opportunities for passive recreation than the No Action Alternative and Alternative 2.



Legend

- New Pump Station*
- Government Canal
- Project Area
- Alternative 4: Middle West Levee Footprint
- Levees
- Floodwall Common to all Alternatives
- HESCO Barriers
- Rail
- Restored Floodplain: Alternative 4
- Dumpsite Clean-up Area: Alternative 4
- County Boundary

*Pump station replaces an existing mobile pumping system

Figure 2-9.
Alternative 4: Middle West.

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2.2.6. Alternative 5: Landward

Under Alternative 5, the new 5,360-foot-long flood protection facility would include a levee located on what is currently Third Place SE northeast of Pacific City Park, the same as under Alternative 3. Third Avenue SE would be rebuilt on top of the new levee on the north side of the existing park area, with roadway transitions to match the existing road surface to the east and west and to match existing driveways on the north side of Third Avenue SE. The new levee would coincide with what is currently the western park boundary, which would provide the largest possible floodplain area among the action alternatives. Landward of the new flood protection facility, 1.5 acres would remain and be available for small-scale active recreation use. At the southwest edge of the park, a new floodwall segment would skirt the western boundary of the large wetland, the same as described for Alternative 3. Farther south in the White River Estates neighborhood, the levee alignment would be same as described for Alternative 3.

The flood protection facility alignment, including the setback levee and setback floodwall components, is shown in Figure 2-10. This alternative would include Government Canal pump station option 5 (see Table 2-2). Dumpsite waste would be managed using Cleanup Option D, as described in Section 2.2.2.4.

2.2.6.1. Area Layout and Uses

The project layout under Alternative 5 and changes in major features currently in the project area are summarized below:

- Where the setback levee is aligned with Third Avenue SE, the roadway would be relocated atop the new levee, with gradual slope transitions to meet the existing roadway elevation to the east, west, and north at Spencer Court, and also to transition into existing driveways (a residence and the New Hope Lutheran Church) north of Third Avenue SE. Thus, the top width of the new levee would need to be wider where the roadway is positioned on top of the levee.

- Utilities in the Third Avenue SE right-of-way that would otherwise be buried under the new levee embankment would be relocated to the north edge of the right-of-way to be accessible for maintenance in the long term.

- The Alternative 5 project configuration at the northeast end and south end would be the same as under Alternative 3.

- Within the existing park area, the flood protection facility would be located approximately 800 feet landward of the existing river bank.

- A total of 1.5 acres of space would remain for park use landward of the new levee. This area would be accessible year-round. This equates to a decrease of 2.6 acres of area that could be used for active recreation compared to what is currently available. Alternative 5

would result in the least amount of area landward of the levee that could be available for active park uses, and the most opportunities for passive recreation uses of all the action alternatives.

- After construction, the ground surface landward of the new levee would be similar to as it is now because no dumpsite waste capping would be necessary.

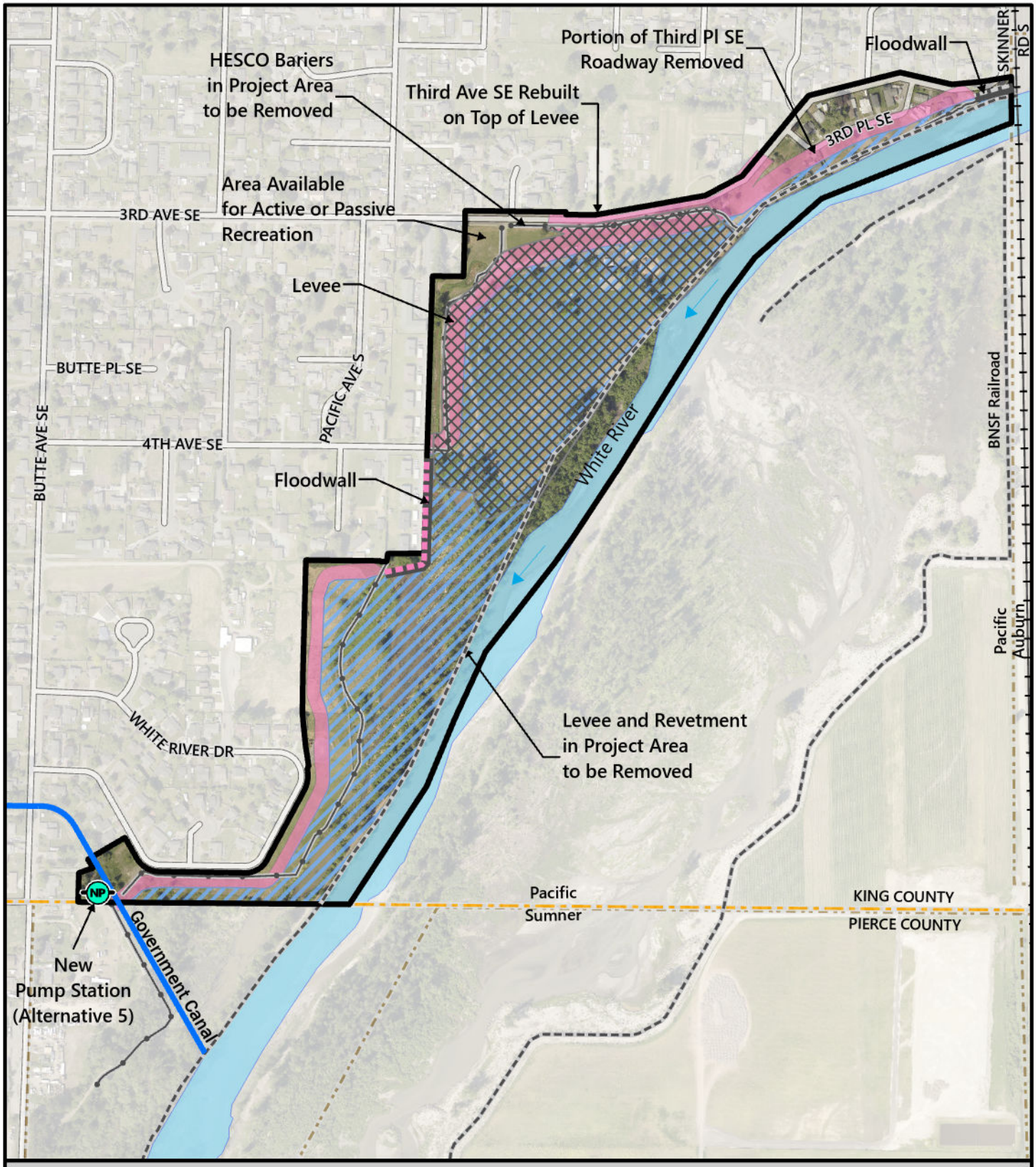
- With 1.5 acres available for active uses, property interests may be needed in order to allow for active park amenities under Alternative 5 within walking distance of the project area.

- Opportunities for habitat improvement and passive recreation use would be the greatest of all the action alternatives.

- The floodplain area riverward of the flood protection facility, from the top of the levee and floodwalls, would provide approximately 31.5 acres of riparian habitat, reconnected floodplain, and enhanced aquatic habitat, the largest of all alternatives. The floodplain would be expected to develop riparian vegetation and floodplain channels, and this transition could provide the greatest opportunities for passive recreation among the action alternatives.

- An existing stormwater pond in the northwest corner of the project area would need to remain or be replaced with a comparable facility; therefore, the setback flood protection facility alignment for Alternative 5 would skirt the eastern edge of the pond to enable it to remain in place. This alternative would not allow for park use in that existing pond location (the same as assumed with the other action alternatives).

- The new pump station would be located on the south side of Government Canal.



Legend

- New Pump Station*
- Project Area
- Alternative 5: Landward Levee Footprint
- Dumpsite Clean-up Area: Alternative 5
- Restored Floodplain: Alternative 5
- Government Canal
- Rail
- Levees
- County Boundary
- City Boundary
- Levees
- HESCO barriers
- Floodwall Common to all Alternatives
- Floodwall: Alternative 5

*Pump Station (Replaces existing Mobile Pump System)

Figure 2-10.
Alternative 5: Landward.

N

0 250 500 1,000 Feet

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2.3. Action Alternatives Benefits Summary

Table 2-4 summarizes benefits of the proposed project action alternatives for each element of the environment. Following are the key benefits:

- The project would substantially reduce the potential for White River flooding in Pacific.
- The project would enhance the ecological health of the river and its floodplain thereby supporting fish and wildlife and natural processes. The project would remove artificial floodplain fill and a failing revetment, reconnect the floodplain to the river channel, restore off-channel rearing habitat for threatened Chinook salmon, and create wildlife habitat.
- Pacific City Park, which was opened in 1972, sits atop a former dumpsite that was active from the 1920s through the mid-1960s. Under current conditions, local surface water and river flooding can inundate the park during the wet season, and there is the possibility that channel migration could erode into subsurface waste and cause pollution in the river. Addressing these risks would improve environmental conditions along the river.

Table 2-4. Potential Beneficial Effects of Proposed Project

Element	Beneficial Effects
Aesthetics, Light, and Glare	
All action alternatives	Removing existing HESCO barriers from the viewshed and creating an elevated recreation viewpoint on the new pathway spanning the length of the project area.
Air Quality	
All action alternatives	None identified.
Energy and Natural Resources	
All action alternatives	None identified.
Environmental Health	
All action alternatives	During operation, potential exposures to contaminants by the public, plants, and animals would be reduced for all action alternatives, because the waste would be removed from the project area, and/or reburied and covered with a protective cap.
Cultural Resources	
All action alternatives	None identified.
Geology and Soils	
All action alternatives	Reduced erosion potential from a modern, reliable flood protection facility designed to an appropriate level of geologic hazard mitigation.

Table 2-4 (continued). Potential Beneficial Effects of Proposed Project

Element	Beneficial Effects
Housing, Land, and Shoreline Use	
All action alternatives	Existing housing and land uses surrounding the project area would be enhanced by a reduction in flood risk.
Noise	
All action alternatives	Reduced noise from the removal of mobile pumping system at Governmental Canal and temporary pumps that have been deployed throughout the study area.
Public Services and Utilities	
All action alternatives	Decreased flooding on utility service and emergency response delays. Removing ongoing maintenance requirements associated with the existing HESCO barriers. Long-term effect on surface water due to the reduction of the potential for pollutants to enter the White River in stormwater runoff.
Park Use and Recreation	
All action alternatives	Creation of between ~11.5 to ~1.5 acres of land, depending on the alternative, which would be usable year-round for potential recreation, landward of the flood protection facility. Creation of a pathway spanning the length of the project area and possible connections to regional trails. Creation of a restored floodplain that would be available for passive recreation.
Transportation	
All action alternatives	Reliably preventing White River flooding, which would reduce time in which roadways are impassable.
Vegetation, Fish, and Wildlife	
All action alternatives	Habitat for native fish and wildlife in the project area would increase in quantity, diversity, and quality.
Water Resources	
All action alternatives	Reliably preventing White River flooding in Pacific and backwater flooding in Government Canal during high river flows along Butte Avenue SE and in residential areas north and south of the canal east of Butte Avenue SE.
Wetlands	
All action alternatives	Shifting of existing degraded depressional wetlands and buffers to a dynamic floodplain system would contribute to restoring natural floodplain functions in the White River watershed.

2.4. Construction Methods for the Action Alternatives

Defining the anticipated construction methods is important for determining impacts during construction of the action alternatives. The anticipated construction sequence would also contribute to potential impacts. Construction methods would be similar among the action alternatives. The sequence and timing of construction activities would be determined by the project proponent in conjunction with the contractor's plans for water management and for area isolation. Starts and stops may be needed to reduce costs, implement interim flood protection/work area isolation, and optimize dry construction conditions. In addition, a remedial option would be selected for dumpsite waste management.

Some elements of the setback flood protection facility would be constructed within Pacific City Park, and other elements would be constructed outside the park. Major elements would include an earthen levee, one or more floodwalls, a new Government Canal pump station, habitat improvements riverward of the new facility, and removal of HESCO barriers and the existing levee and revetment.

Because the former dumpsite footprint area underlies most of Pacific City Park, the excavation process for dumpsite waste removal/capping would need to occur before the existing river bank revetement and levee are removed and before most or all of the setback levee construction could occur amid the park area. Setback floodwall and levee construction to the north and south of the park could be occurring at the same time as the dumpsite waste excavation and capping work. Similarly, the new pump station could be constructed while dumpsite construction activity is occurring to the north.

Due to prevailing shallow groundwater conditions, excavation and handling of dumpsite waste would require dewatering, thus adding to the time required to complete this key part of the project. To expedite completion of dumpsite waste removal, construction would likely start early in a dry season and continue on a weekly and monthly basis until it is done. The work would proceed at a slower rate in the wet season due to wetter conditions and less daylight hours than in the dry season. To enable dumpsite waste removal work in the wet season when river flooding can occur, it is assumed that the contractor would place additional flood protection measures (such as HESCO barriers) atop the river bank along the east side of the park to prevent river water from inundating the active excavation work zone in the park.

Based upon these assumptions as well as the assumptions regarding how the contractor would sequence and carry out the work to excavate and dewater dumpsite waste, it is estimated that the following time frames would be needed to complete the dumpsite waste work:

- Alternative 2 – 13 to 16 months
- Alternative 3 – 16 to 23 months

- Alternative 4 – 21 to 31 months
- Alternative 5 – 28 to 38 months

Much of the other project construction work could occur while dumpsite waste excavation work is occurring, but some of it would have to wait, and some of the construction activities could only occur in the dry season. These activities would include removing the existing revetment and levee and excavating and grading new floodplain areas connected to the existing river channel. Completion of all project construction activities is estimated to take a minimum of 2 to 3 years (for Alternatives 2 and 3), 2.5 to 4 years for Alternative 4, and 3.5 to 5 years (for Alternative 5). The expected general methods and sequencing of construction activities are outlined in the following sections.

2.4.1. Dumpsite Waste Management and Flood Protection Facility

The sequence of construction activities would be determined by the construction contractor. A summary of the steps is provided below.

- Dumpsite waste excavation would take place in a grid pattern to allow wet excavation (due to shallow depth to groundwater) and work area isolation for water management, which would allow the contractor to verify that the work conforms with an Ecology-approved cleanup action plan.
- The existing river bank revetment and levee could be used to provide flood protection and work area isolation during this phase of construction.
- Best management practices required for construction would be determined during project design and permitting, including requirements for worksite isolation. Temporary flood protection barriers may be used along the river bank to provide flood protection during all or portions of the multi-year construction process.
- All excavated dumpsite waste material would be screened and then stockpiled in one of three ways, in accordance with the approved cleanup action plan:
    - Dangerous waste that is characterized for off-site disposal would be disposed of at an appropriate facility.
    - Solid waste that is characterized as exceeding MTCA cleanup guidelines could be used as on-site fill below a cap and landward of the flood protection facility.
    - Material that meets MTCA cleanup guidelines could be used as fill and/or cap material behind (landward of) the flood protection facility.

- Removal of the existing levee and revetment along the White River right bank under all of the action alternatives would occur in an isolated work area close to the river. It would not be possible to dewater the isolated work area before excavation of the levee and revetment begins. The contractor would isolate the work area amid the river bed and bank via use of "bulk bags" (similar to giant sandbags) or similar means.

- During White River low flow conditions when this work would occur, the predicted water depths during the summer construction period would be up to 4 feet in pools and average over 2 feet in the main channel near the right bank and less than 1.5 feet in the Countyline Levee Setback Project left bank floodplain channels (see Appendix B).

- The new Government Canal pump station would be built at the southern end of the project area. Construction methods would consist of the following:

    - Removal of the existing mobile pumping system

    - Clearing, grading, and excavating

    - Installing concrete pads, pumps, and associated facilities

    - Installing a new culvert in the canal, with work area isolation from flow in the canal as needed

- Levee construction would involve clearing the footprint area (if not already cleared for dumpsite waste removal), excavating beneath the levee footprint (if not already excavated for dumpsite waste removal), and placing specified soil material that would provide an inflexible foundation and core for the levee and would also limit water from seeping under the levee during high river flows. The proposed levee would be constructed laterally and above the core fill material, with a minimum top width of about 15 feet and 3:1 (horizontal to vertical) or flatter side slopes. The top of the levee would be surfaced with gravel for long-term maintenance vehicle access. The landward slope of the finished embankment would be planted with grass if it is intended to be used for active park space, or it could be planted with shrubs and trees if it is used for passive recreation or natural habitat. The riverward slope of the levee would be planted with native shrubs, trees, and groundcover vegetation that would provide fish and wildlife habitat benefits.

- Under Alternative 5, levee construction along Third Avenue SE would be similar, except that it would be wider to accommodate relocating the road atop the levee. Local traffic access would be maintained on Third Avenue SE while levee construction and utility relocation is occurring nearby, unless a viable traffic detour could be accomplished north of the New Hope Lutheran Church. Through-traffic would be detoured around the construction zone to the north, on First Avenue E, until the new levee construction is complete and the roadway on top of it is opened for traffic.

- Floodwall construction would involve excavating a wide trench, installing a foundation (likely made of reinforced concrete) in the base of the trench, and then installing the vertical wall (likely made of reinforced concrete) extending above the foundation.
- Upland pile-driving could be a technique used for construction of the floodwall(s).
- To the extent not already done for dumpsite waste removal, floodplain areas riverward of the new flood protection facility (including the existing levee prism and revetment) would be excavated and graded to create the floodplain ground surface.

2.4.2. Improved Habitat and Area Landward of the Levee

The following list summarizes construction methods for helping to improve fish and wildlife habitat and activities in the area landward of the levee.

- Habitat improvement features would be constructed riverward of the new flood protection facility and could include placed wood.
- Native vegetation would be planted on the riverward slope of the new levee embankment and could be planted on landward levee slopes and in the restored floodplain.
- Area landward of the new levee would vary in size between 1.5 and 11.5 acres and could be used for placement of active recreation amenities.

2.4.3. Equipment

Types of equipment used for project construction would likely include track-mounted excavators, excavator loaders, bulldozers, on- and off-road dump trucks, a crane(s), pile-driving equipment, pumps to manage groundwater and surface water (which could be run with electrical or diesel generators), water trucks, street sweepers, drill rigs, and lighting.

2.4.4. Haul Routes

The contractor would determine haul routes in accordance with any local restrictions, which would likely include traveling east-west along Third Avenue SE, north-south along Butte Avenue SE, and east-west along Stewart Road SW. Haul routes could also include north-south on Pacific Avenue S and then east-west on Ellingson Road to Interstate 5. Contractors typically obtain soil and rock fill material from nearby quarries. If the contractor obtains material from the closest quarry in Auburn, trucks might bring fill material from the quarry via Kersey Way SE to R Street SE, to 41st Street SE (which becomes Ellingson Road within Pacific), and travel south on Pacific Avenue S to the project area. The quarry in Auburn stages its trucks on Butte Avenue SE.

2.5. Options Considered But Not Carried Forward

King County considered the potential risks and benefits of other options, but concluded that they did not meet the purpose and need of the project. Those options that were considered but not carried forward are summarized below.

King County considered dredging the White River for flood control and determined that dredging is not a feasible option to carry forward and analyze in this EIS. Dredging would not meet the purpose and need of the project—to substantially reduce the potential for White River flooding in Pacific and to improve environmental conditions along this portion of the White River. Dredging would not provide a long-term flood protection solution because results of dredging could be undone quickly during a single high-flow event. In addition, dredging is detrimental to environmental conditions in the White River.

In evaluating potential flood protection facility alignments, consideration was given to an option that would site a new levee and/or floodwall at the top of the existing river bank for most or all of the project length parallel to the river. This option would not create the environmental improvements sought in the project's purpose and need, and it would cause greater flooding downstream of the project area by reducing the area available for flood storage within the project area. It was therefore not carried forward for this EIS.

In the southern end of the project area, consideration was given to an option that would build a floodwall along the northern bank of Government Canal instead of a pump station to provide sufficient flood protection for adjacent properties and roads. However, this type of facility configuration would not be able to prevent flooding of Butte Avenue SE and would not be sufficient to address anticipated future flood conditions. In comparison to the action alternatives carried forward, each of which includes a new pump station at Government Canal, this option was deemed to be clearly less able to satisfy the project's purpose to reduce flooding in Pacific.

King County also considered an option that would buy out and/or elevate the homes on more properties that are prone to flooding to the north, west, and southwest of Pacific City Park. While doing so would reduce the number of at-risk residents, thus reducing the potential harm caused by White River flooding, it would not prevent flooding of Third Avenue SE and other nearby roads and would thus not sufficiently reduce flooding that affects a large number of Pacific residents and visitors.

Several different remedial action technologies were screened and evaluated to eliminate technologies that are infeasible and/or could not meet key requirements. The technology screening process was based on a general assessment of the effectiveness (including overall protection of human health and the environment) and implementability (the technical and administrative feasibility of a technology). Remedial action technologies carried forward for further consideration included:

- Government/property controls
- Access restrictions

- Solid waste capping
- Solid waste excavation
- Flood protection to prevent erosion or transport of site contaminants

Remedial action technologies not carried forward after the initial screening phase included:

- Active groundwater pumping and treatment
- Soil binding with enzymes
- Solidification in place

2.6. Benefits and Disadvantages of Delaying the Proposed Action

No benefits were identified from delaying the proposed action.

The disadvantages of delaying the proposed action are listed below:

- There would be no reliable, long-term flood protection until the project is built. The HESCO barriers would be maintained but they are not adequate.
- There is a risk of increased flooding and channel migration into the park due to sediment aggradation in the White River. Channel occupation of the park would extend the duration, extent, and cost of dumpsite cleanup and providing long-term flood protection.
- The costs of construction would likely rise over time.
- Environmental conditions along the White River would not be improved.